

# **Configuration Manual**

MSc Industrial Internship Msc. Cybersecurity

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#### National College of Ireland



#### **MSc Project Submission Sheet**

#### School of Computing

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Programme: MSc CYBERSECURITY

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ProjectTHE HYPERAUTOMATION OF SOFTWARE SECURITY PATCHTitle:MANAGEMENT IN ENTERPRISE NETWORKS: A CASE STUDY AT THE<br/>CENTRAL BANK OF IRELAND.

# Word Page Count 28

I hereby certify that the information contained in this (my submission) is information pertaining to research I conducted for this project. All information other than my own contribution will be fully referenced and listed in the relevant bibliography section at the rear of the project.

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**Date:** 5<sup>TH</sup> JANUARY, 2023

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# **Configuration Manual**

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**Use Case**: As an administrator of an IT tenant consisting of a large number of EC2 instances that must be patched on a continuous basis. Rather than waste labour hours manually patching each instance, organizations should automate and hyperautomate already automated processes with AWS Systems Manager.

#### 1.1 Systems Manager

Systems Manager (SSM) provides visibility and control over any AWS infrastructure. SSM allows you to manage inventories by grouping resources together by software or environment, as well as integrate with CloudWatch to monitor analytics and operational data. SSM helps automate operational operations such as executing pre-defined commands on one or more EC2 instances, altering the instance state, attaching/detaching EBS volumes, making snapshots, and deploying patches and upgrades to increase efficiency. In this project the focus is on how to automatically patch several EC2 instances.

#### 1.2 Create VPC

A basic VPC in a single AZ with a public and private subnet should be established for this project. For protection, install servers in a private subnet and an AWS bastion server in the public network. This design will allow the administrator to interface with the servers while without exposing them to the outside world.

a. Go to **VPC** Services > VPC > Your VPCs.

New VPC Experience													
Tell us what you think		You	r VPCs [2] tele								C Actions *	Create VPC	
VPC Dashboard New Filter by VPC:		Q	Alber VPCr									<1 >	0
Q, Select a VPC	4		Name	Ŧ	VPC ID	v	State	v	IPv4 CDR	IPv6 CIDR (Network border group)	IPv6 pool		DHCF
VIRTUAL PRIVATE					vpc-c8656752		⊗ Available		172.31.0.0/16				dagt-
Your VPCs new					vpc-02ae1735999adc1e9		⊖ Available		10.0.0.0/16	-			dagt-
Subnets New		-											•

- b. Give your VPC a name.
- c. Select a CIDR block. Recommended to chose 10.0.0.0/16, which gives far more IP addresses than needed.
- d. The remaining defaults are acceptable. Select Create VPC.

#### **1.3 Create Subnets**

- a. Select Subnets from the browser's left sidebar.
- b. Select Create subnet.
- c. Select the VPC you just established as the VPC ID. This is why, when you construct your VPC, you should give it a name tag so that it can be easily identified.
- d. PrivateA is the name of the subnet.
- e. Zone of availability: us-east-1a IPv4 CIDR block: 10.0.10.0/24
- f. Select Create Subnet.

eate subnets in this VPC.		
vpc-00291a1aa2af5a63c (AWS VPC)		<ul> <li>1</li> </ul>
ssociated VPC CIDRs		
v4 CIDRs		
0.0.0/16		
ubnet settings		
secify the CIDR blocks and Availability Zone for the	subnet.	
ubnet 1 of 1		
Subnet name Create a tag with a key of 'Name' and a value that	vou specify	
PrivateA		
The name can be up to 256 characters long.		
Availability Zone Info Choose the zone in which your subnet will reside,	or let Amazon choose one for you.	
Availability Zone Info Choose the zone in which your subnet will reside, US East (N. Virginia) / us-east-1a	or let Amazon choose one for you.	•
Availability Zone Info Choose the zone in which your subnet will reside, US East (N. Virginia) / us-east-1a IPv4 CIDR block Info	or let Amazon choose one for you.	•
Availability Zone Info Choose the zone in which your subnet will reside, US East (N. Virginia) / us-east-1a IPv4 CIDR block Info Q 10.0.10.0/24	or let Amazon choose one for you.	×
Availability Zone Info Choose the zone in which your subnet will reside, US East (N. Virginia) / us-east-1a IPv4 CIDR block Info Q 10.0.10.0/24 Tags - optional	or let Amazon choose one for you.	×
Availability Zone Info Choose the zone in which your subnet will reside, US East (N. Virginia) / us-east-1a IPv4 CIDR block Info Q 10.0.10.0/24 Tags - optional Key	or let Amazon choose one for you.	×

Create a public subnet now. Click the Create Subnet button.

g. Fill in the blanks with the following information:

VPC ID: Choose your VPC Name of the subnet: PublicA Zone of Availability: us-east-1a 10.0.1.0/24 IPv4 CIDR block h. Your VPC should now have two subnets linked with it.

Subnets (8) Info										C Action	s 🔻 Create subnet	
Q, Filter subnets											< 1 > @	
Name	<ul> <li>Subnet ID</li> </ul>	v	State	v	VPC	Ψ.	IPv4 CIDR	v	IPv6 CIDR	v A	vailable IPv4 addresses	r
PublicA	subnet-06fa6c4d2fe5ad	d6d	⊘ Available		vpc-00291a1	aa2af5a63c   AW	10.0.1.0/24		-	2	51	
PrivateA	subnet-0513a309c938a	286f	⊘ Available		vpc-00291a1	aa2af5a63c   AW	10.0.10.0/24		-	2	51	

#### 1.4 Create Internet Gateway

To make our public subnet available to the internet, an internet gateway would be built.

- a. Select Internet Gateways from the Virtual Private Cloud menu.
- b. Select Create Internet Gateway from the drop-down menu.



- c. AWS IGW is the Name Tag chosen
- d. Click the Create Internet gateway button.

PC > Internet gateways > Create internet gateway				
Create internet gateway 🗤				
n internet gateway is a virtual router that connects a VPC to the internet. To create a new internet gateway specify the name or the gateway below.				
Internet gateway settings	Internet gateway settings			
Name tag Creates a tag with a key of 'Name' and a value that y	you specify.			
AWS IGW				
<b>Tags - optional</b> A tag is a label that you assign to an AWS resource. If your resources or track your AWS costs.	Each tag consists of a key and an optional val	lue. You can use tags to search and filter		
Кеу	Value - optional			
Q Name X	Q AWS IGW	X Remove		
Add new tag You can add 49 more tags.				
	Can	cel Create internet gateway		

e. Click Actions button and select Attach to VPC.

