Cloud Essentials

Project Solution

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Problem Statement:

John is a newbie to the cloud computing domain; he is exploring AWS and is comfortable with creating most of the AWS services. However, he struggles in creating a Virtual Private Cloud (VPC) using the console in the AWS platform. He would need you to assist him in creating a Virtual Private Cloud. While creating a VPC make sure that you:

- Create an Amazon VPC using the VPC wizard, and it should be displayed on the dashboard
- Associate an Elastic IP address with it
- Explore various resources of VPC such as Internet Gateway, NAT Gateway, Subnets, Security Groups
- Launch a NAT Gateway so that internet access is provided to private resources

• Introduce a Public subnet for resources facing the internet such as a web server and a Private subnet for resources at the back end such as database server

- Define security groups with appropriate inbound rules
- Ensure proper routes and corresponding Route tables entries specifying the traffic moving out of the subnet
- Make use of Network ACLs for controlling inbound and outbound traffic in the VPC

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Solution Steps:

Step 1: Login to the AWS Management Console and navigate to VPC from the Services Menu.



Step 3: Next ,we click on Allocate Elastic IP address and then click Allocate on the next page.

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aws Services - Resource Groups - 🖈	4	5ecf37f3b5f6b @ 3057-	-0396-7 👻	N. Virginia 👻	Suppo	ort 🕶
/PC > Elastic IP addresses > Allocate Elastic IP address						
Allocate Elastic IP address						
Ilocate an Elastic IP address by selecting the public IPv4 address pool from which the public IP address is to be allocated. You an have one Elastic IP (EIP) address associated with a running instance at no charge. If you associate additional EIPs with that stance, you will be charged for each additional EIP associated with that instance on a pro rata basis. Additional EIPs are only vailable in Amazon VPC. To ensure efficient use of Elastic IP addresses, we impose a small hourly charge when these IP ddresses are not associated with a running instance or when they are associated with a stopped instance or unattached etwork interface. Learn more						
Elastic IP address settings						
Public IPv4 address pool Public IPv4 devesses are allocated from Amazon's pool of public IP addresses, from a pool that you own and bring to your account, or from a pool that you own and continue to advertise.						
Amazon's pool of IPv4 addresses						
Public IPv4 address that you bring to your AWS account(option disabled because no pools found) Learn more[2]						
Customer owned pool of IPv4 addresses(option disabled because no customer owned pools found) Learn more						

Step 4: An Elastic IP address will be assigned and is ready to use.

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NAT Gateways					c		
Peering Connections	34 232 84 91				c		·
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Network ACLs	Summary Tags						*

Step 5: Once done, we go back to the VPC page and click on the Launch VPC Wizard to create a VPC.

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New VPC Experience Tell us what you think	Launch VPC Wizard	unch EC2 Inst	tances		Service Health	
VPC Dashboard New	Note: Your Instances will launch in the U	IS East (N. Virginia	a) region. 1 Resources		Current Status	Details
Q Select a VPC					Amazon EC2 - US East (N. Virginia)	Service is operating normally
	You are using the following Amazon	VPC resources			View complete service health details	
VIRTUAL PRIVATE	VPCs	N. Virginia 2	NAT Gateways	N. Virginia 1		
Your VPCs	See all regions V		See all regions ¥		Additional information	
Subnets					VPC Documentation	
Route Tables	Subnets See all regions V	N. Virginia	See all regions	N. Virginia U	All VPC Resources	
Internet Gateways New					Forums	
Egress Only Internet	Route Tables	N. Virginia 3	Network ACLs	N. Virginia 2	Report an Issue	
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Elastic IPs New	Internet Gateways	N. Virginia 1	Security Groups	N. Virginia 2		
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Endocinto	Egress-only Internet Gateways	N. Virginia O	Customer Gateways	N. Virginia O	Get started with Network Manager	
Endpoints	See all regions V		See all regions 🖤			
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NAT Gateways	DHCP options sets	N. Virginia 1	Virtual Private Gateways	N. Virginia 🔘		
Peering Connections	See all regions		See all regions #		Amazon VPC enables you to use your own i	solated resources within the AWS
SECURITY					cloud, and then connect those resources dir industry-standard encrypted IPsec VPN con	rectly to your own datacenter using inections.
Network ACLs	Elastic IPs	N. Virginia 1	Site-to-Site VPN Connections	N. Virginia O		

Step 6: From the list of given options, we select VPC with Public and Private Subnets and proceed.

