ALMOST Ready for IPv6!

- IPv6 Deployment Status in Japan -

2008.6.18

Takashi Arano
Intec Netcore, Inc.

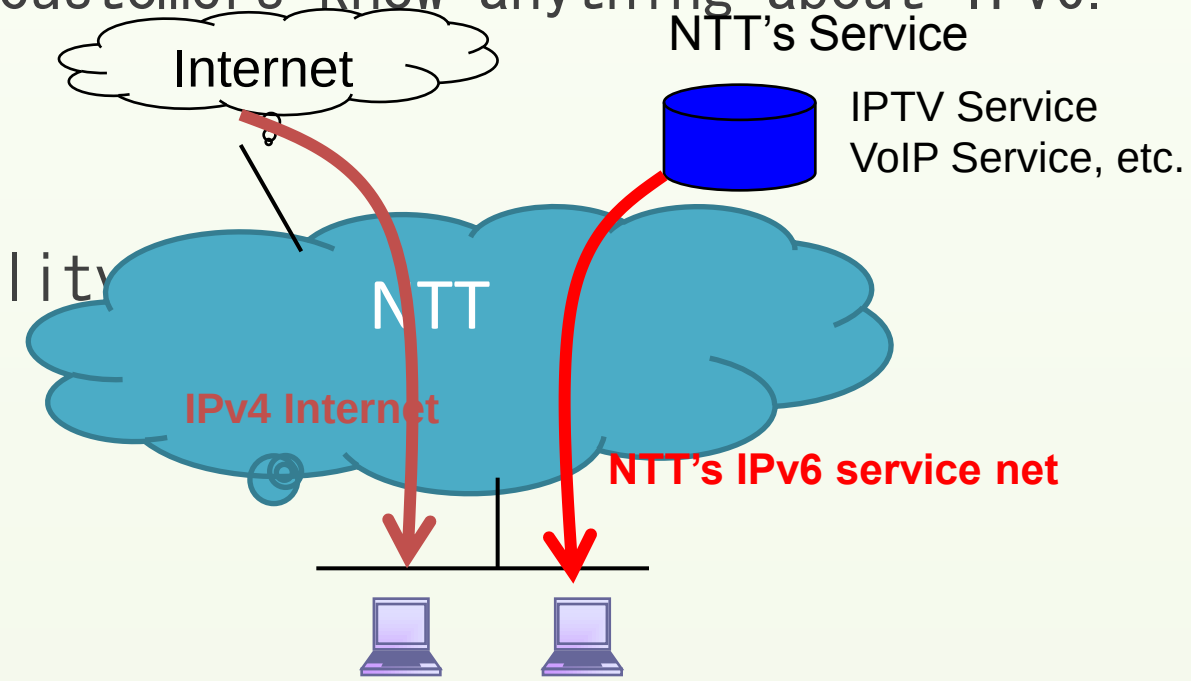
Summary

- Commercial IPv6 CLOSED networks with millions of IPv6 sites
- New IPv6 applications appearing
- Still little about IPv6 Internet
- IPv4 address exhaustion problem accelerating IPv6
  - JPNIC report published and MIC report coming soon

- Why IPv6? Because it will change the world…

Millions of IPv6 sites

- NTT West/East services deliver IPv6 addresses to home sites.
  - Millions of IPv6 sites, although IPv6 closed net.
  - Multicast enable
  - They don't let customers know anything about IPv6.
- Why IPv6?
  - Manageability
  - Future extensibility
  - Multicast



Solving Chicken-Egg Problem

- There are one simple answer.
  - Infrastructure comes first.
  - Applications follow.

- IPv6 applications are appearing, once IPv6 networks are provided.
  - Several applications and solutions have been developed since NTT IPv6 services started.

