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TDDI41 Lab report

Högskoleingenjörsutbildning i datateknik, 180 hp

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DNS

1-2

a) A name server which answers queries about names in a zone.

b) A domain is a subtree of the namespace, and a zone is a part of the namespace of which a NS is authoritative. Zone $\subseteq$ Domain

c) A recursive query will not return until it has a complete answer, whereas the non-recursive can return a "partial" answer—i.e. "I don't know, but ask this other guy ...".

Recursive resolving should foremost be used to focus the caching to specific machines rather than having entire subnets' hosts handle their own caching.

Iterative resolving is always found on authorative name servers.

d) The purpose of delegation is to delegate administration of DNS zones, effectively limiting the branching factor for each NS.

e) A RR consists of node name (NAME), record type (TYPE), class code (CLASS), TTL, length of the RDATA field (RDLENGTH), and data of type-specific relevance (RDATA) such as IP address and hostname.

f) "Answer" lists the answer to the query (Address record, Canonical name record).

"Authority" lists the authorities for the query.

"Additional" lists other relevant info related to the query, such as addresses of the name servers.

g) In the header:

Authorative name server answer: [AA]
Recursive query: [RD]

h) Glue records are [A] records, held higher in the tree, for delegated zone name servers.

1-3

PTR records corresponding to IP addresses in the network 10.131.24.64/27 are contained in `[24.131.10.in-addr.arpa.]`. Another network that have PTR records in the same zone would be 10.131.24.96/27, and so would 10.131.24.128/28.

The problem with delegating authority over the DNS records corresponding only to 10.131.24.64/27 is that we don't delegate PTR records, but zones. The most specific zone we can delegate is 24.131.10.in-addr.arpa. unless *1-4*.

1-4

Classless in-addr.arpa delegation allows for narrower delegation of zones within an IP-range, not limiting us to 256 address blocks. Using the RFC 2317 an authority uses CNAMEs to insert subdomains that can then be delegated. For instance, the subnet 172.20.24.8/29 could be delegated as 8-15.24.20.172.in-addr.arpa, with logical CNAMEs such as 8.8-15.24.20.172.in-addr.arpa, 9.8-15.24.20.172.in-addr.arpa, and so on.

2-1

a) informatix.ida.liu.se has address 130.236.177.26

b) www.ida.liu.se is an alias for informatix.ida.liu.se, i.e. 130.236.177.26

c) liu.se has address 130.236.5.6

2-2

a/b) www.ida is not within the zone for ns3, but within the domain for dns.liu.se.

3-1

Use host to find out which name servers are authoritative for the zone adlibris.se.

```
$ host -a adlibris.se a.ns.se

;; AUTHORITY SECTION:
adlibris.se. 86400 IN NS c.ns.ip-only.net.
adlibris.se. 86400 IN NS b.ns.ip-only.net.
adlibris.se. 86400 IN NS a.ns.ip-only.net.
```

*Which organization(s) operate them?*ip-only.net

3-2

```
$ host -l sysinst.ida.liu.se ns.ida.liu.se | sed '1,/^$/d' | wc -l
125
```

3-3

```
$ host -a ida.liu.se $(host -av ida.liu.se | grep SOA \
| sed 's/.*SOA//g ; s/\.\ .*//g ; s/\t//g')
```

We found the records (A,AAAA,MX,SOA,NS) regarding the zone, and glue records for the name servers.

This is all the information available as the ida.liu.se domain is wholly delegated to the ida.liu.se zone, which subsequently only delegates **sub**-domains if such exists.

4-1

a)

```
$ dig ida-gw.sysinst.ida.liu.se
[...]
;; ANSWER SECTION:
ida-gw.sysinst.ida.liu.se. 300 IN A 130.236.178.1
```

b)

```
$ dig ida-gw.sysinst.ida.liu.se SOA
[...]
;; QUESTION SECTION:
;ida-gw.sysinst.ida.liu.se. IN SOA

;; AUTHORITY SECTION:
sysinst.ida.liu.se. 300 IN SOA sysinst-gw.ida.liu.se. david.byers.liu.se. 2016110901 3600 18
```

c)

```
  $ dig -x 130.236.189.1
[...]
;; QUESTION SECTION:
;1.189.236.130.in-addr.arpa. IN PTR

;; ANSWER SECTION:
1.189.236.130.in-addr.arpa. 3564 IN PTR idagw-189.ida.liu.se.
```

4-2

a)

```
  $ dig www.ida.liu.se A +trace | grep Received
;; Received 525 bytes from 130.236.1.9#53(130.236.1.9) in 1 ms
;; Received 865 bytes from 192.203.230.10#53(e.root-servers.net) in 30 ms
;; Received 483 bytes from 130.239.5.114#53(g.ns.se) in 11 ms
;; Received 1188 bytes from 192.36.125.2#53(sunic.sunet.se) in 4 ms
;; Received 958 bytes from 130.236.146.68#53(ns2.liu.se) in 2 ms
```

b)

```
dig update.microsoft.com +trace | grep Received

;; Received 525 bytes from 130.236.1.9#53(130.236.1.9) in 58 ms
;; Received 872 bytes from 192.36.148.17#53(i.root-servers.net) in 5 ms
;; Received 790 bytes from 192.54.112.30#53(h.gtld-servers.net) in 21 ms
;; Received 61 bytes from 208.84.2.53#53(ns2.msft.net) in 61 ms

$ dig update.microsoft.com @ns2.msft.net +trace | grep Received
;; Received 40 bytes from 208.84.2.53#53(ns2.msft.net) in 22 ms
```