

JACOB CROUCH

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CAREER SUMMARY

Software developer with 4 years of experience working on distributed systems at AWS scale. Searching for new opportunities to make an impact by bringing my coding, design, and leadership skills.

EDUCATION

University of Michigan
BS in Computer Science

September 2015 - May 2019

PROFESSIONAL EXPERIENCE

Amazon Web Services (AWS Global Accelerator)

Portland, OR

Work on a distributed and highly available global networking service as a member of the AGA platform team. Responsibilities include our public facing APIs, AWS console, and the back-end infrastructure used to integrate with other AWS services. Think web services, document databases, event-driven workflows, serverless, etc.

Software Development Engineer 2

October 2021 - Present

- Wrote a 1-pager after an incident to convince management to put two new APIs on our road map: AddEndpoints and RemoveEndpoints. Then designed, implemented, tested, and launched them. These APIs were important to launch because they 1. Provide customers better control of their endpoint groups 2. Are idempotent and use an aws sdk auto-retryable exception during transaction conflicts to support high concurrency, removing the need for customers to implement their own complicated stabilization logic 3. Are up to 8x faster at adding and removing endpoints than through the UpdateEndpointGroup API as they no longer require resolving existing endpoints 4. Protect the service's health check resources by both putting a limit on the number of endpoints that can be added or removed at a time and by introducing locking before the health checks are given out. These APIs have reached a max call rate of over 14k in a five minute window, and have yet to result in a single ticket. Multiple customers have also reached out and expressed their satisfaction with the improved performance and simplicity of the APIs.
- Designed and prototyped a system that can automatically provide relevant metrics, logs, graphs, and resolution steps to tickets upon ticket creation. The project involved making runbooks machine readable so that the information could be retrieved programmatically. The proof of concept won AGA's org-wide hackathon as the best project. The followup work to make it production ready was then turned into an intern project which I mentored. Today, five total alarms have been onboarded to the project and have reduced mean-time to resolution of those issues by 60%. Other teams are now looking into adopting it as well.
- Performed over 20 interviews for the AGA team

Software Development Engineer 1

July 2019 - October 2021

- Gained valuable leadership experience while mentoring an intern during their intern project. Worked closely with them throughout the internship to help manage tasks, review design docs, perform code reviews, overcome obstacles, and teach best practices
- Designed AGA's ListCustomRoutingPortMappingsByDestination API from the API signature to the back-end code. The API is used by online multiplayer gaming customers to help their servers register with matchmakers

- Led and launched a cross team feature to add tagging support for AGA resources, allowing customers to create tag-based resource policies and organize cost allocation. Implemented the authorization strategy to help support tag-based access control along with the new tagging APIs. Also owned the metrics, runbooks, alarms, security review, and integration tests. Discovered a potential security flaw before launch related to iam policies and AGA's hierarchical resource structure where a user could create a policy that would allow them to create a subresource that they would immediately get locked out of. Came up with the solution to limit tagging support only to the top-level Accelerator resource.
- Led and launched console support for AGA's Custom Routing and Custom Port Overrides features. Designed new customer workflows by creating new sagas, react components, and pages. Worked closely with pms and tech writers on the UI/UX and documentation
- Wrote a python script to automatically generate the daily on-call report. The script grabs all of a day's tickets and fills out the report template. Prior to this script, operators had to manually go back through the day's tickets and fill out the report. Later, as part of a winning hackathon project it was put into a lambda to send out twice daily emails to the team, letting on-calls sleep again after night shifts and reducing overall hand-off times at the end of shifts
- Improved auditor workflow runtimes by up to 1000% by realizing that the workflows were seeing throttling and timeouts on the sfn client due to the listStepFunctions call using the default maxItems instead of the actual max. Prior to the change we had just been continuously increasing the timeouts
- Designed and implemented a set of compliance tests for our APIs to ensure that they remained compliant with AWS standards. Did this using reflection to ensure that any current or future APIs had the correct annotations. During this process, I uncovered two APIs that were non-compliant and fixed them. A month later, there was a question around whether one of these APIs was compliant at a certain time, and we were able to confirm that we had fixed it in time.
- Wrote a Tampermonkey script using javascript to automate the MCM creation process for any pipeline with just one click. The workflow can block the pipeline, gather changes, find and fill out the correct MCM template, create the MCM and mark it for approval, and send a slack notification to authors so that they can approve it. This extension saves about 15 minutes of operator time on average for each pipeline they want to deploy.

SKILLS

Skills Kotlin, Java, Go, Python, C/C++, Javascript, Linux, AWS, TamperMonkey, Bash