

Pulumi case study



The challenge

Previously, Learning Machine had relied heavily on infrastructure as code that included templates which were supplemented by a large amount of ad-hoc scripts. This sprawl led to them having 25,000 lines of code that were difficult to understand and maintain and increasingly fragile. Of the five people within the operations and development team, only one DevOps-focused team member was able to fully understand these deployment scripts. This slowed productivity across the development team as they didn't feel comfortable modifying the scripts or deploying new applications. Learning Machine wanted to create an environment that their developers were comfortable with, supported their CI/CD goals, and provided improved agility. On top of this, one of Learning Machine's customers approached them requesting a single-tenant application suite, driving the need for Learning Machine to automate their deployments.

The solution

Learning Machine evaluated a few solutions prior to Pulumi but given the structure and varying security requirements of Learning Machine and their customers, none of the options they evaluated could support their team as well as Pulumi could. Learning Machine was already invested in AWS, and Pulumi's cloud native infrastructure as code was the perfect fit.

Pulumi enables the use of familiar programming languages to define infrastructure as code. Learning Machine's team was using TypeScript and was able to directly use Pulumi's extensive set of code libraries, so the team at Learning Machine didn't have to learn a new infrastructure language during the onboarding process. At the beginning of the engagement, Pulumi helped the Learning Machine team identify how they could modify their 25,000 lines of code to make it more manageable and easier to understand. Pulumi spent one month advising, planning the structure, and providing samples of what the new environment would look like prior to going live. As an added benefit, Learning Machine has been able to take advantage of Pulumi's ever-growing code and documentation libraries.

As part of their new environment, Learning Machine began using Amazon Elastic Container Service (Amazon ECS) to run and scale their containerized applications, and AWS Fargate, a compute engine for Amazon ECS. This has enabled Learning Machine to run their containers without having to manage servers or clusters.



About Learning Machine

Learning Machine is a leader in blockchain-secured digital records that are recipient owned, vendor independent, and verifiable anywhere. With universities and international governments as their primary customers, The Learning Machine Issuing System allows them to issue blockchain records at scale, rooted in any blockchain they choose. Learning Machine provides standards-compliant records at scale, that are verifiable, tamper evident, and owned by the issuers and recipients, meeting the needs of the most security-sensitive organizations.

Benefits

With the help of Pulumi, Learning Machine was able to reduce their 25,000 lines of code to only 500 lines of JavaScript through the power of general-purpose programming. This has allowed Learning Machine to run their code locally and more quickly deploy new applications themselves and stand up new environments. The new environment shifted away from a monolithic structure by breaking services into containers, making it easier to monitor different accounts and better isolate points of failure. Previously, making updates or adding new instances was a tedious and error-prone task, but the organization is now able to do so in a matter of hours.

When evaluating their options, Learning Machine was more interested in the benefits of the model, and didn't consider the potential cost savings. But the new comprehension and agility offered by Pulumi enabled Learning Machine to quickly switch to Amazon ECS and AWS Fargate which in turn cut their AWS bill in half. The new environment has allowed Learning Machine to focus less on infrastructure maintenance, and more on deploying new applications into their AWS accounts, making their spending on AWS more efficient.

Learning Machine has been able to pass additional benefits along to their customers as well. With improved automation, end-users are getting a more responsive and reliable experience. Updating stacks is a quick and seamless process now. The new technology and processes have allowed for CI/CD, helping them better align to customers' needs and serve them faster. When standing up new environments, Learning Machine has been able to cut their deployment time from one month to less than one day.

Next steps

Learning Machine plans to continue building up their development team to support single-tenant deployments. With the flexibility of running containerized applications through Amazon ECS and AWS Fargate, Learning Machine will be able to quickly build and deploy new applications as their customers' CI/CD requirements evolve.