

50.005 Quiz NS 3 (15 mins)Name: Sample Solutions

Student ID: _____

Note: During the quiz, you can consult written or printed materials. But you can't go online or look at anything electronic, including your laptop, smartphone, etc.

1. Suppose that your department has a local DNS server for all the computers in the department. You are an ordinary user (i.e., not a system administrator). Can you determine if an external web site was likely accessed recently from a computer in your department? Explain.

Yes [1pt]. One possible method is to do a DNS lookup for the web server in question and note the time taken for getting the answer. If the time was small (e.g., LAN delay of a say few milliseconds), the answer was likely cached by the local server due to a recent access [2pts].

2. I ran the command **dig MX sutd.edu.sg** and got the following (edited and excerpted) output:

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;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 21444
;; flags: qr rd ra; QUERY: 1, ANSWER: 2, AUTHORITY: 3, ADDITIONAL: 6

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;sutd.edu.sg.                IN      MX

;; ANSWER SECTION:
sutd.edu.sg.                3600    IN      MX      5 post.global.frontbridge.com.
sutd.edu.sg.                3600    IN      MX      0 sutd1.eo.ook.com.

;; AUTHORITY SECTION:
sutd.edu.sg.                2350    IN      NS      nsrv.sutd.edu.sg.
sutd.edu.sg.                2350    IN      NS      dnssec1.singnet.com.sg.
sutd.edu.sg.                2350    IN      NS      dnssec3.singnet.com.sg.

;; ADDITIONAL SECTION:
dnssec1.singnet.COM.sg.     2328    IN      A        165.21.83.11
dnssec1.singnet.COM.sg.     2328    IN      AAAA     2001:c20:18:a::36
dnssec3.singnet.COM.sg.     2328    IN      A        165.21.100.11
dnssec3.singnet.COM.sg.     2328    IN      AAAA     2001:c20:10:a::37
ns.sutd.edu.sg.             13487   IN      A        202.94.70.254

;; Query time: 15 msec
;; SERVER: 192.168.0.1#53(192.168.0.1)
```

(a) Was this query iterative or recursive?

Recursive [2pts]. Because both the rd (recursion desired) and ra (recursion available) flags are set.

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(b) As far as you can tell from the output, what functions do the machines **sutd1.eo.ook.com** and **nsrv.sutd.edu.sg** serve respectively?

sutd1.eo.ook.com is an email server for the sutd.edu.sg domain [2pts]. nsrv.sutd.edu.sg is an authoritative DNS name server for the email server [2pts].

3. How does DNS, in usual practice, mitigate the problem of outdated answers being cached and used? Does this mechanism solve the problem completely? Why?

DNS lookup results are subject a specified time-to-live (TTL) that limits how long the results can be cached [2pts]. This increases the chance that the cached results will be refreshed before a user queries their outdated versions.

No [1pt]. Since a DNS name-to-value mapping can change at any time, after the change, it is still possible for a user to query the name before the TTL expires [2pts].