

Is IPv6 Reverse DNS Delegation required?

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Agenda

- Introduction of
“IPv6 Operations Study Group in Japan”
- Discussion report of ‘Necessity of IPv6 Reverse DNS Delegation’ in some Japanese operators community

IPv6 Operations Study Group in Japan

- Established under IPv6 Deployment Committee, IAJapan
- Purpose
 - Clarifying IPv6 operation referential models
 - Identifying and sharing issues to deploy IPv6 between engineers
 - Operators, Developers, Researchers, and End users

Description

- Discussion on Mailing-list & off-line meeting
- Members
 - Chairs
 - Akihiro Inomata (Fujitsu), Masaru Mukai (POWERD COM),
 - Board members
 - Takashi Arano (Intec NetCore), Kuniaki Kondo (Intec NetCore),
 - Koichiro Fujimoto (NEC), Tomohiro Fujisaki (NTT)
 - various internet engineers (over 100 members)
 - ISP Operators
 - Router Developers
 - Slers
 - Home appliance developers
 - OS venders
 - Researchers (WIDE Project Members, etc.)

Discussion in IPv6 Ops Japan

- Address policy
- Small subscribers access
 - Dynamic prefix assignment, DNS Discovery, etc.
- ISP routing policy
 - Multi-homing, Address aggregation
- Transition model
 - Scenario
- Enterprise network
 - Network model, Security
- DNS reverse lookup

Interim discussion was reported in IPv6 SIG at APNIC 13

See <http://www.apnic.net/meetings/13/sigs/ipv6/index.html>

Necessity of IPv6 Reverse DNS Delegation

- Start of this discussion

In 2nd JPNIC Open Policy Meeting

Question from an attendee:

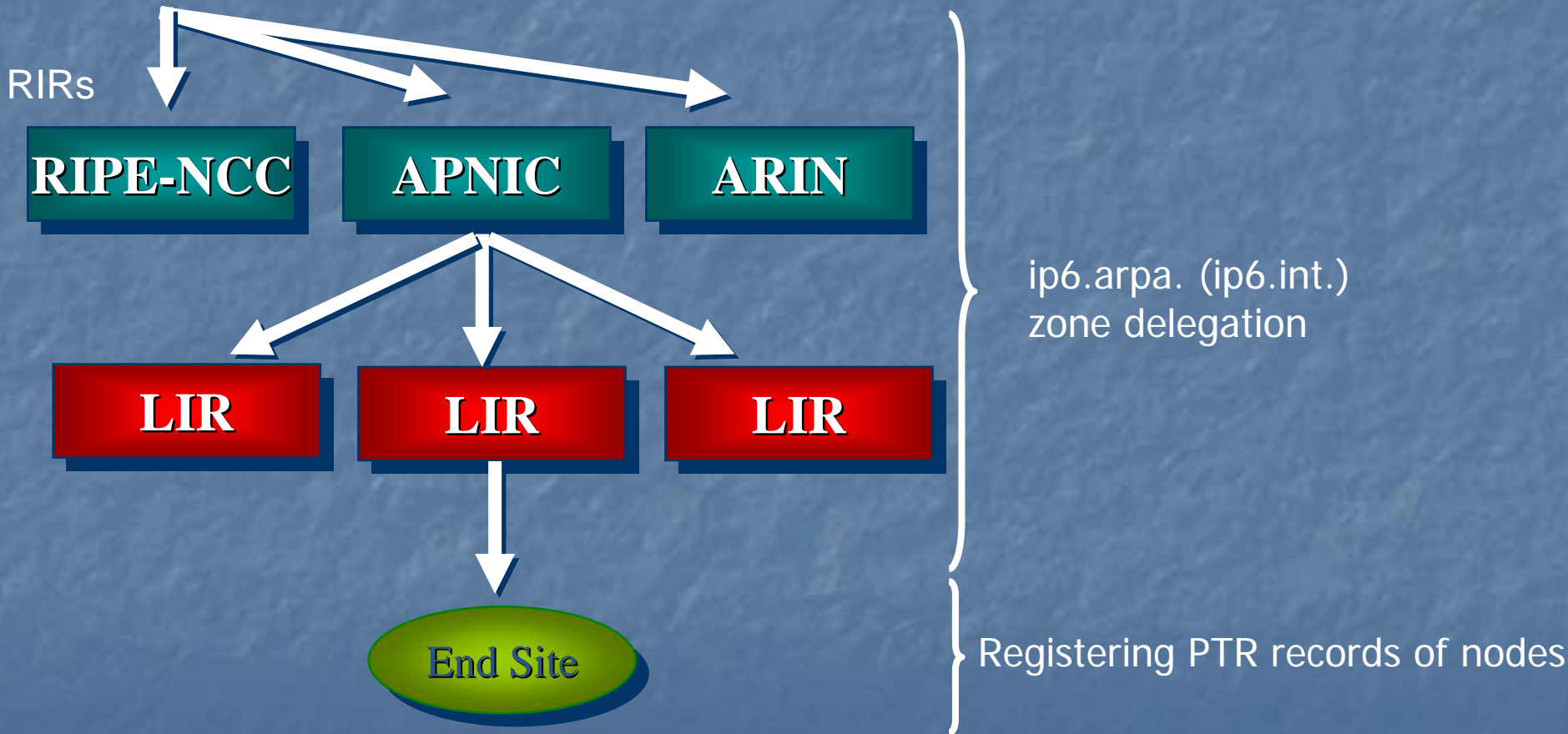
- In IPv4, DNS delegation and PTR record setting is almost mandatory. How about in IPv6?



