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Introduction to AWS
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Course title BackSpace Academy AWS Certified Cloud Practitioner



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BackSpace Academy AWS Certified Associate

# • About the Lab

Please note that not all AWS services are supported in all regions. Please use the US-East-1 (North Virginia) region for this lab.



These lab notes are to support the hands on instructional videos of the Introduction to AWS section of the BackSpace AWS Cloud Practitioner Course.

Please note that AWS services change on a weekly basis and it is extremely important you check the version number on this document to ensure you have the latest version with any updates or corrections.

# Checking your AWS Usage and Monthly Bill

In this section we will learn how to use the AWS Billing & Cost Management Dashboard to keep track of costs.

From the AWS management console select 'My Billing Dashboard" from the account drop down menu.



You will now see your total spend summary, spend by service and forecast spend (by clicking the Cost Explorer).



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# Creating an S3 Bucket and Uploading Files

## In this section we will create an S3 bucket, upload files to it and download files from it.

Click on the services menu and search S3.

#### Select S3

aws	Services <b>v</b>		Q s3	×
	A	Services (7)	Search results for 's3' Services	See all 7 results ► 🔒
		Features (10) Documentation (299,517) Marketplace (520)	S3 Scalable Storage in the Cloud	
			S3 Glacier	

#### Click on Create Bucket



The create bucket dialog box will appear.

Enter a unique name for your bucket (it will need to different from the one below)

Click 'Next"

mazon S3 > Create bu	ucket		
Create bucke	t data stored in S3. Learn more 🛂		
General configura	ation		
Bucket name pcoady-backspace-in Bucket name must be unig Region	itro-aws ue and must not contain spaces or upper	case letters. See rules for bucket na	ming 🖸
US East (N. Virginia) (	us-east-1	•	
Copy settings from exis Only the bucket settings in Choose bucket	sting bucket - optional n the following configuration are copied.		

Leave other settings as is and click *Create bucket* (by default the bucket is private)

You will now see your bucket has been created.

Bucket	<b>cets</b> (13)		Copy ARN Empty	Delete Create bucket
Q	pcoady			X 1 match < 1 > @
Q	pcoady Name	Region ⊽	Access 🗸	X 1 match < 1 > @

# Uploading Files to your Bucket

#### Click on the link to the bucket

Buckets (13)	C	Copy ARN Empty	Delete Create bucke	et
Buckets are containers for data stored in	n S3. Learn more 🔀			
Q pcoady			X 1 match $\langle$ 1 $\rangle$	۲
Name 🔺	Region $\bigtriangledown$	Access 🗸	Creation date	V
pcoady-backspace- intro-aws	US East (N. Virginia) us- east-1	Bucket and objects not public	January 18, 2021, 02:12:33 (UTC+11:00)	

Click Upload

coady-	backspa	ce-intro	-aws		
Objects	Properties	Permission	s Metrics	Management	Access points
Objects (	))				
Objects are the	e fundamental enti	ties stored in Ama	zon S3. For others to	o access your objects, y	you'll need to explicitly gra
C	Delete	Actions <b>v</b>	Create folder	Upload	

Drag a folder with files onto the form.

	load			
Upload				
			)10 - Intro	
		File Home	Share View	
		Pin to Quick Copy	Paste	Move
Files and foldows (0)	Drop the files and folders you want to upload h	ie ci	lipboard	
		$\leftarrow \rightarrow \cdot \uparrow$	≪ OneDrive → Docume	:nts → (
		V A Quick access	Name	UIU-U6U
Name 🔺 Folder	V Size	Desktop	x 01-0	010-110 010-110 obe Prem
	→ Move	🗮 E:\	Ada	obe Pren
	· ·····	E Pictures	Auc	dio1
		2019	🐔 🛛 💁 Aud	dio2
		2010 - Intro	og Auc	dio3
		aws-cognit	o-lab-v3	dio4

Scroll down and click Upload

Your files will begin uploading

≡	Uploading		- 20/	Cancel
	Total remaining: 9 files: 11.5 MB(97.75%) Estimated time remaining: 2 minutes Transfer rate: 97.3 KB/s	- 2m		
	Upload: status		Exit	
	<ol> <li>The information below will no longer be available af</li> </ol>			
	Summary			
	Destination s3://pcoady-backspace-intro-aws	Succeeded ② 0 files, 272.0 KB (2.25%)	Failed ⊙ 0 files, 0 B (0%)	

Your upload will eventually complete.

Ξ	⊘ Upload succeeded View details below.
	Upload: status
	③ The information below will no longer be available after you navigate away from this page.
	Summary
	Destination Succeeded Failed
	s3://pcoady-backspace-intro-aws
	Files and folders Configuration
	Files and folders (9 Total, 11.8 MB)
	Q Find by name
	Name 🔺 Folder 🗢 Type 🗢 Size 🗢 Status
	aws1.mp3 Audio1/ audio/mpeg 2.8 MB OSucceeded

# Downloading files from your bucket

Click Exit to navigate back to the bucket details.

Click on the folder to view its contents

ocoady-backspa	ce-intro-aws		
<b>Objects</b> Properties	Permissions Metr	rics Management Access	points
<b>Objects</b> (1) Objects are the fundamental enti	ties stored in Amazon S3. For ot	hers to access your objects, you'll need to ex	plicitly grant them permissions. Learn mo
Q Find objects by prefix	Create fr	Uptoad	T Size
Name     Audio1/	Folder	✓ Last modified	✓ Size

Select one of the files

Select Actions -> Download

Amazon S3	mazon S3 > pcoady-backspace-intro-aws > Audio1/						
Audio	1/						
Objects	Objects Folder properties						
<b>Object</b>	Objects (9) Objects are the fundamental entities stored in Amazon S3. For others to access your objects, yo						
C	Delete	Actions A Create	e folder Upload				
Q Fin	d objects by pref	Open					
		Calculate total size					
	Name	Сору	ast modified				
	🗅 aws1.mp3	Move	anuary 18, 2021, 02:27				
	aws2.mp3	Initiate restore	anuary 18, 2021, 02:27				
	aws3.mp3	Query with S3 Select	anuary 18, 2021, 02:27				
	aws4.mp3	Download actions	anuary 18, 2021, 02:27				
	aws5.mp3	Download	anuary 18, 2021, 02:27				
	aws6.mp3	Download as	anuary 18, 2021, 02:27				
	aws7.mp3	Edit actions	anuary 18, 2021, 02:27				
	aws8.mp3	Rename object	anuary 18, 2021, 02:28				
	aws9.mp3	Edit storage class	anuary 18, 2021, 02:28				

# Troubleshooting

If you get the following screen it means you have clicked on the S3 URL and not the download link as detailed above. You cannot access files directly from a URL as they have private access.



# Clean Up

We will now delete the files and bucket so that you will not be billed by AWS.

Go back to the S3 dashboard.

Amazon S3 > pcoady-backspace-intro-aws > Audio1/
Audio1/
Objects Folder properties
<b>Objects</b> (9) Objects are the fundamental entities stored in Amazon S3. For others to access your objects, y

## Select the bucket

# Click Empty

Decelerate (17)	٦	C. A.	ODV ARN	Emoty	Delete	Create bur	ket
BUCKETS (13)	L		opy and	Linpty	Delete	create but	Ret
Buckets are containers for data stored	in S3. Learn more [						
Q pcoady					X 1 match	< 1 >	0
Q pcoady					X 1 match	< 1 >	0
Q pcoady	Region	▽	Access	▽	X 1 match Creation date	< 1 >	0
Q pcoady	Region	⊽	Access	⊽	X 1 match Creation date	< 1 >	0

# Enter permanently delete

# Click Empty

m	oty bucket	
▲	<ul> <li>Emptying the bucket deletes all objects in the bucket and cannot be undone.</li> <li>Objects added to the bucket while the empty bucket action is in progress might be deleted.</li> </ul>	
Pei	manently delete all objects in bucket "pcoady-backspace-intro-aws"?	
To c	onfirm deletion, type <i>permanently delete</i> in the field. rmanently delete	
	Cancel	Empty

# You will see a green success message

Click Exit

iccessfully emptied bucket "pcoady-backspa ew details below. If you want to delete this bu	<b>:e-intro-aws"</b> cket, use the <u>delete bucket configuration</u> .		
mpty bucket: status			Cancel
(i) The details below are no longer available	after you navigate away from this page.		
Summary			
Source s3://pcoady-backspace-intro-aws	Successfully deleted	Failed to delete 0 objects	
Failed to delete (0)			
<b>Q</b> Find objects by name			< 1 >
Name V Prefix V	Version ID  v Type  v Last mod	dified V Size	▼ Error ▼
	No failed object deletions		

#### Click Delete

azon S	53			
<b>Buck</b> Buckets	t <b>ets</b> (13) s are containers for data sto	red in S3. Learn more 🔀	Copy ARN Empty	Delete Create bucket
Qŗ	ocoady			X 1 match < 1 > (2)
	Name	▲ Region ▽	Access v	Creation date
	propidy backspace	US East (N. Virginia) us-	Bucket and objects not	January 18, 2021, 02:12:33

## Confirm the name of the bucket to delete

## Click Delete bucket

Delete bucket		
<ul> <li>Deleting a bucket cannot be undone.</li> <li>Bucket names are unique. If you delete a bucket, another AWS user can use the n Learn more [2]</li> </ul>	iame.	
Delete bucket pcoady-backspace-intro-aws		
To confirm deletion, type the name of the bucket. pcoady-backspace-intro-aws		
	Cancel	Delete bucket

# Creating a SQL Database with RDS

In this section, we will use the Relational Database Service to create a database. We will also connect into the database.

