

Building a Custom-Designed Social Networking Platform for UCW Students

Part 1

Aditya Prashant Arte (2305505)

Amandeep Singh (2231193)

Maduka Aravindi (2316990)

Obioma Joseph Nwagwu (2313367)

Rajani Mishra (2303650)

MBA, University Canada West

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Professor: Sarah Gholibeigian

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Abstract

The project presents the development process and implementation of a student-specific social network designed for University Canada West through Amazon Web Services infrastructure. The platform creates an environment where students can enhance their engagement and knowledge sharing abilities while accessing networking features in a secure scalable cloud platform. The feasibility study demonstrates that AWS provides superior capabilities when compared to conventional hosting solutions due to its enhanced cost performance and adaptability and enhanced system efficiency. AWS EC2 joins Elastic Beanstalk together with RDS and DynamoDB along with S3 Lambda and CloudFront were chosen for building an integrated platform that provides high availability combined with safe data management.

Composition of the implementation phase particularly included VPC Virtual Private Cloud setup and RDS MySQL relational database installation along with EC2 web application deployment utilizing Elastic Load Balancing and Auto Scaling services. Systematic solutions removed IAM role misconfigurations as well as security group access restrictions and S3 permission issues. The developed estimation model showed how AWS pricing works with flexible payments and reserved instances maximize value while scaling automatically.

The evaluative study confirms that AWS establishes the best platform for university-focused social networking platforms that combine data security with regulatory compliance and platform operational excellence. The upcoming improvements for the system will concentrate on developing better UI/UX alongside implementing advanced protection measures while also establishing automated deployment automation to deliver a more refined user-friendly approach.

Feasibility Analysis

Cloud Solution Advantages

The hosting techniques of cloud computing particularly Amazon Web Services (AWS) provide various benefits when used for dynamic platforms such as social media. AWS delivers scalable and economical reliable infrastructure to process large quantities of workloads efficiently. The AWS pay-as-you-go system enables companies to spend only on real-time usage while traditional hosting forces businesses into continuous maintenance costs in addition to hardware purchasing expenses (AWS,2023). A social network service needs this flexibility since user traffic patterns can drastically change.

Auto-scaling functions from AWS let customers control resource allocations through demand-based modifications. Cryptographic Extension 2 Auto Scaling provides users with a system that adapts to peak-hour traffic increases automatically (AWS 2023). AWS implements multi-AZ (Availability Zone) deployments to distribute resources across several data centers thereby ensuring online availability when problems occur. Social networking sites need reliable service because user pleasure directly depends on it.

AWS CloudFront enables users to get content with reduced latency by delivering data from servers located nearest to them throughout the world. The speedy delivery of multimedia content is ensured through CloudFront (AWS, 2023). This service meets the requirements of social networking sites as it deals with images and videos. AWS represents a superior selection

to conventional hosting because it handles scalability problems and offers worldwide accessibility better than traditional hosting methods.

AWS Specific Features

AWS delivers purpose-built services for developing social networking platforms. AWS Elastic Beanstalk serves as an essential platform that simplifies web application deployment while also managing infrastructure components automatically and supporting Python and Node.js development languages according to AWS documentation (AWS, 2023). Developers can focus on building the platform without worrying about infrastructure maintenance.

Among excellent options for database management is Amazon RDS (Relational Database Service). Users receive managed relational database service support which includes PostgreSQL and MySQL database engines through this solution. RDS enables database performance alongside high availability through its management of routine tasks which include backups as well as scalability and patching duties (Amazon Web Services, 2023). Non-relational data requires non-proprietary DynamoDB through Amazon which provides managed NoSQL service features including application-level scalability and low response times specifically designed for user-generated content.

Amazon S3 (Simple Storage Service) serves as a vital service for the platform through secure storage solutions designed for multimedia assets including photos videos and documents. S3 provides economical life cycle management for massive user-generated material storage. AWS Lambda enables serverless computing that runs platform code automatically upon events

including user file uploads or feedback submission and all without server administration needs (AWS, 2023).

Customers using Amazon CloudFront benefit from improved performance because the content cache exists at edge locations which results in reduced access time. The global user base benefits from this feature because it ensures a smooth and fast experience.

Integration and Compatibility

Developing a single social networking platform through AWS services requires resolving multiple complexities which require safe and efficient component communication. Amazon EC2 instances requiring application hosting must function flawlessly through Amazon RDS databases and alongside Amazon S3 storage for multimedia assets. The process necessitates Virtual Private Cloud setup to establish a secure network separation which requires appropriate security groups together with network access control lists (ACLs) for stopping unauthorized entry (AWS 2023).

The main challenge lies in minimizing delays that occur when data transfers from EC2 instances to S3. By placing S3 endpoints inside VPC organizations users obtain fast and securable access to S3 buckets. A proper implementation of Identity and Access Management (IAM) policies will enable management of authorized service and user access to protect sensitive data.

AWS service compatibility checks must be handled as part of the overall development process. Both structured and unstructured data need appropriate configuration between Amazon RDS and DynamoDB to ensure efficient management. The right monitoring solution that

includes Amazon CloudWatch enables users to monitor performance metrics and identify bottlenecks during integration processes (AWS, 2023).

Cost Efficiency and Management

AWS delivers various cost-saving tools along with pricing models that help reduce expenditures for social networking systems. Organizations whose traffic fluctuates frequently should choose the pay-as-you-go model because it enables them to pay only for the utilized resources. Customers who enter long-term commitments to consumption levels through reductions Plans and Reserved Instances achieve substantial price reductions on their predictable workloads according to Amazon Web Services (Amazon Web Services, 2023).

AWS Budgets along with AWS Cost Explorer serves as tracking and management tools to monitor and control costs within their systems. Businesses can track expenses with the help of these technologies while building budget alerts and detecting spots for cost reductions. Teams can detect unused resources through the extensive utilization metrics which Cost Explorer provides (AWS, 2023).

Challenges in Implementation

Automating a social networking platform on AWS involves significant challenges in keeping the platform secure and compliant with regulations. Security protocols must be robust since the system will process sensitive user data that contains multimedia content with personal information. The protection of data requires encryption as a measure during both movement

stages and storage periods. AWS offers built-in encryption features within S3 and RDS that establish secure data protection from unapproved access (Amazon Web Services, 2023).

The user base determines how challenging it becomes to maintain data protection law compliance with GDPR and FERPA. AWS simplifies compliance for businesses through its compliance certifications as well as AWS Artifact alongside other tools to assist regulation fulfillment. A proper configuration of IAM policies ensures both private data protection and secure execution of authorized tasks by permitted users.

The prevention of data loss demands business institutions to establish both regular backup schedules and disaster recovery protocols. Users can arrange automated backup activities through Amazon RDS Automated Backups and AWS Backup to preserve their data during breaches or operational failures (AWS, 2023).

Requirement Analysis and Data Management

The primary aim of the requirement analysis is to establish a robust and engaging online platform for University Canada West (UCW) students. The platform can achieve exceptional scalability together with top-tier security and reliable performance due to AWS cloud services. The platform depends on these features to deliver support for an active academic community which requires collaboration.

Platform Requirements

The following table outlines the essential platform requirements and their business impacts:

Table 1: Platform Requirements and Business Impacts

Requirement Type	Description	Business Impact
User Interface (UI)	A clean and intuitive interface enabling users to create profiles, access the profile via secure login, customize dashboards, and interact seamlessly.	Enhances user engagement and satisfaction, fosters adoption, and minimizes training costs.
Database Management	A well-structured database that efficiently stores and retrieves user profiles, posts, and multimedia content.	Facilitates scalability, ensures accurate data access, and supports seamless operations.
Networking and Connectivity	A solid Virtual Private Cloud (VPC) with AWS Elastic Load Balancer (ELB) to ensure reliable traffic management.	Guarantees smooth performance, especially during peak activity, and fosters trust in platform reliability.
Security and Compliance	Advanced measures so that they can secure user and system data, adhering to standards like GDPR.	Builds user trust, mitigates risks of data breaches, and ensures business continuity.

Elaboration on Key Requirements

1. User Interface (UI):

The user interface (UI) is an integral component of the social platform and will consist of the following functionalities as proposed by Far and Rad (2022):

- Features include profile creation, dashboard personalization, and compatibility with mobile devices.
- Multilingual support will cater to UCW's diverse student body, promoting inclusivity and accessibility.
- Smooth navigation across features will encourage engagement, fostering a lively online community.

2. Database Management:

- In the database, the AWS DynamoDB will handle structured data like user feedback and interactions, which will ensure low-latency responses.
- The AWS RDS will support complex queries and maintain associations between user data at all levels of interaction.
- The combination of the AWS DynamoDB and AWS RDS services will reduce downtime while simultaneously optimizing data organization for a user-friendly experience for students, administrators, and educators using the platform (Stanic & Pokomi, 2023).

3. Networking and Connectivity:

- The social networking platform will entail a secure VPC will provide isolated environments for platform traffic, thus enhancing the reliability and performance of the social networking platform.
- The AWS Elastic Load Balancer (ELB) will distribute traffic effectively, hence preventing overload and site crash during high-demand periods. Some of the times

when the social networking platform would experience a high traffic are during exams, open discussions, and events. It is expected that the students will share and exchange a lot of content during these times.

4. Security and Compliance:

Security is an important element in all web-based platforms since it prevents unauthorized access while protecting the privacy of user data. The social networking platform will achieve security and compliance in the following ways:

- It will incorporate a Multi-Factor Authentication (MFA) function and encryption protocols to protect user data. These technologies have a proven performance record of maintaining the security of user data (Obaidat, 2020).
- It will be designed cognizant to the Canada's Personal Information Protection and Electronic Documents Act (PIPEDA), and other relevant provincial standards will position the platform as trustworthy and dependable (Scassa, 2020).

Data Management

According to Saura (2021), efficient data management is essential in ensuring the platform delivers a seamless user experience. Some of the crucial processes entail effective data categorization, organization, and storage to support real-time interactions and scalability.