Multicast solutions over IPv6 network

- Live Lesson Services to remote sites in prep-schools (Becare, inc.)
  - High quality streaming with low cost
  - More than 1/10 cost reduction compared to using satellite network
- Earthquake Flash Report System(NTT Communications)
  - It reports that earthquake of intensity x will come in y seconds.
  - To be Urgent, Real-time
  - Unicast doesn't work
- Information delivery system to convenience stores (FamilyMart)
  - Delivers campaign info, sales manuals updates, etc from the headquarter.
  - IPv4/IPv6 dualstack in 6,000 stores
  - Solution from satellites to Broadband & Multicasts saves costs

授業配信(Becare)

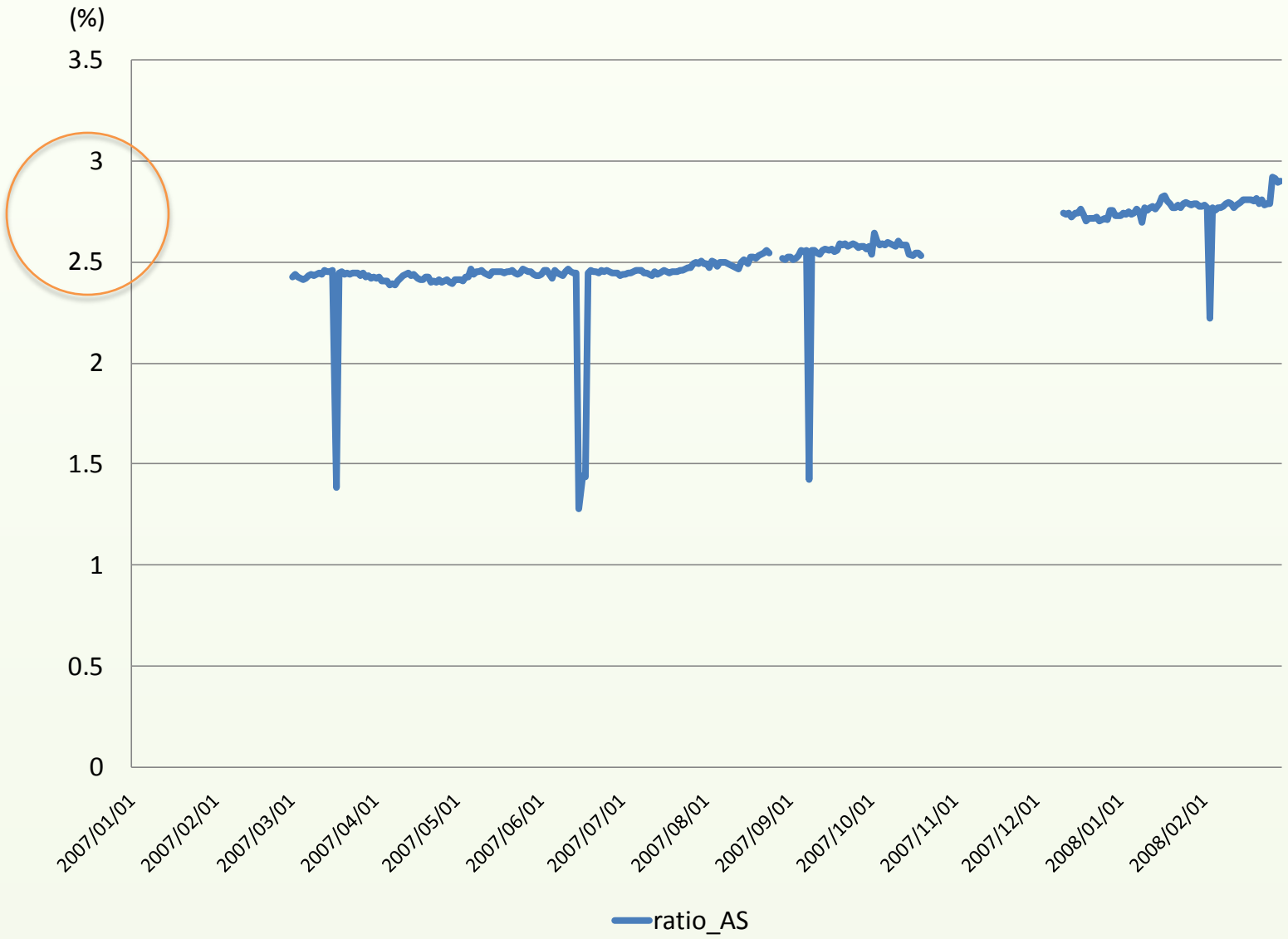
フレッツフォン(NTT東)

キオスク端末(Familymart)