# Creating a Security Group

By default, inbound access from the Internet to our database instance is blocked. We will create a security group that defines an inbound rule that allows access from the Internet. We can then associate this security group to our database instance.

From the AWS console search VPC.

Select VPC



Scroll down and select Security > Security Groups

### Click Create security group

Egress Unly Internet Gateways New		Secu	rity Group	<b>s</b> (26) Info		C	Actions  Create se	curity group
Carrier Gateways New	•	Q	Filter security g	roups				1 > 0
DHCP Options Sets New								
Elastic IPs New			Name	$\nabla$	Security group ID	Security group name 🛛 🔻	VPC ID	▼ Description
Managed Prefix Lists <mark>New</mark>			-		sg-00095ac24f95d08bd	default	vpc-0619ac58ad2099004	default VI
Endpoints			-		sg-005d074df4f0a61c3	AutoScaling-Security	vpc-e4a1b39f	AutoScali
Endpoint Services			-		sg-00e3612dc0511ae6c	rds-launch-wizard-1	vpc-e4a1b39f	Created fr
NAT Gateways New Peering Connections			-		sg-01e4a233fb2339551	rds-launch-wizard-7	vpc-e4a1b39f	Created fr
▼ SECURITY			-		sg-01ed2f01e4091f38f	RedisSG	vpc-e4a1b39f	Redis Sec
Network ACLs			-		sg-01f31a737b67ef82f	ELBSG	vpc-027e0ed6869cbab0c	ELB Secur
Security Groups New			_		sg-021b26da62e3ee6c8	rds-launch-wizard	vpc-e4a1b39f	Created fr

# Give it the name *backspace-rds-intro-lab*

#### Give it a description

reate secu	rity group Info
security group acts a	s a virtual firewall for your instance to control inbound and outbound traffic. To
Basic details	
Security group nam backspace-rds-int Name cannot be edited	e Info ro-lab Hafter creation.
Description Info	access to MySQL RDS.
VPC Info	
vpc-e4a1b39f (De	fault VPC)

#### Click Add rule for Inbound rules

Select type *MySQL/Aurora* 

Select source Anywhere

Click Create security group

Inbound rules Inf	fo				
Type Info MYSQL/Aurora	Protocol Info TCP	Port range Info	Source Info	Description - optional Info	Delete
			0.0.0.0/0 × ::/0 ×		
Add rule					
Outbound rules	Info				
Гуре Info	Protocol Info	Port range Info	Destination Info	Description - optional Info	
All traffic	All	All	Custom ▼ Q 0.0.0.0/0 ×		Delete
Add rule					
<b>ags – <i>optional</i></b> . tag is a label that you ass	sign to an AWS resource	. Each tag consists of a key and	an optional value. You can use tags to search an	d filter your resources or track your AWS costs.	
lo tags associated with	the resource.				
Add new tag	tag				
				Cancel	ate security group

<ul> <li>Security group (sg-<u>0f944f4fcdc</u></li> <li>Details</li> </ul>	Security group ( <u>sg-0f944f4fcdc960b6b   backspace-rds-intro-lab</u> ) was created successfully Details							
VPC > Security Groups > s	g-0f944f4fcdc960b6l	- backspace-rds-intro-	lab					
sg-0f944f4fcdc9	)60b6b - ba	ackspace-rd	s-intro-lab					
Delete security group	Copy to new secu	ity group						
Details								
Security group name	Security g	oup ID	Description	VPC ID				
🗗 backspace-rds-intro-lab	D backspace-rds-intro-lab D sg-0f944f4		Inbound internet acces MySQL RDS.	ss to 🗇 vpc-e4a1b39f				
Owner	Inbound ru	les count	Outbound rules count					
<b>D</b> 361919435810	2 Permissi	on entries	1 Permission entry					
Inbound rules Outbou	nd rules Tags							
Inbound rules				Edit inbound rules				
Туре	Protocol	Port range	Source	Description - optional				
MYSQL/Aurora	ТСР	3306	0.0.0/0	-				
MYSQL/Aurora	ТСР	3306	::/0	-				

# Creating an RDS Database

#### From the AWS console search *RDS*

Click on RDS



Select 'Databases"

### Select 'Create database"

Amazon RDS ×	RDS > Databases	
Dashboard Databases Ouery Editor	Databases	C Group resources C Modify Actions ▼ Restore from 53 Create database
Performance Insights Snapshots	DB identifier	▲ Role ▼ Engine ▼ Region & AZ ▼ Size ▼ Status ▼ CPU
Automated backups Reserved instances	4	No instances found

#### Select Standard Create



#### Select MySQL

Engine type Info		
O Amazon Aurora	MySQL	O MariaDB
		- W
O PostgreSQL	Oracle	O Microsoft SQL Server
(F)	ORACLE	SQL Server
Edition MySQL Community		

#### Select Free Tier

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In the Settings section give your instance a name/identifier.

Fill in a master username and password (remember this we will need it later)

Settings
DB instance identifier Info Type a name for your DB instance. The name must be unique cross all DB instances owned by your AWS account in the current AWS Region
backspace-intro-aws
The DB instance identifier is case-insensitive, but is stored as all lowercase (as in "mydbinstance"). Constraints: 1 to 60 alphanumeric characters or hyphens (1 to 15 for SQL Server). First character must be a letter. Can't contain two consecutive hyphens. Can't end with a hyphen.
▼ Credentials Settings
Master username Info
Type a login ID for the master user of your DB instance.
Sadmin-
1 to 16 alphanumeric characters. First character must be a letter
Auto generate a password Amazon RDS can generate a password for you, or you can specify your own password
Master password Info
Constraints: At least 8 printable ASCII characters. Can't contain any of the following: / (slash), "(double quote) and @ (at sign).
Confirm password Info

In the *DB Instance size* section select db.t2.micro instance class

DB instance size	
DB instance class Info	
Choose a DB instance class t imited to those supported b	hat meets your processing power and memory requirements. The DB instance class options below are y the engine you selected above.
Standard classes (ind	ludes m classes)
Memory Optimized	classes (includes r and x classes)
<ul> <li>Burstable classes (in</li> </ul>	cludes t classes)
db.t2.micro	Not EBS Optimized
Include previous as	preration classes
include previous go	

Uncheck Enable storage autoscaling

Storage	
Storage type Info	
General Purpose (SSD)	
Allocated storage	
20	GiB
Minimum: 20 GiB, Maximum: 16384 GiB) Higher allocated storage <b>may improve</b> IOPS performance <b>Storage autoscaling Info</b> Provides dynamic scaling support for your database's storage based on your application's needs. Enable storage autoscaling Enabling this feature will allow the storage to increase once the specified threshold is exceeded.	

#### Scroll down to *Connectivity*

Expand Additional connectivity configuration

Select yes for publicly accessible (we will look at security later in the course)

Select Choose existing for VPC security group

Select the *backspace-rds-intro-lab* security group we created previously (click outside the list after selecting to close the list)

Connectivity	C
Virtual private cloud (VPC) Info VPC that defines the virtual networking environment for this DB instance.	
Default VPC (vpc-e4a1b39f)	
Only VPCs with a corresponding DB subnet group are listed.	
( After a database is created, you can't change the VPC selection.	
▼ Additional connectivity configuration Subnet group Info	
DB subnet group that defines which subnets and IP ranges the DB instance can use in the VPC you se default	elected.
Amazon EC2 instances and devices outside the VPC can connect to your database. Choose one or specify which EC2 instances and devices inside the VPC can connect to the database. No RDS will not assign a public IP address to the database. Only Amazon EC2 instances and devices i your database. Existing VPC security groups	r more VPC security groups that
Choose VPC security groups	
Q	
AutoScaling-Security-Group-1	
RedisSG	
WordPress Certified by Bitnami and Automattic-5-5-1-0 on Debian 10- AutogenByAWSMP-	
WebServerSG	
aws-cloud9-BackSpace-Labs-aa0e0177557d4b7da26fa3c1fe150530- InstanceSecurityGroup-1EQOMGDRQ5CW8	
LocalServerSG	
backspace-rds-intro-lab	
default	

Click outside the list to add the security group. You should then see the security group added.

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#### Scroll down to Database authentication

Leave as Password authentication

Da	atabase authentication
Da	tabase authentication options Info
•	Password authentication Authenticates using database passwords.
0	Password and IAM database authentication Authenticates using the database password and user credentials through AWS IAM users and roles.
•	Password and Kerberos authentication (not available for this version) Choose a directory in which you want to allow authorized users to authenticate with this DB instance using Kerberos Authentication.

Scroll down and expand Additional configuration

Enter a database name.

Uncheck Enable automatic backups

Leave all other options default.

