

1. Create VPC with 2 private and 2 public subnets.

Open VPC and create one new VPC.

The screenshot shows the AWS VPC 'Create VPC' configuration page. In the 'VPC settings' section, 'VPC only' is selected. A 'Name tag - optional' field contains 'my-vpc'. Under 'IPv4 CIDR block', 'IPv4 CIDR manual input' is selected, with '192.168.0.0/24' entered. In the 'IPv6 CIDR block' section, 'No IPv6 CIDR block' is selected. Below, the 'Your VPCs (1/2)' list shows one VPC named 'my-vpc' with ID 'vpc-0a1c19d689d25443f', state 'Available', and IPv4 CIDR '192.168.0.0/24'. The list was last updated about 2 hours ago.

Go to subnets and create 2 public subnets and 2 private subnets.

The screenshot shows the AWS Subnets dashboard. A green banner at the top indicates 'You have successfully created 1 subnet: subnet-0b530a493375be687'. The 'Subnets (7)' list shows seven subnets: 'pub-01-subnet', 'pub-02-subnet', 'pri-01-subnet', and 'pri-02-subnet' are private subnets; others are public. The list was last updated 1 minute ago.

You have successfully created 1 subnet: subnet-0b530a493375be687

Subnets (7) Info	Last updated 2 minutes ago	Actions	Create subnet		
sf12fb9c515 my-v...	Block Public... Off	IPv4 CIDR 192.168.0.0/28	IPv6 CIDR -	IPv6 CIDR association ID -	Available IPv4 addresses 11
sf12fb9c515 my-v...	Block Public... Off	IPv4 CIDR 192.168.0.16/28	IPv6 CIDR -	IPv6 CIDR association ID -	Available IPv4 addresses 11
sf12fb9c515 my-v...	Block Public... Off	IPv4 CIDR 192.168.0.32/28	IPv6 CIDR -	IPv6 CIDR association ID -	Available IPv4 addresses 11
sf12fb9c515 my-v...	Block Public... Off	IPv4 CIDR 192.168.0.48/28	IPv6 CIDR -	IPv6 CIDR association ID -	Available IPv4 addresses 11
sf12fb9c515 my-v...	Block Public... Off	IPv4 CIDR 192.168.0.64/28	IPv6 CIDR -	IPv6 CIDR association ID -	Available IPv4 addresses 11
sf12fb9c515 my-v...	Block Public... Off	IPv4 CIDR 192.168.0.80/28	IPv6 CIDR -	IPv6 CIDR association ID -	Available IPv4 addresses 11
sf12fb9c515 my-v...	Block Public... Off	IPv4 CIDR 192.168.0.96/28	IPv6 CIDR -	IPv6 CIDR association ID -	Available IPv4 addresses 11

2. Enable DNS Hostname in VPC.

- Select the instance which we need to change DNS hostname.

Your VPCs (1/4) [Info](#)

Name	VPC ID	State
-	vpc-0db9d4fb39c8bc078	Available
my-vpc01	vpc-0a1c19d689d25443f	Available
my-vpc02	vpc-0d8997270f02b3d54	Available
my-vpc03	vpc-0cf92e5f12fb9c515	Available

- Click on actions and select VPC change settings.

Info

Last updated 2 minutes ago

[Actions](#)

- Create default VPC
- Create flow log
- Edit VPC settings Selected
- Edit CIDRs
- Manage middlebox routes
- Manage tags
- Delete VPC

fb9c515 / my-vpc03

Resource map | CIDRs | Flow logs | Tags | Integrations

- Enable DNS hostnames and save.

☰ [VPC](#) > [Your VPCs](#) > [vpc-0cf92e5f12fb9c515](#) > [Edit VPC settings](#)

Edit VPC settings [Info](#)

VPC details

VPC ID

vpc-0cf92e5f12fb9c515

Name

my-vpc03

DHCP settings

DHCP option set [Info](#)

dopt-06d4ee1170f72d8d3

DNS settings

Enable DNS resolution [Info](#)

Enable DNS hostnames [Info](#)

 You have successfully modified the settings for vpc-0cf92e5f12fb9c515 / my-vpc03.

Last updated
2 minutes ago

[Actions](#) 

3. Enable Auto Assign Public IP in 2 public subnets.

Click on subnets. Select your first public subnet and Go to actions and click on actions and click edit subnet changes and enable it.

