

# 计算机网络实验报告\_3\_DNS

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## 计算机网络实验报告\_3\_DNS

实验目的

实验过程及问答题

1).nslookup

2)ipconfig

3)Tracing DNS with Wireshark

实验思考

## 实验目的

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1. 巩固并掌握DNS相关知识
2. 了解nslookup和ipconfig等命令的使用

## 实验过程及问答题

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### 1).nslookup

1.Run nslookup to obtain the IP address of a Web server in Asia. What is the IP address of that server?

我选取的服务器是[www.bilibili.com](http://www.bilibili.com)的服务器(四个),IP地址有如下四个:120.92.168.13, 119.3.33.86, 119.3.44.211, 120.82.162.180

```
C:\Users\61794>nslookup www.bilibili.com
服务器:  mx.ustc.edu.cn
Address:  202.38.64.56

非权威应答:
名称:      s.w.bilicdn1.com
Addresses: 120.92.168.13
           119.3.33.86
           119.3.44.211
           120.92.162.180
Aliases:   www.bilibili.com
           a.w.bilicdn1.com
```

2.Run nslookup to determine the authoritative DNS servers for a university in Europe.

选取的是牛津大学(ox.ac.uk),其DNS服务器如下图所示

```

C:\Users\61794>nslookup -type=NS ox.ac.uk
服务器:  mx.ustc.edu.cn
Address:  202.38.64.56

非权威应答:
ox.ac.uk      nameserver = dns2.ox.ac.uk
ox.ac.uk      nameserver = auth4.dns.ox.ac.uk
ox.ac.uk      nameserver = dns0.ox.ac.uk
ox.ac.uk      nameserver = auth5.dns.ox.ac.uk
ox.ac.uk      nameserver = dns1.ox.ac.uk
ox.ac.uk      nameserver = auth6.dns.ox.ac.uk
ox.ac.uk      nameserver = ns2.ja.net

```

3.Run nslookup so that one of the DNS servers obtained in Question 2 is queried for the mail servers for Yahoo! mail. What is its IP address?

通过上述服务器无法查询

```

C:\Users\61794>nslookup mail.yahoo.com dns2.ox.ac.uk
DNS request timed out.
    timeout was 2 seconds.
服务器:  UnKnown
Address:  163.1.2.190

*** UnKnown 找不到 mail.yahoo.com: Query refused

C:\Users\61794>

```

## 2)ipconfig

ipconfig \all命令截图如下:

```
C:\Users\61794>ipconfig /all
```

Windows IP 配置

```
主机名 . . . . . : LAPTOP-P45LULAV
主 DNS 后缀 . . . . . :
节点类型 . . . . . : 混合
IP 路由已启用 . . . . . : 否
WINS 代理已启用 . . . . . : 否
DNS 后缀搜索列表 . . . . . : ustc.edu.cn
```

以太网适配器 以太网:

```
媒体状态 . . . . . : 媒体已断开连接
连接特定的 DNS 后缀 . . . . . :
描述. . . . . : Realtek PCIe GbE Family Controller
物理地址. . . . . : 54-05-DB-87-7C-E8
DHCP 已启用 . . . . . : 是
自动配置已启用. . . . . : 是
```

无线局域网适配器 本地连接\* 1:

```
媒体状态 . . . . . : 媒体已断开连接
连接特定的 DNS 后缀 . . . . . :
描述. . . . . : Microsoft Wi-Fi Direct Virtual Adapter
物理地址. . . . . : 34-C9-3D-91-74-55
DHCP 已启用 . . . . . : 是
自动配置已启用. . . . . : 是
```

以太网适配器 VMware Network Adapter VMnet1:

```
连接特定的 DNS 后缀 . . . . . :
描述. . . . . : VMware Virtual Ethernet Adapter for VMnet1
物理地址. . . . . : 00-50-56-C0-00-01
DHCP 已启用 . . . . . : 是
自动配置已启用. . . . . : 是
本地链接 IPv6 地址. . . . . : fe80::7c00:cda4:9dfd:7f3b%7(首选)
IPv4 地址 . . . . . : 192.168.220.1(首选)
子网掩码 . . . . . : 255.255.255.0
获得租约的时间 . . . . . : 2021年10月6日 22:12:17
租约过期的时间 . . . . . : 2021年10月6日 23:57:00
默认网关. . . . . :
DHCP 服务器 . . . . . : 192.168.220.254
DHCPv6 IAID . . . . . : 687886422
DHCPv6 客户端 DUID . . . . . : 00-01-00-01-27-23-55-75-54-05-DB-87-7C-E8
```

