Defense Collaboration Services

Award Winner: DISA Team

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An Enterprise Collaboration Team of the Defense Information Systems Agency (DISA) sought to replace the legacy managed service, Defense Connect Online (DCO), with a collaboration service that is based on open standards and is open source. The chosen solution, Defense Collaboration Services (DCS), features a web conferencing solution based on Big Blue Button and chat services based on OpenFire. DCS features a modular, standards-based architecture that is more flexible and cost-effective than DCO. After an initial \$34 million investment into DCS, the cost was reduced by 50 percent, from \$39 million to \$19 million per year. The breakeven point for the investment is projected to be May 2016.

Background

The mission of the Enterprise Collaboration Program is to provide enterprise collaboration capabilities that improve the operational efficiency of our joint warfighters by enabling collaboration across organizational boundaries. Using these collaboration capabilities, joint warfighters are able to collect and disseminate administrative and command and control information in real time. The legacy collaboration service offering, Defense Connect Online, was a proprietary licensed product offered by a managed service provider.

Throughout 2012 and 2013, in a time of DoD-wide budget cuts and travel restrictions, the demand for online collaboration capability steadily increased, requiring additional licenses and consuming an ever increasing percentage of the available budget for the entire portfolio of services. In lieu of this, the Enterprise Collaboration Team realized that it needed to pursue an alternate approach for providing secure collaboration capability for DoD. The Enterprise Collaboration Team performed an analysis of alternatives to identify a suite of open-source collaboration services that met program requirements while providing a flexible and interoperable architecture. The selected approach, Defense Collaboration Services, provides web conferencing and instant messaging/chat capabilities in a manner that is more secure, modular, and cost-effective.

Problem/Opportunity

DCO provided collaboration services as licensed products delivered by a managed service provider. Under this arrangement, the Enterprise Collaboration Program was locked into one specific product and was dependent on the vendor for upgrades and new features. Additional licenses were required to support the increasing users of the service. Licensing and management costs for web conferencing and chat services were \$38.72 million in FY15, and costs were projected to rise yearly. With these limitations as drivers, the Enterprise Collaboration Team looked to the open-source community for a collaboration tool with a standards-based open architecture that is more cost-effective.

Approach

The Enterprise Collaboration Team performed a functional analysis that concluded that opensource software alternatives could satisfy collaboration requirements while providing a cost-efficient and open architecture. The new collaboration service, DCS, is an integrated solution based on a mature open-source web conferencing software package, Big Blue Button, and XMPPbased chat software, OpenFire. These services are a modular suite of software components that make use of standards to provide interoperability. For example, conference Voice Over Internet Protocol is provided by Free-switch, which uses G729 and can be easily modified to support commercial telephones, and the XMPP-based chat solution is not client dependent, eliminating licensing costs. DoD services are leveraging open-source chat clients that use XMPP to communicate, including SWIFT and Transverse. SWIFT and Transverse do not require license fees, reducing the cost to agencies to implement chat services.

Outcome

Figure 1 shows that after an initial \$34 million investment into DCS, the cost was reduced by 50 percent, from \$39 million to \$19 million per year. The breakeven point for the investment is projected to be May 2016.



Figure 1. DCO/DCS Estimated Costs (in millions of dollars operations-and-maintenance)

The benefits of an open standards-based architecture are already being realized. Performance problems were experienced in large meetings when using the desktop-sharing capability due to the inefficiency of Flash Video. With relatively little effort and a quick turnaround, the Enterprise Collaboration Team was able to upgrade the service to the H264 standard to increase the desktop-sharing performance during large meetings.

Current Status

After a cycle integration and testing, DCS was implemented in milCloud. DCS reached its full operational capability in June 2015, fully replacing DCO as the DoD cloud service offering. Figure 2 shows that DCS supports more than 60,000 monthly meetings, totaling more than 3 million meeting minutes.



Figure 2. DCS Monthly Usage

Challenges

The approach taken with DCS was a major shift away from the way services were provided in the past. Previously, contracts were issued for software licenses and managed services from commercial providers. This shift forced a culture change at DISA and rebuilding of internal system integration skills, particularly in improving cybersecurity of communications services. Additionally, the software industry is undergoing a major shift from perpetual licenses for software to a recurring usage fee model. When DoD cybersecurity requirements are added to these new services, these fees can increase dramatically. Through the systems integration work to implement this open-source collaboration service in a secure network environment, DISA has gained a better understanding of these security requirements and how to buy these capabilities in other services. In addition, industry realizes our resolve in lowering the cost of software and services while maintaining our high standard of cybersecurity.

About the Award Winner

DISA's Enterprise Collaboration Team included Yangwei Wang, Deepak Seth, Brian Fuchs, Jay Chung, and Steven Crum.

The Enterprise Collaboration Team looked to the open-source community for conferencing solutions that met the program's requirements for functionality, performance, and interoperability. Yangwei Wang reviewed opensource software products and found that Big Blue Button met the conferencing requirements and that Open-Fire met the XMPP chat requirement. Once a set of products was chosen, Dr. Wang developed and executed a pilot to verify the findings of his initial research and move the products into the integration phase.

Once an open-source solution was chosen, the architecture had to be documented to aid in deployment troubleshooting and interoperability with other services. Deepak Seth applied the Systems Modeling Language to document the architecture and interactions between components. These architectural models were an integral tool that aided the deployment and testing of DCS.

In order to create DCS, the open-source software had to be enhanced to meet the Security Technical Implementation Guide requirements for web applications. Brian Fuchs led the effort to integrate these services with DISA's Identity Access Management and Authentication Gateway Services to ensure a secure and interoperable product. These enhancements enabled DCS to attain an authority to operate on DoD networks and support users worldwide.

DISA's cloud service provider, milCloud, was chosen to host DCS. Jay Chung led the deployment team. His first priority was to design a computing infrastructure that provided the resources necessary to serve users DoD-wide. Mr. Chung also employed a new cloud provisioning system, DISA CONS3RT & BMC BladeLogic, to automate virtual system deployment and configuration management, thereby improving efficiency and significantly reducing information technology management costs.

Steven Crum led the development testing team that ensured the functionality, performance, scalability, and interoperability of DCS. Mr. Crum developed a testing strategy to test DCS against its requirements. Testing was performed on a per-release basis and led to improved stability and performance.