



# Hong Kong, Are You IPv6 Ready?

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# The Reality



- Essentially, ISPs in HK cannot get new IPv4 addresses from APNIC anymore after getting their last /22 (for APNIC members only)
- Trading of IPv4 addresses may become active
- Cost of running IPv4 will inevitably become higher and higher as IPv4 addresses have to be consumed
- Deploying IPv6 is more about business survival
  - You may lose business if you do not support IPv6



# IPv6 in Hong Kong (1/3)



- HK is lagging behind the neighboring economies
  - But we are catching up
  - **We have progressed quite a lot after [IPv6World.Asia](#) Conference held in Nov 2009**
  - More and more people are aware of the IPv4 address space exhaustion issue



# IPv6 in Hong Kong (2/3)



- **Backbone ISPs:** Most can provide IPv6 transit service in HK
- **Business-Oriented ISPs:** Around 6 can provide IPv6 access service in limited scale
- **Residential Broadband ISPs:** None can provide IPv6 service yet but they have started trial
- **Mobile Operators:** All are testing out IPv6
- **Content Providers / Web Hosting Service Providers:** They are starting to realize the importance of IPv6



# IPv6 in Hong Kong (3/3)



- **Government Networks:** They are testing out IPv6 in big scale
  - **Most of Government websites are now IPv6 accessible!!!**
- **Universities:** All have IPv6 transport enabled but still need to do a lot of work on servers and other parts
- **One public IPv6 Tunnel Broker, Teredo and 6to4 Relays in HK providing free service (thanks to he.net)**



# IPv6 Readiness Among Universities in HK



IPv6 Status Survey

http://www.mrp.net/IPv6\_Survey.html

## Hong Kong Universities

Organisation (domain)	Web	Mail	DNS	NTP	XMPP
City University of Hong Kong ( <a href="http://cityu.edu.hk">cityu.edu.hk</a> )	PROBLEM	FAIL	0/3 0/3		
Hong Kong Baptist University ( <a href="http://hkbu.edu.hk">hkbu.edu.hk</a> )	FAIL	FAIL	0/2 0/2		
Lingnan University ( <a href="http://ln.edu.hk">ln.edu.hk</a> )	FAIL	FAIL	0/2 1/3		
The Chinese University of Hong Kong ( <a href="http://cuhk.edu.hk">cuhk.edu.hk</a> )	SUCCESS	FAIL	2/3 2/3	Stratum 2	
The Hong Kong Institute of Education ( <a href="http://ied.edu.hk">ied.edu.hk</a> )	FAIL	FAIL	0/5 0/5		
The Hong Kong Polytechnic University ( <a href="http://polyu.edu.hk">polyu.edu.hk</a> )	FAIL	FAIL	0/2 0/2		
The Hong Kong University of Science and Technology ( <a href="http://ust.hk">ust.hk</a> )	PROBLEM	FAIL	0/2 0/2		
The University of Hong Kong ( <a href="http://hku.hk">hku.hk</a> )	<a href="http://www.ipv6">www.ipv6</a>	FAIL	0/4 1/5	FAIL	



# IPv6 at HKIX



- CUHK/HKIX is committed to help Internet development in HK
  - HKIX is a good source of information about IPv6 development in HK
- IPv6 supported by HKIX since Mar 2004
  - Dual stack
- Today, 71 AS'es (out of ~153 AS'es in total) have their IPv6 enabled at HKIX
  - 35 AS'es in Nov 2009
  - Many were activated in the last 3 months
- Today, >4,400 IPv6 routes served by HKIX MLPA route servers
  - ~1,600 routes in Nov 2009
- Most Root / TLD servers at HKIX support IPv6 transport
- IPv6 total traffic is still < 1% when compared with IPv4 total traffic



# IPv6 Participants at HKIX



- Check the following links for the full lists:
  - <http://www.hkix.net/hkix/connected.htm>
  - <http://www.hkix.net/hkix/npconnected.htm>