ipconfig /displaydns 命令截图如下:

```
C:\Users\61794>ipconfig /displaydns

Windows IP 配置

safebrowsing.googleapis.com
-----
记录名称. . . . . : safebrowsing.googleapis.com
记录类型. . . . . : 1
生存时间. . . . . : 148
数据长度. . . . . : 4
部分. . . . . : 答案
A (主机) 记录 . . . . : 180.163.150.161


edge.microsoft.com
-----
记录名称. . . . . : edge.microsoft.com
记录类型. . . . . : 5
生存时间. . . . . : 100
数据长度. . . . . : 8
部分. . . . . : 答案
CNAME 记录 . . . . . : edge-microsoft-com.a-0016.a-msedge.net


记录名称. . . . . : edge-microsoft-com.a-0016.a-msedge.net
记录类型. . . . . : 5
生存时间. . . . . : 100
数据长度. . . . . : 8
部分. . . . . : 答案
CNAME 记录 . . . . . : a-0016.a-msedge.net


记录名称. . . . . : a-0016.a-msedge.net
记录类型. . . . . : 1
生存时间. . . . . : 100
数据长度. . . . . : 4
部分. . . . . : 答案
A (主机) 记录 . . . . : 204.79.197.219


steamcommunity.com
-----
记录名称. . . . . : steamcommunity.com
记录类型. . . . . : 1
生存时间. . . . . : 599287
数据长度. . . . . : 4
部分. . . . . : 答案
A (主机) 记录 . . . . : 23.198.114.132
```

ipconfig /flushdns 命令截图如下:

```
C:\Users\61794>ipconfig /flushdns

Windows IP 配置

已成功刷新 DNS 解析缓存。
```

### 3)Tracing DNS with Wireshark

4.Locate the DNS query and response messages. Are then sent over UDP or TCP?

是通过UDP协议发送的



\*WLAN

文件(F) 编辑(E) 视图(V) 跳转(G) 捕获(C) 分析(A) 统计(S) 电话(Y) 无线(W) 工具(T) 帮助(H)

ip.addr == 114.214.251.58 and dns

No.	Time	Source	Destination	Protocol	Length	Info
43	00:04:51.709095	114.214.251.58	202.38.64.56	DNS	72	Standard query
44	00:04:51.709271	114.214.251.58	202.38.64.56	DNS	72	Standard query
45	00:04:51.723665	202.38.64.56	114.214.251.58	DNS	149	Standard query
46	00:04:51.723665	202.38.64.56	114.214.251.58	DNS	173	Standard query
49	00:04:51.768884	114.214.251.58	202.38.64.56	DNS	89	Standard query
50	00:04:51.769091	114.214.251.58	202.38.64.56	DNS	89	Standard query
51	00:04:51.782153	202.38.64.56	114.214.251.58	DNS	223	Standard query
52	00:04:51.801240	202.38.64.56	114.214.251.58	DNS	283	Standard query
238	00:04:52.454094	114.214.251.58	202.38.64.56	DNS	78	Standard query
239	00:04:52.454348	114.214.251.58	202.38.64.56	DNS	78	Standard query
254	00:04:52.504360	202.38.64.56	114.214.251.58	DNS	94	Standard query
257	00:04:52.504360	202.38.64.56	114.214.251.58	DNS	106	Standard query

Frame 43: 72 bytes on wire (576 bits), 72 bytes captured (576 bits) on interface \Device\NP ^

Ethernet II, Src: IntelCor\_91:74:54 (34:c9:3d:91:74:54), Dst: Hangzhou\_35:8a:e2 (ac:74:09:35:8a:e2)

Internet Protocol Version 4, Src: 114.214.251.58, Dst: 202.38.64.56

User Datagram Protocol, Src Port: 56236, Dst Port: 53

Domain Name System (query)

Transaction ID: 0x3984

Flags: 0x0100 Standard query

Questions: 1

Answer RRs: 0

5.What is the destination port for the DNS query message? What is the source port of DNS response message?

