


Amazon Virtual Private Cloud (VPC): VPC Overview and CIDRs



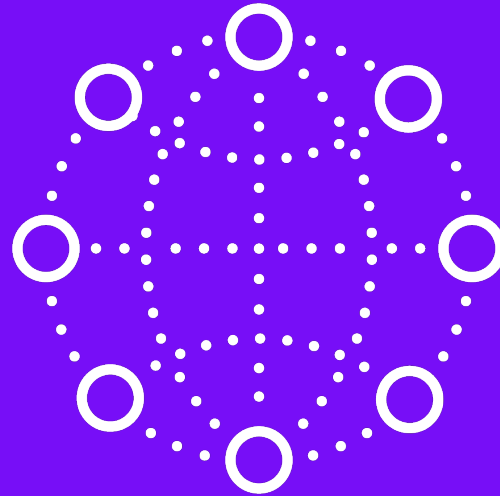
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Amazon VPC Overview



Amazon VPC

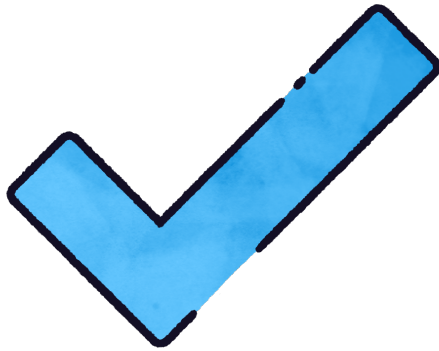
Logically isolated part of AWS Cloud where you can define your own network. You have complete control of virtual networks, including IP address ranges, subnets, route tables, and network gateways.



Think of a VPC as your very own virtual data center network in the cloud.



Two Types of VPCs



Default

Automatically created by AWS when you
create an AWS Account
Default CIDR of 172.31.0.0/16



Custom

Created by you with a custom CIDR
block range
More granular control



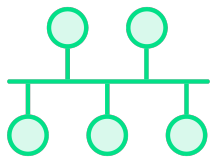
Important VPC Components



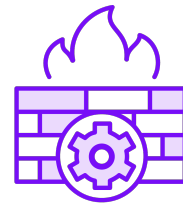
CIDR Block



Security Groups



Subnets



Network Access Control Lists (NACLs)



Route Tables



Network Gateways



Things to Know When Creating VPCs



You select an IP CIDR block to use for the networking resources in the VPC



Private IPv4 CIDR blocks are **required** and range from **/16** to **/28**



IPv6 CIDR blocks are **optional** and range from **/44** to **/60**



CIDRs must be from the RFC 1918 range: **10.0.0.0**, **172.16.0.0**, **192.168.0.0**



Carefully consider your IP planning when creating a VPC



Amazon VPCs are Regional resources!



**There is a soft limit of 5
VPCs per Region, per
account.**



These Are Private IP Ranges

VPCs use private address space. This means they are NOT publicly resolvable!



10.0.0.0/8



172.16.0.0/12



192.168.0.0/16



IPv4 CIDR Example

10.0.0.0/16



IPv4 CIDR Example

10.0.0.0/16

An IPv4 range is made up of 32 total bits

Each of these colored portions of the CIDR make up 8 bits (*Separated by the dots*)

You need to know this to calculate CIDRs correctly



IPv4 CIDR Example

10.0.0.0/16



This indicates the amount of bits for the subnet mask
Translates to **255.255.0.0** for the network addresses



IPv4 CIDR Example

10.0.0.0/16



255.255.0.0 means that the first two octets are used for network addresses



IPv4 CIDR Example

10.0.0.0/16



This means there are 16 remaining bits (last two octets) for usable IPs



IPv4 CIDR Example

10.0.0.0/16

To calculate the total available IP addresses, you take $2^{(\# \text{ of remaining bits})}$

Number of remaining bits = **32 Total Bits - 16 Used Bits**

In this example that gives you **$2^{16} = 65,536$ IPs**





Module Summary and Exam Tips



VPC Review

Logically isolated network where you can define your own configs

Private IPv4 is required, IPv6 is optional

IPv4 CIDR must be between /16 and /28

**Valid CIDRs are
10.0.0.0, 172.16.0.0,
192.168.0.0**

VPCs are a Regional resource



**Be sure you know how to
read CIDR block notation
and calculate the number of
hosts!**



Default Resources within VPCs

DHCP Option Sets to configure DHCP options like domain names, NTP servers, and DNS servers

Main route table (default) with a primary local route

Main NACL (default) with two simple rules

