IPv6 Transition and NAT

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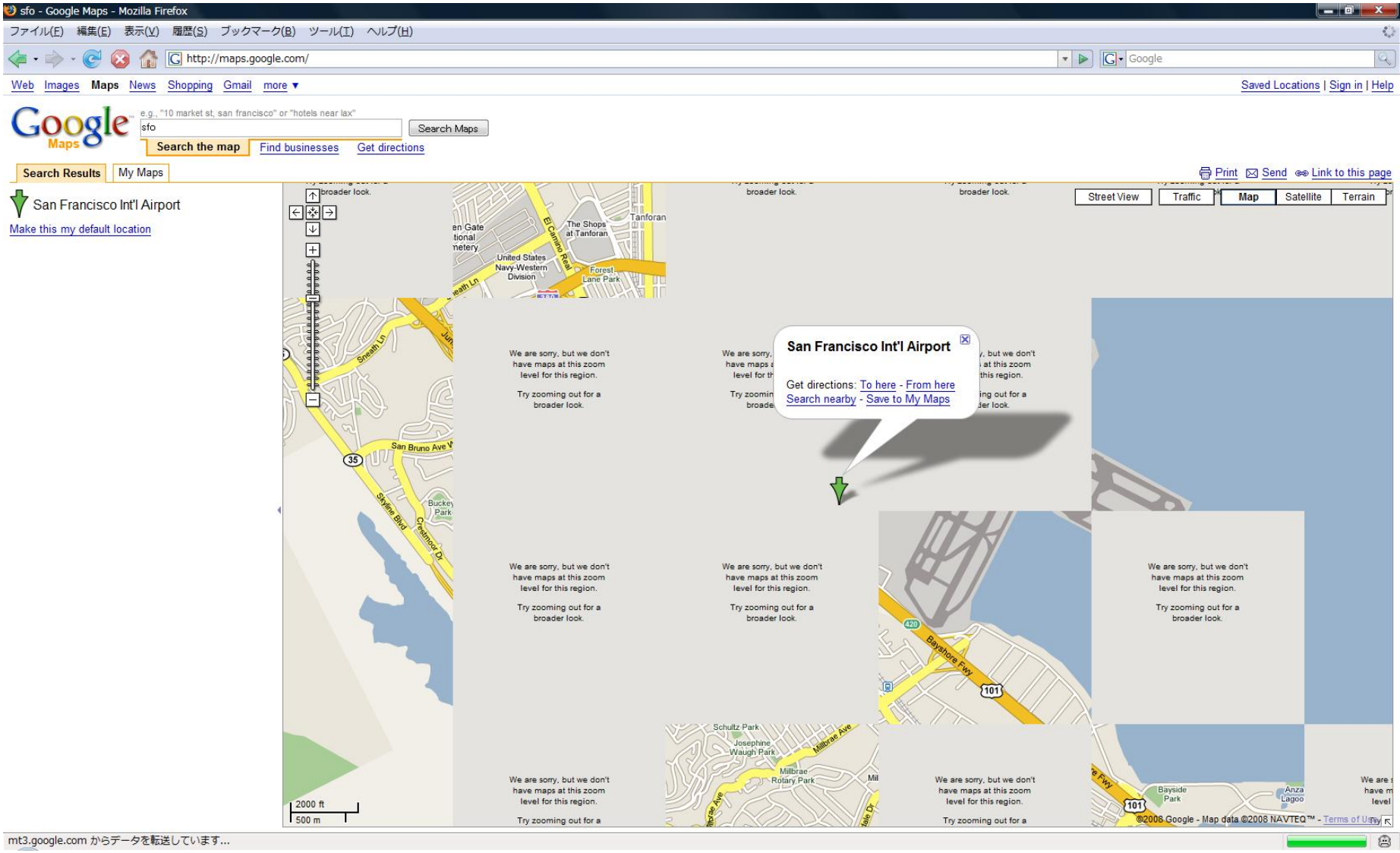
NAT: Two Purposes for Transition