DNS查询目标端口(见上题截图)和响应消息的源端口都是53

No.	Time	Source	Destination	Protocol	Length	Info
43	00:04:51.709095	114.214.251.58	202.38.64.56	DNS	72	Standard query
44	00:04:51.709271	114.214.251.58	202.38.64.56	DNS	72	Standard query
45	00:04:51.723665	202.38.64.56	114.214.251.58	DNS	149	Standard query
46	00:04:51.723665	202.38.64.56	114.214.251.58	DNS	173	Standard query
49	00:04:51.768884	114.214.251.58	202.38.64.56	DNS	89	Standard query
50	00:04:51.769091	114.214.251.58	202.38.64.56	DNS	89	Standard query
51	00:04:51.782153	202.38.64.56	114.214.251.58	DNS	223	Standard query
52	00:04:51.801240	202.38.64.56	114.214.251.58	DNS	283	Standard query
238	00:04:52.454094	114.214.251.58	202.38.64.56	DNS	78	Standard query
239	00:04:52.454348	114.214.251.58	202.38.64.56	DNS	78	Standard query
254	00:04:52.504360	202.38.64.56	114.214.251.58	DNS	94	Standard query
257	00:04:52.504360	202.38.64.56	114.214.251.58	DNS	106	Standard query

Frame 45: 149 bytes on wire (1192 bits), 149 bytes captured (1192 bits) on interface \Device\NP ^

Ethernet II, Src: Hangzhou\_35:8a:e2 (ac:74:09:35:8a:e2), Dst: IntelCor\_91:74:54 (34:c9:3d:91:74:54)

Internet Protocol Version 4, Src: 202.38.64.56, Dst: 114.214.251.58

User Datagram Protocol, Src Port: 53, Dst Port: 56236

Domain Name System (response)

Transaction ID: 0x3984

Flags: 0x8180 Standard query response, No error

Questions: 1

Answer RRs: 3

6.To what IP address is the DNS query message sent? Use ipconfig to determine the IP address of your local DNS server. Are these two IP addresses the same?

发送到202.38.64.56,和本地DNS服务器IP地址相同

	Time	Source	Destination
43	00:04:51.709095	114.214.251.58	202.38.64.56
44	00:04:51.709271	114.214.251.58	202.38.64.56
45	00:04:51.723665	202.38.64.56	114.214.251.58

无线局域网适配器 WLAN:

```

连接特定的 DNS 后缀 . . . . . : ustc.edu.cn
描述 . . . . . : Intel(R) Wi-Fi 6 AX201 160MHz
物理地址. . . . . : 34-C9-3D-91-74-54
DHCP 已启用 . . . . . : 是
自动配置已启用. . . . . : 是
IPv6 地址 . . . . . : 2001:da8:d800:196:1dc3:336d:9844:d836(首选)
临时 IPv6 地址. . . . . : 2001:da8:d800:196:4802:ab58:aff4:6f5(首选)
本地链接 IPv6 地址. . . . . : fe80::1dc3:336d:9844:d836%4(首选)
IPv4 地址 . . . . . : 114.214.251.58(首选)
子网掩码 . . . . . : 255.255.240.0
获得租约的时间 . . . . . : 2021年10月6日 23:58:53
租约过期的时间 . . . . . : 2021年10月7日 1:13:08
默认网关. . . . . : fe80::ae74:9ff:fe35:8ae2%4
                  114.214.240.1
DHCP 服务器 . . . . . : 202.38.64.17
DHCPv6 IAID . . . . . : 53791037
DHCPv6 客户端 DUID . . . . . : 00-01-00-01-27-23-55-75-54-05-DB-87-7C-E8
DNS 服务器 . . . . . : 202.38.64.56
                  202.38.64.17
TCP/IP 上的 NetBIOS . . . . . : 已启用

```

7.Examine the DNS query message. What “Type” of DNS query is it? Does the query message contain any “answers”?