Edit subnet settings Info

Subnet

Subnet ID

subnet-0d731413aa4728794

Name

pub-1

Auto-assign IP settings Info

Enable AWS to automatically assign a public IPv4 or IPv6 address to a new primary network interface for an instance in this subnet.

Enable auto-assign public IPv4 address Info

Enable auto-assign customer-owned IPv4 address Info

Option disabled because no customer owned pools found.

Resource-based name (RBN) settings Info

Specify the hostname type for EC2 instances in this subnet and optional RBN DNS query settings.

Enable resource name DNS A record on launch Info

And save the changes. Select the second subnet and do the same process.

 You have successfully changed subnet settings:

- Enable auto-assign public IPv4 address

Subnets (1/7) Info

Last update less than a minute ago

Find subnets by attribute or tag

<input type="checkbox"/>	Name	Subnet ID	State	VPC
<input type="checkbox"/>	-	subnet-0cc304f411ffbe14c	 Available	vpc-0db9d4fb39c8bc078
<input type="checkbox"/>	-	subnet-0446b22818aa451b1	 Available	vpc-0db9d4fb39c8bc078
<input type="checkbox"/>	-	subnet-05523948fb6f25c67	 Available	vpc-0db9d4fb39c8bc078
<input type="checkbox"/>	pub-01-subnet	subnet-0d731413aa4728794	 Available	vpc-0cf92e5f12fb9c515 my

4. Add 2 private subnets in private route table.

Create a route table with the name pri-route table. And select VPC which the private subnets are present.

Create route table Info

A route table specifies how packets are forwarded between the subnets within your VPC, the internet, and your VPN connection.

Route table settings**Name - optional**

Create a tag with a key of 'Name' and a value that you specify.

pri-routeable

VPC

The VPC to use for this route table.

vpc-0cf92e5f12fb9c515 (my-vpc03)

Tags

A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

Key

Q, Name

Value - optional

Q, pri-routeable

X

Remove

Add new tag

You can add 49 more tags.

Create route table**VPC dashboard****AWS Global View**

Filter by VPC

Virtual private cloud**Your VPCs****Subnets****Route tables****Internet gateways****Route table rtb-072698f31881e4245 | pri-routeable was created successfully.****Actions****rtb-072698f31881e4245 / pri-routeable****Details** Info**Route table ID**

Main

rtb-072698f31881e4245

No

VPC

Owner ID

vpc-0cf92e5f12fb9c515 | my-vpc03

235351028455

Explicit subnet associations

-

Edge associations

-

Select the private route table and go to the actions and select edit subnet associations.

eu-north-1.console.aws.amazon.com/vpcconsole/home?region=eu-north-1#RouteTables:

Gmail YouTube Maps

WS Search [Alt+S] Account ID: 2353-5102

Europe (Stockholm) m

VPC > Route tables

Route tables (1/5) Info

Last updated 1 minute ago

Actions **Create route**

View details Set main route table
Edit subnet associations
Edit edge associations
Edit route propagation
Edit routes
Manage tags
Delete route table

Name	Route table ID	Explicit subnet associa...	Edge associations	Main
-	rtb-0b42283383e9a976a	-	-	Yes
-	rtb-06bf5b21abfa964d7	-	-	Yes
-	rtb-0231e0c25d8f9f91f	-	-	Yes
pri-routeable	rtb-072698f31881e4245	-	-	No
-	rtb-08f5272920ed3ca4f	-	-	Yes

rtb-072698f31881e4245 / pri-routeable

Details Routes Subnet associations Edge associations Route propagation Tags

Details

Route table ID: rtb-072698f31881e4245 Main: No Explicit subnet associations: - Edge associations: -

Select the 2 private subnets and save it.

Edit subnet associations

Change which subnets are associated with this route table.

Available subnets (2/4)

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
pub-01-subnet	subnet-0d731413aa4728794	192.168.0.0/28	-	Main (rtb-0231e0c25d8f9f91f)
pub-02-subnet	subnet-03c9125782b571c1c	192.168.0.16/28	-	Main (rtb-0231e0c25d8f9f91f)
pri-01-subnet	subnet-085b49e94e790394c	192.168.0.32/28	-	Main (rtb-0231e0c25d8f9f91f)
pri-02-subnet	subnet-0b530a493375be687	192.168.0.48/28	-	Main (rtb-0231e0c25d8f9f91f)

Selected subnets

- subnet-085b49e94e790394c / pri-01-subnet X
- subnet-0b530a493375be687 / pri-02-subnet X

Actions: Cancel Save associations

You have successfully updated subnet associations for rtb-072698f31881e4245 / pri-routable.