Data Management Considerations

The table below demonstrates the data types necessary for the successful development of the platform, their purposes, associated metadata, and the Input/Output Operations Per Second (IOPS) requirements:

Table 2: Data Management Considerations

Data Type	Purpose	Metadata Associated	IOPS Requirement
Text Posts	Facilitate discussions, reviews, and feedback among users.	User ID, timestamps, and post length	Low (10-50 IOPS)
Images	Enrich user interactions through visual content such as event photos and shared experiences.	File format, dimensions, and upload date	Medium (50-100 IOPS)
Videos	Provide engaging tutorials, promotional content, and event recordings.	Resolution, video length, and encoding details	High (100-500 IOPS)
Metadata Logs	Track user activities and resource usage.	Resource type, login details, access logs	Medium (50-100 IOPS)

Purpose and Applications of Data

1. Text Posts:

- *Purpose:* The purpose of text posts will be to promote interaction and discussions among students. This data type will help in creating a community-focused environment. It will also support textual information that can be posted independently or integrated into multimedia posts. As Moran et al. (2020) note, text posts will make posted content more appealing and engaging to the UCW students, administrators, and educators.

- *Application:* Text-based content like posts and comments will act as the mainstay of the user engagement strategy on the social platform.

2. Images:

- *Purpose:* Integrating images will enable students to share static visual content. This content can be in the form of snapshots and selfies from campus events or collaborative projects. Imagery will be a visual way of capturing and sharing memorable times, events, and interactions.
- *Application:* Utilizing images will enhance the platform's aesthetic appeal and provide users with creative expression tools.

3. Videos:

- *Purpose:* Videos will be used to deliver multimedia content for educational, promotional, and recreational purposes. They will present audio-visual content that appeals to both audio and video enthusiasts.
- *Application:* The video data type will serve as an effective medium for sharing workshop content, tutorials, and event promotions.

4. Metadata Logs:

- *Purpose:* Metadata logs will be used to monitor system usage and user interactions. The outcome will be an optimized platform performance.
- *Application:* Metadata logs will provide insights into user behavior among students, educators, and administrators. Therefore, this data will be used to inform continuous data-based improvements.

Additional Considerations

- Regular maintenance and data audits will be performed to ensure smooth performance of the social networking platform (Wu et al., 2021).
- It is possible that the social networking platform may be targeted by cyberattacks or technological failure. Therefore, backup mechanisms will utilize AWS services like S3 to secure data against accidental loss or corruption (Lee, 2024).
- Since social media usage varies across users and times, data will be categorized based on frequency of access to optimize storage solutions (Wu et al., 2021).

AWS Service Selection and Cost Estimation

Introduction

Through this part, our team intends to identify the necessary services of AWS in creating a digital space where students can interact, share knowledge, and access academic resources and provides a cost estimation for those services. As AWS provides a vast variety of cloud services with scalability and security, it has been chosen as the lender in creating this digital space.

AWS Service Selection

This service selection relies on addressing the platform requirements of Peer-to-peer learning and collaboration, Access to educational materials and resources, Networking opportunities among students and faculty, A hub for university updates, events, and announcements.

Compute and Hosting Services

Amazon EC2 (Elastic Compute Cloud)

Amazon EC2 provides the broadest and deepest compute platform with secure compute for the applications as the security is built into the foundation of Amazon EC2 with the AWS Nitro System. (Amazon Web Services, n.d.) Using AWS EC2 as the computing service, it provides the necessary computing power to run this student digital space's backend, and it hosts web applications to manage the requests that are coming from students to access the educational materials and resources. And since EC2 instances have the auto scaling facility, this digital platform will get adjusted based on the demand. As an example, at the end of the semester when students are mostly using this platform, it will automatically adjust to face the higher traffic.

AWS Elastic Beanstalk

AWS Elastic Beanstalk provides deploying and scaling web applications and services and application health monitoring. (AWS, n.d.). As AWS Elastic Beanstalk supports multiple programming languages like Python, Java, PHP, and Node.js, it makes it easier to perform the requests of the students and with the auto scaling facility, it addresses the high traffic in the peak times such as exams and University events. This ensures the higher responsive rate of the digital platform without any manual intervention. Most importantly, AWS Elastic Beanstalk facility is pay as go service which helps the university to optimize its costs while maintaining the higher performance and providing good engagement and experience through the digital platform.

AWS Lambda

AWS Lambda is a serverless computing service which mainly response to triggers such as changes in data, shifts in system state, or actions by users. (Amazon Web Services, n.d.) As this digital platform facilitates university updates, events, and announcements, automatic notifications and

alerts are important. AWS Lambda can trigger notifications when a new event, announcement or campus closure update has been made in the platform which makes easier for students to get updated just by clicking on the alert. Also, Lambda facilitates real-time interactions such as chat, discussion forums, or live Q&A sessions which make it easier and accessible the Peer-to-peer learning and collaboration and Networking opportunities among students and faculty. As an event driven service, Amazon Lambda stops its operation whenever not needed which eliminates the additional operational costs. Importantly, it clears the old posts related to events and announcements that ensured the efficiency of the platform.

Storage and Database Services

Amazon RDS (Relational Database Service)

Amazon Relational Database Service is simple to set up, operate, and scale with demand and it allows students and instructors to create a new profile in minutes. (Amazon Web Services, n.d.) As this digital platform mainly facilitates networking opportunities among students and faculty, use of Amazon RDS efficiently manages the structured data such as student numbers, student profile, posts and announcements. Meantime, as RDS provides automated backups, snapshots, and multi-AZ (Availability Zone) deployment, it ensures data reliability and zero downtime to students. University only has to pay for storage and computing resources used that ensures cost optimization.

Amazon S3 (Simple Storage Service)

Amazon S3 is a storage service offering industry-leading scalability, data availability, security, and performance with cost optimization and data analysis. (Amazon Web Services, n.d.) With the Amazon S3 capability to store media files, students can upload their profile picture, course notes,

course recording and any related document which makes it easier the learning and collaboration. Also, it provides the advantage of cost optimization as it allows automatic tiering of data which directs frequent accessible data into Standard Storage and old documents and data into S3 Glacier for long-term, low-cost storage. Importantly, S3 provides an automatic backup facility which ensures the data is restored if accidentally a file is deleted, or data is destroyed because of a disaster.

Amazon DynamoDB

Amazon DynamoDB is a serverless, NoSQL database service which is supported with managed backups, point-in-time recovery. (Amazon Web Services, n.d.) As this digital platform focuses on networking between students and faculty, use of Amazon DynamoDB facilitates the Real-Time Messaging & Notifications without any delays which strengthens the student networking. Meantime, use of Amazon DynamoDB makes the platform for students to engage with each other's discussion threads as it has the capacity to automatically scale and transfer millions of operations per second.

Networking and Security

Amazon VPC (Virtual Private Cloud)

Amazon Virtual Private Cloud is a commercial cloud computing service which gives an isolated and full control over virtual networking environment. (Amazon Web Services, n.d.) VPC allows the subnets, it ensures the data security of students and faculty since those are secured in the private subnet while public subnets host web applications which require internet connection. Also, VPC ensures the direct and fast communication of data which ensures the efficient profile access of students. Security groups and network ACLs ensure the management of traffic and the risk of attacks on private data.

AWS Route 53

AWS Route 53 is a highly available and scalable service which provides domain name resolution and improves the performance of the digital platform. (Amazon Web Services, n.d.) AWS Route 53 manages the traffic and platform performance by allocating students and faculty access based on their geographical locations. Importantly, it monitors the health of EC2 instances and automatically directs the traffic to backup instances which ensures the continuous availability of the digital platform to students and faculty.

AWS CloudFront

Amazon CloudFront is a content delivery network which Securely deliver content with low latency and high transfer speeds. It ensures faster access to course materials and videos which facilitates efficient Peer-to-peer learning and collaboration. (Amazon Web Services, n.d.) Also, as AWS CloudFront has the facility to deliver live video streams with low latency, it ensures the networking opportunities and hosting live events which increase the student engagement. Also, it has an automatic scaling facility which handles the traffic effectively in the peak times such as exams and semester ends. AWS CloudFront can be integrated with the AWS Shield in preventing any DDoS attacks and it acts as a buffer to prevent the original server to ensure the security of the student's platform.

AWS Shield

This acts as a shield to protect applications running in AWS using Denial of Service (DDoS) protection service. (Amazon Web Services, n.d.) AWS Shield can automatically detect and mitigate the attacks which ensure uninterrupted access to the digital platform. Aso, If the shield

detects any suspicious traffic patterns it directs that traffic to scrubbing infrastructure to filter and analyze the traffic and only the legitimate traffic will enter to the platform.

AWS WAF (Web Application Firewall)

AWS WAF is a firewall that helps to protect the web application server against a range of Internet threats. (Amazon Web Services, n.d.) This ensures the security, availability, and integrity of the platform by filtering the traffic. AWS WAF provides the facility for secure and reliable student access where students can enter their credential to get enter to the platform and it detects and prevents multiple failed attempts of login from the same IP address to ensure the security of the platform. AWS WAF integrates with the AWS CloudFront in delivering faster content and ensuring better performance to smoothen the student experience.

Cost Estimation

Service	Estimated Monthly Cost (USD)	References
Amazon EC2 (t3. medium, web hosting)	\$40 - \$80	(CAST AI, 2024)
AWS Elastic Beanstalk	Included in EC2 pricing	(CAST AI, 2024)
Amazon S3 (100GB storage for images/videos)	\$2 - \$10	(CAST AI, 2024)
Amazon RDS (db.t3. micro, 20GB storage)	\$15 - \$50	(CAST AI, 2024)
Amazon DynamoDB (100K reads/writes per month)	\$10 - \$30	(CAST AI, 2024)

Amazon VPC & Route 53	\$5 - \$15	(CAST AI, 2024)
AWS CloudFront (1TB bandwidth)	\$50 - \$100	(CAST AI, 2024)
AWS IAM, WAF, Shield	\$10 - \$50	(CAST AI, 2024)
Total Estimated Monthly Cost	\$150 - \$350	

Procedure-

Created VPC (UCW-Social-Network-VPC) with CIDR: 10.0.0.0/16.

