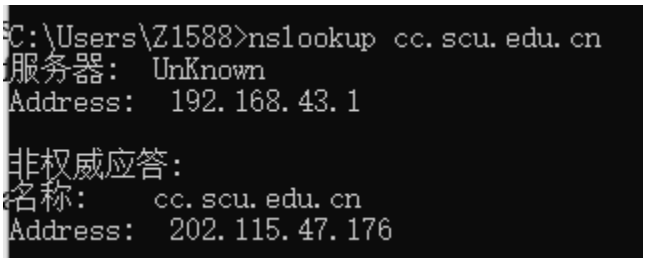
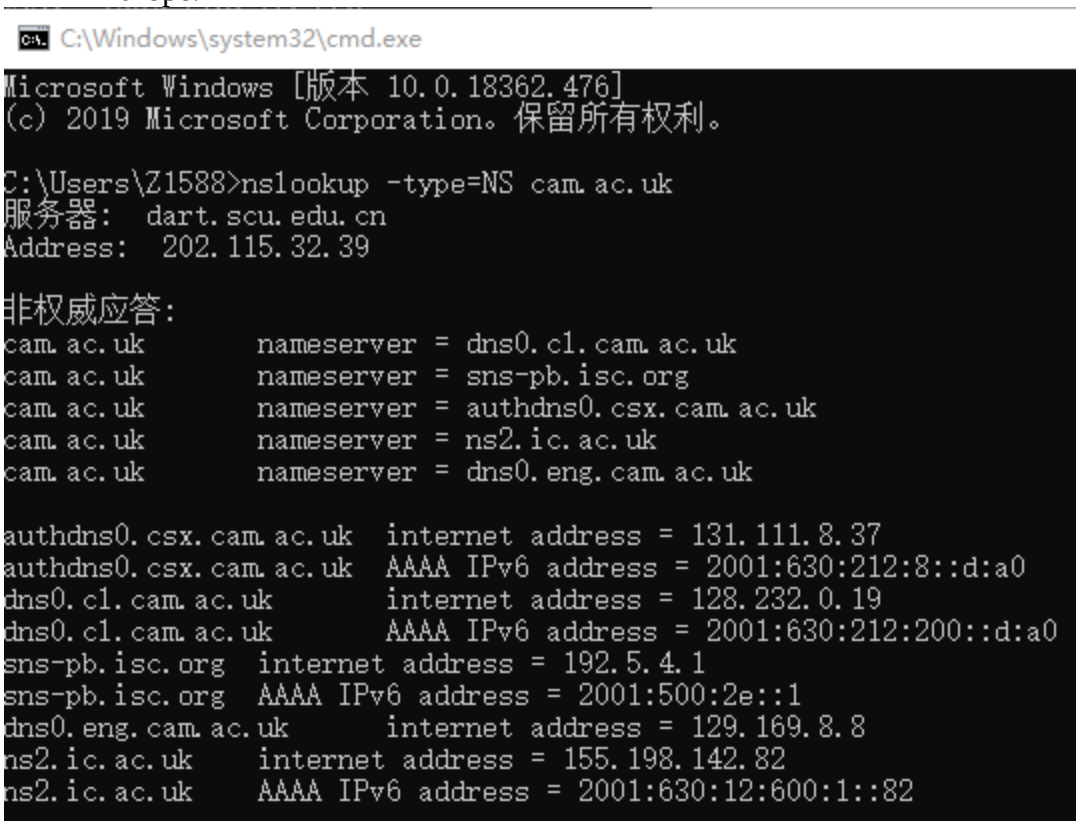
1. Run *nslookup* to obtain the IP address of a Web server in Asia. What is the IP address of that server?

202.115.47.176



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



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?

IP 地址是 192.168.1.1 和 192.168.1.5

```
C:\Users\Z1588>nslookup -type=MX www.yahoo.com
服务器:  dart.scu.edu.cn
Address:  202.115.32.39

非权威应答:
www.yahoo.com   canonical name = atsv2-fp-shed.wg1.b.yahoo.com

wg1.b.yahoo.com
        primary name server = yf1.yahoo.com
        responsible mail addr = hostmaster.yahoo-inc.com
        serial  = 1574580664
        refresh = 30 (30 secs)
        retry   = 30 (30 secs)
        expire  = 86400 (1 day)
        default TTL = 300 (5 mins)
```

```
C:\Users\Z1588>nslookup www.yahoo.com dns9.hichina.com
服务器:  UnKnown
Address:  140.205.81.25

名称:    www.yahoo.com
Addresses:  192.168.1.1
          192.168.1.5
```