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Step 1: Select a VPC C	onfiguration					
VPC with a Single Public Subnet	In addition to containing a public subnet, this configuration adds a private subnet whose instances are not addressable from the Internet. Instances in	Internet, 53. DynamoDB, SNS				
VPC with Public and Private Subnets	the private subnet can establish outbound connections to the Internet via the public subnet using Network Address Translation (NAT). Creates:	SQS, etc.				
VPC with Public and Private Subnets and Hardware VPN Access	A /16 network with two /24 subnets. Public subnet instances use Elastic IPs to access the Internet. Private subnet instances access the Internet via Network Address Translation (NAT). (Hourly charges for NAT devices apply.)	Amazon Virtual Private Cloud Public Subnet				
VPC with a Private Subnet Only and Hardware VPN Access	Select					
					Cancel a	and Exit
					u noor u	
🗨 Feedback 🔇 English (us)	© 2008 - 2020, Amazon Internet Servi	ces Private Ltd. or its affiliates. All rights reserve	ed. Privacy Poli	cy Terrr	is of Use

Step 7: On the next step, we fill in the relevant details such as VPC name, Public subnet IPv4 CIDR and its Availability Zone and Private subnet IPv4 CIDR and its Availability zone, Elastic IP address that we created in the earlier steps etc. and click on **Create VPC**.

WS Services - tep 2: VPC with Public IPv4 CIDR block: IPv5 CIDR block: VPC name: Public subnet's IPv4 CIDR: Availability Zone:*	Resource Groups And Private Subnets 10.0.0/16 (65531 IP addresses available) No IPv6 CIDR Block Anazon provided IPv6 CIDR block JPv6 CIDR block owned by me Lab VPC 10.0.25.024 (251 IP addresses available) us east 1a	Ω 5ed37/385f6b @ 3057 0396-7 * Ν. Virginia * Support *
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Private subnet's IPv4 CIDR:"	10.0.50.0/24 (251 IP addresses available)	
Availability Zone:*	us-east-ta 🗸	
Private subnet name:	Private subnet	
Y	ou can add more subnets after AWS creates the VPC.	
pecify the details of your NAT gat	way (NAT gateway rates apply).	Use a NAT instance in
Elastic IP Allocation ID:*	eipalloc-0b4fb1c21290e96cb	
Service endpoints		
	Add Endpoint	
Enable DNS hostnames:* 6	€ Yes ○ No	
Hardware tenancy:*	Default 🗸	
		Cancel and Exit Back Create

Step 8: A status windows is displayed that shows the current progress of creation of required resources.

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Step 2: VPC with Publi	ic and Private Subne	ets					
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Private subnet name:	Private subnet		478/				
	You can add more subnets at	fter AWS creates the VPC.	Waiting for NAT Gateway status to become				
Specify the details of your NAT g	ateway (NAT gateway rates ap	oply).	available (This may take a few minutes)	27		Use a NAT	instance instead
Elastic IP Allocation ID:"	eipalioc-0b4fb1c21290e96c	b					
Service endpoints							
	Add Endpoint						
Enable DNS hostnames:*	● Yes ◯ No						
Hardware tenancy:*	Default 👻						
					Cancel and	Exit Back	Create VPC
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Step 9: Once done we get a VPC Successfully created message and the VPC is created in AWS.

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aws services -	Resource Groups 🗸 🚯	🎝 5ecf37f3b5f6b @ 3057-0396-7 ▾ N	Virginia 👻 S	Support
New VPC Experience	VPC Successfully Created			
VPC Dashboard New	Your VPC has been successfully created. You can launch instances into the subnets of your VPC. For more information, see Lau	nching an Instance into Your Subnet.		
Q Select a VPC				
VIRTUAL PRIVATE CLOUD				
Your VPCs				
Subnets				
Route Tables				
Internet Gateways New				
Egress Only Internet Gateways New				
DHCP Options Sets New				
Elastic IPs New				
Managed Prefix Lists New				
Endpoints				
Endpoint Services				
NAT Gateways				
Peering Connections				
SECURITY				

• We can verify that from the VPC Dashboard that lists the VPC details and has a VPC ID which we can note for future references.

