West Virginia State Treasurers Office

RFP #STO12007
Network Equipment Infrastructure

Presented to:
Frank Whittaker
Purchasing Division
2019 Washington Street East
P.O. Box 50130
Charleston, WV 25305-0130

Submitted by:
Todd May
Client Relationship Manager

Date:
April 10, 2012

Version:
Version 1.8

Solution #1
ORIGINAL

RFP No.: STO12007

Bid Opening Date: 4/10/2012

Bid Opening Time: 1:30 PM

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WV PURCHASING
DIVISION

ADVIZEX

ADVIZEX

April 10, 2012

Frank Whittaker
Purchasing Division
2019 Washington Street East
P.O. Box 50130
Charleston, WV 25305-0130

RE: RFP STO12007

Mr. Whittaker:

AdvizeX Technologies, LLC (AdvizeX) appreciates the opportunity to respond to your RFP related to Computer Network Infrastructures.

I, Todd May, am the authorized contact person that can speak on behalf of AdvizeX.

My contact information is as follows:

Todd May
Client Relationship Manager
AdvizeX
6480 Rockside Woods Blvd. S, Suite 190
Independence, OH 44131
216-901-1818 x4110
tmay@advizex.com

Based upon our review of RFP STO12007, it is confirmed that AdvizeX meets all mandatory requirements established in said RFP.

We are looking forward to the next step in this authorization process.

Sincerely,

Todd May
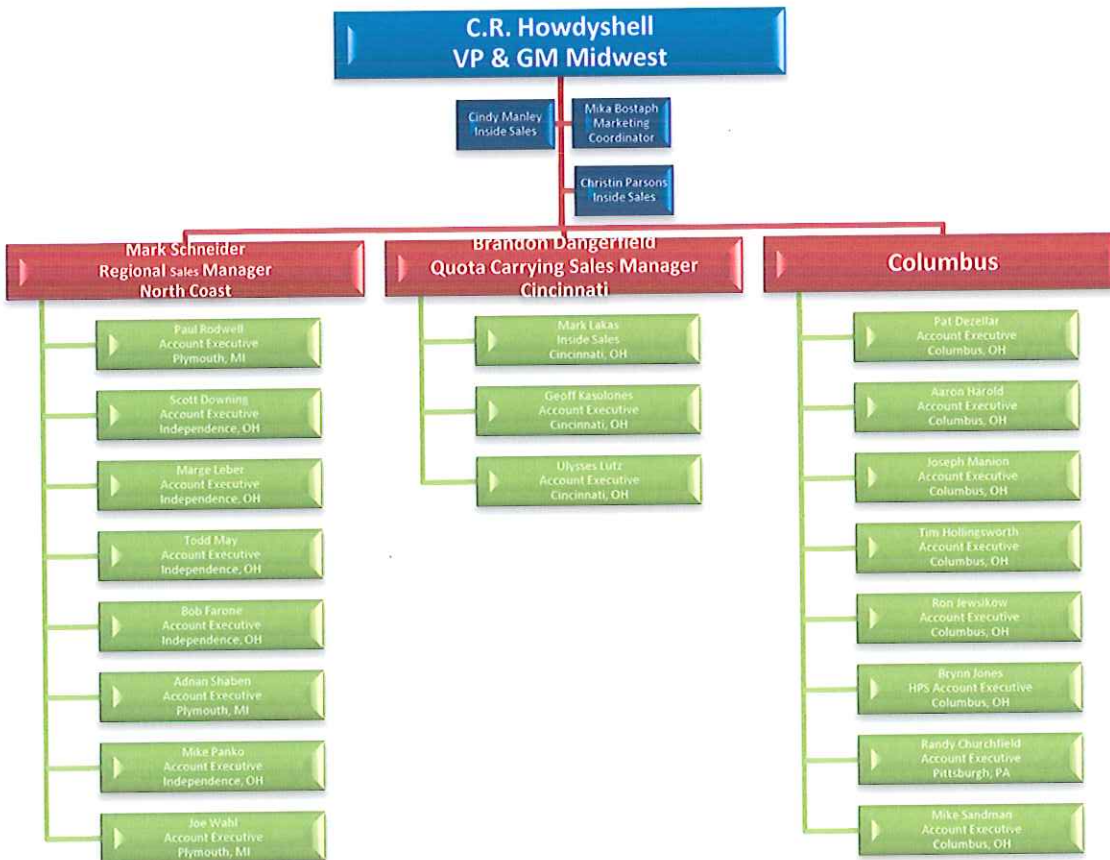Client Relationship Manager

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ATTACHMENT A – VENDOR RESPONSE SHEET

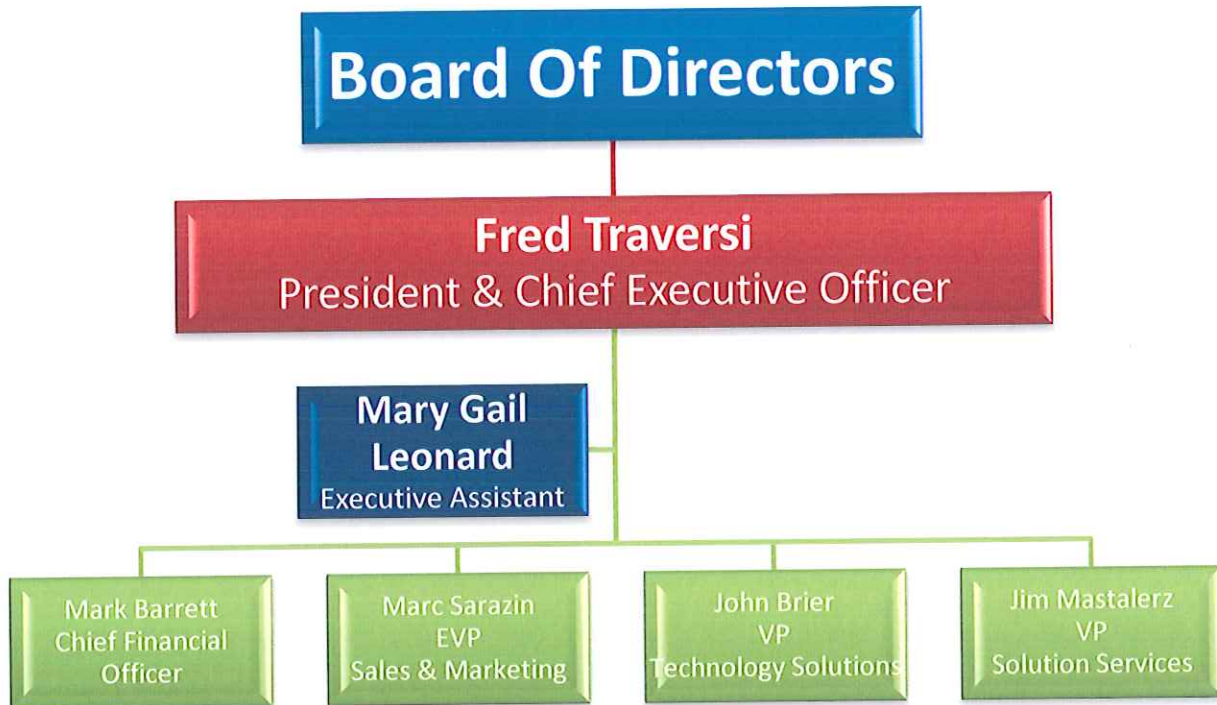### 2.3 QUALIFICATIONS AND EXPERIENCE

An organization chart identifying the Vendor's overall business structure and locations, including an explanation of the various services offered by the company.

2.3.1 AdvizeX Organizational Chart

2.3.1.1 Midwest Marketing Organization

2.3.1.2 AdvizeX Management / Officers

AdvizeX Technologies LLC is a privately held information technology company with headquarters in Cleveland, OH. We operate in offices in 9 states. This includes Charleston, WV, Pittsburgh, PA, Columbus, OH, Cincinnati, OH, Nashville, TN, Chicago, IL, Boston, MA, Baltimore, MD, Rochester, NY and Atlanta, GA. We currently employ more than 200 people. The majority of our employees are sales engineers, sales representatives or technical consultants.

