

DNS / DNSSEC Workshop

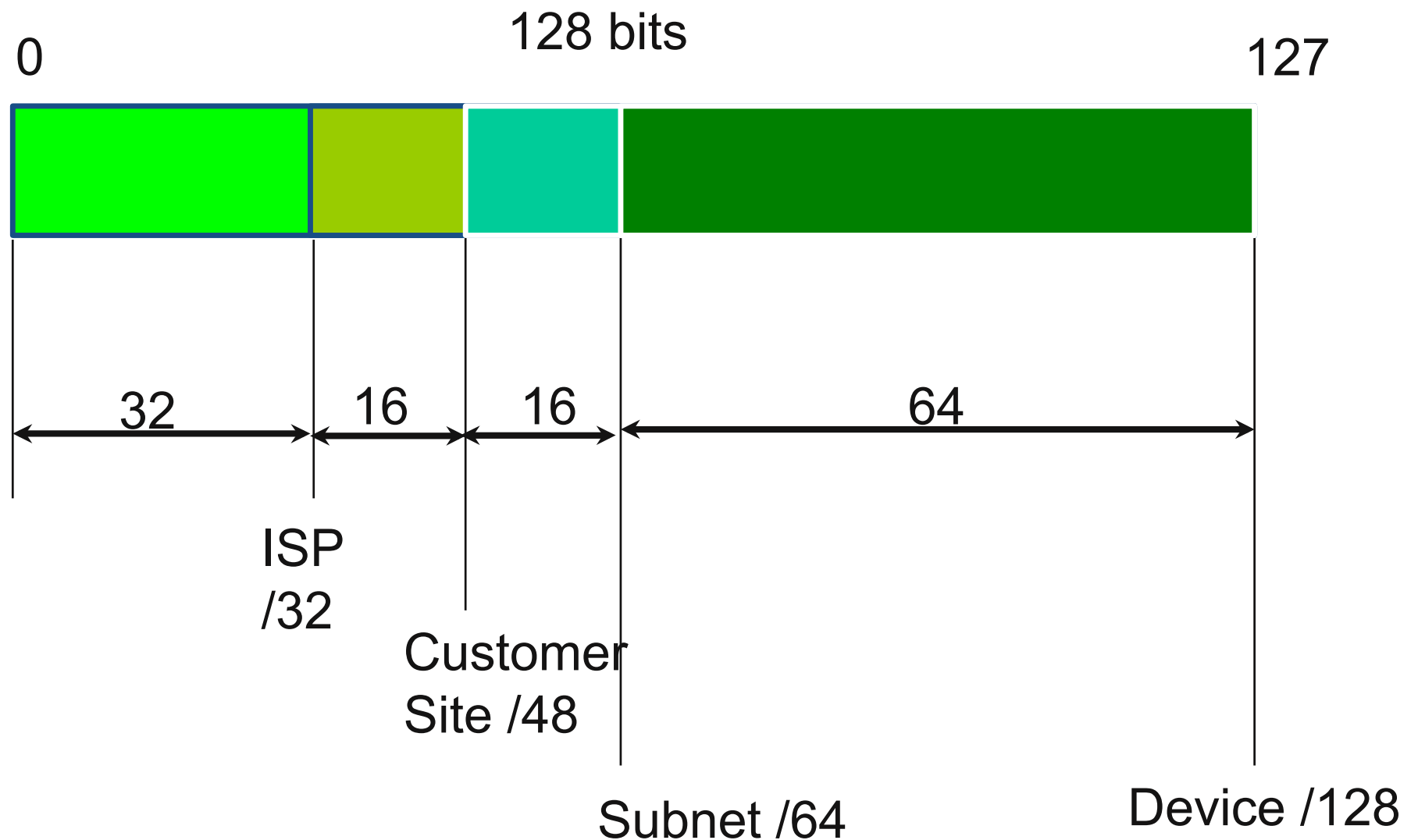
IPv6 and DNS

Slides courtesy  **APNIC**

IPv6 addressing

- 128 bits of address space
- Hexadecimal values of eight 16 bit fields
 - X:X:X:X:X:X:X:X (X=16 bit number, ex: A2FE)
 - 16 bit number is converted to a 4 digit hexadecimal number
- Example:
 - FE38:DCE3:124C:C1A2:BA03:6735:EF1C:683D
 - Abbreviated form of address
 - 4EED:0023:0000:0000:0000:036E:1250:2B00
 - →4EED:23:0:0:0:36E:1250:2B00
 - →4EED:23::36E:1250:2B00
 - (Null value can be used only once)

IPv6 addressing structure



IPv6 representation in the DNS

- Forward lookup support: Multiple RR records for name to number
 - AAAA (Similar to A RR for IPv4)
- Reverse lookup support:
 - Reverse nibble format for zone ip6.arpa

IPv6 forward lookups

- Multiple addresses possible for any given name
 - Ex: in a multi-homed situation
- Can assign A records and AAAA records to a given name/domain
- Can also assign separate domains for IPv6 and IPv4

