

Cloud Chat

Brendan Dill

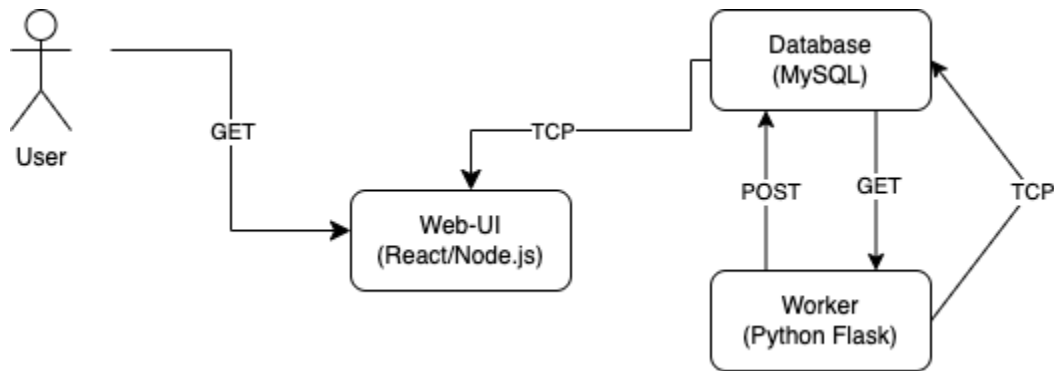
Jessica Gorr

Kiah Johnson

Nathan Parlett

Zharia Washington

Chapter 1: Team's Vision



Chapter 2: Implementation

CloudChat is a live chat room service that allows users to send messages back and forth to the other users in the room. Users can register with a username and password in order to maintain a discreet identity, or they can register as a guest with only a username.

For our CloudChat service, we will be implementing the following components (web-ui, worker, and database) together as stated:

WebUI

We will be using Node.js and React to build the front-end of the application. This will interact with the worker and database upon user actions via TCP connections, where this will allow the front-end web-ui to communicate with the back-end worker and database, exchanging user data. As this will relay user information to the worker and the database. For example, messages sent or user credentials. Actions taken by the user will trigger an on-click event that will use the worker to retrieve and store database information. Using React to build the user interface, it will also implement Bootstrap as a front-end framework.

Worker

For the worker, we will be using Python Flask to connect to the database. In which the worker will be able to retrieve and store messages, user information, etc. upon user actions. The worker can then communicate with the database via TCP connections, where this will allow the exchange of user and chat information. We will be using a REST API to develop a backend API, where it will then be able to use GET and POST requests to store and retrieve user and chat information. The REST API will provide us with flexibility and security to exchange important information for the application.

Database

We are using MySQL for all of our database needs. The database is used to store messages, user information, etc. It communicates with the worker and web-ui via GET and POST requests, where it is then able to communicate and exchange user and chat information. The database has four tables. There is a user table that stores usernames, IP addresses, and whether or not the user is registered or a guest, a password table that stores usernames and password hashes for registered users, a banlist table that stores the IP addresses of banned users, and a messages table that stores user messages along with the username of the poster and the time the message was sent. The database also contains many MySQL procedures to make it easier for the worker to interact with the database. NewGuestUser takes in a username and an IP address and writes them into the Users table along with the string "Guest". NewRegisteredUser takes in a username, an IP address, and a password hash. The username and IP are written into the user table. The username and password hash are written into the password table. BanUser takes in an IP address and writes it to the banlist table. IsBanned takes in an IP address and will return, "User is banned" if the user is in the banlist table. UserLogin takes in a username and password hash. It finds the row in the password table corresponding to the username and checks if the password hashes match. If there is a match, it will return, "Valid Credentials". Otherwise, it will return, "Invalid Credentials". AddMessage takes in a username, a message, and the time the message was sent. These are then written into the messages table. GetLastTwelveMessages will return the last 12 messages. This can be used for displaying the room to users when they first enter the chatroom.

