Coveros Modernizes Application Deployment Process

with Agile and DevOps Practices

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Transportation Security Administration

The **Transportation Security Administration**, or **TSA**, in the Department of Homeland Security has authority over the security of people traveling in the United States. The TSA had broadly been trying to expand their agile software development practices and apply more agile methodologies to their application teams. Coveros was brought in to help modernize, enhance, and maintain over seventy TSA enterprise applications using agile and DevOps software development practices.

CHALLENGES

- Developers spent a vast amount of time on scripts to install and upgrade applications in each environment; most deployments used long install scripts that developers stored on their own workstations
- Efforts to deliver agile and basic continuous integration struggled to move forward due to developer culture
- Delivering rapidly was difficult because the organization lacked the ability to constantly deploy to nondevelopment environments
- Agile and DevOps understanding varied over the program, and most developers were accustomed to older business standards
- There was no central artifact repository, so binaries and files needed for deployment were passed between teams using SharePoint

The TSA needed an agile and DevOps presence added to their existing culture and environments. Agile understanding is part of the culture, but an appreciation of DevOps practices and principles is not. Before the engagement, TSA was having difficulties maintaining environment upgrades, causing wasted hours on system configuration and security patching. Teams also struggled with deployment, and applications would take up to six months to be pushed from the test environment through to production. Developers would perform most of the testing on their own workstations.

SOLUTION

Coveros was brought on board initially to implement Sonatype Nexus Lifecycle services, and subsequently to share DevOps experience and best practices to help the team with deployment, infrastructure upgrades, and automation.

Coveros began by automating the infrastructure installations so they could be easily and reliably repeated. We worked to migrate the development team from the legacy infrastructure to a new environment so the legacy systems could be retired.

The next priority was to implement a continuous delivery pipeline from the development environment into staging and then production. Coveros also ensured their build and continuous integration practices were aiding the development teams to rapidly deliver

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CHALLENGES

- Installing and upgrading applications across environments took too much time
- Continuous integration was a struggle
- Developers stored scripts and files on their own workstations
- Understanding of agile and DevOps varied

SOLUTIONS

- Educated on agile and DevOps practices and culture
- Automated infrastructure installations
- Set up a central artifact repository
- Implemented a continuous delivery pipeline

high-quality code. The delivery pipeline uses Microsoft Team Foundation Server for Git source control, Chef for automated deployment of application and infrastructure software, Jenkins for continuous integration, SonarQube for quality metrics, Selenium Grid for automated functional testing, Sonatype Nexus Repository Manager as an artifact repository, and Sonatype Nexus Lifecycle, Auditor, and Firewall for identifying security vulnerabilities in third-party components. This pipeline enables higher quality code to be delivered more quickly, and it has allowed the TSA to change their processes because they have more confidence in the software and the release process.

They are replicating the same pipeline in the Microsoft Azure cloud, decreasing the time it takes for TSA application deployment from months to minutes. Deployment of application software and upgrades to infrastructure are done using Chef so that all deploys are repeatable and reliable, decreasing risk and downtime and increasing auditability and governance. The development teams have more feedback and better practices to generate the feedback loops, using standardized branching strategies and better continuous integration discipline. The enterprise architecture and security teams have more control of the libraries being used within the applications, with the ability to scan and block components with known vulnerabilities and to identify where different components are in use when new vulnerabilities are discovered.

Coveros is continuing to enhance their pipeline and processes both on premises and in the cloud to implement configuration management practices that increase feedback to developers and reduce risk and effort during deployments.

TECHNOLOGY SOLUTIONS

- **Infrastructure as Code:** Chef Server, Chef Automate, Chef Client
- **Source Control:** Microsoft Team Foundation Server
- **Automation Build Orchestration:** Jenkins, MSBuild, Maven, Sonatype Nexus Repository Manager
- **Automated Testing:** Selenium Grid, JMeter
- **Security:** Sonatype Nexus Lifecycle, Auditor, Firewall

BUSINESS VALUE

As a result of the Coveros engagement, the TSA had success in modernization and enhancement of agile and DevOps development practice across various applications' environments. Our expertise in the agile and DevOps fundamentals enabled us to deliver solutions that helped the TSA across the agency. With automation, environments have adapted to a more efficient and safer approach to application deployment. Developers have the tools to deliver high-quality code faster and with better feedback. And the organization is changing their release processes to take advantage of these improvements and the higher confidence they have in the delivered products.

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