



Azha **S**ystems Case Study



Background

Previous Decennial Census efforts used paper based processes for data collection, including lists, forms, questionnaires and maps. Paper processes were slow, inefficient, and prone to error and resulted in high labor costs due to the magnitude of the Census data collection effort.

The 2010 Decennial Census wanted automated systems to improve efficiency and make their data collection and reporting more accurate. The Department of Commerce wanted to develop the Field Data Collection Automation (FDCA) project. The scope of this project, because of the scope of the Decennial Census was a large project for the Federal Government. Data collection operations were required for over 500,000 enumerators who reported to 500 interconnected, temporary local census offices and 12 regional census offices.

FDCA included mobile hand held computers for field personnel used for data collection, GPS address verification and administrative applications. Office computing was required for temporary and regional offices. Office computing had to be reliable, include office and back-office applications, prioritize the work of a geographical workforce and provide their operational status, include an automated workflow decision function and be able to disseminate the data efficiently. Security had to be tight to protect sensitive Census data. Wireless and wireline connectivity needed to be supported for the census offices and the enumerators in the field. All equipment needed to be purchased, delivered to the workforce and maintained.

Project Requirements

The 2010 Decennial Census FDCA systems required applications that could support recruiting, training, tasking, managing and paying the field workforce in both English and Spanish. Applications needed to status and support both automated and paper based operations for a diverse workforce. Paper based systems were still used in some areas of the Census operation. Automated systems needed to directly capture information collected during interviews for over 500,000 enumerators, 500 local offices and 12 regional Census offices.

Common user interfaces, consolidated data and maximum performance were required for custom and legacy applications. Connectivity was required via wireline and wireless access to all Census offices and enumerators. Security was a priority for all applications, including procedures and protocols to ensure Census data was kept confidential. Software needed to be developed with user friendly interfaces to allow accurate and efficient collection of information, GPS address verification and administrative applications. All user interfaces

had to be intuitive and easy to use with minimal training to support the diverse workforce. Support services were required to procure, supply and maintain all IT equipment. The system had to be flexible, without system redesign, to allow the Census operations to expand and contract as needed. Continual monitoring was required to identify and repair system outages and ensure maximum up time.

The Azha Systems Solution

The Azha Systems solution included the following responsibilities:

- Backups, Restoration, Storage
- Certification and Accreditation Support
- Configuration Monitoring
- Custom Reporting
- Dashboard Development
- Hardware Purchase, Deployment, and Repair
- Project Management
- Security Engineering
- Software Applications Support
- Software Development
- System Documentation
- System Engineering
- System Integration
- System Logging
- Systems Monitoring
- System Testing

The Azha Systems technical solution included a number of systems and services. Hyperic web application management was used to monitor servers, services, files, scripts, open ports and event logs. Hyperic calculated and reported uptime and mean time to repair for each 14 day calendar period. Report metrics were provided separately for problems impacting shared functions, resources effecting office staff and for groups of field staff greater than 20. Historical data was stored in a PostgreSQL database configured for failover, replication, and load balancing. Continual monitoring was required to support the performance of 700 servers, 600 network devices and 30,000 items every 30 seconds.

Jasper report server was used to develop custom reports. Reports identified which items were failing most often, listed all known outages and prioritized critical outages. Over thirty custom reports were developed for system administrators, program managers, and Census Bureau leadership.

Tripwire was used to monitor the systems for any changes to the configuration. Every change was stored in the Tripwire database to allow review any time. Reports could be generated ongoing to update management.

Oracle databases were monitored for changes to SQL schema, permissions and configuration.

Acrsight was used for system logging. If a hardware or software error was encountered, the Syslog facility logged the error, alerted the user, and attempted to repair the error automatically.

An Executive Interactive Dashboard was developed and provided to allow the Command Center staff to see “at a glance” the entire US Map. Any reported problems were identified by geographic region, severity and type. Users could “drill down” to see additional information; including contact information for each monitored item which allowed staff to quickly contact the correct person to fix each issue. The dashboard aggregated data from the Hyperic, Tripwire, and Asset Management system.