

Q1

VPC 1  $\Rightarrow$  10.0.0.0/24 256 IP add.

10.0.0.0, 10.0.0.1, 10.0.0.2 --- 10.0.0.255

Q2

VPC 2  $\Rightarrow$  10.0.0.0/23 512 IP add.10.0.0.0, 10.0.0.1, --- 10.0.0.255, 2<sup>256</sup>10.0.0.0, 10.0.0.1, --- 10.0.0.255, 2<sup>256</sup>

Total bits in IPv4 = 32

Bits in CIDR IP = 23

 $\frac{32}{2} - 23 = 9$  bits =  $2^9 = 512$  IP Address

00000000 00000000 0000000<sup>1</sup> reserved 9 bits

13

Q3

VPC 3  $\Rightarrow$  10.0.0.0/22

1024

10  $32 - 22 = 10 \Rightarrow 2^{10} = 1024$  IP address

10.0.0.0, 10.0.0.1, 10.0.0.2 --- 10.0.0.255

10.0.1.0, 10.0.1.1, 10.0.1.2 --- 10.0.1.255

10.0.2.0, 10.0.2.1, 10.0.2.2 --- 10.0.2.255

10.0.3.0, 10.0.3.1, 10.0.3.2 --- 10.0.3.255

27/12 x 8

$$\begin{array}{r} 2^8 \\ 2^7 \\ 2^6 \\ 2^5 \\ 2^4 \\ 2^3 \\ 2^2 \\ 2^1 \\ 2^0 \end{array}$$

$$16 + 8 + 4 + 2 + 1$$

Q. VPC 4  $\Rightarrow$  10.0.0.0/21

$$\begin{array}{r} 2^8 \\ 2^7 \\ 2^6 \\ 2^5 \\ 2^4 \\ 2^3 \\ 2^2 \\ 2^1 \\ 2^0 \end{array}$$

$$000 \quad 111$$

$$2^8 - 2^7 = 111$$

$$2^8 - 2^7 - 2^6 = 111$$

$$2^8 - 2^7 - 2^6 - 2^5 = 111$$

$$2^8 - 2^7 - 2^6 - 2^5 - 2^4 = 111$$

$$2^8 - 2^7 - 2^6 - 2^5 - 2^4 - 2^3 = 111$$

$$2^8 - 2^7 - 2^6 - 2^5 - 2^4 - 2^3 - 2^2 = 111$$

$$2^8 - 2^7 - 2^6 - 2^5 - 2^4 - 2^3 - 2^2 - 2^1 = 111$$

$$2^8 - 2^7 - 2^6 - 2^5 - 2^4 - 2^3 - 2^2 - 2^1 - 2^0 = 111$$

$$\text{Total} = 32$$

$$\text{CJDR} = 21$$

$$\text{Avail.} \Rightarrow 11 \Rightarrow 2^{11} = 2048 \text{ JP}$$

10.0.0.0 --- 10.0.0.255, 10.0.1.0, --- 10.0.1.255

10.0.2.0 --- 10.0.2.255, 10.0.3.0 --- 10.0.3.255

10.0.4.0 --- 10.0.4.255, 10.0.5.0 --- 10.0.5.255

10.0.6.0 --- 10.0.6.255, 10.0.7.0 --- 10.0.7.255

Q. VPC 5  $\Rightarrow$  10.0.0.0/20

$$\text{Total} = 32$$

$$\text{CJDR} = 20$$

$$\text{Avail.} = 12 \Rightarrow 2^{12} = 4096$$

$$\begin{array}{r} 33 \\ 256 \quad | \quad 4096 \\ \underline{256} \quad \quad \quad \underline{256} \\ 1536 \quad \quad \quad 1536 \end{array}$$

$$\begin{array}{r} 2^8 \\ 2^7 \\ 2^6 \\ 2^5 \\ 2^4 \\ 2^3 \\ 2^2 \\ 2^1 \\ 2^0 \end{array}$$