Since 1975 AdvizeX has been providing organizations with the expertise needed to chart a successful, strategic course towards the next-generation IT systems that will best support your company's business goals. Whether you're exploring virtualization or cloud solutions, undertaking a network refresh, implementing new applications at the desktop, or tackling system upgrades, turn to AdvizeX for deep industry knowledge and best-in-class service and support. AdvizeX designs and implements integrated solutions utilizing best in class products from the industry's best strategic business partners.

Businesses today are searching for the best ways to manage the complexity of the IT challenges they face. Issues like data security, server sprawl, the need for consolidation, automation and virtualization are critical to meeting the levels of productivity, efficiency

and reliability that competitive markets demand. AdvizeX has developed specialization in the following area to address these issues.

They include Virtualization of data centers, servers, storage, networks, desktops, and applications. The very nature of the WVSTO RFP is our specialization. Creating a seamless environment that combines servers, storage, networking and virtualization to enable IT to provide business applications as service is very essence of what we have proposed from the VCE Company. We do it with a common packaging like VCE and as an al carte offer with best of breed products from our partners. Some of our offerings that are relevant to the WVSTO RFP are:

- Virtual Data Centers
- Backup and Recovery Solutions
- Enterprise Networks
- Storage Efficiency and Tiering
- Application and Infrastructure Management
- Solution Centers

Virtual Data Centers

Virtual Data Centers are no longer slide ware. The reality is that IT departments are moving quickly to implement them. AdvizeX can provide your organization with the expertise required to implement a virtual data center, starting with assessment and planning and moving through all stages of implementation and post-migration support. Our team of experts can also advise you on best available solutions from leading virtualization vendors such as HP, EMC, VMware, Microsoft and Oracle that are right sized for your existing IT resources and budget.

In the virtual data center, each of the critical building blocks --- network, servers, applications and storage -- need to be not only optimally virtualized but also working together in a fully integrated and orchestrated fashion. AdvizeX can help your organization move beyond virtualization silos with a comprehensive approach to all four areas using best of breed technology and a knowledge base honed through years of real-world experience.

Providing Innovative Solutions to Backup and Recovery Challenges

As you consider your options for optimizing your operational recovery system, AdvizeX can help. And our approach is by no means limited to point solutions. Our well-certified experts can provide sophisticated levels of assessment using a unique vendor-agnostic methodology called the Advizor™ tool. We can benchmark current configurations to identify critical gaps, map out solid implementation paths, and custom-tailor a solution to address the specific needs of your computing environment. In addition, two strategically located Solution Centers allow you to view simulations of multi-vendor solutions so you can see how your

planned implementation performs before its deployed. Both resources are examples of our comprehensive and holistic approach to IT assessment and implementation.

AdvizeX for Your Enterprise Networking Needs

The costs associated with supporting an enterprise network infrastructure constitute a substantial portion of many IT budgets. But network inefficiencies can hamper even the most robust data center build-outs. AdvizeX networking experts can assess network performance by evaluating current LAN, WAN and SAN configurations, identifying potential bottlenecks, and looking for areas that would benefit from the latest networking innovations.

Designing Storage Efficiency and Performance

As the trend toward more efficient data centers continues, companies have come to understand the value of doing more with less. The same is true of data storage today. By leveraging the latest storage technologies, AdvizeX can reduce costs, enhance computing performance, and create the best solution to fit your needs.

The finely-tuned design of your storage infrastructure is key to your data's reliability. You should depend on nothing less than flawless data availability, protection, and recovery. AdvizeX is a dependable storage partner that incorporates advanced technologies to provide best-in-class solutions. Some of these include thin provisioning, storage virtualization, automated storage tiering

AdvizeX Solution Centers: See How Your Environment Performs *Before* It's Deployed

Today's IT solutions are not only more complex and layered but also heavily dependent on multivendor interoperability. Because suppliers focus mainly on the performance of individual products, the challenge for IT managers is to ensure that a planned implementation can perform optimally up and down stacks and across multiple network domains. AdvizeX Solution Centers are a rich resource and toolset allowing our customers to meet this challenge.

- Synergistically mix and match server, storage, and network elements in standard or customized configurations before you implement. Real-world video simulations and demos show exactly how new applications or emerging technologies fit into your current IT resource configuration.
- IT managers can test drive planned implementations, while minimizing risk and saving valuable planning and preparation time. If you have specialized requirements, AdvizeX can customize a demo to show how your actual data or applications will perform in specified vendor configurations.

2.3.2 Public Sector References

The following references have been attached to this section:

1. State of West Virginia State Court of Appeals
2. State of West Virginia Department of Administration
3. State of West Virginia Supreme Court of Appeals

2.3.2.1 West Virginia State Court of Appeals

SUPREME COURT OF APPEALS
STATE OF WEST VIRGINIA

STEVEN D. CANTERBURY
ADMINISTRATIVE DIRECTOR

ADMINISTRATIVE OFFICE
BUILDING 1, ROOM E-100
1900 KANAWHA BOULEVARD, E.
CHARLESTON, WV 25305-0832
(VOICE) 304/558-0145
(TTY) 304/558-4219
(FAX) 304/558-1212
www.state.wv.us/wvsca/

October 11, 2011

Mr. Greg Kidder
Chief Procurement Officer
WVNET
837 Chestnut Ridge Road
Morgantown, WV 26505

Dear Mr. Kidder:

Please use this letter as confirmation of our business relationship with AdvizeX Technologies. AdvizeX has been a trusted advisor for the West Virginia Supreme Court of Appeals for several years. We purchase nearly all of our Hewlett-Packard infrastructure from AdvizeX. This includes HP Blades, HP Proliants, HP EVA Storage Systems, and HP SAN switches.

AdvizeX provides extensive presales resources to help us choose the best solutions to support the various Court locations throughout the State. They have also assisted with post sales consulting resources.

WVNET can expect a high level of service and support from AdvizeX.

Sincerely,

Scott Harvey
Director, Technology Division
West Virginia Supreme Court of Appeals

SH/seh

2.3.2.2 State of West Virginia Department of Administration

STATE OF WEST VIRGINIA
DEPARTMENT OF ADMINISTRATION
OFFICE OF TECHNOLOGY
Kyle Schafer
Chief Technology Officer

Earl Ray Tomblin
Acting Governor

Robert W. Ferguson, Jr.
Cabinet Secretary

DATE: October 7, 2011

TO: Whom it May Concern

SUBJECT: Letter of Reference

Please accept this Letter of Reference on behalf of AdvizeX Technologies and their Client Relationship Manager, Todd May. I have personally worked very closely with Todd, on an almost daily basis during the past four years. AdvizeX has proven to be one of the State's very best vendors. The quality of their sales, service and support is unsurpassed among IT vendors.

David L. Shingleton, Administrative Services Manager

Capitol Complex, Bldg 5, 10th Floor Charleston, WV 25305 Phone: (304) 957-8265

2.3.2.3 State of West Virginia Supreme Court of Appeals

SUPREME COURT OF APPEALS
STATE OF WEST VIRGINIA

STEVEN D. CANTERBURY
ADMINISTRATIVE DIRECTOR

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October 11, 2011

Mr. Greg Kidder
Chief Procurement Officer
WVNET
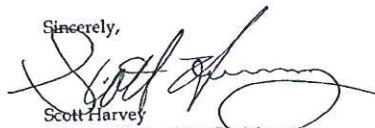837 Chestnut Ridge Road
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WVNET can expect a high level of service and support from AdvizeX.

