# Case study

National Background Investigation System (NBIS) — investigation management program

**Problem statement**

The Department of Defense (DOD) through the NBIS Program Executive Office (PEO) has been directed to reform and modernize federal personnel vetting. This reform requires the use of transformational approaches to reengineer the process for executing the personnel vetting mission in an efficient and agile manner utilizing information technology capabilities such as:

- Big data concepts supporting machine learning and artificial intelligence solutions
- Secure cloud architecture
- Agile development of automated tools
- Advanced data analytics
- Intelligence amplification
- Mandated and emerging relevant data sources (i.e. social media)
- Emerging or not previously utilized technology and automation

The NBIS PEO required a rapid prototyping activity to produce a minimum viable product (MVP) supporting basic investigation capabilities within 90 days. Following successful demonstration, the second phase of the project required a full spectrum NBIS investigation management capability enabling full life cycle security clearance processing for seven federal agencies, within one year.

**Perspecta's solution**

To support the accelerated timelines required and the complexity of this development effort, Perspecta proposed and implemented a Scaled Agile Framework (SAFe)-based agile development process allowing for rapid system development. Using a suite of Amazon Web Services (AWS) and commercial off-the-shelf software, the proposed investigation management application would use a three-tiered architecture that works together to meet all customer requirements. This includes secure user authentication and access control processes, user experience components, a workflow engine, a databroker component, an application programming interface gateway and a privileged access manager.

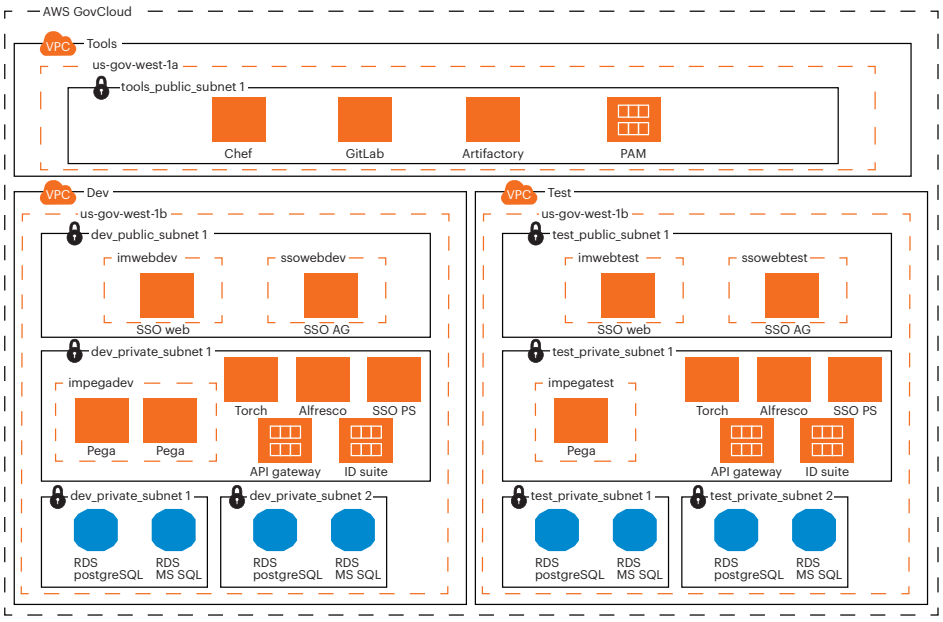
During the development efforts, Perspecta demonstrated to the NBIS PEO that production operations of the new application in AWS GovCloud would meet and exceed all performance and security requirements with a better total cost of ownership versus an on-premise deployment. All NBIS investigation management environments (development, test, pre-production, production and contiuity of operations plans) are deployed in AWS GovCloud.

**AWS architecture**

The NBIS investigation management release train begins with our development and test environments. All development products and components are stored in either the GitLab continuous integration and continuous delivery (CI/CD) repository for source code or the Artifactory repository for binary files. When we choose to upgrade our AWS test environment, the DevOps processes are kicked off to pull the code from GitLab CI and the binaries from Artifactory, and deployed into the AWS test environment.

**AWS services usage**

Perspecta leverages several native AWS services to form the foundation of the software-defined infrastructure, such as: Elastic Compute Cloud (EC2); Elastic Block Store (EBS) and Simple Storage Service (S3); Virtual Private Cloud (VPC); Elastic Load Balancing (ELB) and other network services; Relational Database Service (RDS) for both SQL Server and PostgresSQL; and




**The architecture shown above supports modernizing the IM system.**

CloudFormation templates in the CI/CD pipelines. The CI/CD tools used are Jira, Confluence, GitLab, Artifactory, Selenium, Chef, AWS S3 and CloudFormation. This overarching integration of all aspects of the infrastructure in the AWS GovCloud provides end-to-end automation.

### Third-party apps and services

Perspecta augmented the native AWS services with third-party products such as: Pega's case management platform for user experience and workflow, CA Technologies security suite (SiteMinder, Identity Suite, Privileged Access Manager, etc.) and Torch as the data broker.

### Results

Perspecta began this effort in June 2018 and delivered the initial capability to the NBIS PEO in September 2018. The use of AWS services in GovCloud enabled us to stand up fully functional development and testing environments in less than two weeks. This allowed our teams to hit the ground running and meet the aggressive 90-day requirement. We then completed phase two in September 2019 and are preparing for phase three to continue enhancements and incorporate new mission requirements into the system.



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