#### f. Select your VPC and click Attach internet gateway.

							C	,	e/						
ten og sendt pao trenk		Inter	net gateways	(1/2) 🖬	a la							C	Actions A Create	internet gate	way
VPC Dashboard New		9,1	Filter internet gates	10/5									View details	< 1 >	
Filler by VPC:	4												Attach to VPC		
Q, Belect a VPC		•	Name	$\nabla$	Internet gateway ID	v	State	$\nabla$	VPC ID	$\nabla$	Owner		Detach from VPC		Ψ.
VIRTUAL PRIVATE			AWS IGW		igw-0631720#7c25b488b		Detached		-		115441552148		Manage tags		
Your VPCs new			-		igw-22314259		O Attached		vpc-c86b67b2		113441532148		Delete internet gateway		
Submets New															
Route Tables															
Internet Gateways new															

g. Attach your VPC after selecting it.

### 1.5 Create NAT gateway

The NAT gateway will permit the private servers access to connect to the internet in order to get updates and fixes.

- a. Navigate to Virtual Private Cloud > NAT Gateways.
- b. Select Create NAT gateway from the drop-down menu.
- c. Give your NAT gateway a name.
- d. Choose your public subnet (PublicA).
- e. Select the Allocate Elastic IP option.
- f. Select Create NAT gateway from the drop-down menu.

c / INAT gateways /	Create NAT gatewa	у		
reate NAT gat				
ate a NAT gateway and as	sign it an Elastic IP	address.		
NAT gateway setting	gs			
Name - optional Create a tag with a key of 'Nam	ne' and a value that yo	u specify.		
AWS NAT				
The name can be up to 256 cha	aracters long.			
Subnet Select a public subnet in which	to create the NAT gat	teway.		
subnet-06fa6c4d2fe5ad	d6d (PublicA)		•	
Assign an Elastic IP address to eipalloc-01aec8af077b6	the NAT gateway. 21ba		•	Allocate Elastic IP
Tags				
Tags A tag is a label that you assign your resources or track your AV	to an AWS resource. E VS costs.	ach tag consists of a key and a	an optional value. You can i	use tags to search and filter
Tags A tag is a label that you assign your resources or track your AV Key	to an AWS resource. E VS costs.	ach tag consists of a key and a very a very and a very a very and a very	an optional value. You can t	use tags to search and filter
Tags A tag is a label that you assign your resources or track your AV Key Q. Name	to an AWS resource. E VS costs.	iach tag consists of a key and i Value - <i>optional</i> Q AWS NAT	an optional value. You can a	use tags to search and filter Remove
Tags A tag is a label that you assign your resources or track your AV Key Q Name Add new tag You can add 49 more tags.	to an AWS resource. E VS costs.	ach tag consists of a key and a Value - <i>optional</i> Q AWS NAT	an optional value. You can	use tags to search and filter

#### **1.6 Configure Public Route Table**

Currently, there is only one route table linked with the VPC, which facilitates connectivity across our subnets. Making the default route table public is not a smart idea since all new subnets will be automatically associated with the default, necessitating the creation of a new route table.

- a. Navigate to VIRTUAL PRIVATE CLOUD and choose Route Tables.
- b. Select Create route table from the drop-down menu.
- c. Give your route table a name and choose a VPC. Preferably to make the name obvious, so to generally attach it to the VPC and specify whether it's public or private.
- d. Select Create.

Route Tables > Create route table			
Create route table			
A route table specifies how packets are for	warded between the subnets within your VPC, the interne	et, and your VPN connection.	
Name tag	AWSPublicRT	θ	
VPC*	vpc-00291a1aa2at5a63d 👻	C 0	
	Key (128 characters moximum)	Value (256 characters maximum)	
		This resource currently has no tags	
	Add Tag 50 remaining (Up to 50 tags maximum)		
* Required		Cancel Crea	•

- e. Select your newly created public route table. Options should show at the bottom of the browser once selected. You may enlarge it by dragging it.
- f. Navigate to the Subnet Associations tab.
- g. Select Edit subnet associations from the menu.
- h. Choose your public subnet and then click Save.
- i. Navigate to the Routes tab.
- j. Select Edit Routes from the menu.
- k. Select the Add route option.
- 1. 0.0.0.0/0 as the destination

- m. Select Internet Gateway as the Target, then your Internet Gateway.
- n. Select Save Routes.

NB: Remember to change the auto ip settings now that your public subnet is actually public.

- a. Select Subnets from the VIRTUAL PRIVATE CLOUD menu.
- b. Determine your public subnet.
- c. Select Modify auto-assign IP settings from the Actions menu.
- d. Select Enable auto-assignment of public IPv4 addresses and save.

#### **1.7** Configure a Private Route Table

- a. Choose the primary route table.
- b. Go to the Routes tab and update the routes.
- c. Replace Destination: 0.0.0.0/0 with the IP address of your NAT Gateway.

#### 1.8 Create Bastion Security Group

- a. Under SECURITY, choose Security Groups.
- b. Select Create security group from the drop-down menu.
- c. Give your security group a name. I picked AWSBastion so that I know which VPC it is affiliated with and what it is used for on my bastion server.
- d. Choose your VPC.
- e. Click Add rule to add an inbound rule.
- f. SSH, My IP as the source. This restricts SSH access to your machine.
- g. Select Create security group from the drop-down menu.

Basic details					
Security group name: Infe AWSBastion Hare cannot be effect of the rotation. Description: Infe AWS Bastion Host VPC: Infe Vpc: Unle Vpc: OUSPIa1as2at5s63c (AWS VPC)		¥			
Inbound rules tota Type tota SSH V	Protocal Info	Portrange brie	Source Info Custom A Q.	Description - optional rate	Delate
Add rule			Custom Anywhere My IP		
Outbound rules lefs	Reduct tota	Perturner Info	Pertination into	Provide address of	
All traffic T	All	ALL	Custom <b>v</b> Q, 0.0.0.0/0 X	umscription - Optionial - Info	Delate
Add rule					

#### 1.9 Create DB Security Group

- 1. Select Create security group from the drop-down menu.
- 2. Name of the security group: AWSDBSG
  - VPC: AWS VPC
  - Type: SSH, Source: Custom, and then choose the Bastion Security Group
  - Type: SSH, Source: Custom, and then choose the Bastion Security Group

instance to control int	ound and outbound traffic. To create	a new security group, complete	the fields below.		
	×				
Protecol July	Port range July	Searce Into		Description - optional late	
TCP	22	Custom V	Q, 99-066011124a587x507 X		Delete
TEP	3380	Custom V	Q, 99.0b6011124a5f7x507 X		Delete
	Instance to control ind	Instance to control inbound and outfloand traffic. To create Potecial info TO <sup>1</sup> 22 TO <sup>2</sup> 3389	Instance to control inbound and outboard traffic. To create a new security group, complete Protecol infe Pertrange info TO <sup>1</sup> 22 Contern V	Instance to control inbound and outbound traffic. To create a new security group, complete the fields below.	Instance to control inboard and outboard traffic. To treate a new security group, complete the fields below.