Sincerely,

Scott Harvey
Director, Technology Division
West Virginia Supreme Court of Appeals

SH/seh

2.3.3 Resumes of Project Team Members

Please refer to the following pages for the following team references:

- Jhune Marra
- Joseph Stottman
- Armando Centeno

2.3.3.1 Team Member Jhune Marra

Profile Summary

Senior Storage Consultant focused on Storage Area Networking (SAN), Network Attached Storage (NAS) and Content Addressed Storage (CAS), specializing in EMC products and solution sets. Over 17 years of experience in system architecture, planning and design on SAN arrays (EMC Symmetrix, VMax, CLARiiON, VNX Arrays), NAS (EMC Celerra, VNX), Brocade/McData and Cisco SAN infrastructure, as well as Next Generation Backup, Recovery and Archiving (EMC Centera).

Possesses solid architecture and implementation experience in Business Continuity (SRDF, TimeFinder, RecoverPoint, MirrorView, and SnapView), configuration and management of clients' SAN, NAS and CAS arrays using EMC Control Center (ECC), Symmetrix Management Console (SMC), Navisphere, Unisphere, Celerra Manager, Fabric Manager, Device Manager, symcli, naviseccli, and other command line interfaces (CLI)

Provides technical and consultative leadership to deliver EMC focused technologies for client solutions opportunities

Jhune's experience within the solutions practice includes:

- Develops technical strategies to deliver EMC solutions and services including scoping, effort estimates, and client presentations/meetings to support customers' business objectives.
- Implementation, architecture, and design engineering of EMC Symmetrix DMX, VMax, VNX, CX, NS and Centera, including local and remote replication (SnapView, TimeFinder, SRDF, and RecoverPoint)
- Best practice design and layout of Symmetrix, VMax, VNX, CLARiiON and Celerra
- Best practice design and layout of Oracle DB and MS Exchange on EMC Arrays, including performance analysis, and workload profiling.
- Business Continuity solution architecture ensuring clients' RPOs and RTOs are met, including bandwidth analysis for remote replication sizing and solution validation.
- Delivers and has successfully completed several customer onsite transitional and operational residencies focused on migration, implementation, configuration, and management of SAN, NAS and CAS infrastructure using GUI and/or CLI, including knowledge transfer, and documentation.
- Provides the following custom services: EMC Oracle and MS Exchange Data Layout, EMC Symmetrix and CX/VNX performance analysis, SAN Assessment, Transition, Training, Remediation planning, and Resource modeling.

- Extensive experience managing and analyzing EMC's Symmetrix, VMax, CLARiiON, and VNX storage systems using various management software, command line interface and other proprietary tools.
- Multiple EMC Proven Professional Certifications – Specialist EMCIE on Symmetrix, VNX Unified, Celerra, Centera and RecoverPoint.

Technical Experience

Jhune has experience with the design and implementation of EMC best practices, and administration of the following environments:

Operating Systems: Windows, Solaris, HPUX, AIX and Linux

Platforms: EMC Symmetrix (VMAX, DMX), VNX (File and block), CLARiiON, Celerra, and Centera

Software: EMC SRDF, TimeFinder, MirrorView, SnapView, Open Replicator, SAN Copy, RecoverPoint, Ionix ControlCenter, Unisphere, Symmetrix Management Console (SMC), Symmetrix Performance Analyzer (SPA), SymMerge, SymWin, STPNavigator, Performance Manager, Business Continuance Solution Designer (BCSD), Network Storage Designer Unified (NSD-U)

Professional Designations and Certifications

- EMC Implementation Engineer, RecoverPoint Data Replication and Recovery (EMCP/T)
- EMC Implementation Engineer, VNX Solutions Specialist v7.0 (EMCIE)
- EMC Proven Professional Implementation Engineer – Symmetrix Solutions Specialist v6.0 (EMCIE)
- EMC Proven Professional Implementation Engineer – NAS Specialist v5.0 (EMCIE)
- EMC Proven Professional Implementation Engineer – CAS Specialist v5.0 (EMCIE)
- EMC Information Storage Associate (EMCISA)
- EMC Certified Proven Professional – Associate (EMCPA)
- Certified McData Technical Associate (CMTA)

Selected Project Engagement Experience

Jhune is part of the Midwest Division Storage Practice team as a Senior Solutions Consultant leading projects on storage professional services for various clients.

Jones Day, Cleveland, Ohio

- VMax and Unified VNX planning, implementation and migration from legacy CX/DX
- Open Replicator to migrate data from DMX/VMax, and CX/VMax on 2 data centers.
- Implemented SRDF/A and provided level 1 to 3 SRDF/A design including bandwidth sizing using BCSD tool and SymMerge.
- Created Design Workbook, including from-to migration details, hosts remediation, zoning, runbook and detailed procedures.
- Upgraded to latest SMC and SPA versions, including Unisphere multi-domain environment.
- Provided knowledge transfers, design sessions and first-level onsite support.
- Deploying more than 13 VNX5300 File arrays across multiple remote offices, which include site preparation, planning, layout and centralized replication to production VNX at main data center.

MS Exchange Data Layout, AdvizeX/EMC Clients, Midwest Region

- Standardized the processes, deliverables, and methodology for the MS Exchange Data Layout practice in the AdvizeX Midwest region, delivering to AdvizeX direct clients and supporting EMC in providing the service to its customers.
- Mapping the LUNs and backend components in the storage array in relation to the required performance based on the MS Exchange sizing calculator and EMC-Microsoft best practices, working together with the Microsoft Exchange team.
- This includes analysis and iteration of the layout design based on the JetStress results.

EMC Business Continuity Practice, Central Division

- Provided BC solution architecture for several EMC BC projects doing bandwidth analysis, performance analysis, SRDF Level 1-3 design, migration strategy, implementation and test procedure planning, documentation and knowledge transfer.
- Assisted in RecoverPoint solution architecture.

Oracle Data Layout, AdvizeX/EMC Clients, Midwest Region

- Standardized the processes, deliverables, methodology, and led the Oracle Data Layout practice in the AdvizeX Midwest region, delivering to AdvizeX direct clients and supporting EMC in providing the same service to its customers.
- The tasks involve storage array, Oracle database, hosts and operating system performance analysis; best practice data layout and storage array configuration.
- Oracle Database workload profiling on the storage array

SAN Assessment, Cardinal Health, Dublin, Ohio

- Helped Cardinal Health in validating their current issues and challenges in their SAN infrastructure by analyzing data gathered from their SAN switches and directors.

- Provided a report and presentation to Cardinal executives with recommendations based on findings and industry standard best practices.

NAS Remediation and Transition Planning, Cardinal Health, Dublin, Ohio
- Delivered a custom NAS remediation and transition planning service by helping Cardinal teams create strategic transition, training, remediation plans and resource modeling.
- The compiled documents contain the tasks and activities involved in the transition along with the timeline, skill requirements, and effort estimates of the remediation based on criticality and impact.

Previous Work Experience

2005 – 2010   EMC Corporation   Central/Midwest Division, US; Southeast Asia
Solution Architect/ Account Technology Consultant / Resident Consultant
- Responsible for customer residencies focused on SAN, NAS, CAS and BuRA.
- Completed several transitional and operational residencies doing SAN migration, deployment and implementation, managing SAN in multiple Data Centers across North America with Petabytes of usable storage capacity, and thousands of SAN switches/ports using command line interface and custom scripts/runbooks. Performed SAN allocation and decommissioning of EMC SAN with TimeFinder and SRDF configuration via CLI.
- Responsible for customer solution architecture, design and technical account management, administration, deployment/implementation, documentation, migration, infrastructure assessment, knowledge transfer/training, solution lead and architecture focused on SAN (Symmetrix/CLARiiON), NAS (Celerra), CAS (Centera), Backup (Legato Networker, ADIC) and Archiving (Centera, Legato DiskXtender, EmailXtender).

1997 – 2004   Hewlett-Packard Corporation   Makati City, Philippines
Systems Engineer/Solution Architect/Principal Consultant/Project Manager
- Responsible for design, development and technical quality of large enterprise solutions in the Telecommunications, Manufacturing and Semiconductor Industries that involve multiple technologies and subsystems, and have a major business impact on the customer.
- Integrated best in class server, storage and networking solutions and custom-developed frameworks to provide a flexible, open architecture as well as turnkey implementation.

