

Network Address Translation and IPv4 Address Exhaustion: A Mechanism to Transition to IPv6

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My View of NAT

- ◇ “A Retrospective View of Network Address Translation”
IEEE Network special issue on Middleboxes,
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<http://www.cs.ucla.edu/~lixia/papers/NAT-in-Retrospect.pdf>

- ◇ One sentence summary
 - People’s fundamental goal: get connected, and
 - they take most pragmatic way to get there
 - Easiest and cheapest ways win

Bridging IPv4 \leftrightarrow IPv6 During Transition

- ◇ “One level of indirection solves all the problems”
- ◇ NAT(4 \leftrightarrow 6) comes to rescue
- ◇ This time the picture is a bit more complicated than it used to be
 - Clients, servers, networks in between

NAT to Bridge IPv4 \leftrightarrow IPv6

- ◇ Not the plain old NAT as we used to know
- ◇ Not just NAT, but tunnels too
- ◇ “One level of indirection solves all problems in computer science”
- ◇ Two levels of indirection solves even more problems

"You can solve every problem with another level of indirection, except for the problem of too many levels of indirection."

What May Be Ahead

- ◇ Increasing IPv6 rollout at clients, servers, networks
- ◇ With all the NATing and tunneling: network operations and connectivity debugging challenges
- ◇ To make it more challenge: creating multiple alternative ways of NATting IPv4 \leftrightarrow IPv6 ?