The screenshot shows the AWS VPC dashboard. In the left sidebar, under 'Virtual private cloud', 'Your VPCs' is selected. The main area displays a table titled 'Your VPCs (1/2)'. A new VPC entry for 'UCW-SocialNW-VPC' is listed, with its VPC ID as 'vpc-062b1908ed32cedb0'. The table includes columns for Name, VPC ID, State, Block Public Access, IPv4 CIDR, and IPv6 CIDR. Below the table, a detailed view for the selected VPC is shown, including sections for Details, Resource map, CIDs, Flow logs, Tags, and Integrations. The 'Details' section provides specific configuration details such as VPC ID, State (Available), DNS resolution (Enabled), Main network ACL (acl-0da446fd89b3c5b52), and IPv6 CIDR (Network border group). The 'Resource map' section is currently empty.

Your VPCs (1/2) Info

Name	VPC ID	State	Block Public...	IPv4 CIDR	IPv6 CIDR
vpc-0e619128a3380f7d8	Available	<input type="checkbox"/> Off	172.31.0.0/16	-	-
UCW-SocialNW-VPC	Available	<input type="checkbox"/> Off	10.0.0.0/16	-	-

Subnets (6)
Subnets within this VPC

- us-east-1a**
 - A public-subnet-1
 - A private-subnet-2
- us-east-1b**
 - B private-subnet-1
 - B public-subnet-1
- us-east-1c**
 - C public-subnet-3
 - C private-subnet-3

Route tables (2)
Route network traffic to resources

- rtb-04407937bc4c79b02
- public-route-table

Network connections (1)
Connections to other networks

- ucw-igw

Your VPCs (1/2) Info

Name	VPC ID	State	Block Public...	IPv4 CIDR	IPv6 CIDR
vpc-0e619128a3380f7d8	Available	<input type="checkbox"/> Off	172.31.0.0/16	-	-
UCW-SocialNW-VPC	Available	<input type="checkbox"/> Off	10.0.0.0/16	-	-

UCW-SocialNW-VPC / UCW-SocialNW-VPC

[Details](#) | [Resource map](#) | **CIDRs** | [Flow logs](#) | [Tags](#) | [Integrations](#)

IPv4 CIDRs Info

Address family	CIDR	Status
IPv4	10.0.0.0/16	Associated

[Edit CIDRs](#)

Configured Public (10.0.1.0/24) and Private (10.0.2.0/24) subnets.

Subnets (12) Info

Name	Subnet ID	State	VPC	Block Public...
-	subnet-02d57ef7fe1e46876	Available	vpc-0e619128a3380f7d8	Off
private-subnet-2	subnet-07075eaf70483ccf4	Available	vpc-0e62b1908ed32cedb0 UC...	Off
-	subnet-0fd7c7205ce0712d8	Available	vpc-0e619128a3380f7d8	Off
-	subnet-0eefb41be81a806ca	Available	vpc-0e619128a3380f7d8	Off
public-subnet-3	subnet-09a2ba41fb54b9c7a	Available	vpc-062b1908ed32cedb0 UC...	Off
private-subnet-1	subnet-05ddb72926bb3a767	Available	vpc-062b1908ed32cedb0 UC...	Off
-	subnet-0b0dd86800ae7c8fa0	Available	vpc-0e619128a3380f7d8	Off
-	subnet-02c793def18693b04	Available	vpc-0e619128a3380f7d8	Off
public-subnet-1	subnet-0bb1c77b425f425c7	Available	vpc-062b1908ed32cedb0 UC...	Off
-	subnet-04a5c7a912a45fb15	Available	vpc-0e619128a3380f7d8	Off
private-subnet-3	subnet-00d9ec42be2b1899a	Available	vpc-062b1908ed32cedb0 UC...	Off
public-subnet-2	subnet-08045d3062d0a2745	Available	vpc-062b1908ed32cedb0 UC...	Off

Configured Route Tables for internet and private access.

Route tables (1/3) Info

Name	Route table ID	Explicit subnet associations	Edge associations	Main	VPC
-	rtb-0b196bda0ab315769	-	-	Yes	vpc-0e619128a3380f7d8
<input checked="" type="checkbox"/> public-route-table	rtb-023c4c86f968bb020	3 subnets	-	No	vpc-062b1908ed32cedb0 UC...

rtb-023c4c86f968bb020 / public-route-table

Details | **Routes** | Subnet associations | Edge associations | Route propagation | Tags

Routes (2)

Destination	Target	Status	Propagated
0.0.0.0/0	igw-0bdbcf5b5b7b9c906	Active	No
10.0.0.0/16	local	Active	No

VPC dashboard

Route tables (1/3) Info

Name	Route table ID	Explicit subnet associations	Edge associations	Main	VPC
rtb-0b196bda0ab315769	-	-	-	Yes	vpc-0e61912
public-route-table	rtb-023c4c86f968bb020	3 subnets	-	No	vpc-062b190

rtb-023c4c86f968bb020 / public-route-table

Subnet associations

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
public-subnet-3	subnet-09a2ba41fb54b9c7a	10.0.5.0/24	-
public-subnet-1	subnet-0bb1c77b425f425c7	10.0.1.0/24	-
public-subnet-2	subnet-08045d3062d0a2745	10.0.3.0/24	-

Subnets without explicit associations (3)

The following subnets have not been explicitly associated with any route tables and are therefore associated with the main route table:

Name
Find subnet association

Attached is an Internet Gateway (UCW-IGW) for public access.

Internet gateways (1/2) Info

Name	Internet gateway ID	State	VPC ID	Owner
igw-07562503692266b38	Attached..	vpc-0e619128a3380f7d8	45085622	
ucw-igw	igw-0bdbcf5b5b7b9c906	Attached..	vpc-062b1908ed32cedb0 UCW-SocialNW-VPC	45085622

igw-0bdbcf5b5b7b9c906 / ucw-igw

Details

Internet gateway ID igw-0bdbcf5b5b7b9c906	State Attached	VPC ID vpc-062b1908ed32cedb0 UCW-SocialNW-VPC	Owner 450856220378
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The screenshot shows the AWS VPC Security Groups page. The left sidebar includes options like Subnets, Route tables, Internet gateways, Egress-only internet gateways, Carrier gateways, DHCP option sets, Elastic IPs, Managed prefix lists, NAT gateways, Peering connections, Security (Network ACLs, Security groups), PrivateLink and Lattice, and CloudShell.

The main content area displays the "Security Groups (1/7) Info" table. The "Inbound rules" tab is selected, showing three rules:

Name	Security group rule ID	IP version	Type	Protocol	Port range
-	sgr-0a10a158f1ac5213e	IPv4	HTTP	TCP	80
-	sgr-0c04dfd46f8b052fa	-	MYSQL/Aurora	TCP	3306
-	sgr-0392bbbba5ac7f0b	IPv4	SSH	TCP	22

The screenshot shows the AWS VPC Security Groups page. The left sidebar includes options like Subnets, Route tables, Internet gateways, Egress-only internet gateways, Carrier gateways, DHCP option sets, Elastic IPs, Managed prefix lists, NAT gateways, Peering connections, Security (Network ACLs, Security groups), PrivateLink and Lattice, and CloudShell.

The main content area displays the "Security Groups (1/7) Info" table. The "Outbound rules" tab is selected, showing one rule:

Security group rule ID	IP version	Type	Protocol	Port range	Destination
sgr-0b3abfb828db0c43f	IPv4	All traffic	All	All	0.0.0.0/0

Created MySQL 8.0 RDS instance (ucw-socialnw-db).

Configured VPC: UCW-Social-Network-VPC with a private subnet.

Set public access = No, connected via EC2 security group.

Modify DB instance: ucw-socailnw-db

Settings

DB engine version
Version number of the database engine to be used for this database
8.0.40

DB instance identifier [Info](#)
Type a name for your DB instance. The name must be unique across all DB instances owned by your AWS account in the current AWS Region.
ucw-socailnw-db

The DB instance identifier is case-insensitive, but is stored as all lowercase (as in "mydbinstance"). Constraints: 1 to 63 alphanumeric characters or hyphens. First character must be a letter. Can't contain two consecutive hyphens. Can't end with a hyphen.

Credentials management
You can use AWS Secrets Manager or manage your master user credentials.

- Managed in AWS Secrets Manager - most secure**
RDS generates a password for you and manages it throughout its lifecycle using AWS Secrets Manager.
- Self managed**
Create your own password or have RDS create a password that you manage.

Auto generate password
Amazon RDS can generate a password for you, or you can specify your own password.

Master password [Info](#)

Password strength
Minimum constraints: At least 8 printable ASCII characters. Can't contain any of the following symbols: / ' " @

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Instance configuration
The DB instance configuration options below are limited to those supported by the engine that you selected above.

DB instance class [Info](#)
 Hide filters
 Include previous generation classes
 Standard classes (includes m classes)
 Memory optimized classes (includes r and x classes)
 Burstable classes (includes t classes)
db.t3.micro
 2 vCPUs 1 GiB RAM Network: Up to 2,085 Mbps

Storage

Storage type [Info](#)
Provisioned IOPS SSD (io2) storage volumes are now available.
General Purpose SSD (gp2)
 Baseline performance determined by volume size

Allocated storage [Info](#)
 20 GiB
 Allocated storage value must be 20 GiB to 6,144 GiB

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Additional storage configuration

Storage autoscaling [Info](#)
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 after the specified threshold is exceeded.

Availability & durability

Multi-AZ deployment [Info](#)
 Create a standby instance (recommended for production usage)
Creates a standby in a different Availability Zone (AZ) to provide data redundancy, eliminate I/O freezes, and minimize latency spikes during system backups.
 Do not create a standby instance

Connectivity

Network type [Info](#)
To use dual-stack mode, make sure that you associate an IPv6 CIDR block with a subnet in the VPC you specify.

IPv4
Your resources can communicate only over the IPv4 addressing protocol.

Dual-stack mode
Your resources can communicate over IPv4, IPv6, or both.

