

Summary:


This lab covers basics for *EC2, S3, CFN, CloudWatch, and R53*.

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1. 1st EC2 creation

Create free tier Linux EC2 instance:


Amazon Linux
 Free tier eligible

Amazon Linux 2 AMI (HVM), SSD Volume Type - ami-0dc2d3e4c0f9ebd18 (64-bit x86) / ami-008a8487adc2b32ec (64-bit Arm)

Select

☒ 64-bit (x86)
☐ 64-bit (Arm)

Amazon Linux 2 comes with five years support. It provides Linux kernel 4.14 tuned for optimal performance on Amazon EC2, systemd 219, GCC 7.3, Glibc 2.26, Binutils 2.29.1, and the latest software packages through extras. This AMI is the successor of the Amazon Linux AMI that is approaching end of life on December 31, 2020 and has been removed from this wizard.

Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	t2	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	t2	t2.micro <small>Free tier eligible</small>	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	t2	t2.small	1	2	EBS only	-	Low to Moderate	Yes

Cancel Previous **Review and Launch** Next: Configure Instance Details

Number of instances Launch into Auto Scaling Group

Purchasing option ☐ Request Spot instances

Network Create new VPC

Subnet Create new subnet

Auto-assign Public IP

Placement group ☐ Add instance to placement group

Capacity Reservation

Domain join directory Create new directory

Cancel Previous **Review and Launch** Next: Add Storage

Volume Type ⓘ	Device ⓘ	Snapshot ⓘ	Size (GiB) ⓘ	Volume Type ⓘ	IOPS ⓘ	Throughput (MB/s) ⓘ	Delete on Termination ⓘ	Encryption ⓘ
Root	/dev/xvda	snap-053c42bdb1128764a	8	General Purpose SSD (gp2) ▼	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypt ▼

Change Source to My IP:

Assign a security group: ☒ Create a **new** security group
☐ Select an **existing** security group

Security group name:
Description:

Type ⓘ	Protocol ⓘ	Port Range ⓘ	Source ⓘ	Description ⓘ
SSH ▼	TCP	22	My IP ▼ [REDACTED]	e.g. SSH for Admin Desktop ⓘ

Create and utilize keys

Select a key pair

☒ I acknowledge that I have access to the selected private key file (*.pem), and that without this file, I won't be able to log into my instance.

Cancel

Launch Instances

Instructions for connecting with SSH:

EC2 Instance Connect

Session Manager


SSH client

EC2 Serial Console

Instance ID

 `i-0d560f1fb92d0df36`


1. Open an SSH client.
2. Locate your private key file. The key used to launch this instance is myfirstec2instance.pem
3. Run this command, if necessary, to ensure your key is not publicly viewable.

 `chmod 400 myfirstec2instance.pem`

4. Connect to your instance using its Public DNS:

 `ec2-54-146-11-151.compute-1.amazonaws.com`

Example:

 `ssh -i "myfirstec2instance.pem" ec2-user@ec2-54-146-11-151.compute-1.amazonaws.com`

Connect using SSH, if using Win10 – SSH is loaded in CLI:

```

C:\Users\IvanVlad\Desktop\CLOUD STASH>ls
'ls' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\IvanVlad\Desktop\CLOUD STASH>cd aws training

C:\Users\IvanVlad\Desktop\CLOUD STASH\AWS Training>dir
Volume in drive C is OSDisk
Volume Serial Number is 241D-7C71

Directory of C:\Users\IvanVlad\Desktop\CLOUD STASH\AWS Training

07/11/2021  02:42 PM    <DIR>          .
07/11/2021  02:42 PM    <DIR>          ..
07/11/2021  01:26 AM             1,244,175  AWS-LABS_Account_Admin.docx
07/11/2021  01:04 AM                96  iamadmin_accessKeys_general.csv
07/11/2021  01:09 AM                96  iamadmin_accessKeys_production.csv
07/11/2021  02:42 PM             1,700  myfirstec2instance.pem
               4 File(s)          1,246,067 bytes
               2 Dir(s)        347,756,855,296 bytes free

C:\Users\IvanVlad\Desktop\CLOUD STASH\AWS Training>ssh -i "myfirstec2instance.pem" ec2-user@ec2-54-146-11-151.compute-1.
amazonaws.com
The authenticity of host 'ec2-54-146-11-151.compute-1.amazonaws.com (54.146.11.151)' can't be established.
ECDSA key fingerprint is SHA256:b0Ty1RBSMQpJF4Xa9014J0UeDxD87WToghVwD+/wucw.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-54-146-11-151.compute-1.amazonaws.com,54.146.11.151' (ECDSA) to the list of known hosts.

