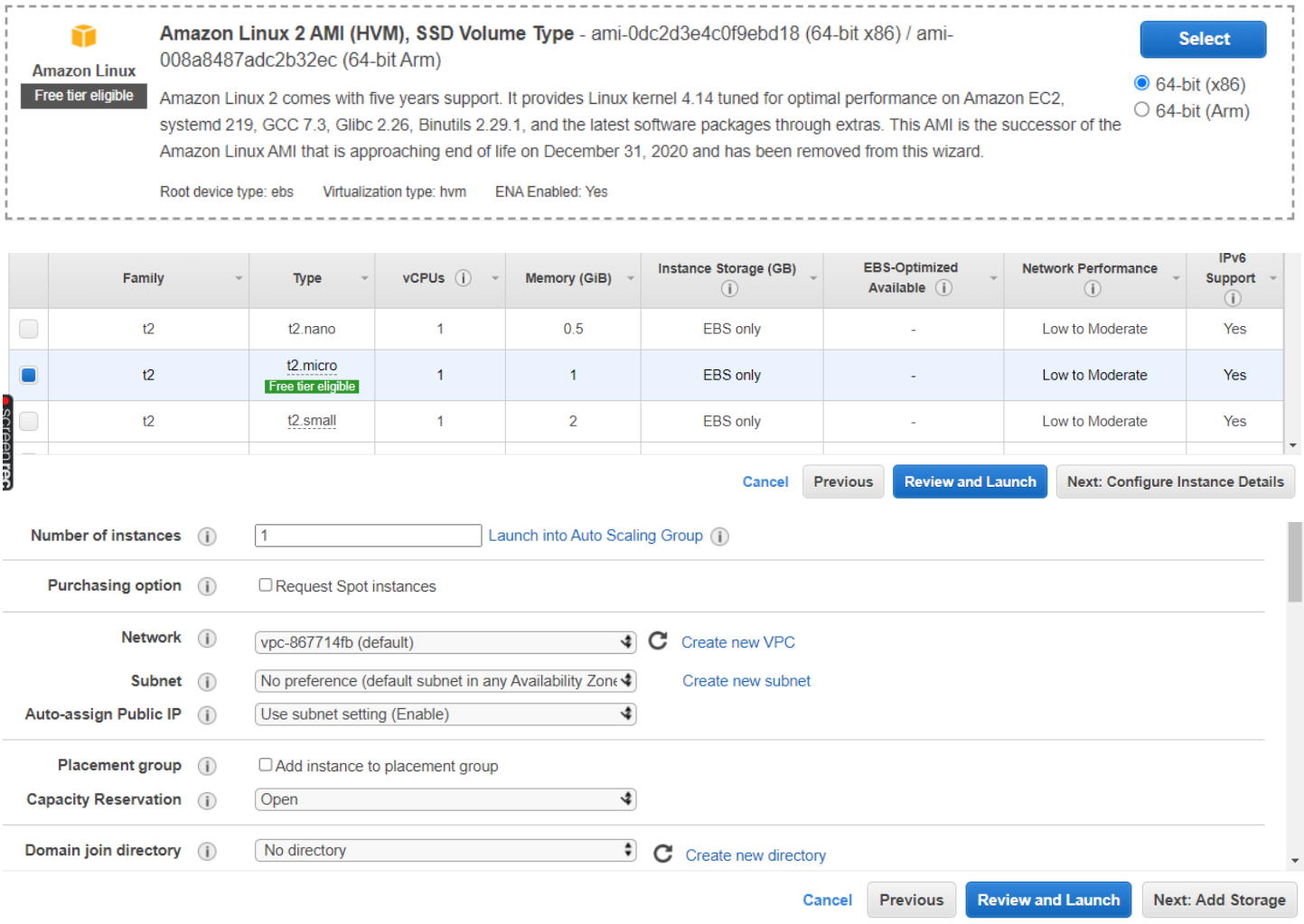
Summary:

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

Contents

1. 1st EC2 creation

Create free tier Linux EC2 instance:



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	☑	Not Encrypte

Change Source to My IP:

Assign a security group: ◉ Create a **new** security group
○ Select an **existing** security group