# Other Observations



- People are now aware of APNIC's policy change of IPv6 initial allocation criteria
  - Getting independent IPv6 address space is not difficult
- Need TLD servers to support AAAA glue records and run IPv6 transport in order to have full IPv6 experience
  - **.HK – Done!**
  - **.ASIA – Done!**
  - Registrars' support is increasing
- Should not just do IPv6 for websites
  - Should also do IPv6 for mail services and all other services (such as NTP services e.g. [ntp.cuhk.edu.hk](http://ntp.cuhk.edu.hk))
  - World IPv6 Day should give us motivation



# Partners



## for IPv6 Activities in HK

- [Internet Society Hong Kong \(ISOC-HK\)](#)
- [Hong Kong Internet Exchange \(HKIX\)](#)
- [IPv6 Forum Hong Kong Chapter – Cyberport](#)
- [DotAsia Organisation](#)
- [Asia Pacific Network Information Centre \(APNIC\)](#)
- [Hong Kong Internet Service Providers Association \(HKISPA\)](#)
- [Hong Kong Internet Registration Corporation \(HKIRC\)](#)
- [OGCIO, HKSAR Government](#)



# IPv6 Activities in HK by ISOC-HK & Partners



- Dec 2007 – APNIC IRME & IPv6 Training
- Feb 2008 – IPv6 Working Group formed under ISOC-HK
- Jun 2009 – APNIC IRME & IPv6 Training
- Nov 2009 – IPv6World.Asia Conference and APNIC IPv6 Technical Workshops
- Feb 2010 – IPv6World.Asia Talk: Security Issues Arising from IPv6 Deployment
- Mar 2010 – ISOC-HK/IET Talk on IPv6
- Apr 2010 – INET Asia (IPv6 half-day session)
- Apr 2010 – IPv6 Directory Launched ([www.ipv6world.asia](http://www.ipv6world.asia))
- Jun 2010 – APNIC IPv6 Training
- Aug 2010 – APNIC IRME & IPv6 Training and Remote Participation to APNIC 30 Policy Development held in Gold Coast
- Feb 2011 – APRICOT-APAN.Asia 2011 Conference (IPv6 as one of the main themes)
- 3 Jun 2011 – IPv6 Talk at Science Park
- **8 Jun 2011 – World IPv6 Day x IPv6World.Asia**



# IPv6 HK



## Website Directory

- Launched in April 2010 at INET Hong Kong:
- [www.ipv6world.asia](http://www.ipv6world.asia)
- Help you test out local IPv6 connectivity with local websites



# IPv6 Policy of CUHK



- Endorsed by IT Policy Committee of CUHK
  - Campus-Wide IPv6 Deployment as CUHK's IT direction
- Implementation led by ITSC
  - Backbone is already IPv6 ready (dual-stack)
  - Main public-facing services implemented first
    - DNS, Main Websites and NTP services are done
    - Mail services and other services to be done
  - Support other departments
    - Selection of H/W, S/W and equipment
    - Implementation guidelines and configuration templates are being set up
    - Training



# You can help push IPv6 to happen faster



- In fact, turning on IPv6 is not very difficult
  - Most updated equipment and software support IPv6
  - Just turn it on and run dual stack
  - Not much extra cost, if running dual stack
  - It just takes a bit of effort and time
  - **But beware of possible security issues**
- When replacing old equipment and software, make IPv6 as mandatory requirements
- If your providers or vendors are not 100% ready, FORCE them to be 100% ready immediately!
  - Should favor providers and vendors which have started IPv6 earlier



# Innovation & Creativity



- The huge address space of IPv6 can help facilitate better innovation and creativity in HK
  - Think about each and every powered devices in your home (e.g. toaster, rice cooker, water boiler, DVD player, TV and radio, refrigerator, air-conditioner, washing machine, microwave oven, door camera and even light bulb) can have a unique public IPv6 address and you can control or communicate with it from all over the world
- It is limited by your imagination only
- But do NOT forget about the security part!!!



**Hong Kong  
is slowly  
getting ready  
for IPv6!**