1995 – 1997   Institute of Advanced Computer Technology (I/ACT)   Makati City, Philippines
Content Advisor / Instructor
- Developed and conducted training on Alpha and Intel-based operating systems (Tru64 Unix, SCO Unix), programming languages (C, C++, shell programming/scripting), data communications, networking and hardware (PC and compatible hardware troubleshooting and assembly) courses.

2.3.3.2 Team Member Joseph Stottmann

Profile Summary

Joseph Stottmann is a Senior Storage Architect focused on Storage Area Networking (SAN) and Network Attached Storage (NAS), specializing in EMC products and solution sets. He has over 10 years of experience in system architecture, planning and design on SAN arrays (EMC Symmetrix, CLARiiON Arrays), NAS (EMC Celerra), Brocade/McData and Cisco SAN infrastructure, as well as Next generation Backup and Recovery.

Joseph has architecture, implementation, configuration and management experience in SAN and NAS arrays using EMC Control Center (ECC), Symmetrix Management Console (SMC), Unisphere, Celerra Manager, Fabric Manager, Device Manager, symcli, naviseccli, and other command line interfaces (CLI) and Business Continuity (SRDF, Timefinder, MirrorView, SnapView). He has completed planned and implemented SAN Health check assessments and remediation. He has performed SAN (Array and Switch) performance analysis and provided the necessary steps to improve performance.

Joseph's experience within the solutions practice includes:
- SAN architecture/design, assessment, remediation, and migration
- Local and remote replication implementation
- Solution architecture planning and design on SAN, NAS and SAN networking
- Custom services: EMC Oracle, Exchange, SQL Server data layouts on VMAX, DMX, and CX/VNX, EMC Symmetrix performance analysis, SAN assessment, migration, training, remediation planning, and resource modeling
- Onsite residency, configuration, and management of SAN and NAS infrastructures using GUI and/or CLI, including knowledge transfer, and documentation.
- Business Continuity solution architecture ensuring clients' RPOs and RTOs are met
- Deployed at a leading AdvizeX/EMC clients doing SAN storage deployment and implementation, consolidating Data Centers from multiple locations to one, including migrating a datacenter from the UK to the USA.

Technical Experience

Joseph has experience with the design and implementation of EMC best practices for the following environments:

Operating Systems: Windows, VMware, Solaris, HPUX, AIX, Linux and Mac OSX

Storage: EMC Symmetrix (VMAX, DMX and earlier). VNX (File and block),
                      CLARiiON, and Celerra (Dedicated and Gateway). RAID: design,

implementation & best practices. Storage Management EMC Unisphere, Navisphere, Celerra Manager, SMC, Ionix Control Center, Solutions Enabler. Navisphere CLI, Connectrix Manager and Fabric Manager.

BURA:

Enterprise design & implementation. EMC SRDF, TimeFinder, Celerra Replicator, ControlCenter and SnapView, MirrorView, Unisphere, Open Replicator, Open Migrator, SAN Copy, DataDomain. Enterprise Software: Veritas Netbackup, EMC Networker, EMC Backup Advisor (EBA) and Tivoli Storage Manager

EMC Tools:

Work Load Analyzer (WLA), STPNavigator, SymmMerge, Symmwin, NaviService taskbar, CAP tool and SVC/SQ Process

Professional Designations and Certifications
- EMC Technology Architect – Networked Storage – SAN Expert (EMCTAe)
- Implementation Engineer – Networked Storage – SAN Expert (EMCIEe)
- Implementation Engineer, VNX Solutions Specialist
- EMC Network Attached Storage (NAS) Specialist (EMCIE)
- EMC Proven Professional Implementation Engineer – Symmetrix Solutions Specialist (EMCIE)
- EMC Speed Certification (EMC Internal Symmetrix Performance Team)
- EMC Technology Foundations – Business Continuity Associate
- EMC Certified Proven Professional – Associate (EMCPA)
- Cisco Data Center Storage Networking Support Specialist (MDS)
- Cisco Data Center Unified Computing Implementation Specialist (DCUCI)
- Cisco Data Center Support for UC Specialist
- Cisco Unified Computing Technology Support Specialist
- Vmware Certified Professional, Vmware Infrastructure 3
- Microsoft Certified Systems Engineer for Windows 2000

Selected Project Engagement Experience
Jones Day, Cleveland, OH
Team Lead for the Storage Team, working on SAN layouts of Cisco MDS directors and switches. Lead the migration of CLARiiON arrays to a new EMC VNX 5700. Utilizing SAN Copy and host based migration tools. Design of the migration plan, instructions and implementation for updating the Cisco switch firmware around the globe. Lead the implementation and testing of Solarwinds Storage Manager monitoring and reporting software. Plan and Implementation of EMC Ionix Control Center environment to UB12 upgrade.

Chiquita, Cincinnati, OH

Oracle data layout on EMC VMAXe. Utilizing the processes, deliverables and methodology of the Oracle Data Layout practice, in the AdvizeX Midwest region, delivering to Chiquita and supporting EMC in providing the same service to its customers. The tasks involve storage array, Oracle database, hosts and operating system performance analysis; best practice data layout and storage array configuration.

AEP, Columbus, OH

Exchange data layout on EMC VNX inside of VMware ESX environment. Utilizing the processes, deliverables and methodology of the Microsoft Layout practice, in the AdvizeX Midwest region, delivering to AEP and supporting EMC in providing the same service to its customers. The tasks involve storage array, Oracle database, hosts and operating system performance analysis; best practice data layout and storage array configuration.

Harvard Library, Cambridge, MA

Implementation of VNX arrays in Primary and Secondary location, utilizing FAST technology. SAN Copy was used to move data from existing CLARiiON arrays to VNX. Setup MirrorView between the two sites for Disaster Recovery. Knowledge transfer to the Harvard Library staff, for ongoing migrations and day to day management of the VNX arrays.

Schectady Radiology, Schectady, NY

Replacement of EMC CLARiiON with EMC VNX. Migration of data from the CLARiiON to the VNX, utilizing SAN Copy. This system supported the PACS system for the Radiology department.

Dawn Foods, Jackson, MI

Primary technical architect and technical leadership for new SAP deployment on EMC VMAX, Cisco UCS blades, Cisco Nexxus switching, EMC Celerra Gateways, VMware 4.1, VMware SRM. Provided technical leadership, architecture, implementation, and guidance for the customer who was new to UCS, EMC storage, and large-scale VMware deployments.

Alcoa, New Kennsington, PA

Performed architecture review and SAN assessment, doing system analysis, performance array analysis and SAN analysis. Moved to Architect role after the assessment was complete, providing remediation strategy, implementation and test procedure planning, documentation and knowledge transfer.

Oracle Data Layout, AdvizeX/EMC Clients, MidWest Region

Utilizing the processes, deliverables, methodology of the Oracle Data Layout practice in the AdvizeX Midwest region, delivering to AdvizeX direct clients and supporting EMC in providing the same service to its customers. The tasks involve storage array, Oracle database, hosts and operating system performance analysis; best practice data layout and storage array configuration.

CLARiiON Perfomance Analysis, EMC/CTC, Canada

Performed performance analysis, for EMC, on CTC's CLARiiON array. Specifically around CTC's Microsoft Exchange 2010 clusters, with recommendations based on findings and industry standard best practices.

V-Max Perfomance Analysis, EMC/RBS, Stamford, CT

Performed performance analysis, for EMC, on RBS' V-Max array, utilizing thin provisioning, with local and remote replication also active. Specifically around RBS' VMware North American farm, with recommendations based on findings and industry standard best practices.