Additional configuration     Database options, backup disabled, backtrack disabled, Enhanced Monitoring disabled, maintenance, CloudWatch Logs, delete protection disabled
Database options
Initial database name Info
test
H <mark>ryou do not sp</mark> ecify a database name, Amazon RDS does not create a database.
DB parameter group Info
default.mysql5.7
Option group Info
default:mysql-5-7 🔹
Backup Creates a point in time snapshot of your database Enable automatic backups Enabling backups will automatically create backups of your database during a certain time window.
Monitoring
Enable Enhanced monitoring Enabling Enhanced monitoring metrics are useful when you want to see how different processes or threads use the CPU

# Uncheck Enable deletion protection (we want to delete it easily when finished)

## Click Create database

Deletion protection Enable deletion protection Protects the database from being deleted accidentally. While this option is enabled, you can't delete the database.
Estimated monthly costs
The Amazon RDS Free Tier is available to you for 12 months. Each calendar month, the free tier will allow you to use the Amazon RDS resources listed below for free:
750 hrs of Amazon RDS in a Single-AZ db.t2.micro Instance.
20 GB of General Purpose Storage (SSD).
<ul> <li>20 GB for automated backup storage and any user-initiated DB Snapshots.</li> </ul>
Learn more about AWS Free Tier. 🔽
When you free usage expires or if your application use exceeds the free usage tiers, you simply pay standard, pay- as-you-go service rates as described in the Amazon RDS Pricing page.
Cancel Create database

Click on the database details link

<b>Creating database</b> <u>backspace-intro-aws</u> . Your database might take a few minutes	to launch.				View crede	ential details
RDS > Databases						
Databases	Group resources	См	odify Actions 🔻	Restore from S	53 Create	e database
Q Filter databases					<	1 > @
• DB identifier		Role 🔻	Engine 🔻	Region & AZ 🔻	Size 🔻	Status 🔻
O backspace-intro-aws		Instance	MySQL Community	us-east-1f	db.t2.micro	O Creating

Your instance will show status 'creating".

RDS > Databases > backspace-intro-aws						
backspace-intro-a	Modify Actions <b>v</b>					
Summary						
DB identifier backspace-intro-aws	CPU -	Info Creating	Class db.t2.micro			
Role	Current activity	Engine	Region & AZ			
Instance	0 Connections	MySQL Community	us-east-1f			
	1	1				

# Connecting to your RDS Instance

To connect to your MySQL Database you will need to download and install the MySQL Workbench.

Instructions for Windows:

https://dev.mysql.com/doc/workbench/en/wb-installing-windows.html

Instructions for Mac:

https://dev.mysql.com/doc/workbench/en/wb-installing-mac.html

Instructions for Linux:

https://dev.mysql.com/doc/workbench/en/wb-installing-linux.html

Wait for your instance status to be 'available"

Successfully created database ba	View credential details		
RDS > Databases > backspar backspace-intro-a	Modify Actions <b>v</b>		
Summary			
DB identifier	CPU	Info	Class
Role	- Current activity	Engine	ab.tz.micro Region & AZ
Instance	0 Connections	MySQL Community	us-east-1f

Scroll down and copy the database server endpoint

Connectivity & security Monitoring Logs & events Configuration Maintenance & backups Tags						
Connectivity & security						
Endpoint & port	Networking	Security				
Endpoint backspace-intro-aws.clbmnfzd56wx.us-east- 1.rds.amazonaws.com Port 3306	Availability zone us-east-1f VPC Default VPC (vpc-e4a1b39f) Subnet group default Subnets subnet-557c9c6b subnet-c94c9fe7 subnet-c94c9	VPC security groups default (sg-7d1df536) ( active ) Public accessibility Yes Certificate authority rds-ca-2015 Certificate authority date Mar 6th, 2020				

Open the MySQL Workbench application click to add a new connection

MySQL Wo	rkbench	- 🗆	×					
<u>F</u> ile <u>E</u> dit <u>V</u>	jew <u>D</u> atabase <u>T</u> ools <u>S</u> cripting <u>H</u> elp							
			×					
~ > `	$\lambda$							
	MySQL Workbench is the official graphical user interface (GUI) tool for MySQL. It allows you to design,							
	create and browse your database schemas, work with database objects and insert data as well as							
	design and run SQL queries to work with stored data. You can also migrate schemas and data from other							
	database vendors to your MySQL database.							
	Browse Documentation > Pead the Plan > Discussion the Forume >							
	browski bocumentation - Read the blog - Discussion the Fordins -							
	MySQL Connections 🕑 🕲 🔍							

#### Give the connection a name.

The Hostname will be the RDS server endpoint.

The port will be 3306.

The Username will be the master username we created in RDS (i.e. admin)

#### Click Test Connection

🔊 Setup New Conn	nection	– 🗆 ×
Connection Name:	BackSpace Test	Type a name for the connection
Connection Method:	Standard (TCP/IP)	$\checkmark$ Method to use to connect to the RDBMS
Parameters SSL	Advanced	
Hostname:	hfzd56wx.us-east-1.rds.amazonaws.com	Name or IP address of the server host - and TCP/IP port.
Username:	admin	Name of the user to connect with.
Password:	Store in Vault Clear	The user's password. Will be requested later if it's not set.
Default Schema:		The schema to use as default schema. Leave blank to select it later.
Configure Server	Management	Test Connection Cancel OK

Enter the password you created in RDS for your master username

🕅 Setup New Con	nection			
Connection Name:	BackSpace Test			
Connection Method:	Standard (TCP/IP)			
P MySQL Workb	ench			
i Succ	essfully made the MySQL connection			
Inform	nation related to this connection:			
Host: backspace-intro-rds.clbmnfzd56wx.us-east-1.rds.amazo Port: 3306 User: admin SSL: enabled with ECDHE-RSA-AES128-GCM-SHA256				
A succ the pa	A successful MySQL connection was made with the parameters defined for this connection.			
ОК				

#### Click OK

Click on the Connection



# vercome to iviysQL workbench

MySQL Workbench is the official graphical user interface (GUI) tool for MySQL. It allows you to design, create and browse your database schemas, work with database objects and insert data as well as

design and run SQL qu stowork with stored data. You can also migrate schemas and data from other doabase vSQL Editor An SQL editor instance for 'BackSpace Test' is opening and should be available in a moment. Please stand by...Read the Blog > Cancel zd56wx....

#### You will soon be connected to your database server

If you cannot connect then please see the 'Troubleshooting Connection Issues" below.

MrsOI Workhansh			×
WySQL Workbench		- 0	^
Backspace Test ×			
File Edit View Query Databas	se Server Lools Scripting Help		
		(O)	
Navigator		SQLAdditions	
MANAGEMENT <sup>27</sup>	🚞 🔛   🕖 🚀 👰 🕐   🔂   📀 💿 🗐   Limit to 1000 rows	✓ ▶   By ftp   Jump to ▼	
Server Status	1	Automatic contact halp is displied. Use the tealbar to manually get halp for the surrent care	at
Client Connections		position or to toggle automatic help.	et
Users and Privileges			
Data Export			
Data Import/Restore			
Startup / Shutdown			
A Server Logs			
🖉 Options File			
PERFORMANCE			
Dashboard			
🖑 Performance Reports			
👌 Performance Schema Setup			
SCHEMAS 🚯 🖉			
Q Filter objects			
▶ 🗐 innodb			
▶ Sys	<	Context Help Snippets	
F 🔄 test	Output		
	Action Output -		
	# Time Action	Message Duration / F	Fetch
Information			
No object selected			
Object Info Session			

Hover over the 'test" database under 'SCHEMAS" and click the information icon to get information about the database that was created by us in RDS.



You then get an information screen for the database.



# **Troubleshooting Connection Issues**

If you are getting connection errors then check the following:

### Wrong Username / Password



Make sure you use the correct username and password.

The username and password must be the one created when the RDS instance was created.

Settings		your AWS account in the current region. DB instance	
DB Instance Identifier*	backspace-intro-aws	identifier is case insensitive, t stored as all lower-case, as in	
Master Username*	admin	"mydbinstance". Learn More.	
Master Password*			
Confirm Password*			
* Required	Cancel	Previous Next Step	

## **Bad Connection String**



This error means nothing exists at the endpoint. Check the connection endpoint and port are correct.

The hostname will be the RDS Instance Connection Endpoint without :3306 on the end.



## No Connection



This error means your server exists but you are unable to connect to it. This can be caused by:

- You have not selected 'public' when creating instance and the security group inbound rules will be incorrect. This will block traffic to your instance. See *Security Group Inbound Rules* below.
- You have a dynamic IP address or multiple IP addresses passing through a load balancer. See *Security Group Inbound Rules* below.
- Firewall at your end is blocking access to port 3306. See *Client-side Firewall* below.

### Security Group Inbound Rules

If you did not select yes for publicly accessible as detailed, your security group will block remote access. The security group may have an inbound rule for your IP address. If you are using a dynamic IP address or you are connecting from different networks then this will need to be changed to "anywhere" for the lab.

