

WEB APP – SINGLE SERVER TO ELASTIC EVOLUTION (**STAGE 3**) BY **ADRIAN CANTRILL**

Note: The project instructions are detailed in Adrian's GitHub repository.

Project Link Source:

<https://github.com/acantril/learn-cantrill-io-labs/tree/master/aws-elastic-wordpress-evolution>

In this section, we build **Stage 3**, skipping **Stage 2** because it only involves refactoring the **Stage 1**, which is already covered in my initial CloudFormation templates.

Objectives:

- Offload the **Database** from the **WordPress instance** by migrating it to an **RDS instance**. This ensures that in the event of an instance crash, the database can survive, or vice versa.
- This practice is also necessary to enable **scaling** for both the WordPress app and the database without affecting each other.

Instructions:

1. Log in to your AWS Console. Ensure that your account has Administrator Access..
2. Copy and paste the following link into your browser
<https://console.aws.amazon.com/cloudformation/home?region=us-east-1#/stacks/quickcreate?templateURL=https://learn-cantrill-labs.s3.amazonaws.com/aws-elastic-wordpress-evolution/A4LVPC.yaml&stackName=A4LVPC>.

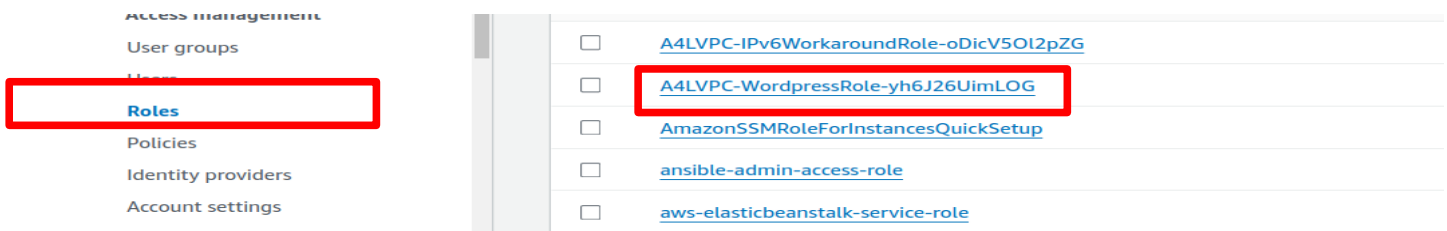
This CloudFormation template will create the infrastructure for our **WordPress** app. Click "**I acknowledge that AWS CloudFormation might create IAM resources,**" then click "**Create stack.**" Wait for the stack to move into the "**CREATE_COMPLETE**" state before continuing.

3. Download the CloudFormation template from this link:
https://github.com/robudexIT/awsdevopsproject/blob/cloudformation/cloudformation/wordpress/wordpress_instance_rds.yaml

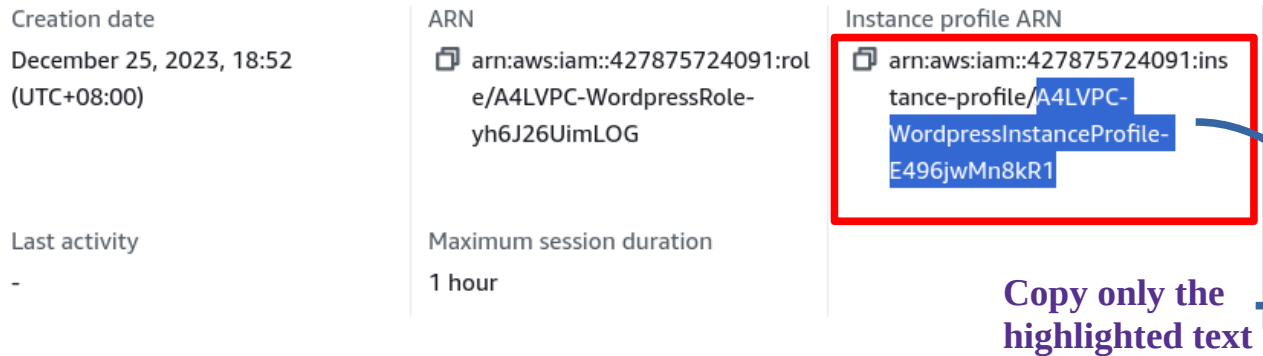
This CloudFormation template contains the same instructions as in **Stage 3**

