



I D C C U S T O M E R S P O T L I G H T

Driving Effective Community Software Collaboration at the DoD with Forge.mil

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Introduction

Military demand for software ranges widely — from major defense weapon systems to office automation needs that improve productivity and from support for these weapons systems to meeting logistics, planning, communications, and command and control requirements. Users include the warfighter at the "tip of the spear" up through senior military leadership and operations. Development and delivery processes are complex because military software must meet the highest standards of security and quality. These systems must pass comprehensive, multitiered test and approval procedures atypical for civilian work.

Forge.mil is a central software development, delivery, and collaboration platform built to effectively manage those projects and processes at scale. It was created in 2009 by the Defense Information Systems Agency (DISA), an agency within the U.S. government's Department of Defense (DoD). Forge.mil is available to U.S. military, DoD government civilians, and DoD contractors and partners.

Since its inception, Forge.mil has helped structure coherent processes and workflows across hundreds of projects and driven substantial code reuse and development efficiencies. This resulted in measurable improvements in terms of cycle time and cost reductions. Forge.mil also has facilitated the rapid onboarding of new projects and has accelerated the transition from legacy platforms.

Prior to Forge.mil, software management was inconsistent across projects, often done "ad hoc" and in silos. Project teams had to "reinvent the wheel" for new initiatives with custom-built processes and tool chains. This was time consuming, inefficient, and expensive. Also, projects lacked a scalable approach for managing strict security and compliance requirements for areas such as access control and process enforcement.

To help address those problems, military leadership authorized the creation of a central software development and delivery platform, Forge.mil. CollabNet TeamForge was chosen as the basis for that platform, after the evaluation of multiple technology choices (both closed and open source).

Solution Snapshot

Organization: U.S. DoD's Defense Information Systems Agency (DISA)

Operational Challenge: Securely coordinate IT for range of software projects for combat support and command and control — from embedded to logistics to operations — to enable development across separate internal teams, partners, and stakeholders

Solution: Forge.mil based on CollabNet TeamForge

Project Duration: 3 months to deliver SoftwareForge (April 2009); 9 months to deliver ProjectForge (January 2010); 2 years to deliver Forge.mil Community (April 2011)

Benefit: Enables a community platform and collaborative, centralized access to software during development across a wide range of developers, partners, and stakeholders with consistent processes and workflow to significantly speed deployment, cut costs, and improve software quality and visibility

Motivation and Implementation

The idea for Forge.mil was born in 2009. Earlier programs such as Federated Development and Certification Environment (FDCE) for service-oriented architecture (SOA) had demonstrated the potential of collaborative software development. Military leadership launched the initiative for Forge.mil with the goal of providing such collaborative software development options for all of DoD.

The DISA Chief Technology Office team evaluated multiple application life-cycle management (ALM) products, eventually concluding that CollabNet TeamForge provided the most appropriate capabilities and fastest time to delivery. After three months, the first iteration of Forge.mil went live. Called SoftwareForge, it included enhancements to TeamForge, meeting several DoD security requirements (such as CAC/PKI enablement). SoftwareForge was accredited and deployed to both the unclassified DoD network (NIPRNet) and the classified DoD network (SIPRNet).

After SoftwareForge rolled out in April 2009, certain teams needed to use the same toolset for projects but were unable to operate in the open; they wanted and required a private project space. These groups needed greater access control and/or were teams that did not have intellectual property rights necessary to share software and therefore requested a private project space.

To address this need, the Forge.mil team delivered ProjectForge in January 2010. ProjectForge provides the same ALM tools and capabilities as SoftwareForge to DoD projects and programs but was created to support projects that need to restrict access to specific project members and/or those who are not doing DoD community source development. While SoftwareForge is free to valid users, ProjectForge requires a fee for service and is provided on demand from a DoD datacenter, operated by DoD-cleared personnel, and run in compliance with DoD requirements for information assurance and operations support.

To address collaboration needs, the team launched the Forge.mil Community site in April 2011, extending SoftwareForge and ProjectForge with additional social features and knowledge management services.

