**CIRD Notation**

**Example:**

VPC name = VPC1 IPAddress : 10.0.0.0/22 - 1024 IP Address

Total number of bits in IPV4 – 32

Bits in CIDR IP Address – 22

32 - 22 = 10 , 2^10 = 1024 IP Address

**Exercise:**

/23 🡪32-23 = 9 🡪 2^9 🡪 512

/24 🡪32-24 = 8 🡪 2^8 🡪 256

/25 🡪32-25 = 7 🡪 2^7 🡪 128

/26 🡪32-26 = 6 🡪 2^6 🡪 64

/27 🡪32-27 = 5 🡪 2^5 🡪 32

/28 🡪32-28 = 4 🡪 2^4 🡪 16

/21 🡪32-21 = 11 🡪 2^11 🡪 2048

/20 🡪32-20 = 12🡪 2^12🡪 4096

/19 🡪32-19= 13🡪 2^13🡪 8192

/18 🡪32-18 = 14🡪 2^14🡪 16384

/17 🡪32-17 = 15🡪 2^15🡪 32768

/16 🡪32-16 = 16🡪 2^16🡪 65536

**Example 1:**

VPC1 – 10.0.0.0/24 🡪 256 IP Address

Total number of bits in IPV4 -32

Bits in CIDR IP Address -24

32-24=8, 2^8 =256 IP Address

10.0.0.0, 10.0.0.2,…….,10.0.0.255

**Example 2:**

VPC2 – 10.0.0.0/23 🡪 512 IP Address

Total number of bits in IPV4 -32

Bits in CIDR IP Address -23

32-23=9, 2^9 =512 IP Address

10.0.0.0, 10.0.0.2,…….,10.0.0.255,10.0.1.0,……10.0.1.255

**Example 3:**

VPC3 – 10.0.0.0/22 🡪 1024 IP Address

Total number of bits in IPV4 -32

Bits in CIDR IP Address - 22

32-22=, 2^10 = 1024 IP Address

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

**Example 4:**

VPC4 – 10.0.0.0/25🡪 128 IP Address

Total number of bits in IPV4 -32

Bits in CIDR IP Address -25

32-25=, 2^7 = 128 IP Address

10.0.0.0,….,10.0.0.127

**Example 5:**

VPC – 10.0.0.0/26 🡪 64 IP Address

Total number of bits in IPV4 -32

Bits in CIDR IP Address - 26

32-26=, 2^6 = 64 IP Address

10.0.0.0, 10.0.0.1,…….,10.0.0.63

**Example 6:**

VPC – 10.0.0.0/27 🡪32 IP Address

Total number of bits in IPV4 -32

Bits in CIDR IP Address -27

32-27=, 2^5 = 32 IP Address

10.0.0.0, 10.0.0.1,…….,10.0.0.31

**Example 7:**

VPC – 10.0.0.0/28 🡪 16 IP Address

Total number of bits in IPV4 -32

Bits in CIDR IP Address - 28

32-28=, 2^4 = 16 IP Address

10.0.0.0, 10.0.0.1,…….,10.0.0.15

**Example 8:**

VPC – 10.0.0.0/21 🡪 2048 IP Address

Total number of bits in IPV4 -32

Bits in CIDR IP Address -21

32-21=, 2^11= 2048 IP Address

10.0.0.0, 10.0.0.1,…….,10.0.0.255,…, 10.0.7.0,……10.0.7.255

**Example 9:**

VPC – 10.0.0.0/20 🡪 4096 IP Address

Total number of bits in IPV4 -32

Bits in CIDR IP Address - 20

32-20=, 2^12=4096 IP Address

10.0.0.0, 10.0.0.1,…….,10.0.0.255,….,10.0.15.0,……10.0.15.255

**Example 10:**

VPC – 10.0.0.0/19 🡪 8192 IP Address

Total number of bits in IPV4 -32

Bits in CIDR IP Address - 19

32-19=, 2^13 = 8192 IP Address

10.0.0.1, 10.0.0.2,…….,10.0.0.255,10.0.1.0,……10.0.1.255,…,10.0.30.0,..10.0.30.255