```

```

 _| ( _|_ )
 _| ( _|_ ) /
 _| \ _|_ |

Amazon Linux 2 AMI

https://aws.amazon.com/amazon-linux-2/
2 package(s) needed for security, out of 13 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-28-223 ~]$

```

2. 1st S3 Bucket creation

Create S3 koala bucket and upload files, create archive folder:

Search for services, features, marketplace products, and docs [Alt+S] iamadmin@ivan-general Global Support

Successfully created bucket "koalacampaign-ivan1234567" View details

To upload files and folders, or to configure additional bucket settings choose **View details**.

Amazon S3

Account snapshot View Storage Lens dashboard
Storage lens provides visibility into storage usage and activity trends. [Learn more](#)

Buckets (1) Info
Buckets are containers for data stored in S3. [Learn more](#)

Refresh Copy ARN Empty Delete Create bucket

Find buckets by name < 1 > Settings

Name	AWS Region	Access	Creation date
koalacampaign-ivan1234567	US East (N. Virginia) us-east-1	Objects can be public	July 11, 2021, 15:33:59 (UTC-05:00)

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koalacampaign-ivan1234567 [Info](#)
[Objects](#) | [Properties](#) | [Permissions](#) | [Metrics](#) | [Management](#) | [Access Points](#)
Objects (3)

Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3 inventory](#) to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

[Refresh](#) [Copy S3 URI](#) [Copy URL](#) [Download](#) [Open](#) [Delete](#) [Actions](#) [Create folder](#) [Upload](#)
 Find objects by prefix

[<](#) [1](#) [>](#) [Settings](#)

<input type="checkbox"/>	Name	Type	Last modified	Size	Storage class
<input type="checkbox"/>	koalanom1.jpg	jpg	July 11, 2021, 15:40:35 (UTC-05:00)	20.9 KB	Standard
<input type="checkbox"/>	koalanom2.jpg	jpg	July 11, 2021, 15:40:35 (UTC-05:00)	43.7 KB	Standard
<input type="checkbox"/>	koalazzz.jpg	jpg	July 11, 2021, 15:40:34 (UTC-05:00)	184.3 KB	Standard

3. 1st Cloud Formation Stack:

Create CFN stack:

[aws](#)
[Services](#)
 Search for services, features, marketplace products, and docs

[iamadmin@ivan-general](#)
[N. Virginia](#)
[Support](#)

Step 1

Specify template

Step 2

Specify stack details

Step 3

Configure stack options

Step 4

Review

Create stack

Prerequisite - Prepare template

Prepare template

Every stack is based on a template. A template is a JSON or YAML file that contains configuration information about the AWS resources you want to include in the stack.

☒ Template is ready
 ☐ Use a sample template
 ☐ Create template in Designer

Specify template

A template is a JSON or YAML file that describes your stack's resources and properties.

Template source

Selecting a template generates an Amazon S3 URL where it will be stored.

☐ Amazon S3 URL
 ☒ Upload a template file

Upload a template file

ec2instance.yaml

[Feedback](#)
[English \(US\)](#)

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Use YAML Template:

Parameters:

LatestAmiId:

Type: 'AWS::SSM::Parameter::Value<AWS::EC2::Image::Id>'

Default: '/aws/service/ami-amazon-linux-latest/amzn2-ami-hvm-x86_64-gp2'

KeyName:

Type: AWS::EC2::KeyPair::KeyName

Description: "Name of an existing SSH Keypair to access the instance"

SSHAndWebLocation:

Description: The IP address range that can be used to SSH to the EC2 instances

Type: String

MinLength: '9'