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

udp

No.	Time	Source	Destination	Protoc
20	0.144442	10.132.10.226	202.115.32.39	DNS
21	0.152962	202.115.32.39	10.132.10.226	DNS
22	0.189245	10.132.10.226	40.90.185.223	TCP
23	0.189246	10.132.10.226	40.90.185.223	TLSv1
24	0.189392	10.132.10.226	40.90.185.223	TCP
25	0.189393	10.132.10.226	40.90.185.223	TCP
26	0.189396	10.132.10.226	40.90.185.223	TLSv1
32	0.605690	10.132.10.226	61.135.185.193	TCP
33	0.605889	10.132.10.226	61.135.185.193	TCP
34	0.629696	40.90.185.223	10.132.10.226	TCP
35	0.673459	40.90.185.223	10.132.10.226	TCP

```
    Total Length: 66
    Identification: 0x8de1 (36321)
  > Flags: 0x0000
    ...0 0000 0000 0000 = Fragment offset: 0
    Time to live: 128
    Protocol: UDP (17)
    Header checksum: 0xacc9 [validation disabled]
    [Header checksum status: Unverified]
    Source: 10.132.10.226
```

5. What is the destination port for the DNS query message? What is the source port of DNS response message?
   53；53

```
> Frame 20: 80 bytes on wire (640 bits), 80 bytes captured (640 bits) on interface
> Ethernet II, Src: IntelCor_6f:1b:70 (34:f6:4b:6f:1b:70), Dst: RuijieNe_4c:47:53 (
> Internet Protocol Version 4, Src: 10.132.10.226, Dst: 202.115.32.39
> User Datagram Protocol, Src Port: 58899, Dst Port: 53
> Domain Name System (query)
v User Datagram Protocol, Src Port: 53, Dst Port: 58899
    Source Port: 53
    Destination Port: 58899
    Length: 266
    Checksum: 0x6cf9 [unverified]
    [Checksum Status: Unverified]
```

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?
   202.115.32.39；一样的

```
    20 0.144442    10.132.10.226    202.115.32.39    DNS    80 Standard query 0x15b0 A suggestion.
    21 0.152962    202.115.32.39    10.132.10.226    DNS    300 Standard query response 0x15b0 A su
```

```
无线局域网适配器 WLAN:

   连接特定的 DNS 后缀 . . . . . :
   描述. . . . . . . . . . . . . . : Intel(R) Dual Band Wireless-AC 3165
   物理地址. . . . . . . . . . . . : 34-F6-4B-6F-1B-70
   DHCP 已启用 . . . . . . . . . . : 是
   自动配置已启用. . . . . . . . . : 是
   本地链接 IPv6 地址. . . . . . . . : fe80::acc2:5ea1:b289:db45%3(首选)
   IPv4 地址 . . . . . . . . . . . . : 10.132.10.226(首选)
   子网掩码 . . . . . . . . . . . . : 255.255.240.0
   获得租约的时间  . . . . . . . . . : 2019年11月24日 15:18:57
   租约过期的时间  . . . . . . . . . : 2019年11月24日 17:18:57
   默认网关. . . . . . . . . . . . . : 10.132.15.254
   DHCP 服务器 . . . . . . . . . . . : 10.132.15.254
   DHCPv6 IAID . . . . . . . . . . . : 53802571
   DHCPv6 客户端 DUID  . . . . . . . : 00-01-00-01-24-ED-C8-A9-34-F6-4B-6F-1B-70
   DNS 服务器  . . . . . . . . . . . : 202.115.32.39
                                       202.115.32.36
   TCPIP 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”?

类型为 A，没有应答

```
▾ Flags: 0x0100 Standard query
    0... .... .... .... = Response: Message is a query
    .000 0... .... .... = Opcode: Standard query (0)
    .... ..0. .... .... = Truncated: Message is not truncated
    .... ...1 .... .... = Recursion desired: Do query recursively
    .... .... .0.. .... = Z: reserved (0)
    .... .... ...0 .... = Non-authenticated data: Unacceptable
  Questions: 1
  Answer RRs: 0
  Authority RRs: 0
  Additional RRs: 0
▾ Queries
  ▾ suggestion.baidu.com: type A, class IN
      Name: suggestion.baidu.com
      [Name Length: 20]
      [Label Count: 3]
      Type: A (Host Address) (1)
      Class: IN (0x0001)
  [Response In: 21]
```

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

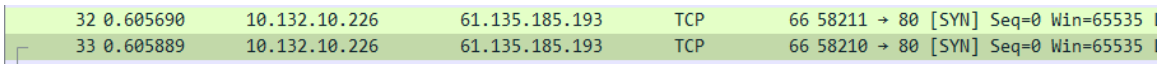
2 个 RRs 被提供，每个应答的 RRS 都包含下面的这些信息，name、type、class、time to live、data length。第一个 RR 包含 CNAME 信息，第二个包含 Address 信

息。