Security group name: launch-wizard-1

Description: launch-wizard-1 created 2021-07-11T14:39:50.800-05:00

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

Create and utilize keys

Choose an existing key pair

Select a key pair

myfirstec2instance

☑ 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

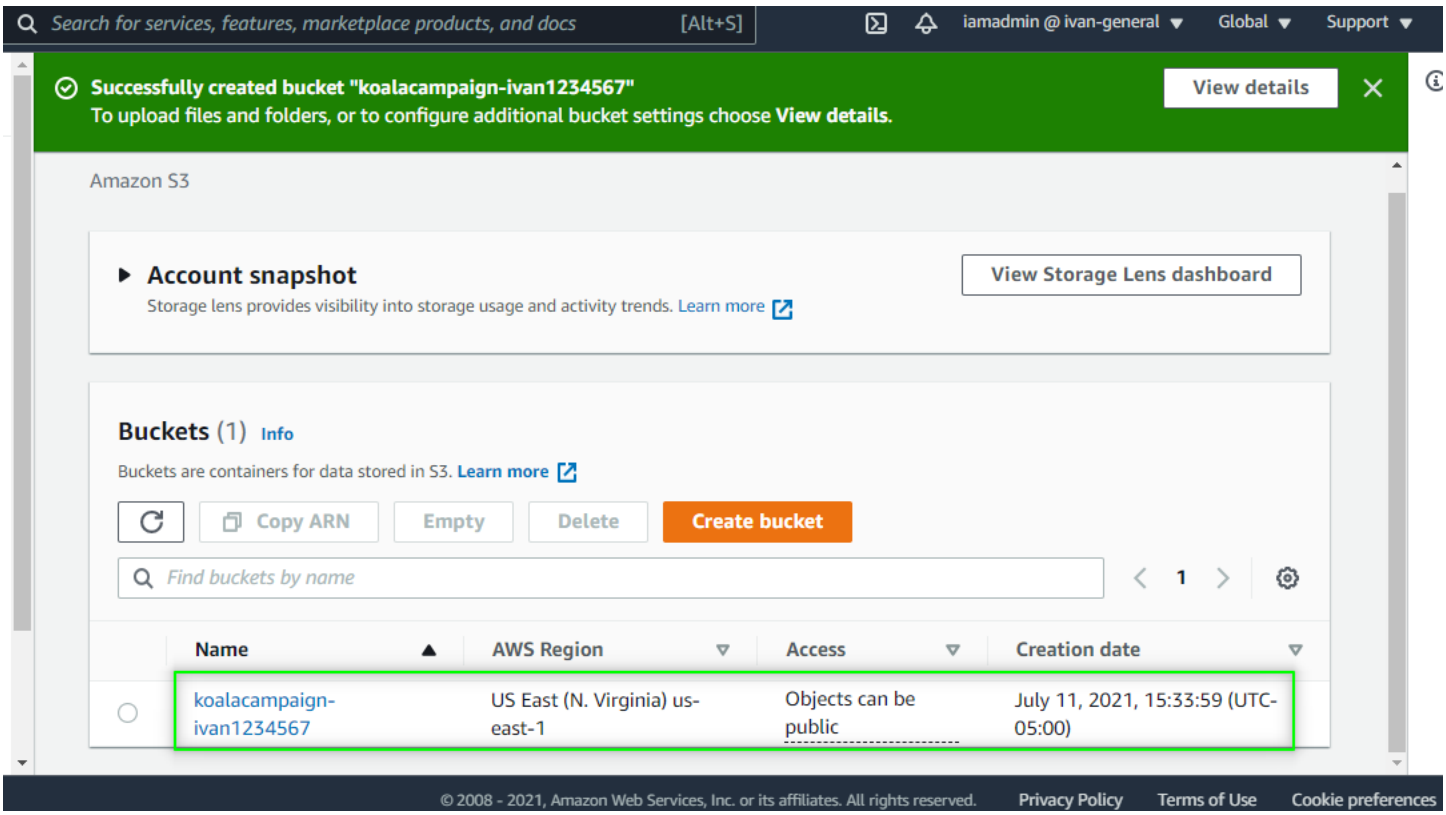
Connect using SSH, if using Win10 – SSH is loaded in CLI:

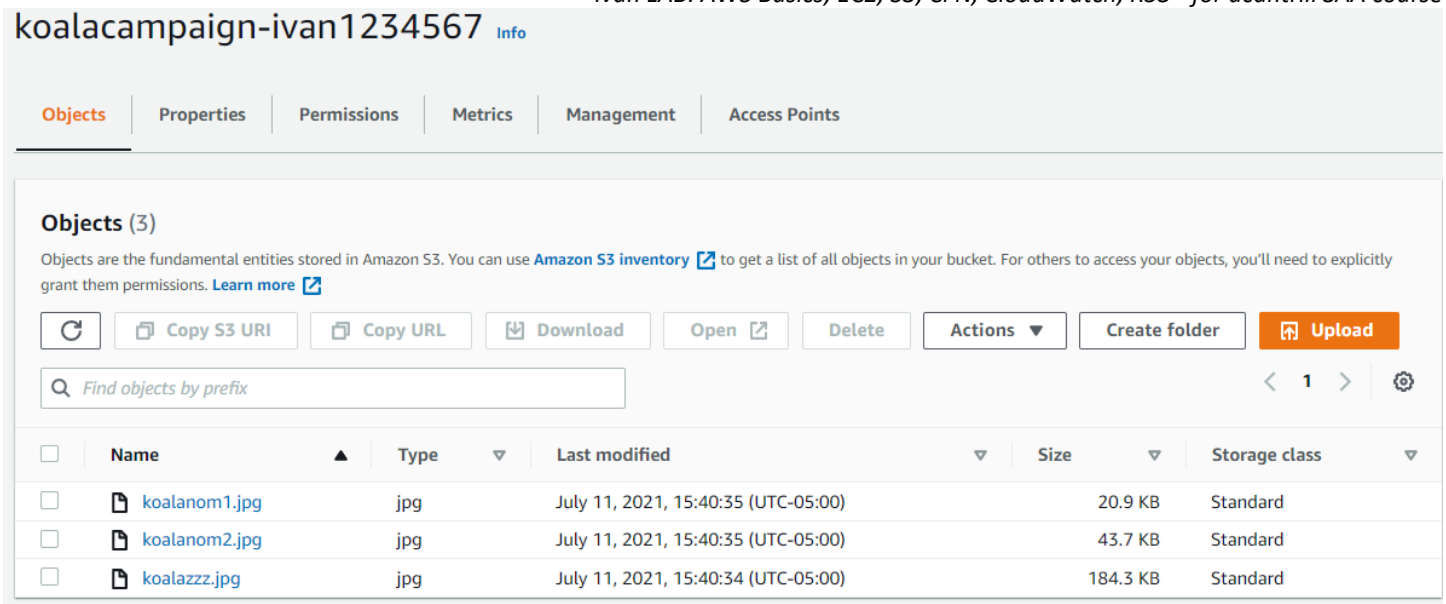
```
C:\Users\IvanVlad\Desktop\CLOUD STASH>ls
'ls' is not recognized as an internal or external command,
operable program or batch file.

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:bOTy1RBSMQpJF4Xa9014JOUeDxD87WToghVwD+/