GyuHo Kim / BackEnd & Cloud Engineer

Area of Interest
Openstack Cloud, Public Cloud(AWS, GCP, OCI), SpringBoot

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Skills
SpringBoot, Kotlin, Java, OpenStack, Network System

Teaching Experience

Mentor of C++ Study for freshman Dept. Software Engineering(2023.03-04)

Mentor of Data Structure Study @ AM:PM(2023.03-2023.06) : BFS, DFS, Stack, Queue, Deque, etc

Publications

- AR safety training system based on Aruco markers using gyrosensor data and image data

Experiences

Developer Community Meetup in Samsung Electronics Seocho Building(2023.11)
- Presentation topic: Introduction to OpenStack and attempt to install Monasca

Lead of JBNU AM:PM Team at CodeClub Korea(2023.04 - 2023.07)
- Coding lessons to elementary school students through Code Club educational donation volunteer activities

JETT(Jeonbuk National University's Engineer Top-Tier)(2023.11~Current)
- Selected as an outstanding student in the College of Engineering at JBNU to serve as a College of Engineering Ambassador

Projects

JCode(JBNU CSAI's WebIDE Platform for Coursework)
- Role: Project Lead / System Architect / Backend Engineer
- Tech Stack: Docker, Node.js, Spring Boot, OAuth2, Squid, Reverse Proxy, OpenStack, NginX
- Led the design, development, and rollout of JCode, a secure WebIDE platform for students at JBNU, enabling consistent development environments across devices and operating systems.
- Background & Motivation:
    - The original system used Code-Server instances on JBNU's JCloud with password-based access
    - A critical security breach (via Jupyter Notebook vulnerability) led to system-wide mining malware infection
    - Students expressed dissatisfaction with the insecure, manual password-entry system
- Key Contributions:
    - Re-architected the platform to support OAuth2-based authentication via Keycloak and Google SSO
    - Designed a secure reverse proxy mechanism using Node.js to route JWT-authenticated users to their isolated Docker containers
    - Implemented fine-grained access control and RBAC for instructor-managed workspace access
    - Containerized all IDE environments with isolated Docker instances, preventing privilege escalation and lateral movement

    - Deployed a Squid-based proxy server for outbound HTTPS access, enabling secure extension and package installs under Docker networking constraints
- Security Enhancements:
    - Enforced token-based access with per-user internal IP and port encoding in JWT
    - Prevented direct host access using Docker isolation and proxy enforcement\
- Leadership:
    - As Project Lead and Architect, created detailed architecture documentation and sprint-based module delivery plans
    - Acted as PM in later stages: coordinated development progress, adapted implementation based on evolving requirements
- Impact:
    - Currently used as the official WebIDE system for coursework in JBNU
    - Helps prevent LLM-based academic dishonesty by controlling development environments and access vectors
    - Sets the foundation for future smart education tools at the university

JLLM(JBNU's Private LLM Serving System)

- Role: Infrastructure & AI System Engineer
- Tech Stack: vLLM · JCloud (Private IaaS) · OpenWebUI
- Built and deployed a private Large Language Model (LLM) serving system within Jeonbuk National University (JBNU), using vLLM for optimized inference and high throughput. The system is hosted on JCloud, JBNU's internal IaaS, and serves as a secure, in-house alternative to commercial LLM APIs.
- Key Contributions:
    - Deployed vLLM on dual RTX 4090 GPUs to support OpenAI-compatible inference endpoints
    - Integrated with OpenWebUI, an open-source chat interface, to enable a seamless public-facing UI for end users
    - Enabled API key-based access control by leveraging vLLM's built-in authentication features
    - Diagnosed and resolved memory issues (due to tensor padding and KV cache overhead), selecting a ~20GB model suitable for 48GB VRAM deployment
    - Transitioned from the earlier Ollama-based system that had previously served 40GB models
- Impact:
    - Delivered fast, reliable private LLM access to employees in the JBNU
    - Planned expansion into JBNU's internal development systems to support AI-powered workflows
    - Reduced dependency on external commercial models and strengthened campus-wide LLM infrastructure
    - Improved data privacy and model control via secure, self-hosted architecture

LSA(Lab Safety Assistant)

- Role: Backend Developer / Software Engineer
- GitHub: github.com/GyuHo123/LSA_Server_SpringBoot
- Developed a backend system for an AR-based laboratory safety education platform to enhance the effectiveness of conventional, theory-heavy safety training. Contributed across system design, domain modeling, and deployment automation.
- Key Contributions:
    - Designed and implemented core business logic using Kotlin and Spring Framework
    - Defined REST APIs and maintained structured API documentation
    - Conducted requirement analysis through expert interviews and modeled use cases (UML, BPMN)

