Debbie Pao

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WORK EXPERIENCE

Amazon Web Services (AWS)

Elastic Block Store (EBS) Developer Experience Team: Software Engineer (L5) 9/2022-*present*

- Designed and pioneered scheduler cron job which installs persistent server configurations and RPMs on EBS server hardware and physical compute hosts in multi-region data centers. Increases customer efficiency by fully automating 15+ hours per installation of manual operations, supports Gamma testing of EBS volume control plane, and monitors health of resources.
- Led 4 teams in cross-team proposal of short and long term approaches to manage unauthorized deletion of resources and prevent security risks due to overly permissive access controls. Increased granularity of access policies by 90% by adding operator approval system and integrating AuthN and AuthZ with component that automates cleanup of idle resources as the sole methods to invoke critical operations.
- Onboarded 18 engineers to the EBS testing platform which enables continuous Gameday and Oracle RAC resource testing via development lifecycle. Resolved outdated and misconfigured resources that blocked critical production software delivery by automating 3 weeks of manual effort in setup process, improving visibility, streamlining server installation, performing resource health checks, and reducing operational load by 98%.
- Launched new feature to improve EBS hardware resource testing efficiency through enhanced control of custom timeouts. Resulted in eliminating tests that hung indefinitely for months, increasing customer productivity, a higher turnover rate, and minimizing hardware costs by cutting down utilization to 48 hours max. Usage rate grew to 60% a month post-launch and 25+ tests were properly terminated.

Twilio

Messaging Services Sender Team: Senior Software Engineer 9/2021-9/2022

- Managed a team of 6 engineers to migrate a new microservice from MySQL to DynamoDB to address restrictions on scalability and efficiency problems and drive down monthly costs by $30K, building a more resilient Twilio Messaging product that processes over 300+ million messages/day.
- Led 5 engineers to redesign and modularize the Messaging Services product architecture to prepare for next generation v2 large-scale API features by separating complex business logic into 3 distinct microservices and 3 distinct database storage systems.
- Directed 8 engineers to redesign and conduct load testing on the complex number selection algorithm that minimized the queuing and delay time Twilio delivers messages to destination by 5 seconds, decreased database writes by 9K queries/second, and improved accuracy to 100% guaranteeing that no number is over-selected.

Messaging Core Team: Software Engineer 7/2019-9/2021

- Led 6 teams in cross-functional initiative to re-architect existing distributed system to strengthen resiliency of message delivery receipt processing by migrating processing of OTT delivery receipts over to a generic Messaging Channel-agnostic processor. Eliminated risks to allow for removal of 40K messages/second scalability restriction by moving away from MySQL to AWS. Focused on 10 functional requirements, such as: new queue data model, processing order and retries, database storage schema updates, status callbacks, error code mappings, NACK processing, billing, OTT Read receipts, and failover/fallback handling strategies.
- Presented solution for MySQL split brain incident at R&D company wide ops review that prevented losing 60K+ messages by decreasing the automatic failover time window from minutes to seconds and making sure the widely-used internal MHA tool cleanly shuts down connections to the old dead primary.
- Non-linearly scaled and defined the capacity model to ensure high availability and resiliency during high traffic holiday season for most critical distributed system in Messaging by load testing the system expected to handle more than 40K+ requests/second and process a total of 960+ million message segments/day with different patterns based on peak production customer traffic.

Amazon

Amazon Web Services (AWS): Software Development Engineer Intern 5/2018-8/2018

- Implemented customer-facing features to improve the developer workflow experience in continuous deployment pipelines for Amazon's cloud version control system. Designed algorithms to calculate quality of source code files compared to existing code stored in system.
- Engineered data models for AWS DynamoDB using operating systems and security principles to provide secure and scalable read-and-write operations for customers' data. Practiced test-driven development using Cucumber.io to validate.

NOTABLE PROJECTS

Esc Twilio Python 12/2020-8/2021

Virtual escape room experience based in Twilio HQ that started as a company-wide internal hackathon project to showcase to new hires.

- Flask app that integrated Twilio's Programmable Messaging and Voice TwiML Call products with integrity checks and rate limiting.
- Launched successfully and was incorporated into the official onboarding process for all Twilio's Summer 2021 interns.

SKILLS

Coding Languages: Java, Python, MySQL, HTML, CSS, Javascript, Scala
Technical Skills: Dropwizard, MySQL MHA, AWS EC2, AWS DynamoDB, AWS S3, Apache Kafka, Datadog, Rollbar, Pagerduty, Nagios, HAProxy, Jenkins, Kibana, Mockito, UNIX, Apache JMeter, OpenAPI Swagger, Redis, Apache Maven, Zeppelin, AWS CloudWatch, AWS Step Functions, AWS Lambda

EDUCATION

University of California, Berkeley

Graduated: 5/2019

B.S., Major in Bioengineering, Minor in Electrical Engineering and Computer Sciences

Relevant Coursework: Operating Systems and Systems Programming, Computer Security, Efficient Algorithms and Intractable Problems, Data Structures and Programming Methodology, Great Ideas in Computer Architecture (Machine Structures), Structure and Interpretation of Computer Programs, Discrete Mathematics and Probability Theory, Designing Information Devices and Systems