Sample forward lookup file

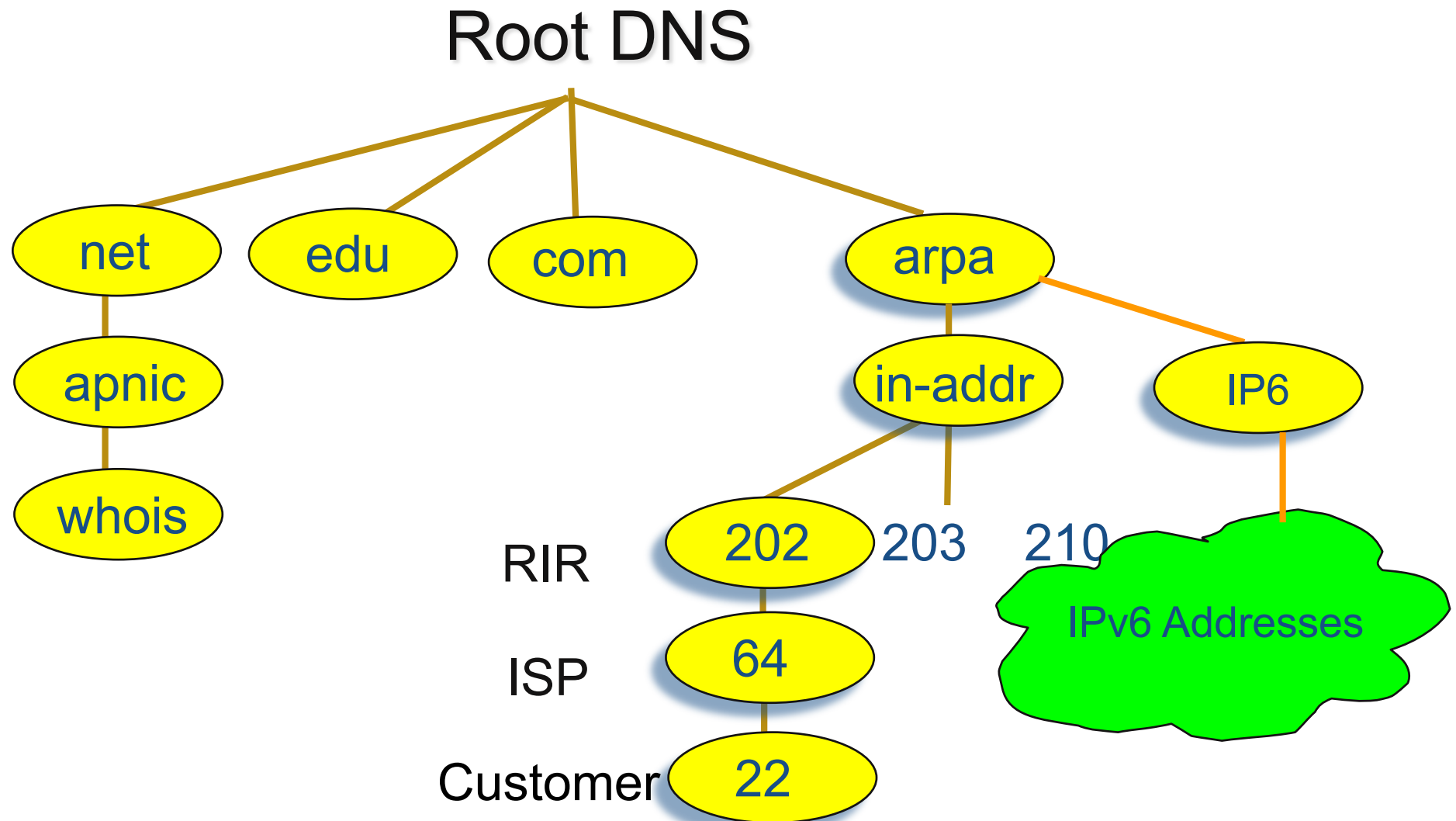
```
;; domain.edu
$TTL      86400
@   IN     SOA     ns1.domain.edu. root.domain.edu. (
                        2002093000    ; serial - YYYYMMDDXX
                        21600          ; refresh - 6 hours
                        1200           ; retry - 20 minutes
                        3600000        ; expire - long time
                        86400)         ; minimum TTL - 24 hours

;; Nameservers
                        IN     NS     ns1.domain.edu.
                        IN     NS     ns2.domain.edu.

;; Hosts with just A records
host1      IN     A      1.0.0.1

;; Hosts with both A and AAAA records
host2      IN     A      1.0.0.2
           IN     AAAA   2001:468:100::2
```

The reverse DNS tree – with IPv6



IPv6 reverse lookups - PTR records

- Similar to the in-addr.arpa

b.a.9.8.7.6.5.0.4.0.0.0.3.0.0.0.2.0.0.0.1.0.0.0.0.0.0.0.1.2.3.4.ip6.arpa.
IN PTR test.ip6.example.com.

- Example: reverse name lookup for a host with address 3ffe:8050:201:1860:42::1

\$ORIGIN 0.6.8.1.1.0.2.0.0.5.0.8.e.f.f.3.ip6.arpa.

1.0.0.0.0.0.0.0.0.0.0.0.2.4.0.0 14400 IN PTR host.example.com.

Sample reverse lookup file

[illegible]

Questions?