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

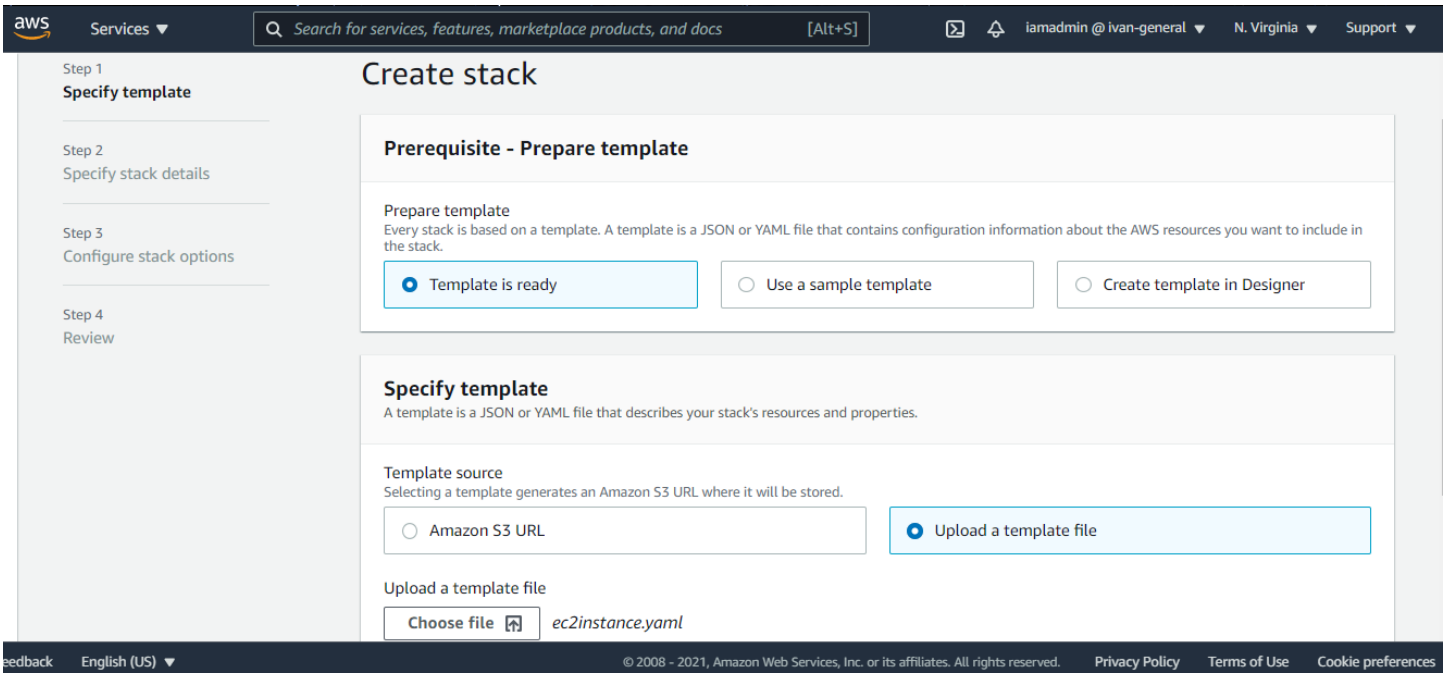
Create S3 koala bucket and upload files, create archive folder:





3. 1st Cloud Formation Stack:

Create CFN stack:



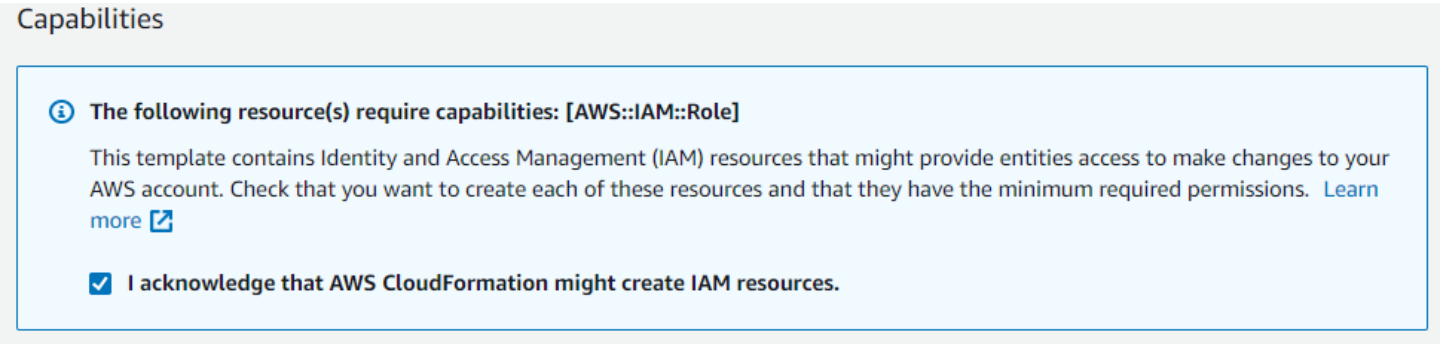
Use YAML Template:

