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[Proposal] Proposal to create IPv4 shared use address space among LIRs

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Proposal Overview

- To reserve an IPv4 shared use address space among LIRs
  - Address space to reserve
    - One /8, out of "global routable" address space is reserved to APNIC
  - An available organization
    - LIR in AP region
    - If it is used in other region, necessary to discuss in each region
  - Advertisement
    - Don't advertise to the global Internet
  - Management
    - The DB registration to RIR is not necessary
  - Procedure to use
    - LIR assign this space to its customers (inc. enterprises)

Motivation of the proposal

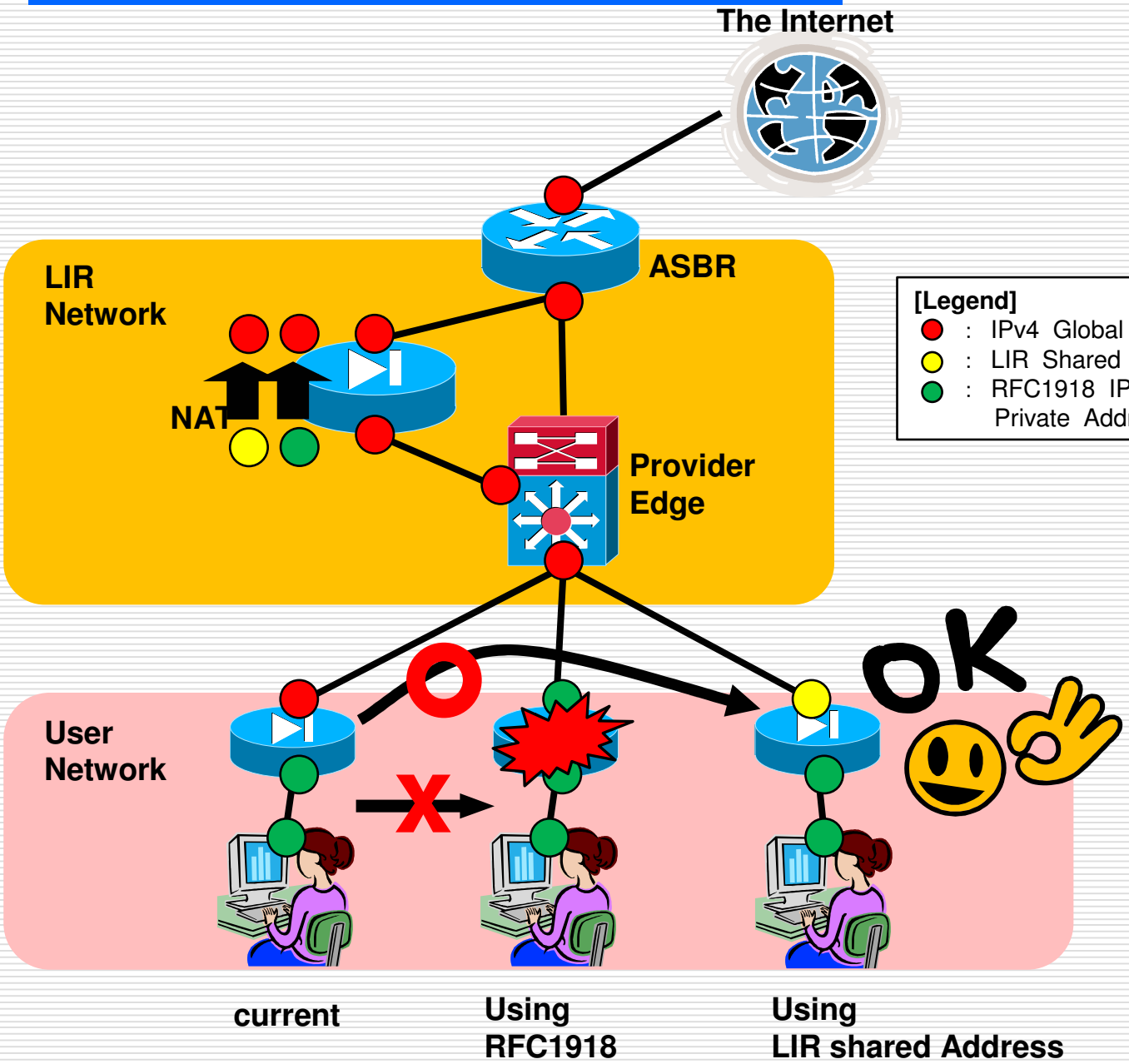
- after IPv4 address exhaustion
  - In the conventional way (LIR assign global IPv4 address to its customer), LIR cannot provide current service to end user.
  - LIR can provide current service to new customer by using this address space.

