

Project 4-3: Configure a VPC and Subnets in AWS

Est. completion time: 45 minutes

Note

Public cloud platforms and related account options change frequently. While the instructions given here were accurate at the time of writing, you might need to adjust the steps or options according to later changes.

Recall that in Project 1-3, you surveyed available AWS account options and had the opportunity to create an AWS account. In this project, you'll create a VPC and two subnets in the VPC, one public and one private. Complete the following steps:

1. In your AWS Management Console, go to the VPC dashboard (see Figure 4-24). The VPC service is listed under the Networking & Content Delivery category.

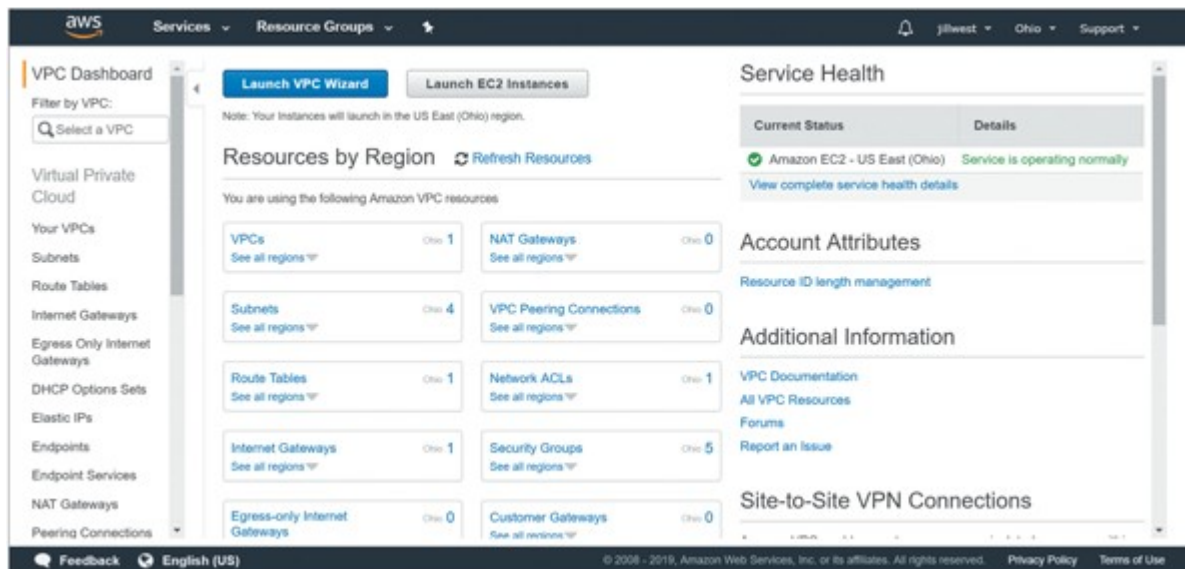


Figure 4-24 The AWS VPC dashboard

Source: Amazon Web Services, Inc.




2. In the left pane, click **Your VPCs** to see what VPCs you currently have running. Click **Create VPC**. Give the VPC a name, such as MyVPC. Specify an IPv4 CIDR block such as 192.168.0.0/24. You don't need an IPv6 CIDR block; make sure you use the Default tenancy. Click **Create**, and then click **Close**. You should now see the new nondefault

VPC listed along with any other VPCs you already had in your account. What CIDR



block did you use?

192.168.0.0/24



Details Info			
VPC ID  vpc-0b82e205ce42d8b10	State  Available	DNS hostnames Disabled	DNS resolution Enabled
Tenancy Default	DHCP options set dopt-032bd85c5e21fc944	Main route table rtb-0b7b8ccdd6e63923b	Main network ACL acl-0b0190a807c402a49
Default VPC No	IPv4 CIDR 192.168.0.0/24	IPv6 pool –	IPv6 CIDR (Network border group) –
Route 53 Resolver DNS Firewall rule groups –	Owner ID  479879377679		

3. AWS created a default route table for your new VPC. To see what routes are included, click the route table's ID, and then click the **Routes** tab. The route table should only include one route for local traffic to the VPC you just created and no other routes. What is



the destination range for the local traffic route?

192.168.0.0/24

Routes	Subnet associations	Edge associations	Route propagation	Tags
Routes (1) Edit routes				
<input type="text" value="Filter routes"/> Both < 1 > 				
Destination	Target	Status	Propagated	
192.168.0.0/24	local	 Active	No	

4. You do not yet have a subnet in this new VPC. To create a subnet, click **Subnets** in the left pane, and then click **Create subnet**. Give the subnet a name, such as MyPrivateSubnet. Select the VPC you created in Step 2. You do not need to specify an AZ. Assign a CIDR block that is contained within the VPC's CIDR range, such as 192.168.0.0/26. Click **Create** and then click **Close**. You should now see the new subnet

listed with any other subnets you already had in your account. What CIDR block did you



use?