Click the security group

connect		
Endpoint	Port	Publicly accessible
backspace-intro-aws.cvn9gzwmqrrv.us-east- 1.rds.amazonaws.com	3306	Yes
Security group rules (2)		
<b>Q</b> Filter security group rules		< 1 > (
Security group	▼ Туре	Rule
Security group rds-launch-wizard-5 (sg-2e8b8e58)	▼ Type CIDR/IP - Inbound	Rule

#### You will be taken to the EC2 console

# Select the "Inbound" tab Click "Edit"

EC2 Dashboard	Create Security Group	Actions 💙			
Events					💘 tr 1
Tags	Q search : rds-launch-wize	ard-5 🙁 Add filter			
Reports	Name Grou	in ID 🔺	Group Name		escription
.imits		.p. 15	oroup numo		
NSTANCES	sg-2	e8b8e58 i	rds-launch-wizard-5	vpc-72d25a0b C	reated from the RDS Management Cor
istances					
aunch Templates					
pot Requests					
eserved Instances					
edicated Hosts			0.0.0		
Scheduled Instances	Security Group; sg-2e8b8e	58			_
MAGES	Description Inbound	Outbound Tags			
MIs	Becomption				
Bundle Tasks	Edit				
LASTIC BLOCK					
TORE	Туре 🕧	Protocol (j)	Port Range (j)	Source (j)	Description (j)
/olumes	Custom TCP Pule	TCP	3306	/32	
snapshots		10	0000	0/32	
ULTWORK 8					

#### Change inbound rule to "Anywhere" 0.0.0.0/0, ::/0

EC2 Dashboa	rd	Create Security Group	Actions 🛩				Ð	* 0
Tags		Q search rds-launch	wizard-11 💿 Add filter			0		
Reports		Name - 0	Group ID	Group Name	- VPC ID	~ Description		
INSTANCES			sg-2c80445f	rds-launch-wizard-11	vpc-72d25a0b	Created from t	he RDS Management	Console
Instances Spot Reque	Edit inbo	ound rules						×
Reserved In	Type (i)	Protocol (j)	Port Range (i)	Source (i)		Description (j)		
Scheduled I Dedicated H	MYSQL/Au	ror • TCP	3306	Anywhere 🔹 0.0.0.0/0, :	/0	e.g. SSH for Admin E	Desktop 😵	
IMAGES AMIs Bundle Task	Add Rule NOTE: Any er rule to be dro	dits made on existing rules pped for a very brief period	s will result in the edited d of time until the new ru	rule being deleted and a new ru le can be created.	ile created with the new deta	ils. This will cause traffic th	hat depends on that	
ELASTIC BLO STORE							Cancel Save	
Snapshots		MYSQL/Aurora	TCP	3306	allowith a	mall and		

#### Client-side Firewall

If you are still having problems connecting, a firewall at your end may be preventing access on port 3306. This is common if you are connecting from your work environment as port 3306 traffic may be blocked.

# Clean Up

To avoid incurring charges from AWS we will terminate the instance.

Go back to the RDS console.

#### Click Actions -> Delete to terminate the instance

ackspace-int	ro-rds		Modify Actions
Summary			Stop Reboot
DB identifier backspace-intro-rds	CPU -	Status 🕢 Available	Create read replica Promote
Role Instance	Current activity	Engine MySQL Community	Take snapshot

Select 'No" for 'Create final snapshot"

Check 'I acknowledge that upon instance deletion, automated backups, including system snapshots and point-in-time recovery, will no longer be available."

Click 'Delete"



Click on the VPC security group we created previously

Actions  Actions				
Summary				
DB identifier	CPU	Status	Class	
backspace-intro-rds	2.71%	🛞 Deleting	db.t2.micro	
Role	Current activity	Engine	Region & AZ	
Instance	stance 0 Connections MySQL Co		us-east-1c	
Connectivity & secu	rity			
Endpoint & port	Networking	J	Security	
	Availability zor	10	VPC security groups	
Endpoint	Availability 201			
Endpoint backspace-intro-	us-east-1c		backspace-rds-intro-lab (sg-	
Endpoint backspace-intro- rds.clbmnfzd56wx.us-east	us-east-1c		backspace-rds-intro-lab (sg- 09ab0f7266fac969b)	
Endpoint backspace-intro- rds.clbmnfzd56wx.us-east 1.rds.amazonaws.com	- VPC		backspace-rds-intro-lab (sg- 09ab0f7266fac969b) (active)	

Select Actions -> Delete security group

Security Groups (1/1) Info	Actions Create security group
Q     Filter security groups       search: sg-09ab0f7266fac969b     X         Clear filters	Manage tags  Manage stale rules Copy to new security group
✓ Name	Delete security group
✓ – sg-09ab0f7266fac969b	backspace-rds-intro-lab vpc-e4a1b39f 🖸

# Creating a Web Server with EC2

# In this section, we will launch a publicly accessible WordPress application on Amazon EC2.

From the AWS console search EC2

## Click EC2

aws Services ▼	Q ec2	× D 4
	Search results for 'ec2'	
Services (6)	Services	See
Features (35)		
Documentation (164,530	o) EC2	
Marketplace (1,037)	Virtual Servers in the Cloud	
	EC2 Image Builder	

#### Select Instances -> Launch Instances

aws Services ▼	Q Search for services, features, marketplace products, and docs [Alt+S] ∑ & BackSpace Labs ▼ N. Virginia ▼ Support ▼
New EC2 Experience Tell us what you think	C Connect Instance state  Actions  Launch instances
EC2 Dashboard New	Q Filter instances
Events	
Tags	Name V Instance ID Instance state V Instance type V Status check Alar
Limits	You do not have any instances in this region
▼ Instances Instances New Instance Types	4

#### Select the AWS Marketplace and search for WordPress



#### Select the Bitnami AMI



Click Continue (This lab will be covered under the AWS free tier for accounts less than 12 months old)

$\frown$	WordPress Certified by Bitnami	Pricing Details			
	WordPress powers over 25% of all websites on the internet, making it the world's most popular blogging and content management platform. It is free and	Hourly Fees			
	open source software developed entirely by its	Instance Type	Software	EC2	Total
$\sim$	community, who have contributed over 45,000	t2.micro	\$0.00	\$0.012	\$0.012/hr
Free tier eligible	unlimited combination of features. Users can easily	t2.small	\$0.00	\$0.023	\$0.023/hr
	create and	t2.medium	\$0.00	\$0.046	\$0.046/hr
	More info	t2.large	\$0.00	\$0.093	\$0.093/hr
	View Additional Details in AWS Marketplace	t2.xlarge	\$0.00	\$0.186	\$0.186/hr
Product Details		t2.2xlarge	\$0.00	\$0.371	\$0.371/hr
Bu	Dite	t3a.micro	\$0.00	\$0.009	\$0.009/hr
Ву		t3a.small	\$0.00	\$0.019	\$0.019/hr
Customer Rating		t3a.medium	\$0.00	\$0.038	\$0.038/hr
Latest version	5.4.1-0-r01 on Debian 10	t3a.large	\$0.00	\$0.075	\$0.075/hr
Base Operating System	Linux/Unix, Debian 10	t3a.xlarge	\$0.00	\$0.15	\$0.15/hr
Delivery Method	64-bit (x86) Amazon Machine Image (AMI)	t3a.2xlarge	\$0.00	\$0.301	\$0.301/hr
License Agreement	End User License Agreement	t3.micro	\$0.00	\$0.01	\$0.01/hr
On Marketplace Since	9/17/14	t3.small	\$0.00	\$0.021	\$0.021/hr
Highlights		t3.medium	\$0.00	\$0.042	\$0.042/hr
		t3.large	\$0.00	\$0.083	\$0.083/hr
<ul> <li>Jetpack plugin is inclu- professional themes in</li> </ul>	ded by default offering access to additional	t3.xlarge	\$0.00	\$0.166	\$0.166/hr
		*2 0-J	<b>60 00</b>	eo 222	én 222/6-

### Choose the t2 micro instance.

# Click Next: Configure Instance Details

1. Choos	e AMI 2. Choose Instance	Type 3. Configure Instance	e 4. Add Sto	rage 5. Add 1	Tags 6. Configure S	Security Group	7. Review	
Step 2 Amazon I combinati about inst	2: Choose an Ins EC2 provides a wide selectio ions of CPU, memory, storag tance types and how they ca	stance Type on of instance types optimiz je, and networking capacity n meet your computing nee	zed to fit differe /, and give you eds.	nt use cases. Ir the flexibility to	nstances are virtual se choose the appropria	ervers that can ru ate mix of resour	in applications. They have ces for your applications.	varying
Filter by:	er by: All instance types   Current generation   Show/Hide Columns							
Curren	tly selected: t3a.small (Varia	able ECUs, 2 vCPUs, 2.2 G	GHz, AMD EPY	C 7571, 2 GiB I	memory, EBS only)			
Note: T	he vendor recommends usin	g a <b>t3a.small</b> instance (or	larger) for the	best experience	e with this product.			
	Family	⊸ Туре ⊸	vCPUs (j)	Memory (GiB)	Instance Storage (GB) (i)	EBS- Optimized Available (i)	• Network Performance (i)	IPv6 Support ▼ (i)
0	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
	General purpose	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes
	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
		I		Cancel	Previous	view and Launcl	Next: Configure Ins	stance Details

Select enable for Auto-assign Public IP

Click Next: Add Storage

1. Choose AMI	2. Choose Instance Type	3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review
Step 3: Configure the instand	tance to suit your require ce, and more.	e Details nts. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management
	Number of instances	Launch into Auto Scaling Group (i)
	Purchasing option	Request Spot instances
	Network	vpc-e4a1b39f   Default VPC (default) C Create new VPC
	Subnet	No preference (default subnet in any Availability Zon )
	Auto-assign Public IP	
	Placement group	Add instance to placement group
	Capacity Reservation	Open Create new Capacity Reservation
	IAM role	None Create new IAM role
	Shutdown behavior	Stop
Sto	p - Hibernate behavior	Enable hibernation as an additional stop behavior
Enable	termination protection	Protect against accidental termination
	Monitoring	Enable CloudWatch detailed monitoring
		Cancel Previous Review and Launch Next: Add Storage