Background

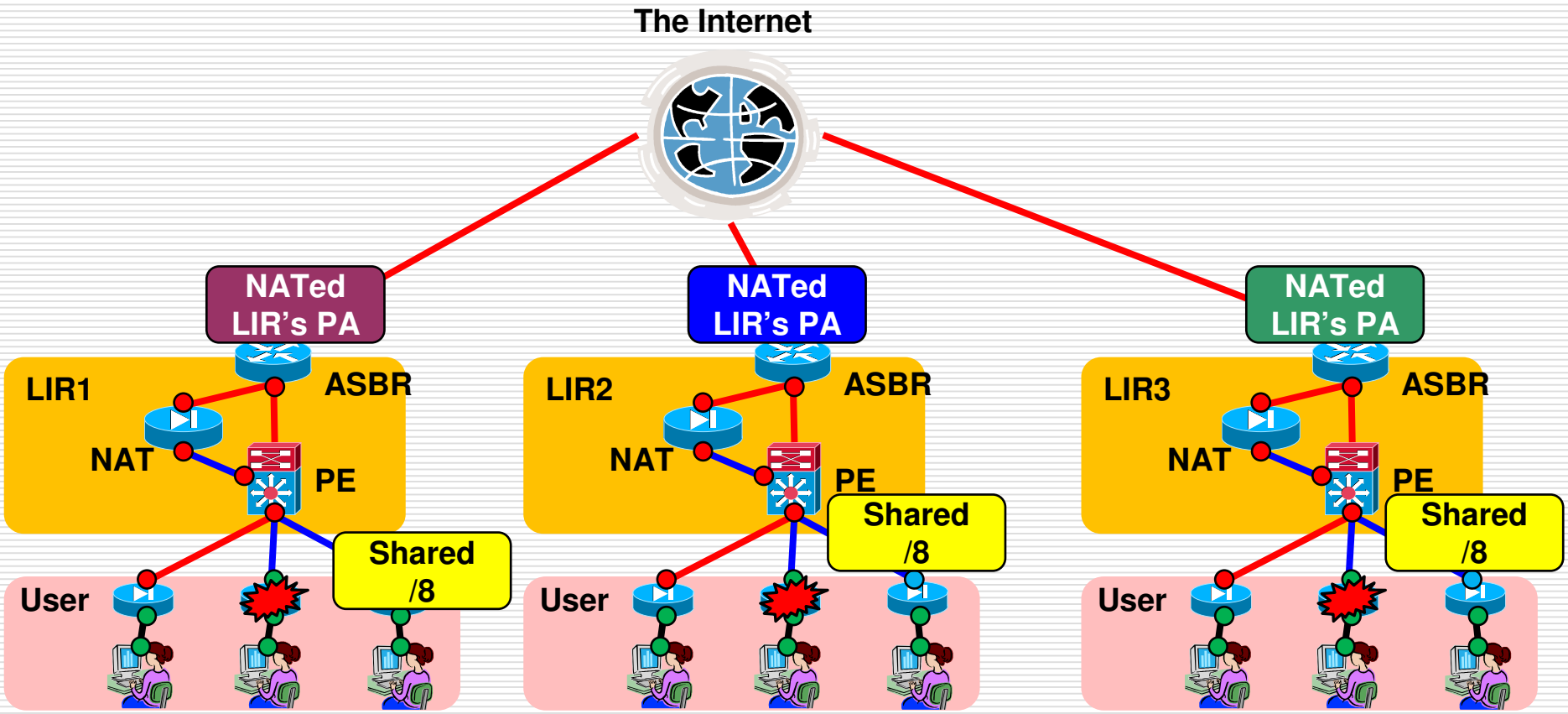
- Even if it is assigned only IPv6 address an end site, communications it not concluded.
  - The communication partners who does not support IPv6 stay in future.
  - IPv6-IPv4 Translator technology does not ripe.
  - The Web site where link directly IPv4 address is left for the time being.