192.168.0.0/26

✓ You have successfully created 1 subnet: subnet-020e7a117459736d2

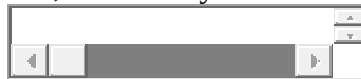
Subnets (1) Info

Filter subnets

Subnet ID: subnet-020e7a117459736d2 Clear filters

<input type="checkbox"/>	Name	Subnet ID	State	VPC	IPv4 CIDR
<input type="checkbox"/>	MyPrivateSubnet	subnet-020e7a117459736d2	✓ Available	vpc-0b82e205ce42d8b10 my...	192.168.0.0/26

5. Your new subnet adopted the main route table from your VPC. Click the route table's ID, and check the routes to confirm nothing has changed. Instances created within this private subnet will not be able to reach the Internet with the current configuration, as there is no route to the Internet.
6. For VM instances within a public subnet to reach the Internet, you'll need to add an Internet Gateway (IG). In the left pane, click **Internet Gateways**. Although you likely already have an IG here, for this project, you'll create a new IG. Click **Create internet gateway**. Give the IG a name, such as MyIG. Click **Create** and then click **Close**. What is



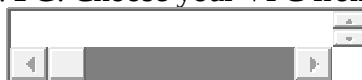
the state of your new IG?

Detached

Details Info

Internet gateway ID igw-0d37235c61c5d4339	State ⊖ Detached	VPC ID -	Owner 479879377679
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7. Attach the IG to your VPC. To do this, select the IG in the list, click **Actions**, and then click **Attach to VPC**. Choose your VPC from the list and click **Attach**. What is the state



of your IG now?

Attached

Details Info			
Internet gateway ID igw-0d37235c61c5d4339	State Attached	VPC ID vpc-0b82e205ce42d8b10 my-vpc-1	Owner 479879377679

8. Now you're ready to add a new subnet that will have access to the Internet through your new IG. Create a new subnet. This time, name it something like MyPublicSubnet. Add it to the same VPC as the first subnet, and use an adjacent CIDR block, such as



192.168.0.64/26. What CIDR block did you use?

192.168.0.64/26

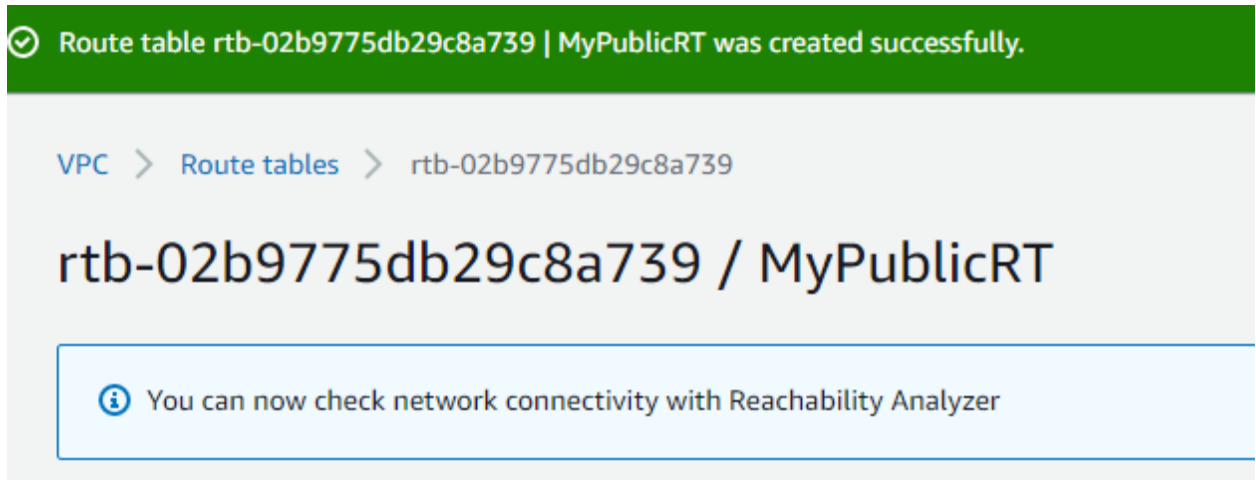
You have successfully created 1 subnet: subnet-007e205e8c181165e					
Subnets (1) Info					
<input type="text" value="Filter subnets"/> Subnet ID: subnet-007e205e8c181165e Clear filters					
<input type="checkbox"/>	Name	Subnet ID	State	VPC	IPv4 CIDR
<input type="checkbox"/>	MyPublicSubnet	subnet-007e205e8c181165e	Available	vpc-0b82e205ce42d8b10 my...	192.168.0.64/26

9. Check the route table for your second subnet. This subnet also adopted the VPC's main route table and so only allows for local traffic. To route Internet traffic through the IG, you could either change this route table (which would affect all resources using this route table, including your private subnet) or create a new route table. For this project, you'll create a new route table. To do this, click **Create route table** above the list of route tables in your account. Give the route table a name, such as MyPublicRT, select the VPC you created earlier in this project, and then click **Create** and **Close**. If you don't see your new route table in the list, click **Route Tables** in the left pane to show the full list. You now have two route tables with the same VPC ID. Which route table is the main route table



for that VPC?

