

## Review Questions for Lecture 3 - Solution

**Your Name:**

Please print out this form (two-sided, if you can) and write your answers legibly in the spaces provided. If you can't write legibly, type.

1. Use the *nslookup* command to determine the IP address of *shell.cec.wustl.edu*, *oasis.cec.wustl.edu* and *google.com*. Write down the first IP address returned for each domain name.

*Name: shell.cec.wustl.edu*

*Address: 128.252.167.161*

*oasis.cec.wustl.edu canonical name = rdp-srv2.seasad.wustl.edu.*

*Name: rdp-srv2.seasad.wustl.edu*

*Address: 128.252.167.168*

*Non-authoritative answer:*

*Name: google.com*

*Address: 172.217.8.174*

2. Which is preferable from the perspective of a DNS server for a top-level domain, iterative processing, or recursive processing. Explain why.

*A TLD DNS server prefers iterative queries so that they are not responsible for resolving all requests they receive, and can instead defer to the querying client or server the task of performing additional queries to ultimately provide the desired answer.*

Which is preferable from the perspective of a local DNS server? Why?

*A local DNS server will benefit from performing recursive processing, as it will allow it to cache useful information that it may be able to subsequently reuse, thereby resolving queries faster and with less processing.*

3. Here is a snapshot from Wireshark showing a DNS query and response to get the address for the onl.arl.wustl.edu.

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▶ Frame 939: 114 bytes on wire (912 bits), 114 bytes captured (912 bits) on interface 0
▶ Ethernet II, Src: a2:f1:03:00:00:24 (a2:f1:03:00:00:24), Dst: Apple_44:05:b9 (3c:07:54:44:05:b9)
▶ Internet Protocol Version 4, Src: 128.252.0.100 (128.252.0.100), Dst: 172.16.20.221 (172.16.20.221)
▶ User Datagram Protocol, Src Port: 53 (53), Dst Port: 57666 (57666)
▼ Domain Name System (response)
  [Request In: 938]
  [Time: 0.001340000 seconds]
  Transaction ID: 0xbf28
  ▶ Flags: 0x8580 Standard query response, No error
  Questions: 1
  Answer RRs: 2
  Authority RRs: 0
  Additional RRs: 0
  ▼ Queries
    ▼ onl.arl.wustl.edu: type A, class IN
      Name: onl.arl.wustl.edu
      [Name Length: 17]
      [Label Count: 4]
      Type: A (Host Address) (1)
      Class: IN (0x0001)
    ▼ Answers
      ▶ onl.arl.wustl.edu: type CNAME, class IN, cname onl100.arl.wustl.edu
      ▶ onl100.arl.wustl.edu: type A, class IN, addr 128.252.153.111

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Why does the response have two answers?

*Because we have asked for a lookup on a name that is an alias for a 'canonical name'. The first answer is the CNAME RR which gives us the canonical name and the second is the A RR which gives us the IP Address*

What does a 'type CNAME' resource record tell us?

*It gives the canonical name for the requested name*

What does a 'type A' resource record tell us?

*The IP address of the host whose name was in the request.*