#### 1.10 Create Systems Manager Role

For the EC2 instances to be monitored by Systems Manager, there's the need to define a role.

- a. Select Identity and Access Management. IAM Services
- b. Select Roles from the Access Management menu.
- c. Select Create role.

Identity and Access	_	Additional resources:
Management (IAM)	4	IAM Roles FAQ
		IAM Roles Documentation
Dashboard		Tutorial: Setting Up Cross Account Access
→ Access management		Common Scenarios for Roles
Groups		
Users		Create role Delete role
Roles		
Policies		Q Search
Identity providers		Peterson (
Account settings		Role name 👻
		AdminAccess
-		

d. Select AWS service, then EC2, and then click Next.

#### Create role

Select type of trusted entity								
AWS service EC2, Lambda and othe	ers Another A Belonging to	WS account a you or 3rd party	Web identity Cognito or any OpenID provider	SAML 2.0 federation Your corporate directory				
Allows AWS services to perfo	rm actions on your behalf. Lea	am more						
Choose a use case	e							
Common use cases								
EC2 Allows EC2 instances to call /	AWS services on your behalf.							
Lambda Allows Lambda functions to c	all AWS services on your beh	alf.						
Or select a service to view i	its use cases							
API Gateway	CloudWatch Events	EKS	IoT Things Graph	Redshift				
AWS Backup	CodeBuild	EMR	KMS	Rekognition				

1 2 3 4

#### e. Look for and choose AmazonSSMManagedInstanceCore. Next, click.

0		4 - 4		
C	rea	te	ro	le

Choose or	e or more policies to attach to your new role.	C
Filter po	licies v Q ssm	Showing 17 results
	Policy name 👻	Used as
	i AmazonEC2RoleforSSM	None
$\Box \rightarrow$	AmazonSSMAutomationApproverAccess	None
$\Box \rightarrow$	AmazonSSMAutomationRole	None
	AmazonSSMDirectoryServiceAccess	Permissions policy (1)
	AmazonSSMFullAccess	None
$\Box \rightarrow$	AmazonSSMMaintenanceWindowRole	None
•	AmazonSSMManagedInstanceCore	Permissions policy (4)
Amaz	zonSSMManagedInstanceCore	
Set p	permissions boundary	

1 2 3 4

- f. Press the Next button.
- g. Give the role a name and click Create role.

#### 1.11 Creating Bastion Host Instance

First, we'll set up our bastion server in our public subnet. A Bastion Host allows us to interact with the private instances that are not visible to the public. Then set up three instances in our own subnet. One instance of Ubuntu, one instance of Red Hat, and one instance of Windows. One may always add more if desired, but having a range of instances is essential for this project.

- a. Go to EC2. Services > EC2
- b. Select Launch Instance from the drop-down menu.

2 Dashboard new	console and the new console, use the N	lew EC2 Experience to	nd improve performance, we i oggle.	I release new screens periodic	cally, we encourage you to try them a	nd let us know wh
ents						
qs						
nits	Resources					C
tances	You are using the following Amazon	EC2 resources in the	US East (N. Virginia) Region:			
ances New	Instances (running)	0	Dedicated Hosts	0	Elastic IPs	
nce Types					Loop to the second	
ch Templates	Instances	0	Key pairs	9	Load balancers	
Requests	Placement groups	0	Security groups	8	Snapshots	
ngs Plans						
rved Instances New	votumes	0				
and the sta						
cated Hosts						
eduled Instances	Easily size, configure, and de	play Microsoft SQL S	erver Always On availability gr	oups on AWS using the AWS I	Launch Wizard for SQL Server. Learn r	more >
eduled Instances acity Reservations	Easily size, configure, and de	ploy Microsoft SQL S	erver Always On availability gr	oups on AWS using the AWS I	Launch Wizard for SQL Server. Learn r	more >
eduled Instances acity Reservations	<ul> <li>Easily size, configure, and de</li> </ul>	play Microsoft SQL S	erver Always On availability gr	oups on AWS using the AWS I	Launch Wizard for SQL Server. Learn r	more >
katend mosts eduled instances acity Reservations ges	Easily size, configure, and de     Launch instance	ploy Microsoft SQL S	erver Always On availability gr	oups on AWS using the AWS I	Launch Wizard for SQL Server. Learn r	nore )
duled instances city Reservations ges tic Block Store	Easily size, configure, and de     Launch instance	ploy Microsoft SQL S	erver Always On availability gr	Service health	Launch Wizard for SQL Server. Learn r	Ith Dashboard
duted mosts duted Instances city Reservations ges tic Block Store mes	Easily size, configure, and de     Launch instance     To get started, launch an Amazon El     cloud.	ploy Microsoft SQL S	erver Always On availability gr a virtual server in the	Service health	Launch Wizard for SQL Server. Learn r C Service Hea Status C This service is a	Ith Dashboard
careed mosts duiled instances acity Reservations ges tic Block Store mes pshots	Easily size, configure, and de     Launch instance     To get started, launch an Amazon El     cloud.     Launch instance *	ploy Microsoft SQL S	erver Always On availability gr	Service health Region US East (N. Virginia)	Launch Wizard for SQL Server. Learn r C Service Hea Status O This service is o	Ith Dashboard
careed mosts duiled instances acity Reservations ges tic Block Store mes pshots ycle Manager	Casily size, configure, and de Launch instance           To get started, launch an Amazon El cloud.           Launch instance           Note: Your instances will launch in the standard standar	ploy Microsoft SQL S C2 instance, which is he US East (N. Virgini	erver Always On availability gr a virtual server in the a) Region	Service health Region US East (N. Virginia) Zones	Launch Wizard for SQL Server. Learn r C Service Hea Status C This service is c	Ith Dashboard
duted mosts duted mosts city Reservations jes tic Block Store mes shots ycle Manager vork & Security	Casily size, configure, and de Launch instance To get started, launch an Amazon El cloud. Launch instance  Note: Your instances will launch in the stance of the standard stance of the standard stance of the standard stance of the standard s	ploy Microsoft SQL S C2 Instance, which is he US East (N. Virgini	erver Always On availability gr a virtual server in the a) Region	Service health Region US East (N. Virginia) Zones	Launch Wizard for SQL Server. Learn r C Service Hea Status O This service is o	Ith Dashboard
i city Reservations ges tity Reservations tit Block Store mes ishots ycle Manager vork & Security rity Groups Twe	Easily size, configure, and de     Launch instance     To get started, launch an Amazon El     cloud.     Launch instance      Note: Your instances will launch in the	ploy Microsoft SQL S C2 instance, which is he US East (N. Virgini	erver Always On availability gr a virtual server in the a) Region	Service health Region US East (N. Virginia) Zones Zone name	Launch Wizard for SQL Server. Learn r C Service Hea Status C This service is o Zone ID	Ith Dashboard
Accurated Hosts heduiled instances pacity Reservations lages tis astic Black Store lumes apshots ecycle Manager twork & Security curity Groups New Hit CiPs New	Easily size, configure, and de     Launch instance     To get started, launch an Amazon El     cloud.     Leunch instance     Note: Your instances will launch in th     Scheduled events	ploy Microsoft SQL S C2 Instance, which is he US East (N. Virgini	erver Always On availability gr a virtual server in the a) Region	Service health Region US East (N. Virginia) Zones Lone name US-east-1a	Launch Wizard for SQL Server. Learn r C Service Hea Status C This service is o Zone ID ure1-er2	more Ith Dashboard

