

Securing Future Growth: Getting Ready for IPv6 NOW!

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Singapore

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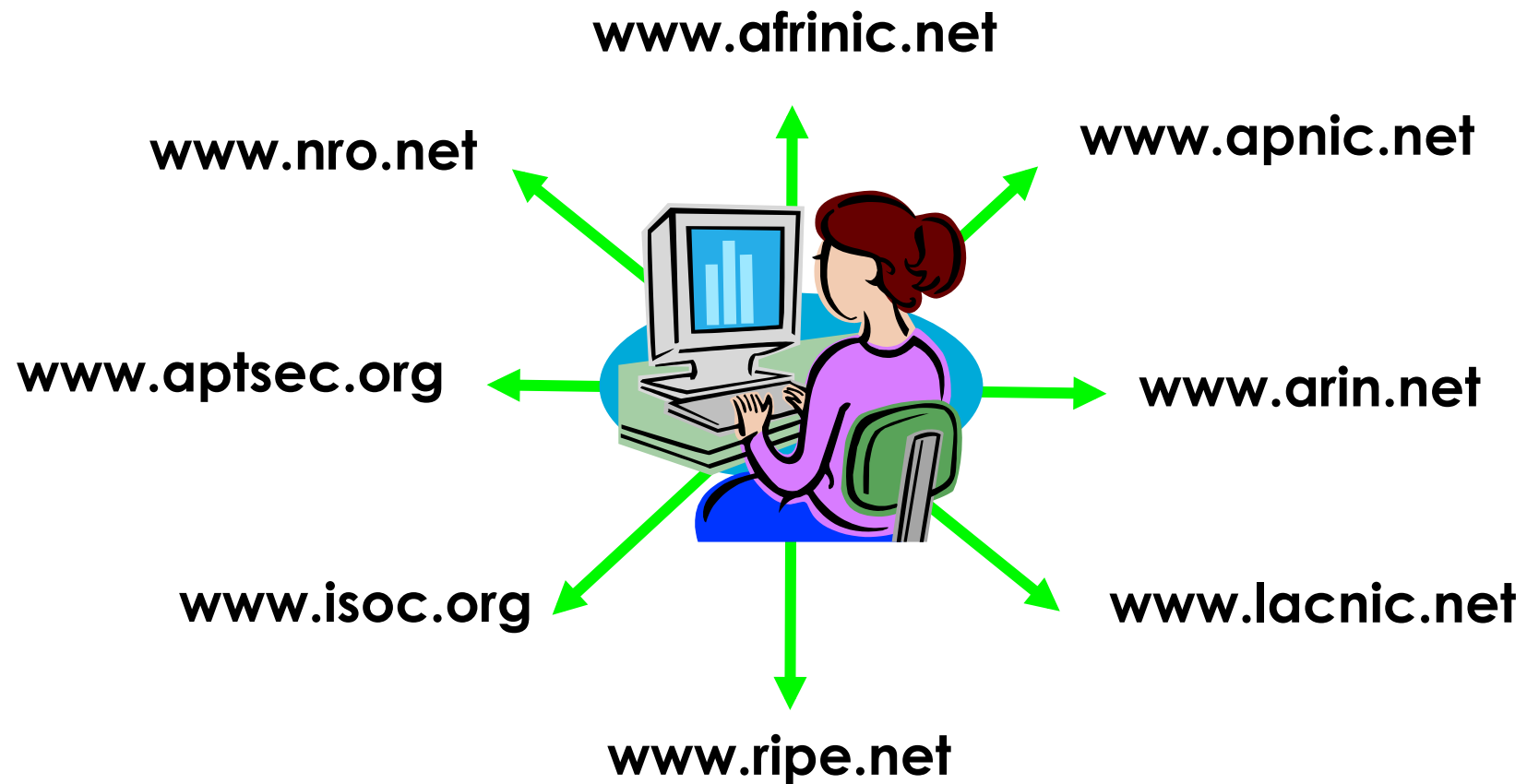
Senior IPv6 Program Specialist, APNIC