    - Established CI/CD pipeline using GitHub Actions for automated deployments via SCP and service restart
    - Tackled critical CORS issues across SpringBoot and NginX by isolating CORS handling to NginX only
    - Built Redis-based session and caching mechanisms for performance optimization
- Tech Stack: Kotlin · Spring Boot · MariaDB · Redis · Docker · GitHub Actions · NginX
- Achievements:
    - Gold Award, Korean Institute of Information Technology undergraduate paper competitions (May 2024)
    - Silver Award, JBNU LINC 3.0 Capstone Design Competition (Jun 2024)
    - Grand Prize, JBNU Software Engineering Interdisciplinary Conference and Exhibition (Dec 2024)
    - Encouragement Award, 2023 XR Device Contents Ideathon (Nov 2023)
    - Encouragement Award, 2024 LINC 3.0 Capstone Olympiad(Oct, 2024)
    - Encouragement Award, 2024 Spatial Information AI Competition(Jun, 2024)
- Published Undergraduate Research Paper:
  “AR safety training system based on Aruco markers using gyrosensor data and image data” (May 2024)(https://www.dbpia.co.kr/Journal/articleDetail?nodeId=NODE11825547)

JCloud(IasS of JBNU)’s Testbed Construction

- Role : Infrastructure Engineer, Undergraduate Researcher @ OSLAB
- Tech Stack: OpenStack
- Led the design and deployment of a testbed for JCloud, Jeonbuk National University's private IaaS built on OpenStack. At the time, JCloud only operated a production environment, with no isolated testbed for experimentation or staging, creating a critical need for a safe infrastructure sandbox.
- Key Contributions:
    - Deployed a dedicated OpenStack-based testbed to mirror production-level JCloud environments
    - Worked as a undergraduated researcher in OSLAB (Operating System Laboratory), which maintains JBNU’s cloud infrastructure
    - Configured core components of OpenStack (e.g., Nova, Neutron, Glance, Keystone) on a standalone test cluster
    - Ensured environment parity with the latest OpenStack release available at the time of deployment
    - Established a modular setup to support experimentation and stability testing before production rollout
- Public Speaking:
    - Presented the project as a speaker at a Developer Community Meetup hosted in conjunction with Samsung Developers Conference Korea (SDC23), held at Samsung Seocho HQ (Nov 2023)

- Shared insights on OpenStack deployment strategies and JBNU's cloud architecture with industry professionals and students

Real-Time Logging Server Optimization

- Role: Backend Developer / Performance Engineer
- Github : https://github.com/GyuHo123/Dungeon_and_Maple_Real-Time_Logging_Server
- Specialized in backend performance tuning for high-traffic environments. Led the optimization of a real-time logging server in the "Dungeon & Maple" , where increasing user traffic caused significant performance degradation.
- Problem Identified:
  - Logging data was being inserted into the database using an ORM that processed each log entry individually
  - As traffic increased, the server issued N individual insert queries, causing severe latency and bottlenecks
- Actions Taken:
  - Analyzed the server-side traffic and ORM behavior to isolate inefficiencies.
  - Introduced batch insert logic to replace N single insert queries with a single batched transaction
  - Conducted load testing and verified a 60% improvement in response time
- Outcome:
  - Achieved stable and scalable performance under increasing traffic
  - Ensured smooth user experience with minimal backend latency
  - Reinforced system reliability by reducing DB write amplification

Education

Jeonbuk National University / B.S. of Software Engineering (2019.03 ~ 2025.02)
- GPA : 4.29/4.5(2nd / 46 in Dept. Software Engineering), Major GPA : 4.21 / 4.5

Jeonbuk National University / Lab Intern of OSLAB @ JBNU(Advisor: Prof. Hyunchan Park)
- Studying about OS & Cloud
- Manage the Project About JHelper(The manual system of J-Edutools)
- Building and operating JCloud, an on-campus IaaS
- Successful on-campus Private-LLM deployment with Ollama.

Leadership

JBNU AM:PM is Dept.Software Engineering @ JBNU's Programming Student Club

2022.03~2022.12 Student Club Operation Team of JBNU AM:PM

2023.01~2023.12 Student Club Leader of JBNU AM:PM
- Pushed for the club to participate in a developer community meetup at Samsung Electronics' Seocho office.(2023.11)
- Hosting and operating a hackathon in the Department of Software Engineering(2023.09)

Awards

11th K-Hackathon - 11th K-Hackathon Regional Finalists(Honam)

2023 XR Device Contents Ideathon - Encouragement Award

2024 Autonomous Driving SW Training and Competition - Grand Prize Award

2024 Korean Institute of Information Technology undergraduate paper competitions - Gold Prize Award

2024 JBNU Capstone Design Competition - Silver Prize Award

2024 Spatial Information AI Competition - Encouragement Award

2024 LINC 3.0 Capstone Olympiad - Encouragement Award

2024 Software Engineering Interdisciplinary Conference and Exhibition - Grand Prize Award