- If LIRs provide the connectivity using IPv4 private (RFC1918) address, Routing is not concluded technically.
  - Address spaces of customer and LIR are duplicate

assumption network



assumption network (cont)



The grounds of this proposal(1)

- Why one /8?
  - The space equal to /8 is necessary.
  - There is an ISP that has customers more than 10mil in AP region(JP). /9 is not enough
  - DNS operational Reason

- Why AP region?
  - There are opinions to be necessary at least in AP region. There is demand that LIR want to use in Japan. (It have reached consensus at JPOPM)
  - If demands occur in other region, we entrust it to judgment of each community.

The grounds of this proposal (2)

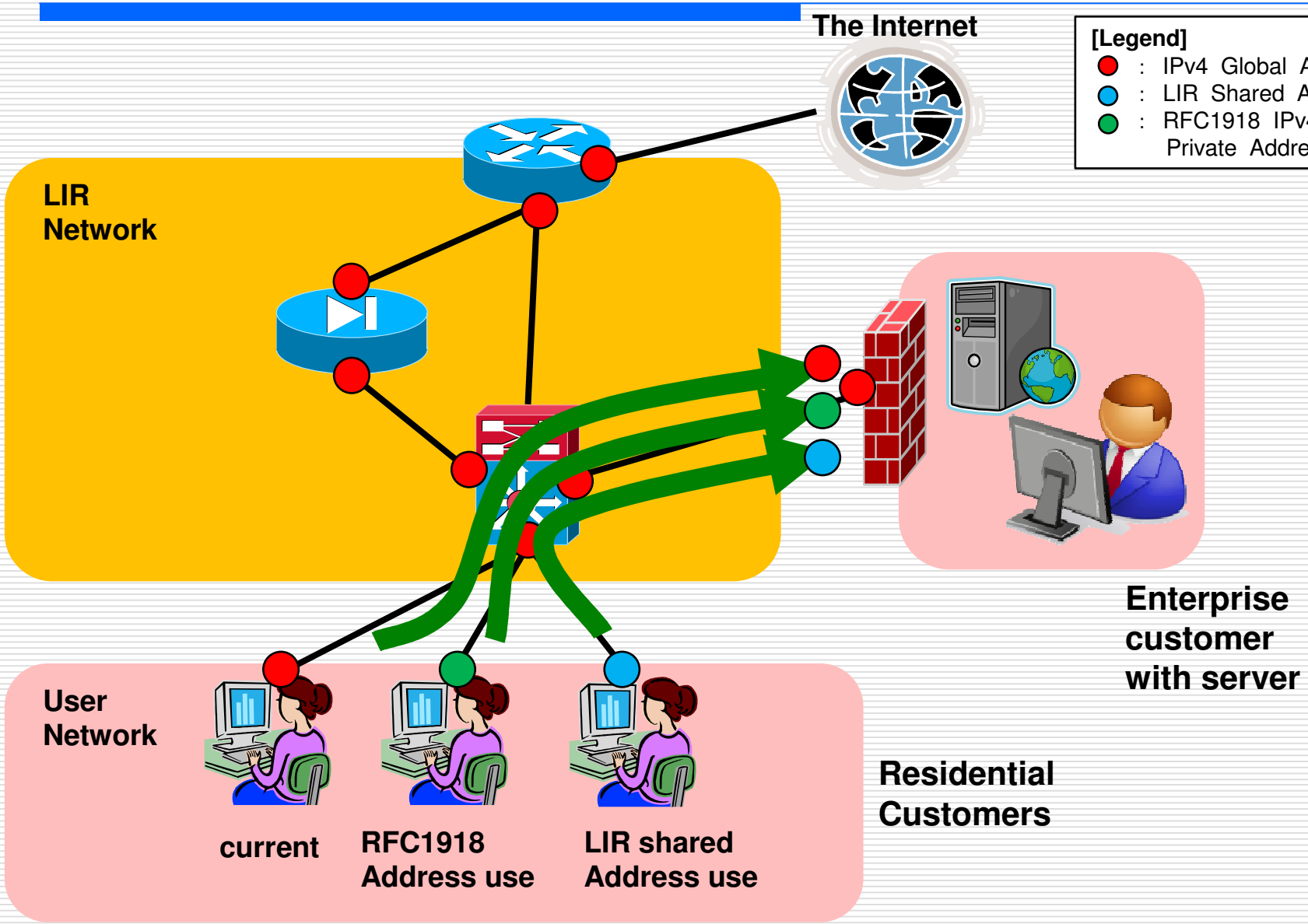
- Why LIR limited?
  - If end user uses this space, the conflict of the addresses happens when LIR use it. It does not solve the problem.
  - LIR cannot claim to their customer (later)