DB subnet group
default-vpc-062b1908ed32cedb0

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Security group
List of DB security groups to associate with this DB instance.
Choose security groups
rds-sg

Certificate authority [Info](#)
Using a server certificate provides an extra layer of security by validating that the connection is being made to an Amazon database. It does so by checking the server certificate that is automatically installed on all databases that you provision.

rds-ca-rsa2048-g1 (default)
Expiry: May 25, 2061

Additional configuration

Public access
 Publicly accessible
RDS assigns a public IP address to the database. Amazon EC2 instances and other resources outside of the VPC can connect to your database. Resources inside the VPC can also connect to the database. Choose one or more VPC security groups that specify which resources can connect to the database.
 Not publicly accessible
No IP address is assigned to the DB instance. EC2 instances and devices outside the VPC can't connect.

Database port
Specify the TCP/IP port that the DB instance will use for application connections. The application connection string must specify the port number. The DB security group and your firewall must allow connections to the port. [Learn more](#)
3306

Database authentication

Database authentication options [Info](#)

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Database authentication

Database authentication options [Info](#)

- Password authentication**
Authenticates using database passwords.
- Password and IAM database authentication**
Authenticates using the database password and user credentials through AWS IAM users and roles.
- Password and Kerberos authentication**
Choose a directory in which you want to allow authorized users to authenticate with this DB instance using Kerberos Authentication.

Monitoring

Choose monitoring tools for this database. Database Insights provides a combined view of Performance Insights and Enhanced Monitoring for your fleet of databases.

<input type="radio"/> Database Insights - Advanced <ul style="list-style-type: none"> • Retains 15-24 months of performance history • Fleet-level monitoring • Integration with CloudWatch Application Signals 	<input checked="" type="radio"/> Database Insights - Standard <ul style="list-style-type: none"> • Retains 7 days of performance history, with the option to pay for the retention of up to 24 months of performance history
---	--

Database Insights pricing is separate from RDS monthly estimates. See [Amazon CloudWatch pricing](#).

▼ Additional monitoring settings
Enhanced Monitoring, CloudWatch Logs and DevOps Guru

Enhanced Monitoring

Enable Enhanced monitoring
Enabling Enhanced Monitoring metrics are useful when you want to see how different processes or threads use the CPU.

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Launched EC2 instance using Amazon Linux 2023.

Assigned it to Public Subnet with Auto-Assign Public IP = Yes.

Attached EC2 Security Group (EC2-SG) allowing:

SSH (22) → My IP

HTTP (80) → Anywhere

MySQL (3306) → From RDS-SG

Launch an instance [Info](#)

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

Name and tags [Info](#)

Name Add additional tags

Application and OS Images (Amazon Machine Image) [Info](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

Search our full catalog including 1000s of application and OS images

Quick Start

Amazon Linux  macOS Ubuntu Windows Red Hat SUSE Linux Debian [Browse more AMIs](#) Including AMIs from AWS, Marketplace and the Community

[Launch instance](#) [Preview code](#)

Amazon Machine Image (AMI)

Amazon Linux 2023 AMI [Free tier eligible](#) ami-05b10e08d247fb927 (64-bit (x86), uefi-preferred) / ami-0f37c4a1ba152af46 (64-bit (Arm), uefi) Virtualization: hvm ENA enabled: true Root device type: ebs

Description
Amazon Linux 2023 is a modern, general purpose Linux-based OS that comes with 5 years of long term support. It is optimized for AWS and designed to provide a secure, stable and high-performance execution environment to develop and run your cloud applications.

Amazon Linux 2023 AMI 2023.6.20250218.2 x86_64 HVM kernel-6.1

Architecture	Boot mode	AMI ID	Publish Date	Username
64-bit (x86) ▼	uefi-preferred	ami-05b10e08d247fb927	2025-02-20	ec2-user

[Verified provider](#)

Instance type [Info](#) | [Get advice](#)

Instance type

t2.micro [Free tier eligible](#)

Family: t2 1 vCPU 1 GiB Memory Current generation: true
 On-Demand Windows base pricing: 0.0162 USD per Hour
 On-Demand Ubuntu Pro base pricing: 0.0134 USD per Hour
 On-Demand SUSE base pricing: 0.0116 USD per Hour
 On-Demand RHEL base pricing: 0.026 USD per Hour

All generations [Compare instance types](#)

[Launch instance](#) [Preview code](#)

The screenshot shows the AWS EC2 'Launch an instance' wizard. On the left, under 'Network settings', a VPC is selected (vpc-062b1908ed32cedb0) and an auto-assign public IP is enabled. A security group named 'ucw-socialnw sg' is chosen. On the right, the 'Summary' section shows one instance being launched with an Amazon Linux 2023 AMI, t2.micro instance type, and 8 GiB storage. A note about the free tier is displayed.

The screenshot shows the AWS EC2 'Launch an instance' wizard. In the 'Inbound Security Group Rules' section, two rules are defined: one for SSH (TCP port 22) from 'My IP' and another for HTTP (TCP port 80) from 'Anywhere'. The right side of the screen shows the same summary as the previous screenshot, including the launch button.

Type | Info Protocol | Info Port range | Info
MySQL/Aurora TCP 3306

Source type | Info Source | Info Description - optional | Info
Custom Add CIDR, prefix list or security group e.g. SSH for admin desktop
sg-0ecfd585862b6b156 X

⚠ Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

Add security group rule Advanced network configuration

▼ Configure storage | Info Advanced
1x 8 GiB gp3 Root volume, 3000 IOPS, Not encrypted

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage

Add new volume

Summary
Number of instances | Info
1

Software Image (AMI)
Amazon Linux 2023 AMI 2023.6...read more
ami-05b10e08d247fb927

Virtual server type (instance type)
t2.micro

Firewall (security group)
New security group

Storage (volumes)
1 volume(s) - 8 GiB

Free tier: In your first year of opening an AWS account, you get 750 hours per month of t2.micro instance usage (or t3.micro when t2.micro isn't available when used)

Cancel Launch instance Preview code

Created Elastic Beanstalk environment (ucwsocialnw) with PHP 8.x.

Configured IAM role & S3 bucket access for Elastic Beanstalk.

Uploaded PHP application and successfully connected it to RDS.

Step 1
Configure environment

Step 2
Configure service access

Step 3 - optional
Set up networking, database, and tags

Step 4 - optional
Configure instance traffic and scaling

Step 5 - optional
Configure updates, monitoring, and logging

Step 6
Review

Configure environment | Info

Environment tier | Info
Amazon Elastic Beanstalk has two types of environment tiers to support different types of web applications.
 Web server environment
Run a website, web application, or web API that serves HTTP requests. Learn more [\[\]](#)
 Worker environment
Run a worker application that processes long-running workloads on demand or performs tasks on a schedule. Learn more [\[\]](#)

Application information | Info
Application name
ucwsocialnw
Maximum length of 100 characters.

► Application tags (optional)

Environment information | Info
Choose the name, subdomain and description for your environment. These cannot be changed later.
Environment name
ucwsocialnw

aws Search [Alt+S] United States (N. Virginia) v vocabs/user3809029=Arte_Aditya_Prashant @ 4508-5622-0378 v

EC2 VPC CloudWatch Aurora and RDS Elastic Beanstalk CloudShell

Environment information [Info](#)

Choose the name, subdomain and description for your environment. These cannot be changed later.

Environment name
Ucwsocialnw-env

Must be from 4 to 40 characters in length. The name can contain only letters, numbers, and hyphens. It can't start or end with a hyphen. This name must be unique within a region in your account.

Domain
Leave blank for autogenerated value .us-east-1.elasticbeanstalk.com [Check availability](#)

Environment description

Platform [Info](#)

Platform type

- Managed platform Platforms published and maintained by Amazon Elastic Beanstalk. [Learn more](#)
- Custom platform Platforms created and owned by you. This option is unavailable if you have no platforms.

Platform
Python

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aws Search [Alt+S] United States (N. Virginia) v vocabs/user3809029=Arte_Aditya_Prashant @ 4508-5622-0378 v

EC2 VPC CloudWatch Aurora and RDS Elastic Beanstalk CloudShell

Platform branch
Python 3.13 running on 64bit Amazon Linux 2023

Platform version
4.4.1 (Recommended)

Application code [Info](#)

- Sample application
- Existing version Application versions that you have uploaded.
- Upload your code Upload a source bundle from your computer or copy one from Amazon S3.

Presets [Info](#)

Start from a preset that matches your use case or choose custom configuration to unset recommended values and use the service's default values.

Configuration presets

- Single instance (free tier eligible)
- Single instance (using spot instance)
- High availability
- High availability (using spot and on-demand instances)
- Custom configuration

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Configure service access Info

Service access
IAM roles, assumed by Elastic Beanstalk as a service role, and EC2 instance profiles allow Elastic Beanstalk to create and manage your environment. Both the IAM role and instance profile must be attached to IAM managed policies that contain the required permissions. [Learn more](#)

Service role
 Create and use new service role
 Use an existing service role

Existing service roles
Choose an existing IAM role for Elastic Beanstalk to assume as a service role. The existing IAM role must have the required IAM managed policies.

EMR_EC2_DefaultRole

EC2 key pair
Select an EC2 key pair to securely log in to your EC2 instances. [Learn more](#)

ucw-socialnw-key

EC2 instance profile
Choose an IAM instance profile with managed policies that allow your EC2 instances to perform required operations.

