

The IPv6 Solution

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8 December

ITU-ASEAN Forum on Over the Top (OTT) Services

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The Internet... but at a bigger scale

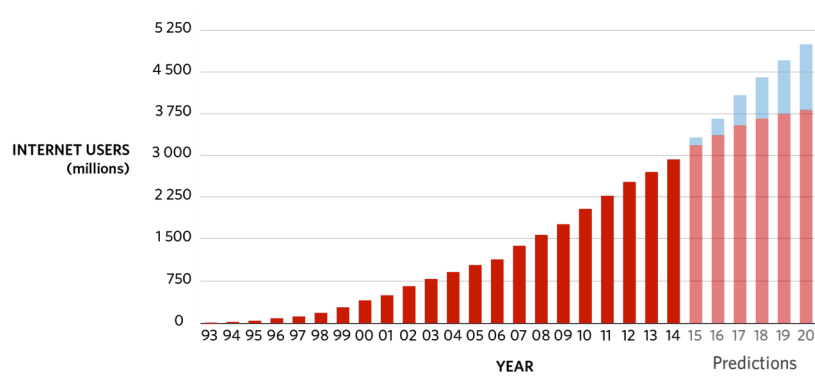
An introduction to IoT

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Global Internet Users by year

Source: ITU World Internet Statistics



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Sustained global uptake



The first billion users was reached in 2005



The second billion users was reached in 2010



The third billion has been reached in 2015

Percentage of world population with Internet

1992
<1%

2014
40%

2017
50%

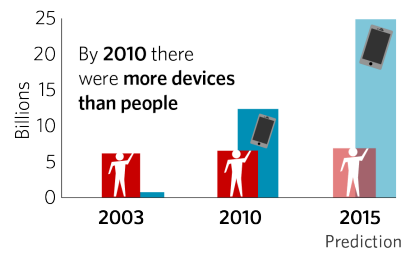
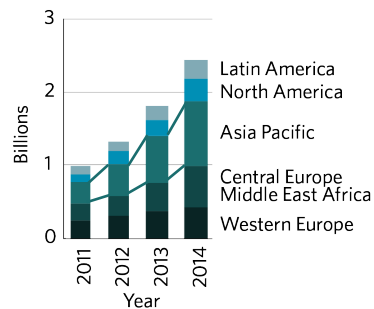
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Devices connected to the Internet

Mobile Broadband Subscriptions

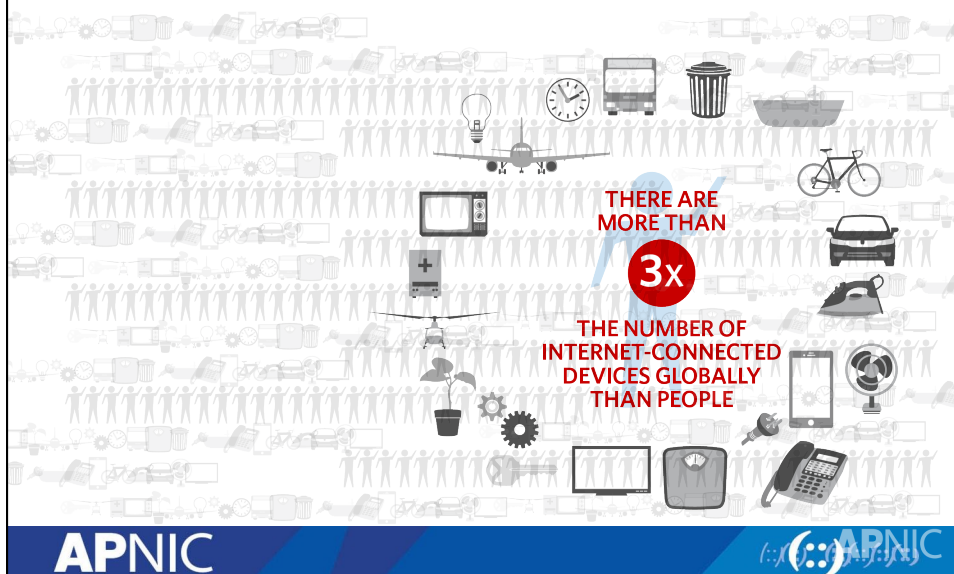
LTE WCDMA/HSPA



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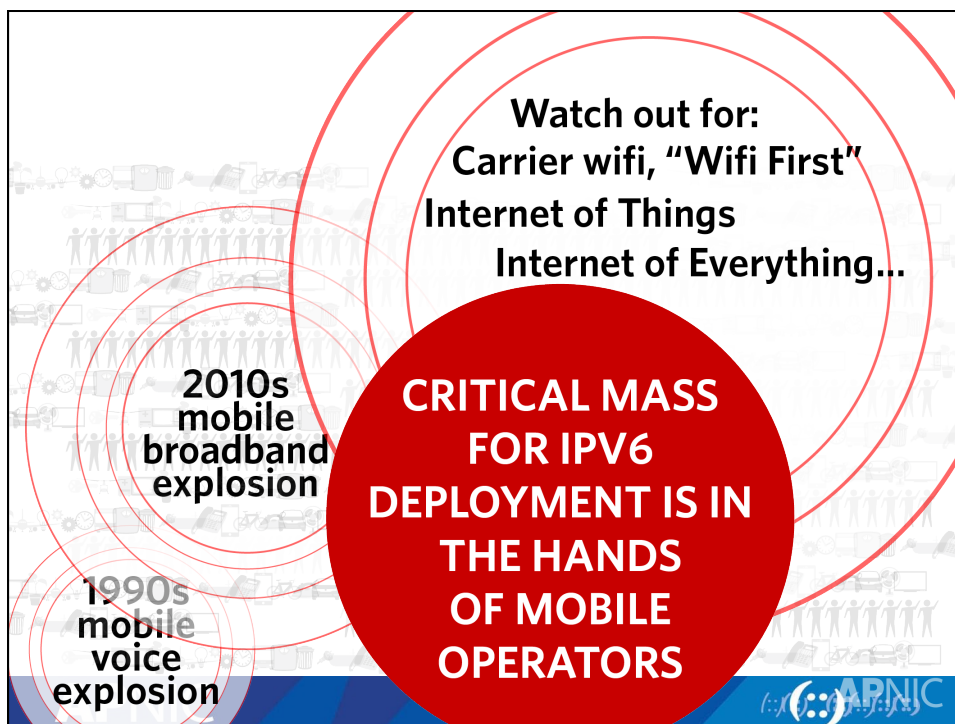
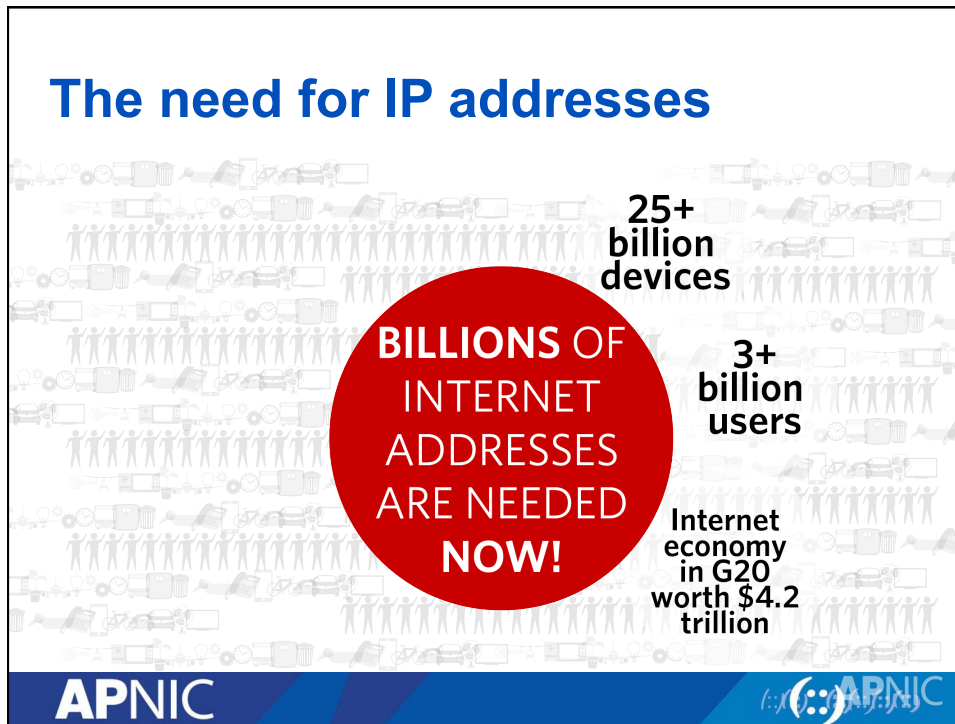


