
IPv6 Implementation and Deployment Experience

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My background

- IPv6 Implementer
 - KAME original member
 - GR2000 IPv6 developer
- IPv6 Deployer
 - Technical marketing of Hitachi network products
 - Many experience to hear the voice from (essential) IPv6 users
- I'll take router vendor's hat in this panel

What were omitted from data sheet

- Sitelocal address
 - We assume it as global address
 - Cannot be site–boundary router
- Router Renumbering
 - Hard to keep consistency with other features
 - Packet filtering, Access list, SNMP etc
- A6/DNAME/bit labels
 - Hard to understand for casual operators

Harmful Specs for hardware router

- Extension header
 - Need to chase extension header when packet filtering is enabled
 - It has big impact to router performance
- Similar Idea with extension header
 - SCTP
 - Several chunks in one packet
 - MPLS
 - Stacked label
- Wondering spec
 - Mobile IPv6

Security

- IPv6 NAT is necessary?
 - Some operators in a company want to hide what IP addresses are used
 - Number of IP addresses and subnets tells number and size of projects
 - Idea of privacy address is not enough
 - Other solution is welcome :-)

Security(2)

- IPv6 enabled firewall
 - Still need to study
 - One idea is:
 - Uni-directional filter
 - Dig bi-directional hole by authentication
 - Simple VPN solution using global address
 - Branch office VPN
 - Remote access VPN

Transition mechanism

- NAT-PT/TCP-relay translator is best and enough
 - Because they use static address mapping
 - Dynamic address mapping have problem when the mapping table is free
 - Applications may keep to use the address
- Transition mechanism from IPv4 to IPv6?
 - Necessary but impossible theoretically
 - Game of PlayStation 2 don't work on PlayStation 1
- Number of mechanisms should be reduced
 - We don't like people in evaluation division make the table what protocol is supported/not supported

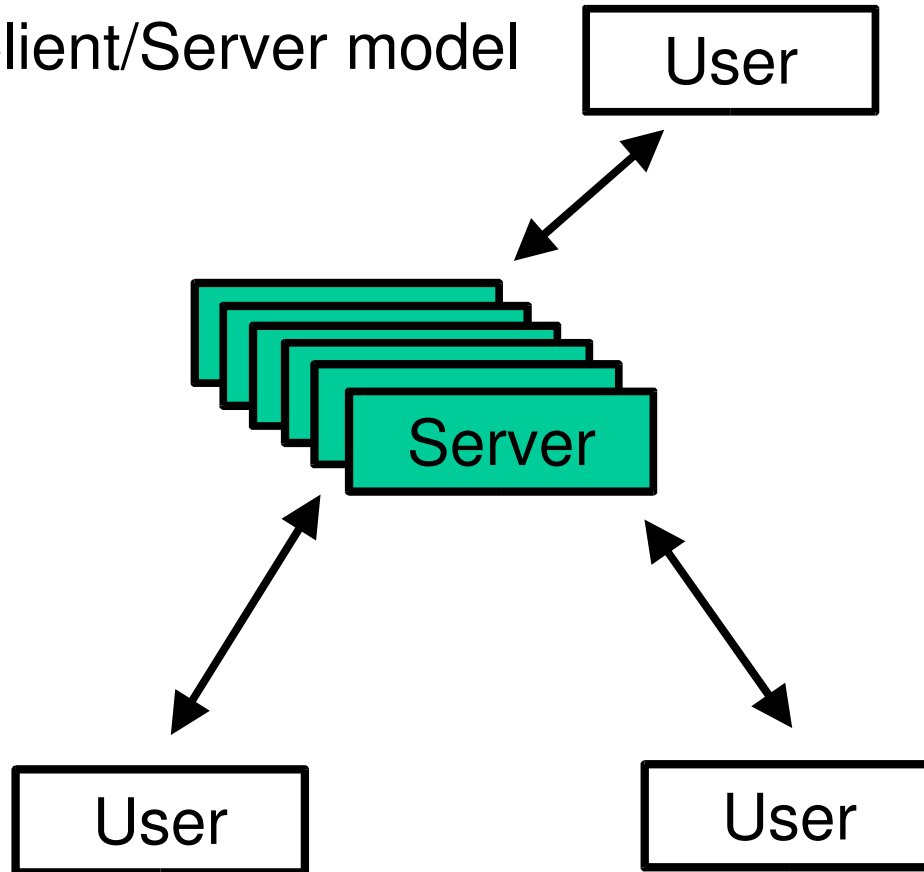
What is missing that really hurts?