- c. Choose Amazon Linux 2 AMI. Next, click.
- d. Choose t2.micro. Next, click.
- e. Select Configure Instance Details from the drop-down menu.

Network: Choose the VPC

Subnet: Choose the public subnet.

#### Check that Auto-assign Public IP is enabled.

1. Choose AMI	2. Chorse Instance Type	3.0	offgare Instance 4. Add Storage	5. Add Tags	6. Configure Security Group	20.0 7. Ranteur
Step 3: Co tonfigure the insta	nfigure Instan	ce D	etails You can isunch multiple instances	s from the same A	MIL request Spot instances to	ces to take advantage of the lower pricing, assign an access management rule to the instance, and more.
	Number of instances	۲	4	Launch into A	uto Scaling Group 🛞	
	Purchasing option	0	Request 8pot instances			
	Network	۰	vpc-00291a1aa2a5a63c   AWA	S VPC	4 C Create new Vi	ev/PC
	Subnet	•	subnet-06ta6c4t2fe5add6d   P 250 IP Addresses available	PublicA   us-east-1	ta 4 Create new si	ex subject
,	Auto-assign Public IP	۰	Enable		4	
	Placement group	۰	Add instance to placement g	poup		
0	Capacity Reservation	0	Open		4	
	Iomain join directory	۲	No directory		C Create new d	ww.directory
	IAM role	0	None		4 C Create new IA	ov VAA rde
	CPU options	۵	Specify CPU options			
	Shutdown behavior	0	Slop		4	
81op	- Hibersate behavior	۰	Enable hibernation as an ad	iditional stop beha	avior	
Enable te	mination protection	۲	Protect against accidental te	mination		
	Monitoring	۲	Enable CloudWatch detailed Additional charges apply.	moniforing		
	Tenancy	0	Shared - Run a shared hardwa Additional charges will apply for	se instance r dedicated tenan	4 ncy	
	Elastic Inference	۲	Add an Elastic Inference acc Additional charges apply.	celerator		
						Cancel Previous Review and Launch Next: Add intorage

#### f. Maintain default storage. Next, click.

#### g. Include a tag. Name is the key, and Bastion is the value. Select Next.

1. Choose AMI	2. Choose Instance Type	3. Configure Instance	4. Add Storage	5. Add Tags	6. Configure Security Group	7. Review				
Step 5: Ac A tag consists of A copy of a tag o Tags will be appl	dd Tags (a case-sensitive key-value can be applied to volumes, lied to all instances and vol	e pair. For example, you instances or both. lumes. Learn more abo	could define a ta ut tagging your A	g with key = Na mazon EC2 reso	me and value = Webserver. ources.					
Key (128 cl	haracters maximum)		Value (2	i6 characters ma	aximum)		nstances (j)	Volumes (i)	Network Interfaces ()	
Name			Bastion				2			۲
Add another t	ag (Up to 50 tags ma	odimum)								

#### h. Choose the Bastion Security Group.

	a contraction of the second states of		
Step 6: Configure Security Group A security group is a set of freeval rules that control the turtle: for you HTTP and HTTPS parts. You can create a new security group or an	ir instance. On this page, you can also naes to allow specific traffic et from an existing one below. Learn more about Amazon EC2 as	to react your instance. For example, if you want to set up a west server and allow internet staffic to curity groups.	reach your instance, and rules that above unvestinced access to the
Assign a security group: O Disate a new so	carety group		
🖲 Soloci av existe	g security group		
Annuality Group (D	Name	Description	Autors
ag-obio/m24ad/7c507	A//SBaston	AVIS Bastion Host	Cope to new
📄 sg-07e4c8ad5862e2b8f	WARDERD	Allows 89H & RDP from bestion	Copy to new
sg-063446ed7108e8931	ticitauti	default VPC second- group	Cope to name

i. Review and release. Make sure that either the key pair is downloaded or utilise an existing key pair to which access is granted to.

#### 1.12 Create Private Instances

- a. Click the Launch Instance button.
- b. Decide on Red Hat Enterprise Linux 8 (HVM), \$\$D Volume Type arri-096/ti3/c22c1c990a (84-bit X88) / arri-06680590665a2ddc11 (64-bit Arm)
  Red Hat Enterprise Linux 8 (HVM), \$\$D Volume Type arri-096/ti3/c22c1c990a (84-bit X88) / arri-06680590665a2ddc11 (64-bit Arm)
  Red Hat Enterprise Linux version 8 (HVM), ESS General Purpose (ISSD) Volume Type
  Red Berle type ets VMashadam type two EVAl Exated Tits
  - c. Choose t2.micro.

Step 2: Choose an Instance Type Analase Eco provide a web selection of instance types optimized to it offerent use cases, Instances are virtual servers that can run approach thry our opticizant. Learn new accurate largest and how they can meet your computing sects. ons of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources rs. They have varying comb

Filter by: Al	instance families	*	Current generation	٠	Show/Hide Columns
---------------	-------------------	---	--------------------	---	-------------------

	Family	~	Туре -	vCPUs () · · ·	Memory (GIB) -	· () (83) agendit exercise	EBS-Optimized Available ())	Network Performance () -	IPv6 Support ①
0	12		12 rano	4	0.5	EBS only		Low to Moderate	Yes
	u u		12.micro Promilian adaptida	1	1	EBS only	-	Low to Moderate	Yes
	12		\$2.5008E	1	2	EBS only		Low to Moderate	Yes
	12		t2.metium	2	4	EBS only		Low to Moderate	Yes
	12		12.8928	2	8	EBS only		Low to Moderate	Yes
	12		t2.xlarge	4	16	EBS only		Moderate	Yes
	2		t2.2xlarge	8	32	EBS only		Moderate	Yes
8	5		t3 rano	2	0.5	EBS only	Yes	Up to 5 Gigabit	Yes
	5		tî.micro	2	1	EBS only	Yes	Up to 5 Gigabit	Ves
	5		t3.smail	2	2	EBS only	Yes	Up to 5 Gigabit	Yes
	5		t3.medium	2	4	EBS only	Yes	Up to 5 Gigabit	Yes
	15		t3.bege	2	0	EBS only	Yes	Up to 5 Gigabit	Yes

d. Choose our database security group. Step 6: Configure Security Group Sacht group a det intervit to set of intervit to the for your instance. For instance, for instance, for example, if you want to set up a web server and allow intervit to the to reach your instance, and instant due weekered access to the HTTPP and HTTPP gords. You can create a new security group or select that an exercise gord a test instant due to the the for the security gords. Assign a security group: O Creste a new security group

	Betect an existing security group		
Security Group ID	Kame	Description	Actions
sg-0b6011124a977c607	AVV8Bastion	AW8 Bastion Host	Capy to new
sg-07e4c9ac8352c2b6f	AWSDBSG	Allows SSH & RDP from basilion	Capy to new
g-06344bcs710%8931	default	default VPC security group	Copy to new

Inbound raises for sq-07e4cbad5566abbdf (Selected security groups: sq-07e4cbad5562abbdf)						
Туре 🛈	Protocol ()	Port Range ①	Source ()	Description (j)		
55H	TCP	22	sg-db6011124a517c507 (AWS5eation)			
RDP	TCP	3369	sg-0b6011124a5/7c507 (AWSBastion)			

cel Previous Review and Launch

- e. Finally, click Review and Launch.
- f. Enter the same key combination as the Bastion Host.
- g. Repeat the instructions for the RHEL instance, but this time build an Ubuntu Server LTS instance.

~	SUSE Linux Enterprise Server 18 SP2 (HVW), SSD Volume Type - ami-06x650(cbcsH0007) (94-bit x00) / ami-06095(76d00013bb (94-bit Am)	Select
SUSE Linux	SUBE Linux Entroprise Servior 15 Service Pack 2 (HVM), EBS General Purpose (SSO) Witama Type. Amazon EC2.4MI Tools preinstalloct, Apache 2.2, MySQL 5.5, PHP 5.3, and Ruby 1.6.7 analable.	64-bit (185)
Providen eligible	Root device type else Vistualization type: Inver Existing date: Vise	O 64-bit (Am)
0	Ubumtu Server 20.04 LTS (HVM), SSD Volume Type - ami-042e820730655603 (64-bit x00) / ami-0b/56660697c852252 (64-bit Arm)	Select
	Ubuntu Server 20.04 LTS (HVM),EBS General Purpose (SSD) Volume Type. Support evaluable from Canonical (Http://www.ubuntu.com/clead/services).	G4-bit (x05)
Pice for eligible	Roct device types white Vehicalization types have a RNA Resident Year	O 64-bE (Am)
۲	Ubuntu Server 18.04 LTS (HVM), SSD Volume Type - ami 0131171008b11eb (64-bit x80) / ami 02ed825a38300edf (64-bit Arm)	Select
	Uburku Server 18.04 LTS (HVM) EBS General Purpose (SSD) Valume Type. Support analiable from Canonical (http://www.uburku.com/doad/serv/cas).	65-bit (x06)
The for eight	Roof device type else Velocitation type from EXILE-rodded Ves	O 65-bit (Arm)

h. Repeat the instructions for the RHEL instance, but this time construct a Microsoft
 Windows Server 2019 Base instance.

4	Microsoft Windows Server 2019 Base - ami-07017/6d0e3086d32	Select
Windows	Nicresoft Windows 2019 Datacenter edition. (English)	64.ht (x05)
Free Ser eligible	Root device type else . Webalization type Invin . ENA Enabled 'Yea	64 M (100)

#### 2 Systems Manager

#### 2.1 Managed Instances

- a. Go to AWS Systems Manager by navigating to Services > AWS Systems Manager.
- b. On the left, select Fleet Manager.

Services ¥	Q. Search for services, finitives, evaluations evaluation and data [201-5]	(5) Q <sup>2</sup> Very Segme # Instrumention *	n. Vegela 🔻 Sege
	Manager AWS Systems Manager Fleet Manager Streamline your remote server management Manager at robuster for Without a Unit and the action partial	Get started with Fleet Manager Renstale manage your Windows and Linux Instances running on XMC, or one premise.	
	How it works	Pricing (US) With System Verager Flast Manager Is a free capability Advanced-instances for pricing util applies. Learn mark (2	
	Art Strategy         Construction           Art Strategy         Construction	More resources (2) Quint integ User guildo Falga	

There are no instances listed in the Managed instances section. This is due to the fact that we have yet to assign the SSM role that was generated to the instances.

		C View density	Account management +
			- ( ) - (
Textianue name	SSM Agent ping status	Operating System	SSM Agovet version
	You do not have any managed instances in this	region	
We recommend Quick	Simult to configure the implant KE2 instances as Manage	d Instances in Fleet Manager console	
	Quick Setup		
	Instance name	Tentense name 35H Agent ping statue Vez da not have any managed battanees in the We recommend Quick Senap to configure to a proport IE2 instances on Manage	View densits     View densits

d. Go to EC2 and choose the RHEL instance.

e. Navigate to Actions > Security > Modify IAM role.

