

FMV “Cloud” Optimization



Executive Summary

Sequestration, “doing more with less”, budget constraints... today, the Department of Defense (DoD) faces a reversal of past spending conditions that will affect their ability to meet current and future mission requirements. This is especially challenging in an era where commercial-off-the-shelf products are created using new technologies and service offerings that will not only help the economy, but also improve production.

To further compound the difficulty of today’s budget restrictions, Full Motion Video (FMV) (e.g., streaming video) requirements and mission capabilities are still growing at exponential rates. Specifically, there is a likelihood that huge volumes of storage and maintenance, as well as access control demands, could further hinder DoD progress in execution of operational missions.

With the emergence of “commodity-driven” storage vendors and new standards, one needs to consider fiscally prudent measures when driving towards a cloud-based, enterprise solution for FMV storage demands.

Challenge

Storage Area Networking (SAN) has been around for some time, yet as new techniques, technologies and standards evolve, the cost to create, maintain and scale a SAN solution is still a steadfast, cost accounting burden. Given the state of the economy and its impact on the DoD budget, “doing more with less” will only exacerbate this problem as the increase of digital storage requirements are levied on the warfighter. Digital storage is not only a “product”, but also a “by-product” with only one trajectory path, and that is “up”.

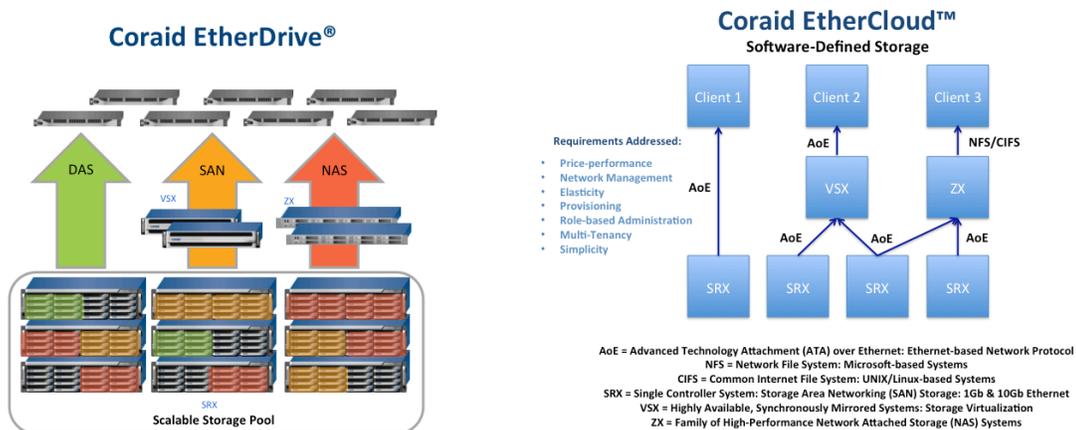
The Information Technology industry is transitioning to a “software-defined” market. There is “Software as a Service” (SaaS), Software-Defined Networks (SDN) and even Software-Defined Storage (SDS) to name a few. The point of the challenge statement is, as we migrate to this new “software-defined” market, the digital footprint of Information Technology will only expand in size. Thus, the compelling reason for a smarter and more cost conscious approach to building storage architectures.

Today, there has to be a more balanced effort where we leverage fiscal conservatism while managing the “appetite” for producing and consuming digital information with regards to FMV requirements. If we can control the cost of storage through the use of new standards that use commodity-driven technology, we might be able to continue development of FMV solutions without a detrimental impact on FMV capabilities and mission sets. We are balancing the checkbook without losing site of the mission.

