A Proposal for IPv6 IRR service at APNIC

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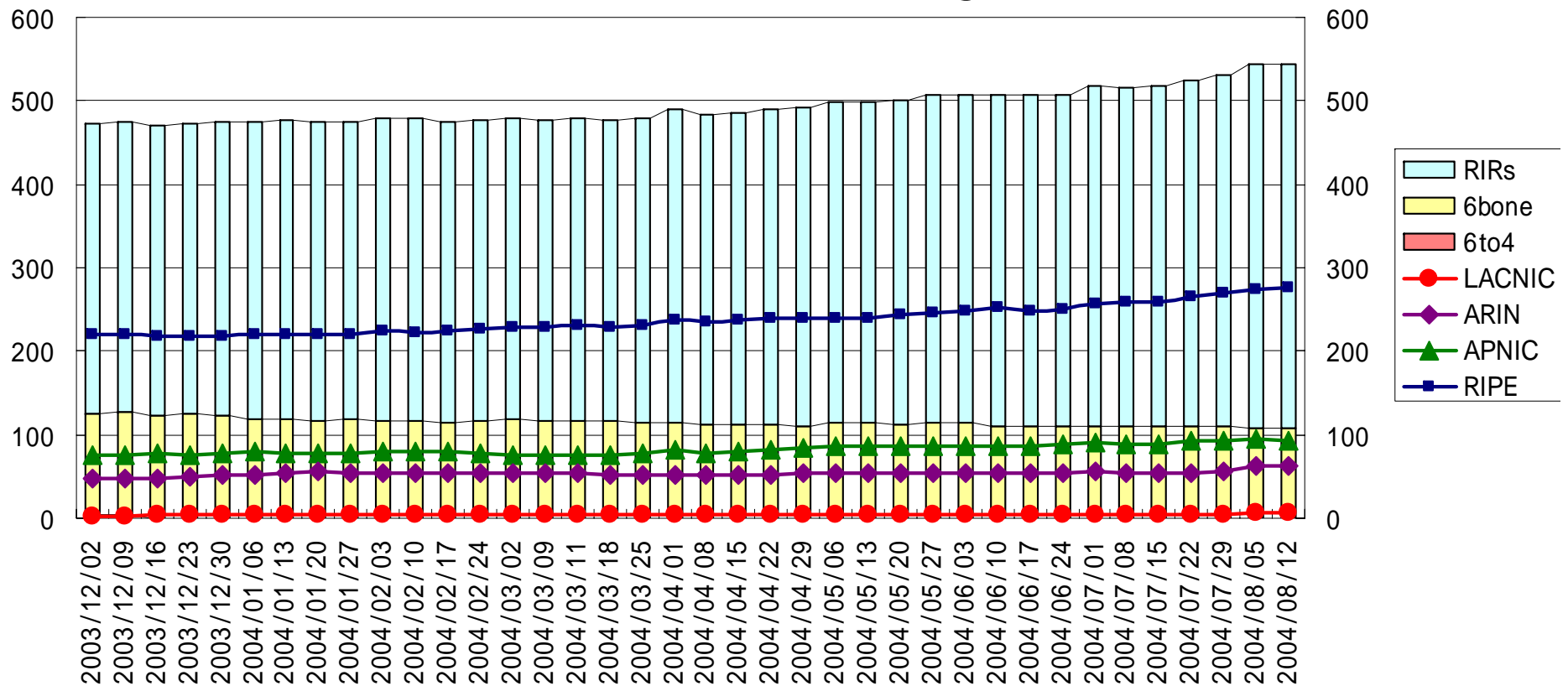
Sep. 2, 2004

APNIC18 database SIG @ Nadi, Fiji

Background

- IPv6 network is being deployed gradually, but still it is not so widely used.
  - it will be inevitably used in future.

- IPv6 network is based on almost the same routing architecture as IPv4.

