

IFT 266 Introduction to Network Information Communication Technology (ICT)

Lab 25

Breakdown the IPv6 address

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Answer the open questions in the spaces provided
or
Circle/highlight the correct parts

1. What are the 3 sections of an IPv6 address and how many bits are in those sections?

Section Name	Section Size (Bits per section)
1) Routing Prefix	48
2) Subnet ID	16
3) Interface Identifier	64

2. Highlight, circle, or separate (whatever is easier and noticeable) each separate section of the following IPv6 addresses. Base answers on the /64 subnets.

2001:0DB8:85A3:5678:4321:ABCD:EF89:FE44

1:2:3:4:5:6:7:8

4104:FEA4:9002:5:1

4:3A:0:21:B45::423F

A::321E:45:9C:FFF:6

80FE:CAFE:123:5912::42:1

3. This question is very similar to question two except we are going to switch up the prefix i.e. /48, /52, /56.

You are going to take the IP address and break it apart into the 3 sections. You can either circle, highlight, or space apart the answer.

2001:0DB8:85A3:5678:4321:ABCD:EF89:FF44 /60

5578:4782:DEDE:3434:1572:DCBA:1235:AE8B /64

11:AA:23AB:7462:5555:32:486:1 /56

1111:23:4AA:8974:3 /60

AA:BB:C:DD:E::F /64

32::4813:93:0:0:23 /52

2001:0DB8:88:149F:123:3245:AAA:B /60

3C4D:2180:4572:AFFE:CAFE:ABBC:2000:0123 /48

1282:BAFF:44:3223::4 /56

21::4523:0:0:0:2 /52

4. Let's move out of the 48-64 range; highlight just the prefix range of the next set of IP addresses.

2402:9400:0000:0000:0000:0000:1111 /128

2402:9400:0000:0000:0000:0000:1111 /124

2402:9400:0000:0000:0000:0000:1111 /120

2402:9400:0000:0000:0000:0000:1111 /116

2402:9400:0000:0000:0000:0000:1111:1111 /112

2402:9400:0000:0000:0000:0000:1111:1111 /108

2402:9400:0000:0000:0000:0000:1111:1111 /104

2402:9400:0000:0000:0000:0000:1111:1111 /100

2402:9400:0000:0000:0000:1111:1111:1111 /96

2402:9400:0000:0000:0000:1111:1111:1111 /92

2402:9400:0000:0000:0000:1111:1111:1111 /88

2402:9400:0000:0000:0000:1111:1111:1111 /84

5. Did you know you can even have odd subnets like /127, /126, /125, /123, etc..?

It may seem intimidating but it's actually pretty simple.

Let's take this example IP: **2001:EF01:2345::FFFF**

Next, let's take the last hextet from that IP: **FFFF**

Lastly, let's take out the last nibble from that hextet: **F**

In decimal format, what number does **F** represent?

15

How many binary digits do you need to represent that number?

4

How many numbers are between /128 and /124?

16

Piece it together yet? If not, let's break it down this way.

CIDR	End of Range	Binary Representation
/128	::	0000
/127	::1	0001
/126	::3	0011
/125	::7	0111
/124	::F	1111

Now it your turn.... try and finish these ranges.

CIDR	End of Range	CIDR	End of Range
/123	::1F	/76	::F:FFFF:FFFF:FFFF
/122	::3F	/75	::1F:FFFF:FFFF:FFFF
/121	::7F	/74	::3F:FFFF:FFFF:FFFF
/120	::FF	/73	::7F:FFFF:FFFF:FFFF
/119	::1FF	/44	::F:FFFF:FFFF:FFFF:FFFF:FFFF
/118	::3FF	/43	::1F:FFFF:FFFF:FFFF:FFFF:FFFF
/117	::7FF	/42	::3F:FFFF:FFFF:FFFF:FFFF:FFFF
/116	::FFF	/41	::7F:FFFF:FFFF:FFFF:FFFF:FFFF
/115	::1FFF	/19	0:1FFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF
/114	::3FFF	/18	0:3FFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF
/113	::7FFF	/17	0:7FFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF