coveros

Coveros Accelerates Software Delivery

and Streamlines Application Development with DevOps Pipeline

AoI NETWORKS.

AOL Networks is AOL's industry-leading global advertising and technology arm. Balancing the intersection of premium and programmatic, AOL Networks enables the world's top marketers and media brands to reach consumers across desktop, mobile, tablet, and connected TVs with impact through premium experiences, programmatic buying, and performance-driven campaigns. They are the global partner of choice for leading publishers, advertisers, and agencies seeking to maximize the value of their online brands.

CHALLENGES

- Lack of DevOps knowledge and dedicated effort from application developers
- Developers, quality assurance testers, and technical operations groups operated in distinct silos, leading to delays getting software built, installed, and tested and contributing to long release cycles
- Developers had limited experience in DevOps or any agile ceremonies

AOL Networks was embarking on a greenfield re-implementation of a mission-critical, data-intensive advertising application and was seeking to streamline its software development, test, and deployment process. To do so, it was looking to standardize on a set of technologies to provide continuous integration and

continuous deployment (CI/CD) capabilities as part of a DevOps solution to support their emerging agile development process. Unfortunately, the organization's attempts at putting a basic DevOps pipeline in place on previous projects were unsuccessful.

SOLUTION

Coveros was hired by AOL to build a baseline CI/CD capability for their federated multiservice application and train other project teams within AOL Networks on DevOps practices. This work was performed in three phases: DevOps Assessment and Recommendations, DevOps Pipeline Implementation, and Organizational Rollout.

In the first phase, Coveros quickly evaluated the existing software development process and DevOps goals for the advertising application project described above. Based on this analysis, Coveros determined there were a few good foundations in place with Jenkins and some Chef deployment automation into an internal private virtual machine cloud, but no cohesive continuous build, deployment, or testing processes. A proposed DevOps architecture was created, as well as recommendations for DevOps automated tools to be used to build a basic DevOps pipeline.

The result of our DevOps Assessment and Recommendations phase was a presentation describing the proposed DevOps pipeline, along with architectural diagrams and tool recommendations. Because AOL

CHALLENGES

- No dedicated DevOps effort
- Limited experience in agile ceremonies
- Siloed teams
- Long release cycles

SOLUTIONS

- DevOps pipeline and architecture
- Supporting automation tools
- Collaboration among agile teams
- Continuous testing
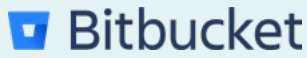
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Coveros was successful at quickly assessing AOL's CI/CD capability and recommending an approach to putting an automated DevOps pipeline in place.

had some existing automation tools, Jenkins and Chef were given priority over new tools if it was determined that their capabilities were sufficient to support a fully functioning DevOps pipeline. A proof-of-concept prototype was also developed that used Jenkins to build a single application, run unit testing and quality analysis with SonarQube, deploy a simple application using Java and Tomcat into a virtual machine, then run basic automated smoke tests against it. This was demonstrated to the project team and AOL management for approval to move forward.
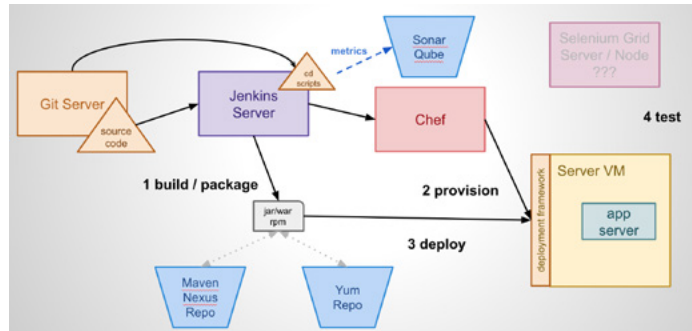

Figure 1: DevOps pipeline and tools architecture

In the second phase, DevOps Pipeline Implementation, Coveros developed the baseline DevOps pipelines for each of the application development teams. The development teams used a wide variety of Java-based technology stacks, as well as multiple database platforms that imposed unique requirements for the development pipelines. Each Jenkins pipeline provided end-to-end automation, from code check-in (using Git, Atlassian Stash, and Bitbucket) through continu-

ous integration activities and automated provisioning and deployment of applications, into QA, staging, and production environments, using a multilayered library of custom and open source Chef cookbooks. Static analysis of the software using SonarQube, along with automated tests for unit, integration, system, and regression testing, were integrated into the pipeline to support continuous testing on all environments.
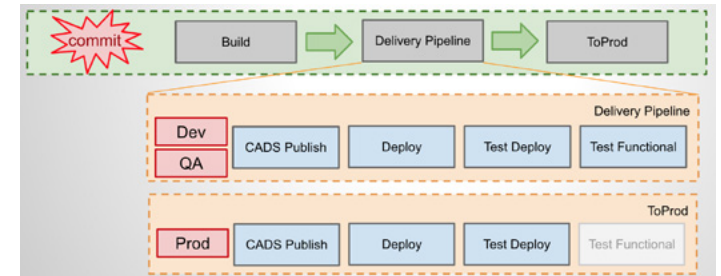

Figure 2: DevOps pipeline flow

During the implementation, Coveros developed a series of presentations and process documents to train the project teams on basic DevOps concepts, DevOps pipeline design, and the use of new tools. For example, Coveros created Chef and Jenkins documents that outlined the best practices and design guidelines for implementing various aspects of the pipeline automation. Coveros also created and delivered multiple training presentations for the use of Git, Chef, and Jenkins for developers. These documents outlined DevOps best practices and patterns that applied not only to the advertising application, but also to other applications across the organization. Throughout the project,

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Coveros team members worked closely with the integrated project teams of development, QA, and tech-ops, training and mentoring them to enable long-term success and internal ownership of the pipeline.

In the final phase of DevOps implementation, Coveros provided ongoing DevOps coaching to multiple teams seeking to leverage the DevOps work performed on the advertising application project, allowing AOL to drive DevOps improvements throughout the organization. Coveros continued to evangelize DevOps to groups outside of the initial project team to assure others became familiar with how to set up a DevOps pipeline. Additional hands-on consulting was provided to other AOL teams while continuing to enhance the baseline DevOps pipeline. Training on DevOps and our baseline DevOps pipeline was given to each team seeking to take advantage of what was developed.

TECHNOLOGY SOLUTIONS

- Jenkins
- Chef
- SonarQube
- Nexus
- Git
- Atlassian Stash/Bitbucket
- Continuous integration
- Continuous delivery

BUSINESS VALUE

Coveros was successful at quickly assessing AOL's CI/CD capability and recommending an approach to putting an automated DevOps pipeline in place. These improvements were implemented across the organization and used within an initial project to deliver mission-critical software on time and within budget.

With the use of an automated DevOps process, defects are identified earlier in the process, and conducting automated provisioning of downstream environments allows baseline testing to be performed on production-like environments during the continuous integration process. Developers immediately are given feedback on whether their code would work on downstream environments, and they can eradicate any defects right away. The teardown and setup times vastly decreased for testing by automating the initialization and configuration of test environments using Chef; after tech-ops personnel launched new virtual machines, test environments now can be set up in a matter of minutes, instead of days or weeks spent waiting for overworked operations teams to install complicated software packages by hand. Improvements in end-to-end automated deployments provided AOL with the ability to continuously deploy new code into production when necessary. Automating the DevOps process also significantly decreased software project time to market because the testing and deployment processes are better automated and defects are identified earlier in the process.

Overall, automating a DevOps pipeline enabled the entire organization to become more agile and customer-focused, allowing AOL to deliver high-quality software rapidly. Previous release cycles measured in months can now be done in hours.