TYPE=A(即查询该IP地址),查询消息不包括answers

ip.addr == 114.214.251.58 and dns

No.	Time	Source	Destination	Protocol	Length	Info
43	00:04:51.709095	114.214.251.58	202.38.64.56	DNS	72	Standard query
44	00:04:51.709271	114.214.251.58	202.38.64.56	DNS	72	Standard query
45	00:04:51.723665	202.38.64.56	114.214.251.58	DNS	149	Standard query
46	00:04:51.723665	202.38.64.56	114.214.251.58	DNS	173	Standard query
49	00:04:51.768884	114.214.251.58	202.38.64.56	DNS	89	Standard query
50	00:04:51.769091	114.214.251.58	202.38.64.56	DNS	89	Standard query
51	00:04:51.782153	202.38.64.56	114.214.251.58	DNS	223	Standard query
52	00:04:51.801240	202.38.64.56	114.214.251.58	DNS	283	Standard query
238	00:04:52.454094	114.214.251.58	202.38.64.56	DNS	78	Standard query
239	00:04:52.454348	114.214.251.58	202.38.64.56	DNS	78	Standard query
254	00:04:52.504360	202.38.64.56	114.214.251.58	DNS	94	Standard query
257	00:04:52.504360	202.38.64.56	114.214.251.58	DNS	106	Standard query

```

Transaction ID: 0x3984
> Flags: 0x0100 Standard query
Questions: 1
Answer RRs: 0
Authority RRs: 0
Additional RRs: 0
v Queries
> www.ietf.org: type A, class IN
[Response In: 45]

```

8.Examine the DNS response message. How many “answers” are provided? What do each of these answers contain?

包含了三个:



1. 规范CNAME的地址 type = CNAME
2. 规范后的IPV4地址1 type = A
3. 规范后的IPV4地址2 type = A

ip.addr == 114.214.251.58 and dns

No.	Time	Source	Destination	Protocol	Length	Info
43	00:04:51.709095	114.214.251.58	202.38.64.56	DNS	72	Standard query
44	00:04:51.709271	114.214.251.58	202.38.64.56	DNS	72	Standard query
45	00:04:51.723665	202.38.64.56	114.214.251.58	DNS	149	Standard query
46	00:04:51.723665	202.38.64.56	114.214.251.58	DNS	173	Standard query
49	00:04:51.768884	114.214.251.58	202.38.64.56	DNS	89	Standard query
50	00:04:51.769091	114.214.251.58	202.38.64.56	DNS	89	Standard query
51	00:04:51.782153	202.38.64.56	114.214.251.58	DNS	223	Standard query
52	00:04:51.801240	202.38.64.56	114.214.251.58	DNS	283	Standard query
238	00:04:52.454094	114.214.251.58	202.38.64.56	DNS	78	Standard query
239	00:04:52.454348	114.214.251.58	202.38.64.56	DNS	78	Standard query
254	00:04:52.504360	202.38.64.56	114.214.251.58	DNS	94	Standard query
257	00:04:52.504360	202.38.64.56	114.214.251.58	DNS	106	Standard query

Additional RRs: 0

Queries

- > www.ietf.org: type A, class IN

Answers

- > www.ietf.org: type CNAME, class IN, cname www.ietf.org.cdn.cloudflare.net
- > www.ietf.org.cdn.cloudflare.net: type A, class IN, addr 104.16.45.99
- > www.ietf.org.cdn.cloudflare.net: type A, class IN, addr 104.16.44.99

[Request In: 43]

[Time: 0.014570000 seconds]

9. Consider the subsequent TCP SYN packet sent by your host. Does the destination IP address of the SYN packet correspond to any of the IP addresses provided in the DNS response message?

该目的地址与DNS响应消息中的IP地址相对应

ip.dst == 104.16.45.99 or ip.dst == 104.16.44.99

No.	Time	Source	Destination	Protocol	Length	Info
83	00:04:52.027905	114.214.251.58	104.16.45.99	TCP	66	13669 → 80 [RST] Seq=0
173	00:04:52.277050	114.214.251.58	104.16.45.99	TCP	54	13669 → 80 [RST] Seq=0

Frame 83: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface Ethernet II, Src: IntelCor\_91:74:54 (34:c9:3d:91:74:54), Dst: Hangzhou\_35:8a:e2 (08:00:0c:35:8a:e2), Internet Protocol Version 4, Src: 114.214.251.58, Dst: 104.16.45.99, Transmission Control Protocol, Src Port: 13669, Dst Port: 80, Seq: 0, Len: 0

文件(F) 编辑(E) 视图(V) 跳转(G) 捕获(C) 分析(A) 统计(S) 电话(Y) 无线(W) 工具(T) 帮助(H)

dns.qry.name contains "www.ietf.org"