The Internet of Everything



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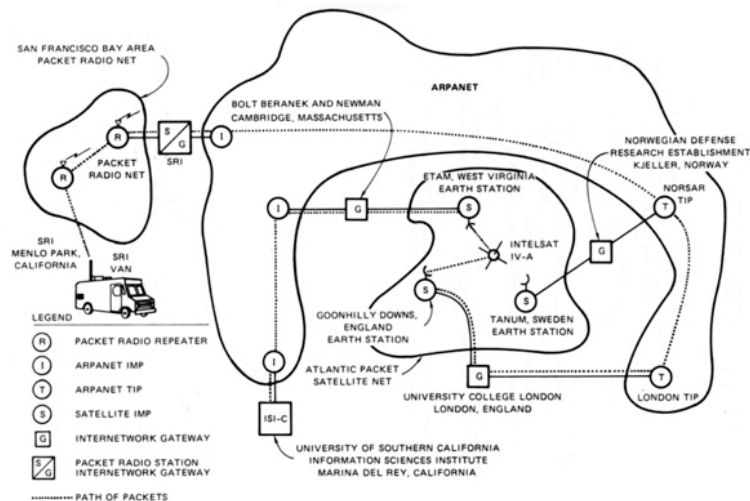
Know the Internet

Addressing needs for IoT

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TCP/IP - history



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Internet goes mobile (circa 1976)



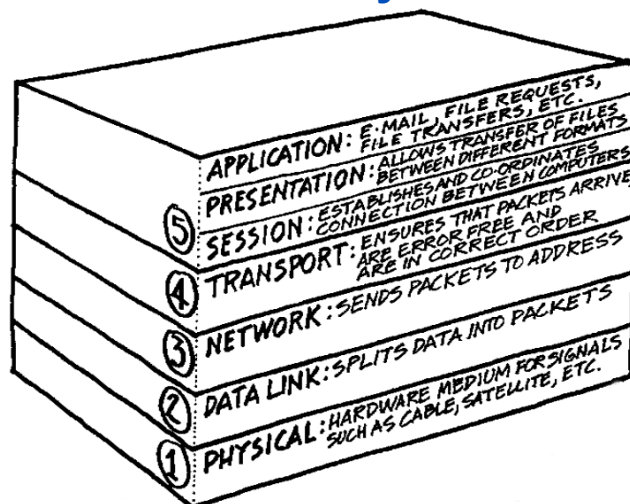
The Packet Radio Van



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What do I mean by Internet?

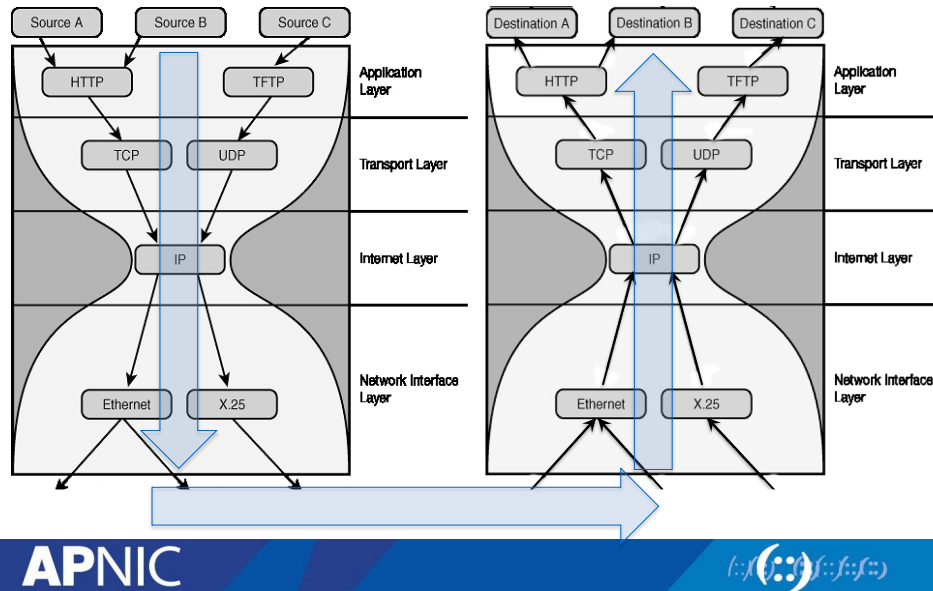


The Open Systems Interconnection (OSI) model

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Many layers, one protocol

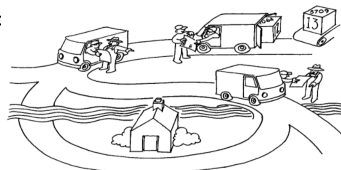


Sending data over the Internet

Data is sent over the Internet in discrete packets



Packets are sent from 'source' to 'destination'