Route tables (1/5) Info

Last updated less than a minute ago

Actions: C A

5. Add 2 public subnets in public route table.

Create a route table with the name pub-route table.

Create route table Info

A route table specifies how packets are forwarded between the subnets within your VPC, the internet, and your VPN connection.

Route table settings

Name - optional
Create a tag with a key of 'Name' and a value that you specify.
pub-route table

VPC
The VPC to use for this route table.
vpc-0cf92e5f12fb9c515 (my-vpc03)

Tags
A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

Key	Value - optional
Q Name X	Q pub-route table X Remove

Add new tag
You can add 49 more tags.

Actions: Cancel S

Select the public route table and edit subnet associations and add two subnets.

⌚ Route table rtb-06d7a6b1a588f9301 | pub-route table was created successfully.

Route tables (1/6) Info					
<input type="text"/> Find route tables by attribute or tag					
<input type="checkbox"/>	Name	Route table ID	Explicit subnet associ...	Edge associations	Actions
<input type="checkbox"/>	-	rtb-0231e0c25d8f9f91f	-	-	View details
<input type="checkbox"/>	pri-routeable	rtb-072698f31881e4245	2 subnets	-	Set main route table
<input type="checkbox"/>	-	rtb-08f5272920ed3ca4f	-	-	Edit subnet associations
<input checked="" type="checkbox"/>	pub-route table	rtb-06d7a6b1a588f9301	-	-	Edit edge associations

Last updated 5 minutes ago

[Create route table](#)

[aws](#) Search [Alt+S] Account ID: 2353-5102-8455 mujahedh Europe (Stockholm)

VPC > Route tables > [rtb-06d7a6b1a588f9301](#) > Edit subnet associations

Edit subnet associations

Change which subnets are associated with this route table.

Available subnets (2/4)

<input type="checkbox"/>	Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
<input checked="" type="checkbox"/>	pub-01-subnet	subnet-0d731413aa4728794	192.168.0.0/28	-	Main (rtb-0231e0c25d8f9f91f)
<input checked="" type="checkbox"/>	pub-02-subnet	subnet-03c9125782b571c1c	192.168.0.16/28	-	Main (rtb-0231e0c25d8f9f91f)
<input type="checkbox"/>	pri-01-subnet	subnet-085b49e94e790394c	192.168.0.32/28	-	rtb-072698f31881e4245 / pri-routeable
<input type="checkbox"/>	pri-02-subnet	subnet-0b530a493375be687	192.168.0.48/28	-	rtb-072698f31881e4245 / pri-routeable

Selected subnets

[subnet-03c9125782b571c1c / pub-02-subnet](#) [X](#) [subnet-0d731413aa4728794 / pub-01-subnet](#) [X](#)

[Cancel](#) [Save associations](#)

⌚ You have successfully updated subnet associations for rtb-06d7a6b1a588f9301 / pub-route table.

6. Public route table will have the routes to internet and local.

Create a internet gateway with the name my-gateway.

[VPC](#) / [Internet gateways](#) / Create internet gateway

Create internet gateway [Info](#)

An internet gateway is a virtual router that connects a VPC to the internet. To create a new internet gateway specify the name for the gateway below.

Internet gateway settings

Name tag
Creates a tag with a key of 'Name' and a value that you specify.

my-gateway

Tags - optional

A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources.

Key	Value - optional
<input type="text" value="Name"/>	<input type="text" value="my-gateway"/>

[Add new tag](#)

You can add 49 more tags.

> igw-039b0cc65033dfd2b

The following internet gateway was created: igw-039b0cc65033dfd2b - my-gateway . You can now attach to a VPC to enable the VPC to communicate with the internet. [Attach to a VPC](#)

igw-039b0cc65033dfd2b / my-gateway

[Actions ▾](#)

Details Info	State	VPC ID	Owner
Internet gateway ID			

Attach to vpc which have the public subnets.