Chapter 3: Building Images

The docker images were all originally made using Dockerfiles and uploaded to DockerHub. The MySQL docker image was pulled from the base image and modified to expose the specific port for the web-ui and the database to communicate. The Dockerfile for the web-ui is utilizing Alpine as a service and incorporates Node.js and JSON. The exposed port is the same as the database, allowing for open communication through TCP connections. Finally, the Dockerfile for the worker is simple, incorporating Alpine, and installing pip requests in order to pull from the database.

Currently, our project is able to deploy a container for the web-ui and database. The next step is setting up and deploying a container for the worker. A docker-compose file is currently in development in order to deploy all the containers and services for the project on Kubernetes.

Chapter 4: Connecting Components

Initially, getting the MySQL server and the web-ui to communicate with each other has been difficult due to the lack of familiarity with concepts such as containerization and cluster networking. Understanding and practicing these techniques was a priority so it can be recognized sooner rather than at the end of the project. Currently, we are able to create a local network on Docker and be able to add individual containers to it. The next difficulty was ensuring that the database and the web-ui could ping each other, and it was recognized that we were utilizing different ports, disabling communication. The fix was successfully made, and now the two components are able to successfully ping each other. The next step is making sure these components can still communicate with the setup of Kubernetes. We expect that this part will be tedious and will require plenty of time to watch tutorials and do research in order to complete the project.

Brendan Dill

Current Address: 434 S Walnut St., West Chester, PA 19382
<https://brdxn.github.io/> - bd985346@wcupa.edu - (610)-306-8108

EDUCATION

Anticipated May 2023

West Chester University, West Chester, PA
Bachelor of Science in Computer Science, *cum laude*
Certificate in Computer Security

- GPA: 3.43

PROJECTS

Fishing Log Application

April 2022

- Used Java and MySQL to develop an application where users can log their fishing catches.
- Users can log their catches into a crowdsourcing database where they can access the information and use it for their next fishing trip.

Developed a portfolio website (<https://brdxn.github.io/>)

- Developed using NodeJS, ReactJS, Bootstrap, JSX, CSS, and HTML.

WORK EXPERIENCE

Software Engineer Intern - ATPCO, Dulles, VA

August 2022 – Present

- Technologies used during my experience were Java, Springboot, Redis, MongoDB, PostgreSQL, IBM DB2, AWS, Kubernetes, Docker, and COBOL.
- Contributed with the migration to MongoDB.
- Converted a COBOL/DB2 program to Java in order to work with PostgreSQL.
- Used AWS EKS and microservices to develop a self-service application.
- Conducted smoke tests, unit tests (JUnit), and integration tests.

Server - Cheesecake Factory, King of Prussia, PA

March 2021 – May 2022

- Used excellent customer service, communication, and group member skills.
- Processed payments and aimed for at least \$1200 in sales per a shift.
- Trained new employees and showed them their responsibilities.

SKILLS

- Java, Springboot, Python, and Apache PySpark
- AWS, Kubernetes, Helm, and Docker
- JavaScript (NodeJS and ReactJS)
- SQL (SQL: MySQL, PostgreSQL, PL/SQL, TSQL; NoSQL: Redis, MongoDB)
- HTML, CSS, Bootstrap, C Programming, Jenkins, and Git
- Cybersecurity, Big Data Engineering, Agile, and Batch Processing

Jessica Gorr

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Education

BACHELOR OF SCIENCE | MAY 2023 | WEST CHESTER UNIVERSITY

MAY 15, 2023

MAJOR: COMPUTER SCIENCE

- Minor: Applied Statistics, ABET Certificate in Cybersecurity
- Dean's List (GPA per semester > 3.670) fall 2019 – spring 2023.
- Member of Upsilon Phi Epsilon Honors Fraternity
- PSAC Scholar Athlete Award- Years 2019-2020, 2020-2021, 2021-2022
- IWLCA Academic Honor Roll (Cumulative GPA > 3.5, through minimum six semesters)