```
    .... .... ...0 .... = Non-authenticated data: Unacceptable
    .... .... .... 0000 = Reply code: No error (0)
  Questions: 1
  Answer RRs: 2
  Authority RRs: 5
  Additional RRs: 5
> Queries
v Answers
  v suggestion.baidu.com: type CNAME, class IN, cname suggestion.a.shifen.com
      Name: suggestion.baidu.com
      Type: CNAME (Canonical NAME for an alias) (5)
      Class: IN (0x0001)
      Time to live: 5600
      Data length: 22
      CNAME: suggestion.a.shifen.com
  v suggestion.a.shifen.com: type A, class IN, addr 157.255.77.80
      Name: suggestion.a.shifen.com
      Type: A (Host Address) (1)
      Class: IN (0x0001)
      Time to live: 49
      Data length: 4
      Address: 157.255.77.80
> Authoritative nameservers
```

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?

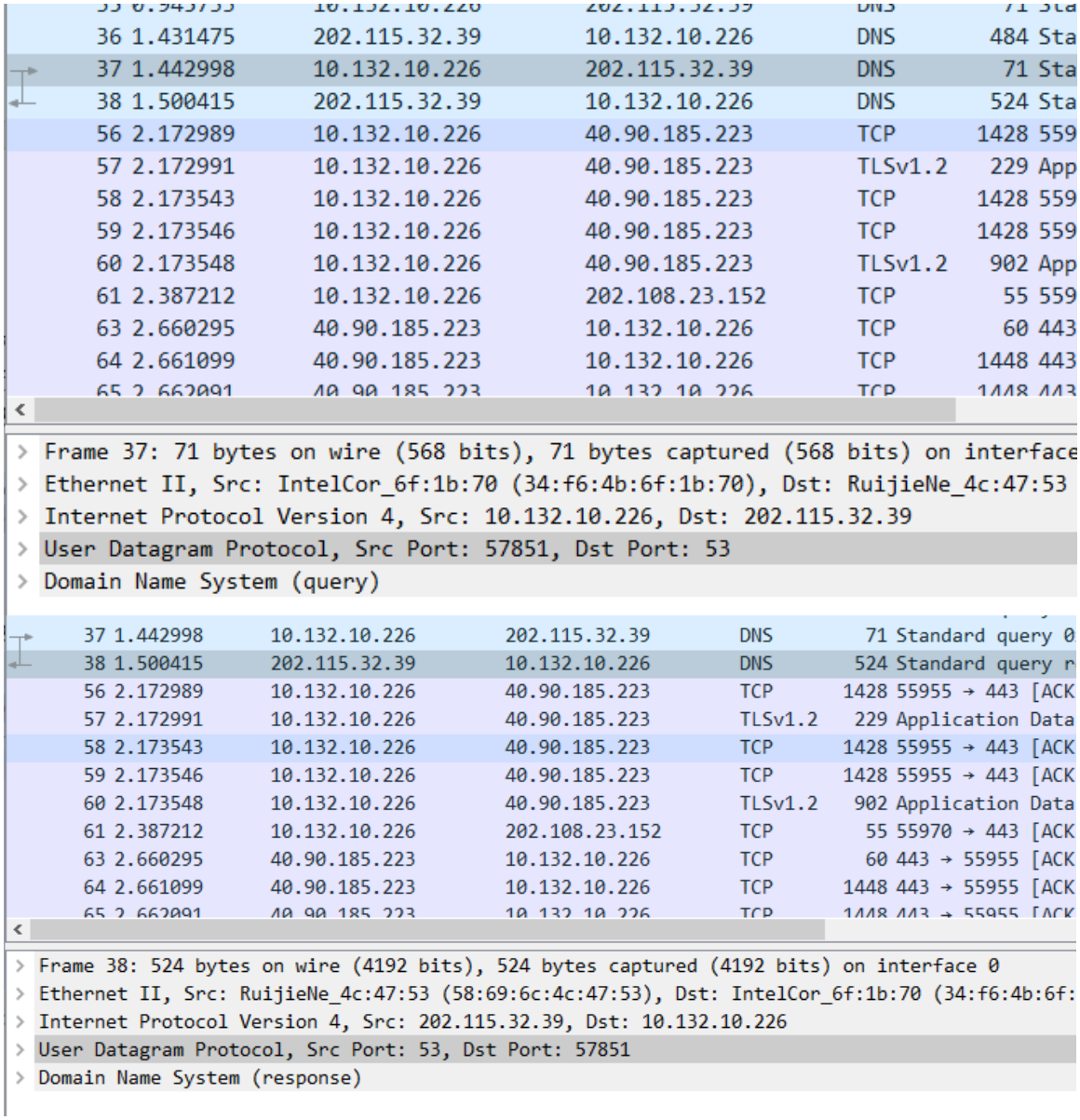
不一致



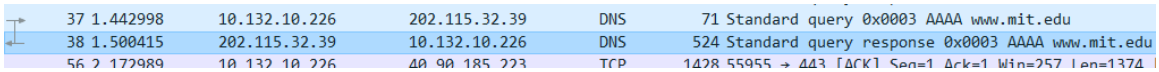
10. This web page contains images. Before retrieving each image, does your host issue new DNS queries?

没有。

11. What is the destination port for the DNS query message? What is the source port of DNS response message?
    53；53

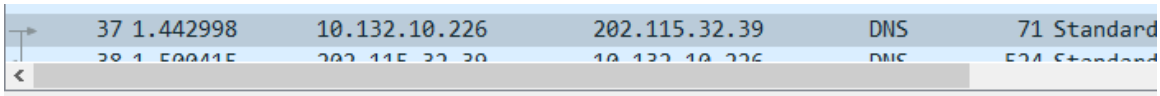


12. To what IP address is the DNS query message sent? Is this the IP address of your default local DNS server?
    202.115.32,39；一样



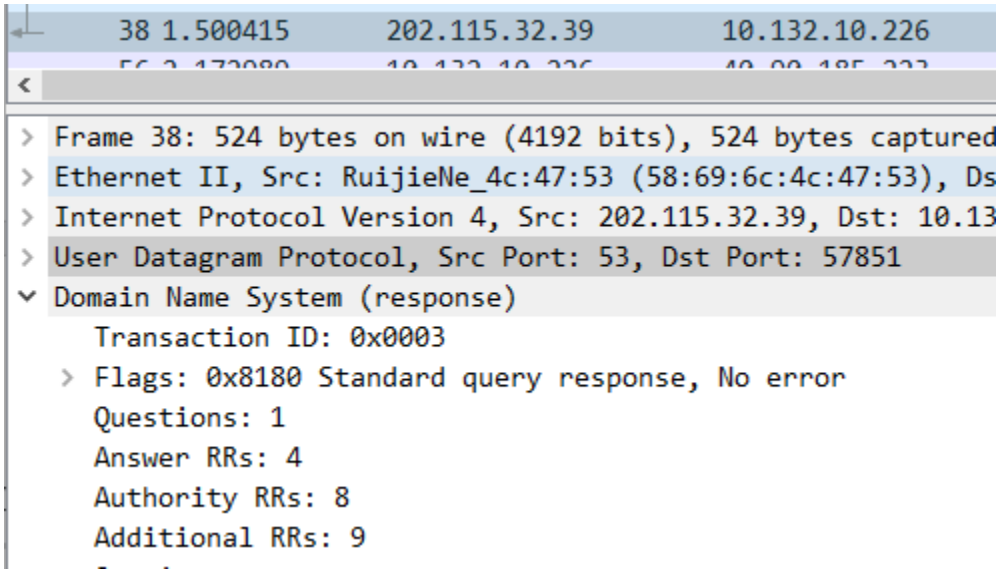
```
无线局域网适配器 WLAN:

