A fast, flexible converged platform for Enterprise Hybrid Cloud (EHC) on-premise/off-premise operational scenarios, designed to leverage the simplicity, agility, and security of the EMC Isilon Scale-Out Network Attached Storage (NAS) intelligent data storage solution.

CHALLENGE

Geospatial Information Systems (GIS) are prominent in the government sector, and the importance of geospatially correlating any and all resources, equipment, personnel, facilities, data, etc., is growing rapidly. Most agencies already know the power of GIS applications to transform raw data into graphical maps. Now, the ability to overlay these maps with operational images and video is also possible, and can leverage the simple, efficient, and secure capabilities of solutions integrating the unified storage capabilities of the EMC Vblock Enterprise Hybrid Cloud (EHC) with Isilon Scale-Out NAS.

The explosion of data, especially the importance and volume of file-based unstructured data, such as imagery, video, and audio files, challenges all agencies, and is expected to continue to grow and comprise nearly 80% of all data, according to an IDC report.\(^1\) As noted by Ashish Nadkarni, research director for storage systems at IDC, “The importance of unstructured data in the enterprise is underscored by the fact that beginning in 2015, unstructured data will surpass structured data in terms of both capacity shipped and revenue. IDC estimates that in 2017, unstructured data will account for 79.2% of capacity shipped and 57.3% of revenue.” IDC further notes that with the digital universe doubling every two years, the size of the digital universe will grow to about 8 zettabytes by 2015 (which is 8,000,000,000 terabytes), up from just 1 zettabyte in 2010.

With geospatial map data ranging from gigabytes to terabytes, and imagery and video files ranging from terabytes to petabytes, in many agencies, there is a recognized need for GIS data consolidation and sharing to improve decision making, deliver better and more agile services, and provide consistent results. Some see GIS solutions themselves as a type of unifying interoperability platform.

HYBRID CLOUD-BASED GIS

The traditional ways of serving GIS applications, where each operations group, department or agency deploys a physical standalone GIS system with its own dedicated storage and processing, are inefficient and costly to maintain. IT asset utilization rates remain low because resources are not shared. Even worse, data becomes duplicated and out of sync across the organizations, creating inconsistent results and conclusions.

In the government sector, where budget pressures are greater than ever, virtualization, cloud, and shared service technologies are now available from EMC, Cisco, VMware and Intel which, when combined, enable agencies to consolidate their GIS data into a common pool.
Organizations can dial into the same shred GIS data repository. They access and analyze layers as needed. They create knowledge and actions, confident they’re working from the same consistent and secure data baseline.

Here are some examples of how agencies can benefit from an EMC Vblock hybrid cloud-based GIS solution:

- **Intelligence agencies.** Service and military personnel traverse unknown territories with greater confidence. Governments survey various landscapes in real time to detect unusual patterns. Suspects are tracked and topology is analyzed for best mission routes.

- **Transportation departments.** Routes are planned and mapped. Traffic queues and bottlenecks are detected, vehicles and platforms are added, environmental scenarios adjusted, and new routes and traffic patterns are simulated, visualized, and monitored in real time.

- **Emergency management, fire, and utilities.** Data layers are analyzed and shared across departments to locate surface and subsurface utilities, evacuation points, and hospitals. Dignitaries, VIPs, and persons of interest are tracked. Emergency responders and national defense support personnel can meet user and operational needs quickly through advanced planning.

- **Targeted localized planning services.** Users can view neighborhood demographics, trends, and diverse data types from socio-economic data to map imagery and video layers. Property boundaries and markers are noted. Correlations can be drawn between geospatial proximity and resource allocations to identify trends or uncover inconsistent resource assignments.

**GIS SOLUTION COMPONENTS**

EMC’S number one design principle was to offer an open, scalable, reliable, and secure environment from which to serve geospatial information – at an affordable price – across agencies and directly to users. EMC also recognized the need to provide a solution that could grow in line with the GIS data explosion – one that is simpler to procure and manage, which enables governments to add capacity as needed.

**Vblock Infrastructure**

The solution is based on the Vblock Infrastructure Platforms from VCE, a coalition of which EMC is a significant part. VCE has delivered the industry’s first completely integrated IT offering that combines best-in-class networking and compute components from Cisco and Intel; storage, security, and management technologies from EMC; and virtualization capabilities from VMware. Seamless support assures end-to-end vendor accountability. This pre-integrated, converged infrastructure enables rapid virtualization deployment so government departments can quickly experience operational flexibility and see a return on investment. Vblock Infrastructure Platforms offer varying storage capacities and processing and network performance, and they support such capabilities as enhanced security and business continuity. This cloud solution can be configured to support on-premise and off-premise hybrid cloud operations.

**Ersi Application**

Ersi is the world’s leading geospatial software company, and the ArcGIS application is the geospatial application most often seen in government agencies. Working with Ersi and VCE, EMC conducted functionality testing in the lab. Installation and workload testing was performed to prove the solution. Ersi’s ArcGIS Server suite on a Vblock infrastructure platform can be deployed via a variety of different service scenarios. A government organization can install and operate its own GIS hybrid cloud. An agency department or group could create its own cloud and share it with others, or it may be preferable to engage with a service provider for a secure hosted service.
Access Device
Users, with appropriate credentials, can access the EMC GIS Hybrid Cloud solution via Intel-based PCs, Apple MACs, smart tablets, and/or mobile phones. Thanks to EMC’s VDI solution, enabled by VMware® View™, the users feel like they are “virtually” in front of the geospatial information – no matter where they are physically. In addition, the EMC solution supports the mobile applets being developed by Ersi and other GIS application providers.

Chargeback and Reporting
The EMC GIS hybrid cloud solution can use “charge backs” as a way for individual units, departments, or agencies to track and be billed for their use. For example, some departments, like Planning, might have more active, daily users than others, and want real-time access to visualized information, while other departments, such as Transportation, may simply need ad-hoc access. Charge backs “apportion” costs based on each of these department’s actual usage levels. The Unified Infrastructure Management (UIM) that’s available with Vblock can help with this.

Big Data Backup and Protection
As an added option, EMC offers a suite of backup and protection software and services to ensure government GIS operations continue – no matter what. EMC Data Domain®, for example, an award-winning data deduplication technology, eliminates the cost of storing multiple copies of the information. EMC NetWorker helps you back up your GIS data within the available time window.

SUMMARY
GIS is a dynamic IT environment. Hardware and software vendors are coming together to provide a better understanding of industry and workload patterns. They operate different workflows and processes, but what is consistent is the need to capture, analyze, and display exploding volumes of geospatial information across multiple departments and domains. To aggregate, deduplicate, and make consistent your multiple pools of GIS data into one shared repository is the vision and mandate for today.

With EMC GIS Hybrid Cloud solution, you can do that. Your operation will become a streamlined and efficient organization in the way you manage your GIS data. Your operating costs will decline and the automation inherent in the EMC Isilon data storage will “free-up” resources for reallocation to other higher-priority mission areas or to realize cost savings. Your operational users and IT staff will become more agile and empowered. Ultimately, you’ll gain more operational value from the information, rather than spending all your resources and time just managing it.

CONTACT US
To learn more about how the EMC Hybrid Cloud can help solve your operational and IT challenges, contact your local EMC representative – or visit us at www.EMC.com.

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