- IPv6 benefit in short term
 - Users are very realistic
- Operational cost is hard to count
 - Transition cost is also needed
- Cost benefit of device is most understandable for users

One example of cost benefits in IPv6

- Gaming network in IPv4

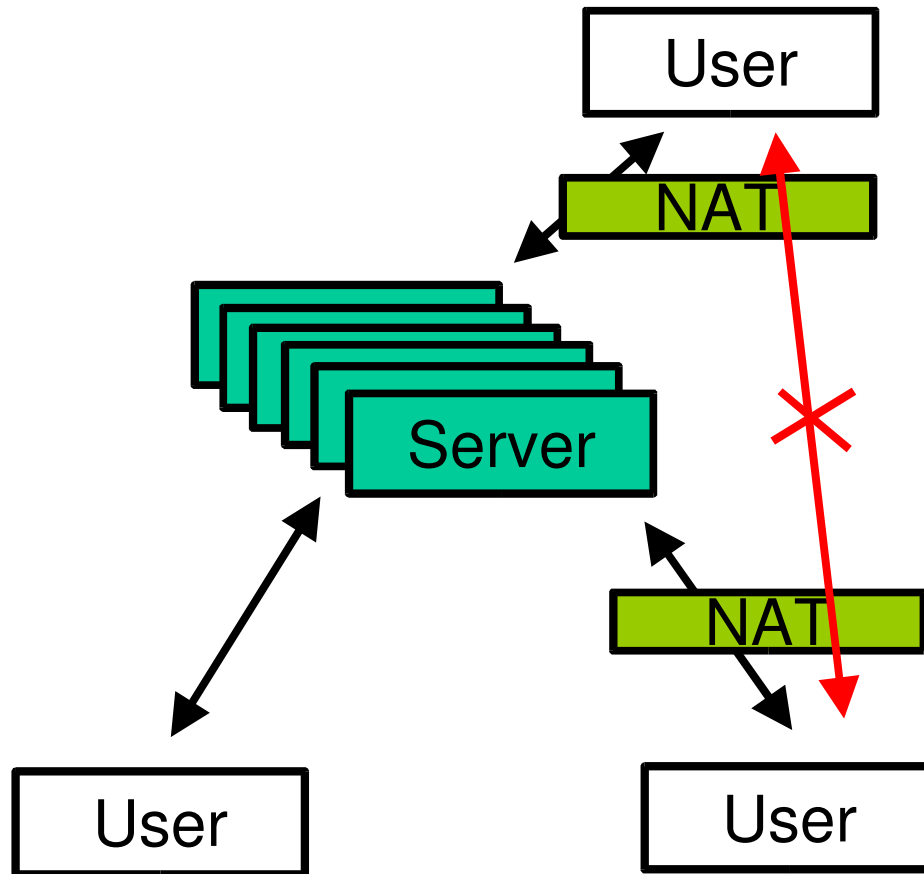
- Client/Server model



1. Moving data
2. Chat data
3. Patch data

One example of cost benefits in IPv6

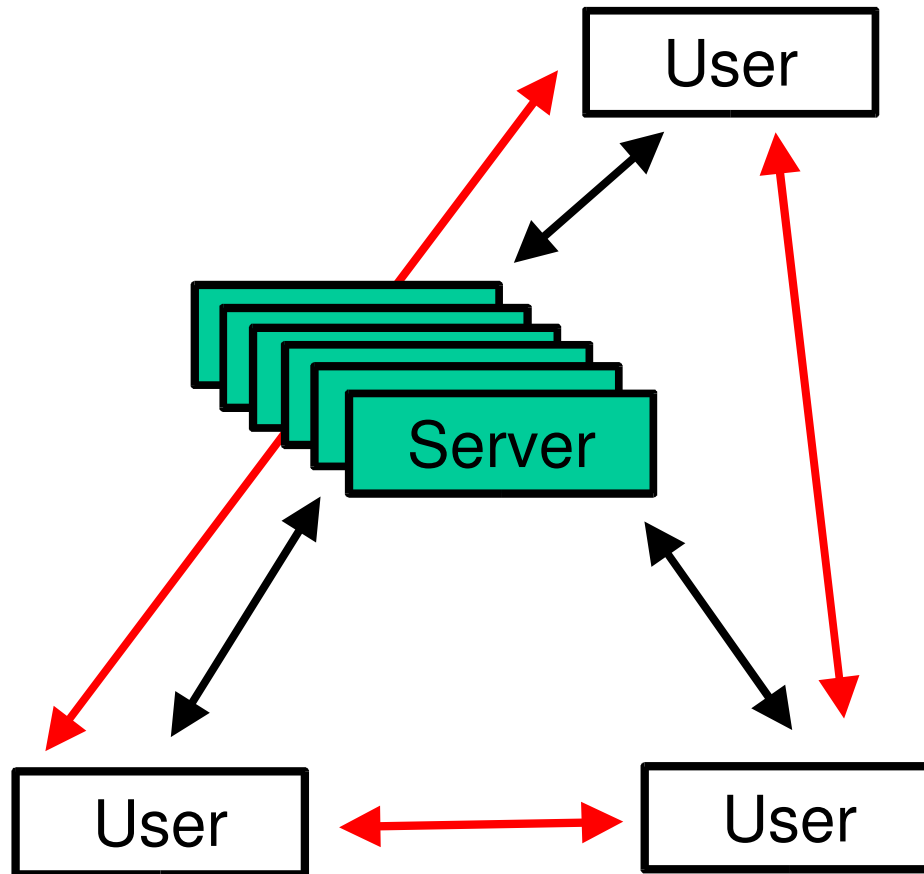
- Gaming network in IPv4



1. Moving data
2. Chat data
3. Patch data

One example of cost benefits in IPv6

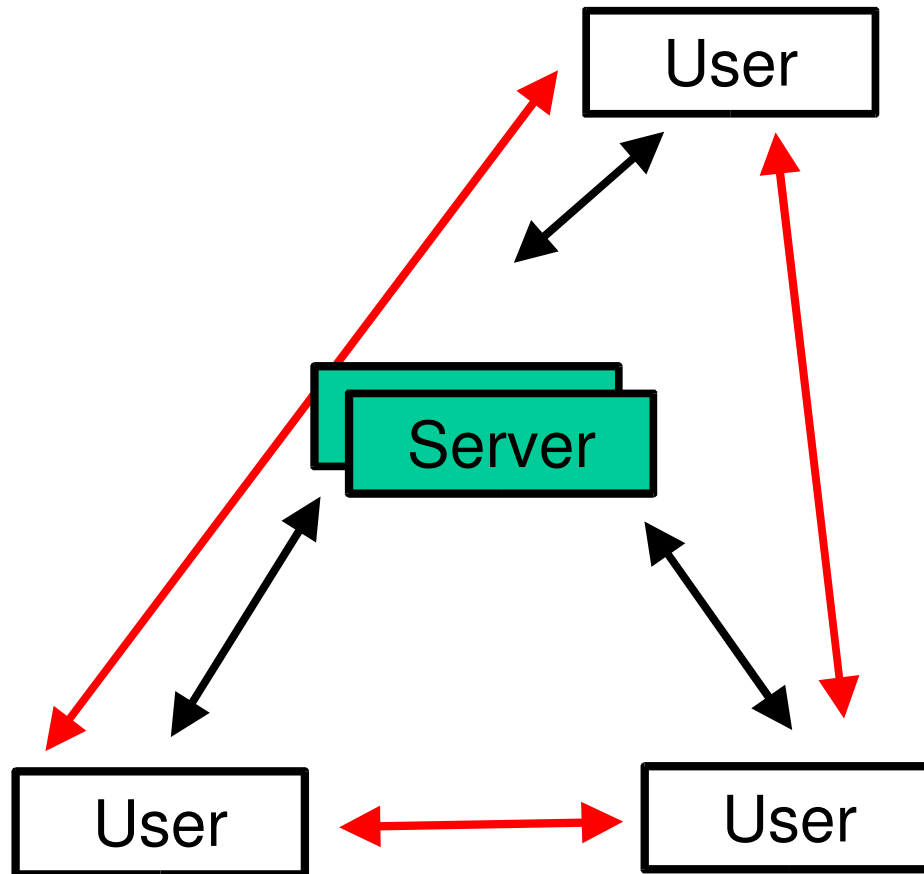
- Gaming network in IPv6



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One example of cost benefits in IPv6

- Gaming network in IPv6



1. Moving data
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Furthermore

- Text chat data should be changed to Voice
 - Hands are already used for game controller
 - Mouth is better interface than hands
 - Client–Server model cannot handle voice chat
 - IPv6 is necessary
- User side benefit?
 - IPv4: \$5/month, IPv6: \$3/month
 - This is fun thing for IPv6 users :-P

Other examples?

- I have only one example
- We must find out other many example
 - Otherwise IPv6 never be deployed