$$\begin{array}{r} 16 \\ 8 \\ 4 \\ 2 \\ 1 \\ 0 \end{array}$$

10.0.0.0 --- 10.0.16.255

Q. VPC 6  $\Rightarrow$  10.0.0.0/19

$$\text{Total} = 32$$

$$\text{CJDR} = 19$$

$$\text{Avail.} = 13 = 2^{13} = 8192$$

$$\text{IP endpt.} = \frac{8192}{256} = 32$$

10.0.0.0 --- 10.0.31.255

Q. 2 VPC 7  $\Rightarrow$  10.0.0.0/18

$$\text{Avail} \Rightarrow 32 - 18$$

$$\Rightarrow 14 \Rightarrow 2^4 = 16 \text{ hosts}$$

$$\text{Avail} = \frac{16}{256} = 64$$

10.0.0.0 ----- 10.0.63.255

Q. 2 VPC 8  $\Rightarrow$  10.0.0.0/17

$$\text{Avail} \Rightarrow 32$$

$$\begin{array}{r} 17 \\ \hline 15 \end{array}$$

$$\Rightarrow 2^5 = 32 \text{ hosts}$$

$$\Rightarrow \frac{32}{256} = 128$$

10.0.0.0 ----- 10.0.127.255

Q. 2 VPC 9  $\Rightarrow$  10.0.0.0/16

$$\Rightarrow 2^4 \approx 65536$$

$$\Rightarrow \frac{65536}{256} = 256$$

10.0.0.0 ----- 10.0.255.255

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Q. VPC 10  $\Rightarrow$  10.0.0.0/25

$$\text{Avail} = 2^{32-25} = 2^7 = 128 \text{ IP}$$

10.0.0.0 - - - 10.0.0.128

Q. VPC 11  $\Rightarrow$  10.0.0.0/26

$$\text{Avail} = 2^6 = 64$$

10.0.0.0 - - - 10.0.0.64

Q. VPC 12  $\Rightarrow$  10.0.0.0/27

$$\text{Avail} = 2^5 = 32$$

10.0.0.0 - - - 10.0.0.32

Q. VPC 13  $\Rightarrow$  10.0.0.0/28

$$\text{Avail} = 2^4 = 16$$

10.0.0.0 - - - 10.0.0.16

DAY-6

Q. Find 1st & last IP addresses

i) VPC 2  $\Rightarrow$  20.15.0.0/23

$$\begin{aligned} \text{Avail. IP} &= 32 - 23 \\ &= 9 \Rightarrow 2^9 = 512 \text{ IP Address} \\ &= \frac{512}{256} = 2 \text{ (Upper limit)} \end{aligned}$$

20.15.0.0 - - - - 20.15.1.255

ii) VPC 3  $\Rightarrow$  20.15.0.0/24

$$\begin{aligned} \text{Avail} &= 32 - 24 \\ &= 8 = 2^8 = 256 \text{ IP} \\ &= \frac{256}{256} = 1 \end{aligned}$$

20.15.0.0 - - - - 20.15.0.255

iii) VPC 4  $\Rightarrow$  20.15.0.0/25

$$\begin{aligned} \text{Avail} &= 32 - 25 = 7 \\ &= 2^7 = 128 \text{ IP} \end{aligned}$$

Ans

20.15.0.0 - - - - 20.15.0.128

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iv) VPC 5  $\Rightarrow$  20.15.0.0/26