4. Stage3 Instructions Cloudformation:

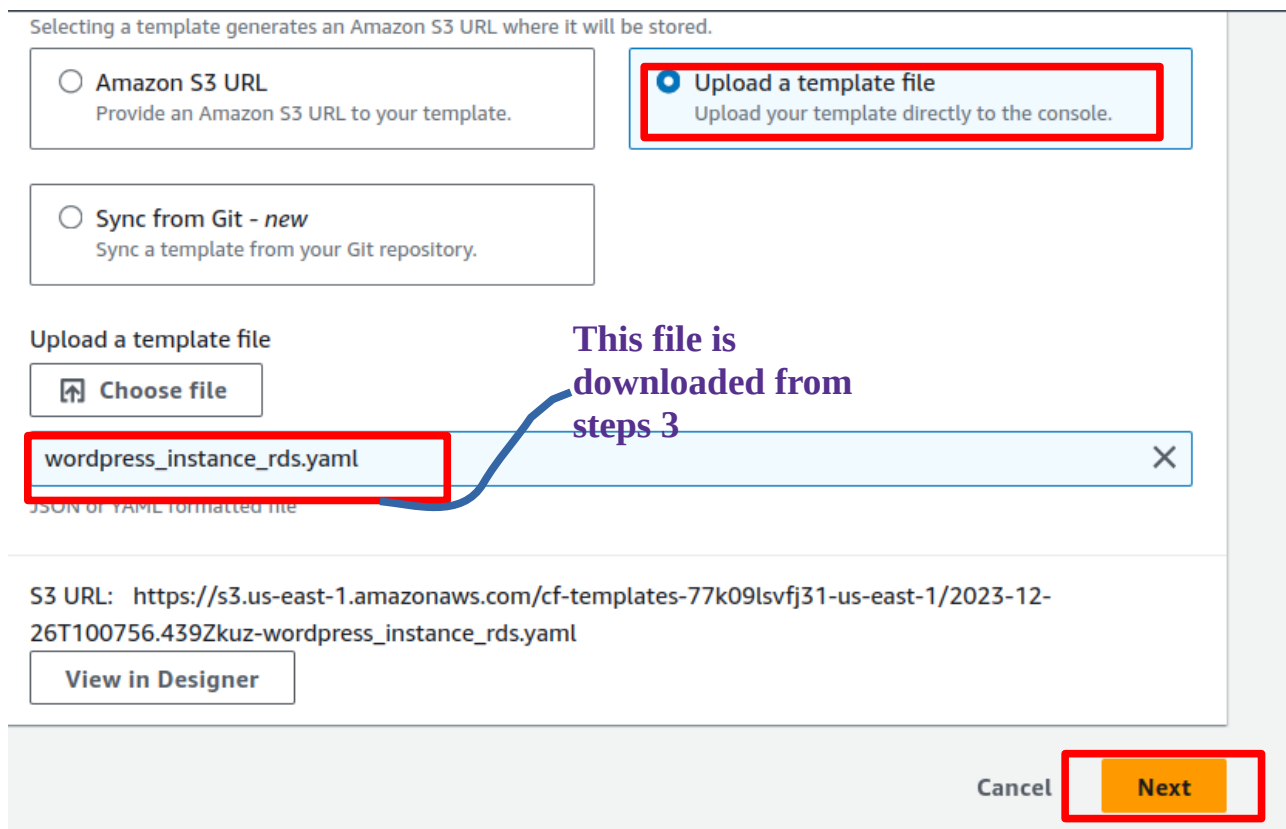
- Goto <https://us-east-1.console.aws.amazon.com/iam/home?region=us-east-1#/roles> and look for A4LVPC-WordpressRole Roles and click it.