```
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'
```

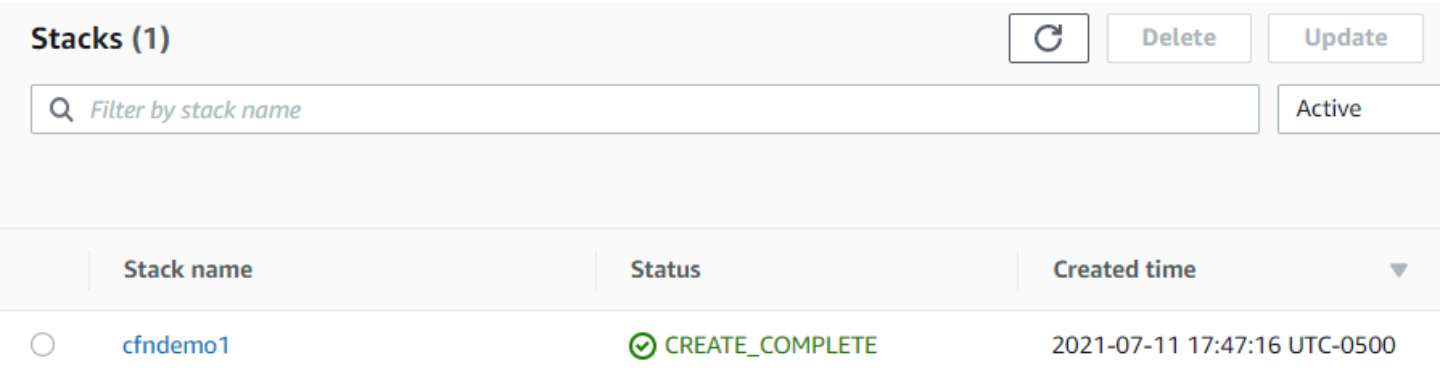
```
    MaxLength: '18'
    Default: 0.0.0.0/0
    AllowedPattern: '(\d{1,3})\.(\d{1,3})\.(\d{1,3})\.(\d{1,3})/(\d{1,2})'
    ConstraintDescription: must be a valid IP CIDR range of the form x.x.x.x/x. Default is 0.0.0.0
/0 and is less safe.
Resources:
  EC2Instance:
    Type: AWS::EC2::Instance
    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
```

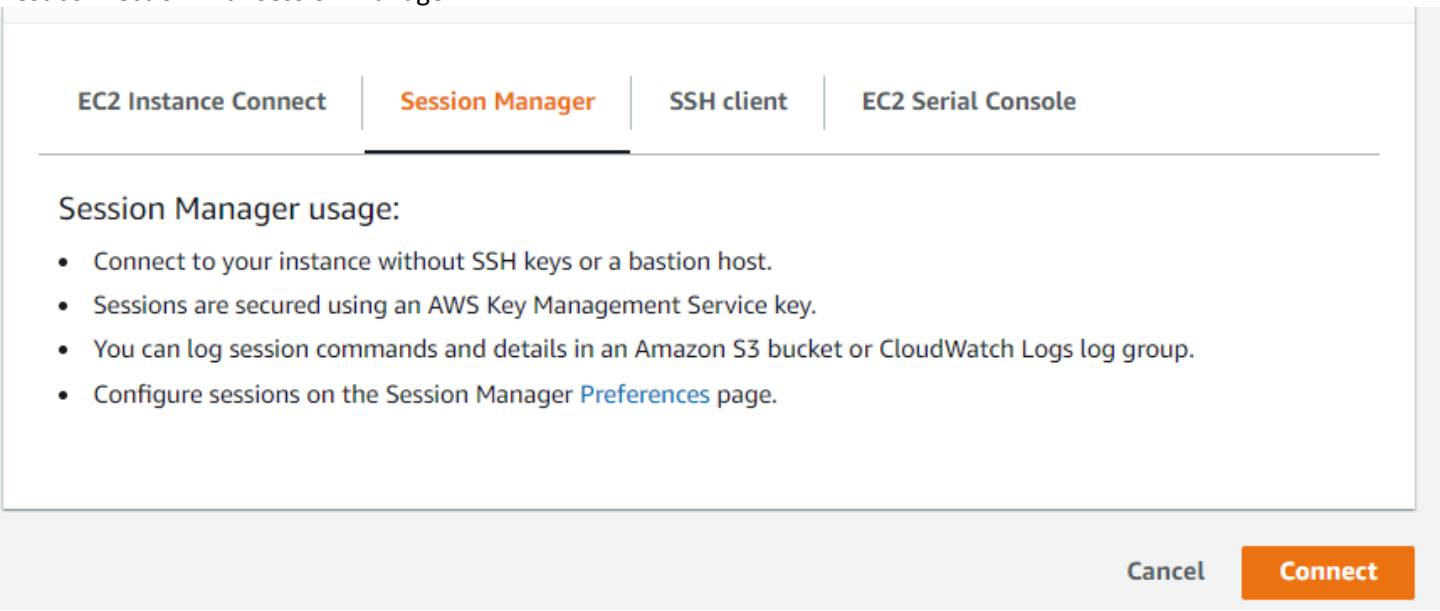
Be sure to check IAM resources:



Stack completion:



Test connection with session manager:

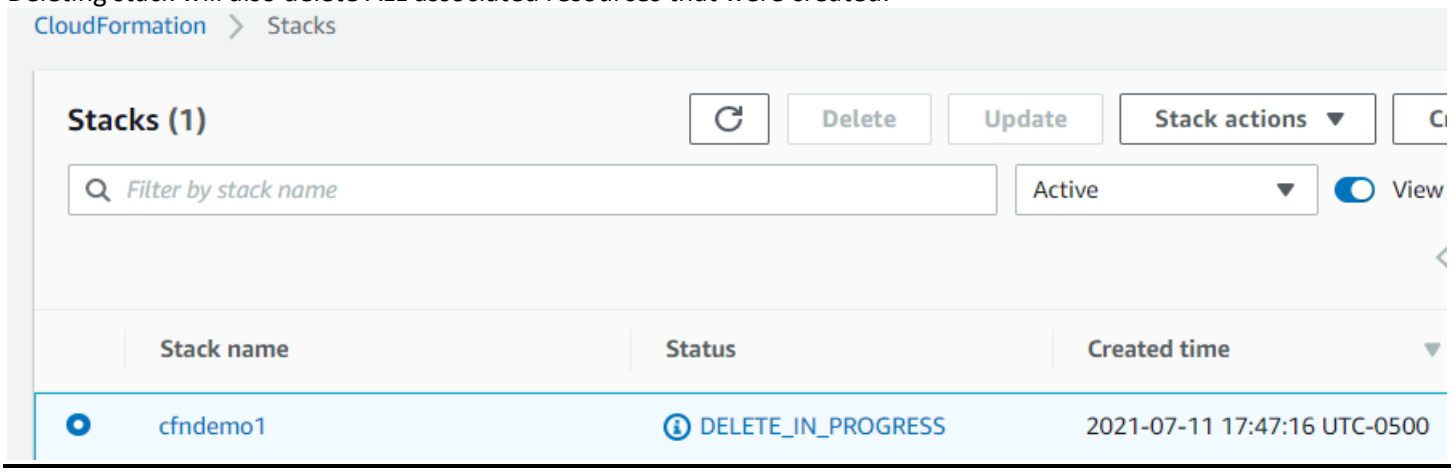


Confirm directories & supported message inputs with Bash:

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
nsole=ttyS0,115200n8 net.ifnames=0 biosdevname=0 nvme_core.io_timeout=4294967295 ro
[    0.000000] x86/fpu: Supporting XSAVE feature 0x001: 'x87 floating point registe
[    0.000000] x86/fpu: Supporting XSAVE feature 0x002: 'SSE registers'
[    0.000000] x86/fpu: Supporting XSAVE feature 0x004: 'AVX registers'
```

