GLOBAL SCIENCE & TECHNOLOGY, INC.

CAPABILITIES STATEMENT: IT DEVELOPMENT AND SUPPORT

GST brings more than 30 years of experience providing IT support to NOAA, NASA, and other Federal and State clients. Our experience spans all IT lifecycle phases, from requirements, design, and development to testing, operations, and ongoing sustainment, for large-scale enterprise systems. Our dedication to quality, centered around a quality management system and ISO 9001:2015 and CMMI-SVC 3 certifications, is evidenced by our "Exceptional" CPAR ratings for Quality across multiple customers and contracts. Key customers include NOAA, NASA, USAF, USDA, and the State of West Virginia.

Core Competencies

Enterprise Data Systems

- Developed and maintain **NASA NSPIRES**, a web services interface for managing the submission and appraisal of research proposals. NSPIRES facilitates the grants process for more than 169,000 registered external users, more than 1,000 registered internal users, and over 7,200 registered organizations.
- Designed, developed, operated, and maintained **CLASS**, NOAA's enterprise-level archive for weather, climate, and environmental data. Maintained 99.9% system availability while managing ingest of up to 15 TB per day, distribution of up to 20 TB per day, and a total data volume of more than 15 PB.
- Developed and operated **GRAVITE**, a node of the JPSS ground segment that ingests data and products for use by JPSS flight program and scientists. GRAVITE ingests 7.5 TB/day of data and products for use by the JPSS flight program and scientists. GST support included development, testing, and deployment of data handling, monitoring, and algorithm capabilities and components using PostgreSQL databases, end-to-end test, system monitoring, scalable architecture design, and system administration.

IT and Helpdesk Support

- Provide comprehensive IT, network, and cybersecurity services for **all 55 West Virginia counties**. GST also manages County and Courthouse NAS (Network Attached Storage) and SAN (Storage Area Network) solutions, VMWare environments, servers, desktops, printers, and a variety of mobile devices and smart phones functioning within the State / County network.
- For **NASA's NSPIRES**, led the effort to perform a complete overhaul of the NSPIRES supporting hardware, reducing the NSPIRES footprint resulting in $4,000 a month savings in data center hosting fees for the remainder of the project. All these changes were completed with no significant user impacts and while exceeding the system availability requirement of 98%.
- For **NOAA CLASS**, provided 10x5 onsite support and 24x7 on-call support and serviced more than 1,000 unique users and millions of data access orders. Managed daily data ingest, performed preventative maintenance, implemented hardware and firmware upgrades, and performed security patching. Supported desktops and laptops, server farms, storage area networks, network-attached storage, enterprise tape robotic libraries, and networking for Linux, Windows, and Apple operating systems. Managed databases including Informix, MongoDB, MySQL, and Oracle.

Cloud Storage and Computing Solutions

- For **NOAA NESDIS**, provide cloud costing support for the NESDIS Common Cloud Framework. Generate metrics related to cloud costing and optimization for development, user acceptance testing, and production. Analyze cost optimization opportunities and provide cost forecasts. Developed a dashboard utilizing QuickSight to visualize costs.
- Designed and implemented the **ABoVE Science Cloud** that combines high-performance computing and high-capacity storage for large-scale modeling and analysis of remote sensing data. More than >100 researchers have used the remote sensing and field data to perform geospatial analysis.
- For **NOAA CLASS**, studied potential uses of public, private, and hybrid cloud services as a solution for data dissemination using a common access service; procured public cloud services to assess performance and build a local small-scale cloud computing system using AWS S3.
- Forklifted **GRAVITE** hardware and software to port the Investigator-led Processing System (IPS) and GRAVITE Algorithm Development Area (G-ADA) segments of GRAVITE to the Amazon Web Services (AWS) Cloud.

Cybersecurity

- Monitored **CLASS** security using CLASS Security Event and Incident Management tools. Developed Business Continuity Plan to minimize the impact to operational functions while recovering from an outage incident and conducted annual COOP exercises. IT security procedures included monthly system-wide scanning, security tests and evaluations, regular risks analysis and self-assessments, proactive security patching, and regular training.
- Develop, implement, and maintain system security and contingency plans in accordance with NASA Procedural Requirement 2810A and NIST SP 800-53 for **NSPIRES.** Apply malicious code controls, including anti-virus software, anti-spyware technology, and intrusion prevention systems.
- For the **State of WV**, help counties improve the security of their applications, information, and networks. Work with customers to ensure compliance with Department of Homeland Security Cybersecurity Infrastructure Security Agency, the Multi-State Information Sharing and Analysis Center, and Elections Infrastructure Information Sharing and Analysis Center standards. Worked with 32 rural counties to develop proposals to receive federal grant funding to improve overall cyber posture in County, Municipal, Education, and Health Departments. Upon award, have provided services, software, and equipment to implement cybersecurity improvements.

Software Design, Development, and Sustainment

- Designed and developed **NOAA CLASS** and oversaw the expansion of CLASS's archive capacity to meet the demands of its ever-increasing information holdings. Performed all lifecycle phases of requirements, design, implementation, test, deployment, operations, and maintenance following MCMI-DEV Level 3 processes.
- For **NOAA NCEI**, reengineered legacy software to make it more efficient and maintainable. These efforts improved automation and reliability and reduced cost and maintenance by developing easy-to-use and maintain scripts. In one example, our refactoring of the Pairwise Homogeneity Algorithm reduced code complexity, cut the number of global variables, and reduced the executable lines of code, making the code more maintainable and portable.
- Developing a **USDA "GeoHub"** that improves the ability of researchers to obtain data across USDA domains. GST conducted a feasibility study, began prototype pipeline development with NOAA data in a USDA cloud-hosted environment, and is now developing the GeoHub.
- Developed the ground processing system for the **USAF's WeatherSat**, which receives raw instrument data from the mission operations center to process and transform the data into calibrated and geo-located data, and then weather products from the processed data. Designed the system to meet requirements such as data volume, throughput, latency, interface definition, establishing data formats, internal communication logic, and threshold values for the environmental products.
- Developed a tree height cellphone app for volunteer observers that provides geolocated data as ground truth for ICESAT-2 and GEDI sensors; includes photographs of >10,000 individual trees worldwide in >60 countries.
- Teamed with Rank One Computing to provide facial recognition and AI to support visitor management systems that enhance facility security and safety. To date, GST has integrated these solutions into more than 20 schools and law enforcement facilities.

Cloud Storage and Computing Solutions (cont.)

- Collected and processed weather data from thousands of mobile and stationary sensors using cloud computing, storage, and processing services for NOAA Mesonet.

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