



polarline

**Emerging Technologies
Project**

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I. Project Overview

PolarLine is an E-commerce site built using Django Framework. It has features for buying items from the store, add to the cart, change, or update the items in cart and other basic features like login and registration. This system uses SQLite database to store all the items and cart. The admin can edit and manage the data stored in database. We also incorporated some JavaScript, jQuery, plugins and CSS for aesthetic reasons and responsiveness.

A. Polarline Features

1. Sign Up

Users will be able to register or create an account to Polar Line website. While signing up, they need to provide a series of specific information like username, first name, last name, email address, etc. Users can navigate to the signup page from any pages on the website.

2. Login

Registered users can log in to their account using their credentials through the Login page. They need to provide their username and password to log in to their account. Users will be able to view their cart details when they login to their account and can update their cart or continue shopping as per their interest.

3. Account

The Account page contains personal information of the users under the Personal Details section whereas the Billing/Shipping Address section contains the billing and shipping address accordingly in their respective profiles. Users will be able to update their personal details or the Billing/Shipping Address using the edit option accordingly whenever required.

4. Shop

Shop page is where customers will be able to view all of the products offered by Polarline. Upon clicking a product in the shop page, the user will be redirected to the Details page where all of the specific details of the product are shown. User can add the item to his or her cart through the add to cart button.

5. Cart

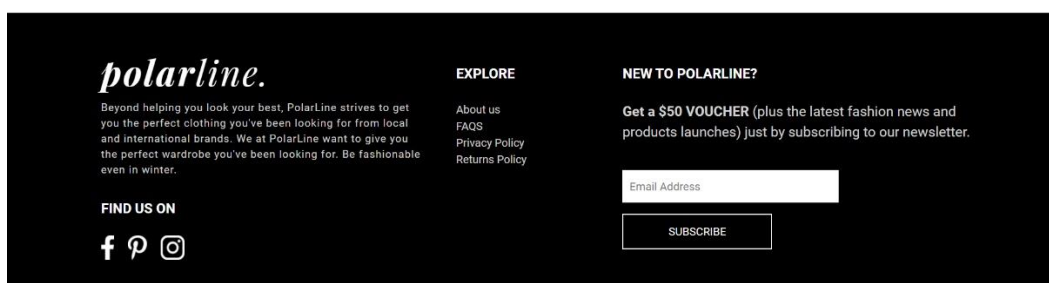
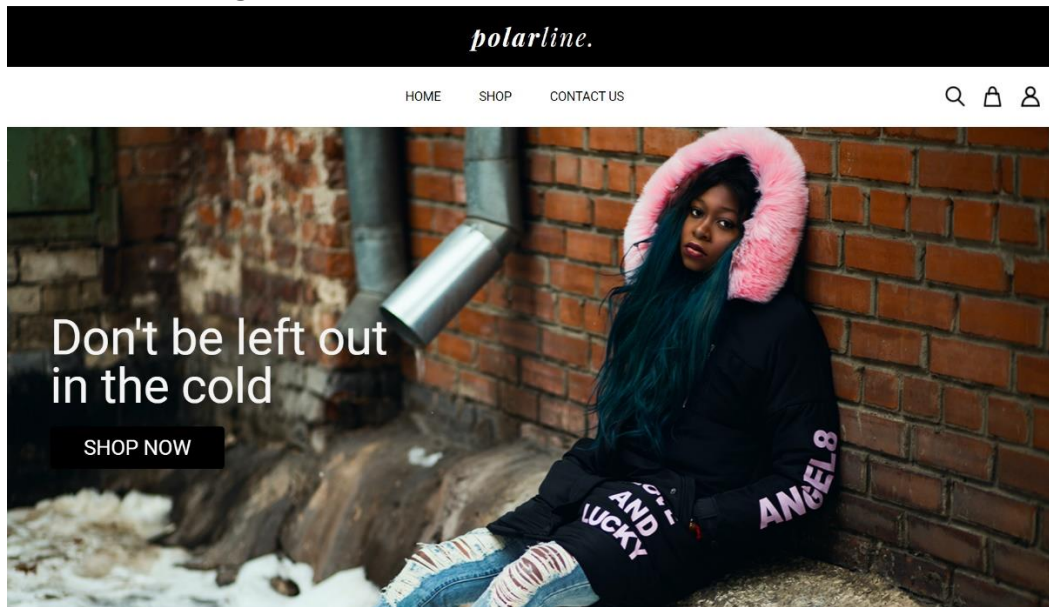
Cart page contains the details of the items a user has added to their cart to proceed with the purchase. Details such as the item name, quantity, price, and the Total will be displayed next to the picture of the item so that customers can cross-check them before proceeding to checkout. Customers can even delete the item in the cart if they don't want to proceed with the purchase and continue shopping. Under Cart Summary, users will find the Sub Total of their order, Tax, shipping cost, including the Total amount.