**Example 11:**

VPC – 10.0.0.0/18 🡪 16384 IP Address

Total number of bits in IPV4 -32

Bits in CIDR IP Address - 18

32-18=, 2^14 = 16384 IP Address

10.0.0.1, 10.0.0.2,…….,10.0.0.255,10.0.1.0,……10.0.1.255,10.0.63.0,…,10.0.63.255

**Example 12:**

VPC – 10.0.0.0/17 🡪 32786 IP Address

Total number of bits in IPV4 -32

Bits in CIDR IP Address - 17

32-17=, 2^ 15= 32786 IP Address

10.0.0.1, 10.0.0.2,…….,10.0.0.255,10.0.1.0,……10.0.1.255,10.0.127.0,….,10.0.127.255

**Example 13:**

VPC – 10.0.0.0/16 🡪 65536 IP Address

Total number of bits in IPV4 -32

Bits in CIDR IP Address - 16

32-16=, 2^16 = 65536 IP Address

10.0.0.1, 10.0.0.2,…….,10.0.0.255,10.0.1.0,……10.0.1.255,10.0.255.0,….,10.0.255.255

**1.VPC 2 – 20.15.0.0/23 => 32-23 = 2^9 = 512**

**20.15.0.0, 20.15.0.1,…20.15.1.255**

**2.VPC 3– 20.15.0.0/24 => 32-24=2^8=256**

**20.15.0.0, 20.15.0.1,…20.15.0.255**

**3.VPC 4– 20.15.0.0/25 => 32-25=2^7=128**

**20.15.0.0,…..20.15.0.255**

**4.VPC 5– 20.15.0.0/26 => 32-26=2^6=64**

**20.15.0.0,…..,20.15.0.63**

**5.VPC 6– 20.15.0.0/27 => 32-27=2^5=32**

**20.15.0.0,……,20.15.0.31**

**6.VPC 7– 20.15.0.0/28 => 32-28=2^4=16**

**20.15.0.0,…..,20.15.0.15**

**7.VPC 8– 20.15.0.0/22 =>32-22=2^10=1024**

**20.15.0.0,….,20.15.3.25**

**8.VPC 9– 20.15.0.0/21 => 32-21=2^11=2048**

**20.15.0.0,……,20.15.7.255**

**9.VPC 10– 20.15.0.0/20 => 32-20 = 2^12=4096**

**20.15.0.0,…..20.15.15.255**

**10.VPC 11– 20.15.0.0/19 => 32-19 = 2^13 =8192**

**20.15.0.0,…..,20.15.31.255**

**11.VPC 12– 20.15.0.0/18 => 32-18 =2^14 = 16384**

**20.15.0.0,…..,20.15.63.255**

**12.VPC 13– 20.15.0.0/17 => 32-17 = 2^ 15 =32768**

**20.15.0.0,……,20.15.127.255**

**13.VPC 14– 20.15.0.0/16 => 32-16 = 65534**

**20.15.0.0,……,20.15.255.255**

**Example - 1 :**

VPC1– 20.15.0.0/22

Subnet 1 – 256 IP’s – 20.15.0.0/24

Subnet 2 – 256 IP’s – 20.15.1.0/24

Subnet 3 – 256 IP’s – 20.15.2.0/24

Subnet 4 – 256 IP’s – 20.15.3.0/24

**Example - 2 :**

VPC2 – 20.15.0.0/21

Subnet 1 – 512 IP’s – 20.15.0.0/23

Subnet 2 –512 IP’s – 20.15.2.0/23

Subnet 3 – 512 IP’s – 20.15.4.0/23

Subnet 4 –512 IP’s – 20.15.6.0/23

**Example - 3:**

VPC3– 20.15.0.0/20

Subnet 1 – 1024 IP’s – 20.15.0.0/22

Subnet 2 – 1024 IP’s – 20.15.4.0/22

Subnet 3 – 1024 IP’s – 20.15.8.0/22

Subnet 4 – 1024 IP’s – 20.15.12.0/22