   连接特定的 DNS 后缀 . . . . . . . :
   描述. . . . . . . . . . . . . . . : Intel(R) Dual Band Wireless-AC 3165
   物理地址. . . . . . . . . . . . . : 34-F6-4B-6F-1B-70
   DHCP 已启用 . . . . . . . . . . . : 是
   自动配置已启用. . . . . . . . . . : 是
   本地链接 IPv6 地址. . . . . . . . : fe80::acc2:5ea1:b289:db45%3(首选)
   IPv4 地址 . . . . . . . . . . . . : 10.132.10.226(首选)
   子网掩码 . . . . . . . . . . . . : 255.255.240.0
   获得租约的时间  . . . . . . . . . : 2019年11月24日 15:18:57
   租约过期的时间  . . . . . . . . . : 2019年11月24日 17:18:57
   默认网关. . . . . . . . . . . . . : 10.132.15.254
   DHCP 服务器 . . . . . . . . . . . : 10.132.15.254
   DHCPv6 IAID . . . . . . . . . . . : 53802571
   DHCPv6 客户端 DUID  . . . . . . . : 00-01-00-01-24-ED-C8-A9-34-F6-4B-6F-1B-70
   DNS 服务器  . . . . . . . . . . . : 202.115.32.39
                                       202.115.32.36
   TCPIP 上的 NetBIOS  . . . . . . . : 已启用
```

13. Examine the DNS query message. What "Type" of DNS query is it? Does the query message contain any "answers"?
AAAA；没有应答

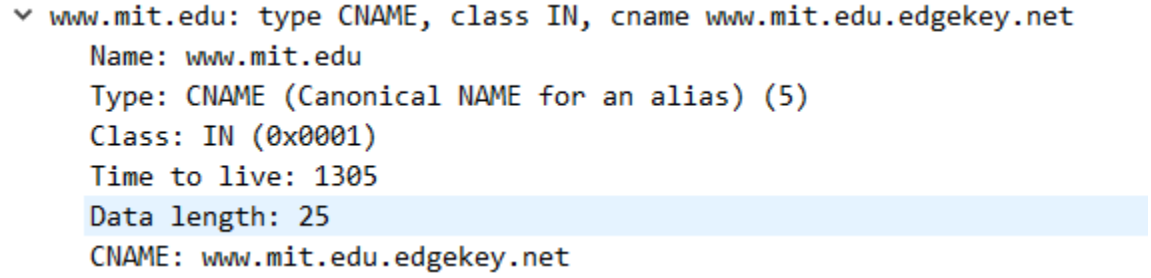