4

```

MaxLength: '18'
Default: 0.0.0.0/0
AllowedPattern: '(\d{1,3})\.\d{1,3})\.\d{1,3})\.\d{1,3})/(\d{1,2})'
ConstraintDescription: must be a valid IP CIDR range of the form x.x.x.x/x. Default is 0.0.0.0/0 and is less safe.
Resources:
  EC2Instance:
    Type: AWS::EC2::Instance
    Properties:
      KeyName: !Ref KeyName
      InstanceType: "t2.micro"
      ImageId: !Ref LatestAmiId
      IamInstanceProfile: !Ref SessionManagerInstanceProfile
      SecurityGroups:
        - !Ref InstanceSecurityGroup
  InstanceSecurityGroup:
    Type: 'AWS::EC2::SecurityGroup'
    Properties:
      GroupDescription: Enable SSH access via port 22 and 80
      SecurityGroupIngress:
        - IpProtocol: tcp
          FromPort: '22'
          ToPort: '22'
          CidrIp: !Ref SSHandWebLocation
        - IpProtocol: tcp
          FromPort: '80'
          ToPort: '80'
          CidrIp: !Ref SSHandWebLocation
  SessionManagerRole:
    Type: 'AWS::IAM::Role'
    Properties:
      AssumeRolePolicyDocument:
        Version: 2012-10-17
        Statement:
          - Effect: Allow
            Principal:
              Service:
                - ec2.amazonaws.com
            Action:
              - 'sts:AssumeRole'
      Path: /
      ManagedPolicyArns:
        - "arn:aws:iam::aws:policy/AmazonSSMManagedInstanceCore"
  SessionManagerInstanceProfile:
    Type: 'AWS::IAM::InstanceProfile'
    Properties:
      Path: /
      Roles:
        - !Ref SessionManagerRole
Outputs:
  InstanceId:
    Description: InstanceId of the newly created EC2 instance
    Value: !Ref EC2Instance
  AZ:
    Description: Availability Zone of the newly created EC2 instance
    Value: !GetAtt
      - EC2Instance
      - AvailabilityZone

```

```
PublicDNS:
  Description: Public DNSName of the newly created EC2 instance
  Value: !GetAtt
    - EC2Instance
    - PublicDnsName
PublicIP:
  Description: Public IP address of the newly created EC2 instance
  Value: !GetAtt
    - EC2Instance
    - PublicIp
```

Be sure to check IAM resources:

Capabilities

i The following resource(s) require capabilities: [AWS::IAM::Role]

This template contains Identity and Access Management (IAM) resources that might provide entities access to make changes to your AWS account. Check that you want to create each of these resources and that they have the minimum required permissions. [Learn more](#)

☒ I acknowledge that AWS CloudFormation might create IAM resources.

Stack completion:

Stacks (1)				Delete	Update
<input type="text"/> <i>Filter by stack name</i>			Active		
Stack name	Status	Created time			
<input type="radio"/> cfndemo1	CREATE_COMPLETE	2021-07-11 17:47:16 UTC-0500			

Test connection with session manager:

EC2 Instance Connect

Session Manager

SSH client

EC2 Serial Console

Session Manager usage:

- Connect to your instance without SSH keys or a bastion host.
- 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.

Cancel

Connect

Confirm directories & supported message inputs with Bash:

Session ID: iamadmin-0356c9b2f73b263b9






Instance ID: i-0cc2d235b3c9deecf




```
[ssm-user@ip-172-31-11-210 bin]$ df -k
Filesystem      1K-blocks    Used Available Use% Mounted on
devtmpfs        492676         0   492676  0% /dev
tmpfs           503444         0   503444  0% /dev/shm
tmpfs           503444       408   503036  1% /run
tmpfs           503444         0   503444  0% /sys/fs/cgroup
/dev/xvda1      8376300 1507344  6868956 18% /
tmpfs           100692         0   100692  0% /run/user/0



[ssm-user@ip-172-31-11-210 bin]$ dmesg
[    0.000000] Linux version 4.14.232-177.418.amzn2.x86_64 (mockbuild@ip-10-0-1-230)
Jun 15 20:57:50 UTC 2021
[    0.000000] Command line: BOOT_IMAGE=/boot/vmlinuz-4.14.232-177.418.amzn2.x86_64
console=ttyS0,115200n8 net.ifnames=0 biosdevname=0 nvme_core.io_timeout=4294967295 rd
[    0.000000] x86/fpu: Supporting XSAVE feature 0x001: 'x87 floating point registers'
[    0.000000] x86/fpu: Supporting XSAVE feature 0x002: 'SSE registers'
[    0.000000] x86/fpu: Supporting XSAVE feature 0x004: 'AVX registers'
[    0.000000] x86/fpu: xstate_offset[2]: 576, xstate_size[2]: 256
```

Deleting stack will also delete ALL associated resources that were created:

CloudFormation > Stacks

Stacks (1)     