EMR_EC2_DefaultRole

[View permission details](#)

[Cancel](#) [Skip to review](#) [Previous](#) **Next**

Set up networking, database, and tags - optional Info

Virtual Private Cloud (VPC)
Launch your environment in a custom VPC instead of the default VPC. You can create a VPC and subnets in the VPC management console. [Learn more](#)

vpc-062b1908ed32cedb0 | (10.0.0.0/16) | UCW-SocialNW-VPC

[Create custom VPC](#)

Instance settings
Choose a subnet in each AZ for the instances that run your application. To avoid exposing your instances to the Internet, run your instances in private subnets and load balancer in public subnets. To run your load balancer and instances in the same public subnets, assign public IP addresses to the instances. [Learn more](#)

Public IP address
Assign a public IP address to the Amazon EC2 instances in your environment.
 Activated

Instance subnets

Availability Zone	Subnet	CIDR	Name
us-east-1c	subnet-00d9ce42be2b1899a	10.0.6.0/24	private-subnet-5

[Filter instance subnets](#)

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Instance subnets

Availability Zone	Subnet	CIDR	Name
us-east-1c	subnet-00d9ce42be2b1899a	10.0.6.0/24	private-subnet-3
us-east-1b	subnet-05ddb72926bb3a767	10.0.2.0/24	private-subnet-1
us-east-1a	subnet-07075eaf70483ccf4	10.0.4.0/24	private-subnet-2
us-east-1b	subnet-08045d3062d0a2745	10.0.3.0/24	public-subnet-2
us-east-1c	subnet-09a2ba41fb54b9c7a	10.0.5.0/24	public-subnet-3
us-east-1a	subnet-0bb1c77b425f425c7	10.0.1.0/24	public-subnet-1

Database info
Integrate an RDS SQL database with your environment. [Learn more](#)

Database subnets
If your Elastic Beanstalk environment is attached to an Amazon RDS, choose subnets for your database instances. [Learn more](#)

Choose database subnets (6)

Availability Zone	Subnet	CIDR	Name
us-east-1c	subnet-00d9ce42be2b1899a	10.0.6.0/24	private-subnet-3
us-east-1b	subnet-05ddb72926bb3a767	10.0.2.0/24	private-subnet-1
us-east-1a	subnet-07075eaf70483ccf4	10.0.4.0/24	private-subnet-2
us-east-1b	subnet-08045d3062d0a2745	10.0.3.0/24	public-subnet-2
us-east-1c	subnet-09a2ba41fb54b9c7a	10.0.5.0/24	public-subnet-3
us-east-1a	subnet-0bb1c77b425f425c7	10.0.1.0/24	public-subnet-1

Choose database subnets (6)

Availability Zone	Subnet	CIDR	Name
us-east-1c	subnet-00d9ce42be2b1899a	10.0.6.0/24	private-subnet-3
us-east-1b	subnet-05ddb72926bb3a767	10.0.2.0/24	private-subnet-1
us-east-1a	subnet-07075eaf70483ccf4	10.0.4.0/24	private-subnet-2
us-east-1b	subnet-08045d3062d0a2745	10.0.3.0/24	public-subnet-2
us-east-1c	subnet-09a2ba41fb54b9c7a	10.0.5.0/24	public-subnet-3
us-east-1a	subnet-0bb1c77b425f425c7	10.0.1.0/24	public-subnet-1

Enable database

Restore a snapshot - optional
Restore an existing snapshot from a previously used database.

Snapshot
None

Database settings
Choose an engine and instance type for your environment's database.

Engine

Engine
mysql

Engine version
8.0.40

Instance class
db.t3.small

Storage
Choose a number between 5 GB and 1024 GB.
5 GB

Username
ucw-socailnw-db

Password
.....

Availability
High (Multi-AZ)

Database deletion policy
This policy applies when you decouple a database or terminate the environment coupled to it.

Create snapshot
Elastic Beanstalk saves a snapshot of the database and then deletes it. You can restore a database from a snapshot when you add a DB to an Elastic Beanstalk environment or when you create a standalone database. You might incur charges for storing database snapshots.

Retain
The decoupled database will remain available and operational external to Elastic Beanstalk.

Delete
Elastic Beanstalk terminates the database. The database will no longer be available.

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Availability
High (Multi-AZ)

Database deletion policy
This policy applies when you decouple a database or terminate the environment coupled to it.

Delete
Elastic Beanstalk terminates the database. The database will no longer be available.

Tags
Apply up to 50 tags. You can use tags to group and filter your resources. A tag is a key-value pair. The key must be unique within the resource and is case-sensitive.
Learn more [?](#)

No tags associated with the resource.

[Add new tag](#)

You can add 50 more tags.

Cancel Skip to review Previous Next

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Screenshot of the AWS CloudFormation console showing the 'Configure instance traffic and scaling - optional' step.

Step 1: Configure environment

Step 2: Configure service access

Step 3 - optional: Set up networking, database, and tags

Step 4 - optional: Configure instance traffic and scaling (selected)

Step 5 - optional: Configure updates, monitoring, and logging

Step 6: Review

Configure instance traffic and scaling - optional

Instances Info

Configure the Amazon EC2 instances that run your application.

Root volume (boot device)

Root volume type: General Purpose...

Size: The number of gigabytes of the root volume attached to each instance.
10 GB

IOPS: Input/output operations per second for a provisioned IOPS (SSD) volume.
3000 IOPS

Throughput: The desired throughput to provision for the Amazon EBS root volume attached to your environment's EC2 instance
125 MiB/s

Amazon CloudWatch monitoring:
The time interval between when metrics are reported from the EC2 instances.

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Screenshot of the AWS CloudFormation console showing the 'Configure instance traffic and scaling - optional' step.

Monitoring interval: 5 minute

Instance metadata service (IMDS):
Your environment's platform supports both IMDSv1 and IMDSv2. To enforce IMDSv2, deactivate IMDSv1. [Learn more](#)

IMDSv1: With the current setting, the environment enables only IMDSv2.
 Deactivated

EC2 security groups:
Select security groups to control traffic.

EC2 security groups (3):

Group name	Group ID
default	sg-09cc25ab00d65f08
<input checked="" type="checkbox"/> ec2-sg	sg-0f41534187825822
<input type="checkbox"/> rds-sg	sg-0ecfd585862b6b156

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Capacity [Info](#)

Configure the compute capacity of your environment and auto scaling settings to optimize the number of instances used.

Auto scaling group

Environment type
Select a single-instance or load-balanced environment. You can develop and test an application in a single-instance environment to save costs and then upgrade to a load-balanced environment when the application is ready for production. [Learn more](#)

Load balanced

Instances

2	Min
8	Max

Fleet composition
Spot Instances are launched at the lowest available price. [Learn more](#)

On-Demand instances

Combine purchase options and instances

Spot allocation strategy - new [Info](#)

The method used to determine how available Spot Instances are allocated based on combined factors that you choose, such as capacity, cost, and instance type prioritization. [Learn more](#)

- Capacity optimized
Requests Spot Instances from the pool with optimal capacity for the number of instances that are launching.
- Price capacity optimized
Requests Spot Instances from the pools that are the least likely to be interrupted and have the lowest possible price.
- Capacity optimized prioritized
Requests Spot Instances optimizing capacity first, while honoring the instance type priorities you set on a best-effort basis.

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Maximum spot price
The maximum price per instance-hour, in USD, that you're willing to pay for a Spot Instance. Setting a custom price limits your chances to fulfill your target capacity using Spot instances.

Default

Set your maximum price

On-Demand base
The minimum number of On-Demand Instances that your Auto Scaling group provisions before considering Spot Instances as your environment scales out.

0

On-Demand above base
The percentage of On-Demand Instances as part of any additional capacity that your Auto Scaling group provisions beyond the On-Demand base instances.

0 %

Capacity rebalancing
Specifies whether to enable the capacity rebalancing feature for Spot Instances in your Auto Scaling Group. This option is only relevant when EnableSpot is true in the aws:ec2:instances namespace, and there is at least one Spot Instance in your Auto Scaling group.

Turn on capacity rebalancing

Architecture
The processor architecture determines the instance types that are made available. You can't change this selection after you create the environment. [Learn more](#)

x86_64
This architecture uses x86 processors and is compatible with most third-party tools and libraries.

arm64 - new
This architecture uses AWS Graviton2 processors. You might have to recompile some third-party tools and libraries.

Instance types
Add instance types for your environment with your preferred launch order. The order preference only applies to On-Demand Instances and Spot Instances that use the capacity optimized prioritized allocation strategy. We recommend you include at least two instance types. [Learn more](#)

1. t3.micro

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Instance Type

2. t3.small

[Add instance type](#)

AMI ID
Elastic Beanstalk selects a default Amazon Machine Image (AMI) for your environment based on the Region, platform version, and processor architecture that you choose. [Learn more](#)

ami-0f513264fcdf1fc53

Availability Zones
Number of Availability Zones (AZs) to use.

Any

Placement
Specify Availability Zones (AZs) to use.

Choose Availability Zones (AZs)

Scaling cooldown

360 seconds

Scaling triggers

Metric
Change the metric that is monitored to determine if the environment's capacity is too low or too high.

CPUUtilization

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Statistic
Choose how the metric is interpreted.

Maximum

Unit

Bytes

Period
The period between metric evaluations.

5 Min

Breach duration
The amount of time a metric can exceed a threshold before triggering a scaling operation.

5 Min

Upper threshold

6000000

Scale up increment

1 EC2 instances

Lower threshold

2000000 capacity

Scale down increment

1 EC2 instances

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The screenshot shows the AWS CloudWatch Metrics console. At the top, there are navigation links for EC2, VPC, CloudWatch, Aurora and RDS, Elastic Beanstalk, and CloudShell. The main area displays a chart titled "Scale down increment" with a value of "-1" and a note: "EC2 instances". Below this is a section titled "Load balancer network settings" with a "Visibility" dropdown set to "Public". Under "Load balancer subnets", there is a table listing subnets across three availability zones:

Availability Zone	Subnet	CIDR	Name
us-east-1c	subnet-00d9ce42be2b1899a	10.0.6.0/24	private-subnet-3
us-east-1b	subnet-05ddb72926bb3a767	10.0.2.0/24	private-subnet-1
us-east-1a	subnet-07075eaf70483ccf4	10.0.4.0/24	private-subnet-2
<input checked="" type="checkbox"/> us-east-1b	subnet-08045d3062d0a2745	10.0.3.0/24	public-subnet-2
<input type="checkbox"/> us-east-1c	subnet-09a2ba41fb54b9c7a	10.0.5.0/24	public-subnet-3
<input checked="" type="checkbox"/> us-east-1a	subnet-0bb1c77b425f425c7	10.0.1.0/24	public-subnet-1

At the bottom of the page, there are links for CloudShell, Feedback, Privacy, Terms, and Cookie preferences.