6. Contact Us

The contact us page shows up the basic contact information of our registered office like address, phone number and email address. Registered users or even guests can send us a message using the form available in the contact us page by providing basic details such as email, the reason why you want to reach out to us, and the exact message one wants to send.

II. Polarline

A. Home Page



B. Sign-up Page

polarline.

HOME SHOP CONTACT US

🔍 🛒 👤

REGISTER

Username

First name

Last name

Email address

Password

Confirm password

Sign Up

Already have an account? [Login](#)

polarline.
Beyond helping you look your best, PolarLine strives to get you the perfect clothing you've been looking for from local and international brands. We at PolarLine want to give you the perfect wardrobe you've been looking for. Be fashionable even in winter.

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Email Address

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C. Login Page

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HOME SHOP CONTACT US

🔍 🛒 👤

LOGIN

Username

Password

Login

Don't have an account? [Sign Up](#)

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 info@polarline.com




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F. Shop Page

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WINTER COLLECTION 2021

HOME >> WOMEN

Sort By

WOMEN'S

- ☐ Tops
- ☐ Jackets
- ☐ Coats
- ☐ Blazers
- ☐ Pants

FILTER BY

- ☐ Cotton
- ☐ Wool
- ☐ Denim
- ☐ Knit
- ☐ Leather

PolarLine Thermal Hoodie (Black)
\$94.99

PolarLine Jacket (Grey)
\$82.99

Lil Champ Sweater Hoodie (White)
\$94.99

Lil Champ Thermal (Pink)
\$54.99

PolarLine Thermals (Blue)
\$124.99

PL Hoodie (Black)
\$73.99

PolarLine Long Coat (Grey)
\$54.99

Amelie Winter Puffer Jacket (Black)
\$43.99

Z Sweater Coat (White)
\$94.99

Au Revoir Sweater (White)
\$54.99

PolarLine Long Coat (Blue)
\$0.99

PolarLine Jacket (Yellow)
\$40.99

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G. Detail Page

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HOME SHOP CONTACT US

Q A U



Amelie Winter Puffer Jacket (Black)

\$43.99

4.9 | Reviews

COLOR

SIZE [Size Guide >>](#)

S M L XL

Availability : In Stock

ADD TO BAG

Product Description

Material : Polyester
Weight : 0.3100kg
Brand : Loren Ipsum
Long cuffed sleeve
2 side pockets
Front Zip Fastening

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H. Cart Page

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HOME SHOP CONTACT US

Q A U

My Cart

	Items	
	<div><div>Au Revoir Sweater (White)</div><div>Price \$54.99</div><div>Quantity <div>- 3 +</div></div><div>Total \$164.97</div></div>	<div>×</div>
	<div><div>Amelie Winter Puffer Jacket (Black)</div><div>Price \$43.99</div><div>Quantity <div>- 2 +</div></div><div>Total \$87.98</div></div>	<div>×</div>

Cart Summary

Sub Total	\$252.95
Tax	Calculated at checkout
Shipping	Calculated at checkout
<hr/>	
Total	\$252.95

Please click the checkout button to continue.