**Example - 4:**

VPC4– 20.15.0.0/19

Subnet 1 –2048 IP’s – 20.15.0.0/21

Subnet 2 –2048 IP’s – 20.15.8.0/21

Subnet 3 –2048 IP’s – 20.15.16.0/21

Subnet 4 –2048 IP’s – 20.15.24.0/21

**Example - 5:**

VPC5– 20.15.0.0/18

Subnet 1 – 4096 IP’s – 20.15.0.0/20

Subnet 2 –4096 IP’s – 20.15.16.0/20

Subnet 3 –4096 IP’s – 20.15.32.0/20

Subnet 4 –4096 IP’s – 20.15.48.0/20

**Example - 6:**

VPC6– 20.15.0.0/17

Subnet 1 – 8192 IP’s – 20.15.0.0/19

Subnet 2 –8192 IP’s – 20.15.32.0/19

Subnet 3 –8192 IP’s – 20.15.64.0/19

Subnet 4 –8192 IP’s – 20.15.96.0/19

**Example - 7:**

VPC7– 20.15.0.0/16

Subnet 1 –16384 IP’s -20.15.0.0/18

Subnet 2 –16384 IP’s -20.15.64.0/18

Subnet 3 –16384 IP’s -20.15.128.0/18

Subnet 4 –16384 IP’s -20.15.192.0/18

**Example - 8:**

VPC8– 20.15.0.0/18

Subnet 1 – 4096 IP’s - 20.15.0.0/20

Subnet 2 –2048 IP’s - 20.15.16.0/21

Subnet 3 –1024 IP’s – 20.15.24.0/20

Subnet 4 – 2048 IP’s – 20.15.28.0/21

Subnet 5 – 1024 IP’s – 20.15.36.0/22

Subnet 6 – 2048 IP’s – 20.15.40.0/21

Subnet 7 – 4096 IP’s – 20.15.48.0/20

**Example - 9:**

VPC9– 20.15.0.0/16

Subnet 1 – 4096 IP’s – 20.15.0.0/20

Subnet 2 – 16384 IP’s – 20.15.16.0/18

Subnet 3 – 4096 IP’s – 20.15.80.0/20

Subnet 4 – 2048 IP’s – 20.15.96.0/21

Subnet 5 – 1024 IP’s – 20.15.104.0/22

Subnet 6 – 8192 IP’s – 20.15.108.0/19

Subnet 7 – 4096 IP’s – 20.15.140.0/20

**Example - 10:**

VPC10– 20.15.0.0/17

Subnet 1 – 2048 IP’s – 20.15.0.0/21

Subnet 2 – 8192 IP’s – 20.15.8.0/19

Subnet 3 – 2048 IP’s – 20.15.40.0/21

Subnet 4 – 1024 IP’s – 20.15.48.0/22

Subnet 5 – 512 IP’s – 20.15.52.0/23

Subnet 6 – 4096 IP’s – 20.15.54.0/20

Subnet 7 – 512 IP’s – 20.15.70.0/23

Subnet 8 – 2048 IP’s – 20.15.72.0/21

**Example - 11:**

VPC11– 20.15.0.0/18

Subnet 1 – 2048 IP’s – 20.15.0.0/21

Subnet 2 – 4096 IP’s – 20.15.8.0/20

Subnet 3 – 512 IP’s – 20.15.24.0/23

Subnet 4 – 1024 IP’s – 20.15.26.0/22

Subnet 5 – 512 IP’s – 20.15.30.0/23

Subnet 6 – 4096 IP’s – 20.15.32.0/20

Subnet 7 – 1024 IP’s – 20.15.48.0/22

Subnet 8 – 2048 IP’s – 20.15.52.0/21

**Example - 12:**

VPC12– 10.0.0.0/16

Subnet 1 – 4096 IP’s – 10.0.0.0/20

Subnet 2 – 1024 IP’s – 10.0.16.0/21

Subnet 3 – 8192 IP’s – 10.0.20.0/19

Subnet 4 – 4096 IP’s – 10.0.52.0/20

Subnet 5 – 2048 IP’s – 10.0.68.0/21

Subnet 6 – 4096 IP’s – 10.0.76.0/20