 Filter by stack name  

Stack name	Status	Created time
 cfndemo1	 DELETE_IN_PROGRESS	2021-07-11 17:47:16 UTC-0500

4. Cloud Watch – test alarms & monitoring

- Demo Steps
- Create an EC2 instance
- t2.micro
- ensure its set to the default VPC and has a public IP
- Optionally enable detailed monitoring
- Connect to the instance and install Extras package and stress
- Install stress (commands listed in code sample below)
- Create an alarm based on the CPU Utilisation of the created instance
- Threshold greater than 15%
- Run stress 'stress -c 2'
- Wait for alarm to .. alarm
- use ctrl + c to cancel stress
- Wait for alarm to return to ..ok

- Delete the alarm
- Delete the instance


Use these commands on the instance:

```
TEXT
sudo amazon-linux-extras install epel -y
sudo yum install stress -y
```

Creating EC2 instance with Monitoring enabled:

Stop - hibernate behavior ⓘ ☐ Enable hibernation as an additional stop behavior

Enable termination protection ⓘ ☐ Protect against accidental termination

Monitoring ⓘ ☒ Enable CloudWatch detailed monitoring 
Additional charges apply.

Tenancy ⓘ Shared - Run a shared hardware instance ⓘ
Additional charges will apply for dedicated tenancy.

Key	Value
Name	cloudwatchEC2


Add another tag (Up to 50 tags maximum)

Monitoring Tab is now available in EC2 service:

cloudwatchEC2 i-0f6b83e64450e08c9 Running t2.micro Initializing No alarms + us-east-1a ec2-35-170-197-214.co... 35.170.197.214

Instance: i-0f6b83e64450e08c9 (cloudwatchEC2)

Details Security Networking Storage Status checks **Monitoring** Tags



Manage detailed monitoring Add to dashboard 1h 3h 12h 1d 3d 1w custom ↺ ↻

CPU utilization (%) 1 0.5 0 No data available. Try adjusting the dashboard time range. 23:45 00:00 00:15 00:30 ● i-0f6b83e64450e08c9 (cloudwatchEC2)	Status check failed (any) (count) 1 0.5 0 No data available. Try adjusting the dashboard time range. 23:45 00:00 00:15 00:30 ● i-0f6b83e64450e08c9 (cloudwatchEC2)	Status check failed (instance) (count) 1 0.5 0 No data available. Try adjusting the dashboard time range. 23:45 00:00 00:15 00:30 ● i-0f6b83e64450e08c9 (cloudwatchEC2)	Status check failed (system) (count) 1 0.5 0 No data available. Try adjusting the dashboard time range. 23:45 00:00 00:15 00:30 ● i-0f6b83e64450e08c9 (cloudwatchEC2)
Network in (bytes) 1 0.5 0 No data available. Try adjusting the dashboard time range.	Network out (bytes) 1 0.5 0 No data available. Try adjusting the dashboard time range.	Network packets in (count) 1 0.5 0 No data available. Try adjusting the dashboard time range.	Network packets out (count) 1 0.5 0 No data available. Try adjusting the dashboard time range.

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Create billing alarm for CPU usage > 15%

<input type="checkbox"/>	Name	State	Last state update	Conditions	Actions
<input type="checkbox"/>	CPUUsageOver15Percent	Insufficient data	2021-07-11 19:50:54	CPUUtilization > 15 for 1 datapoints within 1 minute	No actions