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aws Services -	Resource Groups 👻 🗙	û 5edf37f3b5f6b@ 3057-0396-7 ▼ N. Virginia ▼ Support ▼
New VPC Experience Tell us what you think	Create VPC Actions *	
VPC Dashboard New	Q. Filter by tags and attributes or search by keyword	< < 1 to 1 of 1 > >
Filter by VPC:	Name v VPC ID • State v IPv4 CIDR IPv6 CIDR	DHCP options set Main Route table Main Network ACL Tena
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Internet Gateways New		
Egress Only Internet Gateways _{New}		
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Endpoints	VPC: vpc-0ad78bd2865e1288b	
Endpoint Services		
NAT Gateways	Description CIDR Blocks Flow Logs Tags	
Peering Connections	VPCID vpc-0ad78bd2865e1288b State available	Tenancy default Default VPC No
SECURITY Network ACLs	IPv4 CIDR 10.0.0/16 IPv6 CIDR -	Classic link Disabled
Network ACLS	DNS resolution Enabled	Network ACL acl-096e637941cdad93b
SOCHERY ISTOLES Now		

Step 10: Select the VPC created and click on the **Internet Gateways** on the left navigation pane. We will see that an internet gateway is attached to the VPC which will allows the VPC to connect to the internet.

Services V	Kesource Groups V X	inia ¥	Suppor
New VPC Experience Tell us what you think	VPC > Internet gateways		
VPC Dashboard New A Filter by VPC:	Internet gateways (1/1) Info	jatewa	
Q Select a VPC	Q. Filter internet gateways < 1	>	۲
VIRTUAL PRIVATE	☑ Name ▼ Internet gateway ID ▼ State ▼ VPC ID ▼ Owner		▽
Your VPCs	✓ - igw-0237fd7ccdd856be1		
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Internet Gateways New			
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DHCP Options Sets new Elastic IPs New Managed Prefix Lists new Endpoints Endpoints Endpoint Services NAT Gateways	Details Tags Details Tags Details Internet gateway ID State VPC ID Owner Owner Old Hardbod Control Owner		

Step 11: Next , click on the **Subnets** on the left navigation pane.

We will notice that a Public Subnet and the Private Subnets are created for our VPC . It has a VPC ID which we can match with the VPC ID that we noted earlier for verification.

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Filter by VPC:	7		Name -	Subnet ID		State -	VPC -	IPv4 CIDR	Ŧ	Available IPv4 -	IPv6 CI	OR Availability Zone	Availat	bility Zone II) -	Rou
Q Select a VPC	÷.		Private sub	subnet-00923	351cabe8e88	available	vpc-0ad78bd2865e1288b	10.0.50.0/24		251		us-east-1a	use1-a:	z1		rtb-0
VIRTUAL PRIVATE			Public subnet	subnet-0ddd68	87264273dd90	available	vpc-0ad78bd2865e1288b	10.0.25.0/24		250		us-east-1a	use1-a	z1		rtb-0
Your VPCs																
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Endpoints																
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Step 12: We can now explore Public Subnet by selecting it and navigating through the below tabs.

The details include

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New VPC Experience	Create subnet Actions *	0 4 9
Tell us what you think		
VPC Dashboard New	Q Filter by tags and attributes or search by keyword	< < 1 to 2 of 2 > >
Filter by VPC:	Name - Subnet ID - State - VPC - IPv4 CIDR - Available IPv4 IPv6 CIDR Available IIPv4 Available IPv4 Available IIPv4 IIPv6 CIDR	vailability Zone ID - Route
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CLOUD		
Your VPCs		
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Internet Gateways New		
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DHCP Options	4	•
Sets New	Subnet: subnet-0dd687264273dd90	880
Elastic IPs New		
Managed Prefix	Description Flow Logs Route Table Network ACL Tags Sharing	
LISTS New	Submet ID submet-0ddd987264273dd90 State available	
Endpoints	VPC vpc-0ad78bd2865e1286b Lab VPC IPv4 CIDR 10.0.25.0/24	
Endpoint Services	Available IPV4 Addresses 250 IPV5 CIDR - Available IPV4 Addresses 250 IPV5 CIDR - Availabile upt (interlant) Boute tabile upt (interlant)	
Peering Connections	Network ACL acl-0966637041cdad93b Default subnet No	
Feering conflections	Auto-assign public IPv4 No Auto-assign customer-owned No Auto-assign customer-owned No IPv4 address	
SECURITY	Guide Customer-owned IPV4 pool - Auto-assign IPV6 address No	
Network ACLs	Outpost ID Owner 305703967178	
Security Groups New		

Step 13: On the Route table, we can see destination and find that an internet gateway is attached to the subnet.