	Q, /	nces (1/4) toto						C Conne	ct Instance state 🔻	Actions A Launch in Connect View details	nstances 1	> @
		Name 🛛 🗸	Instance ID	Instance state $-\nabla$	Instance type 🛛 🗢	Status check	Alarm status	Availability Zone		Manage instance state	= 1F	
		Bastion	i-0aa74c418cb60d753	⊖ Running @@	t2.micro	2/2 checks passed	No alarms +	us-east-1a	Change security groups	Instance settings	F	
	2	RHEL Server	i-0d3352a37cff67e6a	⊘ Running @.Q.	t2.micro	2/2 checks passed	No alarms +	us-east-1a	Get Windows password	Networking	F	
		CentOS Server	i-0a768de203488f090	⊘ Running @Q	t2.micro	2/2 checks passed	No alarms +	us-east-1a	Modify IAM role	Security	F .	
		Windows Server	i-05cc448af7e9585af	Ø Running ଷ୍ପ୍	t2.micro	Ø 2/2 checks passed	No alarms +	us-east-1a	-	-	-	
1												

- f. Select the SSM role previously generated for the IAM role.
- g. Click the Save button.

M Att	ach an IAM role to your instance.
Ins	tance ID
ć	i-0d3352a37cff67e6a (RHEL Server)
Al Sel	1 role ect an IAM role to attach to your instance or create a new role if you haven't created any. The role you select replaces any roles that are roughly attached to your instance
	renty attached to your instance.
	MySystemsManagerRole  Create new IAM role
[	MySystemsManagerRole   Create new IAM role

h. Select Reboot instance from the context menu when you right-click the RHEL instance.

# Successfully attached MySystemsManagerRole to instance i-05cc448

Instances (1/4	4) Info		
<b>Q</b> Filter instan	ces		
Name	▼ Instance ID		Instance s
Bastion	i-0aa74c418cb60d75	3	🔗 Runnir
RHEL Ser	i OdZZ525Z7cff67o65	1	🔗 Runnir
CentOS S	Launch instances	þ	🔗 Runnir
Windows	Connect		🕢 Runnir
	Stop instance		
Instance: i-0d33	Start instance		
	Reboot instance		
Details	Hibernate instance	torage	Status
	Terminate instance		
<ul> <li>Instance st</li> </ul>	Instance settings		
Instance ID	Networking		
🗗 i-0d3352	Security ►		
	Image and templates		
Instance state	Monitor and troubleshoot		
		_	

i. Repeat the preceding procedures for the Ubuntu and Windows instances.

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When you return to the Managed instances, one will notice that some instances have populated since they now have the agent and permissions, but the RHEL instance does not. This is because the RHEL AMI does not include the agent. This instance will require manual installation of the agent.

Auts Systems Manager (2) Fleet Manager				
Managed instances Settings				
Managed instances			C View details Instance actions	▼ Account management ▼
Instance ID	Instance name	SSM Agent ping status	Operating System	SSM Agent version
O i-0a768cie2034689090	Ubuntu Server	@ Online	Uburtu	3.8.529.8
O i-05cc448af7c9585af	Windows Server	(Contine	Microsoft Windows Server 2019 Datacenter	3.0.529.0

Putty is being used to SSH into the bastion and then into the RHEL instance. The procedure for various operating systems may be found <u>here</u>.

j. To enable agent forwarding, one must first download Pageant. upon first launch of Pageant, it will appear at the bottom right corner of the screen. Click Pageant to open it and enter your.ppk key.



- k. Open Putty.
- 1. Enter the bastion's public IP address.

🕵 PuTTY Configuration		? >	<
Category:			
<ul> <li>Session</li> <li>Logging</li> <li>Terminal</li> <li>Keyboard</li> <li>Bell</li> <li>Features</li> <li>Window</li> <li>Appearance</li> <li>Behaviour</li> <li>Translation</li> <li>Selection</li> <li>Colours</li> <li>Connection</li> <li>Data</li> <li>Proxy</li> <li>Telnet</li> <li>Rlogin</li> <li>SSH</li> <li>Serial</li> </ul>	Basic options for your PuTTY sess         Specify the destination you want to connect         Host Name (or IP address)         52.2.200.251         Connection type:         Raw       Telnet         Raw       Telnet         Nave or delete a stored session         Saved Sessions         Default Settings         54.172.99.225         Close window on exit:         Always         Never         Only on clear	sion t to Port 22 O Serial Load Save Delete	
About Help	Open	Cancel	

- m. Expand Connection, then SSH, and finally Auth.
- n. Check the Allow agent forwarding box.
- o. Select your.ppk private key by clicking Browse. Then click the Open button.

### 🕵 PuTTY Configuration

×

?





- p. This will launch your terminal. Following that, run: ssh ec2-user@<private ip of RHEL instance>
- q. Run the following command: sudo dnf install -y <u>https://s3.us-east-1.amazonaws.com/amazon-ssm-us-east-1/latest/linux\_amd64/amazon-ssm-agent.rpm</u>
- r. Then runthis commands: sudo systemctl enable amazon-ssm-agent sudo systemctl start amazon-ssm-agent

s. Return to the Systems Manager Managed instances and you should now see the RHEL

instance.				
AWS Systems Manager 🗧 Fleet Manager				
Managed instances Settings				
Managed instances			View details	Instance actions V Account management V
۹,				< 1 > @
Instance ID	Instance name	SSM Agent ping status	Operating System	SSM Agent version
O i-0d53552x57cff67x6a	RHEL Server	@ Online	Red Hat Enterprise Linux	3.0.854.0
O i-0a768de2034881090	Ubuntu Server	(2) Online	Ubuntu	3.0.529.0
O i-05cc448af7e9585af	Windows Server	Online	Microsoft Windows Server 2019 Datacenter	3.0.529.0

#### 2.2 Configure Inventory

- As there is a need to configure inventory. Go to AWS Systems Manager > Managed Instances > Inventory Setup.
- b. Come up with a name. This project made use of Server-Inventory.
- c. Check the box next to Selecting all managed instances in this account.
- d. Program the Schedule to run every 30 minutes.