The grounds of this proposal (3)

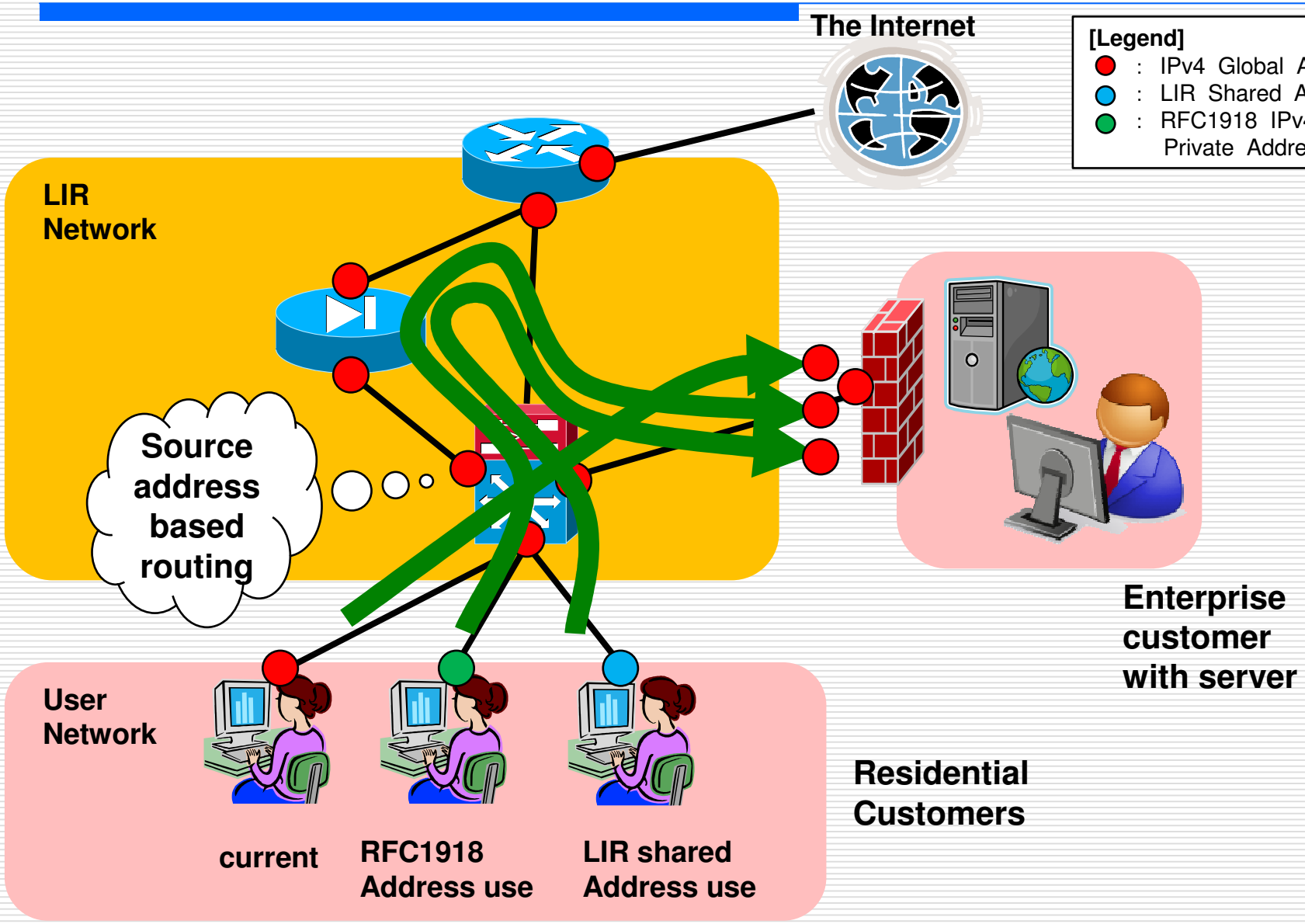
- Why not RFC1918 or 240/4 ?
  - Technical issue
    - Well-known private address does not influence only new customers.
      - Existing customer receive the packet with RFC1918 or 240/4 as source address.
      - Legacy equipment cannot receive it.
      - It is very difficult to update the equipments of existing customers.
    - If LIRs exchange the traffic between customers
      - LIRs cannot use destination based routing
      - LIRs have to use source based routing