```
> Frame 37: 71 bytes on wire (568 bits), 71 bytes captured (568 bits) on interface 0
> Ethernet II, Src: IntelCor_6f:1b:70 (34:f6:4b:6f:1b:70), Dst: RuijieNe_4c:47:53 (58:6
> Internet Protocol Version 4, Src: 10.132.10.226, Dst: 202.115.32.39
> User Datagram Protocol, Src Port: 57851, Dst Port: 53
v Domain Name System (query)
    Transaction ID: 0x0003
  v Flags: 0x0100 Standard query
      0... .... .... .... = Response: Message is a query
      .000 0... .... .... = Opcode: Standard query (0)
      .... ..0. .... .... = Truncated: Message is not truncated
      .... ...1 .... .... = Recursion desired: Do query recursively
      .... .... .0.. .... = Z: reserved (0)
      .... .... ...0 .... = Non-authenticated data: Unacceptable
    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
        [Name Length: 11]
        [Label Count: 3]
        Type: AAAA (IPv6 Address) (28)
        Class: IN (0x0001)
    [Response In: 38]
```

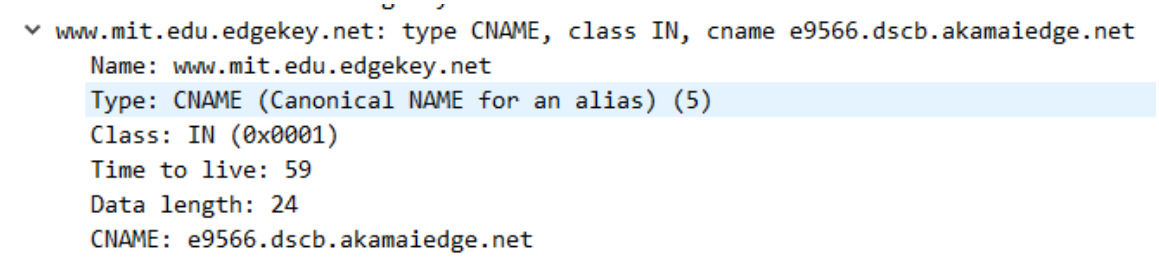
14. Examine the DNS response message. How many “answers” are provided? What do each of these answers contain?
四个回答;



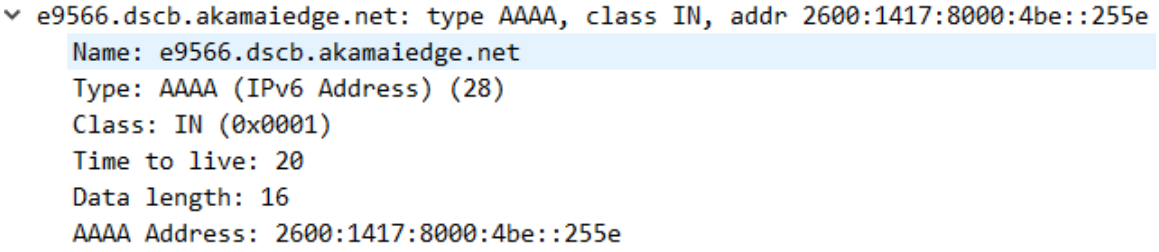
第一个回答包括: name、type、class、time to alive、data length、CNAME



第二个回答包括: name、type、class、time to alive、data length、CNAME



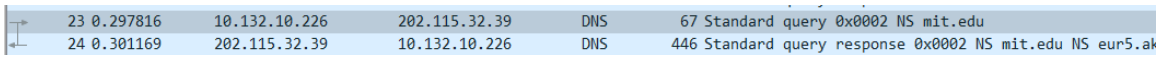
第三个回答包括: name、type、class、time to alive、data length、AAAA address



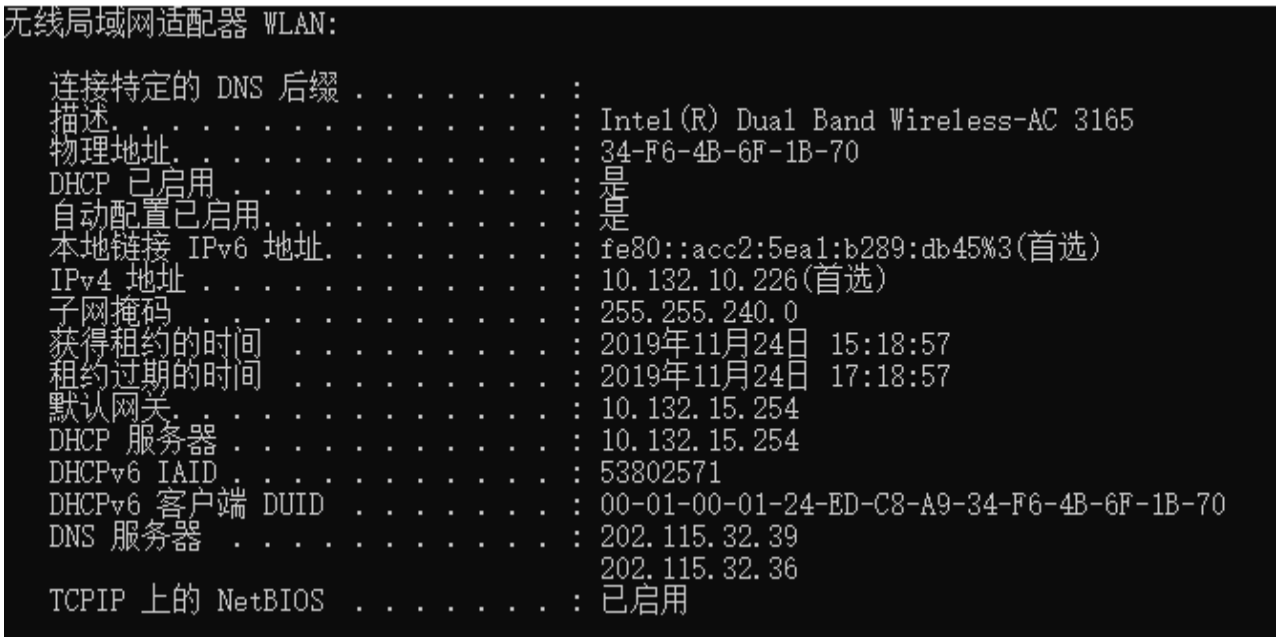
第四个回答包括 name、type、class、time to alive、data length、AAAA address