Ohio State University, Columbus, OH

Designed / Implemented Ionix Control Center, entirely in VMware environment.
Designed / Implemented Cisco SANs, 2 sites, each with 2, 9513 directors, Dual Core / Multiple VSANs or fabrics
Detailed V-Max layout
Created migration plan for current SAN attached hosts with Host Remediation, Current Host Volume Layouts, New Host Volume Layouts utilizing multiple migration scenarios, based on host OS, service levels and downtime availability

Brickstreet, Charleston, WV

Detailed V-Max layout
Created migration plan for current SAN attached hosts with Host Remediation, Current Host Volume Layouts, New Host Volume Layouts utilizing multiple migration scenarios, based on host OS, service levels and downtime availability.
Migrated 27 HUPX and Windows hosts via SRDF and 8 ESX hosts utilizing Storage VMotion

Humana, Louisville, KY

Lead V-Max POC testing at client.
Lead migration team consolidating 2 IBM arrays and 2 EMC DMX arrays onto 2 new V-Max arrays.
Detailed V-Max layout for 2 arrays

Created migration plan for current SAN attached hosts with Host Remediation, Current Host Volume Layouts, New Host Volume Layouts utilizing multiple migration scenarios, based on host OS, service levels and downtime availability.

Migrated 23.5 hosts using combination of SRDF, OpenReplicator, OpenMigrator, HP-UX LVM and VMware Storage VMotion

Norton Health Care

Designed / Implemented Ionix Control Center, in a mixed Physical and VMware environment.

Designed / Implemented Cisco SANs, 2 sites, each with 2, 9513 directors utilizing a Dual Core / Multiple VSANs or fabrics

Detailed V-Max layout for 2 arrays

Created migration plan for current SAN attached hosts with Host Remediation, Current Host Volume Layouts, New Host Volume Layouts utilizing multiple migration scenarios, based on host OS, service levels and downtime availability.

Andersen Windows

Staff Augmentation with the following deliverables

Designed / Implemented Ionix Control Center, entirely in VMware environment.

Designed / Implemented Replication Manager for 2 applications.

Created migration plan for current SAN attached hosts

Migrated servers to Cisco SANs

Trouble shooting for existing environment.

CUNA Financial

Staff Augmentation with the following deliverables

Designed / Implemented Cisco SAN

Designed / Implemented Clariion array

Created migration plan for current SAN attached hosts

Migrated 77 hosts using SANCopy, OpenMigrator, AIX LVM and VMware Storage VMotion.

Previous Work Experience

2010 – Present   AdvizeX Technologies, Inc.

Senior Storage Architect

- Provides technical and consultative leadership to deliver EMC focused technologies for client solutions opportunities
- Responsible for customer residencies focused on EMC storage and VBLOCK
- Implementation, architecture, and design engineering for DMX, VMax, CX, NS and Centera, including local and remote replication (SnapView, TimeFinder, and SRDF)

- Develops technical strategies to deliver EMC solutions and services including scoping, effort estimates, and client presentations/meetings to support customers' business objectives.
- Provides the following custom services: EMC Oracle Data Layout, EMC Symmetrix performance analysis, SAN Assessment, Transition, Training, Remediation planning, and Resource modeling.

2006-2010 Senior Solutions Architect, EMC

- SAN design and/or reconfiguration using existing SAN environment and recommending EMC storage products where needed.
- Symmetrix design and implementation for new frames and for existing frames where new storage or directors are installed.
- Design and installation of EMC ControlCenter
- Disaster Recovery scenarios utilizing BCV, TimeFinder and SRDF.
- Team lead resource for VMware projects.
- Technical Team Lead for assigned projects.
- Mentor GSAP resources to enhance their training with 'real world' engagements.
- Storage management services, Clients staff augmentation and training for client's staff so that they may self maintain.

2004-2006   Senior Storage Consultant, Analysts International

- Storage and Backup Assessments. Utilizing Client disaster recovery requirements and EMC best practices..
- SAN design and/or reconfiguration using existing SAN environment and recommending EMC storage products where needed
- Disaster Recovery scenarios utilizing BCV, TimeFinder, SRDF, SnapView and MirrorView
- Implementations of SnapView Integration modules for Exchange and SQL servers
- Team Lead and Implementation specialist for EMC projects

2000- 2004   Storage/Cluster Management, GE - 4 years

- Designed 2 separate SAN environments for different GE businesses. Brocade and McData switches. JNI, Emulex and QLogic cards.
- Manage SANs in Cincinnati OH, Parkersburg WV and Stamford, CT. These SANs use EMC Symmetrix, Brocade switches and McData switches.
- Lead a transition team a DATA Center from one GE business unit to corporate management.
- Manage file systems on multiple OS platforms. Solaris, Microsoft NT, Windows 2000, AIX, Linux and HPUX. Using multiple volume managers, Veritas Volume Manager for Solaris, Microsoft and Linux. Native managers in Windows, Linux, AIX and HP.

- Designed, implemented and maintain multiple cluster servers. Utilizing Veritas Cluster Server, Microsoft Cluster Server and HP Service Guard.
- Maintain backup infrastructure. Tivoli TSM. IBM ATL Libraries 3590 and LTO tape technologies.
- Support multiple EMC devices in several different physical locations Symmetrix, Clariion, Connectrix and Celerra Data movers.
- Managed 2 projects working with offshore technicians for remote management of metro centers.
- Disaster Recovery scenarios utilizing BCV, TimeFinder, SRDF, SnapView and MirrorView

2.3.3.3 Team Member Armando Centeno

Profile Summary

Experienced Information Systems professional with demonstrated expertise in complete storage system infrastructure lifecycle, methodology and practices. Possesses strong analytical thinking, troubleshooting capabilities and excellent interpersonal communication skills. Evaluates stated requirements and expectations in terms of technical feasibility and cost outcomes. Works closely and effectively with all levels of management to satisfy project/productivity requirements. Demonstrates commitment to leadership/teamwork through positive contributions in streamlining systems and providing superior customer service.

Armando's experience within the solutions practice includes:
- Capable of designing, configuring and administering large SANs
- Best practice design and layout of Symmetrix, VNX, Clariion and Celerra
- Best practice design and layout of Oracle db on Symmetrix, VNX, Clariion
- Performance analysis of Oracle db on Symmetrix, VNX, Clariion
- Heterogeneous storage array migrations (DMX to VMAX, DMX to VNX, HDS to VMAX, etc.)
- EMC Proven Professional Certification – Specialist EMCIE and EMCSA
- Extensive experience managing EMC's Symmetrix and Clariion storage systems
- Storage and SAN switch migrations
- Aptitude for analyzing, testing, identifying problems, creating solutions and successful execution
- Proficient at setting priorities and meeting goals.
- Quick learner with ability to rapidly achieve organizational integration, assimilate job requirements, employ new ideas, concepts, methods, and technologies.
- Works strategically to fulfill business need with emphasis on business translation of technology. Capable of rapidly learning new technologies and processes, and successfully applying them to projects and operations.
- Thrives in independent and collaborative work environments

Technical Experience

Armando has experience with the design and implementation of EMC best practices for the following environments:

Operating Systems: Windows, Solaris, HPUX, AIX and Linux

Platforms: EMC Symmetrix (VMAX, DMX), VNX (File and block), Clariion, and Celerra

Software: EMC SRDF, TimeFinder, Celerra Replicator, ControlCenter, SnapView, MirrorView, Unisphere, Open Replicator, Open Migrator, SAN Copy

Professional Designations and Certifications
- EMC Implementation Engineer, Recoverpoint Data Replication and Recovery (EMCP/T)
- EMC Implementation Engineer, VNX Solutions Specialist (EMCIE)
- EMC Implementation Engineer, Clariion Solutions Specialist (EMCIE)
- EMC Implementation Engineer, Network Attached Storage (NAS) Specialist (EMCIE)
- EMC Implementation Engineer, Backup and Recovery – Avamar Specialist (EMCIE)
- EMC Implementation Engineer, Backup and Recovery – DataDomain Specialist (EMCP/T)
- EMC Information Storage Associate (EMCISA)
- EMC Storage Administrator, Network Attached Storage (NAS) Specialist (EMCSA)
- EMC Storage Administrator, Storage Management Specialist (EMCSA)
- EMC Storage Administrator, Storage Management Associate (EMCPA)

Selected Project Engagement Experience
Armando is currently working on the Midwest Division Storage Practice team as a Senior Solutions Consultant with experience on the following projects where he was the lead the implementer for professional services with the client.