No.	Time	Source	Destination	Protocol	Length	Info
43	00:04:51.709095	114.214.251.58	202.38.64.56	DNS	72	Standard query
44	00:04:51.709271	114.214.251.58	202.38.64.56	DNS	72	Standard query
45	00:04:51.723665	202.38.64.56	114.214.251.58	DNS	149	Standard query
46	00:04:51.723665	202.38.64.56	114.214.251.58	DNS	173	Standard query

<p>Frame 43: 72 bytes on wire (576 bits), 72 bytes captured (576 bits) on interface \Device\NPF... Ethernet II, Src: IntelCor_91:74:54 (34:c9:3d:91:74:54), Dst: Hangzhou_35:8a:e2 (ac:74:09:3... Internet Protocol Version 4, Src: 114.214.251.58, Dst: 202.38.64.56 User Datagram Protocol, Src Port: 56236, Dst Port: 53</p> <p>Domain Name System (query)</p> <p>Transaction ID: 0x3984</p> <p>&gt; Flags: 0x0100 Standard query</p> <p>Questions: 1</p> <p>Answer RRs: 0</p>
---

10.This web page contains images. Before retrieving each image, does your host issue new DNS queries?

并没有,由前面的截图知,本地应该有DNS缓存,在获取图片时直接使用了缓存

11.What is the destination port for the DNS query message? What is the source port of DNS response message?

查询目标端口和相应源端口都是53



^WLAN

文件(F) 编辑(E) 视图(V) 跳转(G) 捕获(C) 分析(A) 统计(S) 电话(Y) 无线(W) 工具(T) 帮助(H)

ip.addr == 114.214.251.58 and dns

No.	Time	Source	Destination	Protocol	Length	Info
148	00:42:04.477693	114.214.251.58	202.38.64.56	DNS	85	Standard query
151	00:42:04.491642	202.38.64.56	114.214.251.58	DNS	138	Standard query
152	00:42:04.493488	114.214.251.58	202.38.64.56	DNS	71	Standard query
154	00:42:04.558575	202.38.64.56	114.214.251.58	DNS	163	Standard query
155	00:42:04.559651	114.214.251.58	202.38.64.56	DNS	71	Standard query
160	00:42:04.624208	202.38.64.56	114.214.251.58	DNS	203	Standard query

< >

> Frame 155: 71 bytes on wire (568 bits), 71 bytes captured (568 bits) on interface \Device\N^

> Ethernet II, Src: IntelCor\_91:74:54 (34:c9:3d:91:74:54), Dst: Hangzhou\_35:8a:e2 (ac:74:09:3

> Internet Protocol Version 4, Src: 114.214.251.58, Dst: 202.38.64.56

> User Datagram Protocol, Src Port: 56719, Dst Port: 53

▼ Domain Name System (query)

Transaction ID: 0x0003

> Flags: 0x0100 Standard query

Questions: 1

Answer RRs: 0

12.To what IP address is the DNS query message sent? Is this the IP address of your default local DNS server?

查询消息的目标IP地址是202.38.64.56,是我的本地DNS服务器IP地址

```
默认网关. . . . . : fe80::ae74:9ff:fe
                  : 114.214.240.1
DHCP 服务器 . . . . . : 202.38.64.17
DHCPv6 IAID . . . . . : 53791037
DHCPv6 客户端 DUID . . . . . : 00-01-00-01-27-23
DNS 服务器 . . . . . : 202.38.64.56
                  : 202.38.64.17
TCP/IP 上的 NetBIOS . . . . . : 已启用
```

ip.addr == 114.214.251.58 and dns						
Time	Source	Destination	Protocol	Length	Info	
148 00:42:04.477693	114.214.251.58	202.38.64.56	DNS	85	Standard query	
151 00:42:04.491642	202.38.64.56	114.214.251.58	DNS	138	Standard query	
152 00:42:04.493488	114.214.251.58	202.38.64.56	DNS	71	Standard query	
154 00:42:04.558575	202.38.64.56	114.214.251.58	DNS	163	Standard query	
155 00:42:04.559651	114.214.251.58	202.38.64.56	DNS	71	Standard query	
160 00:42:04.624208	202.38.64.56	114.214.251.58	DNS	203	Standard query	

Frame 155: 71 bytes on wire (568 bits), 71 bytes captured (568 bits) on interface \Device\N  
 Ethernet II, Src: IntelCor\_91:74:54 (34:c9:3d:91:74:54), Dst: Hangzhou\_35:8a:e2 (ac:74:09:3  
 Internet Protocol Version 4, Src: 114.214.251.58, Dst: 202.38.64.56  
 User Datagram Protocol, Src Port: 56719, Dst Port: 53  
 Domain Name System (query)  
 Transaction ID: 0x0003  
 > Flags: 0x0100 Standard query  
 Questions: 1  
 Answer RRs: 0

13.Examine the DNS query message. What "Type" of DNS query is it? Does the query message contain any "answers"?