By the middle of 2013, Forge.mil had realized strong adoption across DoD:

- 24,000 registered users (including 4,000 on ProjectForge)
- 900 projects (including 150 on ProjectForge)
- 200 active groups within the Forge.mil Community
- 2,900+ applications hosted on Forge.mil
- 150,000+ downloads from Forge.mil (including applications, source code, and documentation)

Upcoming initiatives for Forge.mil include acceptance of DoD-interoperable PKI certificates issued by other federal government agencies and industry partners, CAC/PKI-enabled client access to integrated Git repositories expected by 2014, integration with DISA's emerging cloud environment, and support for current continuous delivery to dev/test preproduction and production environments.

Implementation Challenges

Overcoming individualistic approaches to development was a recognized challenge. A community comes to life only with engaged members who provide code and assets for leverage and reuse. That's why Forge.mil proactively invested in community building, using Webcasts, meetings, and evangelism — eventually growing the community to 24,000 registered members.

Meeting the special, evolving security and other demands of DoD also requires ongoing attention. The Forge.mil team is working directly with CollabNet to meet some of those requirements.

Benefits

Code reuse has been a primary benefit, together with the resulting cost savings, code quality improvements, and acceleration of time to market for new applications. Forge.mil lets users quickly and effectively find and reuse software components within ProjectForge and SoftwareForge. By sharing code with consistent change and configuration management, teams can work on multiple projects at one time jointly — nine projects rather than only one project as before, according to one team — and deliver results faster with fewer resources. Not having to reinvent code saves time and can enable both higher software quality and increased agile responsiveness. Those benefits have been realized repeatedly across projects, ranging from military weapons systems to operational necessities on the business side. Furthermore, Forge.mil's standardized processes for project onboarding, planning, and execution — processes addressing the needs for permissions, firewalls, security, and discipline — have accelerated start-up time for projects while meeting compliance requirements.

Estimates from DISA indicate savings ranging from \$18,000 per project for small teams (1–15 developers) to as much as \$1.2 million per project for enterprise groups (300–2,000 developers). Those are measurable, tangible benefits. There are intangible benefits, too: The development community sparks creativity and innovation impossible to attain otherwise. Forge.mil brings with it many of the social and technology-related benefits of open source software (OSS) communities, inspiring peer networks and strengthening software quality, agility, and innovation.

Project Case Studies

Project benefits are exemplified by users in the Communications and Electronics Command (CECOM) Software Engineering Center (SEC) and users in the Army Armament Research, Development and Engineering Center's (ARDEC's) Automated Test Systems Division (ATSD).

CECOM manages maintenance of software, ranging from embedded systems (such as software embedded in artillery) to inventory and logistics management apps. With siloed tool approaches, there was no common access to code and artifacts. Before bringing in Forge.mil, SEC lacked visibility and traceability across the software life cycle; this became especially evident at the division level. To address those challenges, CECOM investigated multiple tools, including Forge.mil/TeamForge. Forge.mil emerged as a leading contender because it was an existing DoD standard and because of its flexibility, ease of use, and functional coverage — including meeting security/CAC requirements. With 18 projects on ProjectForge today, CECOM already has benefited from accelerated start-up times and improved visibility and collaboration.

ARDEC ATSD provides test sets for weapon systems such as Abrams, Bradley, Paladin, and Howitzer (among other areas). ARDEC ATSD made the decision in 2011 to migrate from a locally hosted TeamForge instance to Forge.mil. Key reasons for that migration included secure access through CAC/certificate authentication, reduction in cost for licenses and server management, and increased collaboration. By migrating to Forge.mil, ARDEC realized all those benefits while retaining other TeamForge benefits such as end-to-end traceability and process workflow enforcement. The transition for its 15 projects to ProjectForge was seamless for developers and other users while resulting in better integration with contractors and enhanced communication across all groups.

Especially helpful to both CECOM and ARDEC are the global, simultaneous access and sustainable structure of the Forge.mil platform. They also benefited from community collaboration and access to common evolving development and delivery processes and approaches. Both teams reported measurable reductions in cost, improved software quality, and faster software innovation — along with improved code visibility and management.

Driven by early successes, these groups expect to broaden their use of Forge.mil by automating continuous integration using Jenkins integrations, by expanding Agile development practices, and by bringing in additional teams.

Methodology

This document contains project and company information that was obtained from questions posed by IDC to multiple teams at the DoD, information from DISA, and information supplied by CollabNet.

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