

IPv6 & DNS: DNSv6



Overview

- How important is the DNS?
- DNS Extensions for IPv6
- DNS Resource Lookup
- Recursive Name Servers Information Discovery
- DNS Service Continuity through IP Networks
- Operational Requirements, Recommendations & Issues
- About IPv6 AAAA glue Records in DNS Zones
- IPv6-capable DNS Software



How important is the DNS?

- Need for Name Resolution (Lookup)
 - Name resolution needed prior to a TCP/IP communication
 - With Internet exponential growth, it became:
 - impossible to memorize millions of IP addresses;
 - impossible to maintain them in a centralized flat file (aka '/etc/hosts') ⊗
- 2 Approaches to the DNS : <u>RFC 1034</u> / <u>RFC 1035</u>
 - A Database: Stores different types of Resource Records (RR):
 - Mainly IP address(es) but other types (NS, MX, PTR, ...)
 - A TCP/IP Protocol and a Client/server Application:
 - IPv4 and IPv6; UDP & TCP; port 53
 - Query (for a RR) → lookup in the DNS database → Response
 - → Data returned to DNS clients SHOULD NOT depend on the underlying IP version



DNS Extensions for IPv6 Support RFC 3596 (DS)

- ❖ Forward lookup ('Name → IPv6 Address'):
 - ➤ A new Resource Record (RR): 'AAAA'
 - The 'AAAA' RR is for IPv6 what the 'A' RR 'is for IPv4
 - ➤ Example:

www.afnic.fr. IN **A** 192.134.4.20

IN **AAAA** 2001:660:3003:2::4:20

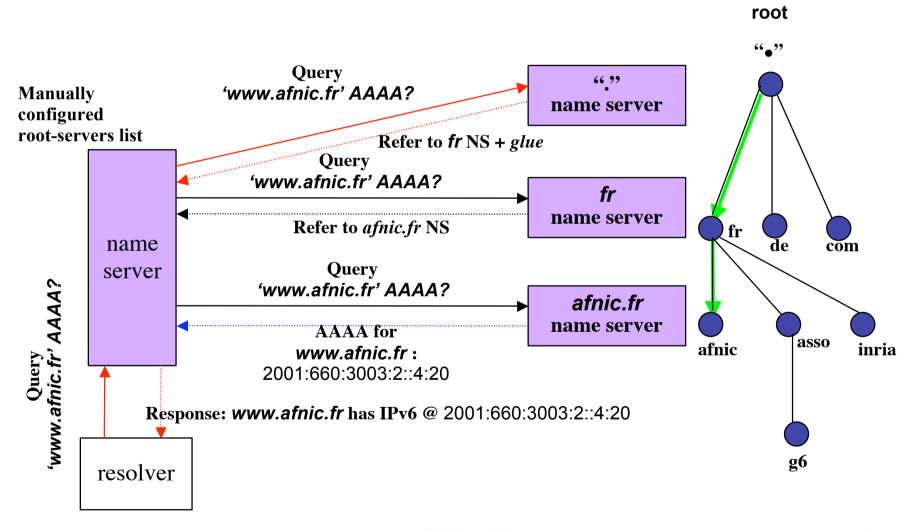
- * Reverse lookup ('IPv6 Address → Name'):
 - > PTR RR (pointer) applied to the **new** reverse tree: **ip6.arpa**
 - ➤ A dedicated tree with *nibble* (4 bits) *boundaries*
 - ➤ ip6.arpa tree is for IPv6 what the in-addr.arpa tree is for IPv4
 - > Example:

\$ORIGIN 1.0.0.0.6.0.0.3.0.6.6.0.1.0.0.2.ip6.arpa.

1.0.0.0.1.0.0.0.0.0.0.0.0.0.0 **PTR** ns3.nic.fr.



DNS AAAA Lookup



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