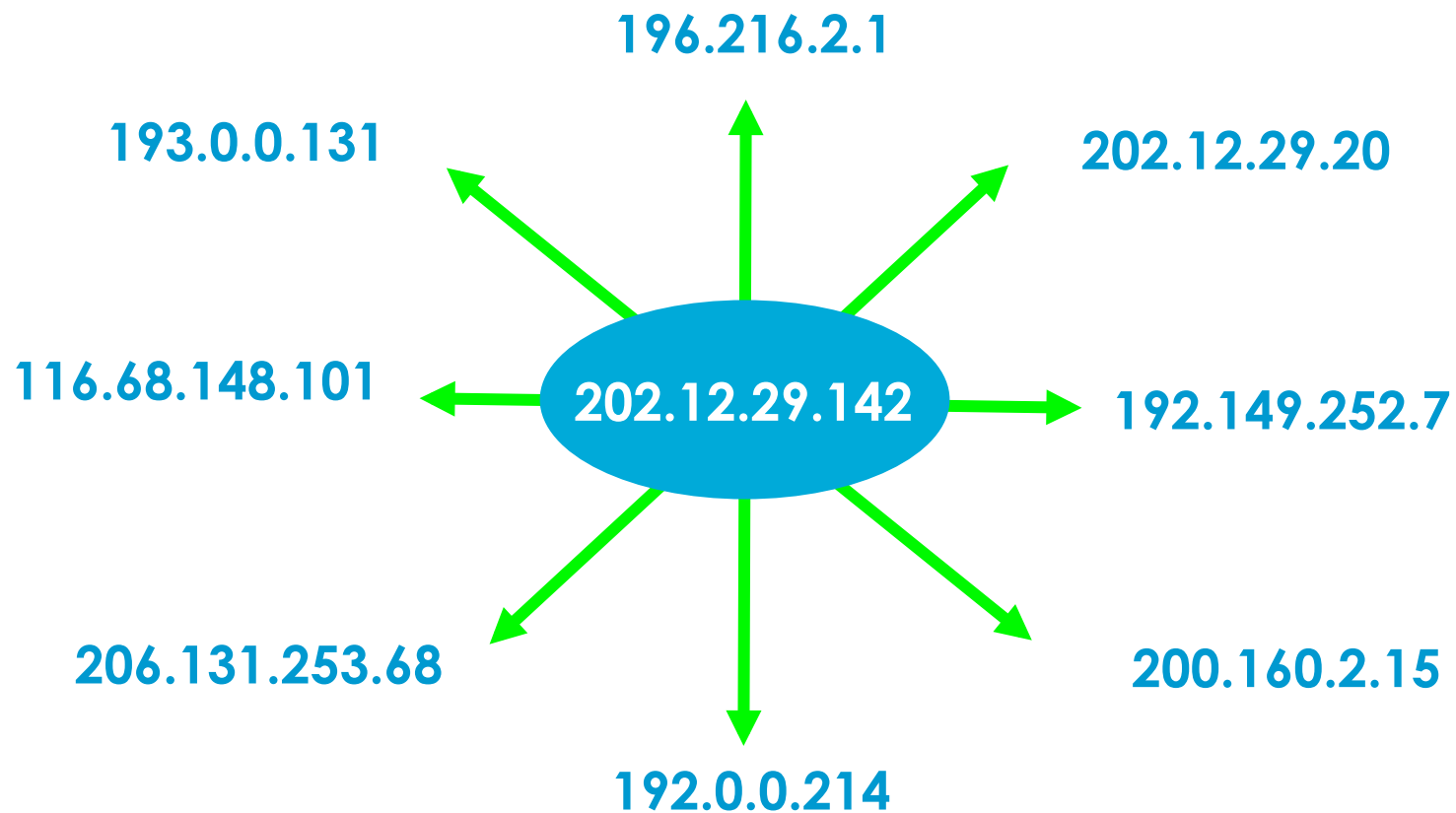
About Internet Protocol (IP)

- On the Internet you are nothing but IP addresses
 - Not same as a domain name
 - Packets, addressing and routing
 - Two types: IPv4 and IPv6
 - Every device directly connected to the Internet needs a unique IP address
 - IP address space is finite

On the Internet, you are nothing but an IP address!