Cardinal Health
- Completion of on-site NAS Residency
- Architecture and design for Celerra migration from NS80 to VNX5500
- Runbook creation for migration method and cadence
- Creation of usermapper migration tools to remediate usermapper mismatches across 24 Celerra arrays

Precision Strip, Inc
- Recoverpoint Implementation – Install and configuration with Continuous Remote Replication
- Migrate CX3-20 to VNX5300
- Configure new SAN switches and attach to existing environment
- Migrate Exchange 2003 Cluster
- Assist in migrating HPUX and Xenserver

Emerson Hospital, Concord MA
- VNX5700 Configuration and Data Layout
- Migrate CX4-480 to VNX5700 using Mirrorview/S
- Migrate NS-40G to VNX File shares with Replicator v2

- Runbook creation for SAN configuration, migration method and cadence

Ohio University
- Multiple VNX implementations with FAST suite and FAST Cache
- Host and SAN infrastructure remediation planning in preparation for migration from EVA to VNX
- Reconfiguration of NS-120 to offsite location as replication target from NS40G with DMX back-end storage
- Symmetrix provisioning
- Microsoft Exchange data layout on VNX
- VMware View (VDI) data layout on VNX
- Replicated DataDomain implementation integrated into Networker with DDBOOST

City of Grove City OH and Western Michigan University
- Multi-site replicated Avamar implementation
- Configuration of host agents for VMware, Windows, Linux backup and recovery
- Configuration of NDMP file server backup acceleration

Sinclair Community College
- Multi-site VNX implementation with FAST suite and FAST Cache
- Host and SAN infrastructure remediation planning in preparation for migration from EVA to VNX
- Data Migrations from HP EVA storage for VMware, HP-UX, Microsoft Windows, PolyServe SQL cluster
- Replicated DataDomain implementation integrated into NetBackup
- DDBOOST & OST Netbackup implementations for server-side deduplication acceleration
- VNX Performance Baseline Analysis

City of Strongsville OH
- VNX implementation
- VMware best practices data layout
- DataDomain implementation integrated into Networker

Seattle Swedish Medical Center, Seattle WA
- DMX to VMAX data migrations
- Open Migrator, Open Replicator, SRDF based data migrations
- SAN configuration, zoning, LUN masking, storage provisioning
- Configuration of thin provisioning
- Host remediation

- ControlCenter configuration to manage VMAX environment
- Knowledge transfer to customer on Solutions Enabler CLI installation and usage
- Knowledge transfer to customer on provisioning using SMC and ControlCenter
- Data migration Runbook creation

Alcoa, Pittsburg PA
- Symmetrix analysis and performance review
- Oracle workload profiling on Symmetrix
- Oracle database layout on Symmetrix

Lakeshore Northeast Ohio Computer Association, Independence OH
- Celerra configuration
- Windows CIFS server migration to Celerra
- VMware Data Layout

Anesthesia Business Consultants, Jackson MI
- Clariion configuration
- Oracle Best Practice Data Layout on Clariion
- Exchange Best Practice Data Layout on Clariion
- Brocade switch firmware upgrades
- HBA firmware upgrades
- Data migration planning

Emerson, St Louis MO
- Symmetrix analysis and performance review
- Oracle workload profiling on Symmetrix
- Oracle database layout on Symmetrix

Ohio Health, Columbus OH
- Celerra Replicator v1 to v2 upgrade
- Celerra Replicator one-to-many and cascade configuration
- Celerra Migrations
- Celerra Replicator failover configuration and testing
- Usermapper remediation across three Celerra arrays
- Fail-safe network implementation on primary production Celerra

Kellogg's, Oak Brook IL
- Symmetrix analysis and performance review
- Oracle workload profiling on Symmetrix

- Oracle database layout on Symmetrix

Previous Work Experience

Jun. 2006 – June 2010   JPMorganChase   Westerville, OH
ENGINEER – Global Storage Sustain
General responsibility for sustain activities within the SAN space at JPMC including:
- Upgrades of storage environments
- Migration design and implementation
- Security remediation of all devices
- Global ESRS Implementation
- Global Navisphere Active Directory integration

Jun. 2006 – June 2010   JPMorganChase   Westerville, OH
ENGINEER – Global Storage Technologies Refresh
Overall responsibility for end-to-end ownership of ensuring assigned device is vacated on schedule and within storage technologies refresh program requirements, architect solution, implementation planning, execution verification

Equipment:
- □ EMC Symmetrix (including VMAX), and Clariion
- □ HDS Enterprise and Modular
- □ IBM XIV
- □ Netapp filers, Celerra Arrays
- □ Brocade, Cisco and McData SAN Directors
- □ SUN, Fujitsu, HP, IBM and Dell servers

Environment:
- □ Multi-petabyte and international datacenters (Total > 50 PB)
- □ SAN environments from single to 25+ switched fabrics with 60k+ Ports

- Storage allocations using command line and scripts or GUI
- Upgrades of storage environments
- Migration design and implementation
- Security remediation of all devices
- Global ESRS implementation
- Global Navisphere Active Directory Integration

Dec. 2003 – Jun. 2006   Eaton Corporation   Eastlake, OH
LEAD STORAGE ANALYST

Responsible for the architecture, management and maintenance of the storage and backup infrastructure of a premier diversified industrial company

Equipment:	☐ EMC DMX 2000, Symmetrix 8xxx/5xxx/3xxx, Clariion CX600/700
	☐ Connectrix/McData/Brocade (ED-140M, DS-32M2 and DS-16B),
	☐ CNT InRange FS/9000
	☐ Storagetek Tape Libraries and 9840 Drives
	☐ Sun SunFire Midrange up to V1280 and Qlogic HBAs
	☐ HP 9000 Servers and Tachyon HBAs
	☐ Dell PowerEdge Servers

Environment:	☐ EMC ControlCenter (v5.2 SP3) HA, Solutions Enabler
	☐ EMC Workload Analyzer/Performance View
	☐ EMC TimeFinder, SRDF and SRDF/CE
	☐ SAN Advisor and StorageScope File Level Reporter
	☐ PowerPath and Navisphere
	☐ Sun Solaris 9 and 8
	☐ HP-UX 11.11, 11.00 and 10.20
	☐ Windows 2003 and 2000
	☐ VMWare ESX v2.x
	☐ Veritas NetBackup Datacenter 4.5 FP5 and NetBackup Enterprise 5.1
	☐ Netbackup Options including Advance Reporter, SSO, Vault and HA.
	☐ ACSLS HA
	☐ Veritas Volume Manager

- Planned, deployed and managed a fully redundant SAN with two mirrored fabrics composed of McData ED-140 Directors and DS-3232 edge switches hosting 792 ports and 165 TB of shared disks employing synchronous SRDF between two data centers to establish a fully redundant failover data center in an active/active mode

2.3.4 Successful Project References

2.3.4.1 West Virginia Office of Technology

The West Virginia Office of Technology is the IT Infrastructure provider for all West Virginia Department of Administration agencies. This encompasses more than 150 agencies. AdvizeX worked with the Office of Technology to develop a storage, server and virtualization infrastructure for production and disaster recovery location. This solution includes an EMC VNX5700 at the production location and an EMC VNX5300 at the DR location. The server platform is HP BL460G7 blades and VMware for server virtualization. OOT will also be deploying EMC RecoverPoint to support array based replication from Charleston to their Disaster Recovery center in Sutton, WV. The network infrastructure is Cisco, but AdvizeX did not design or provide the gear.

The solution is designed to allow the Office of Technology to deploy a common infrastructure that can support the various applications of the supported agencies and provide a business continuity plan for the applications that are deemed to be mission critical. This solution is not yet fully deployed full deployment will take place in Q3 2012. Please contact Todd May, the authorized AdvizeX representative at 216-901-1818 x4110 to schedule a reference interview.