The following internet gateway was created: igw-039b0cc65033dfd2b - my-gateway . You can now attach to a VPC to enable the VPC to communicate with the internet. [Attach to](#)

Attach to VPC (igw-039b0cc65033dfd2b) [Info](#)

VPC
Attach an internet gateway to a VPC to enable the VPC to communicate with the internet. Specify the VPC to attach below.

Available VPCs
Attach the internet gateway to this VPC.

[▶ AWS Command Line Interface command](#)

[Cancel](#) [Attach internet gateway](#)

Edit the routes of add gate way to public routetable.

[aws](#) | [☰](#) [Search](#) [Alt+S] [Europe \(Stockholm\)](#)

[VPC](#) > [Route tables](#) > rtb-06d7a6b1a588f9301

Updated routes for rtb-06d7a6b1a588f9301 / pub-route table successfully [Details](#)

rtb-06d7a6b1a588f9301 / pub-route table

Details Info		Main	Explicit subnet associations	Edge associations
Route table ID	rtb-06d7a6b1a588f9301	No	2 subnets	-
VPC	vpc-0cf92e5f12fb9c515 my-vpc03	Owner ID	235351028455	
Routes	Subnet associations	Edge associations	Route propagation	Tags
Routes (2)				
Filter routes				
Destination	Target	Status	Propagated	Route
0.0.0.0/0	igw-039b0cc65033dfd2b	Active	No	Create
192.168.0.0/20	local	Active	No	Create

7. Create EC2 in public subnet with t2.micro and install PHP.

Create a instance with the name php-server and select amazon liux image and select your VPC and select your publicsubnet and launch the instance.

The screenshot shows the 'Network settings' section of the AWS EC2 'Launch an instance' wizard. It includes:

- VPC - required**: Set to 'vpc-0cf92e5f12fb9c515 (my-vpc03)' with CIDR '192.168.0.0/20'. A 'Create new VPC' button is shown next to it.
- Subnet**: Set to 'subnet-0d731413aa4728794' under 'pub-01-subnet'. Details: VPC: vpc-0cf92e5f12fb9c515, Owner: 235351028455, Availability Zone: eu-north-1a (eun1-az1), Zone type: Availability Zone, IP addresses available: 11, CIDR: 192.168.0.0/28. A 'Create new subnet' button is shown next to it.
- Auto-assign public IP**: Set to 'Enable'.
- Firewall (security groups)**: A note says 'A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.' Two options are shown:
 - Create security group
 - Select existing security group
- Security group name - required**: A field for entering the security group name.

Write the installation code of php in the user data and launch the instance.

The screenshot shows the AWS EC2 'Launch an instance' wizard. In the 'User data - optional' section, a multi-line text input field contains the following script:

```
yum update -y
# Install Apache
yum install -y httpd

# Enable PHP 8.0
amazon-linux-extras enable php8.0
yum install -y php php-cli php-mysqlnd

# Start Apache
systemctl start httpd
systemctl enable httpd

# Add a test PHP page
echo "<?php phpinfo(); ?>" > /var/www/html/info.php
```

Below the text input field is a checkbox labeled 'User data has already been base64 encoded'. To the right of the main form, there is a summary panel with the following details:

- Number of instances:** 1
- Software Image:** Amazon Linux 2023 (ami-043339ea)
- Virtual server type:** t3.micro
- Firewall (security group):** New security group
- Storage (volume):** 1 volume(s) -

A 'Cancel' button is located at the bottom right of the summary panel.

We can check whether the installation is done or not.

```
MUJU SK@DESKTOP-LU541U4 MINGW64 ~/Downloads
$ ssh -i AWS.pem ec2-user@13.60.212.57
The authenticity of host '13.60.212.57 (13.60.212.57)' can't be established.
ED25519 key fingerprint is SHA256:q0bd9gAQLy7v7pLy8G1g6CY6nvuRdq02yx8RTnU0BfM.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '13.60.212.57' (ED25519) to the list of known hosts.

      _#
  ~\_\_ #####_      Amazon Linux 2023
  ~~ \_\_#####\_
  ~~   \#\#
  ~~     \#/ _-->
  ~~       V~' _-'
  ~~~      /
  ~_. _/ _/
  _/_ , _/ _/
  _/m/_ [ec2-user@ip-192-168-0-6 ~]$ sudo systemctl status httpd
● httpd.service - The Apache HTTP Server
  Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; preset: disabled)
  Drop-In: /usr/lib/systemd/system/httpd.service.d
            └─php-fpm.conf
    Active: active (running) since Sun 2025-09-21 05:27:41 UTC; 31min ago
      Docs: man:httpd.service(8)
     Main PID: 8243 (httpd)
```