Subnets VPC Management Con	× +								-	٥
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New VPC Experience Tell us what you think	Create subnet Act	tions ¥							Ð	
VPC Dashboard New	Q. Filter by tags and at	tributes or search by keyword							I< < 1 to 2 of	2 > >
Filter by VPC:	Name -	Subnet ID *	State -	VPC	- IPv4 CIDR	- Available IPv4 -	IPv6 CIDR	Availability Zone -	Availability Zone	D - Rout
Goodeavio	Private sub	subnet-00923e351cabe8e88	available	vpc-0ad78bd2865e1288b	10.0.50.0/24	251	2	us-east-1a	use1-az1	rtb-08
VIRTUAL PRIVATE	Public subnet	subnet-0ddd687264273dd90	available	vpc-0ad78bd2865e1288b	10.0.25.0/24	250	•	us-east-1a	use1-az1	rtb-0f
Your VPCs										
Subnets	< C									
Route Tables	Subnet: subnet-0ddd68	87264273dd90								
Internet Gateways New										
Egress Only Internet Gateways New	Description	Flow Logs Route Table	Network Al	CL Tags	Sharing					
DHCP Options Sets New	Route Table: rtb-0fc4	58dbe951cb81c								
Elastic IPs New		K <	1 to 2 of 2)	 >I 						
Managed Prefix	Destination	Target								
Endpoints	10.0.0/16	local								
Endpoint Services	0.0.0/0	igw-0237fd7ccdd856t	e1							
NAT Gateways										
Peering Connections										
▼ vernig connections										
SECURITY										
Network ACLs										
Security Groups New										
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Step 14: On the Network ACL, we can check the security layer that controls the traffic flowing in and out of the subnet.

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Services	🗸 🗸 Resource Gro	ups 🗸 🦌						∯ Sec	f37f3b5f6b @ 3057-0396-7 👻 🗌	N. Virginia 🔻	Support	٣
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Your VPCs												
Subnets	4											
Route Tables	Description	Flow Logs	Route Table	Network ACL Tags	Shari	ng						
Internet Gateways New												
Egress Only Internet Gateways New	Edit network	ACL association		26								
DHCP Options	Inbound rules	Network ACL:	aci-090803794 (c0a08	30								
Jets new									K	< 1 to 2 of 2	5.51	
Elastic IPs New												
Elastic IPs New Managed Prefix Lists New	Rule #	Туре	Protocol	Port Range / ICMP Type	Source	Allow / Den	у					
Elastic IPs New Managed Prefix Lists New Endpoints	Rule #	Type ALL Traffic	Protocol	Port Range / ICMP Type	Source	Allow / Den	У					
Elastic IPs New Managed Prefix Lists New Endpoints Endpoint Services	Rule # 100	Type ALL Traffic ALL Traffic	Protocol ALL ALL	Port Range / ICMP Type ALL ALL	Source 0.000/0 0.000/0	Allow / Den ALLOW DENY	У					
Elastic IPs New Managed Prefix Lists New Endpoints Endpoint Services NAT Gateways	Rule # 100	Type ALL Traffic ALL Traffic	Protocol ALL ALL	Port Range / ICMP Type ALL ALL	Source 0 0 0 0/0 0 0 0 0/0	Allow / Den ALLOW DENY	y					
Elastic IP5 New Managed Prefix Lists New Endpoints Endpoint Services NAT Gateways Peering Connections	Rule # 100 * Outbound rules	Type ALL Traffic ALL Traffic	Protocol ALL ALL	Port Range / ICMP Type ALL ALL	Source 0.0.0.0/0 0.0.0.0/0	Allow / Den ALLOW DENY	У					
Elastic IPS New Managed Prefix Lists New Endpoints Endpoint Services NAT Gateways Peering Connections	Rule # 100 * Outbound rules	Type ALL Traffic ALL Traffic	Protocol ALL ALL	Port Range / ICMP Type ALL ALL	Source 0.0.0.0/0 0.0.0.0/0	Allow / Den ALLOW DENY	À		K	< 1 to 2 of 2	5 N	
Elastic IPS new Managed Prefix Lists new Endpoints Endpoints Endpoints Services NAT Gateways Peering Connections SECURITY	Rule # 100 - Outbound rules	Type ALL Traffic ALL Traffic	Protocol ALL ALL	Port Range / ICMP Type ALL ALL	Source 0 0 0 0/0 0 0 0 0/0	Allow / Den ALLOW DENY	У У		K	< 1 to 2 of 2	× Я	
Elastic IPs new Managed Prefix Lists new Endpoints Endpoint Services NAT Gateways Peering Connections	Rule # 100 * Outbound rules Rule #	Type ALL Traffic ALL Traffic	Protocol ALL ALL Protocol	Port Range / ICMP Type ALL ALL Port Range / ICMP Type	Source 0 0 0 0 0 0 0 0 0 0 0 0 0 0 Destination	Allow / Den ALLOW DENY	à		K	< 1 to 2 of 2	× × 1	
Elastic IPs new Managed Prefix Lists new Endpoints Endpoint Services NAT Gateways Peering Connections SECURITY Network ACLS Security Groups new	Rule # 100 - Outbound rules Rule # 100	Type ALL Traffic ALL Traffic Type ALL Traffic	Protocol ALL ALL Protocol ALL	Port Range / ICMP Type ALL ALL Port Range / ICMP Type ALL	Source 0.0.0.0/0 0.0.0.0/0 Destination 0.0.0.0/0	Allow / Den ALLOW DENY Allow / Den ALLOW	à		К	< 1 to 2 of 2	> >	