Work and Leadership Experience

SOFTWARE DEVELOPMENT INTERN | IBM | MAY 2022 – AUGUST 2022

- Streamlined and automated processes using JIRA and Python OOP practices to reinvent the current dump management program.
- Implemented several test plans and coordinated testing for projects throughout the development cycle and provided accurate documentation of limiting factors in the code.
- Lead communications between beta testing groups and outlined future improvements to next team using various platforms such as GitHub, Linux, Slack, PowerPoint, etc.
- Ascertained credentials pertaining to data science using R, Python, and Statical Analysis techniques.

TECHNOLOGY INTERN | SAINTS PHILIP AND JAMES SCHOOL | JUNE 2020 – AUGUST 2021

- Instructed students on software programs such as: Microsoft Excel, Office, & PowerPoint, programming skills, typing, & basic components of the computer and how they work.
- Facilitated the creation of current curriculum for students at each grade level according to the standards set by the Archdioceses of Philadelphia.
- Troubleshooted any technology issues within the school pertaining to hardware and software including laptops, smartboards, servers, and programs.
- Redesigned school website and refreshed school website according to feedback from faculty and upkeep with current events of the school and achievements of students.

WOMEN IN STEM WORKSHOP | WEST CHESTER UNIVERSITY | OCTOBER 2021, 2022


- Mentored students in various STEM fields in areas pertaining to computer science, mathematics, and computer engineering with stations and continued communication with outreach programs.
- Designed multiple factor experiments and analysis plans for young women to perform and learn skills in statistics, focusing on t-tests and ANOVA analysis.
- Instructed students on analysis techniques and useful programs such as R, SPSS, and SAS to facilitate the analysis and how to communicate results effectively to an audience.


ADDITIONAL SKILLS


- Programming languages: Java, Python, R, C, SQL, HTML, CSS.
- LARC I Tutor Certification – October 2020.
- Member of West Chester University Varsity Women's Lacrosse Team (August 2019-2023).
- Captain's Leadership Advancement Series – Fall 2022


KIAH JOHNSON

Contact

 kiahj003@gmail.com

 @Kiah Johnson

 (267) 239-6995

 Philadelphia, PA

Skills

Proficient

MATLAB

Java

C++

Familiar

JavaScript

Python

HTML/CSS

Relevant Software

GitHub

Kubernetes

Bootstrap

Wireshark

Relevant Courses

- Computer Algebra
- Computer Science I, II, & III
- Computer Security
- Computer Systems
- Data Communications & Networking I
- Data Structure & Algorithms
- Intro to Cloud Computing
- Modern Malware Analysis
- Programming Language Concepts/Paradigms
- Software Engineering
- Software Security
- User Interfaces

Education

West Chester University of Pennsylvania

Bachelor of Science in Computer Science, Minor in Mathematics, Certificate in Computer Security NSA/ABET

- Cumulative GPA: 3.689 | Expected Graduation: May 2023

Honors & Awards

- College of the Sciences & Mathematics Dean's List: Fall '19, '20, & '22; Spring '20 & '21

- PSAC Scholar Athlete: '19-'20 & '21-'22 Seasons

- All America Scholar Athlete: '19-'20 & '21-'22 Seasons

Professional Experience

Gymnastics Coach

April '17 - Present

Philadelphia Gymnastics Academy; Philadelphia, PA

- Part-time as needed work, to instruct and coach gymnasts between the age of 2-16 in both recreational and team capacities

- Safety & Risk Management Certified through USA Gymnastics

Projects & Notable Coursework

Cloud Computing: Student FAQ Chatbot

- Worked with Python, JavaScript, MySQL, & HTML/CSS to create a Cloud-base Chatbot Application