```
[ec2-user@ip-192-168-0-6 ~]$ ls -l /var/www/html/
total 4
-rw-r--r--. 1 root root 20 Sep 21 05:27 info.php
[ec2-user@ip-192-168-0-6 ~]$ curl http://localhost/info.php
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "DTD/xhtml-
<html xmlns="http://www.w3.org/1999/xhtml"><head>
<style type="text/css">
body {background-color: #fff; color: #222; font-family: sans-serif;}
pre {margin: 0; font-family: monospace;}
a {color: inherit;}
a:hover {text-decoration: none;}
table {border-collapse: collapse; border: 0; width: 934px; box-shadow: 1
.center {text-align: center;}
.center table {margin: 1em auto; text-align: left;}
.center th {text-align: center !important;}
td, th {border: 1px solid #666; font-size: 75%; vertical-align: baseline}
th {position: sticky; top: 0; background: inherit;}
h1 {font-size: 150%;}
h2 {font-size: 125%;}
h2 > a {text-decoration: none;}
h2 > a:hover {text-decoration: underline;}
```

Open browser and check with the <http://ipaddress/info.php>

PHP Version 8.4.10	
System	Linux ip-192-168-0-6.eu-north-1.compute.internal 6.1.150-174.273.amzn2023.x86_64 #1 SMP PREEMPT_DYNAMIC Tue Sep 9 12:21:26 UTC 2025 x86_64
Build Date	Jul 2 2025 02:22:42
Build System	Linux
Build Provider	Amazon Linux
Compiler	gcc (GCC) 11.5.0 20240719 (Red Hat 11.5.0-5)
Architecture	x86_64
Server API	FPM/FastCGI
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc
Loaded Configuration File	/etc/php.ini
Scan this dir for additional .ini files	/etc/php.d
Additional .ini files parsed	/etc/php.d/10-opcache.ini, /etc/php.d/20-bz2.ini, /etc/php.d/20-calendar.ini, /etc/php.d/20-ctype.ini, /etc/php.d/20-curl.ini, /etc/php.d/20-dom.ini, /etc/php.d/20-exif.ini, /etc/php.d/20-fileinfo.ini, /etc/php.d/20-fp.ini, /etc/php.d/20-gettext.ini, /etc/php.d/20-iconv.ini, /etc/php.d/20-mbstring.ini, /etc/php.d/20-mysqlind.ini, /etc/php.d/20-pdo.ini, /etc/php.d/20-phar.ini, /etc/php.d/20-posix.ini, /etc/php.d/20-shmop.ini, /etc/php.d/20-simplexml.ini, /etc/php.d/20-sockets.ini, /etc/php.d/20-sodium.ini, /etc/php.d/20-sqite3.ini, /etc/php.d/20-sysvmsg.ini, /etc/php.d/20-sysvsem.ini, /etc/php.d/20-sysvshm.ini, /etc/php.d/20-tokenizer.ini, /etc/php.d/20-xml.ini, /etc/php.d/20-xmlwriter.ini, /etc/php.d/20-xsl.ini, /etc/php.d/30-mysqli.ini, /etc/php.d/30-pdo_mysqli.ini, /etc/php.d/30-pdo_sqlite.ini, /etc/php.d/30-xnlreader.ini
PHP API	20240924
PHP Extension	20240924
Zend Extension	420240924
Zend Extension Build	API420240924.NTS
PHP Extension Build	API20240924.NTS
PHP Integer Size	64 bits
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	enabled

8. Configure NAT gateway in public subnet and connect to private instance.

Create a NAT gateway

aws | Search [Alt+S] |

VPC > NAT gateways > Create NAT gateway

Elastic IP address 13.62.124.166 (eipalloc-0af25458cf74d491a) allocated.

Create NAT gateway Info

A highly available, managed Network Address Translation (NAT) service that instances in private subnets can use to connect to services in other VPCs, on-premises networks, or the Internet.

NAT gateway settings

Name - optional
Create a tag with a key of 'Name' and a value that you specify.

The name can be up to 256 characters long.

Subnet
Select a subnet in which to create the NAT gateway.

Connectivity type
Select a connectivity type for the NAT gateway.
 Public
 Private

Elastic IP allocation ID Info
Assign an Elastic IP address to the NAT gateway.

Go to the route table and select the private route table and edit the routes.

Route tables (1/6) Info

Last updated 13 minutes ago

Name	Route table ID	Explicit subnet associations	Edge associations	Main
-	rtb-0b42283383e9a976a	-	-	Y
-	rtb-06bf5b21aefba964d7	-	-	Y
-	rtb-0231e0c25d8f9f91f	-	-	Y
pub-route table	rtb-06d7a6b1a588f9301	2 subnets	-	N
<input checked="" type="checkbox"/> pri-routeable	rtb-072698f31881e4245	2 subnets	-	N
-	rtb-08f5272920ed3ca4f	-	-	Yes

rtb-072698f31881e4245 / pri-routeable

Details

Route table ID <input type="text" value="rtb-072698f31881e4245"/>	Main <input type="checkbox"/> No	Explicit subnet associations 2 subnets	Edge associations -
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Select your created NAT gateway

9. Install Apache Tomcat in private EC2 and deploy a sample app.

Create a private instance with your VPC and placed in your private subnet. And create another instance named as bastion host with your VPC and placed in your public subnet.

Login in ssh with the public ip address.