On the Internet, you are nothing but an IP address!



About Internet and APNIC

- The Internet: a global system of interconnected computer networks
 - Internet Protocol (IP) provide connectivity
 - IPv4 and IPv6 = Internet resources
- Regional Internet Registries (RIR)
 - Asia Pacific Network Information Centre (APNIC)
 - Open membership-based industry bodies
 - Non-profit, neutral, and independent
 - Internet resource allocation, registration and other services such as training, supporting infrastructure, community cooperation



IP Addresses: IPv4 vs. IPv6

IPv4	IPv6
Deployed 1981	<i>Deployed 1999</i>
32-bit address 192.149.252.76	128-bit address <i>2001:DB8:0234:AB00:0123:4567:8901:ABCD</i>
Address space $2^{32} = \sim 4,000,000,000$	Address space <i>$2^{128} = \sim 340,000,000,000,000,000,000,000,000,000,000,000,000,000,000$</i>
Security, autoconfig, QoS, mobility added later (IPSec etc)	Security, autoconfig, QoS <i>“built-in” (IPSec etc)</i>
Reached the final /8: April 2011	<i>Projected lifetime: Indefinite</i>

Impact of IPv4 address exhaustions

- Immediate impact
 - ISPs will no longer be able to obtain IPv4 addresses from APNIC
 - Survive for a short time of period with their own pool
 - Business continuity of ISPs and other Internet multi-stakeholders in question
 - Need to find alternative source for IPv4 addresses
 - No sustainable alternative options
- Prolonged impact
 - Difficulties to maintain sustainable Internet growth
 - No more new entries to the Internet market place
 - Impediment of further technological development

Why do we need IPv6

- IPv6 is the only viable option we have now
 - Much larger address space than IPv4
 - Enable sustainable growth of the Internet
 - Possibilities of emergence of new technologies
- More non-computing devices, and mobile devices connecting to the Internet
 - Ever increasing always on end users using global IP addresses

What does this mean to all of us?

- Internet industry is facing a biggest challenge; the biggest since inception of the Internet
- Internet **multi-stakeholders** need to transit to IPv6
 - Including Domain Name Registries and Registrars
 - ISPs need to provide IPv6 connectivity to their customers
 - Content providers must provide reachability via IPv4 and IPv6
 - To maintain global competitiveness, governments need support industry to deploy IPv6

What TLDs need to do?

- Ability to accept AAAA records for their domain name servers - glue records
- Name resolution over IPv6
 - Adapt DNS software applications allow:
 - Domain name resolution with IPv6
 - Accepting incoming connections (both UDP and TCP as appropriate) over IPv6
 - Network infrastructure ready for IPv6 transport:
 - Router configuration, firewall and IPv6 transit etc.
- Ability to access administrative tools
 - web, WHOIS, EPP, etc. over IPv6

IPv6 Readiness of Registrars

- People and organizations connecting to the Internet after mid 2011:
 - May find difficulty in obtaining IPv4 global addresses:
 - It may require more complicated technical adjustments to penetrate multiple NATs
 - It could be more expensive
 - IDNs and new gTLDs will push for more IPv4 addresses
- They may need to use IPv6 to access to the Internet
- Are registrars ready for such challenges?
 - How can you/we support them in transitioning to IPv6?

Your services are only available via IPv4...

LOG IN Username / Customer# Password Create Account | Forgot Password? AUD empty

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Per year pricing	2 years	3 years	5 years	10 years

User with IPv4 address only

User with IPv4 and IPv6 address



Your services is only available via IPv4...