The screenshot shows the AWS Elastic Beanstalk console. At the top, there are navigation links for EC2, VPC, CloudWatch, Aurora and RDS, Elastic Beanstalk, and CloudShell. The main area is titled "Load Balancer Type" and includes the following options:

- Application load balancer: "Application layer load balancer—routing HTTP and HTTPS traffic based on protocol, port, and route to environment processes."
- Classic load balancer: "Previous generation — HTTP, HTTPS, and TCP"
- Network load balancer: "Ultra-high performance and static IP addresses for your application."
- Dedicated: "Use a load balancer that Elastic Beanstalk creates exclusively for this environment."
- Shared: "Use a load balancer that someone in your account created. It can be shared among multiple Elastic Beanstalk environments."

Below this is a "Listeners" section with a table:

Listener Port	Listener Protocol	SSL certificate	Default process	Enabled
80	HTTP	—	default	<input checked="" type="checkbox"/>

At the bottom of the page, there are links for CloudShell, Feedback, Privacy, Terms, and Cookie preferences.

Processes

For each environment process, you can specify the protocol and port that the load balancer uses to route requests to the process. You can also specify how the load balancer performs process health checks.

Name	Port	Protocol	HTTP code	Health check path	Stickiness
default	80	HTTP	/	Disabled	

Rules

Your load balancer routes requests to environment processes based on rules. Rules are evaluated by priority in ascending numerical order. Elastic Beanstalk configures a default rule for each listener. Each default rule routes all traffic to the default process associated with each listener, and has the last priority among all rules of that listener. If a request doesn't match the conditions for any other rule, a default rule routes the request to the listener's default process.

Name	Listener ports	Priority	Host headers	Path patterns	Process
No additional listener rules are currently configured. Click Add rule to add a listener rule.					

Configure updates, monitoring, and logging - optional

Monitoring

Health reporting

Enhanced health reporting provides free real-time application and operating system monitoring of the instances and other resources in your environment. The EnvironmentHealth custom metric is provided free with enhanced health reporting. Additional charges apply for each custom metric. For more information, see [Amazon CloudWatch Pricing](#).

System

Basic
 Enhanced

Health event streaming to CloudWatch Logs

Configure Elastic Beanstalk to stream environment health events to CloudWatch Logs. You can set the retention up to a maximum of ten years and configure Elastic Beanstalk to delete the logs when you terminate your environment.

Log streaming

Activated (standard CloudWatch charges apply.)

Retention

7

Lifecycle

Keep logs after terminating environment

Managed platform updates Info

Activate managed platform updates to apply platform updates automatically during a weekly maintenance window that you choose. Your application stays available during the update process.

Managed updates
 Activated

Weekly update window
 Thursday at 15 : 30 UTC

Update level
 Minor and patch

Instance replacement
 If enabled, an instance replacement will be scheduled if no other updates are available.
 Activated

Email notifications Info

Enter an email address to receive email notifications for important events from your environment. [Learn more](#)

Email
 aditya.arte5505@myucwest.ca

Rolling updates and deployments Info

Application deployments

Choose how Amazon Elastic Beanstalk propagates source code changes and software configuration updates. [Learn more](#)

Deployment policy
 All at once

Batch size type
 Percentage
 Fixed

Deployment batch size
 100
% instances at a time

Configuration updates

Changes to virtual machine settings and VPC configuration trigger rolling updates to replace the instances in your environment without downtime. [Learn more](#)

Rolling update type
 Deactivated

Deployment preferences

Customize health check requirements and deployment timeouts.

Ignore health check
 Don't fail deployments due to health check failures.

False

Health threshold
Lower the threshold for an instance in a batch to pass health checks during an update or deployment.

Command timeout
Change the amount of time in seconds that Amazon Elastic Beanstalk allows an instance to complete deployment commands.
 seconds

Platform software [Info](#)
Configure the options available to your specific platform. These include the proxy server and OS environment properties. [Learn more](#)

Container options

Proxy server

Amazon X-Ray
Amazon X-Ray is a service that collects data about the requests and responses that your application serves and receives. You can use the tools that X-Ray offers to view and filter the data that it provides to identify potential issues and optimization opportunities.

X-Ray daemon
(service charges may apply.)
 Activated

S3 log storage

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Activated

Instance log streaming to CloudWatch logs
Configure the instances in your environment to stream logs to CloudWatch logs. You can set the retention to up to 10 years and configure Elastic Beanstalk to delete the logs when you terminate your environment. [Learn more](#)

Log streaming
(standard CloudWatch charges apply)
 Activated

Retention

Lifecycle

Environment properties
The following properties are passed in the application as environment properties. [Learn more](#)

Name	Value
PYTHONPATH	/var/app/venv/staging-LQM1lest/bin

[Add environment property](#) [Remove](#)

Cancel Previous Next

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Events (30) Info

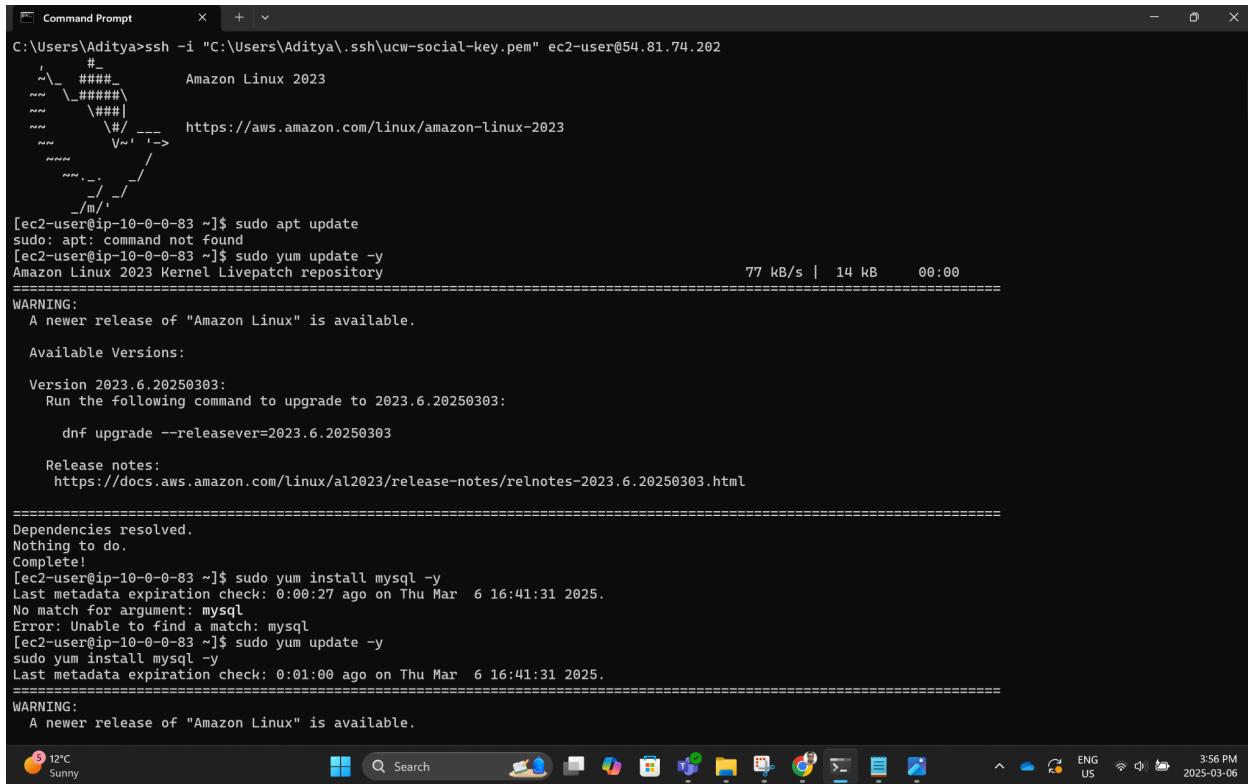
Time	Type	Details
March 6, 2025 15:50:56 (UTC-8)	WARN	Service role "arn:aws:iam::450856220378:role/EMR_EC2_DefaultRole" is missing permissions required to check for managed updates. Verify the role's policies.
March 6, 2025 15:50:45 (UTC-8)	INFO	Launched environment: Ucw-socialnw-app-env. However, there were issues

Events (38) Info

Time	Type	Details
March 6, 2025 18:07:03 (UTC-8)	WARN	Environment health has transitioned from Degraded to Warning. Initialization in progress (running for 2 hours 47 minutes). None of the instances are sending data. Unable to assume role "arn:aws:iam::450856220378:role/EMR_EC2_DefaultRole". Verify that the role exists and is configured correctly.
March 6, 2025 18:04:03 (UTC-8)	WARN	Environment health has transitioned from Warning to Degraded. Initialization in progress (running for 2 hours 44 minutes). No data received from 1 out of 2 instances. Unable to assume role "arn:aws:iam::450856220378:role/EMR_EC2_DefaultRole". Verify that the role exists and is configured correctly.
March 6, 2025 17:57:04 (UTC-8)	WARN	Environment health has transitioned from Degraded to Warning. Initialization in progress (running for 2 hours 37 minutes). None of the instances are sending data. Unable to assume role "arn:aws:iam::450856220378:role/EMR_EC2_DefaultRole". Verify that the role exists and is configured correctly.
March 6, 2025 17:56:04 (UTC-8)	INFO	Added instance [i-046587a50df342a3f] to your environment.
March 6, 2025 17:56:04 (UTC-8)	INFO	Removed instance [i-0a3e50f8099452911] from your environment.

Used SSH key (ucw-social-key.pem) to connect.