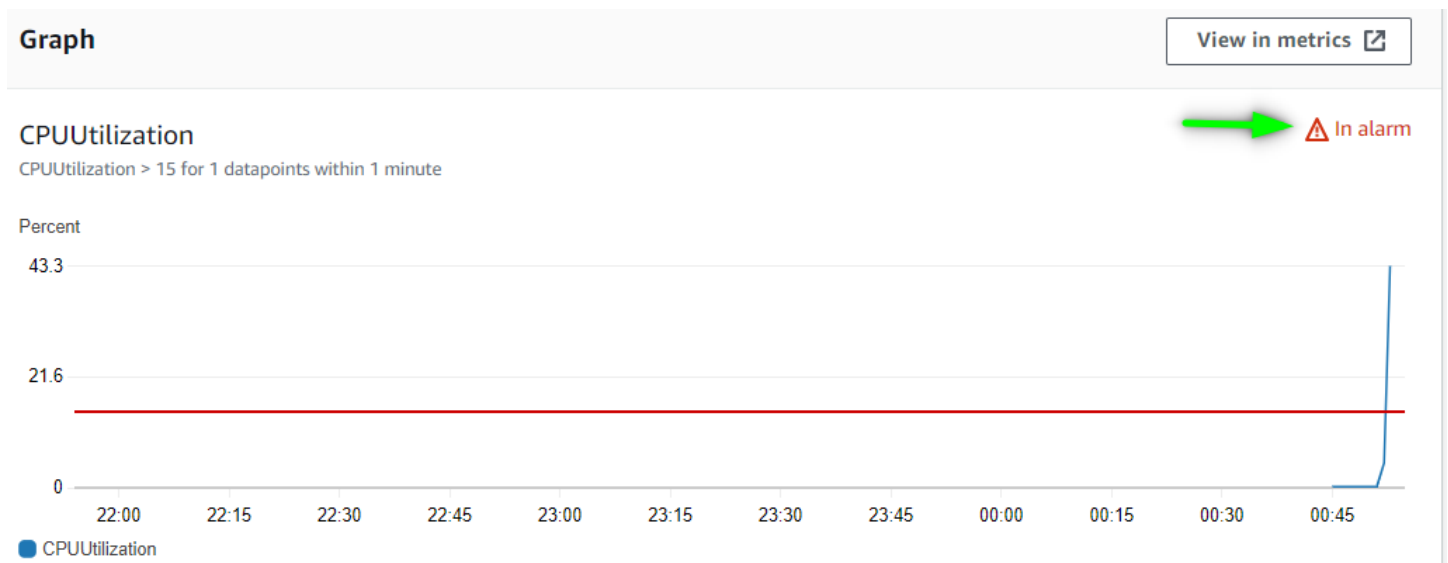
Connect to EC2, install Stress and verify:

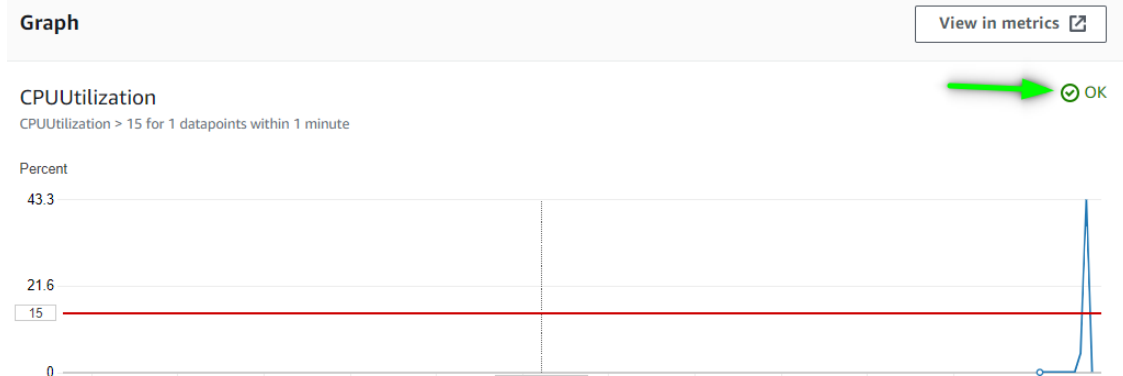
```
Total download size: 39 k
Installed size: 94 k
Downloading packages:
warning: /var/cache/yum/x86_64/2/epel/packages/stress-1.0.4-16.el7.x86_64.rpm: Header V3 RSA/SHA256 Signature, key ID 352c64e5: NOKEY
Public key for stress-1.0.4-16.el7.x86_64.rpm is not installed
stress-1.0.4-16.el7.x86_64.rpm                                | 39 kB  00:00:00
Retrieving key from file:///etc/pki/rpm-gpg/RPM-GPG-KEY-EPEL-7
Importing GPG key 0x352C64E5:
  Userid   : "Fedora EPEL (7) <epel@fedoraproject.org>"
  Fingerprint: 91e9 7d7c 4a5e 96f1 7f3e 888f 6a2f aea2 352c 64e5
  Package   : epel-release-7-11.noarch (@amzn2extra-epel)
  From      : /etc/pki/rpm-gpg/RPM-GPG-KEY-EPEL-7
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Installing : stress-1.0.4-16.el7.x86_64
  Verifying  : stress-1.0.4-16.el7.x86_64
Installed:
  stress.x86_64 0:1.0.4-16.el7
Complete!
[ec2-user@ip-172-31-8-19 ~]$
```

i-0f6b83e64450e08c9 (cloudwatchEC2)