      => It is very critical for large scale ISPs

Why not RFC1918 or 240/4?



Why not RFC1918 or 240/4?



The grounds of this proposal (4)

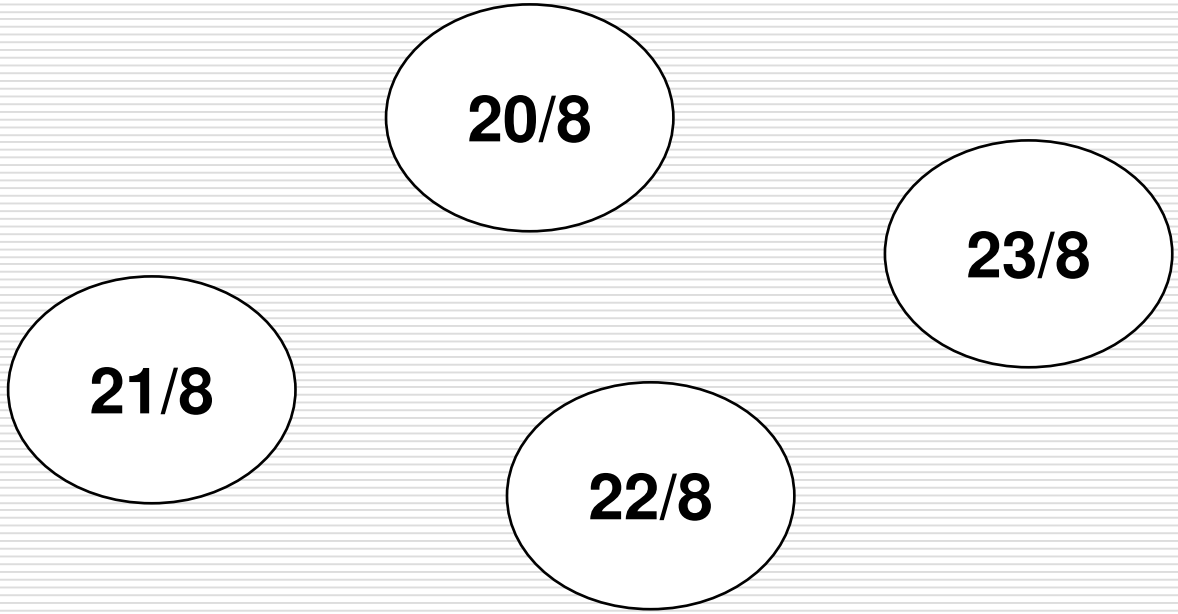
- Why not RFC1918 or 240/4 ? (cont)
  - Political issue
    - Anyone can use private address (RFC1918 or 240/4)
    - LIRs cannot claim to their customers
      - Update software of your equipment
      - Update your policy of Firewall
      - Renumber your internal IP address
      - Buy your new Router