Successfully logged into the EC2 instance.



```

Command Prompt
C:\Users\Aditya>ssh -i "C:\Users\Aditya\.ssh\ucw-social-key.pem" ec2-user@54.81.74.202
#_
~\_ #####
~~\_#####
~~ \###}
~~ \#/ __ https://aws.amazon.com/linux/amazon-linux-2023
~~ V\__'__>
~~ / /
~~ .-.-/
~~ .-.-/
~~ /m/` 

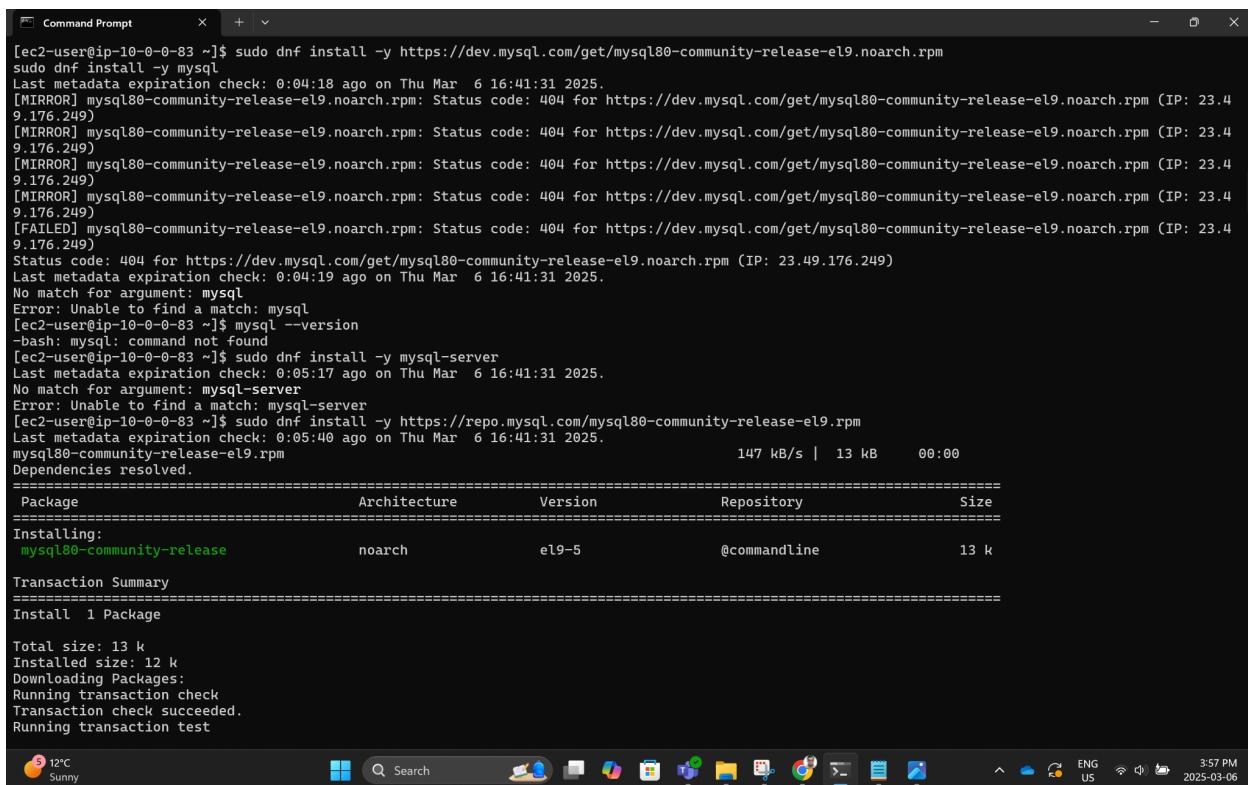
[ec2-user@ip-10-0-0-83 ~]$ sudo apt update
sudo: apt: command not found
[ec2-user@ip-10-0-0-83 ~]$ sudo yum update -y
Amazon Linux 2023 Kernel Livepatch repository
77 kB/s | 14 kB 00:00
=====
WARNING:
A newer release of "Amazon Linux" is available.

Available Versions:
Version 2023.6.20250303:
Run the following command to upgrade to 2023.6.20250303:
dnf upgrade --releasever=2023.6.20250303

Release notes:
https://docs.aws.amazon.com/linux/al2023/release-notes/relnotes-2023.6.20250303.html
=====
Dependencies resolved.
Nothing to do.
Complete!
[ec2-user@ip-10-0-0-83 ~]$ sudo yum install mysql -y
Last metadata expiration check: 0:00:27 ago on Thu Mar 6 16:41:31 2025.
No match for argument: mysql
Error: Unable to find a match: mysql
[ec2-user@ip-10-0-0-83 ~]$ sudo yum update -y
sudo yum install mysql -y
Last metadata expiration check: 0:01:00 ago on Thu Mar 6 16:41:31 2025.
=====
WARNING:
A newer release of "Amazon Linux" is available.

12°C Sunny 3:56 PM 2025-03-06

```

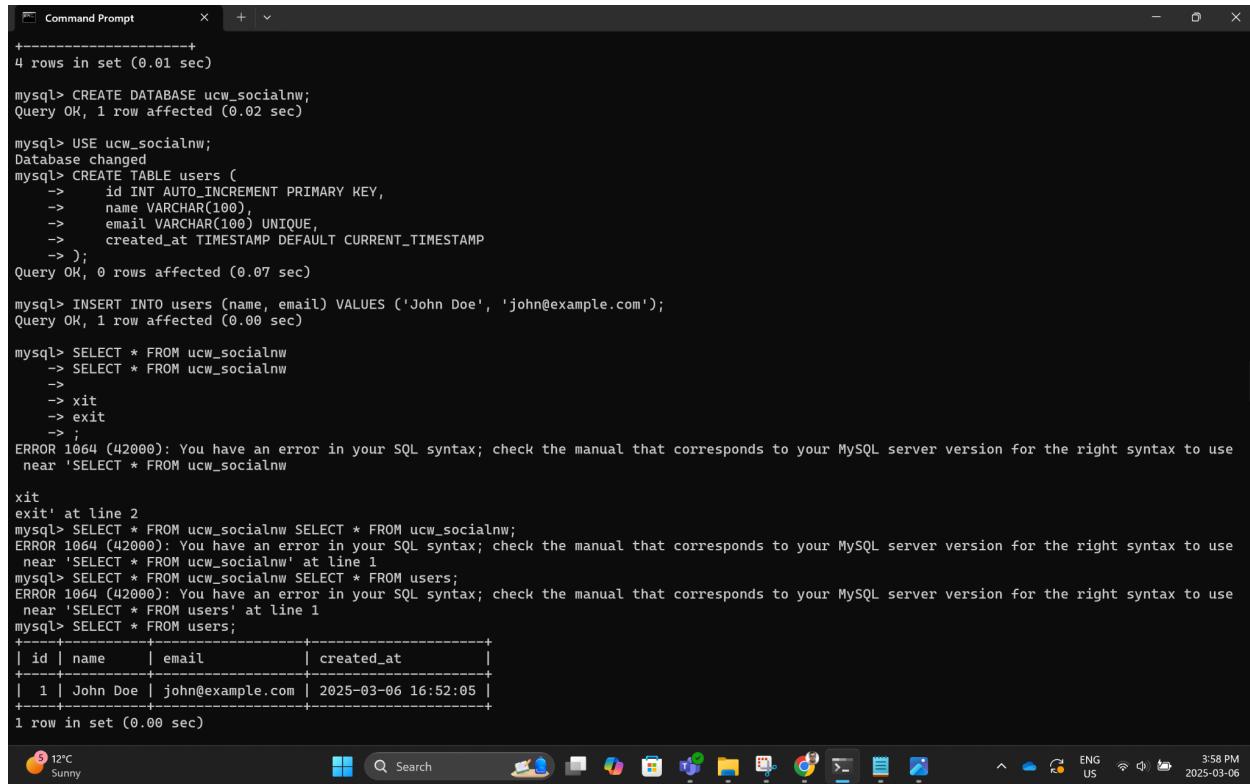


```

Command Prompt
[ec2-user@ip-10-0-0-83 ~]$ sudo dnf install -y https://dev.mysql.com/get/mysql80-community-release-el9.noarch.rpm
sudo dnf install -y mysql
Last metadata expiration check: 0:04:18 ago on Thu Mar 6 16:41:31 2025.
[MIRR] mysql80-community-release-el9.noarch.rpm: Status code: 404 for https://dev.mysql.com/get/mysql80-community-release-el9.noarch.rpm (IP: 23.49.176.249)
[MIRR] mysql80-community-release-el9.noarch.rpm: Status code: 404 for https://dev.mysql.com/get/mysql80-community-release-el9.noarch.rpm (IP: 23.49.176.249)
[MIRR] mysql80-community-release-el9.noarch.rpm: Status code: 404 for https://dev.mysql.com/get/mysql80-community-release-el9.noarch.rpm (IP: 23.49.176.249)
[MIRR] mysql80-community-release-el9.noarch.rpm: Status code: 404 for https://dev.mysql.com/get/mysql80-community-release-el9.noarch.rpm (IP: 23.49.176.249)
[FAILED] mysql80-community-release-el9.noarch.rpm: Status code: 404 for https://dev.mysql.com/get/mysql80-community-release-el9.noarch.rpm (IP: 23.49.176.249)
Status code: 404 for https://dev.mysql.com/get/mysql80-community-release-el9.noarch.rpm (IP: 23.49.176.249)
Last metadata expiration check: 0:04:19 ago on Thu Mar 6 16:41:31 2025.
No match for argument: mysql
Error: Unable to find a match: mysql
[ec2-user@ip-10-0-0-83 ~]$ mysql --version
-bash: mysql: command not found
[ec2-user@ip-10-0-0-83 ~]$ sudo dnf install -y mysql-server
Last metadata expiration check: 0:05:17 ago on Thu Mar 6 16:41:31 2025.
No match for argument: mysql-server
Error: Unable to find a match: mysql-server
[ec2-user@ip-10-0-0-83 ~]$ sudo dnf install -y https://repo.mysql.com/mysql80-community-release-el9.rpm
Last metadata expiration check: 0:05:40 ago on Thu Mar 6 16:41:31 2025.
mysql80-community-release-el9.rpm
Dependencies resolved.
=====
Package           Architecture      Version       Repository      Size
=====
Installing:
mysql80-community-release      noarch        el9-5        @commandline   13 k
Transaction Summary
=====
Install 1 Package

Total size: 13 k
Installed size: 12 k
Downloading Packages:
Running transaction check
Transaction check succeeded.
Running transaction test
12°C Sunny 3:57 PM 2025-03-06