Checkout

VISA

Update Cart

Continue Shopping

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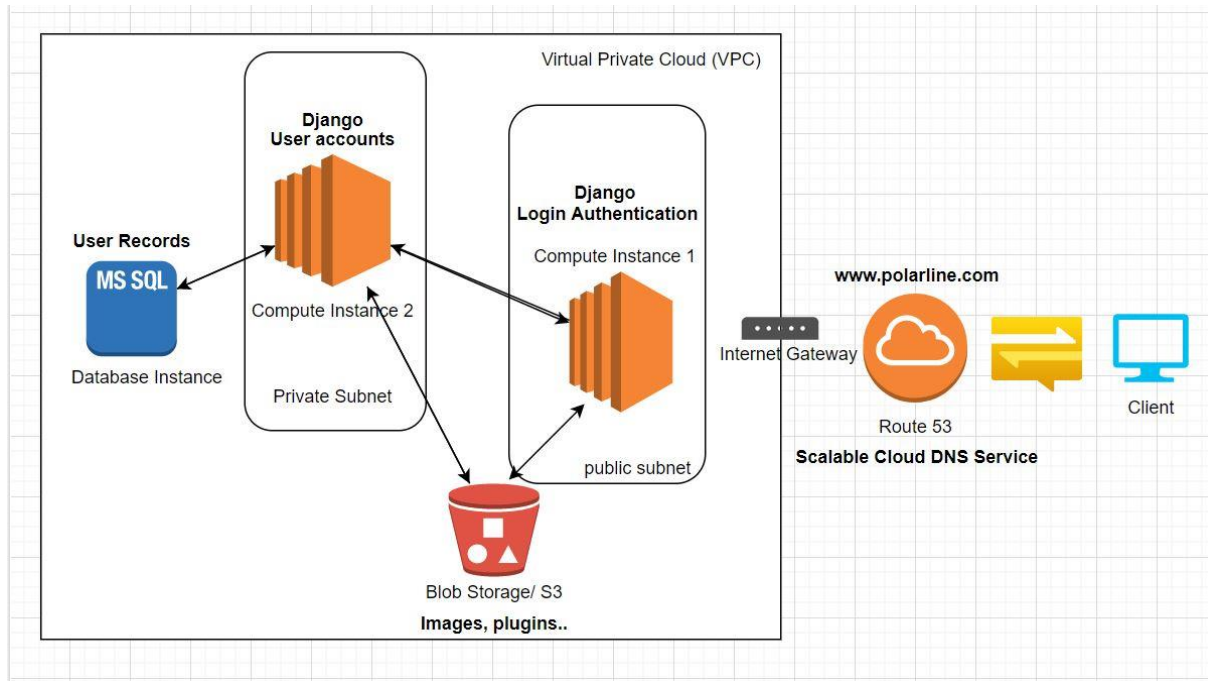
Email Address

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III. Report

A. Deploying in Cloud Environment

The entire application stack can be deployed in cloud environment on IaaS (Infrastructure as a Service) cloud model.



Infrastructure as a Service (Application Deployment)

The application can be deployed in IaaS cloud Model in the following steps:

1. Open the GUI Console from the user account of any Cloud provider of your choice. (Ex. AWS Console)
2. Create a VPC (virtual network dedicated to the Cloud Vendor, which is logically isolated from other virtual networks in the AWS cloud.)
3. Enable DNS service, which translates the domain name to IP address and routes traffic to the actual web server on the cloud environment.
4. Create the fleet of Webservers in Public Subnet and Private Subnet according to the use case.
5. Create an S3 bucket to upload all the Static Content like images on Blob storage/AWS S3 and facilitate API calls between Compute instances. Images, plugins, and other unstructured data is stored in Buckets.
6. When a user enters the website, all images and static content is loaded from the S3 bucket as soon as the user logs in, authentication is done in the public subnet on the compute instance 1.

7. After successful authentication, the user can enter into his account on compute instance 2, which are in a private subnet where the user can search the products add them in the cart and buy them.
8. We select two compute instances with windows and suitable configuration and install Python Interpreter Django pillow (python imaging library), Django math filter library for all the mathematical calculations and phone field library to enable forms for customer information.
9. Connect SQL-based database instance to the Compute instance present in a private instance (database should be isolated from public instance so that it isolated.)
10. Customer Information, Credentials, Invoices, and OLTP data is captured and stored in the database instance.
11. The compute instances on the cloud environment are preconfigured to be elastic in nature, which means they are scalable according to the load. Ex. (Traffic on the eCommerce site generally high in business hours and vice versa in non-business hours) we can enable auto-scaling to optimize resource utilization.
12. Using Identity and access management roles, certain privileges and permissions can be given to the site administrators.