Advertised IPv6 prefixes

- 545 prefixes on Aug. 12, 2004 at NTTv6.NET
  - Observed from Dec. 2, 2003 to Aug. 12, 2004

Background

- IPv6 network is being deployed gradually, but still it is not so widely used.
    - it will be inevitably used in future.

- IPv6 network is based on almost the same routing architecture as IPv4.

Advertised prefixes   RIRs allocated) and inet6num objects in whois database

- 84% of prefixes are "correctly" advertised.
- no bogus routes
- seems to be fewer punching holes comparing with IPv4

prefixes	only in 2001::/16	Matching to inet6num in whois-db		
Prefix length	# of advertised prefixes %	exact match	more specific	no match
/27	1(0.2%)	1	0	0
/32	365(83.5%)	365	0	0
/33	2(0.5%)	0	2 (/32)	0
/35	42(9.6%)	11	31(/32)	0
/42	1(0.2%)	1	0	0
/44	1(0.2%)	0	1(/42)	0
/48	17(3.9%)	15	2(/32)	0
/64	8(1.8%)	0	1(/32) 7(/48)	0
Sum	437(100%)	397	40	0

366 (83.7%)

44 (10.1%)

27 (6.2%)

Advertised prefixes

Problems

- When widely deployed, IPv6 network will have the same troubles as the current IPv4 networks.
  - instabilities due to misconfigured routing
  - malicious attack such as route hijacking

- *To prevent misconfigured or malicious routing information, a mechanism verifying routing information is required.*

Solution

- <u>IPv6 IRR</u> will serve as the database for:
    - verifying advertised prefixes
    - the list of contact points, at least.

- Of course,
    - if it is always correct and up-to-date.
    - if it covers all the routing information.

Proposal

- A framework of IPv6 IRR should be defined.

- IPv6 IRR service should be launched by APNIC.

- IPv6 IRR should be promoted to the other RIRs.

Advantage/Disadvantage

- Advantage
  - Contribution to the stable routing on IPv6 network.
  - Earlier RIRs start, more easily IPv6 IRR is deployed.

- Disadvantage
  - Increased operation cost due to instable routing, which should be paid by service providers.
    - And this will cause customers should pay more

Outstanding Issues

- Framework for IPv6 IRR, such as
    - who administrate the IRR
        - RIR, NIR, LIR,…?
    - what kind of architecture of the IRRs
        - like current IPv4 IRR?
    - how to keep the objects in IRR up-to-date?
        - by some rules/procedures or some techniques?
- Schedule to provide IPv6 IRR service

- To discuss above, it is required to establish a working group.