```



```

Command Prompt + X
+-----+
4 rows in set (0.01 sec)

mysql> CREATE DATABASE ucw_socialnw;
Query OK, 1 row affected (0.02 sec)

mysql> USE ucw_socialnw;
Database changed

mysql> CREATE TABLE users (
    ->     id INT AUTO_INCREMENT PRIMARY KEY,
    ->     name VARCHAR(100),
    ->     email VARCHAR(100) UNIQUE,
    ->     created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
    -> );
Query OK, 0 rows affected (0.07 sec)

mysql> INSERT INTO users (name, email) VALUES ('John Doe', 'john@example.com');
Query OK, 1 row affected (0.00 sec)

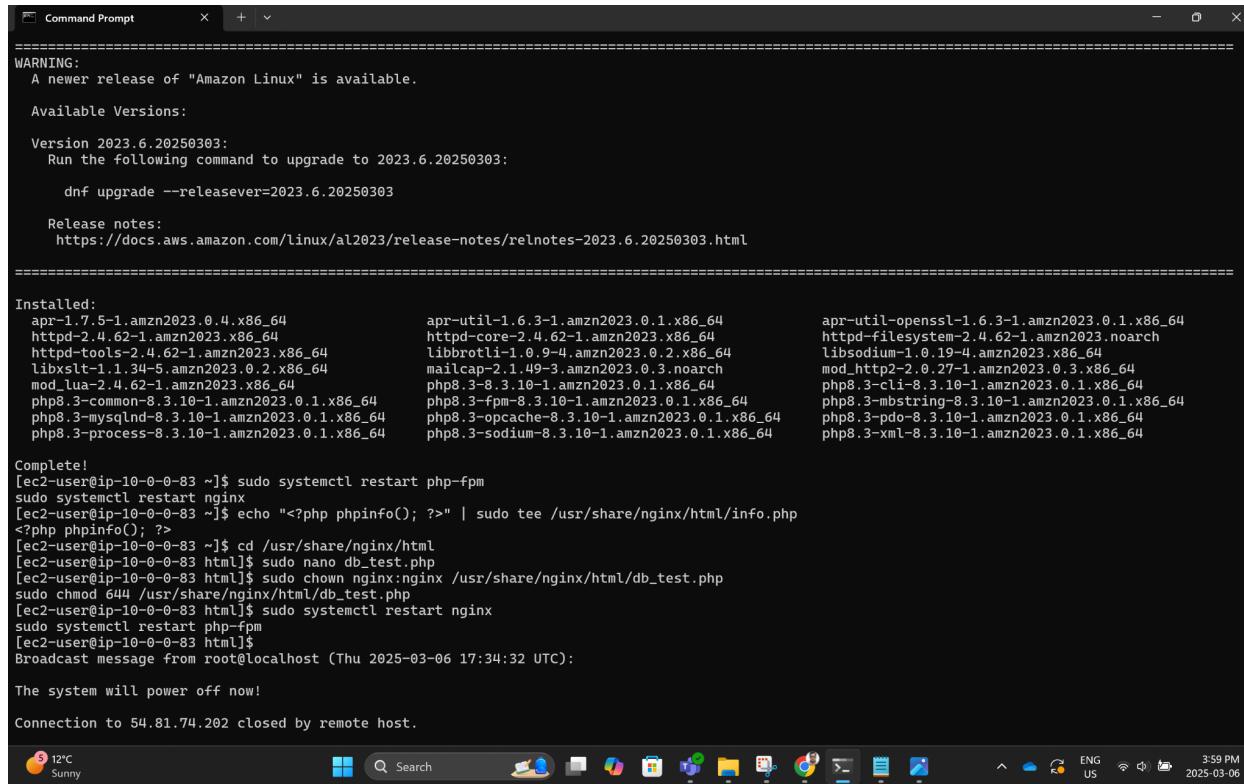
mysql> SELECT * FROM ucw_socialnw
-> SELECT * FROM ucw_socialnw
->
-> xit
-> exit
-> ;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use
near 'SELECT * FROM ucw_socialnw'

xit
exit' at line 2
mysql> SELECT * FROM ucw_socialnw SELECT * FROM ucw_socialnw;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use
near 'SELECT * FROM ucw_socialnw' at line 1
mysql> SELECT * FROM ucw_socialnw SELECT * FROM users;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use
near 'SELECT * FROM users' at line 1
mysql> SELECT * FROM users;
+----+----+----+
| id | name | email | created_at |
+----+----+----+
| 1 | John Doe | john@example.com | 2025-03-06 16:52:05 |
+----+----+----+
1 row in set (0.00 sec)

12°C
Sunny
Search
Clouds
File Explorer
This PC
Control Panel
File
Calculator
Google Chrome
Task View
Power
3:58 PM
ENG US
2025-03-06

```

Installed Nginx & PHP.



```

=====
WARNING:
A newer release of "Amazon Linux" is available.

Available Versions:

Version 2023.6.20250303:
Run the following command to upgrade to 2023.6.20250303:
dnf upgrade --releasever=2023.6.20250303

Release notes:
https://docs.aws.amazon.com/linux/al2023/release-notes/relnotes-2023.6.20250303.html

=====

Installed:
apr-1.7.5-1.amzn2023.0.4.x86_64      apr-util-1.6.3-1.amzn2023.0.1.x86_64
httpd-2.4.62-1.amzn2023.x86_64        httpd-core-2.4.62-1.amzn2023.x86_64
httpd-tools-2.4.62-1.amzn2023.x86_64   libbrotli-1.0.9-4.amzn2023.0.2.x86_64
libxslt-1.1.34-5.amzn2023.0.2.x86_64  mailcap-2.1.49-3.amzn2023.0.3.noarch
mod_lua-2.4.62-1.amzn2023.x86_64       php8.3-common-8.3.10-1.amzn2023.0.1.x86_64
php8.3-common-8.3.10-1.amzn2023.0.1.x86_64  php8.3-fpm-8.3.10-1.amzn2023.0.1.x86_64
php8.3-mysqlnd-8.3.10-1.amzn2023.0.1.x86_64  php8.3-opcache-8.3.10-1.amzn2023.0.1.x86_64
php8.3-process-8.3.10-1.amzn2023.0.1.x86_64  php8.3-sodium-8.3.10-1.amzn2023.0.1.x86_64
php8.3-util-8.3.10-1.amzn2023.0.1.x86_64    php8.3-xml-8.3.10-1.amzn2023.0.1.x86_64
                                              apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_64
                                              httpd-filesystem-2.4.62-1.amzn2023.noarch
                                              libodium-1.0.19-4.amzn2023.x86_64
                                              mod_http2-2.0.27-1.amzn2023.0.3.x86_64
                                              php8.3-cli-8.3.10-1.amzn2023.0.1.x86_64
                                              php8.3-mbstring-8.3.10-1.amzn2023.0.1.x86_64
                                              php8.3-pdo-8.3.10-1.amzn2023.0.1.x86_64
                                              php8.3-xmll-8.3.10-1.amzn2023.0.1.x86_64

Complete!
[ec2-user@ip-10-0-0-83 ~]$ sudo systemctl restart php-fpm
sudo systemctl restart nginx
[ec2-user@ip-10-0-0-83 ~]$ echo "<?php phpinfo(); ?>" | sudo tee /usr/share/nginx/html/info.php
<?php phpinfo(); ?>
[ec2-user@ip-10-0-0-83 ~]$ cd /usr/share/nginx/html
[ec2-user@ip-10-0-0-83 html]$ sudo nano db_test.php
[ec2-user@ip-10-0-0-83 html]$ sudo chown nginx:nginx /usr/share/nginx/html/db_test.php
sudo chmod 644 /usr/share/nginx/html/db_test.php
[ec2-user@ip-10-0-0-83 html]$ sudo systemctl restart nginx
sudo systemctl restart php-fpm
[ec2-user@ip-10-0-0-83 html]$
Broadcast message from root@localhost (Thu 2025-03-06 17:34:32 UTC):

The system will power off now!

Connection to 54.81.74.202 closed by remote host.

  12°C
Sunny
  Search
  File Explorer
  This PC
  File History
  Control Panel
  Task View
  Start
  Settings
  Edge
  Google Chrome
  File
  Mail
  Photos
  OneDrive
  OneNote
  Power
  System
  Network
  Help & Support
  ENG US
  3:59 PM
  2025-03-06

```

Challenges Faced during AWS Core Service Deployment

While deploying the AWS cloud service, including Virtual Private Cloud (VPC), Elastic Compute Cloud (EC2), Relational Database Service (RDS), and Elastic Beanstalk were set. Even though PHP could integrate with MySQL, various challenges were faced, which slowed down the full deployment of a functional web application.

Lack of Adequate Time and Web Development Competence

Due to time constraints and limited front-end development experience, the deployment focused on establishing backend connectivity and not developing a complete web application. Elastic Beanstalk deployment was successfully implemented, but a fully functional user interface

deployment was incomplete. It revealed that web development and AWS CI/CD tool learning are necessary.

IAM Role and Permission Issues

After Elastic Beanstalk deployment, the service failed to take up the required IAM role (EMR_EC2_DefaultRole). The issue resulted from a shortage of permissions, which was resolved by adding a new Elastic Beanstalk service role and the associated AWSElasticBeanstalkFullAccess policy. The service failure highlighted proper IAM policy settings in AWS services interaction.

S3 Bucket Access Denied

Elastic Beanstalk received an "Access Denied" error when we were trying to access an S3 bucket for the deployment. The issue arised be to missing permission in the S3 bucket policy, which was manually adjusted to grant Elastic Beanstalk access. This emphasized the need for correct permissions when using AWS-managed services.

Security Group Configuration Issues

First, EC2 could not reach RDS due to misconfigured security groups. Input rules were altered to allow port 3306 (MySQL) access from the EC2 security group instead of a public IP. Public access to RDS was also turned off for security best practices. This provided hands-on experience in AWS networking and cloud security.

Elastic Beanstalk Environment Timeout

Elastic Beanstalk took longer to initialize than expected, it sometimes threw a "Warning" status due to misconfigurations with load balancers. This was done by switching on proper IAM instance profile permissions and recreating the environment.

Conclusion

Although the complete web application was not developed, this project provided insight into AWS networking, IAM security, and database connectivity. The key learnings were the requirement of IAM roles, security group configurations, and the use of S3 in Elastic Beanstalk deployments. Future improvements include the completion of the web application, installation of automated deployment pipelines, and addition of frontend components for an end-to-end cloud-based system.

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