$$\text{Avail} = 32 - 26$$

$$= 6 \Rightarrow 2^6 = 64 \text{ JP}$$

20.15.0.0 - - - - - 20.15.0.64

v) VPC 6  $\Rightarrow$  20.15.0.0/27

$$\text{Avail} = 32 - 27$$

$$= 5 \Rightarrow 2^5 = 32 \text{ JP}$$

20.15.0.0 - - - - - 20.15.0.32

vi) VPC 7  $\Rightarrow$  20.15.0.0/28

$$\text{Avail} = 32 - 28$$

$$= 4 \Rightarrow 2^4 = 16 \text{ JP}$$

20.15.0.0 - - - - - 20.15.0.16

vii) VPC 8  $\Rightarrow$  20.15.0.0/22

$$\text{Avail} = 32 - 22$$

$$= 10 \Rightarrow 2^{10} = 1024 \text{ JP}$$

$$= \frac{1024}{256} = 4$$

20.15.0.0 - - - - - 20.15.3.255

$\frac{8}{2048}$

viii) VPC 9  $\Rightarrow$  20.15.0.0/21

$$\text{Avail} = 32 - 21 = 11 \Rightarrow 2^{11} = 2048$$

$$= \frac{2048}{256} = 8$$

20.15.0.0 - - - - - 20.15.7.255

x) VPC 10  $\Rightarrow$  20.15.0.0/20

$$\text{Avail} = 32 - 20 = 12 \Rightarrow 2^3 = \frac{4096}{256} = 16$$

20.15.0.0 - - - - 20.15.15.255

x) VPC 11  $\Rightarrow$  20.15.0.0/19

$$\text{Avail} = 32 - 19 = 13 \Rightarrow 2^3 = \frac{8192}{256} = 32$$

20.15.0.0 - - - - 20.15.31.255

xii) VPC 12  $\Rightarrow$  20.15.0.0/18

$$\text{Avail} = 32 - 18 = 14 \Rightarrow 2^4 = \frac{16384}{256} = 64$$

20.15.0.0 - - - - 20.15.63.255

xiii) VPC 13  $\Rightarrow$  20.15.0.0/17

$$\text{Avail} = 32 - 17 = 15 \Rightarrow 2^4 = \frac{32768}{256} = 128$$

20.15.0.0 - - - - 20.15.127.255

xiv) VPC 14  $\Rightarrow$  20.15.0.0/16

$$\text{Avail} = 2^4 = \frac{65536}{256} = 256$$

20.15.0.0 - - - - 20.15.255.255

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Subnets1) VPC 1  $\Rightarrow$  20.15.0.0 /22Subnet 1 - 256 JPs  $\Rightarrow$  20.15.0.0 /24-- 2 - 256 JPs  $\Rightarrow$  20.15.1.0 /24-- 3 - 256 JPs  $\Rightarrow$  20.15.2.0 /24-- 4 - 256 JPs  $\Rightarrow$  20.15.3.0 /242) VPC 2  $\Rightarrow$  20.15.0.0 /21Subnet 1 - 512 JPs  $\Rightarrow$  20.15.0.0 /23-- 2 - --  $\Rightarrow$  20.15.2.0 /23-- 3 - --  $\Rightarrow$  20.15.4.0 /23-- 4 - --  $\Rightarrow$  20.15.6.0 /233) VPC 3  $\Rightarrow$  20.15.0.0 /20 | 1024 JPs / SubnetSN 1  $\Rightarrow$  20.15.0.0 /22SN 2  $\Rightarrow$  20.15.4.0 /22SN 3  $\Rightarrow$  20.15.8.0 /22SN 4  $\Rightarrow$  20.15.12.0 /224) VPC 4  $\Rightarrow$  20.15.0.0 /19 | 2048  
4096 / SubnetSN 1  $\Rightarrow$  20.15.0.0 /21 -  $\frac{2^8}{2} = 2^3$ SN 2  $\Rightarrow$  20.15.8.0 /21 -  $\frac{2^8}{2^3}$ SN 3  $\Rightarrow$  20.15.16.0 /21SN 4  $\Rightarrow$  20.15.24.0 /21