Explorer	AWS Systems Manager > Managed Instances > Setup Inventory
OpsCenter	Satur Inventory
CloudWatch Dashboard	Setup inventory
PHD	Create an inventory association to collect information about software and settings for a target set of managed instances.
Application Management	Provide inventory details
Application Manager New	
AppConfig	Name - Optional
Parameter Store	Server-Inventory
	Provide a name for your inventory.
<ul> <li>Change Management</li> </ul>	
Change Manager New	
Automation	Targets
Change Calendar	
Maintenance Windows	Specify targets by
	<ul> <li>Selecting all managed instances in the account</li> <li>Selection all set</li> </ul>
<ul> <li>Node Management</li> </ul>	Jaconymy any     Jaconymy any     Manually selection instances
Fleet Manager New	C Thereast accounting the second seco
Compliance	
Inventory	
Managed Instances	Schedule
Hybrid Activations	(Requires SSMAgent version 2.0.790.0 and above)
Session Manaper	
Bug Command	Collect inventory data every 30 Minute(s)
Chate Manager	
State Manager	
Match Manager	Parameters
Distributor	
▼ Shared Resources	Acolizations
Descent	(Optional) Collect data for installed applications.
Documents	

This will execute the AWS-GatherSoftwareInventory task on all managed instances every 30 minutes.

WS Systems Manager > State Manager > Association ID: ee361deb-f2e8-4471-acbb-174eec9b07d3 > Description Association ID: ee361deb-f2e8-4471-acbb-174eec9b07d3						
Description Resources Parameters Targets Versions Execution history						
Document name AWS-GatherSoftwareInventory	Association name Server-Inventory					
Document version \$DEFAULT	Association version					
Status O Pending	Association id ee361deb-f2e8-4471-acbb-174eec9b07d3					
Create date Wed, 17 Mar 2021 00:35:18 GMT	Schedule expression rate(30 minutes)					
Last update association date Wed, 17 Mar 2021 00:35:18 GMT	Last execution date					
Output S3 bucket -	Last successful execution date -					
MaxConcurrency -	Instance count by association status Pending:2					
MaxErrors -	Compliance Severity UNSPECIFIED					
	Apply only at cron interval False					

It will be running on your instances if you click the resources tab.

IWS Systems Manager 🗧 State Manager 🍃 Association ID: ee361deb-f2e6-4471-acbb-174eec9b07d3 🍃 Resources							
Association ID: ee361deb-f2e8-4	Apply association now Edit	Delete					
Description Resources Parameters Target	s Versions Execution history						
Resources			< -	1 >			
Resource id	Last applied on	Association status	Detailed status				
i-0x768de203488f090	Wed, 17 Mar 2021 00:35:40 GMT	⊘ Success	View Output				
i-05cc448af7e9585af	Wed, 17 Mar 2021 00:35:21 GMT	@ Pending	View Output				
i-0d3352a37cff67e6a	Wed, 17 Mar 2021 00:35:39 GMT	⊘ Success	View Output				

To get information about the managed inventory, go to AWS Systems Manager > Inventory > Dashboard tab.

AWS Systems Manager > Inventory						
Dashboard Detailed View Settings						
Inventory		Setup Inventory Resource Data Syncs				
Filter by resource groups, tags or inventory types Offline instances are not included (Terminated and Stopped - EC2, Terminated - on-premi	(es)					
٩						
Managed instances with inventory enabled includes instances in the current region and account.	Inventory coverage per type Predefined inventory Types only.	Top 10 Custom inventory types Customer-defined inventory types for the inventory collection.				
Enabled Disabled	AWS-AWSComponent	There is no data to display				
	A//S.Fie					
	AWS instanceDetailed information					
	AIN'S Instance/information					
	AV/S.Network					
	AVIS WindowsRegistry					
	AWS:WindowsRole					
	AWS WindowsUpdate					

#### 2.3 Patch Manager

- a. Select Patch Manager from the Node Management menu.
- b. Select Configure patching from the drop-down menu.



- c. Select instances manually by clicking the button.
- d. Navigate to the RHEL instance. We could choose all RHEL instances if we had more.
- e. In a new Maintenance Window, select Schedule.
- f. Choose Use rate schedule builder.
- g. Every thirty minutes.

Maintenance RHEL-30-minutes is the name of the window.

## h. Select Patching Configuration.

	Name	Instance ID	Platform Type	Operating System	State
	RHEL Server	i-0d3352a37cff67e6a	Linux	Red Hat Enterprise Linux	⊘n
	Ubuntu Server	i-0a768de203488f090	Linux	Ubuntu	⊘n
	Windows Server	i-05cc448af7e9585af	Windows	Microsoft Windows Server 2019 Datacenter	⊘ n.
Patch	ing schedule				
How do Sele Sch Skip	you want to specify a patchi ect an existing Maintenance V edule in a new Maintenance V o scheduling and patch instan	ng schedule? Vindow Vindow ices now			
How do Use Use Use	you want to specify a Mainte a CRON schedule builder rate schedule builder er a CRON/Rate expression	enance Window schedule?			
Mainter Every Mainter Maximur 1	ance Window run frequency 30 nance Window duration n number of hours to allow a Mair	Minute(s) ▼			
Mainter RHEL- Enter a n	nance Window name -30-minutes name between 3 and 128 characte	rs. Valid characters include: a-z, A-Z, 0-9	, and		
WS Systems Ma Window Description	nager > Maintenance Windows > Windo ID: mw-Od383d74924a Tasks History Targets	w ID: mw-0d383d74924aa7e6d > Description a7e6d Tags		Edit Delete	Actions 🔻
Window ID mw-0d383d7 Description	4924aa7e6d		Name RHEL-30-minutes State Ø Enabled		
Cron/Rate exp cron/00 21 ? * Next executio Wed, Mar 17, Window sche	pression * *) in time 2021; 9:00:00 PM UTC dule timezone		Duration 1 hour Cutoff point 0 hours before window close Window start date	25	
- Window schee - Allow unregis Yes	dule offset tered targets		- Window end date -		

j. Repeat steps 5-8 to build a schedule for both Ubuntu and Windows instances.

k. Go to AWS Systems Manager and then to Maintenance Windows. Take note of the time of the next planned execution. Check back in 30 minutes to ensure everything is functioning properly.