# Click Next: Add Tags

1. Choose AMI	2. Choose Instance Typ	e 3. Configure Instance	4. Add Storage	5. Add Tags	6. Configure Security Grou	ıp 7. Reviev	ı		
Step 4: Ac Your instance will edit the settings of storage options in	d Storage be launched with the f of the root volume. You Amazon EC2.	following storage device s can also attach additiona	ettings. You can at I EBS volumes afte	tach additional El r launching an in	BS volumes and instance stance, but not instance stance.	store volumes	s to your instanc Learn more ab	e, or vout	
Volume Type	Device (j) S	napshot (j)	Size (GiB) (j)	Volume Type	1	IOPS (j)	Throughput (MB/s) (i)	Delete on Termination	Encryption (i)
Root	/dev/xvda 0	nap- 1235d3cf67b2c8f8	10	General Purpo	se SSD (gp2) 🗸	100 / 3000	N/A		Not Encrypte 🔻
Free tier eligi usage restric	ble customers can get tions.	up to 30 GB of EBS Gene	eral Purpose (SSD)	or Magnetic stor	age. Learn more about f	ree usage tier	eligibility and		
						Cance	Previous	Review and Laur	nch Next: Add Tags

#### Click to add a Name tag

1. Choo	ose AMI	2. Choose Instance Type	3. Configure Instance	4. Add Storage	5. Add Tags	6. Config	ure Security Group	7. Review	
Step A tag co	5: Ac	dd Tags a case-sensitive key-value	e pair. For example, you	could define a tag	g with key = Nan	ne and val	ue = Webserver.	Learn more abo	ut tagging your Amazon
Key	(128 ch	aracters maximum)				Value	(256 characters	maximum)	
Add T	īag	(Up to 50 tags maximum)		Choose ti Make sure you	This resource of he Add tag buttoo ur IAM policy ind	urrently ha	is no tags to add a Name tag missions to create	tags.	

# Give it a name and click Next: Configure Security Group

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	dd Tags a case-sensitive key-value	e pair. For example, you	u could define a ta	ig with key = Na	me and value = Webserver.	Learn more about tagging your Amazon EC2 resources.	
Key (128 ch	naracters maximum)				Value (256 characters m	naximum)	
Name					backspace-lab-intro-ec2		8
Add another t	ag (Up to 50 tags ma	aximum)					
					Cancel F	Previous Review and Launch Next: Configure Security Gr	oup

### Click Review and Launch

s	Select	an existing security group Press Certified by Bitnami-5-4-1-0-	r01 on Debian 10-AutogenByAWSMP-	
Vpe (i)	Description: This Protocol (i)	security group was generated by A	WS Marketplace and is based on recomn	Description (i)
ssh 🗸	ТСР	22	Custom	e.g. SSH for Admin Desktop
HTTP 🗸	TCP	80	Custom V 0.0.0/0	e.g. SSH for Admin Desktop
HTTPS 🗸	TCP	443	Custom 🖌 0.0.0.0/0	e.g. SSH for Admin Desktop
Add Rule				
A Warning				

#### Click Launch

ep 7: Review Instance Launch ase review your instance launch details. You can go back to edit changes for each section. Click Launch to assign a key pair to your instance and complete the launch proc	cess. 🔺
Improve your instances' security. Your security group, WordPress Certified by Bitnami and Automattic-5-6-0 on Debian 10- AutogenByAWSMP-, is open to the world. Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only. You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. Edit security groups	
AMI Details Edit A	AMI
WordPress Certified by Bitnami and Automattic This image may not be the latest version available and might include security vulnerabilities. Please check the latest, up-to-date, available version at https://bitnami.com/stacks. Root Device Type: ebs Virtualization type: hvm	
Hourly Software Fees: \$0.00 per hour on t2.micro instance. Additional taxes or fees may apply. Software charges will begin once you launch this AMI and continue until you terminate the instance.	
If you have an existing license entitlement to use this software, then you can launch this software without creating a new subscription. If you do not have an exi entitlement, then by launching this software, you will be subscribed to this software and agree that your use of this software is subject to the pricing terms and t seller's End User License Agreement	isting the
Instance Type Edit instance ty	уре
Cancel Previous	unch

# Select Proceed without a key pair

Select "I acknowledge that I will not be able to connect to this instance unless I already know the password built into this AMI."

#### Click Launch Instances





#### Wait for launch to initiate

Launch Status	
	Initiating Instance Launches
	Please do not close your browser while this is loading
	Creating security groups Successful
	Authorizing inbound rules Successful
	Subscribing to Product

When the launch process has started scroll to the bottom of the page and click "View Instances"



After a few minutes, the status of the instance will change to running and status checks will be completed (you will need to refresh the screen to see any changes).

Instances (1) Info	C Connect	Instance state 🔻	Actions <b>v</b>	Launch instances	•
<b>Q</b> Filter instances				< 1 >	0
Name 🛡	Instance ID	Instance state 🛛 🔻	Instance type 🔻	Status check	Ala
backspacel	i-0b65db6d6221f8bff	⊘Running ⊕Q	t2.micro	<ul> <li>Initializing</li> </ul>	No

# Viewing your web server

After the Status checks have completed click on the Instance ID to select the instance.

aws Services -	Resource Groups 🗸 🔸	û pcoady @ 3619-1943-5810 ▾ N. Virginia ▾ Support ▾
New EC2 Experience X	Instances (2)	C Actions V Launch instances V
EC2 Dashboard New	<b>Q</b> Filter instances	< 1 > @
Events New Tags	Name V Instance ID V	Instance state  V Instance type  V Status check  V A
Limits	backspace-lab-intro-ec2	⊘ Running t2.micro 2/2 checks N

Copy the public IP address of your web server (don't click on open address).

Instances       i-0b65db6d6221f         Instance summary for i-0b65d         Updated less than a minute ago         C       Connect	8bff db6d6221f8bff (backspacelab- state ▼	intro-ec2) Info
Instance ID	Public IPv4 address	Private IPv4 addresses
<ul> <li>i-0b65db6d6221f8bff</li> <li>(backspacelab-intro-ec2)</li> </ul>	35.173.248.57   open address 🖸	<b>1</b> 72.31.26.97
Instance state	Public IPv4 DNS	Private IPv4 DNS
<b>O</b> Kunning	<ul> <li>ec2-35-173-248-57.compute-</li> <li>1.amazonaws.com   open address </li> </ul>	D ip-172-31-26-97.ec2.internal
Instance type	Elastic IP addresses	VPC ID
t2.micro	-	🗇 vpc-e4a1b39f (Default VPC) 🖸
AWS Compute Optimizer finding	IAM Role	Subnet ID
Opt-in to AWS Compute Optimizer for recommendations.   Learn more	-	🗇 subnet-b13a5efb 🛂

Paste the IP address in your browser.



# Troubleshooting viewing your WordPress application

If you cannot view your website it probably hasn't finished the launch process completely.

If you navigate to your website and it displays a security message, you have tried to open with https not http.

If after quite some time you still can't view your website, it may be that your security group does not allow inbound requests on port 80 (http). The inbound rules should include:

80 tcp 0.0.0.0/0

Scroll down and click on the Security tab

	curity Networkir	ng Storage Monitoring	g Usage instructions Tags			
<ul> <li>Security det</li> </ul>	ails					
IAM Role -		Owner ID 361919435810	Launch time Tue Sep 01 2020 04:18:12 GMT+1000 (Australian Eastern Standard Time)			
Security groups						
🗗 sg-03dd052	bbd08c91ff (WordPres	s				
Certified by Bitn	ami and Automattic-5-					
5-1 on Debian 1	0-AutogenByAWSMP-)		-1 on Debian 10-AutogenBvAWSMP-)			
▼ Inbound rul	es					
<ul> <li>Inbound rule</li> <li>Q Filter rules</li> </ul>	es		< 1 >			
<ul> <li>Inbound rule</li> <li>Q Filter rules</li> <li>Port range</li> </ul>	es Protocol	Source	Security groups Word			
<ul> <li>Inbound rul</li> <li>Q. Filter rules</li> <li>Port range</li> <li>80</li> </ul>	es Protocol TCP	Source 0.0.0.0/0	Security groups Word WordPress Certified by Bitnami and true			
<ul> <li>Inbound rule</li> <li><i>Q</i> Filter rules</li> <li>Port range</li> <li>22</li> </ul>	es Protocol TCP TCP	Source 0.0.0.0/0 0.0.0.0/0	Security groups Word WordPress Certified by Bitnami and true WordPress Certified by Bitnami and true			

If the rule is not present you will need to add it by clicking on the security group to open it:

<ul> <li>Security details</li> </ul>	-	
IAM Role	Owner ID	Launch time
Security groups	91ff (WordPress Automattic-5- enBwAWSMP-)	Tue Sep 01 2020 04:18:12 GMT+1000 (Australian Eastern Standard Time)

#### Click on the Inbound rules tab

Click on Edit

EC2 Dashboard New	Security Groups (1/1) Info
Events New	Q. Filter security groups ( 1 )
Tags Reports	Security group ID: sg-02f48599856e178be X Clear filters
Limits	
▼ INSTANCES	Security group ID A Security group name VPC ID V Description V
Instances	sg-02f48599856e178be WordPress Certified by vpc-e4a1b39f 🖸 This security group wa
Instance Types	
Launch Templates	
Spot Requests	
Savings Plans	
Reserved Instances	
Dedicated Hosts New	Details Inbound rules Outbound rules Tags
Scheduled Instances	
Capacity Reservations	Inbound rules

# Add a rule for HTTP and Anywhere

#### Click Save rules

Edit inbound i	rules Info				
ibound rules control the in	coming traffic th	at's allowed to reach the in	istance.		
Inbound rules Info					
Type Info	Protocol Info TCP	Port range Info 80	Source Info	Description - optional Info	Delete
NOTE: Any edits on that rule to be	made on existing e dropped for a ve	rules will result in the edit ery brief period of time un	ed rule being deleted and a new rule cre til the new rule can be created.	ated with the new details. This will cause traf	fic that depends
				Cancel Preview change	Save rules

# Finding the Username and Password for your WordPress application

Go back to the EC2 console and select "Monitor and troubleshoot", "Get System Log". Do not click on connect.