my-vpc-1



10. Check the routes for your new route table. This new route still only allows local traffic because you've not yet added a route to the IG. Click **Edit routes** and then click **Add route**. Traffic destined for the Internet can be described with the CIDR range 0.0.0.0/0. Add this destination to your new route. For the target, choose **Internet Gateway** and then click your IG. Click **Save routes** and click **Close**. Check the new route added to your public route table. How can you tell the target for Internet traffic is an Internet Gateway?



by seeing the destination IPv4 address which is private
or seeing the target starts with igw

<input type="text" value="Filter routes"/>		Both	<	1
Destination	Target	Status	Propagated	
192.168.0.0/24	local	Active	No	
0.0.0.0/0	igw-0d37235c61c5d4339	Active	No	

11. Now you need to add the new route table to the public subnet. Return to your list of subnets, and select your public subnet. Click **Actions** and then click **Edit route table association**. Select the public route table, confirm the routes are listed as expected, click **Save**, and then click **Close**. How can you confirm your subnet is now connected to the



IG? by ensuring that in details table confirm that in route table it has listed the main table

Also we can ensure by confirming that it has both Local and IGW route

subnet-007e205e8c181165e / MyPublicSubnet

Actions ▼

Details

<div>Subnet ID</div> <div> subnet-007e205e8c181165e </div>	<div>Subnet ARN</div> <div> arn:aws:ec2:us-east-1:479879377679:subnet/subnet-007e205e8c181165e </div>	<div>State</div> <div> Available </div>	<div>IPv4 CIDR</div> <div> 192.168.0.64/26 </div>
<div>Available IPv4 addresses</div> <div> 59 </div>	<div>IPv6 CIDR</div> <div>–</div>	<div>Availability Zone</div> <div> us-east-1f </div>	<div>Availability Zone ID</div> <div> use1-az5 </div>
<div>Network border group</div> <div> us-east-1 </div>	<div>VPC</div> <div> vpc-0b82e205ce42d8b10 my-vpc-1 </div>	<div>Route table</div> <div> rtb-0b7b8ccdd6e63923b </div>	<div>Network ACL</div> <div> acl-0b0190a807c402a49 </div>
<div>Default subnet</div> <div>No</div>	<div>Auto-assign public IPv4 address</div> <div>No</div>	<div>Auto-assign IPv6 address</div> <div>No</div>	<div>Auto-assign customer-owned IPv4 address</div> <div>No</div>
<div>Customer-owned IPv4 pool</div> <div>–</div>	<div>Outpost ID</div> <div>–</div>	<div>IPv4 CIDR reservations</div> <div>–</div>	<div>IPv6 CIDR reservations</div> <div>–</div>
<div>Owner</div> <div> 479879377679 </div>			

12. By default, nondefault subnets do not auto-assign a public IP address even if there's an IG attached to it. To change this setting, on the Subnets page, select your public subnet, click **Actions**, and click **Modify auto-assign IP settings**. Enable auto-assignment of public IPv4 addresses, and save your change.

Settings

Subnet ID

subnet-007e205e8c181165e

Auto-assign IPv4 [Info](#)

☒ Enable auto-assign public IPv4 address

Auto-assign customer-owned IPv4 address [Info](#)

☐ Enable auto-assign customer-owned IPv4 address
 Option disabled because no customer owned pools found.

Cancel

Save

13. To test your configuration of the public subnet, create a new VM instance. On the Step 3: Configure Instance Details page during setup, select your new VPC and the public subnet you created. Launch the instance. Did your machine receive a public IPv4 address? If so,



what is it? What is the VM's private IP address?
receive public IPv4

no it didn't

Private IP 192.168.0.56

Instance summary for i-0db2ed65dd1e0951f Info		
Updated less than a minute ago		
Refresh Connect Instance state		
Instance ID	Public IPv4 address	Private IPv4 addresses
i-0db2ed65dd1e0951f	–	192.168.0.56
IPv6 address	Instance state	Public IPv4 DNS
–	Running	–
Private IPv4 DNS	Instance type	Elastic IP addresses
ip-192-168-0-56.ec2.internal	t4g.micro	–
VPC ID	AWS Compute Optimizer finding	IAM Role
vpc-0b82e205ce42d8b10 (my-vpc-1)	Opt-in to AWS Compute Optimizer for recommendations. Learn more	–

14. Delete all the resources you created in this project, including the VM instance, the VPC, both subnets, both route tables, and the IG. In what order did you delete these resources? What error messages did you encounter? How did you handle these problems? Check through your account to confirm that all related resources have been deleted.

It started with VM instance

Then Subnets, IG, route tables, and VPC

The problem that I encounter is that I need to detach internet gateway that I created. I detached internet gateway so as to delete it

Delete VPC

Deleting VPC...

Details