

# IPv6 migration strategies

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NL IPv6 Summit

Peter van Eijk

<http://petersgriddle.net>

# How hard is the migration to IPv6?

**IPv6** migration

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**Y2K** check all Operating Systems

+

€ review all applications for the use of  
IP addresses

-/-

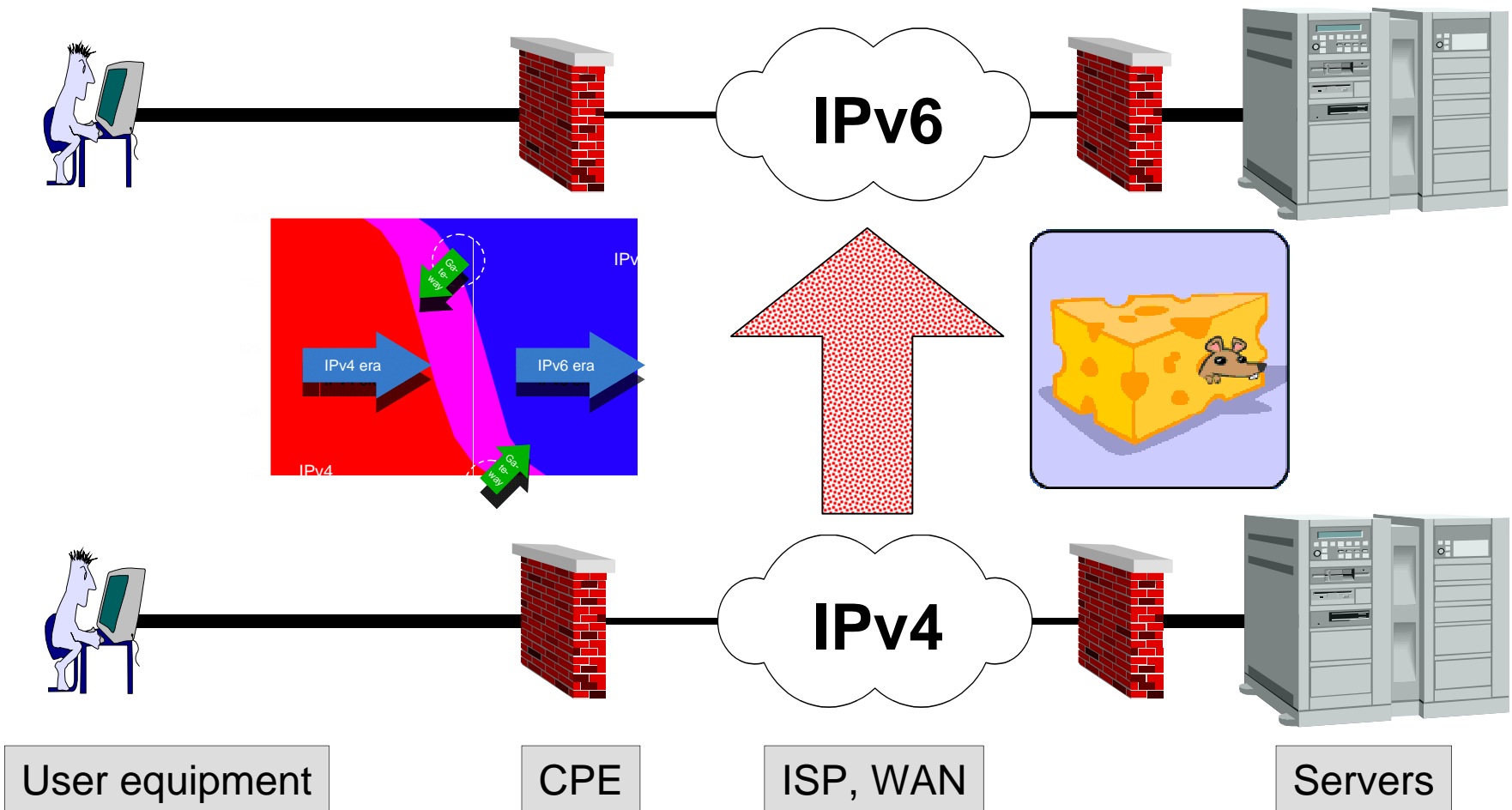
**deadline** there is no rush

In 1965 people drove left in Sweden, in 1967 on the right  
hand side. How did they migrate? City by city?