```
MUJU SK@DESKTOP-LU541U4 MINGW64 ~/Downloads
$ ssh -i AWS.pem ec2-user@13.60.210.225
The authenticity of host '13.60.210.225 (13.60.210.225)' can't be established.
ED25519 key fingerprint is SHA256:3m/aL7g732zVqNcEkdY7j012Zhd2V+1aFUquGP+18PQ.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '13.60.210.225' (ED25519) to the list of known hosts.

          #_
  ~\_\_ #####_      Amazon Linux 2023
  ~~ \_\_#####\_
  ~~   \###|
  ~~     \#/ __
  ~~       V~' '-->
  ~~~        /
  ~~.~.  /`-
  _/m/,'-/
[ec2-user@ip-192-168-0-11 ~]$ |
```

By using public ip login that.add sudo yum update -y

```
[root@ip-10-0-14-43 ~]# sudo yum update -y
Amazon Linux 2023 Kernel Livepatch repository
Dependencies resolved.
Nothing to do.
Complete!
[root@ip-10-0-14-43 ~]# |
```

Yum install java.

```
[root@ip-10-0-14-43 ~]# yum install java
Last metadata expiration check: 0:02:01 ago on Thu Sep 25 13:56:30 2025.
Dependencies resolved.
=====
 Package           Architecture Version
 =====
Installing:
 java-24-amazon-corretto      x86_64    1:24.0.2+12-1.amzn2023.1
Installing dependencies:
 alsa-lib                  x86_64    1.2.7.2-1.amzn2023.0.2
 cairo                     x86_64    1.18.0-4.amzn2023.0.3
 dejavu-sans-fonts          noarch   2.37-16.amzn2023.0.2
 dejavu-sans-mono-fonts     noarch   2.37-16.amzn2023.0.2
 dejavu-serif-fonts         noarch   2.37-16.amzn2023.0.2
 fontconfig                 x86_64    2.13.94-2.amzn2023.0.2
 fonts-filesystem           noarch   1:2.0.5-12.amzn2023.0.2
 freetype                   x86_64    2.13.2-5.amzn2023.0.1
 giflib                     x86_64    5.2.1-9.amzn2023.0.1
 google-noto-fonts-common   noarch   20240401-1.amzn2023.0.2
 google-noto-sans-vf-fonts  noarch   20240401-1.amzn2023.0.2
```

Install tomcat:

- sudo yum update -y
- sudo amazon-linux-extras install java-openjdk11 -y

- wget https://dlcdn.apache.org/tomcat/tomcat9/v9.0.95/bin/apache-tomcat-9.0.95.tar.gz
 - tar -xvzf apache-tomcat-9.0.95.tar.gz
 - mv apache-tomcat-9.0.95 /opt/tomcat
 - sh /opt/tomcat/bin/startup.sh

```
[root@ip-10-0-14-43 opt]# ls
apache-tomcat-9.0.109 aws tomcat tomcat9
[root@ip-10-0-14-43 opt]# cd /opt/tomcat9
-bash: cd: /opt/tomcat9: Not a directory
[root@ip-10-0-14-43 opt]#
[root@ip-10-0-14-43 opt]#
[root@ip-10-0-14-43 opt]# cd apache-tomcat-9.0.109/
[root@ip-10-0-14-43 apache-tomcat-9.0.109]# ls
BUILDING.txt LICENSE README.md RUNNING.txt conf logs webapps
CONTRIBUTING.md NOTICE RELEASE-NOTES bin lib temp work
[root@ip-10-0-14-43 apache-tomcat-9.0.109]# cd bin/
[root@ip-10-0-14-43 bin]# ls
bootstrap.jar ciphers.sh daemon.sh setclasspath.bat startup.sh version.bat
catalina-tasks.xml commons-daemon-native.tar.gz digest.bat setclasspath.sh tomcat-juli.jar version.sh
catalina.bat commons-daemon.jar digest.sh shutdown.bat tomcat-native.tar.gz
catalina.sh configtest.bat makebase.bat shutdown.sh tool-wrapper.bat
ciphers.bat configtest.sh makebase.sh startup.bat tool-wrapper.sh
[root@ip-10-0-14-43 bin]# ./startup.sh
Using CATALINA_BASE:   /opt/apache-tomcat-9.0.109
Using CATALINA_HOME:   /opt/apache-tomcat-9.0.109
Using CATALINA_TMPDIR: /opt/apache-tomcat-9.0.109/temp
Using JRE_HOME:        /usr
Using CLASSPATH:       /opt/apache-tomcat-9.0.109/bin/bootstrap.jar:/opt/apache-tomcat-9.0.109/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.
```

Deploy a sample war:

```
wget https://tomcat.apache.org/tomcat-9.0  
doc/appdev/sample/sample.war -O sample.war
```

```
root@ip-192-168-3-99 tmp]# sudo systemctl daemon-reload
sudo systemctl start tomcat
sudo systemctl status tomcat
● tomcat.service - Apache Tomcat Web Application container
   Loaded: loaded (/etc/systemd/system/tomcat.service; enabled; preset: disabled)
   Active: active (running) since Thu 2025-09-25 09:27:15 UTC; 113ms ago
     Process: 30512 ExecStart=/opt/tomcat/bin/catalina.sh start (code=exited, status=0/SUCCESS)
    Main PID: 30520 (java)
      Tasks: 12 (limit: 1111)
     Memory: 17.4M
        CPU: 66ms
      CGroup: /system.slice/tomcat.service
              └─30520 /usr/lib/jvm/java-24-amazon-corretto.x86_64/bin/java -Djava.util.logging.config.file=/opt/tomca

sep 25 09:27:15 ip-192-168-3-99.ec2.internal systemd[1]: Starting tomcat.service - Apache Tomcat Web Application Cont
sep 25 09:27:15 ip-192-168-3-99.ec2.internal catalina.sh[30512]: Existing PID file found during start.
sep 25 09:27:15 ip-192-168-3-99.ec2.internal catalina.sh[30512]: Removing/clearing stale PID file.
sep 25 09:27:15 ip-192-168-3-99.ec2.internal catalina.sh[30512]: Tomcat started.
sep 25 09:27:15 ip-192-168-3-99.ec2.internal systemd[1]: Started tomcat.service - Apache Tomcat Web Application Cont
lines 1-16/16 (END)
```

Access from Public EC2 using: `http://<Private-EC2-PrivateIP>:8080/sample` (curl or browser if using bastion)

10. Configure VPC flow logs and store the logs in S3 and CloudWatch.

Create a bucket by navigating to S3 bucket.

The screenshot shows the 'Create bucket' page in the AWS S3 console. At the top, there's a navigation bar with the AWS logo, a search bar, and account information for 'Europe (Stockholm)'. Below the navigation is a breadcrumb trail: 'Amazon S3 > Buckets > Create bucket'. The main section is titled 'Create bucket' with a 'Info' link. A note says 'Buckets are containers for data stored in S3.' Under 'General configuration', the 'AWS Region' is set to 'Europe (Stockholm) eu-north-1'. The 'Bucket type' dropdown is open, showing 'General purpose' (selected) and 'Directory'. The 'Bucket name' field contains 'my-s3bucket01'. Below it, a note specifies bucket name rules. A 'Copy settings from existing bucket - optional' section includes a 'Choose bucket' button and a note about copied settings. The 'Object Ownership' section has an 'Info' link. The entire form is enclosed in a light gray border.