	end table of the second second			
Maintenance windows		View details	Edit Delete Actions V Create maintenance window	
Q				< 1 >
	Window ID	Name	State	Next execution time
	mw-011cd000d16b98bee	Windows-30-minutes	@ Enabled	Wed, Mar 17, 2021, 12:00:00 PM UTC
	mw-0be466c899f2ad994	Ubuntu-30-minutes	G Enabled	Wed, Mar 17, 2021, 12:00:00 PM UTC
	mw-0d383d74924aa7e6d	RHEL-30-minutes	Enabled	Wed, Mar 17, 2021, 9:00:00 PM UTC

1. After the patching has been completed, one can check that patching has begun on the

AWS Systems × Manager	MVS Systems Hanager 🖒 Halmesance Windows 🖒 Window ID: mv-011cd500dHi@36bee 🖒 History					
Quick Setup	di Setup Window ID: mw-011cd000d16b98bee Edit Delete Activ					
Operations Management Explorer OpsCenter	Descript	ory	gets Tags		Cance	execution View details
CloudWatch Deshboard Q.					< 1 2 3 ≯	
Application Management		Window execution ID	Status	Status details	Start time	End time
Application Manager Here		28866a4c-c841-48c6-af5a- 5b97f7d8a9af	In Progress		Wed, Mar 17, 2021, 12:25:17 PM UTC	
AppConfig Parameter Store		616719a7-b505-4b2b-b4b0- 4ec3a89fb966			Wed, Mar 17, 2021, 12:24:17 PM UTC	Wed, Mar 17, 2021, 12:24:57 PM UTC
Change Management		6a1c3dba-bda0-4aa5-509c- e3d78d250f89	⊘ Success		Wed, May 17, 2021, 12:23:17 PM UTC	Wed, Mar 17, 2021, 12:23:58 PM UTC
Change Manager New		a30679fb-101f-4560-a783- 584513a423dD	⊘ Success		Wed, Mar 17, 2021, 12:22:17 PM UTC	Wed, Mar 17, 2021, 12:22:57 PH UTC
Automation Change Calendar		153/dcd2-d150-401a-9d40- 85a6d695fcd1			Wed, May 17, 2021, 12:21:17 PM UTC	Wed, Mar 17, 2021, 12:22:02 PM UTC
Maintenance Windows		2f0d93ee-84f8-412b-a523- 06c6920b8c9f			Wed, Mar 17, 2021, 12:20:17 PM UTC	Wed, Mar 17, 2021, 12:20:51 PM UTC
* Node Management		1a737ec8-9tle3-46ce-a506- Da8382c2afb9	⊖ Success		Wed, Mar 17, 2021, 12:19:17 PM UTC	Wed, Mar 17, 2021, 12:19:57 PM UTC
Fleet Manager New Compliance		8ca9c46f-e307-4712-b72b- D4f137deeb3c			Wed, Har 17, 2021, 12:18:17 PM UTC	Wed, Mar 17, 2021, 12:18:55 PM UTC
Inventory		6730b118-dc36-4622-9127- BdDed1589bille	Skipped Overlapping	Window execution skipped, a Maintenance Window cannot run more than once concurrently	Wed, Mar 17, 2021, 12:17:17 PM UTC	Wed, Mar 17, 2021, 12:17:17 PM UTC
Hybrid Activations		a059a7b5-2810-4c21-b755- B3e6b89b55ec	⊖ Success		Wed, Mar 17, 2021, 12:16:17 PM UTC	Wed, Mar 17, 2021, 12:17:30 PM UTC

instances by clicking on the Window ID and then selecting the History tab.

Using AWS Systems Manager, this project successfully generated a hyperautomated patching task.

#### 3. References

Anon, (2022). AWS Systems Manager Patch Manager for orchestrating patching at scale - Mobilise Cloud. [online] Available at: https://www.mobilise.cloud/aws-systems-manager-patch-manager/ [Accessed 5 Jan. 2023].

AWS, A. (n.d.). Patch Manager :: AWS Management and Governance Tools Workshop. [online] mng.workshop.aws. Available at: <u>https://mng.workshop.aws/ssm/use-case-labs/inventory\_patch\_management/patch.html</u>. CloudThat Resources. (n.d.). A Step-by-Step Guide: Centralized Multi-Account OS Patching using AWS Systems Manager | CloudThat. [online] Available at: https://www.cloudthat.com/resources/blog/a-step-by-step-guide-centralized-multi-accountos-patching-using-aws-systems-manager [Accessed 5 Jan. 2023].

www.youtube.com. (n.d.). Schedule Patching Across Multiple Accounts Using AWS Systems Manager Automation. [online] Available at: https://www.youtube.com/watch?v=dcJDvoUfboA [Accessed 5 Jan. 2023].

## **Monthly Internship Activity Report**

The Internship Activity Report is a 1-page monthly summary of the activities performed by you and what you have learned during that month. The Internship Activity Report must be signed off by your Company and included in the configuration manual as part of the portfolio submission.

Student Name:	Oluwasefunmi Alabi	Student number:	x21130094
Company:	Central Bank of Ireland	Month Commencing:	September 2022

In my role as an Intern for 3 months in the Security department of the Central Bank of Ireland, I provided IT security support on planning, analysis and design of Information security systems and frameworks, for all operations in the organisation.

Responsibilities of the job function entailed:

- Software asset and patch management
- Reviewing and main taining CMDB to get visibility of IT estate
- Maintaining and reviewing security vulnerabilities and systems
- Reviewing mailbox security and conducting phishing simulations
- Analyzing, improving, implementing and executing security controls proactively to prevent external threat actors from infiltrating
- company information systems.
- Research more advance and complex attempts/efforts to compromise security protocols.
- · Vulnerability assessments and management
- · Conducting cyber awareness trainings
- · Supporting Incidence response operations
- · Supporting IT security risk and compliance operations
- Performing other task as the business need requires

#### Employer comments

Oluwasefunmi has settled into the Service Lifecycle team well. He splits his time between my team (Service lifecycle) and the Information Security Operations team.

Oluwasefunmi is doing very well against the principal accountabilities. He works well with others in the bank both in my team and securioty operations. Oluwasefunmi is learning the principle accoubntabilities for the Software Assset Management and Information Security role. This has been a huge bonus for the lifecycle team as a member of my team who normally looks after this role is currently on sick leave so Oluwasefunmi has had to step up earlier than expected and has done so convincingly.

	OP Flahm	
Student Signature:	Alach	Date: 20th December, 2022
Industry Supervisor Signature:	Martin Doyle	Date: 20th December, 2022