```
e9566.dscb.akamaiedge.net: type AAAA, class IN, addr 2600:1417:8000:4a2::255e
    Name: e9566.dscb.akamaiedge.net
    Type: AAAA (IPv6 Address) (28)
    Class: IN (0x0001)
    Time to live: 20
    Data length: 16
    AAAA Address: 2600:1417:8000:4a2::255e
```

15. Provide a screenshot.
    实验截图已附在每题的下面
16. To what IP address is the DNS query message sent? Is this the IP address of your default local DNS server?
    202.115.32.39；一样。

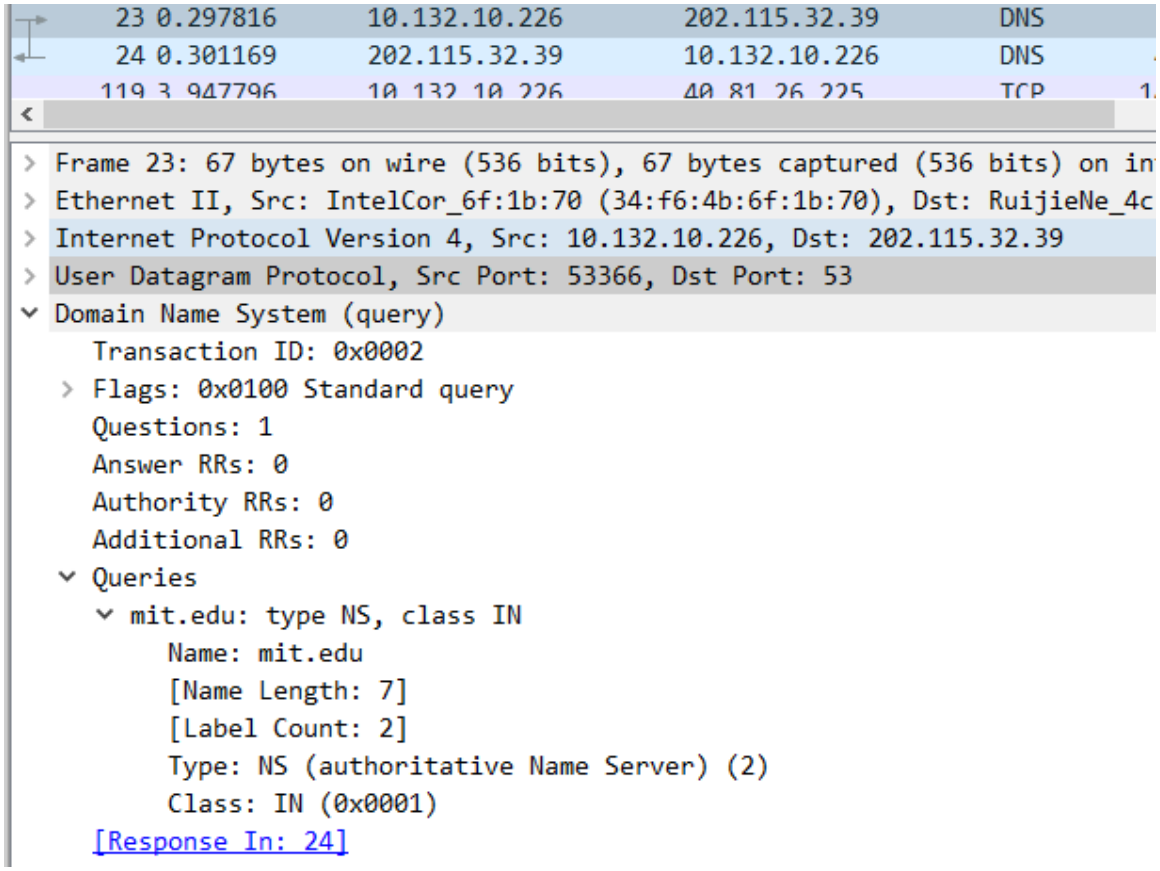