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



4. Cloud Watch – test alarms & monitoring

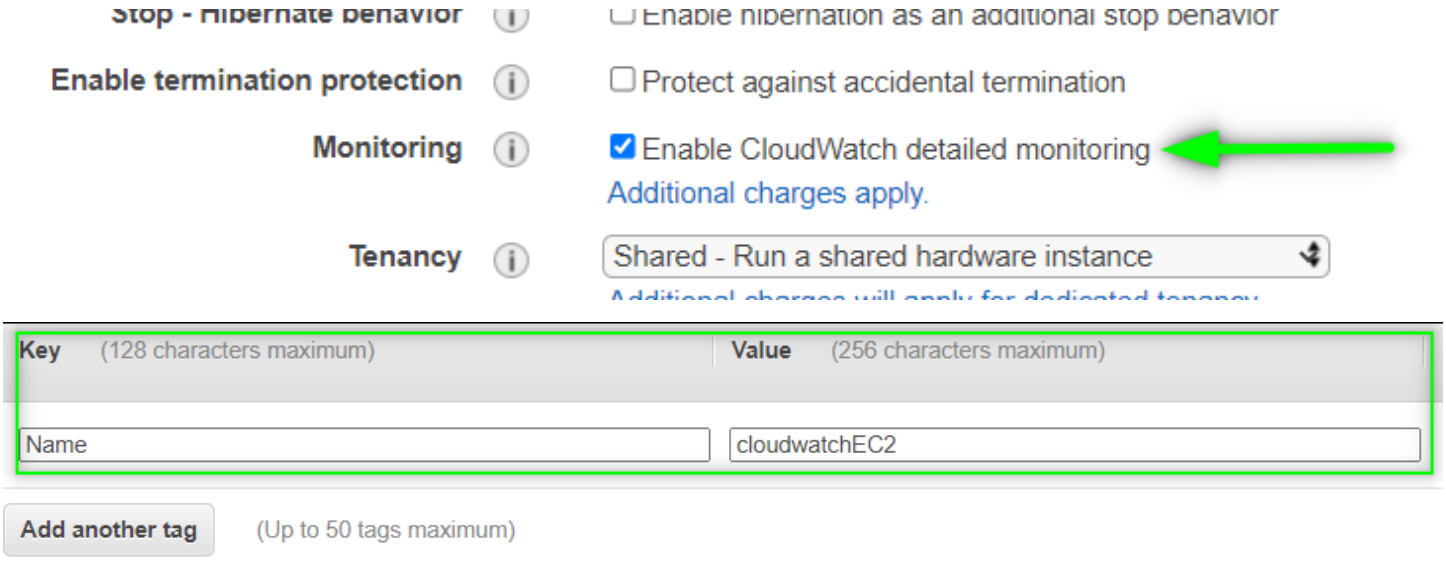
- Demo Steps
- Create an EC2 instance
- t2.micro
- ensure its set to the default VPC and has a public IP
- Optionally enable detailed monitoring
- Connect to the instance and install Extras package and stress
- Install stress (commands listed in code sample below)
- Create an alarm based on the CPU Utilisation 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

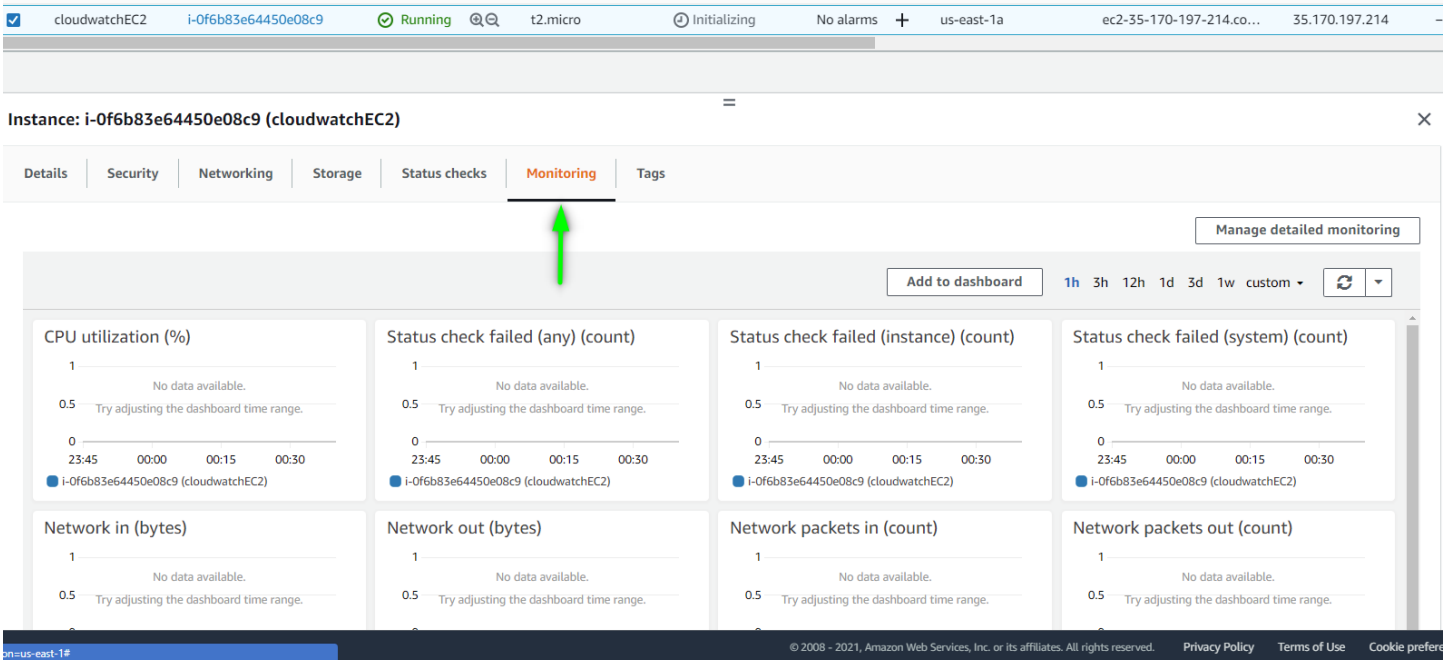
Use these commands on the instance:

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

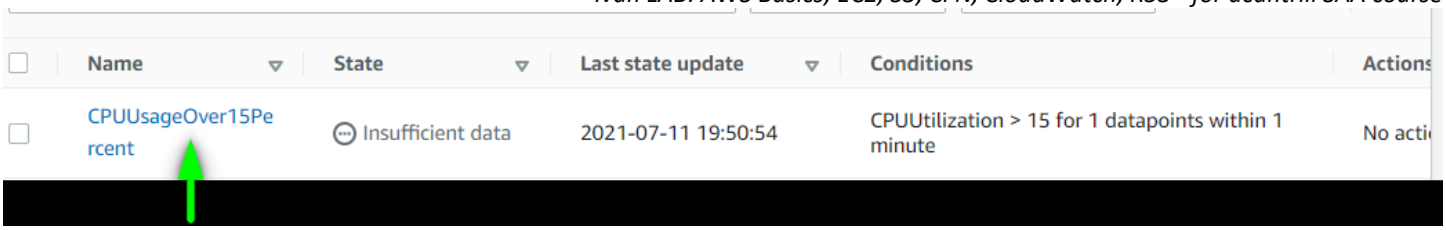
Creating EC2 instance with Monitoring enabled:



Monitoring Tab is now available in EC2 service:



Create billing alarm for CPU usage > 15%



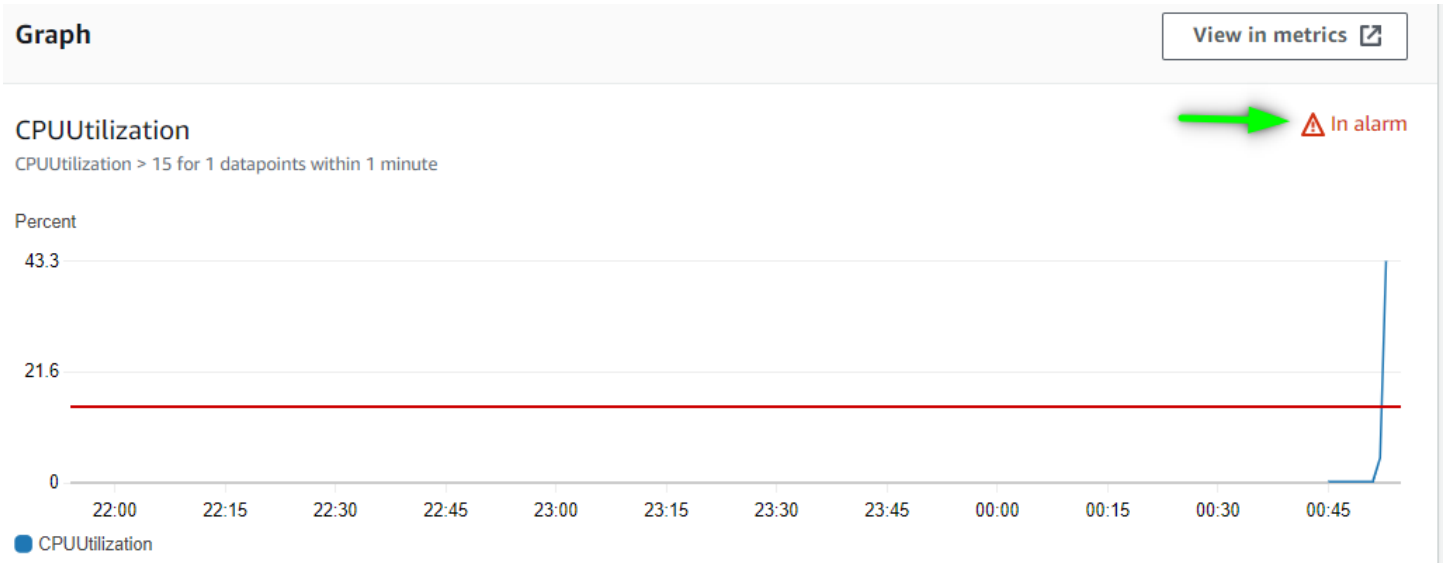
Connect to EC2, install Stress and verify:

```
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                                    1/1
  Verifying  : stress-1.0.4-16.el7.x86_64                                    1/1

Installed:
  stress.x86_64 0:1.0.4-16.el7

Complete!
[ec2-user@ip-172-31-8-19 ~]$
```

i-0f6b83e64450e08c9 (cloudwatchEC2)