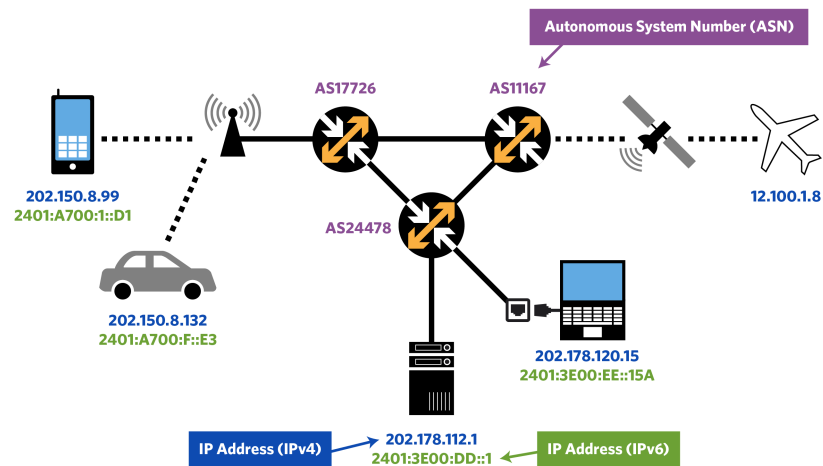


Every source and destination in the Internet must have an IP address



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IP addresses and ASNs

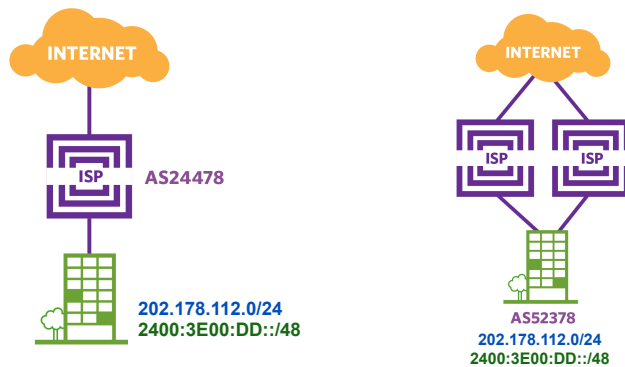


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Connecting to the Internet

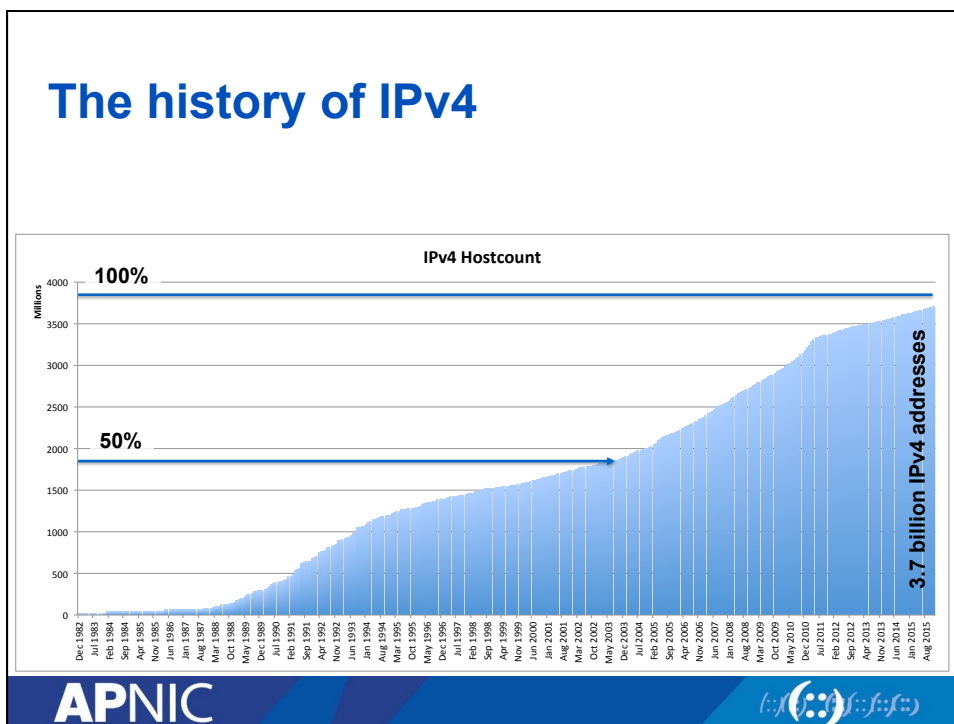
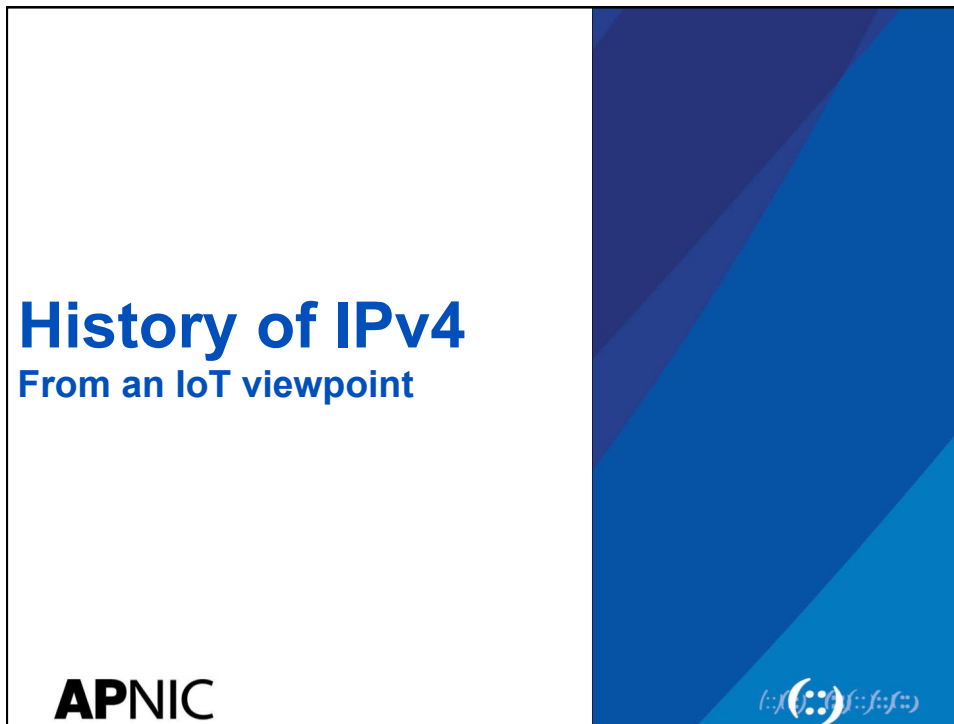


Single-homed network
No need for public ASN

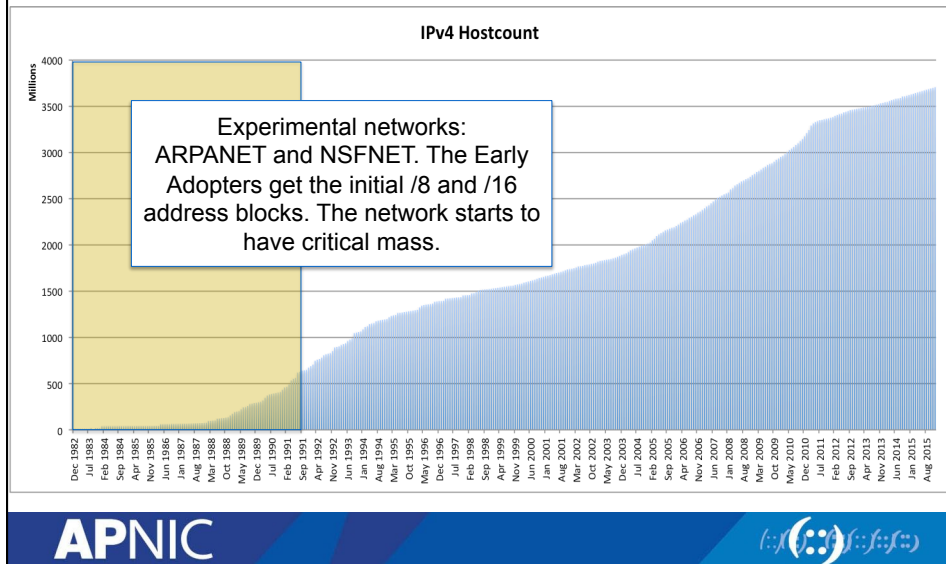
Multi-homed network
MAY have a need for BGP and public ASN

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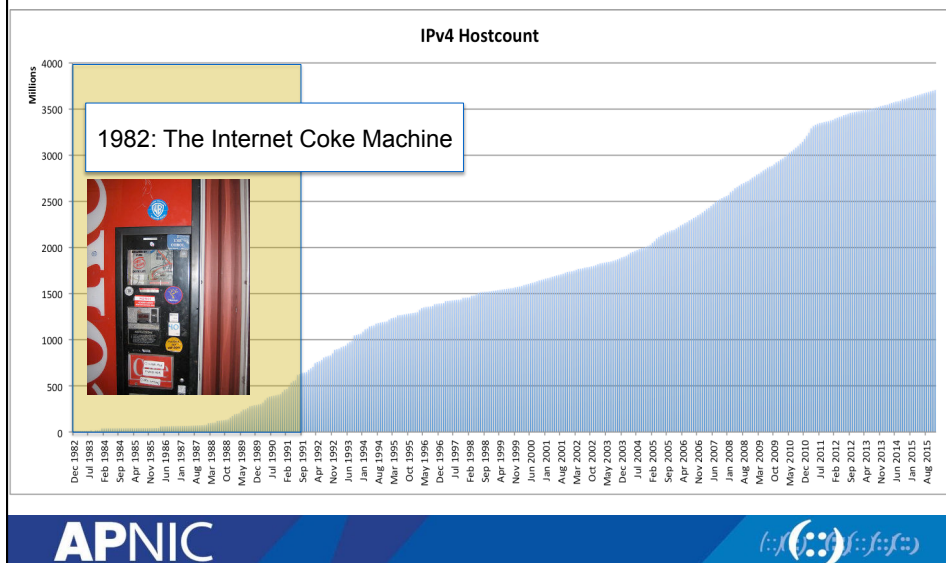