# IPv6 migration is a chain problem

- First: everybody spends money (implement dual stack IPv6)
- Then: some pick the rewards (more address space, phase out IPv4)

# Every component of the chain has to migrate (simplistic view)



User equipment

CPE

ISP, WAN

Servers

# Why did we want IPv6 in the first place?

- More addresses:
  - But: NAT makes  $24+24 = 48$  bits addresses, which is  $>60.000^*$  more than public IP addresses (145.15.15.X + 10.A.B.C)
- Better security:
  - Better than NAT? New technology = new bugs and leaks
- New applications: QoS, VoIP, IPTV
  - Routers ready for prime time?
- No NAT needed
  - No NAT: no walled garden... No provider independence?
- Easier address allocation
  - DHCP is proven technology, why bother?
- More customer revenue (ARPU)?
  - Where? Who? How?

# Who has the real address space problem? [no, maybe]

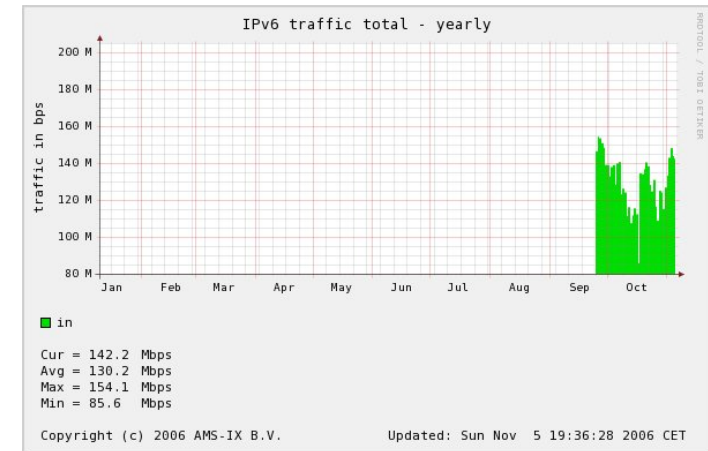
- Retail consumer: no.
  - Will want IPv4 connectivity for next 20+ years
- Organisations: maybe?
  - If by IPv6 you can avoid renumbering with every reorganisation
- ISP: where is the paying customer? More support issues

# Who has the real address space problem? [could be, wannabe]

- We can always use RFC 1918 (10.X.X.X) addresses, can we?
  - Unless we need millions of them. Double NAT??
    - Class A exhaustion is the real problem
    - Comcast is moving on this
  - Unless we need private partner networks
  - Unless we need to merge and renumber
- Deploying millions of connected devices
  - RFID tags?, sensors, machine to machine

# What is there?

- Windows XP and Vista are dual stack (IPv4/v6 on one network card)
- Server OS mostly OK
- Backbone routers +/-
- CPE (ADSL & Cable modems in progress)



IPv6 0.1% of traffic

100 Mbit/sec @ AMS/IX

# What is not there?

- Mature and proven technology
- ISP OSS/BSS and other applications
- Enough skilled people
- Business case (mostly)

# What should you do?

- Specify IPv6 capabilities in all RFP
- Pilot projects
- Upgrade network management to dual stack, which will give you visibility on your evolving IPv6 network

# Possible logical migration for non-ISP organisations

1. Acquire IPv6 space
  - preferably provider independent (PI)
2. Dual stack servers (€)
3. Upgrade all apps
  - start with firewall and network mgt (€€)
4. Upgrade company IP backbone (€€€)
  - Tunnel into public IPv6, migrate to dual-stack ISP
5. Migrate clients to IPv6 (€€)
  - Proxy firewall will NAT for external IPv4 websites

# Possible logical migration for ISPs

1. Begin ASAP with dual stack CPE
  - IPv4 CPE is tomorrows legacy
2. Upgrade OSS/BSS and administrative systems
3. IPv6 in the backbone to CPE
  - Home network IPv4 (192.168.X.X)
  - NAT at CPE

# Thank you

- Subscribe to <http://petersgriddle.net>
  - *“What’s cooking on the net?”*

- Further reading:

<http://www.bgpexpert.com/presentations/overstapv6.pdf>

<http://petersgriddle.net/2006/10/ipv6-has-heartbeat-but.html>

<http://www.ipv6.org/>