- Copy the Instance Profile Name to your notes



- Goto Cloudformation and create stack:



Provide a stack name

Stack name

wordpress-rds-stack

Stack name can include letters (A-Z and a-z), numbers (0-9), and dashes (-).



arn:aws:cloudformation:us-east-1:427875724091:stack/A4LVPC/b3408440-a313-11ee-afd6-0e2f34435afd SNAPPC

subnet-0177e21a38dcb177d (172.31.0.0/20)

subnet-0a771ae5a6a2a3a32 (10.16.48.0/20) (sn-pub-A)

arn:aws:cloudformation:us-east-1:427875724091:stack/A4LVPC/b3408440-a313-11ee-afd6-0e2f34435afd
A4LVPC SNPUBA sn-pub-A

subnet-004ebde96b6eb2590 (10.16.16.0/20) (sn-db-A)

A4LVPC SNDBA

arn:aws:cloudformation:us-east-1:427875724091:stack/A4LVPC/b3408440-a313-11ee-afd6-0e2f34435afd

subnet-05c08ee520a8390db (10.16.96.0/20) (sn-app-B)

SNAPPB A4LVPC sn-app-B

arn:aws:cloudformation:us-east-1:427875724091:stack/A4LVPC/b3408440-a313-11ee-afd6-0e2f34435afd

subnet-001eec5267b580e13 (10.16.32.0/20) (sn-app-A)

arn:aws:cloudformation:us-east-1:427875724091:stack/A4LVPC/b3408440-a313-11ee-afd6-0e2f34435afd
SNAPPA A4LVPC sn-app-A

subnet-0de2004425a932a05 (172.31.48.0/20)

Select AWS::EC2::Subnet::Id

DbASubnetId

subnet-004ebde96b6eb2590 (10.16.16.0/20) (sn



arn:aws:cloudformation:us-east-1:427875724091:stack/A4LVPC/b3408440-a313-11ee-afd6-0e2f34435afd

subnet-0ae3364a501411aed (172.31.80.0/20)

subnet-03cd252bf11bd39c4 (10.16.80.0/20) (sn-db-B)

SNDBB A4LVPC

arn:aws:cloudformation:us-east-1:427875724091:stack/A4LVPC/b3408440-a313-11ee-afd6-0e2f34435afd sn-db-B

subnet-04b1598174ecd3e3 (10.16.176.0/20) (sn-pub-C)

arn:aws:cloudformation:us-east-1:427875724091:stack/A4LVPC/b3408440-a313-11ee-afd6-0e2f34435afd
A4LVPC SNPUBC sn-pub-C

subnet-0e178090712af5d85 (172.31.32.0/20)

subnet-083c530ba7cac3831 (10.16.112.0/20) (sn-pub-B)

A4LVPC

arn:aws:cloudformation:us-east-1:427875724091:stack/A4LVPC/b3408440-a313-11ee-afd6-0e2f34435afd
sn-pub-B SNPUBB

Select AWS::EC2::Subnet::Id

DbBSubnetId

subnet-03cd252bf11bd39c4 (10.16.80.0/

DbCSubnetId

DbC Subnet

Select AWS::EC2::Subnet::Id

DbA Subnet

subnet-004ebde96b6eb2590

DbBSubnetId

DbB Subnet

subnet-03cd252bf11bd39c4

DbCSubnetId

DbC Subnet

Select AWS::EC2::Subnet::Id

Q |

subnet-0899480f8d321a331 (172.31.16.0/20)

subnet-0098ca08e03981651 (172.31.64.0/20)

subnet-0d6aed522b2f7921c (10.16.144.0/20) (sn-db-C)

sn-db-C A4LVPC SNDB

arn:aws:cloudformation:us-east-1:427875724091:stack/A4LVPC/b3408440-a313-11ee-afd6-0e2f34435afd

subnet-0ae3364a501411aed (172.31.80.0/20)

subnet-03cd252bf11bd39c4 (10.16.80.0/20) (sn-db-B)

SNDBB A4LVPC

Name of an existing KeyPair to enable SSH access to the Instance

DbCSubnetId

subnet-0d6aed522b2f7921c (10.16.144.0/20)

subnet-0d6aed522b2f7921c

Q |

A4LVPC-SGLoadBalancer-W0TDFW1NXCG3 (sg-02b85935e398bd32e)