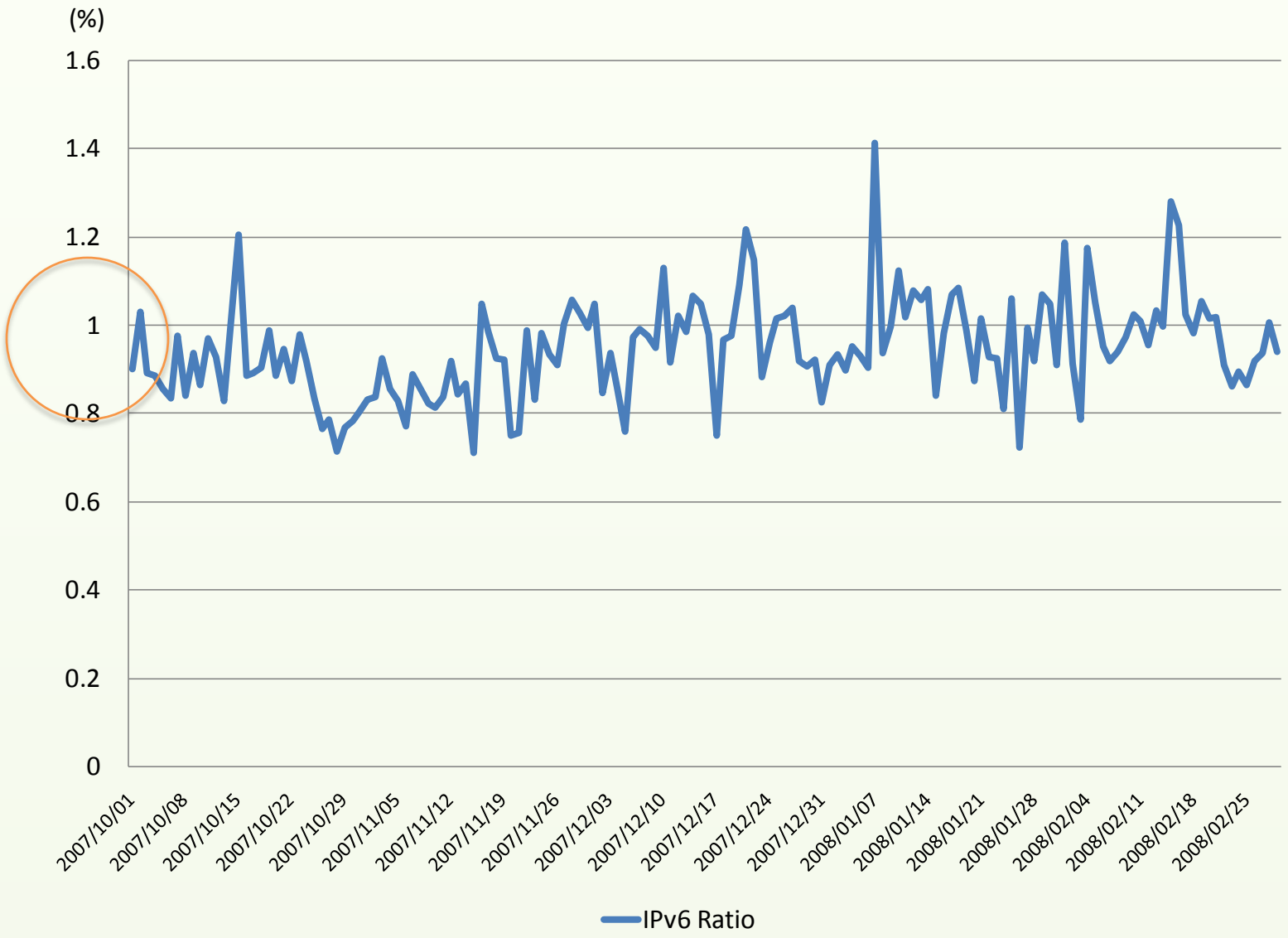
IPv6 deployment metrics says…

- IPv6 Internet is still in the long way…

Dual Stack AS / IPv4 only AS



Queries to .jp servers

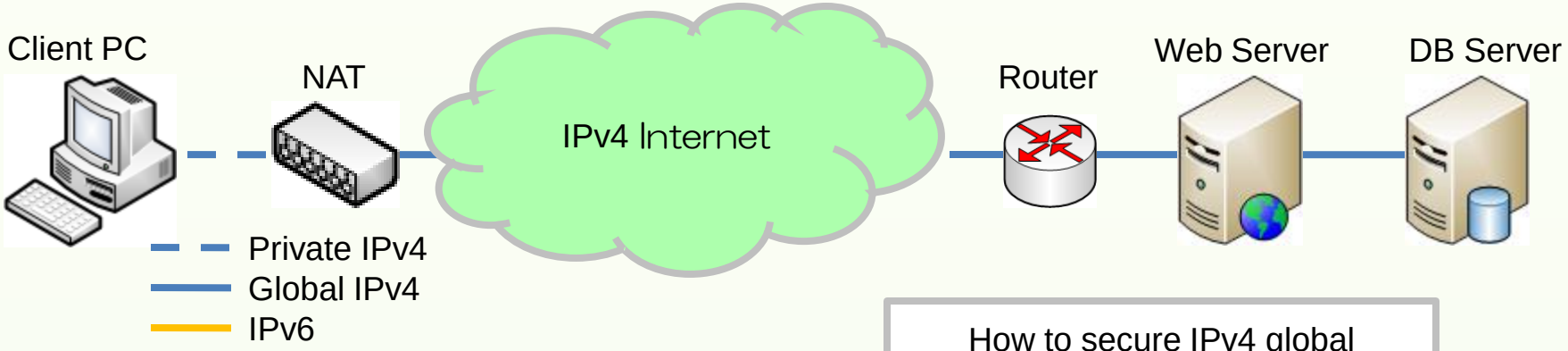


JPNIC report

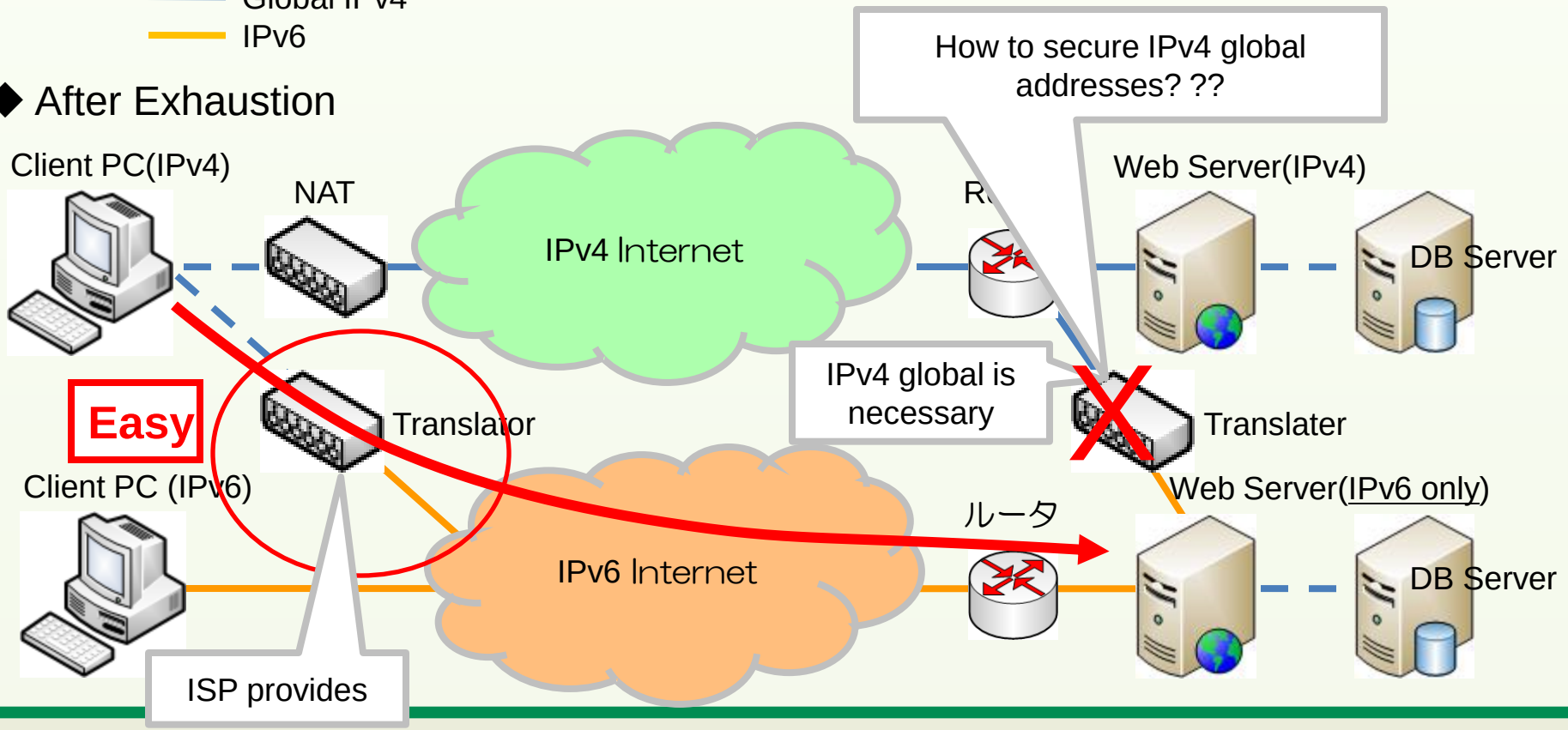
- JPNIC has published “IPv4 address exhaustion report”
  - See http://www.nic.ad.jp/en/ip/ipv4pool/ipv4exh-report-071207-en.pdf
- Summary
  - IPv4 address exhaustion is inevitable.
  - Analysis about impacts on ISPs and iDCs
    - ISPs and iDCs will not be able to expand their network
    - Especially those who will be in trouble after exhaustion are:
      - New ISPs
      - Server operators
  - Among several ways to solve this problem, IPv6 would be only a long-term solution.