Customers say

"We are using the address which anyone can use"

The grounds of this proposal (5)

- Why not normal Global IPv4 address
  - Each ISP request subsequent IPv4 address
    - IPv4 address exhaustion will be close
    - After IPv4 address exhaustion, LIRs have to assign RFC1918 or 240/4.



The grounds of this proposal (6)

- Why not IPv6? That's short time issue
  - New customer may not have IPv6 ready equipment.
  - Current "new" customer is existing customer of other ISP.
  - This proposal does not obstruct a shift to IPv6.
    - The service used this space cannot provide peer-to-peer communication.
    - LIRs can make the time to shift to IPv6 enough.

Advantages of this proposal

- For APNIC
  - It promotes effective use of global IPv4 address space
- For LIRs:
  - By using this shared use address space, LIRs can continue to provide IPv4 connectivity even after the IPv4 address exhaustion.
  - LIRs can provide IPv4 connectivity by dual-stacking shared use addresses with IPv6 addresses. This is important as we currently do not have high-throughput IPv6-IPv4 translators for commercial use.
- For end-users:
  - End user can connect CPE that has only IPv4 after the IPv4 address exhaustion.

Disadvantage

- For Community:
  - Concerns may be raised that global IPv4 addresses that can be allocated to LIRs diminishes by one /8 (however, in the long run, this proposal will save more address than that space)

Address management

- No need for allocation request from LIR to APNIC
- No need for Second Opinion Request from LIR to RIR
- No need for Database (WHOIS) registration
- Uniqueness in LIR's network should be ensured in LIR's network (LIR's responsibility)
- Only LIRs can use this address
  - End-user should be assigned this address from its upstream LIR

Operation

- Route advertisement:
  - Must not be allowed.
- Packet filtering:
  - It is recommended that an LIR filters those packets with this address as source and/or destination
- IX use:
  - Must not be allowed.
- Reverse DNS delegation
  - LIR should manage reverse DNS for this address, and should not leak it in the root-DNS tree.

Q&A

- Q1. Will those address be used?
  - A1. Yes, according to our interview to JP LIRs
- Q2. Is there any other target users?
  - A2. A user who uses global IPv4 addresses in closed network, to avoid a collision with its user's network with RFC1918 address being assigned, for instance.
- Q3. expect LIR uses it?
  - A3. The restrictions expect LIR are difficult. If LIR connect the user, LIR is easy to send the request for renumbering based on policy.
- Q4. What if LIRs, both use this address, merge?
  - A4. At their own risk..
- Q5. If end-user uses NAT, there would be multiple NAT in the network. Won't be there a technical problem?
  - A5. It is clear that decrease connectivity using NAT. This is a solution when it wants to continue provide IPv4 service in that way.
- Q6. Should discuss in IETF?
  - Same as IPv6 documentation prefix, I think that proposal to APNIC is appropriate.
- Q7. The relations with 240/4?
  - A7. It is different from this proposal if 240/4 is usable to end-user same as RFC1918
- Q8. Cannot 240/4 use for this proposal?
  - A8. unusable. CPE (such as a PC, residential router) cannot support,
- Q9. The global addresses already allocated to LIR?
  - The return does not impose duty.