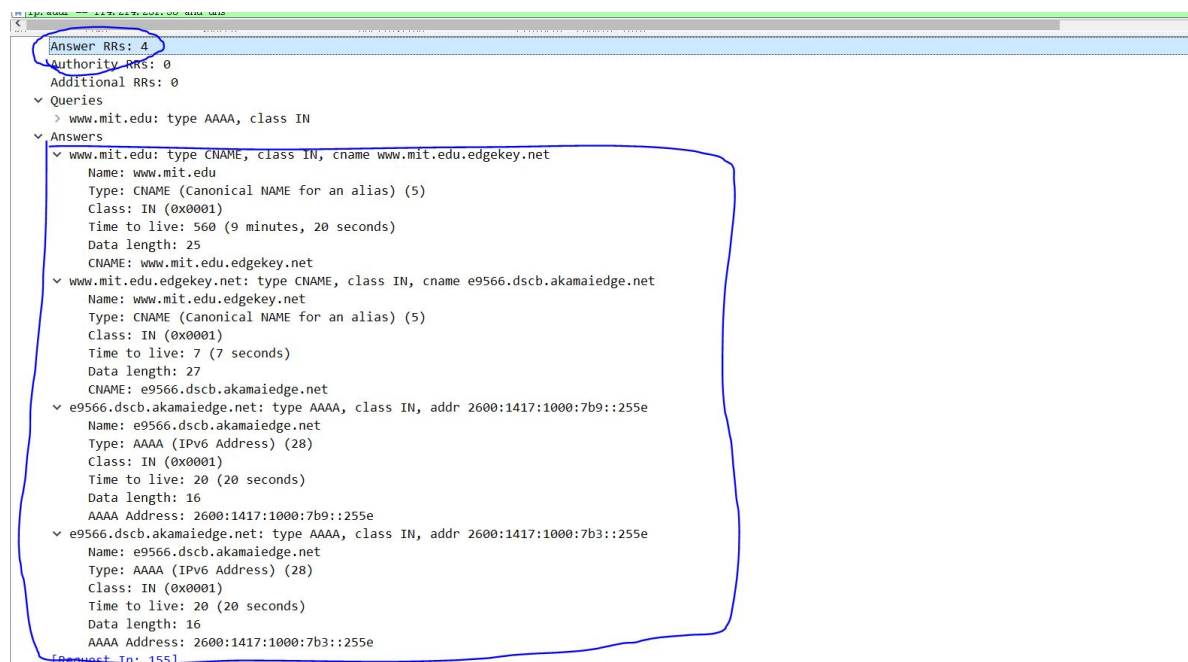
查询是Type = AAAA类型的,不包含Answers.

ip.addr == 114.214.251.58 and dns						
Time	Source	Destination	Protocol	Length	Info	
148 00:42:04.477693	114.214.251.58	202.38.64.56	DNS	85	Standard qu	
151 00:42:04.491642	202.38.64.56	114.214.251.58	DNS	138	Standard qu	
152 00:42:04.493488	114.214.251.58	202.38.64.56	DNS	71	Standard qu	
154 00:42:04.558575	202.38.64.56	114.214.251.58	DNS	163	Standard qu	
155 00:42:04.559651	114.214.251.58	202.38.64.56	DNS	71	Standard qu	
160 00:42:04.624208	202.38.64.56	114.214.251.58	DNS	203	Standard qu	

Transaction ID: 0x0003  
 > Flags: 0x0100 Standard query  
 Questions: 1  
 Answer RRs: 0  
 Authority RRs: 0  
 Additional RRs: 0  
 v Queries  
 v www.mit.edu: type AAAA, class IN  
 Name: www.mit.edu

14.Examine the DNS response message.How many "answers" are provided? What do each of these answers contain?