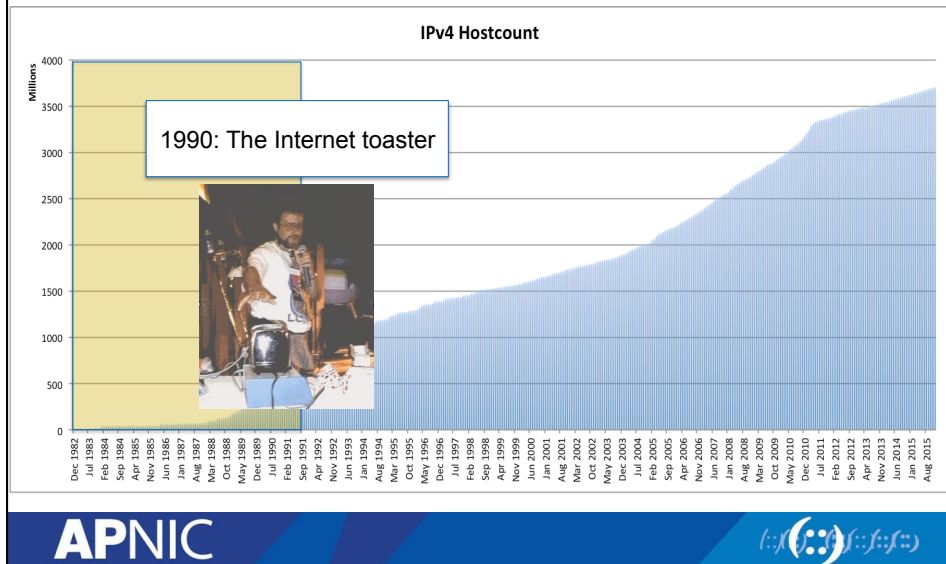
1982 - 1991: Academic & Research Networks



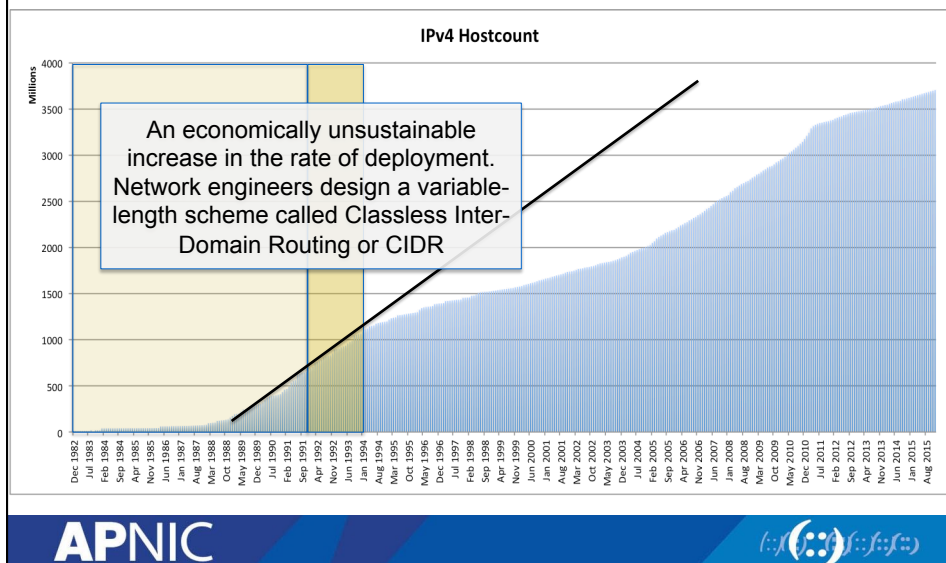
1982 - 1991: Academic & Research Networks



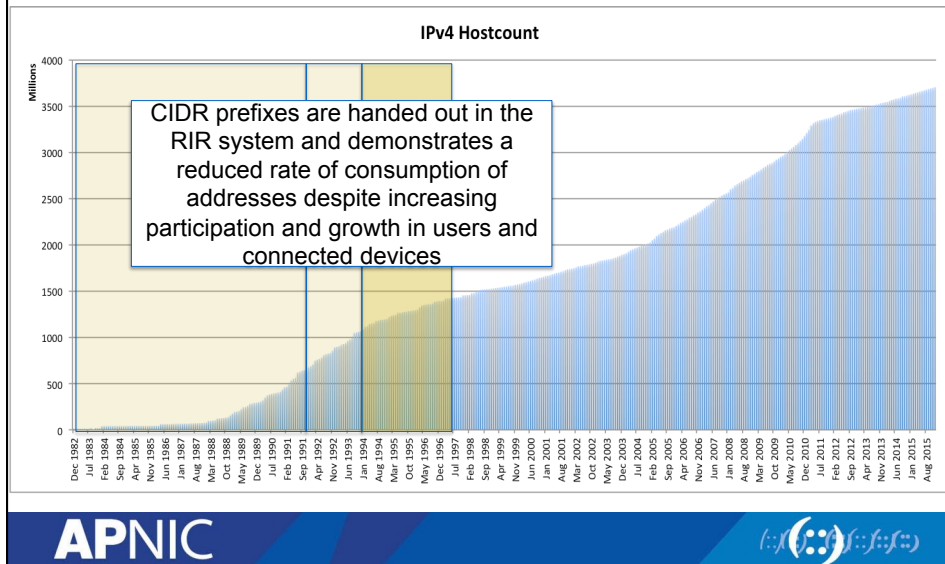
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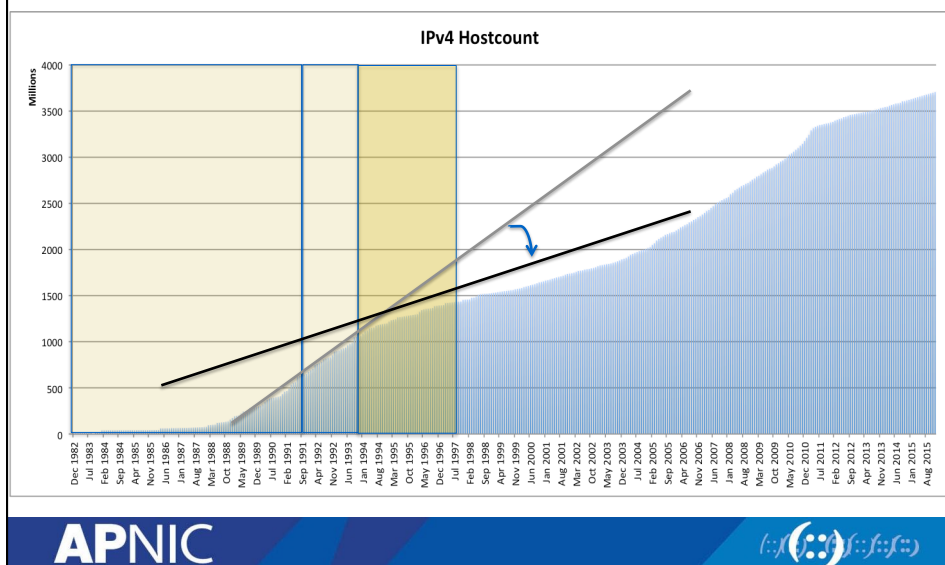
1992 - 1993: Unsustainable Growth