Instances (1/1) Info	C Connec	t Instance state 🔻	Actions Launch in	stances	•
<b>Q</b> Filter instances			Connect	1 >	0
Name 🔻	Instance ID	Instance state 🛛 🛡	Manage instance state	eck	
backspacel	i-0b65db6d6221f8bff		Instance settings	ecks	
		Get system log Get instance screenshot	Networking Security	•	
		Manage detailed monitoring	Image and templates	•	
		Manage CloudWatch alarms	Monitor and troubleshoot		

Scroll up until you find the log entry for the application username and password and copy it.

Get system log Info Copy log 🕑 Download
Review system log for instance i-00f5796aa6147804c as of Tue Sep 01 2020 04:37:48 GMT+1000 (Australian Eastern Standard Time)
[ 70.697584] bitnami[536]: ## 2020-08-31 18:19:41+00:00 ## INFO ## Running /opt/bitnami/var/init/pre-start/040_stack_etc
[ 70.714821] bitnami[536]: ## 2020-08-31 18:19:41+00:00 ## INFO ## Running /opt/bitnami/var/init/pre-start/050_clean_pids
[ 70.818329] bitnami[536]: ## 2020-08-31 18:19:41+00:00 ## INFO ## Running /opt/bitnami/var/init/pre-start/060_check_if_demo_machine
[ 71.102868] bitnami[536]: ## 2020-08-31 18:19:41+00:00 ## INFO ## Running /opt/bitnami/var/init/pre-start/070_change_boot_log_permission
[ 71.110727] bitnami[536]: ## 2020-08-31 18:19:41+00:00 ## INFO ## Running /opt/bitnami/var/init/pre-start/080_prevent_incoming_connectio
[ 73.247197] bitnami[536]: ## 2020-08-31 18:19:43+00:00 ## INFO ## 80 has been blocked
[ 75.257493] bitnami[536]: ## 2020-08-31 18:19:45+00:00 ## INFO ## 443 has been blocked
[ 75.266053] bitnami[536]: ## 2020-08-31 18:19:45+00:00 ## INFO ## Running /opt/bitnami/var/init/pre-start/090_get_default_passwords
[ 75.550791] bitnami[536]: ####################################
[ 75.560766] bitnami[536]: # #
[ 75.570363] bitnami[536]: # Setting Bitnami application password to '4UB0VEI2FAV1' #
[ 75.577887] bitnami[536]: # (the default application username is 'user') #
[ 75.584063] bitnami[536]: # #
[ 75.591147] bitnami[536]: ####################################
[ 75.597509] bitnami[536]: ## 2020-08-31 18:19:45+00:00 ## INFO ## Running /opt/bitnami/var/init/pre-start/100_regenerate_keys
[ 90.621276] bitnami[536]: [Mon 31 Aug 2020 06:20:01 PM UTC] Regenerating keys for wordpress
[ 95.314625] bitnami[536]: [Mon 31 Aug 2020 06:20:05 PM UTC] Regenerating keys for wordpress finished
[ 95.323478] bitnami[536]: [Mon 31 Aug 2020 06:20:05 PM UTC] Regenerating keys for apache2
[ 105.098379] bitnami[536]: [Mon 31 Aug 2020 06:20:15 PM UTC] Regenerating keys for apache2 finished
[ 105.105143] bitnami[536]: [Mon 31 Aug 2020 06:20:15 PM UTC] Finished regenerating keys
[ 105.111226] bitnami[536]: ## 2020-08-31 18:20:15+00:00 ## INFO ## Running /opt/bitnami/var/init/pre-start/110_configure_default_password

Go to the admin subdirectory of your website in your browser

/ 🧊 EC2 Managem	ent Conso 🗙 🗋 user's Blog! – Just anothe 🗙
< → C ☆	C 52.201.236.7/admin
	and the second se

Enter Username user and paste in the password

43

BackSpace Academy AWS Certified Associate

Username or Email Address
Password
Remember Me Log In

#### You will now be in the admin section of your WordPress application



# Troubleshooting logging in to the WordPress application

If you get the following message:

![](_page_45_Figure_1.jpeg)

You have tried to connect to the Linux operating system by clicking on "Connect". Do not click on connect, select "Actions – "Instance settings" - "Get System Log" as detailed previously.

# Clean up

Select Actions -> Instance State -> Terminate

Inst	ances (1/2)			C	Actions 🔺 Launch inst	ances 🔻
Q	Filter instances			_	View details	> @
					Connect	
	Name 🗸 🗸	Instance ID	▼ Instance sta	te ⊽	Get Windows password	eck ⊽
	backspace-lab-intro-ec2	i-00f5796aa6147804c	Running		Create template from instance	ecks
	aws-cloud9-BackSpace	i-0c6d75806f0069664	Stopped		Launch more like this	
•					Manage tags	
			Stop instance		Instance state	
			Start instance		Instance settings	
			Reboot instance		Networking <b>•</b>	
			Hibernate instar	ce	lmage 🕨	
			Terminate insta	ice	Monitoring <b>•</b>	
			Manage instance	state		
					_	

Make sure you terminate the instance so that you are not billed for it anymore.

Terminate instance?	×
Instance IDs 🗗 i-00f5796aa6147804c (backspace-lab-intro-ec2)	
To confirm that you want to terminate the instance, press the <i>terminate</i> button Terminating the instance cannot be undone	below.
Cancel	inate

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# Sending Emails with Amazon SES

## In this section, we will use the Simple Email Service to send an email.

From the AWS console search SES

Click Simple Email Service

![](_page_47_Picture_5.jpeg)

Click on 'Email addresses"

Click on 'Verify a New Email Address"

![](_page_47_Picture_8.jpeg)

Enter your email address and click 'Verify this Email Address"

/erify a New Email Address	×
To verify a new email address, enter it below and click the Ver	ify This Email Address
button. A verification email will be sent to the email address yo	ou entered.

When you receive your verification email click on the supplied link.

You will then receive a success page

Congratulations!
You have successfully verified an email address. You can now start sending email from this address.
For new Amazon SES users — If you have not yet applied for a sending limit increase, then you are still in the sandbox environment, and you can only send email to addresses that have been verified. To verify a new email address or domain, see the <b>Identity Management</b> section of the Amazon SES console.
For new Amazon Pinpoint users — If you have not yet applied for a sending limit increase, then you are still in the sandbox environment, and you can only send email to addresses that have been verified. To verify a new email address or domain, see the Settings > Channels page on the Amazon Pinpoint console.
If you have already been approved for a sending limit increase, then you can start sending email to non-verified addresses.
Thank you for using Amazon Web Services!

Go back to the SES console page and refresh the information to see the email has been verified

Verify a New Email Address Sen	d a Test Email Remove View Details	<b>3</b> 0
Q Search email addresses	X All identities 👻	≪ ≪ 1 to 1 of 1 items ≫ ≫
Email Address Identities	5	Status
		verified

Click on the email address and select 'Send a test email"

Verify a New Email Address Send a Test Email Remove View Details	<del>•</del> •
Q Search email addresses X All identities 👻	≪ ≪ 1 to 1 of 1 items >> >>
Email Address Identities	Status
	verified

Enter the same email address for from and to.

Fill out the email information and click 'Send test email"

Send Test Email	×
Complete the details below to send a test email to the selected email address.	
Email Format:  Formatted  Raw	
From*:	
To*:	
Subject*: This is an SES test	
Body: This is an SES test	
* Required Cancel Send Test Ema	

Check your email to see if it worked.

# Requesting full access to SES

New accounts only have sandbox access but this can be changed by applying to AWS.

Click on Sending Statistic

Click on Edit your account details

![](_page_49_Figure_5.jpeg)

# Creating a Billing Alert with CloudWatch and SNS

In this section, we will create a CloudWatch billing alert that will send an email through the Simple Notification Service whenever our estimated monthly bill exceeds a certain level.