IPv6-Only-Server Problem

◆ Current



◆ After Exhaustion



MIC “Address Exhaustion” report

- Japanese government will publish “Address Exhaustion” report very soon.
- Similar results with JPNIC one
- Roadmap/Action plan suggested
  - *In 2008, all ISPs make plans for IPv6.*
  - *By 2010, all ISPs complete IPv6 deployment.*

Deployment Models

- Motivation for IPv6 Deployment has been modeled as following three.

1. Smooth Transition
2. Forced Deployment
3. Solution-Oriented Deployment

Smooth Transition

- To enable IPv6 at system renovation time
  - No extra cost needed
  - Will take 5-7 years to transit to IPv6 gradually
  - Some enterprise networks, especially IPv6 companies, do this.

Forced Deployment

- IPv4 address exhaustion will force ISP to IPv6.
  - It is not an issue of increasing revenue but that of business continuity.
- Japanese government mandates IPv6 for governmental networks by the end of FY2008.

Solution-Oriented Deployment

- System is introduced as a solution which solves a problem users have, regardless of the version of IP.
- There, IPv6 is chosen because IPv6 implementation has some advantage over IPv4.
  - Cheap
  - Easy
  - Fast
  - Extensible and flexible
  - Especially so In the long run

- Deploy IPv6 as better protocol in a new system.

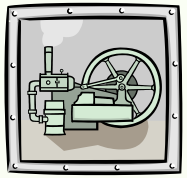
Implication of 3 models

- Who gets merits from IPv6?
  - End users don't care about IPv6.
  - Implementers can get advantages of IPv6 in some situations.

- Stop looking for what IPv6 only can do.
- Stop commenting "this can be done by IPv4"
- Look for where IPv6 can do better, instead.

Learn from the history

- Watt’s stream engines triggered a lot of innovations and changed the worlds.
- How?



- Horses could do the same things as stream engines did.
- There were many other engines what could do the same things. In a sense, Watt’s was an improved technology.
- But, Watt’s could do the same things much better.

- Tens of years later, big innovation happened with invention of locomotive as an application of steam engines.

- Then IPv6?

IPv6 will change the world

- By connecting “everything” to the net, …
- Manufacturer will become “Manufacture Servicer”
  - to know and utilize how customers uses their products
  - to keep contact with customers
- Retailer will be able to know when customers want to buy products and/or services, through networked products, which is innovative to retailers.
- Retailers and “Manufacture Servicers” may become closer and may do M&A…
- Other potential examples
  - Car manufacturers and Insurance companies ??
  - Game, sanitary, music distribution(like iPod), healthcare and medical industries??
- By IPv6 and its enabling information exchange, the whole industry structure will metamorphose …

Thank you very much!

Any questions and comments to arano@inetcore.com