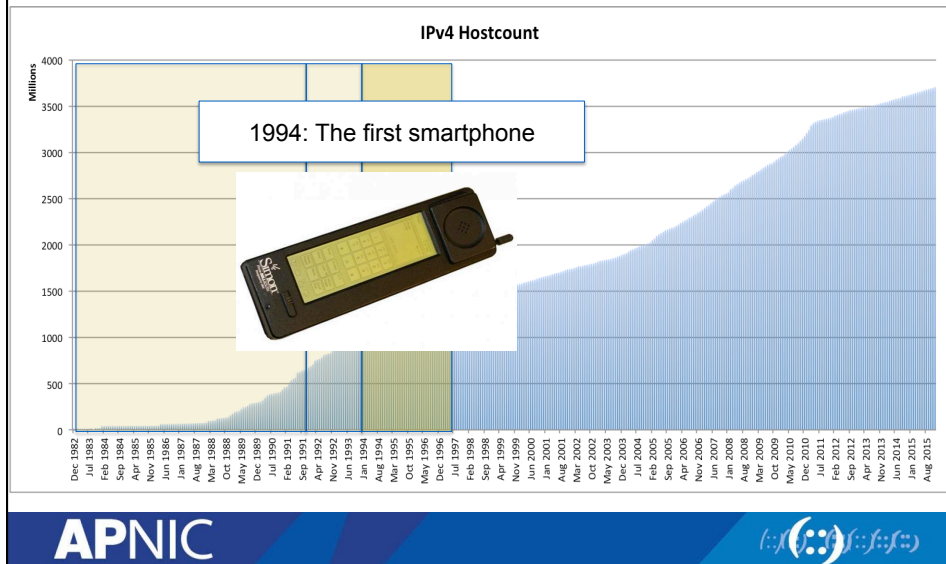
1993 - 1997: CIDR and RIR system



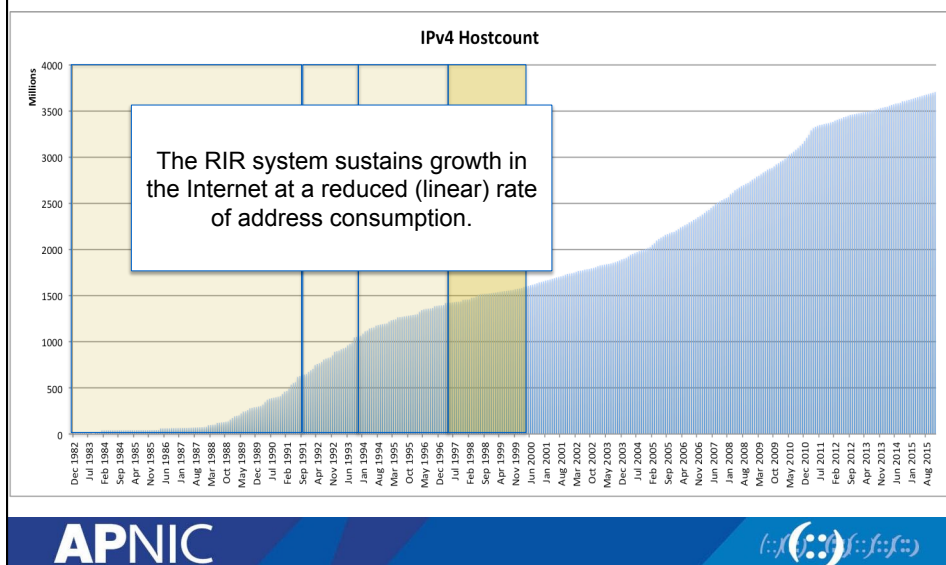
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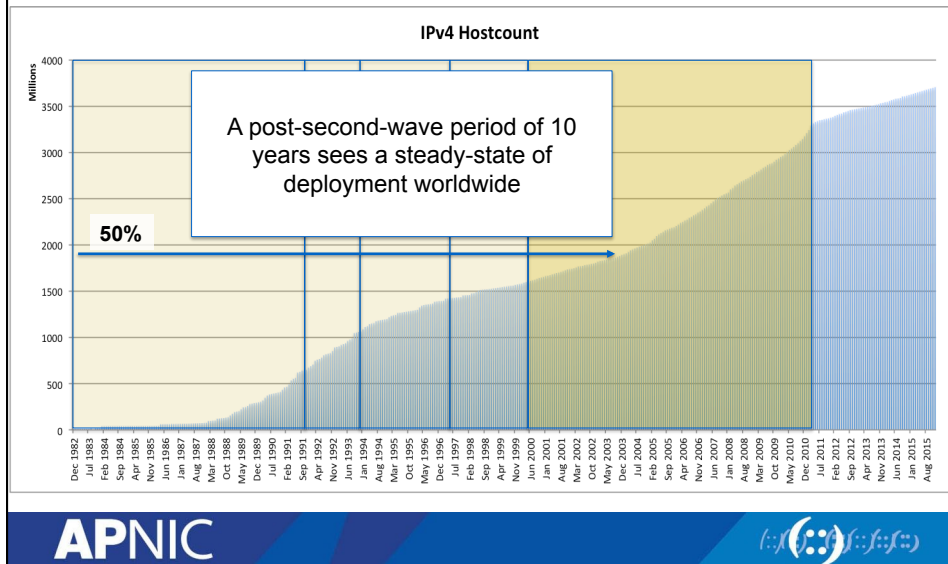
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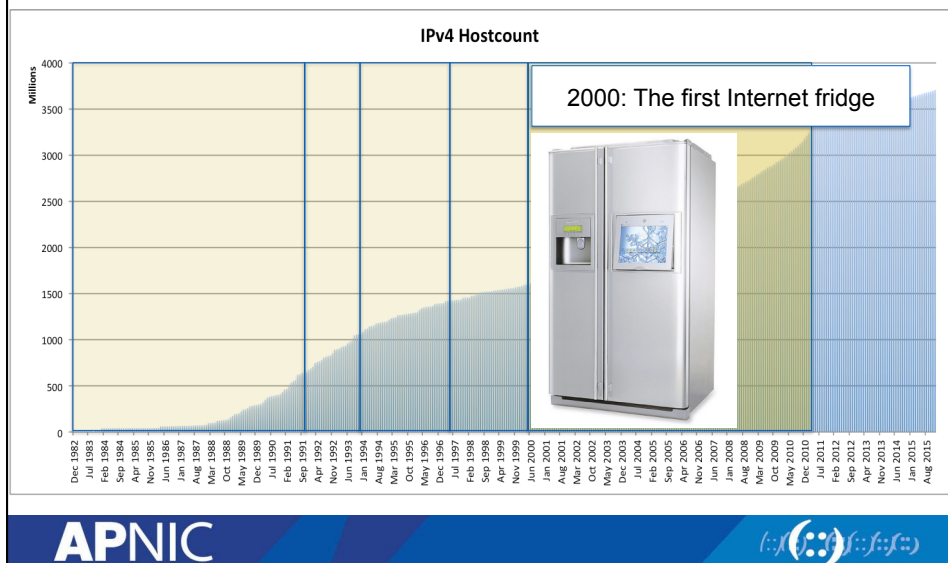
1997 – 2000: Commercialization Boom