Step 15: On the Tags tab, we can check the tag name that we assign to the subnet.

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\leftrightarrow \rightarrow C \triangleq console.aws	amazon.com/vpc/home?region=us-east-1#subnets:sort=SubnetId			Q \$		* 🌒
aws Services +	Resource Groups 👻 🖈	¢	5ecf37f3b5f6b @ 3057-0396-7 👻	N. Virginia	Supp	ort +
New VPC Experience Tell us what you think	Create subset Actions *				Ð	¢ 0
VPC Dashboard New	Q. Filter by tags and attributes or search by keyword			K <	1 to 2 of 2	\rightarrow \times
Filter by VPC:	Name ✓ State ✓ VPC ✓ IPv4 CIDR ✓ Available IPv4.	IPv6 CID	R Availability Zone	Availabili	y Zone II	Route
	Private sub subnet-00923e351cabe8e88 available vpc-0ad78bd2865e1288b 10.0.50.0/24 251		us-east-1a	use1-az1		rtb-08
VIRTUAL PRIVATE	Public subnet subnet 0ddd687264273dd90 available vpc-0ad78bd2665e1288b 10.0.25.0/24 250		us-east-1a	use1-az1		rtb-0fc
Your VPCs						
Subnets	4					Þ
Route Tables	Subnet: subnet-0ddd687264273dd90					
Internet Gateways New						
Egress Only Internet Gateways New	Description Flow Logs Route Table Network ACL Tags Shaning					
DHCP Options Sets New	Add/Edit Tags					
Elastic IPs New	Key Value					
Managed Prefix Lists New	Name Public subnet			Hide Column		
Endpoints						
Endpoint Services						
NAT Gateways						
Peering Connections						
•						
SECURITY						

Step 16: We can now explore Private Subnet by selecting it and navigating through the below tabs.

- The details include
- Description
 Flow Logs
- Flow Logs
- Route Table
- Network ACL
- Tags



Step 17: On the Route table tab, we can find the route table entry and see destination and target attached with the same.

Subnets VPC Management Con	× +										-	٥
\leftarrow \rightarrow C \triangleq console.aws	amazon.com/vpc/home	?region=us-east-1#subnets:so	rt=SubnetId							이 ☆	ABP	* 🌒
aws Services v	Resource Groups	~ 1 .						۵	5ecf37f3b5f6b @ 3057-0396-7 *	N. Virginia 👻	Suppo	t •
New VPC Experience Tell us what you think	Create subnet Actie	ons 🖤									ਦੇ	¢ 0
VPC Dashboard New	Q. Filter by tags and attr	ibutes or search by keyword								K < 1	to 2 of 2	> >
Filter by VPC:	Name	Subpot ID	Stata - N	IPC	- IPv4.0		Available IPv4 -		Availability Zone -	Availabilit	Zone ID	- Poute
Q Select a VPC	Rame		State • •		- 1-440		Available in va	IF VO CIDI	K Availability 2016	Availabilit	y 20110 1D	Route
•	Private sub	subnet-00923e351cabe8e88	available v	/pc-0ad78bd2865e1	288b 10.0.5	0.0/24	251		us-east-1a	use1-az1		rtb-08
VIRTUAL PRIVATE CLOUD	Public subhet	subnet-0d000072042730090	avaliable v	/pc-uau/obuzoobei	2000 10.0.2	0.0/24	250	-	us-easi-1a	use 1-az 1		HD-OIC
Your VPCs												
Subnets	4											Þ
Route Tables	Subnet: subnet-00923e3	351cabe8e88									1	988
Internet Gateways New	Description	Flow Logs Boute Table	Network AC	Tage	Sharing							
Egress Only Internet Gateways <mark>New</mark>	Edit route table ass	ociation	HOGWOIK / NO	iago	onaning							
DHCP Options Sets New	Route Table: rtb-0859	0f35522dd39b0										
Elastic IPs New		К <	1 to 2 of 2 🔿	>								
Managed Prefix Lists New	Destination	Target										
Endpoints	10.0.0/16	local										
Endpoint Services	0.0.0/0	nat-029f44255262399	26									
NAT Gateways												
Peering Connections												
•												
SECURITY												
Network ACLs												
Security Groups New							_					

Step 18: On the Network ACL, we can check the security layer that controls the traffic flowing in and out of the subnet.

