# Case Study: US Air Force DCGS Reference Imagery Transition (DRT)

## Customer

Department of Defense (DoD), US Air Force Lifecycle Management Command (AFLCMC), Air Force Distributed Common Ground System (AF-DCGS).

## Challenge

With 45 geographically separated networked sites, the AF Distributed Common Ground System (AF DCGS) is the premiere globally networked intelligence, surveillance and reconnaissance (ISR) weapon system producing intelligence information collected by the U-2, RQ-4 Global Hawk, MQ-1 Predator and MQ-9 Reaper unmanned aerial vehicles (UAVs). Given the size and scope of DCGS, distributing mission critical ISR data across the enterprise requires system engineers and application developers capable of providing innovative development, integration, and deployment services at scale.

## Amplify Federal DRT Engineering & Solutioning

Amplify Federal, a CVE certified Service-Disabled Veteran-Owned Small Business (SDVOSB), provides the Air Force with TS/SCI cleared engineering support in the areas of *Information Assurance*, *Software Development*, *DevOps*, and *Systems Integration and Test.* Using state-of-the-art technologies (Kubernetes/Docker, Jenkins, and CEPH), advanced GEOINT products (BAE SOCET and Xplorer) and an Agile DevOps methodology, Amplify Federal plays an integral role in the development, test, integration, and deployment the DRT solution.

Amplify Federal's full-lifecycle support of the DCGS mission and the DRT program encompasses the following areas:

***Cross-Platform Software Engineering:*** Through Agile development and a DevOps framework, Amplify Federal's software engineers are delivering a scalable, open-source, petabyte-scale distributed file system engineered for high-performance storage and processing. Our engineers are instrumental in achieving zero downtime deployments that meet or exceed SLAs and have worked to implement a self-healing/self-managing architecture that minimizes administration time and associated costs.

To achieve this, our engineers are utilizing Apache SOLR for real-time indexing and search, Map/Reduce and Spark for data streaming, Docker and Kubernetes for application containerization and orchestration, and CEPH for distributed storage.

As a result, the DRT team is able to move new baselines and patches into production with limited downtime and while maintaining system performance.

***DevOps Implementation:*** Amplify Federal's Sr. DevOps Engineer is the lead engineer supporting software release efforts across all projects in the DRT program. She led the creation and implementation of an automated Continuous Integration/Continuous Development (CI/CD) pipeline using GitLab, Jenkins and Docker. She also led the improvement of the CD portion of the DevOps pipeline by using AgroCD to automate processes.

As a result, Amplify Federal has helped increase DCGS release tempo and eliminated timely deployment bottlenecks. The DRT solution now delivers faster, more accurate, information to the field by removing human intervention in DCGS deployment process.

***Systems Integration:*** Working within an InfiniBand backbone, Amplify Federal's system engineers are integrating open-source technologies with existing DCGS ISR systems to improve ISR imagery transfer and associated analysis. Of note is our team's direct support/test of BAE's GXP products (Xplorer and SOCET) within the Data Storage and Dissemination (DSD) system.

Amplify Federal's system engineers are also involved with developing and maintaining the system architecture baseline, eliciting technical requirements, creating and enhancing Concepts of Operations (CONOPS), and virtualizing Windows Servers to enable integration of BAE GXP products.

Amplify Federal's systems integration efforts ensure that the GXP products delivery the right information to Air Force analysts, exactly when it is needed to make essential decisions.

***Systems Test & QA:*** Amplify Federal is proud to provide the Technical Lead for test and quality assurance on the DRT program, one of the most experienced non-management personnel on the Test team. Our Test Engineer develops and maintains test plans, develops and integrates automated testing tools, conducts tests on all major DRT releases, and interfaces with Air Force personnel to resolve defects in a timely and efficient manner.

These test activities result in more efficient releases and more accurate test data – both of which support increased system uptime, data transfer, and reliability.

***Deploying the DRT Solution:*** Amplify Federal has a long history of CONUS and OCUNUS deployment and maintenance, having managed infrastructure deployment teams of up to 60 engineers at U.S. embassies in over 90 countries from 2008-2020. All Amplify Federal DRT team members are TS/SCI cleared and fully prepared to support the deployment and/or maintenance of the DRT solution, both remotely and on-site.

Our team is directly involved in planning and scheduling DCGS fielding activities and deployment logistics. Not only have we streamlined DCGS deployments by developing kit lists, standard operating procedures (SOPs), and deployment checklists, but our engineers are leading the effort to create the first system equipment inventory on the DRT program.

As a result of our deployment experience, Amplify Federal is well-positioned to deploy baseline upgrades and patches needed for system maintenance. When on-site travel resumes, Amplify Federal's engineers are ready and able to provide support to the DRT solution both CONUS and OCONUS.