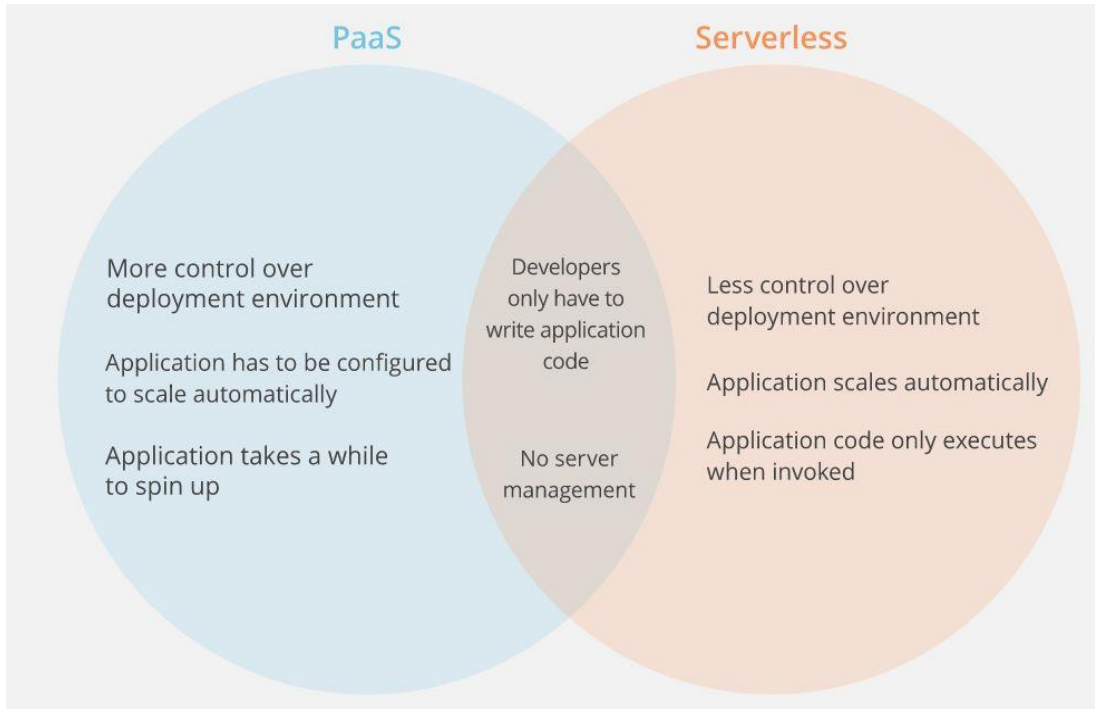
B. Implementing Security Features

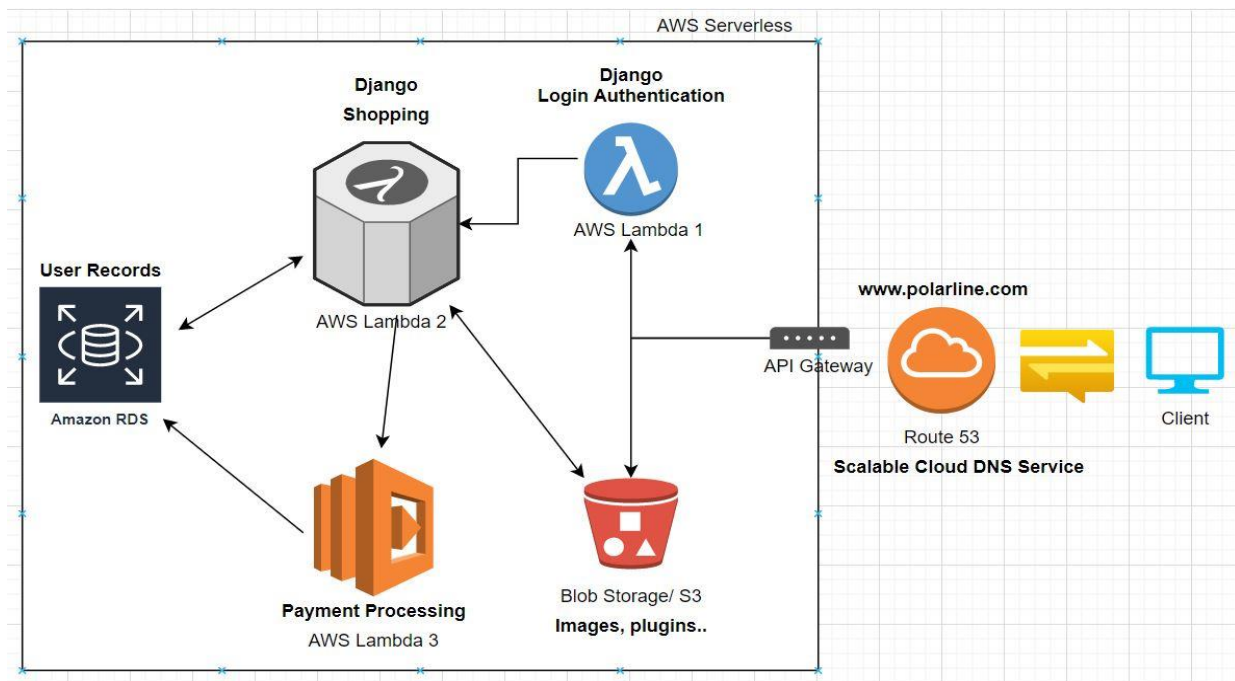
Deploying the application in IaaS model helps in increasing the security features because of the flexibility and more control on configurations and resource allocations. Below are the following steps for implementing security features for the application on the cloud:

- Deploying the website (polarline.com) on IaaS (Infrastructure as Service) cloud model for additional security and more control over Identity access management roles, permissions, and policies.
- Login system with CAPTCHA (Completely Automated Public Turing test to tell Computers and Humans Apart) protection from spam bots, DDoS attacks and also prevent from brute force attacks where hackers repeatedly try to login using hundreds of different passwords.
- Subscribing for Cloud monitoring services from the Cloud Vendor for user log collection and audit/ analytics (log everything and alert based on the threshold policies). Maintaining the user access logs provides an advantage in case any further audit is needed.
- Automated password management of privileged access for Cloud system or site administrations.
- Regular site maintenance including OS, Runtime and firmware patches and updates.
- Enabling Encryption at rest (Server-side encryption, client-side encryption) and encryption at transit (https) and also enable encryption on Database instances.
- Enabling versioning in order to preserve, retrieve, and restore data if something goes wrong. With versioning turned on, we can restore from an older version of the data if a threat or application failure causes data loss.
- Resource access authorization according to the Identity roles and permissions. Different roles have different level of access.
- Since it is an e-commerce website, complying with PCI- DSS (Payment Card Industry Data Security Standard) Information security standards.