LOG IN Username / Customer# Password Create Account | Forgot Password? AUD empty

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Services General Pricing International Pricing Bulk Pricing

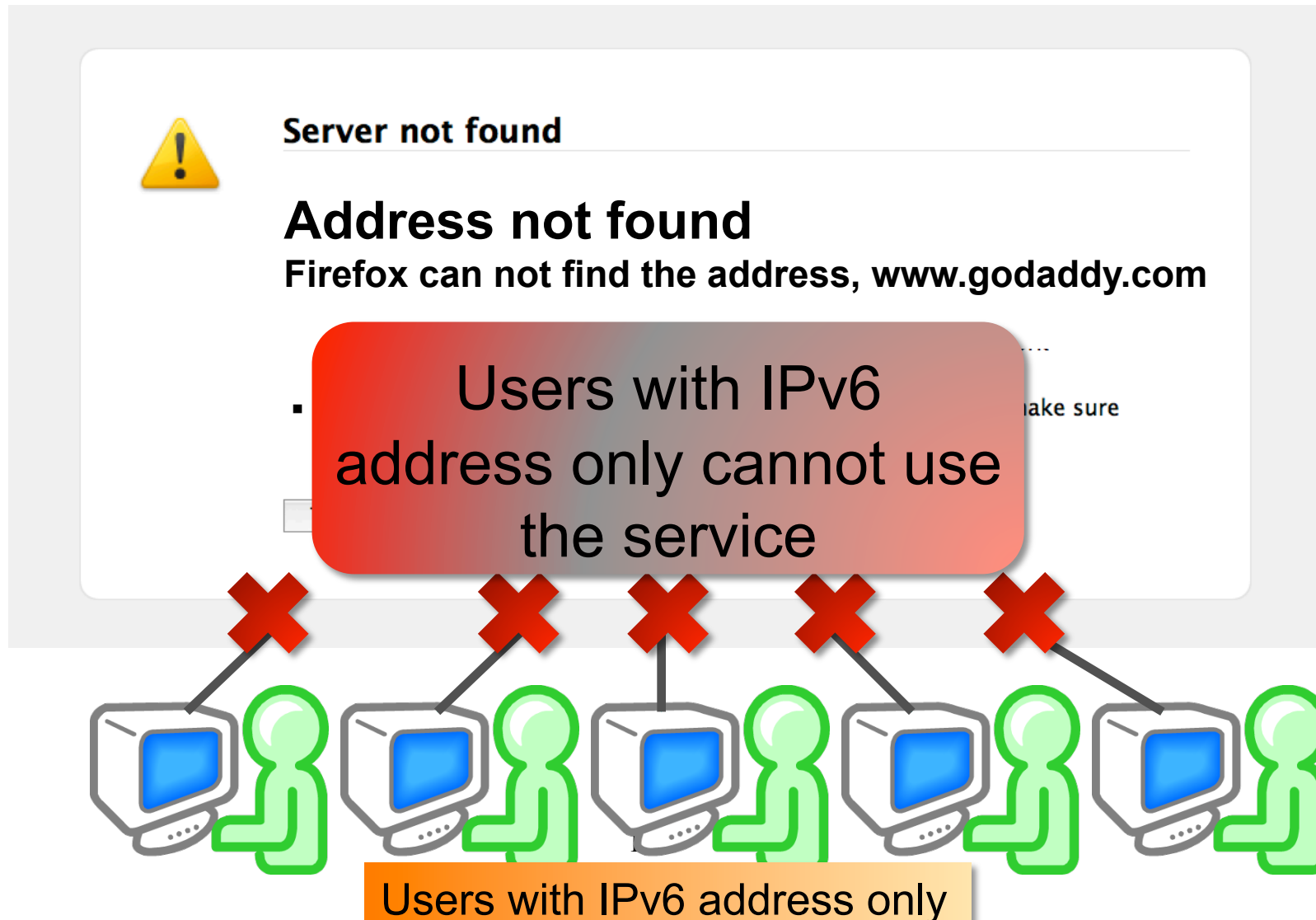
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User with IPv4 address only User with IPv4 and IPv6 address



If your site is not ready for IPv6...



Mobile devices and smart phones!!



Users with IPv6 address only



Today's speakers

- Represent Internet multi-stakeholders
 - Mun Yuen Leong
 - Infocomm Development Authority of Singapore
 - Hideo Ishii
 - Pacnet
 - Joe Waldron
 - Verisign
 - Martin Levy
 - Hurricane Electric

IPv6:

A prerequisite to the sustainable long-term development of a ubiquitous and open Internet

Thank you!

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