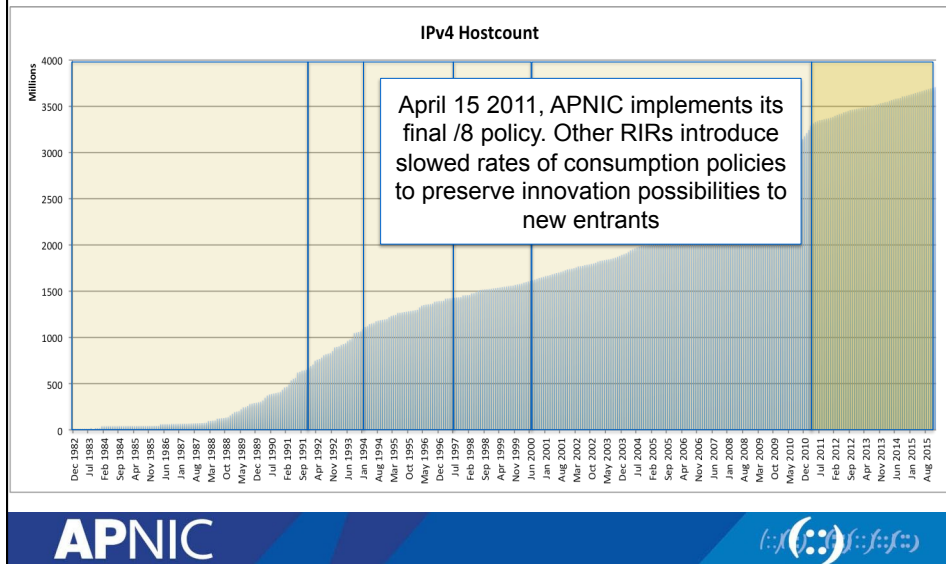
2000- 2010: Growth



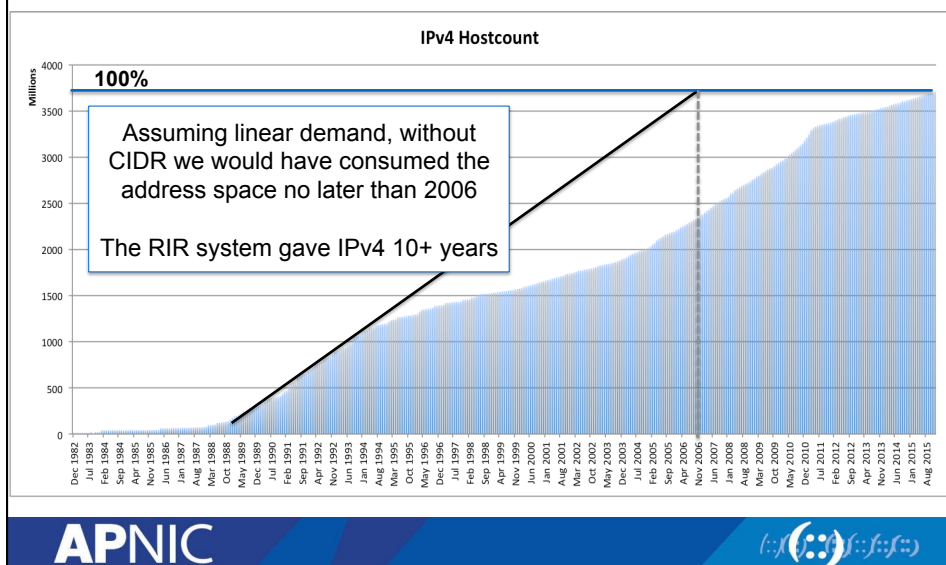
2000- 2010: Growth



2011 : present, rationing policies



An Alternate Future?



ASN visualizations

The ASEAN case

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Why use a public ASN?

Cost

Good interconnection strategy can lower cost of operation by directing traffic through the most cost effective connections wherever possible

Resilience

Path diversification allows better evaluation of interconnection options, which in turn could result in better network resiliency

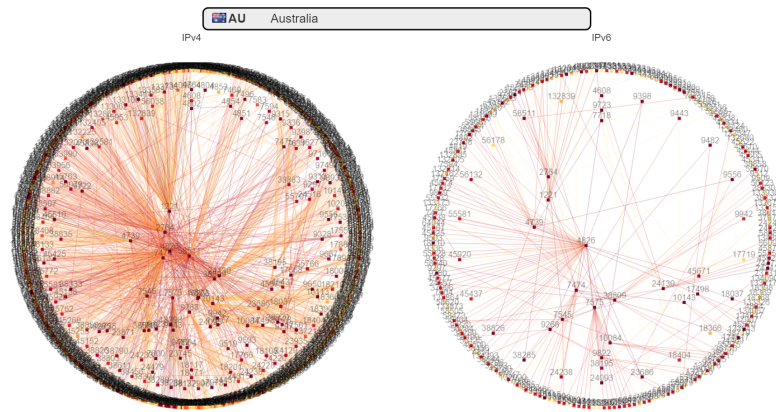
Performance

Understanding where your network traffic goes and when possible shortening the path to your main customers/suppliers/partners could result in better overall network experience

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AS transit map: example

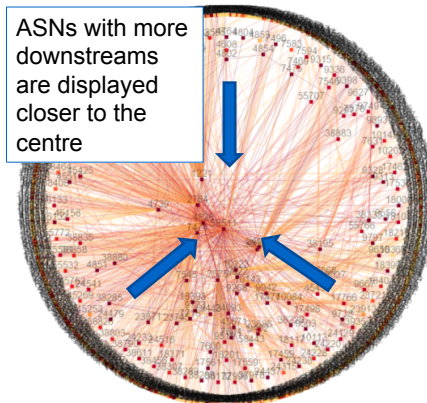


<https://labs.apnic.net/vizas/>

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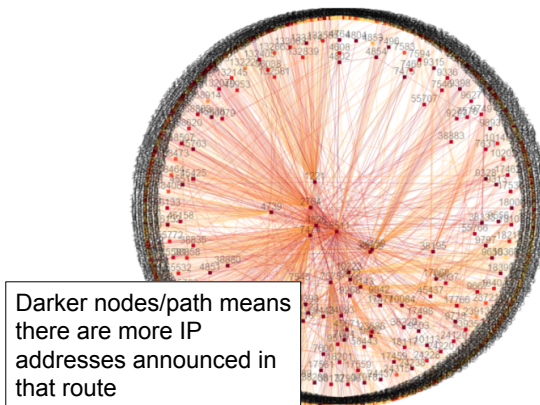
Explanation



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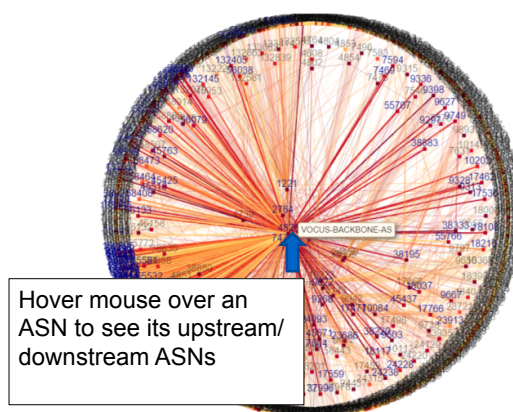
Explanation



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Explanation



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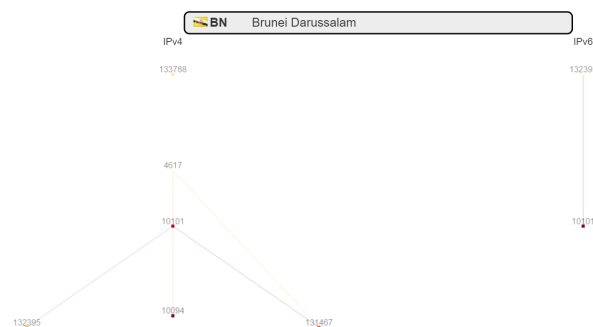
Data source