One candidate of the architecture
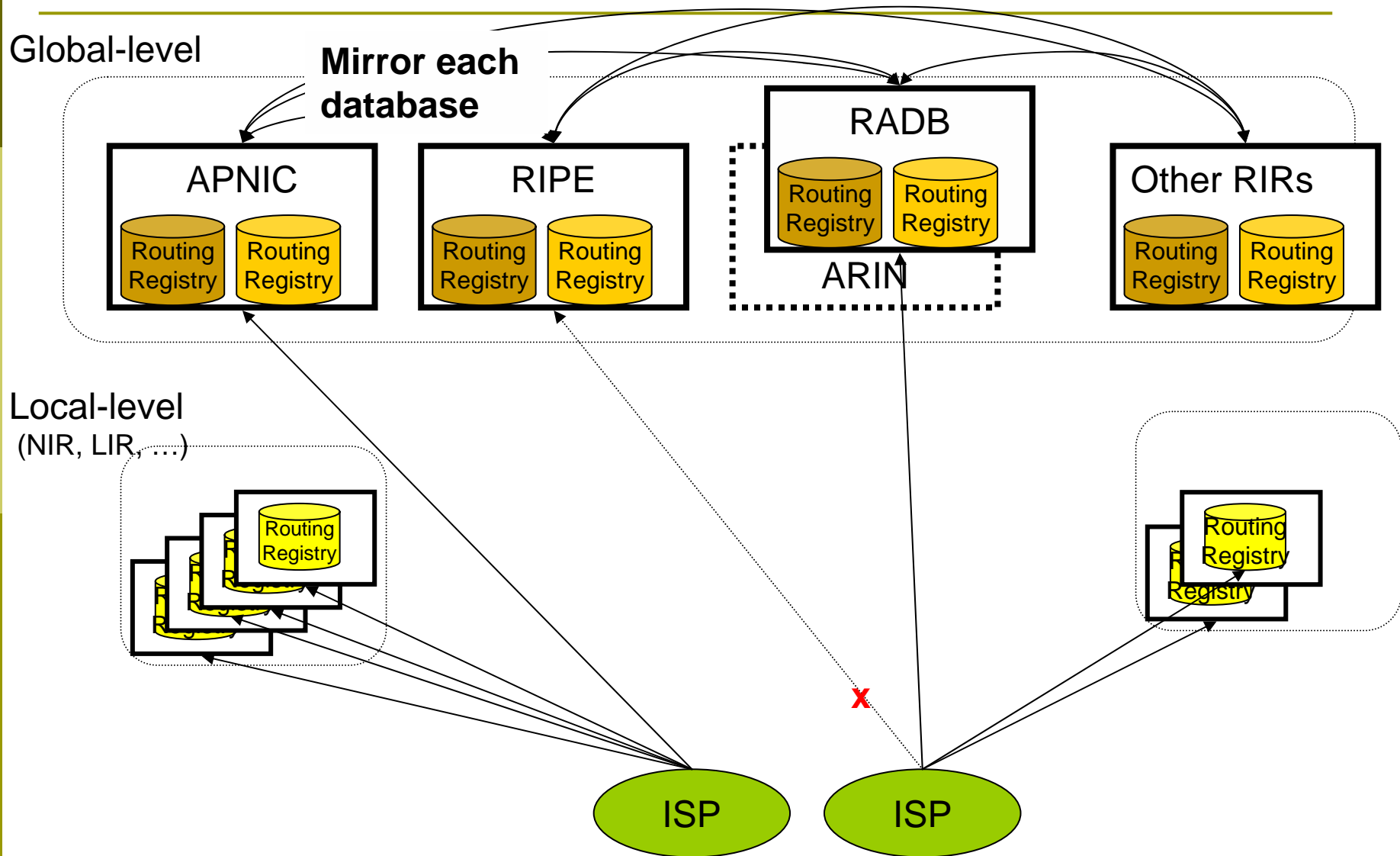
One candidate of the architecture

- Global-level
  - Routing Registries for exchanging aggregated routes which are required to advertise in global level.
    - currently prefix length should be less than or equal to /32.
    - to prevent the global routing table from expanding.

One candidate of the architecture

- Local-level
  - Routing Registries for exchanging in a specific closed user group, such as:
    - IX customers who use more-specific routes that are exchanged at this IX.
    - National Registries who require users to register the routing information that is exchanged in the country.

Schedule

- Framework discussion
  - on database-sig and/or policy-sig mailing list (Sep. 2004 ~ Dec. 2004)
    - draft framework for IPv6 IRR
    - sometimes closely related with global routing policy
  - promotion to other RIRs (Jan. 2005 ~Mar. 2005)

- IPv6 IRR service by APNIC
  - in parallel to framework discussion
  - jointly verify the implementation of IRR server software (Sep. 2004 ~ Dec. 2004)
  - launch the service after the consensus among RIRs.

Summary

- We proposed:
  - A framework of IPv6 IRR should be defined.
  - IPv6 IRR service should be launched by APNIC.
  - IPv6 IRR should be promoted to the other RIRs.

- To achieve them, it is required to establish a working group for this discussion.

□ Thank you!
and any comments?

- Special thanks to:
  - JPNIC IRR planning team
    - Tomoya YOSHIDA (Chairperson)
    - Kuniaki KONDO (ex-Chairperson)
    - Masashi ETO
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    - Junichi MATSUMOTO

    - … and JPNIC staff

  - NTT Labs.
    - Yuichi TEZUKA

    - … and IPv6 research group