🗊 Subnets VPC Management Con	× +									-	٥
\leftrightarrow \rightarrow C \triangleq console.aws	amazon.com/vpc/h	nome?region=us-	east-1#subnets:so	rt=SubnetId					0, ☆	ے 🗠	
aws Services -	Resource Grou	ups v 1k						@ 3057-0396-7 🔻	N. Virginia 👻	Support	-
New VPC Experience Tell us what you think	Create subnet	Actions V								Ð	¢ 6
VPC Dashboard New	Q. Filter by tags a	nd attributes or searc	h by keyword						< < 1 to	2 of 2	> >
Filter by VPC:	Name	 Subnet ID 		State VPC	- IPv4	CIDR - Available IPv4 -	IPv6 CIDR	Availability Zone -	Availability Z	Zone ID -	Rout
Q Select a VPC	Privata cub	subset 00022	251cabo9c99	ovailable une 0ad70bd200l	5a1200b 10.0	50.0/24 251	in to oldit	us cost 1a	usof art	ione ib	rtb 00
•	Public subne	at subnet-0ddd6	37264273dd90	available vpc-0ad78bd286	5e1288b 10.0	25 0/24 250	-	us-east-1a	use1-az1		rtb-06
VIRTUAL PRIVATE		50 500101-00000	712012100000	aranabio ape-odar obazooi	10.0	20.0124 200		45-0451-14	0301-021		100-01
Your VPCs											
Subnets	<										Þ
Route Tables	Description	Flow Logs	Route Table	Network ACL Tag:	s Shar	ng					-
Internet Gateways New		01									
Egress Only Internet Gateways New	Edit network A	Network ACL: a	cl-096e637941cdad9	36							
DHCP Options Sets New	Inbound rules										.
Elastic IPs New								K	< 1 to 2 of 2	> $>$	11
Managed Prefix	Rule #	Туре	Protocol	Port Range / ICMP Type	Source	Allow / Deny					
Endpoints	100	ALL Traffic	ALL	ALL	0.0.0/0	ALLOW					11
Endpoint Services		ALL Traffic	ALL	ALL	0.0.0/0	DENY					
NAT Gateways											. 1
Peering Connections	Outbound rules										
•								K	< 1 to 2 of 2	> >	11
SECURITY	Dule #	Time	Brotocol	Port Paper / ICMP Tore	Destination	Allow / Domy					
Network ACLs	Rule #	type	Protocol	Port Range / ICMP Type	Destination	Allow / Deny					4.1
Security Groups New	100	ALL Traffic	ALL	ALL	0.0.0.0/0	ALLOW					- 1
¥		ALL Traffic	ALL	ALL	0.0.0/0	DENY					

• On the Tags tab, we can check the tag name that we assign to the subnet.

Subnets VPC Management Con	× +		- a ×
$\leftarrow \rightarrow C$ $\hat{\bullet}$ console.aws	amazon.com/vpc/home?region=us-east-1#subnets:sort=SubnetId		Q 🖈 🐵 🗯 🌒 :
aws Services -	Resource Groups 👻 💃	۵	Sedf37f3b5f6b @ 3057-0396-7 🔻 N. Virginia 🔻 Support 👻
New VPC Experience Tell us what you think	Create subnet Actions *		단 후 @
VPC Dashboard New	Q. Filter by tags and attributes or search by keyword		< < 1 to 2 of 2 ⇒ >
Filter by VPC:	Name - Subnet ID - State - VPC -	IPv4 CIDR - Available IPv4 - IPv6 CID	R Availability Zone - Availability Zone ID - Route
Q Select a VPC	Private sub subnet-00923e351cabe8e88 available vpc-0ad78bd2865e1288b	10.0.50.0/24 251 -	us-east-1a use1-az1 rtb-08
•	Public subnet subnet-0ddd687264273dd90 available vpc-0ad78bd2865e1288b	10.0.25.0/24 250 -	us-east-1a use1-az1 rtb-0fc
CLOUD			
Your VPCs			
Subnets	<		•
Route Tables	Subnet: subnet-00923e351cabe8e88		
Internet Gateways New	Description Elaw Loos Doute Table Natural ACL	Sharing	
Egress Only Internet Gateways New	Description Providues Route Idure Intervolk PGL Iags	anaing	
DHCP Options Sets New	Add/Edit Tags		
Elastic IPs New	Key Value	ł	
Managed Prefix Lists _{New}	Name Privat	e subnet	Hide Column
Endpoints			
Endpoint Services			
NAT Gateways			
Peering Connections			
*			
SECURITY			
Network ACLs			
Security Groups New			

Step 19: Next , click on the **NAT Gateways** on the left navigation pane and check the status is available.It allows resources in the private subnet to connect to the internet.