5) VPC 5  $\Rightarrow$  20.15.0.0/18 | 4096 / SN

SN1  $\Rightarrow$  20.15.0.0/20

SN2  $\Rightarrow$  20.15.16.0/20

SN3  $\Rightarrow$  20.15.128<sup>3/2</sup>.0/20

SN4  $\Rightarrow$  20.15.48.0/20

6) VPC 6  $\Rightarrow$  20.15.0.0/17 | 8192 / SN

SN1  $\Rightarrow$  20.15.0.0/19

SN2  $\Rightarrow$   $\frac{2^{13}}{2^8} = 2^5 = 32 \Rightarrow$  20.15.32.0/19

SN3  $\Rightarrow$  20.15.64.0/19

SN4  $\Rightarrow$  20.15.96.0/19

$$\begin{array}{r} 128 \\ 64 \\ \hline 192 \end{array}$$

7) VPC 7  $\Rightarrow$  20.15.0.0/16

SN1  $\Rightarrow$  20.15.0.0/18

SN2  $\Rightarrow$   $\frac{2^{14}}{2^8} = 2^6 = 64 \Rightarrow$  20.15.64.0/18

SN3  $\Rightarrow$  20.15.128.0/18

SN4  $\Rightarrow$  20.15.192.0/18

8) VPC 8  $\Rightarrow$  20.15.0.0/18-

$\Leftrightarrow 16$

SN1  $\Rightarrow$  4096  $\cancel{+} p \Rightarrow$  20.15.0.0/20

SN2  $\Rightarrow$   $\frac{2^{11}}{2^8} = 2^3 = 8 \Rightarrow$  20.15.16.0/20  $\cancel{+} 1$

SN3  $\Rightarrow$   $\frac{2^{10}}{2^8} = 2^2 = 4 \Rightarrow$  20.15.24.0/202

SN4  $\Rightarrow$  8  $\Rightarrow$  20.15.28.0/21

$$SN_5 = 4 \Rightarrow 20, 15, 36.0 / 22$$

$$SN_6 = 8 \Rightarrow 20, 15, 40.0 / 22$$

$$SN_7 = 16 \Rightarrow 20, 15, 48.0 / 20$$

$$\begin{matrix} & & 11 \\ & 20, 15, 6 & 3 \\ & & 255 \end{matrix} / 20$$

9) VPC 9  $\Rightarrow 20, 15, 0.0 / 16$

$$SN_1 = 4096 = \frac{2^{12}}{2^8} = 16 \Rightarrow 20, 15, 0.0 / 20$$

$$SN_2 = 16384 = \frac{2^{14}}{2^8} = 64 \Rightarrow 20, 15, 16.0 / 18$$

$$SN_3 = 4096 = 16 = 20, 15, 8.0.0 / 20$$

$$SN_4 = 2048 = \frac{2^8}{2^8} = 8 \Rightarrow 20, 15, 96.0 / 21$$

$$SN_5 = 1024 = \frac{2^{10}}{2^8} = 4 = 20, 15, 10.0 / 22$$

$$SN_6 = 8192 = \frac{2^{13}}{2^8} = 32 = 20, 15, 10.8.0 / 19$$

$$SN_7 = 4096 = \frac{2^{12}}{2^8} = 16 = 20, 15, 18.0.0 / 20$$

$$\begin{matrix} & & 11 \\ & 20, 15, 15 & 6 \\ & & 255 \end{matrix} / 20$$

10) VPC 10  $\Rightarrow$  20.15.0.0/18

$$SN1: 2048 = \frac{2^10}{2^8} = 8 \Rightarrow 20.15.0.0/12$$

$$SN2: 4096 = \frac{2^{12}}{2^8} = 16 = 20.15.8.0/20$$

$$SN3: 512 = 2 = 20.15.24.0/23$$

$$SN4: 1024 = \frac{2^{10}}{2^8} = 4 = 20.15.26.0/22$$

$$SN5: 512 = 2 = 20.15.80.0/23$$

$$SN6: 4096 = \frac{2^{12}}{2^8} = 16 = 20.15.32.0/20$$

$$SN7: 1024 = \frac{2^{10}}{2^8} = 4 = 20.15.48.0/22$$

$$SN8: 2048 = \frac{2^{11}}{2^8} = 8 = 20.15.52.0/21 \Rightarrow \\ 20.15.59.255/21$$

11) VPC 10  $\Rightarrow$  20.15.0.0/17

$$SN1: 2048 = 8 \Rightarrow 20.15.0.0/12$$

$$SN2: 8192 = \frac{2^{13}}{2^8} = 32 = 20.15.8.0/19$$

$$SN3: 2048 = 8 = 20.15.40.0/21$$

$$SN4: 1024 = 4 = 20.15.48.0/22$$

$$SN5: 512 = 2 = 20.15.52.0/23$$

$$SN6: 4096 = 16 = 20.15.54.0/20$$

$$SN7: 512 = 2 = 20.15.70.0/23$$

$$SN8: 2048 = 8 = 20.15.72.0/21$$