- Using the subnets in the VPC provided by the cloud vendor, implement inbound and outbound firewall rules for the incoming and outgoing traffic.
- Using automated tools to detect misconfigured storage and permission settings and continuously checking for other misconfigurations and anomalies.

C. Serverless Application

Serverless is a term that generally refers to serverless applications. Serverless applications are ones that do not need any server provision and do not require to manage servers. Serverless applications scale instantly, automatically, and on demand, without any extra configuration from the developer or the vendor.





E-commerce Polarline.com serverless Architecture

AWS Lambda: it is a serverless compute service that lets to run the code without provisioning or managing servers. AWS Lambda helps you to upload code and the event details on which it should be triggered. Java, Python, Go, and C# are some of the languages that are supported by AWS Lambda function.

AWS S3: it is a simple storage service designed to make web-scale computing easier for developers.

Amazon RDS: it is a serverless database that makes it easy to set up, operate, and scale a relational database.

When the client enters into the polarline.com website through DNS, the request goes through the API gateway directed to s3 storage in order to load all the static content of the webpage. Once the client clicks to log in, lambda function 1 is triggered, and client credentials are processed for login authentication. Once it is successful, the client enters the user account where shopping, adding/removing cart items operations are processed on Lambda function 2. Once the client completes shopping and moves to the payment method, lambda function 3 is triggered to process the payment, and OLTP records are stored on AWS Serverless Relational Database (RDS). The client can access Invoices, edit customer information directly on the RDS database records through AWS lambda 2.