

# 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  $\rightarrow 32-23 = 9 \rightarrow 2^9 \rightarrow 512$

/24  $\rightarrow 32-24 = 8 \rightarrow 2^8 \rightarrow 256$

/25  $\rightarrow 32-25 = 7 \rightarrow 2^7 \rightarrow 128$

/26  $\rightarrow 32-26 = 6 \rightarrow 2^6 \rightarrow 64$

/27  $\rightarrow 32-27 = 5 \rightarrow 2^5 \rightarrow 32$

/28  $\rightarrow 32-28 = 4 \rightarrow 2^4 \rightarrow 16$

/21  $\rightarrow 32-21 = 11 \rightarrow 2^{11} \rightarrow 2048$

/20  $\rightarrow 32-20 = 12 \rightarrow 2^{12} \rightarrow 4096$

/19  $\rightarrow 32-19 = 13 \rightarrow 2^{13} \rightarrow 8192$

/18  $\rightarrow 32-18 = 14 \rightarrow 2^{14} \rightarrow 16384$

/17  $\rightarrow 32-17 = 15 \rightarrow 2^{15} \rightarrow 32768$

/16  $\rightarrow 32-16 = 16 \rightarrow 2^{16} \rightarrow 65536$

## Example 1:

VPC1 – 10.0.0.0/24  $\rightarrow 256$  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  $\rightarrow 512$  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 → 32768 IP Address

Total number of bits in IPV4 -32

Bits in CIDR IP Address - 17

$32-17=, 2^{15} = 32768$  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**

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### **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