SGLoadBalancer A4LVPC

arn:aws:cloudformation:us-east-1:427875724091:stack/A4LVPC/b3408440-a313-11ee-afd6-0e2f34435afd

default (sg-07ed7f8f6da8f7bd2)

default (sg-0e7434be34ae371ae)

A4LVPC-SGEFS-E9OClKGONR7K (sg-04b9c54cd792738f2)

A4LVPC

arn:aws:cloudformation:us-east-1:427875724091:stack/A4LVPC/b3408440-a313-11ee-afd6-0e2f34435afd SGEFS

default (sg-0afc412c475946c55)

A4LVPC-SGDatabase-HPS0ZRPJB29C (sg-0e57ec766b5e64939)

A4LVPC SGDatabase

arn:aws:cloudformation:us-east-1:427875724091:stack/A4LVPC/b3408440-a313-11ee-afd6-0e2f34435afd

vprofile-alb-sg (sg-08009d847ef92d83b)

Select AWS::EC2::SecurityGroup::Id

RdsSecurityGroupID

A4LVPC-SGDatabase-HPS0ZRPJB29C (sg-0e57ec766b5e64939)

SSHLocation

The IP address or group of IP Address that allowed to access EC2 Instance

0.0.0.0/0

primary-ec2-keypair

Q

vprofile-backend-sg (sg-0702b0f5cce362f00)

primaryrootstack-VPCStack-16LRMPJIDMSQC-BackendSg-TA4QRS9WD5MM (sg-0fcb7b2befd2cfc18)
(BackendSg)
arn:aws:cloudformation:us-east-1:427875724091:stack/primaryrootstack-VPCStack-16LRMPJIDMSQC/7e03a0c0-71cf-11ee-8717-0eb7c939d005
BackendSg BackendSg primaryrootstack-VPCStack-16LRMPJIDMSQC

A4LVPC-SGWordpress-8D9EXLG7YMTX (sg-0c5012c6840ff7a02)

arn:aws:cloudformation:us-east-1:427875724091:stack/A4LVPC/b3408440-a313-11ee-81e8-024fe2435afd
A4LVPC SGWordpress

A4LVPC-SGWordpress-8D9EXLG7YMTX (sg-0c5012c6840

vprofile-frontend-sg (sg-037b0a748275fe2cc)

Select AWS::EC2::SecurityGroup::Id

WordpressSubnetId
Subnet of for Wordpress Server

Select AWS::EC2::Subnet::Id

Cancel Previous Next

InstanceProfileRole

Role use by the ec2 instance in your behalf

A4LVPC-WordpressInstanceProfile-E496jwMn8kR1

primary-ec2-keypair

Q |

subnet-0921b5419555cd4a4 (192.168.10.0/24) (backendPubSub01)

primaryrootstack-VPCStack-16LRMPJIDMSQC BackendPubSub01 BackendPubSub01
arn:aws:cloudformation:us-east-1:427875724091:stack/primaryrootstack-VPCStack-16LRMPJIDMSQC/7e03a0c0-71cf-11ee-8717-0eb7c939d005

subnet-048c1b4194fa799ca (10.16.160.0/20) (sn-app-C)

sn-app-C A4LVPC
arn:aws:cloudformation:us-east-1:427875724091:stack/A4LVPC/b3408440-a313-11ee-afd6-0e2f34435afd SNAPPC

subnet-0177e21a38dcb177d (172.31.0.0/20)

subnet-0a771ae5a6a2a3a32 (10.16.48.0/20) (sn-pub-A)

arn:aws:cloudformation:us-east-1:427875724091:stack/A4LVPC/b3408440-a313-11ee-afd6-0e2f34435afd
A4LVPC SNPUBA sn-pub-A

subnet-004ebde96b6eb2590 (10.16.16.0/20) (sn-db-A)

A4LVPC SNDBA
arn:aws:cloudformation:us-east-1:427875724091:stack/A4LVPC/b3408440-a313-11ee-afd6-0e2f34435afd sn-db-A

subnet-05c08ee520a8390db (10.16.96.0/20) (sn-app-B)

SNAPPB A4LVPC sn-app-B

Select AWS::EC2::Subnet::Id

Cancel

Previous

Next

WordpressSubnetId

subnet-0a771ae5a6a2a3a32 (10.16.48.0/20)

► **Stack policy**

Defines the resources that you want to protect from unintentional updates during a stack update.