```
23 0.297816     10.132.10.226     202.115.32.39     DNS     67 Standard query 0x0002 NS mit.edu
24 0.301169     202.115.32.39     10.132.10.226     DNS     446 Standard query response 0x0002 NS mit.edu NS eur5.ak
```

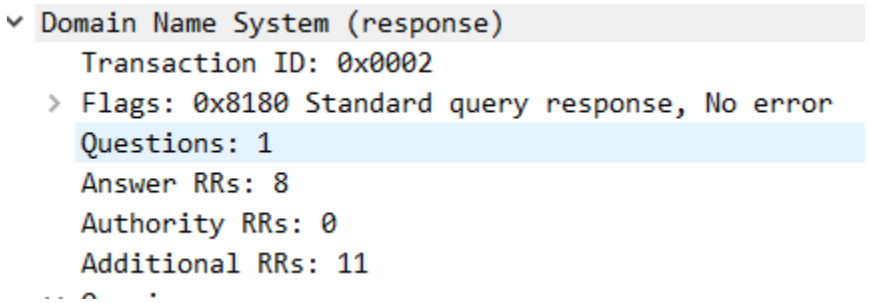


```
无线局域网适配器 WLAN:

   连接特定的 DNS 后缀 . . . . . :
   描述. . . . . . . . . . . . . . : Intel(R) Dual Band Wireless-AC 3165
   物理地址. . . . . . . . . . . . : 34-F6-4B-6F-1B-70
   DHCP 已启用 . . . . . . . . . . : 是
   自动配置已启用. . . . . . . . . : 是
   本地链接 IPv6 地址. . . . . . . : fe80::acc2:5ea1:b289:db45%3(首选)
   IPv4 地址 . . . . . . . . . . . : 10.132.10.226(首选)
   子网掩码 . . . . . . . . . . . . : 255.255.240.0
   获得租约的时间  . . . . . . . . : 2019年11月24日 15:18:57
   租约过期的时间  . . . . . . . . : 2019年11月24日 17:18:57
   默认网关. . . . . . . . . . . . : 10.132.15.254
   DHCP 服务器 . . . . . . . . . . : 10.132.15.254
   DHCPv6 IAID . . . . . . . . . . : 53802571
   DHCPv6 客户端 DUID  . . . . . . : 00-01-00-01-24-ED-C8-A9-34-F6-4B-6F-1B-70
   DNS 服务器  . . . . . . . . . . : 202.115.32.39
                                     202.115.32.36
   TCPIP 上的 NetBIOS  . . . . . . : 已启用
```

17. Examine the DNS query message. What “Type” of DNS query is it? Does the query message contain any “answers”?
    NS；没有应答

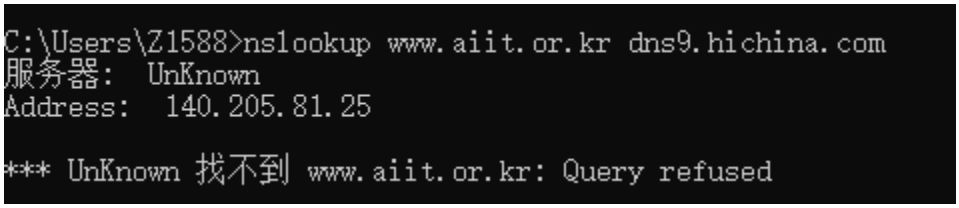


18. Examine the DNS response message. What MIT nameservers does the response message provide? Does this response message also provide the IP addresses of the MIT namesers?
提供了 8 个，并在额外的 RRS 记录中提供了域名服务器的 IP 地址。



```
        Data length: 9
        Name Server: ns1-37.akam.net
    mit.edu: type NS, class IN, ns asia1.akam.net
        Name: mit.edu
        Type: NS (authoritative Name Server) (2)
        Class: IN (0x0001)
        Time to live: 165
        Data length: 8
        Name Server: asia1.akam.net
    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: 165
        Data length: 7
        Name Server: use5.akam.net
    mit.edu: type NS, class IN, ns usw2.akam.net
        Name: mit.edu
        Type: NS (authoritative Name Server) (2)
        Class: IN (0x0001)
        Time to live: 165
        Data length: 7
        Name Server: usw2.akam.net
Additional records
    usw2.akam.net: type A, class IN, addr 184.26.161.64
        Name: usw2.akam.net
        Type: A (Host Address) (1)
        Class: IN (0x0001)
        Time to live: 34140
        Data length: 4
        Address: 184.26.161.64
    ns1-37.akam.net: type A, class IN, addr 193.108.91.37
        Name: ns1-37.akam.net
        Type: A (Host Address) (1)
        Class: IN (0x0001)
        Time to live: 86163
        Data length: 4
        Address: 193.108.91.37
    ns1-37.akam.net: type AAAA, class IN, addr 2600:1401:2::25
        Name: ns1-37.akam.net
        Type: AAAA (IPv6 Address) (28)
        Class: IN (0x0001)
        Time to live: 86163
```

19. Provide a screenshot.
    截图已附在每个题后面。
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.



换用国内域名服务器找不到该记录。