2.3.4.2 Goss International

Goss International is headquartered in Durham, New Hampshire (USA) and has major manufacturing centers in North America, Asia and Europe as well as a global sales and support network. The company supplies presses and finishing systems – including the most automated and productive web offset presses in the world – for magazine, newspaper, packaging, catalog, direct mail and other printing applications. The company is differentiated by its printing process knowledge, engineering expertise, high-tech industrial manufacturing capabilities and ability to execute and support large-scale capital equipment projects. The company employs over the 3000 people and has annual revenues of $1 billion.

Goss engaged with AdvizeX in October 2011 to redesign their IT infrastructure. The initial effort was to deploy a new infrastructure for their Exchange environment. The key decision criteria that drove their decision was the need to do more with fewer IT resources. They also were seeking an infrastructure that would allow them to roll out new applications faster and better collaborate with their business units. Additional benefits include the ability to reduce cost and save time by having a single virtualized pool of resources with common manageability. It is their goal to get to "IT as a service" and the VBlock best met the requirement to achieve their goals.

After an assessment of their environment it was determined that the VCE Company's VBlock unified infrastructure would provide them the safest way to incorporate the technologies they wanted into a single source vendor. The solution included an EMC VNX5X00, Cisco UCS blade servers, Cisco Nexus switches, VMware ESX Enterprise + with SRM. The solution is still being deployed but a proof of concept was done in advance, so the team at Goss already knows the solution will support their loads. They have also recently completed a second POC to virtualize their Tier 1 applications that reside on HP UX based servers. Their data warehouse update that ran for 15 hours was reduced to 5 hours in the VBlock configuration.

The AdvizeX team consisted of Marlon Acuna, Client Relationship Manager, Lisa Hanna, Quotes Specialist and Shane O'Brien, Presales Engineer. Please contact Todd May, the authorized AdvizeX representative at 216-901-1818 x4110 to schedule a reference interview.

2.3.4.3 Dawn Foods

Dawn Foods is a privately held $2B+ global manufacturer and supplier for the bakery industry with a headquarters in Jackson Michigan. They both manufacture packaged finished goods for sale, provide wholesale products and services, and they act as a global distributor of other manufacturers products and services.

They recently made a decision to move their operations off of legacy hardware and software and onto a combination of products from SAP and from Oracle to support their anticipated growth and changing business. AdvizeX was the principal technical architect of the hardware infrastructure to support their environment including using EMC VMAX storage, Cisco Unified Compute System for servers and VMware as the mainstream virtualization platform. The deployed infrastructure design is modeled after the VBLOCK architecture but because of the unique combination of Oracle products and SAP products they choose to self integrate the components instead of purchasing all of the components pre-integrated at the factory. Please contact Todd May, the authorized AdvizeX representative at 216-901-1818 x4110 to schedule a reference interview.

2.3.5 Subcontractors

AdvizeX will not use subcontractors for these services.

2.4 PROJECT AND GOALS

2.4.1 Unified Storage

*The following sets of questions are explanation based, concerning the **Unified Storage Array** that may be proposed.*

a.	Does the array have 8Gbps Fibre Channel connections to the SAN switches?	Yes
b.	Does the array have the capability to support 10Gbps FCoE for storage presentation?	Yes
c.	Does the array have the capability to support 10Gbps iSCSI for storage presentation?	Yes
d.	Does the array support automatic, dynamic read/write memory (cache) allocation?	Yes
e.	Does the array support both 2.5" and 3.5" disk drives?	Yes
f.	Does the array support RAID 1/0 (striped and mirrored)?	Yes
g.	Does the array support RAID 5 (single parity)?	Yes
h.	Does the array support RAID 6 or RAID-DP (double parity)?	Yes
i.	Can the storage administrator choose which tier of disk in a storage pool is used when creating a new LUN?	Yes
j.	Can individual LUNs be expanded "on the fly" without down time on the system using the LUN?	Yes
k.	Can individual LUNs be converted from thick to thin provisioned and vice versa?	Yes
l.	Does the array support space reclamation on existing thin provisioned LUNs?	Yes
m.	Can individual LUNs be manually migrated between disk types in a storage pool without down time on the system using the LUN?	Yes
n.	Does the array support the exclusion of particular LUNs from automatic tiering?	Yes
o.	Are full copies (clones) of LUNs available for use immediately after initiating clone operation?	Yes

p.	Are full copies (clones) mountable by a different host?	Yes
q.	Does the replication technology in the array support both local and remote protection?	Yes
r.	Does the storage array utilize 10Gbps Ethernet for the NAS (CIFS/NFS) functionality?	Yes
s.	Does the storage array support NDMP for backup of raw file systems?	Yes
t.	Does the NDMP support allow for file and folder level restoration without the need to restore the entire NAS file system containing those items?	Yes
u.	Does the CIFS file server support Windows 2008 R2 native-mode Active Directory domains?	Yes
v.	Does the CIFS file server support Volume Shadow Copy to allow end-user or support staff recovery of files and folders using the "Previous Versions" features built into the Windows client operating systems when utilizing snapshot technology on the CIFS file shares?	Yes
w.	Does the CIFS file server support ABE (access-based enumeration)?	Yes
x.	Does the array support de-duplication of data presented via file protocols (CIFS/NFS)?	Yes
y.	Does the array support compression of data presented via file protocols (CIFS/NFS)?	Yes
z.	Does the array provide the ability to administer the system via a command line interface (CLI installed on a remote system or direct SSH/telnet interface)?	Yes
aa.	Does the array provide the ability to script administrative actions for bulk operations?	Yes

2.4.1.1 SSD Support

Does the array support the use of solid state drives (SSD) or enterprise flash drives (EFD) as an extension of read/write cache to enhance performance and alleviate hot spots from sudden, unexpected spikes in workload? If yes, response should provide details on how this works within the array and any limitations of this technology.

Vendor Response:
Yes. FAST Cache is a performance optimization feature that accelerates application

performance by up to 200 percent. Using Enterprise Flash Drives (EFD) to extend existing cache capacities, FAST Cache automatically absorbs unpredicted "spikes" in application workloads whether the IO is read or write.

Key FAST Cache features include:

- Support for up to 2 TB usable capacity
- Supports read and write operations
- Simple configuration and monitoring via Unisphere
- Non-disruptive integration
- Maintains data contents on failover to avoid re-warming the FAST Cache

2.4.1.2 Total Active Paths
How many total active paths does a host have to an individual LUN?

Vendor Response:
It depends on the number of initiators in the host but a LUN can be accessed from both storage processors in the array via an ALUA.

2.4.1.3 Total Bandwidth Available
What is the total bandwidth available for a host to an individual LUN?

Vendor Response:
The VNX series is specifically designed to allow for simple expansion of connectivity as well as the option to add new interconnect technologies including 8 GB FC and 10Gb iSCSI. With Hot-pluggable Flexible I/O Modules, users can install additional front-end connectivity for up to 32 total ports. The introduction of new I/O types will provide further scalability through greater bandwidth per port.

2.4.1.4 Supported Drives and Enclosures
What is the total number of drives and drive enclosures supported by the array (expandability)?

Vendor Response:
VBlocks are not field upgradeable; 125 drives

2.4.1.5 External Key Management Support
When implementing the data-at-rest encryption does the array provide internal key management system, utilize (or require) an external key management system or rely on drive-based encryption without the need for a key management system?

> Vendor Response:
> Requires an external key management system.

2.4.1.6 Storage Pool Tiers

How many tiers of storage (drive types) may be placed in a single storage pool?

> Vendor Response:
> System must be able to dynamically optimize data placement across 2 or 3 tiers of data storage (e.g. Flash, SAS, and NL-SAS) based on user policy.

2.4.1.7 Automatic Data Tiering

Does the array support automatic data tiering within a configured storage pool to allow migration of data to higher or lower speed disks based on an activity algorithm? If yes, response should explain how the automatic data tiering works in the proposed unified storage array.

> Vendor Response:
> The expansion is simply done by adding enough drives of a particular tier to form a standard private RAID group. We recommend increments of 5 for RAID-5 and increments of 8 for RAID-6.