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e -> e i console.av	s.amazon.com/vpc/nomerr	egion=us-east-1#INatGatewa	ys:state=avaliable;sort=natia	atewayid				4 2 4	* * *
aws Services	 Resource Groups 	*					f6b @ 3057-0396-7 🝷	N. Virginia 👻 S	upport 👻
New VPC Experience Tell us what you think	Create NAT Gateway	Actions 🛩							0 ¢
VPC Dashboard New	Q Status available	Add filter						< < 1 to 1	of 1 > >
Filter by VPC:	Name - NA	AT Gateway ID 🔺 Status	- Status Message	 Elastic IP Address - 	Private IP Address-	Network Interface -	VPC	Subnet	Created
Q Select a VPC		020f44265262 musilable		24 222 04 04	10.0.25.122	oni 0o20706b0o0	upp 0ad79bd2986	subset 0ddd6973	July 11. 2
,		1-0201-1200202 UV0/00/0		04.202.04.01	10.0.20,100	611-00007000000	vpc-0aur00u2000	300101-00000012	outy 11, 2
VIRTUAL PRIVATE									
Your VPCs									
Subnets									
Route Tables									
Internet Gateways New									
Egress Only Internet Gateways New									
DHCP Options Sets New									
Elastic IPs New									
Managed Prefix Lists New									
Endpoints	()								
Endpoint Services	NAT Gateway: nat-029f442	25526239926							
NAT Gateways	Detaile	onitoring Tags							
Peering Connections	Details	and age							
•	NAT Gate	eway ID nat-029/442552623992	6		Stat	is available			
SECURITY	Status M	essage -			Elastic IP Addre	ss 34.232.84.91			
Network ACLs	Private IP A	ddress 10.0.25.133			Network Interface	D eni-0e30796b0e96	i9e631		
Security Groups New		VPC vpc-0ad78bd2865e128	Bb Lab VPC		Subr	et subnet-0ddd68726	4273dd90 Public subnet		
Security Groups new	C	Created July 11, 2020 at 2:42:1	PM UTC+5:30		Delet	d -			

Step 20: Finally, we verify the security group , by clicking on the Security Groups in the left navigation pane. We can check the Security group ID and the associated VPC ID, it matches with the VPC created.

🔋 VPC Management Console	× +						-	σ
← → C 🌲 console.aws.a	mazon.com/vpc/home?region=us-east-1#S	ecurityGroups:				Q 🕁		* 6
aws services v	Resource Groups 🗸 🔒				f6b @ 3057-0396-7 🔻	N. Virginia	• Sup	pport 🗸
New VPC Experience Tell us what you think	VPC > Security Groups							
Subnets Route Tables	Security Groups (1/1) Info			C	Actions V Create	security gr	oup	
Egress Only Internet Gateways New	☑ Name ⊽ Se	curity group ID 🛛 🗢 Security group name 🗢	VPC ID 🗢	Description	♥ Owner	⊽	Inbo	Sui
DHCP Options Sets New	🗹 - sg	-04ec4af66123d9bfb default	vpc-0ad78bd2865e1288b	default VPC security	gr 30570396717	3	1 Per	m
Elastic IPs New	4							•
Managed Prefix Lists New								
Endpoints								
Endpoint Services						G		
NAT Gateways	sg-04ec4af66123d9bfb - default							1
Peering Connections	Details Inbound rules Out	bound rules Tags						
Network ACI s								
Security Groups New	Details							
•	Security group name	Security group ID	Description	VP	CID			
VIRTUAL PRIVATE NETWORK (VPN)	🗗 default	☐ sg-04ec4af66123d9bfb	default VPC security group	Ø	vpc-0ad78bd2865e1288	b		
Customer Gateways								
Virtual Private Gateways	Owner 305703967178	Inbound rules count 1 Permission entry	Outbound rules count 1 Permission entry					
Site-to-Site VPN Connections							_	
			# 0000 America late	mat Dan Jam Dahusta I tal.			Dellas	-

• Next we check the Inbound rules and Outbound rules in the below tabs to check the incoming and outgoing traffic to the provisioned resources.