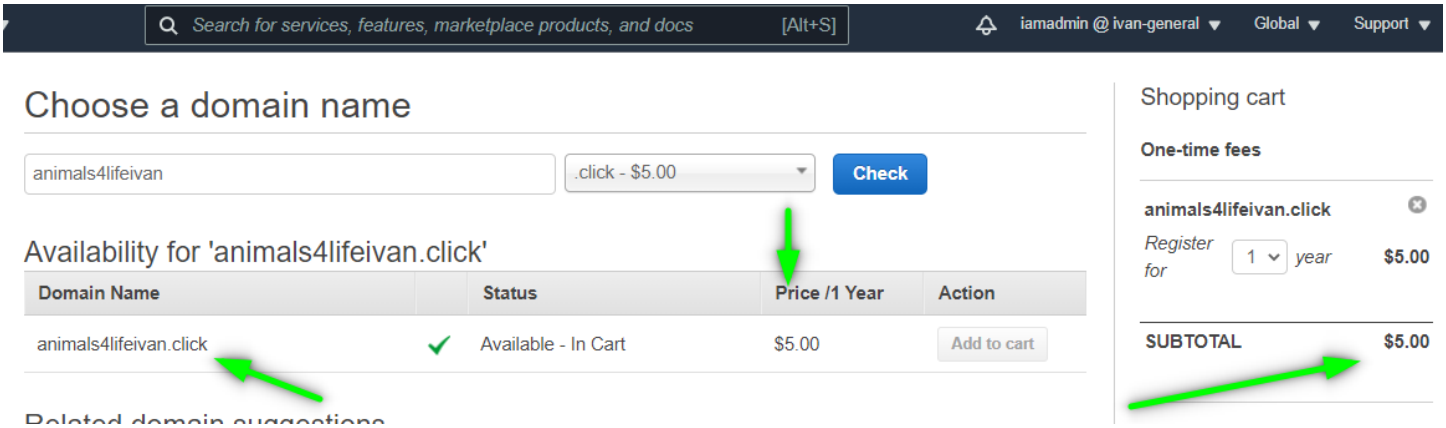
Public IPs: 35.170.197.214 Private IPs: 172.31.8.19

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

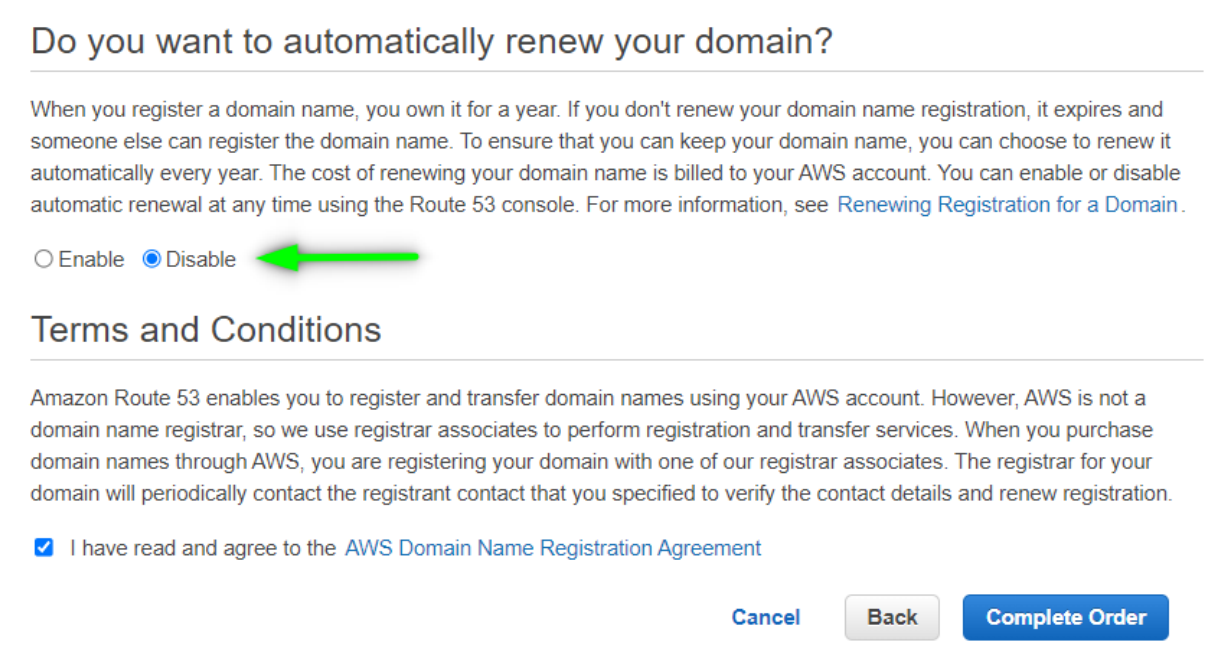


5. Route 53 – Register Domain for Course

Navigate to Route53 to create and register domain:



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



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 ×

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 [redacted] | **Administrative contact** [redacted] | **Technical contact** [redacted]

We are now ready to create domain records:

Records (2) Info
Automatic mode is the current search behavior optimized for best filter results. To change modes go to settings.

Delete record | Import zone file | Create record

Filter records by property or value | Type | Routing policy | Alias | 1

Record name	Type	Routin...	Differ...	Value/Route traffic to
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.
animals4lifeivan.click	SOA	Simple	-	ns-1692.awsdns-19.co.uk. awsdns-hostmaster.amazon.com. 1 7200 900 1209600 86400