# **Enabling Billing Alerts**

From the AWS management console search Billing

Select Billing

aws Services ▼	Q billing	×	Σ	¢	BackSpace Labs
	Search results for 'billing'				
Services (1) Features (1)	Services				
Documentation (4,290) Marketplace (116)	Access, analyze, and control your AWS costs and usage.				
	Features				

Select Billing Preferences Check Receive Free Tier Usage Alerts Check Receive Billing Alerts

Home Cost Management	IMPORTANT: Upcoming change to the Detailed Billing Report (DBR) and the Detailed Billing Report with Resources & Tags (DBR-RT)     On June 15, 2019, AWS will be changing the way unused reservation costs are presented in the legacy Detailed Billing Reports. If you currently use the DBR or DBF     portions of your reservation costs, then you should begin using the AWS Cost & Usage Reports. Learn more
Cost Explorer Budgets	
Cost & Usage Reports	Preferences
Cost allocation tags	▼ Billing Preferences
Billing Bills	Receive PDF Invoice By Email Turn on this feature to receive a PDF version of your invoice by email. Invoices are generally available within the first three days of the month.
Payment history Credits	Disable credit sharing When credit sharing is disabled, credits will only be applied to the credit owner's account, and will not be shared across accounts in the same billing family. Download cre preference history.
Preferences Billing preferences	<ul> <li>▶ RI discount sharing ⊕</li> <li>▼ Cost Management Preferences</li> </ul>
Payment methods Consolidated billing Tax settings	Receive Free Tier Usage Alerts Turn on this feature to receive email alerts when your AWS service usage is approaching, or has exceeded, the AWS Free Tier usage limits. If you wish to receive these email address that is not the primary email address associated with this account, please specify the email address below.
	Email Address: Receive Billing Alerts Turn on this feature to monitor your AWS usage charges and recurring fees automatically, making it easier to track and manage your spending on AWS. You can set up to receive email notifications when your charges reach a specified threshold. Once enabled, this preference cannot be disabled. Manage Billing Alerts or try the new budge
	▶ Detailed Billing Reports [Legacy] Save preferences

Click Save preferences

# Creating a CloudWatch Alarm

From the AWS management console search *CloudWatch* 

### Select CloudWatch

![](_page_51_Picture_6.jpeg)

Click on 'Alarms", 'Create Alarm"

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![](_page_52_Picture_0.jpeg)

## Click Select metric

P 1 ecify metric and nditions	Specify metric and conditions	
tep 2	Metric	
Configure actions Step 3 Add name and description	Graph Preview of the metric oc metric expression and the alarm threshold.	
Step 4	Cancel	Next

#### Search Billing

If you do not see any billing metrics it is most probably you are not operating in the US-East1 (N. Virginia) region. Please ensure you always operate from the US-East region during the course.

1							
0.8							
0.6				Your CloudW	atch graph i	s empty.	
0.4				Select some m	etrics to app	bear nere.	
0.2							
0 15:30	15:45	16:00	16:15 16:30	16:45	17:00	17:15	17:
All metrics	Graphed metrics	Graph opti	ons Source				
Q Search fo	or any metric, dimensio	on or resource id					
Q Search for 625 Metric	or any metric, dimensio S	on or resource id					
Q Search fo 625 Metric Billing	or any metric, dimensions s	on or resource id	CloudFront			DynamoDB	

If you do not see any billing metrics it is most probably you are not operating in the US-East1 (N. Virginia) region. Please ensure you always operate from the US-East region during the course.

Select *Total Estimated Charge* from the billing metrics.

All metrics	Graphed metrics	Graph options	Source	]
All > Billing	<b>Q</b> Search for any me	etric, dimension or resour	ce id	
55 Metrics				
By Linked 32 Metrics	Account and Ser	vice		By Linked Account 3 Metrics
By Service	e			Total Estimated Charge

## Select EstimatedCharges metric

### Click Select metric

elect metric												3
Untitled grap	oh 🥒						1h <mark>3h</mark> 12i	n 1d 3d 1	w custom -	Line	•	3.
No unit 140												
140												
140												
139 10:00 EstimatedCha	10:05 arges	10:10	10:15	10:20	10:25	10:30	10:35	10:40	10:45	10:50	10:55	11:00
All metrics	Graphe	d metrics (1)	Graph	options	Source	***						
All > Billing	> Total E	stimated Cha	rge <b>billi</b>	ng 🛛 Q	Search for ar	ıy metric, dirr	ension or re	source id			Graph	search
Currenc	sy (1)					Metric Nan	1e					
						EstimatedC	harges					
										Cance	al Selec	t metric

Set the alarm threshold to not exceed \$10

Click Next

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CloudWatch > Alarms > Step 1 Specify metric and conditions	Specify metric and conditions	
Step 2	Metric	Edit
Configure actions	Graph This alarm will trigger when the blue line goes above the red line	for 1 datapoints within 6 hours.
Step 3 Add name and description	No unit	Namespace AWS/Billing
Step 4	100	Metric name
rieview and create		Currency
	50	USD
	005/26 05/28 05/30 05/31 EstimatedCharges	Q Maximum X
		Period 6 hours
	Conditions Threshold type	
	• Static Use a value as a threshold	O Anomaly detection Use a band as a threshold
	Whenever EstimatedCharges is Define the alarm condition. Greater > threshold Greater/Equal >= threshold	Lower/Equal     Lower       <= threshold     < threshold
	than Define the threshold value. 10 USD Must be a number	
	Additional configuration	
		Cancel

Select in Alarm for notification

Select Create new topic

Enter a unique topic name

Enter an email address to receive the alert

Click Create Topic

CloudWatch > Alarms > Creat Step 1 Specify metric and conditions	Configure actions
Step 2	Notification
Configure actions	Alarm state trigger Remove
Step 3 Add name and description	In alarm       Insufficient data         The metric or expression is outside of the defined threshold.       Insufficient data         The metric or expression is within the defined threshold.       Insufficient data
Step 4 Preview and create	Select an SNS topic         Optime the SNS (Simple Notification Service) topic that will receive the notification.         Select an existing SNS topic         Optime the SNS (Simple Notification Service) topic that will receive the notification.         Select an existing SNS topic         Optime the SNS (Simple Notification Service) topic that will receive the notification.         Use topic name must be united.         proady-Account-Billing-Alert         SNS topic names can contain only alphanumeric characters, hyphens (-) and underscores ().         Email endpoints that will receive the notification         yield a comma-separated test of email addresses. Each address will be added as a subscription to the topic above.         Optime Separated test of email addresses. Each address will be added as a subscription to the topic above.         Optime Separated test of email addresses. Each address will be added as a subscription to the topic above.         Optime Separated test of email addresses. Each address will be added as a subscription to the topic above.         Optime Separated test of email addresses. Each address will be added as a subscription to the topic above.         Optime Separated test of email addresses. Each address will be added as a subscription to the topic above.         Optime Separated test of email addresses.         Optime Separated test of email addresses.         Optime Separated test of email addresses.         Descord addresses. <t< td=""></t<>

#### Click Next

Q pcoady-Account-Billing-Alert	×	
Only email lists for this account are available		
Email (endpoints)		
aws@backspace.academy - View in SN	S Console 🗗	
Add notification		
Auto Scaling action		
Auto Scannu action		
5		
Add Auto Scaling action		
Add Auto Scaling action EC2 action This action is only available for EC2 Per-Instance	Metrics	
Add Auto Scaling action EC2 action This action is only available for EC2 Per-Instanc Add EC2 action	Metrics	
Add Auto Scaling action EC2 action This action is only available for EC2 Per-Instanc Add EC2 action	Metrics	
Add Auto Scaling action EC2 action This action is only available for EC2 Per-Instanc Add EC2 action	Metrics Cancel Previo	

# Give the alarm a unique name

Click Next

55

CloudWatch > Alarms >	Create alarm	
Step 1 Specify metric and conditions	Add a description	
Step 2	Name and description	
	Define a unique name	
Step 3 Add a description	pcoady-Account-billing-alert	
Step 4	Alarm description - optional Define a description for this alarm. Optionally you can also use markdown.	
Preview and create	Alarm description	
	Up to 1024 characters (0/1024)	
	Cancel Previous Next	

Click Create alarm

		пипеорисс
Step 4		AWS/Billing
Preview and create	150	Metric name
		EstimatedCharges
	100	Currency
		USD
	50	Statistic
		Maximum
	07/16 07/18 07/20 07/22	Derived
	EstimatedCharges	6 hours
	Conditions	
	Threshold type	
	Static	
	Whenever EstimatedCharges is	
	Greater (>)	
	than	
	10	
	Additional configuration	
	Step 2: Configure actions	Edit
	Actions	
	Notification When in Alarm, send a notification to "pcoady-Account-Billing-Alert"	
	Step 3: Add a description Name and description	Edit
	Name Description pcoady-Account-billing- alert	
		Cancel Previous Create alarm

# If you haven't already confirmed your email a confirmation email will be sent to you.

Search Current Mailbox     ♀     Current Mailbox       All     Unread     By Date ~ ↑       ~     Today	AWS Notification - Subscription Confirmation AWS Notifications <no-reply@sns.amazonaws.com></no-reply@sns.amazonaws.com>
AWS Notifications AWS Notification - Subscri 1:34 PM You have chosen to	You have chosen to subscribe to the topic: arn:aws:sns:us-east-1:161762789278:pcoady-Account-Billing-Alert
AWS Notifications AWS Notification - Subscri 1:31 PM You have chosen to	To confirm this subscription, click or visit the link below (If this was in error no action is necessary):
Udemy Join in! Your course Amaz 10:03 AM	Please do not reply directly to this email. If you wish to remove yourself from receiving all future SNS subscription confirmation requests please send an email to ans-opt-out

Click on the link in the email to confirm the SNS subscription

![](_page_58_Picture_2.jpeg)

Go back to the CloudWatch console and refresh the screen.