👔 VPC Management Console	× +								_	- 0
\leftrightarrow \rightarrow C (a) console.aws.a	mazon.com/vpc/home?reg	gion=us-east-1#Securi	tyGroups:					Q 🕁		*
aws Services v	Resource Groups 🗸	*				↓ Secf37f3b5f6b	@ 3057-0396-7 👻	N. Virginia	a 🕶 🛛	Support
New VPC Experience Tell us what you think	VPC > Security Grou	ps								
Subnets A	Security Group	s (1/1) Info				C Act	ions 🔻 Crea	te security <u>c</u>	proup	
Internet Gateways New	Q Filter security g	nroups						< 1 ;		9
Egress Only Internet Gateways <mark>New</mark>	✓ Name		ty group ID 🗢 👳	Security group name v VPC	ID V	Description	♥ Owner	∇	In	nbour
DHCP Options Sets New	-	sg-04e	c4af66123d9bfb d	default vpc-	0ad78bd2865e1288b	default VPC security gr.	3057039671	78	1	Pern
Elastic IPs New	4									•
Managed Prefix Lists New										
Endpoints										
Endpoint Services				—				1	-	
NAT Gateways	sg-04ec4af66123d9b	fb - default								
Peering Connections	Details Inbou	nd rules Outbour	nd rules Tags							
SECURITY										
Network ACLs	Inbound rules						Edit	inbound rul	es	
Security Groups New										
VIRTUAL PRIVATE	Туре	Protocol	Port range	Source		Descri	ption - optional			
NETWORK (VPN) Customer Gateways	All traffic	All	All	sg-04ec4af66123d9t	ofb (default)	-				
Virtual Private Gateways										
Site-to-Site VPN Connections										
Feedback Q English (US)					© 2008 - 2020, Amazon	Internet Services Private Ltd. or it	s affiliates. All rights rese	rved. Privac	v Policy	Terms

• By default, the security group, permits all traffic to the resources, which can be edited as required from the edit option.

👔 VPC Management Console 🛛 🗙	+						- 0	1
\leftrightarrow \rightarrow C $($ console.aws.amaz	on.com/vpc/home?region=us-e	ast-1#SecurityGroups:				Q ☆	* 🕲	6
aws services + R	esource Groups 👻 🔸				Д Secf37f3b5f6b @ 3057-03	396-7 👻 N. Virginia 🔻	Support	*
New VPC Experience Tell us what you think	VPC > Security Groups							
Subnets Route Tables	Security Groups (1/1)	nfo			C Actions 🔻	Create security gro	IP .	
Internet Gateways New	Q Filter security groups					< 1 >	0	
Egress Only Internet Gateways <mark>New</mark>	Name 🗸	Security group ID	Security group name 🗢	VPC ID 🛛	Description ∇ Ow	vner 🗢	Inbou	
DHCP Options Sets New	2 -	sg-04ec4af66123d9bfb	default	vpc-0ad78bd2865e1288b	default VPC security gr 305	5703967178	1 Pern	
Elastic IPs New	•						•	
Managed Prefix Lists _{New}								
Endpoints								_
Endpoint Services			—			=		
NAT Gateways	sg-04ec4af66123d9bfb - defau	ilt						Î
veering Connections	Details Inbound rules	Outbound rules Tags						l
SECURITY								l
Network ACLs	Outbound rules					Edit outbound rules		l
Security Groups New	Outbound futes					East outboard rates		l
▼ VIRTUAL PRIVATE	Туре	Protocol	Port range	Destination	Description - optional			l
NETWORK (VPN) Customer Gateways	All traffic	All	All	0.0.0.0/0	-			l
Virtual Private Gateways								
Site-to-Site VPN Connections								

Evaluation Criteria:

Total Marks: - 100 Marks

Distribution:

- Create an Amazon VPC using the VPC wizard, and it should be displayed on the dashboard 20 Marks
- Associate an Elastic IP address with it 20 Marks

• Explore various resources of VPC such as Internet Gateway, NAT Gateway, Subnets, Security Groups – 10 Marks

• Launch a NAT Gateway so that internet access is provided to private resources – 10 Marks

• Introduce a Public subnet for resources facing the internet such as a web server and a Private subnet for resources at the back end such as database server – 10 Marks

- Define security groups with appropriate inbound rules 10 Marks
- Ensure proper routes and corresponding Route tables entries specifying the traffic moving out of the subnet 10 Marks
- Make use of Network ACLs for controlling inbound and outbound traffic in the VPC 10 Marks