Solution

In both of the author’s previous papers, “[Full Motion Video Services White Paper](#)” (a 30,000 foot view) and “[Standardizing Full Motion Video Services for Operational Effectiveness](#)” (a 15,000 foot view), Storage was only addressed as a prerequisite. Other than general planning essentials, not much depth was conveyed on what considerations should be mandated when building the “Storage Cloud” to house and protect the data. To optimize FMV capabilities and sustain it in a 365x24x7 operation, an architect must focus on functional requirements such as multiple ingress and egress (terrestrial) paths, “storage-at-rest” (e.g., encryption) mandates, geographic separation for survivability, power, cooling and equipment redundancy, maintenance to ensure uptime, transport security, administrative and managerial controls with tools to simplify performance and accelerate proficiency, as well as standardization to, most importantly, ensure interoperability and satisfy compliance with Cyber-Security policies (e.g., Information Assurance). Again, these are all attentive details to examine, but the quandary of the budget remains.

The evolution of a storage standard like [Advanced Technology Attachment \(ATA\) over Ethernet \(AoE\)](#) which could be considered a disruptive technology, if not a commodity of the future, brings [Coraid](#) to the forefront. By using a network storage protocol, AoE is a connectionless protocol that doesn’t rely on the transport or sessions layers. In in-itself, AoE is a network protocol that rides over Ethernet. A Coraid solution is a Software-Defined Storage approach that from a price-performance perspective leverages data elasticity, which can scale as you need it, when you need it, on a budget, and without disturbing the Enterprise. When constructed within a Brocade Ethernet Fabric [Virtual Cluster Switching \(VCS\)](#) architecture that includes Network Monitoring, both conform to Ethernet standards while removing the Spanning Tree protocol and manageability problems associated with a traditional Internet Protocol (IP) networks. The AoE approach promotes the utilization of x86 hardware, where the overall storage and network topology can be distributed for maximum processing ability that also allows parallel role-based administration access inherent to the intelligent software.



The value proposition to employ commodity-based hardware (e.g., x86) and network protocols (e.g., Ethernet) responds to resource freedom and cost reductions that meet present business demands. With the removal of complex, resource-intensive legacy SAN constructs that require micro-administrative labor configurations, coupled with prolonged training (e.g., “does not require a rocket scientist”) that are project and time management headaches, Coraid reshapes the FMV infrastructure on a budget. Full Motion Video consumption will multiply in petabytes of either block and/or file storage, which in a Coraid solution of EtherDrive storage in a EtherCloud deployment, simplifies processes to encourage simplicity at scale.

When planned with a Wide Area Network and/or a Local Area Network (LAN) transport framework as [Objective Interface Systems’ \(OIS\)](#) Black Channel products are designed, the entire “Cloud” architecture can be provisioned to

carry, as well as safeguard all disparate information and data sources across multiple domains in a multi-level security environment end-to-end using thick, thin or zero-clients without relinquishing or outsourcing control. Using the Black Channel FIPS-compliant Suite B cryptographic solution, OIS answers with a low cost, effective alternative over traditional HAIPE technology and amazingly, all delivered on “one-wire”. The “Cloud”, with role-based administration and 3rd party “storage-at-rest” mechanisms, as well as Black Channel transport security, the “source and methods” impact to data collection (storage) and transmission can be protected and directed to the exact, authorized individual and/or organization with a reduced risk of information compromise to personnel who do not have a “need-to-know”.

Lastly, to complete the holistic solution architecture, strong consideration should be placed in utilizing Cisco Systems voice and video suite of products. No other vendor today has the depth and breadth, as well as Joint Interoperability Test Command (JITC) [certification portfolio](#) necessary to comply with DoD guidance on interoperability and information assurance. The combination of presence, voice, video, collaboration, conferencing and voicemail systems complete the FMV communications needs.

Summary

The aforementioned systems combined in a solution contribute to a total reduction of complexity along with a lower cost of ownership. Together, the system of products result in a modular design that blends the best-in-class concepts of performance and cost with improved efficiencies. In closing, a consideration the Chief Executive Officer of Coraid pointed out resonates... “In order to achieve the economics and scalability required for information dominance, the DoD should be leveraging the same architectures that large-scale cloud and Web services are using.”