► **Rollback configuration**

Specify alarms for CloudFormation to monitor when creating and updating the stack. If the operation breaches an alarm threshold, CloudFormation rolls it back.

► **Notification options**

► **Stack creation options**

Cancel

Previous

Next

No notification options

There are no notification options defined

Stack creation options

Timeout

-

Termination protection

Deactivated

► **Quick-create link**

Create change set

Cancel

Previous

Submit

wordpress-rds-stack

Delete

Stack info

Events

Resources



Outputs

Parameters

Template

Overview

Stack ID

 [arn:aws:cloudformation:us-east-1:427875724091:stack/wordpress-rds-stack/3554f280-a3e2-11ee-9976-12f426b06025](#) 

Description

-

Status

 **CREATE_COMPLETE**

Status reason

-

Stack info

Events

Resources

Outputs

Parameters

Template

Change sets

Git sync - new

Resources (8)

 Search resources

Logical ID



Physical ID



Type



Status



ParameterDBEndpoint

[/A4L/Wordpress/DBEndpoint](#) 

AWS::SSM::Parameter

 **CREATE_COMPLETE**

ParameterDBName

[/A4L/Wordpress/DBName](#) 

AWS::SSM::Parameter

 **CREATE_COMPLETE**

ParameterDBPassword

[/A4L/Wordpress/DBPassword](#) 

AWS::SSM::Parameter

 **CREATE_COMPLETE**

ParameterDBRootPassword

[/A4L/Wordpress/DBRootPassword](#) 

AWS::SSM::Parameter

 **CREATE_COMPLETE**

ParameterDBUser

[/A4L/Wordpress/DBUser](#) 

AWS::SSM::Parameter

 **CREATE_COMPLETE**

RDSWordpress

[a4lwordpress](#) 

AWS::RDS::DBInstance

 **CREATE_COMPLETE**

Wordpress

[i-0817aa04f4680068d](#) 

AWS::EC2::Instance

 **CREATE_COMPLETE**

WordPressRDSSubNetGroup

[wordpressrdssubnetgroup](#) 

AWS::RDS::DBSubnetGroup

 **CREATE_COMPLETE**

- Check If the RDS Instance is created successfully.

The screenshot shows the Amazon RDS console. On the left sidebar, the 'Databases' link is highlighted with a red box. The main content area shows a list of databases with one entry: 'a4lwordpress' with a status of 'Available'. This entry is also highlighted with a red box. Above the list, there are buttons for 'Group resources', 'Modify', 'Actions', 'Restore from S3', and 'Create database'.

- Go to <https://console.aws.amazon.com/ec2/v2/home?region=us-east-1#Instances:sort=desc:tag:Name>
- Select the Wordpress Instance and copy the Public IP Address and paste it to browser address bar
- If this page will appear that means the wordpress setup is successful

The screenshot shows the Amazon EC2 console. At the top, there are buttons for 'Connect', 'Instance state', 'Actions', and 'Launch instances'. Below these is a search bar and a filter for 'Instance state = running'. A table lists instances, with one entry 'Wordress' (ID: i-0817aa04f4680068d) in a 'Running' state. This row is highlighted with a red box. Below the table, the details for the selected instance are shown. Under the 'Networking' tab, the 'Public IPv4 address' is listed as '3.85.164.146', which is also highlighted with a red box. A blue arrow points from this address to the text 'Paste this Public Ip Address to Browser'.

**Paste this Public Ip
Address to Browser**

Welcome

Welcome to the famous five-minute WordPress installation process! Just fill in the information below and you'll be on your way to using the most extendable and powerful personal publishing platform in the world.

Information needed

Please provide the following information. Do not worry, you can always change these settings later.

Site Title

Username

Usernames can have only alphanumeric characters, spaces, underscores, hyphens, periods, and the @ symbol.

