

Coveros DevOps Consulting and Implementation Services

Effective Automation for Accelerating Delivery



INTRODUCTION

Automation of the build, test, and deployment process is a keystone capability of any agile software project. Experts will tell you that without a comprehensive continuous integration and continuous delivery (CI/CD) process, you are unlikely to finish the work you specify during your sprints or be able to significantly reduce your delivery process. In addition, automation of this process significantly reduces downstream surprises and costly debugging time during product releases. Our experts can show you how to accomplish this and more to reduce build integration and configuration issues and improve efficiency and quality.

Coveros provides a broad set of DevOps consulting and implementation services to help accelerate your delivery.

DEVOPS TRANSFORMATION

Transformation to a DevOps model is not as simple as it might seem. While there are plenty of automation tools and frameworks for improving your release process, what works best is only discovered through an iterative improvement process. Besides instilling DevOps process discipline and tooling, transformations must tackle cultural, organizational, and skills issues to be successful.

Coveros has helped organizations of all sizes transition to DevOps. Our certified DevOps consultants

have experience with a wide range of build, test, and deployment automation tools, as well as expertise in leading an organization through an enterprise-wide transformation.

Our DevOps transformation approach follows an iterative, three-step process:

1. Assess your current DevOps capability by comparing your capabilities with others using a formalized model
2. Build and pilot needed process, tooling, and staff capabilities to demonstrate their benefits
3. Deploy incremental improvements across the enterprise, measure progress, and reassess your DevOps posture

DEVOPS PIPELINE IMPLEMENTATION

A critical component of any DevOps program is the automation to support continuous integration, delivery, and deployment of software into production. Whether your development, testing, and production environments are located in data centers, on premise, or in the cloud, Coveros can help automate and accelerate your entire DevOps pipeline. Key services we provide for DevOps pipeline implementation include:

- *Continuous integration:* Automation to support branch and merge processes, source control, automated builds, check-in tests, and nightly regression testing



- *Continuous delivery and deployment:* Automation to support provisioning of testing and production environments, automated installation of applications, configuration management of application artifacts, automated testing in appropriate environments, deployment scripts, and production monitoring
- *DevOps engineering:* Building of DevOps capabilities with maintainability and usability in mind
- *Quality gates and dashboards:* Development of appropriate exit criteria for pipeline activities, as well as dashboards to display progress and results

To accelerate DevOps implementations, Coveros has created SecureCI, an open source CI/CD environment. SecureCI is a collection of industry-standard, open source tools, shown in figure 1, that provide an easy-to-use DevOps automation environment.

Coveros has significant expertise in many of the DevOps tools, environments, and frameworks used

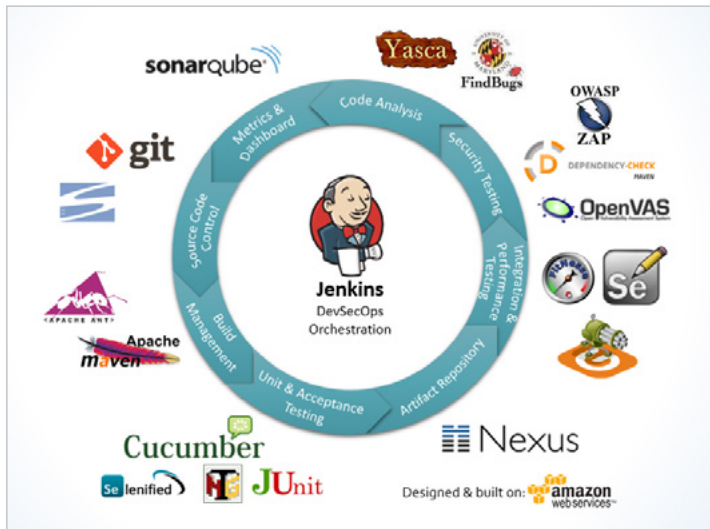


Figure 1: SecureCI DevOps toolchain

- Lightweight static code analysis during build check-ins performed during continuous integration
- Robust static code analysis (IAST) into nightly regression testing processes and QA environments
- Network and passive vulnerability analysis to detect issues in production-like environments
- Dynamic security testing in continuous integration and continuous delivery processes
- Binary analysis to detect vulnerable open source frameworks and libraries

DEVOPS COACHING

While coaching is part of every DevOps transformation we perform, some organizations choose to focus their improvement efforts on bringing on board coaches in lieu of a more formal assessment, build, and deploy process. At Coveros, we provide a variety of coaching capabilities to help your organization improve:

- Enterprise DevOps coaches educate executives and senior leadership on DevOps principles and hold value stream analysis workshops with business leaders
- DevOps process coaches work with cross-functional teams to embrace DevOps capabilities and effectively

- integrate testing, security, release management, and operations into fully functioning delivery teams
- Technical DevOps coaches focus on helping DevOps engineers successfully integrate DevOps pipelines

Coveros coaches do more than just facilitate. We believe that teams learn best by working alongside others who have done it before and can model proper behavior. Our coaches pair with and mentor your staff to accelerate their DevOps skills improvement.

ABOUT COVEROS

For over a decade Coveros has helped organizations accelerate their software delivery with the latest DevOps and agile methods. Our full complement of cutting-edge services help organizations assess and improve their software development, testing, DevOps, and application security practices.

Our clients include such leading organizations as UnitedHealth Group, Delta Dental, Department of Homeland Security, Symantec, US Air Force, Fannie Mae, RSA, WorldBank, and Advent.

Coveros is headquartered in northern Virginia.

To learn more about Coveros and our agile and DevOps services, go to www.coveros.com.

to implement pipelines today, including Jenkins, Git, Subversion, Maven, Chef, Puppet, Ansible, Docker, SonarQube, AWS, and Azure.

DEVSECOPS

Continuous security is a key component of building releasable software frequently. Coveros has been integrating security tools into continuous integration and continuous delivery processes for a decade.

Our DevSecOps services integrate security tools into your DevOps process, including:



Coveros Modernizes Application Deployment Process

with Agile and
DevOps Practices

CASE STUDY



CASE STUDY

Coveros Modernizes Application Deployment Process with Agile and DevOps Practices



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

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

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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CASE STUDY

Coveros Modernizes Application Deployment Process with Agile and DevOps Practices



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.