响应消息提供了4个Answers,这些答案包含两个规范CNAME地址(Type = CNAME)和两个指向的IPv6地址(Type = AAAA)



15. Provide a screenshot.

如上图

16. To what IP address is the DNS query message sent? Is this the IP address of your default local DNS server?

发往202.38.64.56,是我的本地默认DNS地址

Time	Source	Destination	Protocol	Length	Info
338 00:51:03.663134	114.214.251.58	202.38.64.56	DNS	79	Standard query 0x0002 NS mit.edu.ustc.edu.c
339 00:51:03.669251	202.38.64.56	114.214.251.58	DNS	135	Standard query response 0x0002 No such name
340 00:51:03.669723	114.214.251.58	202.38.64.56	DNS	74	Standard query 0x0003 NS mit.edu.edu.cn
342 00:51:03.679502	202.38.64.56	114.214.251.58	DNS	141	Standard query response 0x0003 No such name
343 00:51:03.680099	114.214.251.58	202.38.64.56	DNS	67	Standard query 0x0004 NS mit.edu
350 00:51:03.763958	202.38.64.56	114.214.251.58	DNS	234	Standard query response 0x0004 NS mit.edu N

17. Examine the DNS query message. What "Type" of DNS query is it? Does the query message contain any "answers"?

Type = NS即查询权威DNS,不包含Answers



```

<
> User Datagram Protocol, Src Port: 62127, Dst Port: 53
v Domain Name System (query)
  Transaction ID: 0x0004
  > Flags: 0x0100 Standard query
  Questions: 1
  Answer RRs: 0
  Authority RRs: 0
  Additional RRs: 0
v Queries
  v mit.edu: type NS, class IN
    Name: mit.edu
    [Name Length: 7]
    [Label Count: 2]
    Type: NS (authoritative Name Server) (2)
    Class: IN (0x0001)
    [Response In: 350]

```

18.Examine the DNS response message. What MIT nameservers does the response message provide? Does this response message also provide the IP addresses of the MIT nameservers?

如图,提供的是MIT的权威DNS域名,不提供MIT域名的IP地址

```

> mit.edu: type NS, class IN
v Answers
  v mit.edu: type NS, class IN, ns asia2.akam.net
    Name: mit.edu
    Type: NS (authoritative Name Server) (2)
    Class: IN (0x0001)
    Time to live: 486 (8 minutes, 6 seconds)
    Data length: 16
    Name Server: asia2.akam.net
  v mit.edu: type NS, class IN, ns use5.akam.net
    Name: mit.edu
    Type: NS (authoritative Name Server) (2)
    Class: IN (0x0001)
    Time to live: 486 (8 minutes, 6 seconds)
    Data length: 7
    Name Server: use5.akam.net
  v mit.edu: type NS, class IN, ns ns1-37.akam.net
    Name: mit.edu
    Type: NS (authoritative Name Server) (2)
    Class: IN (0x0001)
    Time to live: 486 (8 minutes, 6 seconds)
    Data length: 9
    Name Server: ns1-37.akam.net
  v mit.edu: type NS, class IN, ns asia1.akam.net
    Name: mit.edu
    Type: NS (authoritative Name Server) (2)
    Class: IN (0x0001)

```

070	c0	2b	c0	0c	00	02	00	01	00	00	01	e6	00	09	06	6e	+	.....
-----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	---	-------


19.Provide a screenshot.

如上图

接下来的20-23题无法回答,由于指令运行TIME OUT,经过助教解答得知这是正常结果,截图如下

```
C:\Users\61794>nslookup www.aiit.or.kr bitsy.mit.edu
DNS request timed out.
    timeout was 2 seconds.
服务器:  UnKnown
Address:  18.0.72.3

DNS request timed out.
    timeout was 2 seconds.
DNS request timed out.
    timeout was 2 seconds.
DNS request timed out.
    timeout was 2 seconds.
DNS request timed out.
    timeout was 2 seconds.
*** 请求 UnKnown 超时
```



20.To what IP address is the DNS query message sent? Is this the IP address of your default local DNS server? If not, what does the IP address correspond to?

21.Examine the DNS query message. What “Type” of DNS query is it? Does the query message contain any “answers”?

22.Examine the DNS response message. How many “answers” are provided? What does each of these answers contain?

23.Provide a screenshot.

## 实验思考

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本实验通过对ipconfig和nslookup的灵活使用,巩固加深了对DNS相关知识的总结和应用,同时在助教的帮助下排除了实验的意外情况,值得借鉴.