1. Share IPv4 addresses: NAT44
2. Connect IPv*X* to IPv*Y*: NAT64

1. Share IPv4 Addresses

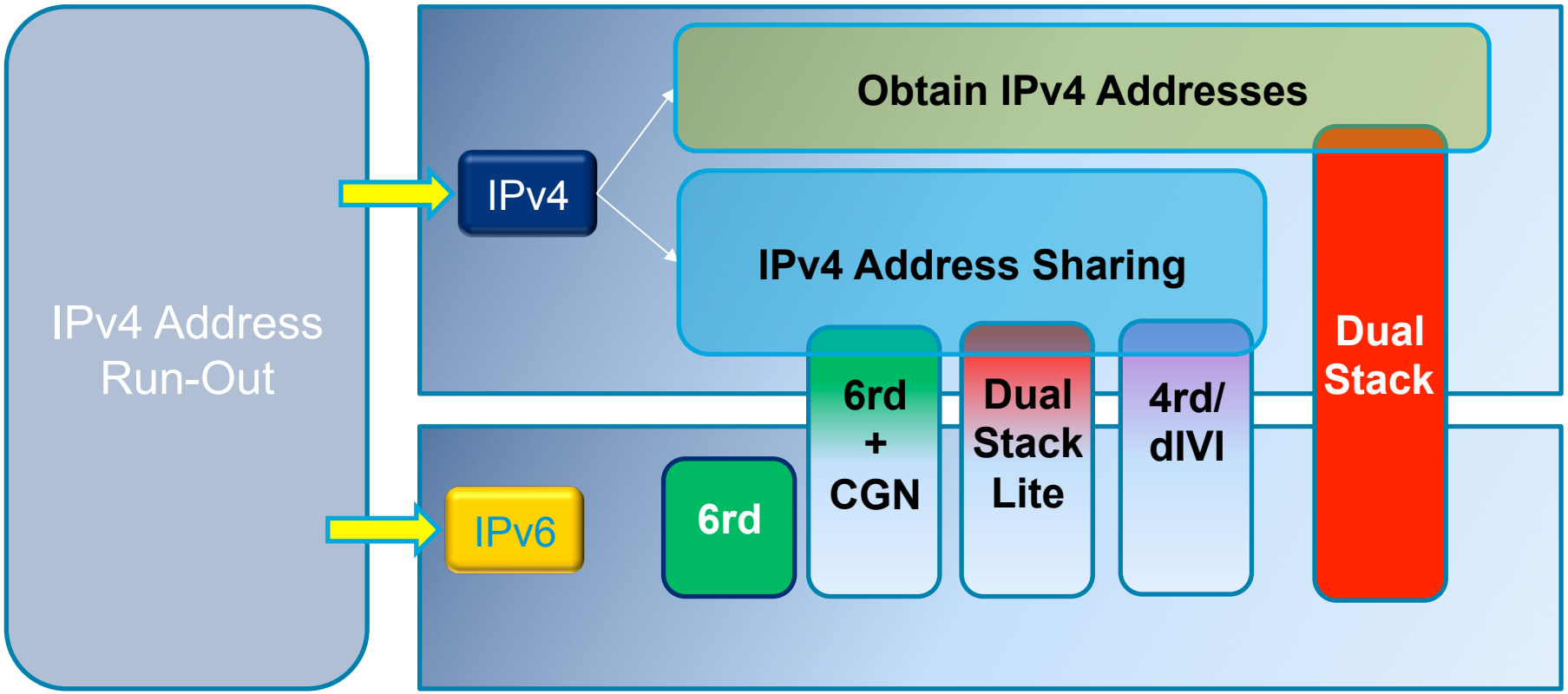
- Still lots of IPv4 content
  - School websites, day care websites, ...
- Still lots of IPv4 applications
  - Skype, IP televisions
- Not enough IPv4 addresses
  - pure dual stack is not viable everywhere
- NAT is not perfect
- NAT Purpose 1: share IPv4 addresses among hosts

Address Sharing Gone Bad



Source: Shin Miyakawa, NTT Communications

Address Sharing Technologies



2. Connect IPv*X* to IPv*Y*

- NAT Purpose 2: connect IPv6 to IPv4

Connecting IPvX to IPvY

- NAT64 is not perfect
- IPv6 and IPv4 are not compatible
  - Fragmentation (IPv4: network fragments, IPv6: hosts fragment)
  - minimum MTU (IPv4: 576, IPv6: 1280)
  - IPv4 options versus IPv6 extensions
- Like NAT44:
  - NAT64 can also bring Application Layer Gateway (ALG) issues
  - Complicates troubleshooting and abuse handling

IPv6 Transition: Tunnel or Translate?

Thank you.