Modern Malware Analysis: Malware Analysis Tool

- Utilized Windows XP environment, Virtual Box, WinDbg, Rootkits, & Volatility

- Built a runnable Python Script to determine if a PC is infected by its memory dump & built a dynamic heuristic analysis tool to detect unknown malware

Software Security: Vulnerability Attacks

- Utilized Unix/Linux & Command Line Shell

- Exploited attacks such as Stack Buffer Overflow, Return-Oriented Program, SQL Injection, & Session Hijacking Vulnerabilities

Activities

Women in Business Member

Jan '22 - Present

West Chester University of Pennsylvania

- Attend bi-weekly meetings to develop professional knowledge & create connections with other students

Women in Computer Science Member

Sept '19 - Present

West Chester University of Pennsylvania

- Attend bi-weekly meetings to discuss relevant information & create connections with other students

NCAA Women's Gymnastics Team Member

Aug '19 - Present

West Chester University of Pennsylvania

- Devote 17.5-20 hours weekly for practices & competitions

- Developed skills such as leadership, teamwork, & time management

Nathan B. Parlett

1254 Bowman Ave | West Chester, PA 19380 | 610-436-4921 | NP983807@wcupa.edu

EDUCATION

West Chester University, Pursuing a Bachelor's Degree In **Computer Science & Certificate In Computer Security.**

GPA 3.75

2021-Present, Expected Graduation **May 2023.**

Delaware County Community College,
2019-2021

TECHNICAL SKILLS

Java, C, Python, C++, Object Oriented Programming, Linux, Unified Modeling Language, Statistics, Calculus.

CLASS HIGHLIGHTS

CSC 231 Computer Systems: Learned the basics of C, Assembly, and computer hardware. Transcribed assembly code into C.

CSC 472 Software Security: Analyzed assembly code in depth. Learned about the operation of the stack. Utilized stack overflow, return oriented programming, and ASLR bypass via GOT overwrite in hacking labs. Used python to write exploit scripts.

CSC 401 Software Engineering: Learned higher principles of Object Programming and Object Oriented Design. Implemented design patterns. Learned Unified Modeling Language.

CSC 301 Cyber Security and Ethics: Discussed and wrote about important ethical issues related to privacy, technology, and Cyber Security. Gave group presentation on smart home technology.

INTERESTS

Linux, Programming, Cyber Security, Open Source Software, Piano, Music Theory, Philosophy.

WORK HISTORY

United Parcel Service

August 2019 - Present

Package Handler

- Handle customer packages during shipping process.
- Load Trucks, Sort Packages, Tend to Belts.

Chic-fil-A

September 2017 – July 2018

Cashier:

- Take and process customer orders, Resolve issues with customer orders.

ZHAYRIA WASHINGTON

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www.linkedin.com/in/zhayria-washington-2a2b86221

OBJECTIVE

I am a computer science student looking to gain experience in computer security, and software development.

SKILLS & ABILITIES

- Programming Languages: Python, Java, C, HTML, CSS

EXPERIENCE

2022-Present

MOBILE TECHNICIAN, *ASURION*

- Performed functional tests on handsets to diagnose the problem.
- Performed cosmetic repair to the handset to remedy the diagnosed fault.
- Specialized repair of Apple, Samsung, and Google mobile devices.
- Performed updates in order to troubleshoot software issues.
- Maintain and organize Inventory.

2021-2022

ASSISTANT MANGER, *T-Mobile*

- Delivering the Un-carrier experience by promoting sales and service expertise.
- Used Side by side-selling skills for personalized solutions.
- Troubleshooted any software or hardware issues on the devices we carried.
- Helped with data recovery or data transfer between different devices
- Updating and maintaining the upkeep of the store to satisfy regulations.

EDUCATION

Dec 2023

B.S Computer Science, West Chester, *West Chester University*

- PSAC Scholar Athlete 2020-2021, 2021-2022
- ABET Certificate in Cybersecurity

LEADERSHIP

- Member of the West Chester University track and field team 2019-2023
- Residents Assistant 2022-2023