Public IPs: 35.170.197.214 Private IPs: 172.31.8.19

Within cloudwatch, can observe instance as Stress creates false load on CPU usages:





5. Route 53 – Register Domain for Course

Navigate to Route53 to create and register domain:

Search for services, features, marketplace products, and docs [Alt+S] iamadmin@ivan-general Global Support

Choose a domain name

animals4lifeivan .click - \$5.00 Check

Availability for 'animals4lifeivan.click'

Domain Name	Status	Price /1 Year	Action
animals4lifeivan.click	✓ Available - In Cart	\$5.00	Add to cart

Related domain suggestions

Shopping cart

One-time fees

animals4lifeivan.click

Register for 1 year \$5.00

SUBTOTAL \$5.00

In prod, auto-renewal is most common – using disable as this is a training domain:

Do you want to automatically renew your domain?

When you register a domain name, you own it for a year. If you don't renew your domain name registration, it expires and someone else can register the domain name. To ensure that you can keep your domain name, you can choose to renew it automatically every year. The cost of renewing your domain name is billed to your AWS account. You can enable or disable automatic renewal at any time using the Route 53 console. For more information, see [Renewing Registration for a Domain](#).

☐ Enable ☒ Disable

Terms and Conditions

Amazon Route 53 enables you to register and transfer domain names using your AWS account. However, AWS is not a domain name registrar, so we use registrar associates to perform registration and transfer services. When you purchase domain names through AWS, you are registering your domain with one of our registrar associates. The registrar for your domain will periodically contact the registrant contact that you specified to verify the contact details and renew registration.

☒ I have read and agree to the [AWS Domain Name Registration Agreement](#)

Cancel

Back

Complete Order

As domain registers, you will receive emails needing approval and process can take a while:

Domain Name	Status	Timestamp
animals4lifeivan.click	Domain registration in progress	July 11, 2021 21:42 UTC-5

Registration of animals4lifeivan.click succeeded Inbox x

Amazon Route 53 <route53-dev-admin@amazon.com> 9:58 PM (0 minutes ago) ☆ ↩ ⋮

to me ▾

Dear AWS customer,

We successfully registered the animals4lifeivan.click domain. We also created a hosted zone for the domain.

Your next step is to add records to the hosted zone. These records contain information about how to route traffic for your domain and any subdomains. To learn how to add records to your hosted zone, see [Working with Records](#).

If you did not request this change, contact [Amazon Web Services Customer Support](#) immediately.


Regards,
Amazon Route 53


Domain details:


Registered domains > animals4lifeivan.click

Edit contacts
Manage DNS
Delete domain

Domain	animals4lifeivan.click	Transfer lock ⓘ	Enabled (disable)	Name servers ⓘ	ns-1692.awsdns-19.co.uk ns-676.awsdns-20.net ns-1055.awsdns-03.org ns-8.awsdns-01.com Add or edit name servers
Registration date ⓘ	2021-07-11	Authorization code ⓘ	Get code		
Expiration date ⓘ	2022-07-11 (extend)	Domain name status code ⓘ	clientTransferProhibited		
Auto renew ⓘ	Disabled (enable)	Tag ⓘ	View and manage tags for your domains using Tag editor	DNSSEC status ⓘ	Disabled Manage keys

Registrant contact Verified


Administrative contact


Technical contact


We are now ready to create domain records:

Records (2) [Info](#)
⌂
Delete record
Import zone file
Create record

Automatic mode is the current search behavior optimized for best filter results. [To change modes go to settings.](#)

Type ▼
Routing policy ▼
Alias ▼
< 1 >
⚙

<input type="checkbox"/>	Record name ▼	Type ▼	Routin... ▼	Differ... ▼	Value/Route traffic to ▼
<input type="checkbox"/>	animals4lifeivan.click	NS	Simple	-	ns-1692.awsdns-19.co.uk. ns-676.awsdns-20.net. ns-1055.awsdns-03.org. ns-8.awsdns-01.com.
<input type="checkbox"/>	animals4lifeivan.click	SOA	Simple	-	ns-1692.awsdns-19.co.uk. awsdns-hostmaster.amazon.com. 1 7200 900 1209600 86400