



# IT Engineering and Integration U.S. Nuclear Regulatory Commission Past Performance

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## *Network Engineering*

G2SF engineers played a key role in designing and implementing a Wide Area Network (WAN) optimization solution to support access for Resident Inspectors at remote nuclear facilities, allowing for better internet connectivity, speed and throughput. In support of the WAN as well as other classified and unclassified networks, G2SF currently manages and staffs the Network Operations Center (NOC) providing 24-hour monitoring of the network infrastructure from layers 2-5 perspectives using multiple tools such as What's Up Gold, Riverbed, Cisco Prime, and Splunk. G2SF provides daily event management support for the notification of network events, routine maintenance and support, and Tier 2 and Tier 3 support for network related incidents. G2SF engineers were also key contributors to the design and development of the network for the build out and migration of a new NRC building and data centers.

## *Exchange Upgrade*

G2SF successfully migrated the NRC's Microsoft Exchange 2007 environment to Microsoft Exchange 2013. This was completed in preparation for future plans to move all email to Office 365. Phase 1 was the analysis of the Exchange 2007 environment, identification of interdependencies of external systems, extensive research, and requirements definition. During Phase 1, many aspects of Exchange 2007 were reviewed such as servers and configurations, policies, backup and recovery plans, DR procedures, monitoring, and network and bandwidth. Outlook Web Application configurations were reviewed including the research, coordination and dependencies for the Internet Security and Acceleration server. The NRC virtual infrastructure was also reviewed to determine the ability to support Exchange 2013. Phase 2 of the migration was the Exchange 2013 detail design and testing to be able to support a centralized email infrastructure from a disperse Exchange 2007 email infrastructure. A consolidated design would better align efforts to eventually migrate to O365. This included documenting schema attributes; designing co-existence of Exchange 2007 and Exchange 2013 during migration (mail flow, OWA, Mobility, migration planning, and monitoring); designing a monitoring plan using Microsoft SCOM 2012 R2; designing the mailbox databases; leveraging 20 blade servers; designing Dell Compellent SAN Storage; designing the backup and recovery system; designing policies; developing COOP procedures; reversing proxy using Citrix Netscaler for OWA and EAS designs; creating a DISA hardened Windows 2012 R2 image; and building and testing the Exchange 2013 environment and all its components in the test environment, including security components. Phase 3 of the migration included building, implementing and migrating to Exchange 2013. Windows 2012 R2 servers were deployed, with Exchange 2013 installed, to NRC headquarters and 5 regional office locations around the country. Working closely with various departments within the NRC, the G2SF Engineering & Integration Team was able to successfully migrate over 10,000 mailboxes and implement Microsoft SCOM 2012 for dedicated monitoring of the new Exchange 2013 environment. A new COOP strategy was implemented due to changes in technology between Exchange 2007 and Exchange 2013.

## *O365*

G2SF is providing Microsoft Office 365 (O365) Cloud engineering technical expertise, operation support, and transition services for the U.S. Nuclear Regulatory Commission. The G2SF Engineering & Integration Team work closely with the NRC to conform to the Federal Cloud Computing Strategy (Cloud First policy), the Data Center Optimization Initiative (DCOI), FedRAMP, and other Federal and DoD regulations.

The O365 project started with a Systems Requirement Design (SRD) task based on what “known” information. This was the initial RFP or Task Order with mutually understood and agreed upon terminology, technology, scopes, requirements, assumptions, constraints, etc. The SRD outlined and categorized into requirements for Business, Solution, Security, Authentication, Network, Performance/Reliability, External Interfaces, System Administration, and Futures. Within the NRC, this permitted the effort to work in parallel on different requirements: Information Assurance/Fedramp/Control Implementation Summary (CIS)-NRC/ATO; Network infrastructure (perimeter security); On-premise Office365 readiness (Active Directory, Exchange, desktop Office); PKI/ICAM PIV authentication and engaging Microsoft to work through the architecture/design choices based upon the requirements and obtain a full understanding of the implications that various choices had upon capabilities.

G2SF’s Sr. System Engineers followed Microsoft Best Practices as well as industry best practices to develop a comprehensive design, test, and implementation of a hybrid Office 365 that provided the NRC secure connectivity to O365 services. Exchange Online was chosen to be the first service to be implemented. G2SF’s Engineering & Integration Team was able to successfully implement security controls and network connection to the O365 via ExpressRoute and migrate over 9000 mailboxes to Exchange Online within a 5-month time frame.

Mailbox migrations to Exchange Online was only the first phase of the NRC integration to O365. G2SF continues to work with the NRC to develop a plan to discover, cleanse and ingest user .pst files to O365 archive mailboxes. Collaboration services for OneDrive, SharePoint, Skype, and Mobility will be integrated via O365 by utilizing native or a third-party solution. G2SF works with the NRC to help develop requirements and solutions to utilize O365 collaboration services so that the agency users have multiple options to collaborate from any location at any time using a wide variety of devices.

G2SF continues to provide Engineering and Integration services to the NRC to include the design, development, implementation, integration, management, and continuous improvement of various engineering related projects across the NRC enterprise. The G2SF Engineering & Integration Team works closely with the NRC to ensure that IT plans, solutions, services, and investments align with the NRC’s Enterprise Architecture and strategic objectives.