Go to cloud watch and select log groups and create a log group.

The screenshot shows the 'Create log group' page in the AWS CloudWatch console. On the left is a sidebar with 'CloudWatch' selected, showing 'Favorites and recents', 'Dashboards', 'AI Operations', 'Alarms', 'Logs' (with 'Log groups' selected), 'Log Anomalies', 'Live Tail', 'Logs Insights', 'Contributor Insights', 'Metrics', and 'Application Signals'. The main area is titled 'Create log group' with a 'Log group details' section. It contains a note about CloudWatch Logs log classes, a 'Log group name' input field with 'vpc-flow-logs', a 'Retention setting' dropdown set to 'Never expire', a 'Log class' dropdown set to 'Standard', and a 'KMS key ARN - optional' input field. The entire form is enclosed in a light gray border.

Go to vpc and select your vpc int that vpc select flow logs and create flowlog.

VPC > Your VPCs > Create flow logs

my-vpc vpc-0d5ad1c5d8a1cudad Available

Flow log settings

Name - optional

my-flowlog

Filter
The type of traffic to capture (accepted traffic only, rejected traffic only, or all traffic).

Accept
 Reject
 All

Maximum aggregation interval | Info
The maximum interval of time during which a flow of packets is captured and aggregated into a flow log record.

10 minutes
 1 minute

Destination
The destination to which to publish the flow log data.

Send to CloudWatch Logs
 Send to an Amazon S3 bucket
 Send to Amazon Data Firehose in the same account
 Send to Amazon Data Firehose in a different account

Destination log group | Info
The name of an existing log group or the name of a new log group that will be created when you create this flow log. A new log stream is created for each monitored network interface.

Go to cloudwatch and log groups vpc-flow-logs if you didn't see any streams delete an instance it will give the logs.

aws | Search [Alt+S] | Account: Europe (Stockholm) ▾

CloudWatch > Log groups > vpc-flow-logs > eni-0caf5943ad2ea6353-all

CloudWatch		Log events	Actions ▾	Start tailing	Create				
Favorites and recents	▶	You can use the filter bar below to search for and match terms, phrases, or values in your log events. Learn more about filter patterns	Clear	1m	30m	1h	12h	Custom	UTC time
		Display ▾							
		▶ Timestamp Message							
		▶ 2025-09-24T13:21:24.000Z 2 235351028455 eni-0caf5943ad2ea6353 - - - - - 1758720084 1758720115 - NODATA							
		▶ 2025-09-24T13:22:24.000Z 2 235351028455 eni-0caf5943ad2ea6353 - - - - - 1758720144 1758720175 - NODATA							
		▶ 2025-09-24T13:23:24.000Z 2 235351028455 eni-0caf5943ad2ea6353 - - - - - 1758720204 1758720235 - NODATA							
		▶ 2025-09-24T13:24:24.000Z 2 235351028455 eni-0caf5943ad2ea6353 - - - - - 1758720264 1758720295 - NODATA							
		▶ 2025-09-24T13:25:24.000Z 2 235351028455 eni-0caf5943ad2ea6353 - - - - - 1758720324 1758720355 - NODATA							
		▶ 2025-09-24T13:26:24.000Z 2 235351028455 eni-0caf5943ad2ea6353 - - - - - 1758720384 1758720415 - NODATA							
		▶ 2025-09-24T13:27:24.000Z 2 235351028455 eni-0caf5943ad2ea6353 - - - - - 1758720444 1758720475 - NODATA							
		▶ 2025-09-24T13:28:24.000Z 2 235351028455 eni-0caf5943ad2ea6353 - - - - - 1758720504 1758720535 - NODATA							
		▶ 2025-09-24T13:29:24.000Z 2 235351028455 eni-0caf5943ad2ea6353 - - - - - 1758720564 1758720595 - NODATA							
		▶ 2025-09-24T13:30:24.000Z 2 235351028455 eni-0caf5943ad2ea6353 - - - - - 1758720624 1758720655 - NODATA							
		▶ 2025-09-24T13:31:24.000Z 2 235351028455 eni-0caf5943ad2ea6353 - - - - - 1758720684 1758720715 - NODATA							