- Routeviews.org
 - RIBs from the Oregon Internet Exchange, for both IPv4 and IPv6
- 12 November 2015 data (taken at 2am UTC)
- This is a snapshot, not live data
- The list of ASNs per country/economy is sourced from the NRO's global delegated statistics file (<https://www.nro.net/statistics>)

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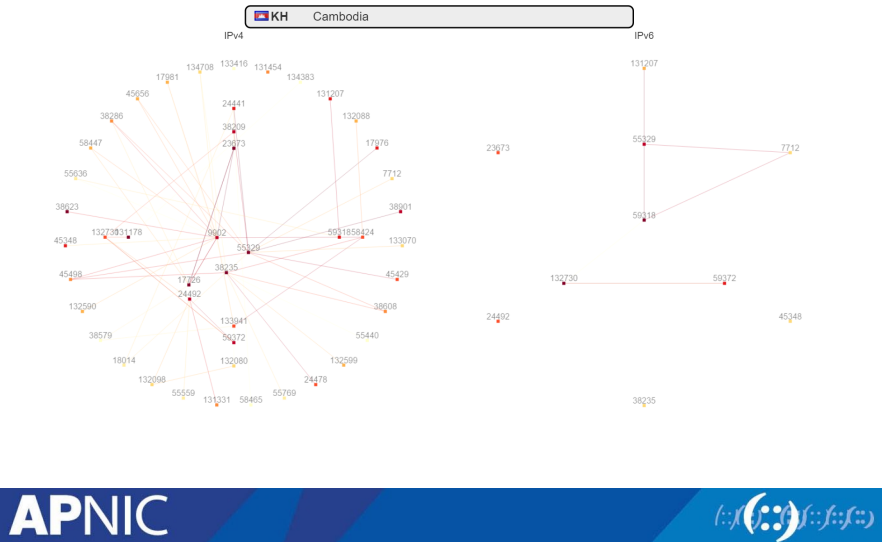
Brunei Darussalam

0.4 million population

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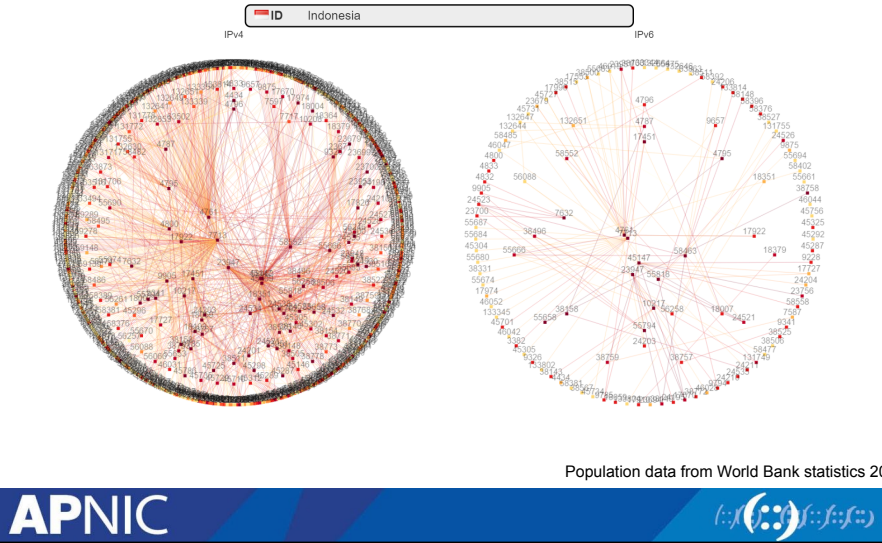
Cambodia

15.3 million population

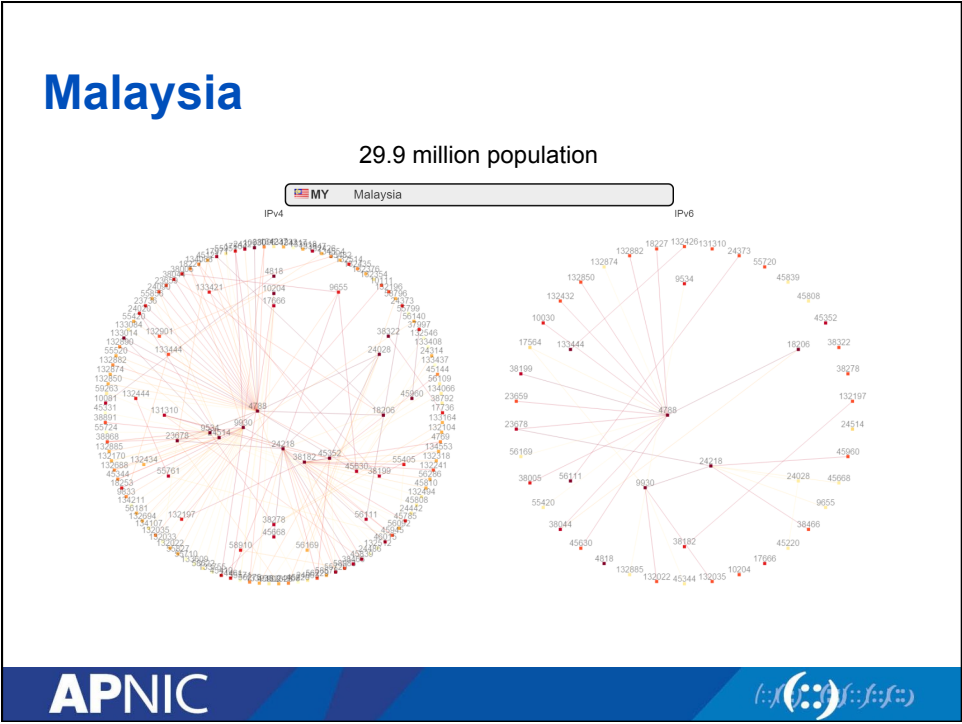
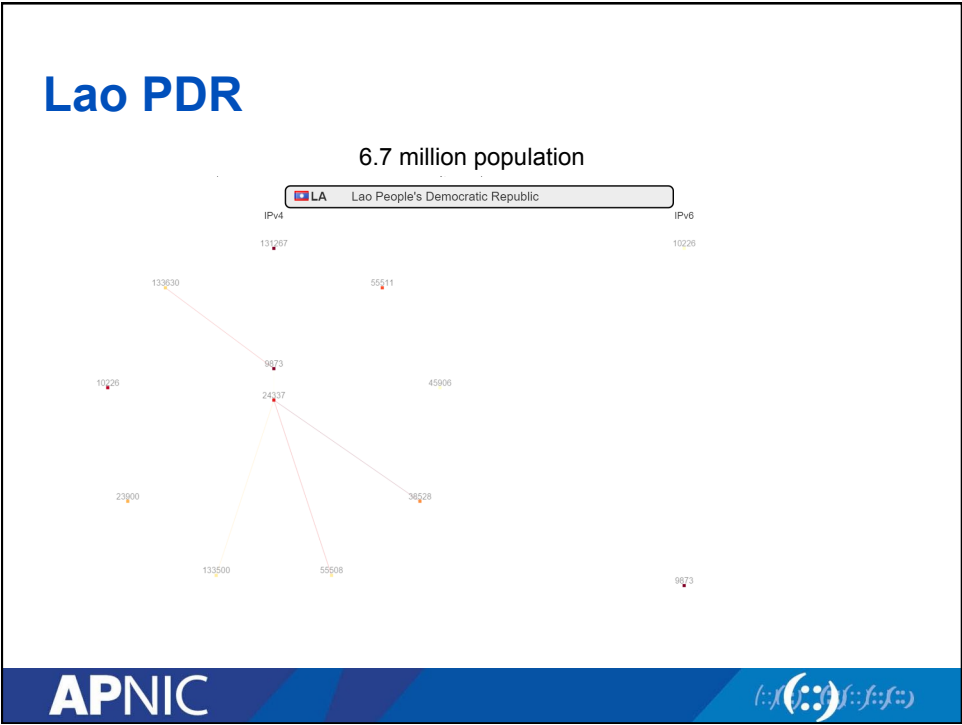


