

# Securing Future Growth: Getting Ready for IPv6 NOW!

ICANN41, 23<sup>rd</sup> June 2011

Singapore

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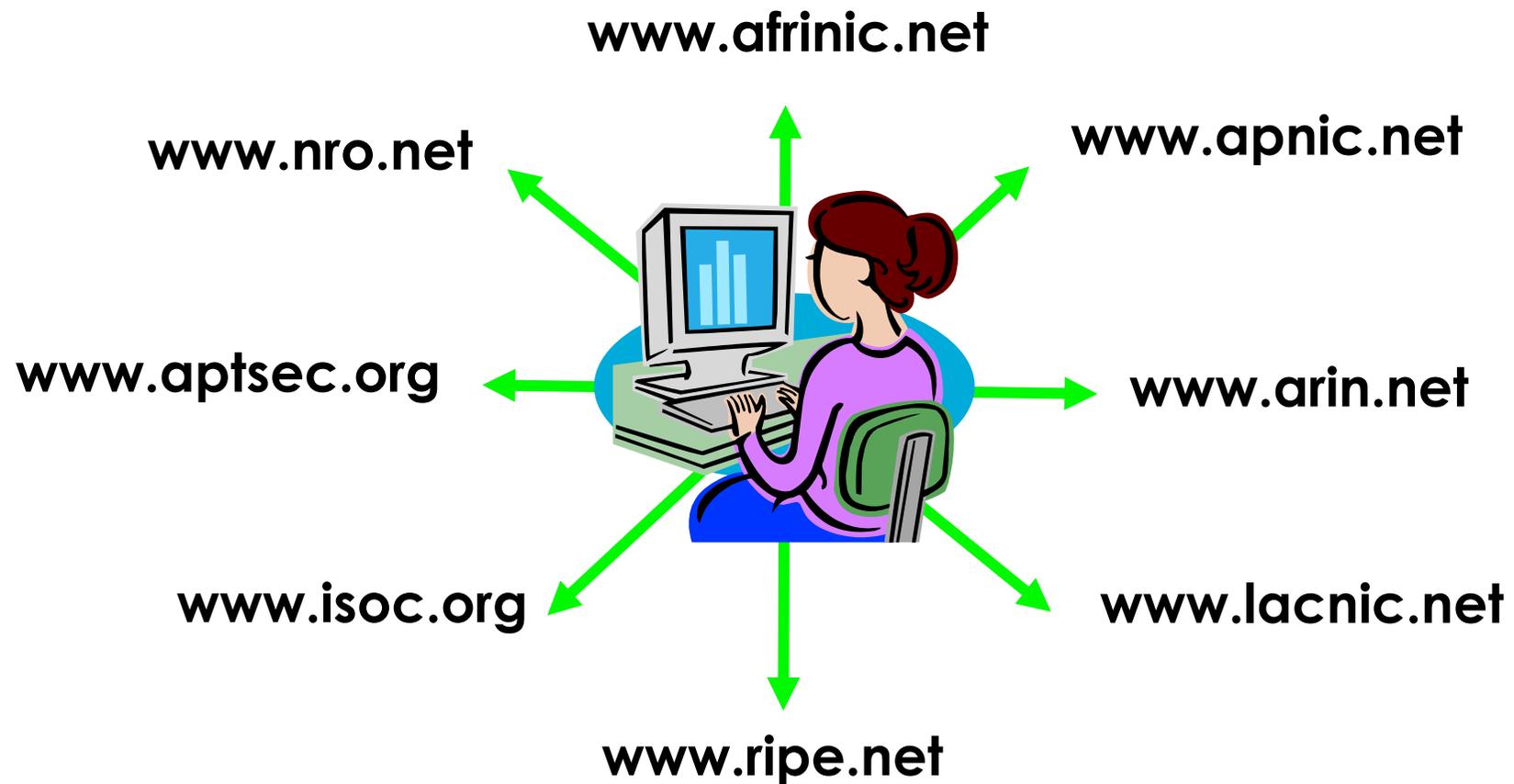
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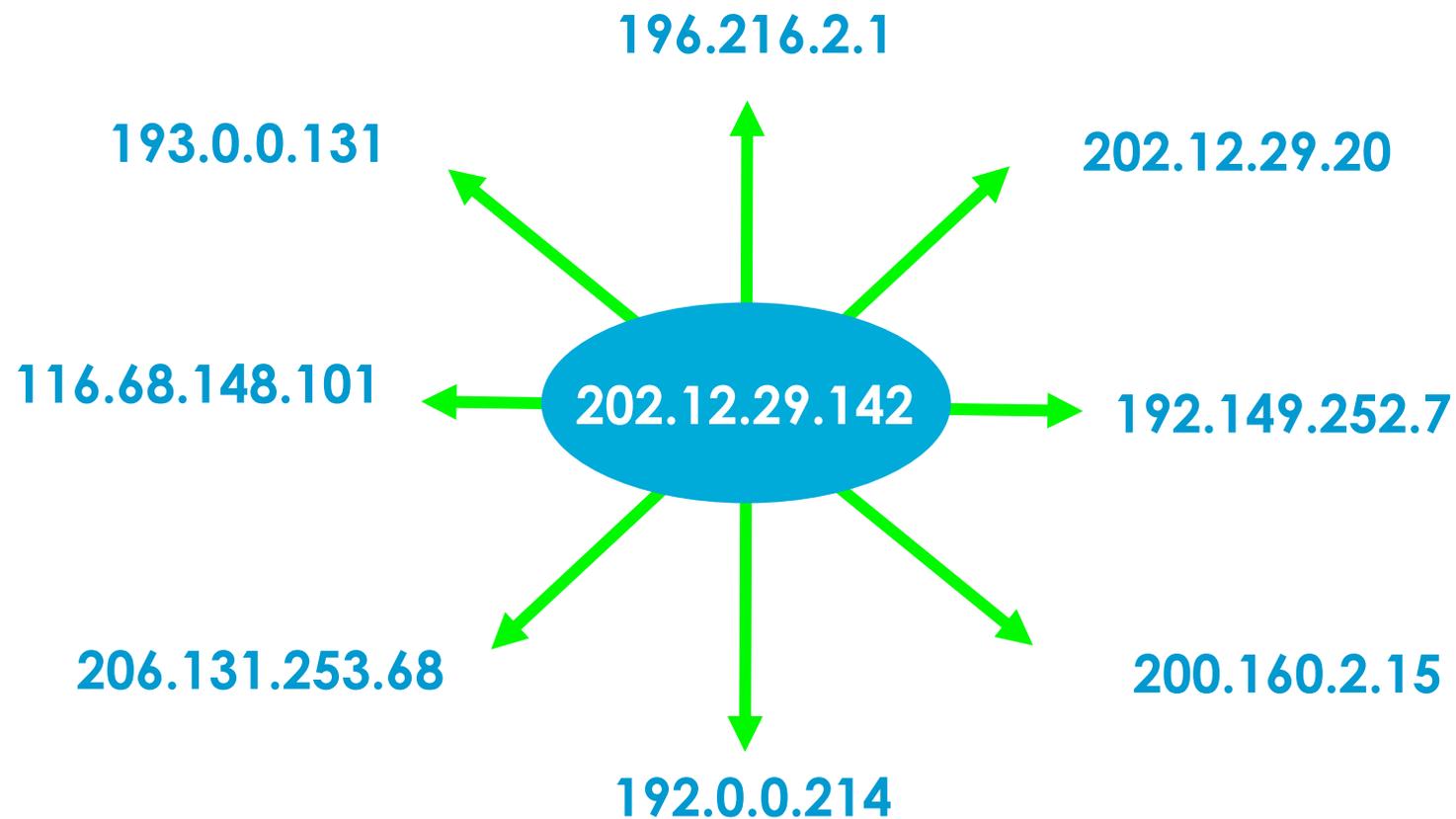
# About Internet Protocol (IP)

- 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!



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# 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	<i>128-bit address</i> <i>2001:DB8:0234:AB00:0123:4567:8901:ABCD</i>
Address space $2^{32} = \sim 4,000,000,000$	<i>Address space</i> <i><math>2^{128} = \sim 340,000,000,</math></i> <i>000,000,000,000,000,</i> <i>000,000,000,000,000</i>
Security, autoconfig, QoS, mobility added later (IPSec etc)	<i>Security, autoconfig, QoS</i> <i>“built-in” (IPSec etc)</i>
<b>Reached the final /8: April 2011</b>	<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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User with IPv4 address only

User with IPv4 and IPv6 address



# Your services is only available via IPv4...

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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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