We've discussed this in:

- IPv6 Ops open meeting
- JANOG, etc.

Reverse DNS delegation (lookup)



Current Usage of Reverse DNS lookup

- For security check by servers
 - Reject access if hosts do not have reverse mapping
- Verifying clients location
 - Use domain name for geographic information
- Improve readability
 - Log file , traceroute, etc.
- Writing access list
 - Make groups of IP address using reverse lookup

Current state of Reverse DNS

- Policy View Point -

- In IPv4, ISPs should maintain in-addr.arpa record

RFC 2050:

5. In-ADDR.ARPA Domain Maintenance

The regional registries will be responsible for maintaining IN-ADDR.ARPA records only on the parent blocks of IP addresses issued directly to the ISPs or those CIDR blocks of less than /16. Local IRs/ISPs with a prefix length of /16 or shorter will be responsible for maintaining all IN-ADDR.ARPA resource records for its customers.

APNIC address management policy:

10.5 Responsibility to maintain in-addr.arpa records

LIRs should maintain in-addr.arpa resource records for their customers' networks.

Current state of Reverse DNS

- IPv6 policy viewpoint -

- IPv6 ISP must delegate reverse lookup zone upon request

IPv6 Address Allocation and Assignment Policy

- 5.6. Reverse lookup

When an RIR/NIR delegates IPv6 address space to an organization, it also delegates the responsibility to manage the reverse lookup zone that corresponds to the allocated IPv6 address space. Each organization should properly manage its reverse lookup zone. When making an address assignment, the organization must delegate to an assignee organization, upon request, the responsibility to manage the reverse lookup zone that corresponds to the assigned address.

Why reverse lookup is a problem in IPv6?

- End user has so many address
 - It's hard to maintain (especially by hand)
 - Address is so long
 - Maintenance cost is high if ISPs do it for their customers
- There will be so many unmanaged networks
 - Who and how manage DNS servers ? Where will they locate?
 - Is the reverse record in such DNS servers credible?
- Temporary address for privacy (RFC3041)
- Inconsistency in the transition period from ip6.int. to ip6.arpa

Example: IPv6 reverse record zone file

```
;  
; Example PTR Record File  
;  
$ORIGIN e.f.f.3.ip6.int.  
9.6.e.5.9.7.e.f.f.f.7.2.0.9.2.0.1.0.0.0.0.0.0.0.0.0.0.1.1.8.1 IN PTR pisces.nttv6.net.  
d.0.2.1.c.d.e.f.f.f.9.c.0.a.2.0.0.0.0.0.0.0.0.0.0.0.0.0.1.8.1 IN PTR aries.nttv6.net.  
9.2.2.1.c.d.e.f.f.f.9.c.0.a.2.0.0.0.0.0.0.0.0.0.0.0.0.0.1.8.1 IN PTR cancer.nttv6.net.  
6.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.f.f.f.f.0.0.0.0.0.1.8.1 IN PTR virgo.nttv6.net.  
9.7.1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.5.0.0.0.0.0.0.0.0.1.8.1 IN PTR virgo.nttv6.net.  
7.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.f.f.f.f.0.0.0.0.0.1.8.1 IN PTR paix.nttv6.net.  
5.1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.f.f.f.f.0.0.0.0.0.1.8.1 IN PTR cancer.nttv6.net.  
2.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.f.f.f.f.0.1.8.1 IN PTR cancer.nttv6.net.
```

It's hard to maintain without mistake...

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IPv6 networks in practice

- Nodes that have non-EUI64 address (statically assigned address) looks registered
- Few nodes with EUI-64 address have reverse lookup entry.
- In JANOG, there are about 20 IPv6 DNS operators, and none of them maintain reverse records...

Discussion about reverse lookup

- In IPv4, it's easy to maintain reverse lookup because only need to register global address for NAT. It's impossible to register all machines in campus. (Campus network operator)
- If it is not necessary, possible to provide IPv6 connectivity with lower cost. (ISP operator)
- It's convenient if caller's FQDN can be resolved, but it does not need to be DNS to provide this function.

Discussion about reverse lookup (cont.)

- In P2P environment, it will be needed to identify the origin of communication.
- What we need is not the exact host name but the domain host belongs.
- Privacy will be more important in P2P environment that IPv6 will provide, so some mechanism to handle reverse lookup will be needed.



There are some demands for necessity of IPv6 reverse lookup, but some mechanism such as automatic registration will be necessary.

IPv6 reverse lookup in the future

Utilizing new DNS feature:

- DDNS mechanism
- DNS Sec
- Use of ICMPv6 node information query for reverse DNS lookup
 - [draft-itojun-ipv6-nodeinfo-revlookup-00.txt](#)
- Automatic population of the Reverse path DNS
 - [draft-ietf-dnsop-ipv6-dns-issues-00.txt](#)

Conclusion

- Introduce discussion interim of DNS necessity in some Japanese community
- Discussion is on going, and we'll try to develop how to utilize IPv6 reverse DNS lookup function.