Password

19*rDCQRvtvnp)hcKh

Hide

Strong

Important: You will need this password to log in. Please store it in a secure location.

Your Email

Double-check your email address before continuing.

Search engine visibility

☐ Discourage search engines from indexing this site

It is up to search engines to honor this request.

Install WordPress

- **Let Perform Initial Configuration and make a post**

Welcome

Welcome to the famous five-minute WordPress installation process! Just fill in the information below and you'll be on your way to using the most extendable and powerful personal publishing platform in the world.

Information needed

Please provide the following information. Do not worry, you can always change these settings later.

Site Title

Catagram

Username

admin

Usernames can have only alphanumeric characters, spaces, underscores, hyphens, periods, and the @ symbol.

Password

4n1m4l54L1f3

Hide

Medium

Important: You will need this password to log in. Please store it in a secure location.

Your Email

rogmer.bulaclac@gmail.com

Double-check your email address before continuing.

Search engine visibility

☐ Discourage search engines from indexing this site

It is up to search engines to honor this request.

Install WordPress

Click This



Username admin

[Log_In](#)

Click This



admin

Password

● ● ● ● ● ● ● ● ● ● ● ●

☐ Remember Me

[Log In](#)

Lost your password?

[← Go to Catagram](#)

Login User and Password here:

- Click Posts in the menu on the left
- Select Hello World! Click Bulk Actions and select Move to Trash Click Apply
- Click Add New
- If you see any popups close them down
- For title The Best Animal(s)!
- Click the + under the title, select Gallery Click Upload
- Select some animal pictures.... if you dont have any use google images to download some Upload them
- Click Publish
- Click Publish Click view Post

Final Result:



- Let's log in to our instance to ensure that no **MariaDB/MySQL** database is installed:

EC2 > Instances > i-0817aa04f4680068d > Connect to instance

Connect to instance [Info](#)

Connect to your instance i-0817aa04f4680068d (Wordpress) using any of these options

EC2 Instance Connect

Session Manager

SSH client

EC2 serial console

Session Manager usage:

- Connect to your instance without SSH keys, a bastion host, or opening any inbound ports.
- Sessions are secured using an AWS Key Management Service key.
- You can log session commands and details in an Amazon S3 bucket or CloudWatch Logs log group.
- Configure sessions on the Session Manager [Preferences](#) [page](#).

Click This

Cancel **Connect**

```
[root@ip-10-16-57-211 bin]#  
[root@ip-10-16-57-211 bin]#  
[root@ip-10-16-57-211 bin]# systemctl status mariadb  
Unit mariadb.service could not be found.  
[root@ip-10-16-57-211 bin]#
```

**NO database
Installed Confirm**

- Log in to the RDS instance to make sure the WordPress database was installed successfully.

```
[root@ip-10-16-57-211 bin]# mysql -h a4lwordpress.ctgivagolcpv.us-east-1.rds.amazonaws.com -u a4lwordpressuser -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MySQL connection id is 80
Server version: 8.0.32 Source distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MySQL [(none)]> show databases
-> ;
+-----+
| Database |
+-----+
| a4lwordpressdb |
| information_schema |
| mysql |
| performance_schema |
| sys |
+-----+
5 rows in set (0.005 sec)
```

Wordpress Db

**Database
credentials is
located in
Parameter Store**

```
MySQL [(none)]> use a4lwordpressdb;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A
```

Database changed

```
MySQL [a4lwordpressdb]> show tables;
```

```
+-----+
| Tables_in_a4lwordpressdb |
+-----+
| wp_commentmeta |
| wp_comments |
| wp_links |
| wp_options |
| wp_postmeta |
| wp_posts |
| wp_term_relationships |
| wp_term_taxonomy |
| wp_termmeta |
| wp_terms |
| wp_usermeta |
| wp_users |
+-----+
```

Wordpress Tables

```
12 rows in set (0.001 sec)
```

```
MySQL [a4lwordpressdb]>
```

Thats Conclude the Stage 3.....

You can delete the the wordpress-stack.. dont delete the A4LVPC we will need it in Stage 4