The Alarm State will be INSUFFICIENT\_DATA until enough data has been collected by CloudWatch

Events		nity state v i / w
Rules Event Buses	Name 🗢 State	✓ Conditions Acti
Logs Insights	□ test-ReadCapacityUnitsLimit-BasicAlarm ♥ OK	ConsumedReadCapacityUnits >= 240 for 5 No r datapoints within 5 minutes
Metrics	□ test-name-index-WriteCapacityUnitsLimit-BasicAlarm ⊘ OK	ConsumedWriteCapacityUnits >= 240 for 60 No r datapoints within 1 hour
Settings	test-name-index-ReadCapacityUnitsLimit-BasicAlarm	ConsumedReadCapacityUnits >= 240 for 60 No r
• Add a dashboard	test-WriteCapacityUnitsLimit-BasicAlarm	ConsumedWriteCapacityUnits >= 240 for 5 datapoints within 5 minutes No r
	proady-Account-billing-alert     consultation	nt data EstimatedCharges > 10 for 1 datapoints within 6 Valic hours
		HealthyHostCount <= 1 for 1 datapoints within 1

After a few days you will have plenty of billing data to view

aws	Services 🗸	Resource Groups 🐱 🔭		🇘 Paul Coady 👻 N. Virg	inia 🔹 Support 👻
CloudWatch Dashboards		CloudWatch > Alarms		Switch to	o your original interface
Alarms ALARM INSUFFICIENT		Alarms (10)	Clear selection C Crea	ate composite alarm Actions V ny state V Any type V	Create alarm
Billing		□ Name ▼ State		Conditions	Actions
Log groups		□ pcoady-billing-alert	2020-06-01 17:59:23	6 hours	-

# **Creating** an IAM User

In this section, we will use the Identity and Access Management (IAM) service to create a user with console access and programmatic access.

From the AWS console click search IAM

#### Select IAM

aws Services ▼	Q iam X D	<u>,</u>
	Search results for 'iam'	
Services (1)	Services	
Features (10) Documentation (47,449 Marketplace (189)	) IAM Manage access to AWS resources	
	Features	See
	Groups	

## Select Users -> Add user

Search IAM  Dashboard	Add user Delete user	e or access key	
Groups Users	User name 👻	<b>Groups</b> Adiministrators	Access key age
Roles Policies Identity providers Account settings Credential report			

#### Give the user a name

Add user	1	2	3	4
	Details	Permissions	Review	Complete
Set user details				
You can add multiple users at once with the same access type and permission	s. Learn more			
User name* Lest-user Add another user				

#### Check Programmatic access

# Check AWS Management Console access

#### Click Next: Permissions

Select AWS access type		
Select how these users will access AWS. Acc	and autogenerated passwords are provided in the last step. I	Learn more
Access type*	ogrammatic access ables an access key ID and secret access key for the AWS lls. VS Management Console access ables a password that allows users to sign-in to the AWS Ma	API, CLI, SDK, and other development anagement Console.
Console password*	togenerated password stom password	
Require password reset	er must create a new password at next sign-in ers automatically get the IAMUserChangePassword policy to ssword.	allow them to change their own
* Required		Cancel Next: Permissions

We won't set any permissions for the user at this point.

#### Click Next: Tags

Add user	1 2 3 4
Set permissions for test-user	
Add user to group	Attach existing policies directly
Add user to an existing group or create a new one. Using groups is a best-prace more	ctice way to manage user's permissions by job functions. Learn
Add user to group	
Create group	

#### We won't set any tags.

Click Next Review

![](_page_60_Picture_9.jpeg)

Click Create user

Add user		1 2 3 4 5
Review		
Review your choices. After you create th	e user, you can view and download the autogenerated p	password and access key.
A This user has no perm You haven't given this user a to the previous step and add	issions ny permissions. This means that the user has no access ng some type of permissions.	s to any AWS service or resource. Consider returning
User details		
User name	test-user	
AWS access type	Programmatic access and AWS Management Consol	e access
Console password type	Autogenerated	
Require password reset	Yes	
		Cancel Previous Create user

Download the csv file containing the user credentials (access key and secret access key) to a safe location.

You will need this for access using the Command Line Interface (CLI) later in the course.

٩dd	user			1	2 3 4 5
O Lo	Success You successful instructions for you can create Users with AW	ly created the users shown below. You c signing in to the AWS Management Cor new credentials at any time. S Management Console access can sign	can view and download use nsole. This is the last time th n-in at: https://backspace-la	er security credentials. You can hese credentials will be availal abs.signin.aws.amazon.com/co	i also email users ble to download. However, onsole
	User	Access key ID	Secret access key	Password	Email login instructions
+ (	test-user	AKIAVIRAUKQREM2SV2OF	********* Show	********* Show	Send email 🗗
					Close

# Creating a Highly Available Architecture with Elastic Beanstalk

In this section, we will create a highly available and fault tolerant architecture using the AWS Elastic Beanstalk service.

From the Management Console search Elastic Beanstalk

![](_page_62_Picture_4.jpeg)

### Click Create Application

![](_page_62_Picture_6.jpeg)

Give your application a name Test Application.

Create a web app	
Create a new application and environment with a sample application or your own code. By creating an environment, you allow AWS Elastic Beanstalk to manage AWS resources and permissions on your behalf. Learn more	
Application information	
Application name Test Application Up to 100 Unicode characters, not including forward slash (/).	

#### Scroll down to Platform

Select Node. Is as the platform

Platform	
Platform	
Node.js	▼
Platform branch	
Node.js 12 running on 64bit Amazon Linux 2	•
Platform version	
5.2.4 (Recommended)	•

## Scroll down to Application code

Select Sample application

Click Configure more options

Application code	
<ul> <li>Sample application Get started right away with sample code.</li> <li>Upload your code Upload a source bundle from your computer or copy</li> </ul>	one from Amazon S3.
Cancel	Configure more options Create application

Select High availability

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astic Beanstalk > Getting started	
Config	ure TestApplication-env
Presets	
Start fron values an	) a preset that matches your use case or choose Custom configuration to unset recommended d use the service's default values.
Configura	tion presets
🔘 Single	instance (Free Tier eligible)
🔘 Single	instance (using Spot instance)
O High a	availability
O High a	availability (using Spot and On-Demand instances)
O Custo	m configuration

#### Scroll down and click *Create app*

Health event log streaming: disabled Edit	Edit	Edit
Network	Database	Tags
This environment is not part of a VPC.	Engine: Instance class: Storage (GB): Multi-AZ:	Tags: none
Edit	Edit	Edit
	Cancel	Previous Create app

Your application will now start being created.

![](_page_64_Picture_5.jpeg)

After some time, your environment will be created.

Click on the website url

![](_page_65_Figure_1.jpeg)

#### You will now see the Sample Application

	What's Next?
Congratulations Your first AWS Elastic Beanstalk Node js application is now running on your own dedicated environment in the AWS Cloud	<ul> <li>AWS Elastic Beanstalk overview</li> <li>AWS Elastic Beanstalk concepts</li> <li>Deploy an Express Application to AWS Elastic Beanstalk</li> <li>Deploy an Express Application with Amazon ElastiCache to AWS Elastic Beanstalk</li> <li>Deploy a Geddy Application with Amazon ElastiCache to AWS Elastic Beanstalk</li> <li>Customizing and Configuring a Node is Container</li> <li>Working with Logs</li> </ul>

# Clean Up

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We will now delete the environment so that you will not be billed by AWS.

Click on Applications

Select the application

Select Actions -> Delete application

Elastic Beanstalk X	Elastic Beanstalk > Applications
Environments Applications Change history Recent environments TestApplication-env	All applications       C       Actions       Create a new application         Q. Filter results matching the display values       Create environment       Create environment         Delete application       View application versions       1       >       Image: Create environment
	Application name  Application Environments  Application Environments  Application Environments  Application Environment  Creat
	Test Application envTestApplication- 19 02:03:31 UTC+11002021-01- 19 02:03:31 UTC+1100arn:aws:elasticbeanstalk:u 1:361919435810:applicat Application

Confirm Application Deletion	×
Permanently delete <b>Test Application</b> ? This action can't be undone.	
If you proceed with this action, the following environments will be terminated: <ul> <li>TestApplication-env</li> </ul>	
Enter the name of the application to confirm:	
Cancel	te

## Click on the environment

Elastic Beanstalk $ imes$	Elastic Beanstalk > Applications
Environments Applications Change history	Info Your application is being deleted.
<ul> <li>Recent environments</li> <li>TestApplication-env</li> </ul>	All applications       C       Actions       Create a new application         Q. Filter results matching the display values        1       >       Image: Compare the display values
	Application name     Environments     □     Date     Last     ARN
	Test Application     TestApplication- env     2021-01- 19     2021-01- 19 02:42:57     arn:aws:elasticbeanstal 1361919435810:applic UTC+1100

You will now see your environment is being terminated.

![](_page_67_Figure_1.jpeg)

67 🖊