Indonesia

254.4 million population

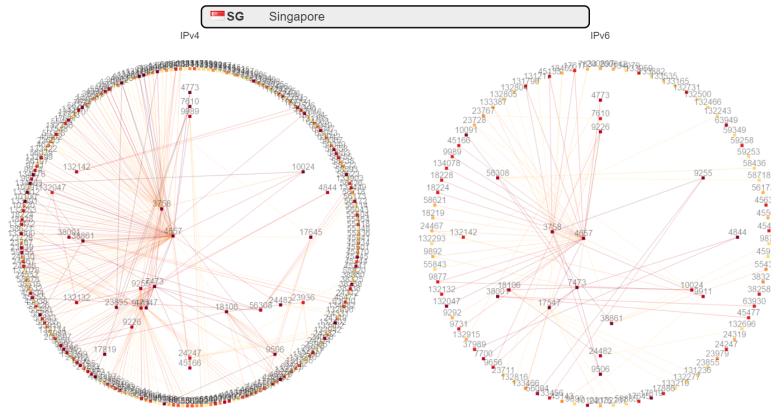


Population data from World Bank statistics 2014



Singapore

5.5 million population

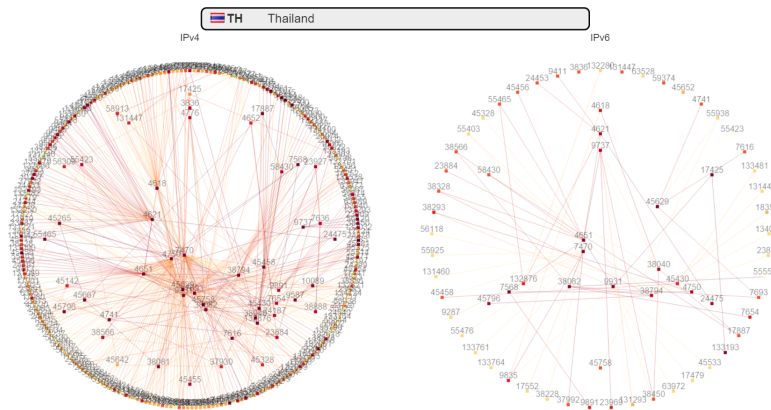


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Thailand

67.7 million population

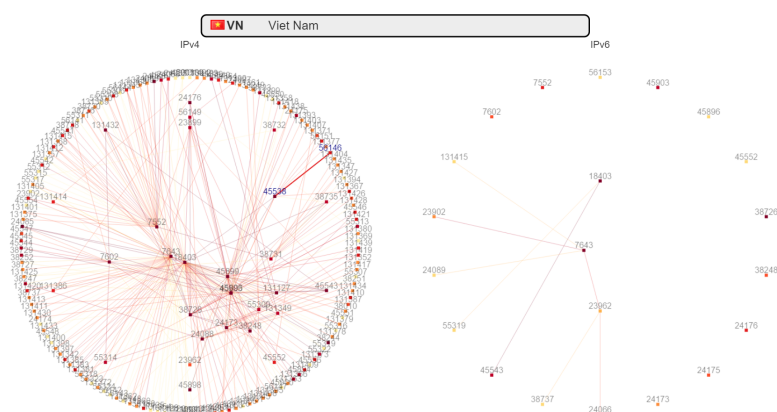


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Vietnam

90.7 million population

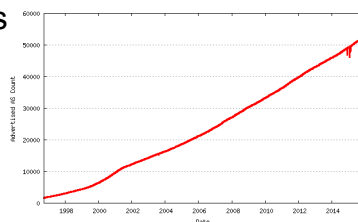


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Looking ahead

- Global trends



- As more organisations interconnect with upstreams, downstreams and peers, the number of advertised ASNs will continue to grow
- OTT services and technologies such as SDN and network virtualisation will drive innovations and change the way networks are interconnected, so expect to see a more dynamic ecosystem in the future

Chart source: <http://www.polaroo.net/tools/asn32/>

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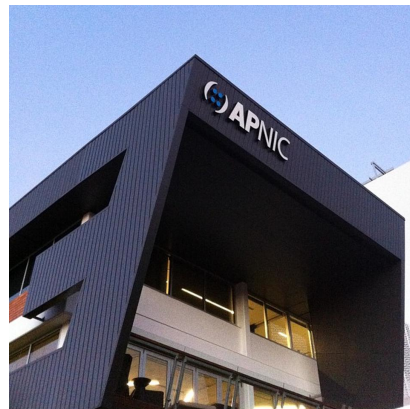
About APNIC

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What is APNIC?

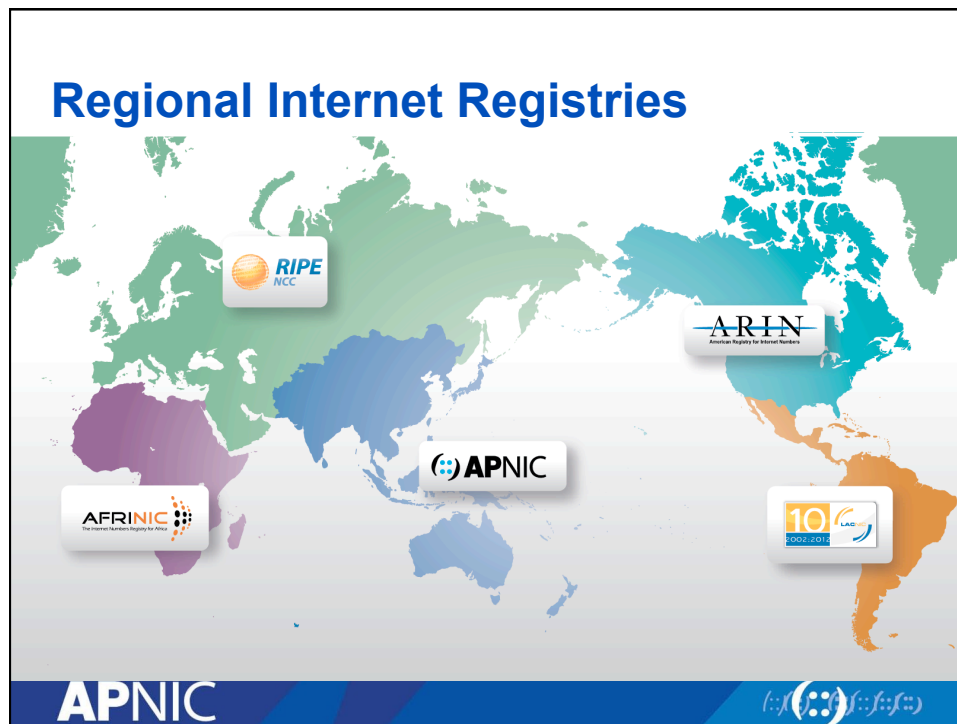
- The Regional Internet address Registry (RIR) for the Asia Pacific region
- Delegates and manages Internet number resources
 - Including IPv4 and IPv6 addresses
- Supports training, education and internet development
- A neutral, independent, not-for-profit, open membership-based organisation, since 1993



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APNIC's Vision

*A global, open, stable, and secure
Internet that serves the entire Asia
Pacific community*



You're Invited!

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