2.4.1.8 Automatic Tiering Policies

Does the array support policies on automatic tiering to allow SAN administrators to designate particular LUNs that should only be migrated to higher (or lower) speed disks? If yes, response should explain how this functionality is implemented in the proposed array.

> Vendor Response:
> For FastVP a heat map is maintained for 1GB chunks across the storage array. The monitoring is continuous and the heat map is essentially a geometric moving average, which favors recent data over older data and ranks each slice in the pool.

2.4.1.9 Scheduled Policy Changes

Does the array allow scheduled policy changes for the automatic tiering of individual LUNs based on regularly occurring events? (An example would be the ability to schedule a particular LUN to only be migrated to higher speed disks during a time period that is known to be very busy).

> Vendor Response:
> **Yes.** Customers can define data movement schedules to minimize FAST management responsibilities.

2.4.1.10 Dynamic Storage Pool Expansion

Does the array allow dynamic expansion of storage pools through the addition or more drives and/or RAID arrays into the storage pool? If yes, response should provide details on how this feature is implemented and any limitations imposed on this process.

> Vendor Response:
> Yes, virtual provisioned pools can be expanded non-disruptively.

2.4.1.11 Support for De-eduplication

Does the array support de-duplication of data contained on LUNs presented via block level protocol (FC/FCoE/iSCSI)? If yes, response should explain this functionality on the proposed array.

> Vendor Response:
> No.

2.4.1.12 Snapshot Counts

How many snapshots of a single LUN can be made? Response should include any details on performance degradation when utilizing multiple snapshots on a LUN.

> Vendor Response:
> Yes. RecoverPoint is able to capture 1000+ snapshot of a single LUN with no performance degradation

2.4.1.13 Snapshot Requirements

Please outline the typical storage requirement for snapshots, both individual and multiple incremental snapshots of the same LUN? Also, response should provide a brief explanation of how snapshot technology is implemented on the array.

> Vendor Response:
> Yes. RecoverPoint uses a journal to capture consistent restartable snapshots. The journal size depends on the amount of time (rollback) required to capture snapshots and the write change rates from production. Typically a 24 hour rollback can be

support by 15-20% of the production capacity.

2.4.1.14 Snapshot Capabilities

Does the replication technology in the array have the ability to take multiple snapshots of the LUNs to enable recovery or testing with copies of those LUNs at a user configurable interval? If yes, response should provide details on how this technology is implemented in the array.

Vendor Response:
Yes. RecoverPoint CDP is capable of creating 1000+ snapshots of each LUN protected with journaling. User are able to select any point in time snapshot visible in the journal, bring the image online to an alternate host, determine if this is the correct data to be recovered, then restore that data to production. Other options would be to click a button and failover to the alternate host or extract data from the mount data and copy back to production.

Testing can be done by leveraging image access which allows virtual access to the target replica, while replication continues with no impact (snapshots continue to be capture in the journal). SRM automates testing and leverages this function via the EMC SRA for SRM and tight integration with RecoverPoint. SRM management of a RecoverPoint consistency group can be selected from within the RecoverPoint GUI for simple configuration. All of the above is user configurable.

2.4.1.15 Bandwidth Requirements

What are the typical bandwidth requirements of the replication technology after initial seeding of the data to the remote site has been completed?

Vendor Response:
Yes. RecoverPoint offer significant bandwidth reduction technologies. It offers three levels of compression; write folding, and Avamar-based deduplication that provide typical bandwidth reduction of 9:1. Although there is no typical bandwidth requirement (based on write rate and change rate), RecoverPoint has been proven very effective in environments where bandwidth is scarce, supporting real-time replication over links as small as 3Mbit/s.

2.4.1.16 Replicated Data Compressed or De-duplicated for Bandwidth

Is the data being replicated compressed or de-duplicated to reduce bandwidth requirements?

> Vendor Response:
> Yes. RecoverPoint is user configurable to leverage compression and deduplication, and has granularity per consistency group.

2.4.1.17 Replicated Data Encrypted Between Arrays

Is the data being replicated encrypted between the source and destination arrays?

> Vendor Response:
> No. RecoverPoint does not encrypt data natively.

2.4.1.18 Replication and RPO Goals

Does the replication technology support RPO goals of 15 minutes or less using asynchronous replication to a remote site? Response should detail any bandwidth or latency requirements to meet this goal.

> Vendor Response:
> Yes. RecoverPoint support both synchronous and asynchronous replication and can architected and granularly configured per consistency group for an RPO of 15 minutes for less.

2.4.1.19 CAS/WORM Array Support

Does the array have the capability to serve as a CAS/WORM device to replace optical storage systems? If so, what level of compliance does the CAS functionality provide?

> Vendor Response:
> Yes, the VNX platform supports FLR (File Level Retention). FLR-E protects data content from changes made by users through CIFS, NFS, and FTP. FLR-C protects data content from changes made by users through CIFS, NFS, and FTP, from changes made by administrators, and also meets the requirements of SEC rule17a-4(f).

2.4.2 Server Hardware

The following sets of questions are explanation based, concerning the **Server Hardware** that may be proposed. Each question should be responded to on Attachment A. Some questions will require a "yes or no" response while others will require a more detailed response on Attachment A.

The following sets of questions are explanation based, concerning the Server Hardware that may be proposed.

a.	Do the proposed servers support 16GB DIMMs?	Yes
b.	Do the proposed servers support 32GB DIMMs?	No
c.	Do the proposed servers contain more than the required minimum of 192GB RAM per server?	No

2.4.2.1 Total Available Processing Power
What is the total available processing power of the servers in the proposed solution? Response should provide a breakdown on core count, core speed and total processing power (GHz) for the proposed servers.

> Vendor Response:
> 8 blades with 2 Intel Xeon X5690 3.46GHz /6c/130W/12MB cache/DDR3 1333MHz per blade

2.4.2.2 Maximum DIMM Capacity
How many DIMMs can the servers in the proposed solution hold (without add-ons)?

> Vendor Response:
> Total memory supported is 192Gb (six DIMMS per CPU)

2.4.2.3 DIMM Add-on Capability
Are add-ons (drawers, trays, add-on blades, etc.) available to increase the number of DIMMs that can be installed in a server? If so, what is the maximum number of DIMMs that can be installed in the servers with any available add-ons?

> Vendor Response:

Total memory supported is 192Gb (six DIMMS per CPU)

2.4.2.4 Maximum RAM With Add-ons

What is the maximum RAM supported by the servers without add-ons (drawers, trays, etc.)? With add-ons?

Vendor Response:
192Gb; with add-ons N/A

2.4.2.5 DIMM Size and Speed in Proposal

What size and speed DIMMs are being used in the proposed server configuration? Response should provide a detailed description of the RAM layout utilized on the servers.

Vendor Response:
16GB DDR3-1066MHz RDIMM/PC3-8500/quad rank/Low-Dual Volt

2.4.2.6 If proposing Rack Mount Servers:

2.4.2.6.1 How many available PCI-Express slots do the servers in the configuration have?

Vendor Response:
This does not apply since server blade technology is being used.

2.4.2.6.2 What is the speed of the PCI-Express slots in the servers? Please provide a detailed listing of the available PCI-e expansion slots and their speeds and note which are already populated.

Vendor Response:
This does not apply since server blade technology is being used.

2.4.2.7 If proposing Blade Servers:

2.4.2.7.1 How many total slots are in the proposed chassis?

Vendor Response:
8 slots per chassis with 2 chassis included in the solution

2.4.2.7.2 Are the blade chassis in this proposal equipped with all required power supplies, fans and I/O modules/switches to support fully populating the blade chasses without additional cost beyond the purchase of the blade servers?

Vendor Response:
Yes

2.4.2.7.3 How many slots are used by the servers included in this proposal?

Vendor Response:
8

2.4.3 Network Switches

The following sets of questions are explanation based, concerning the **Network Switches** that may be proposed. Each question should be responded to on Attachment A. Some questions will require a "yes or no" response while others will require a more detailed response on Attachment A.

a.	Due to the core competency of the WVSTO staff as well as other WV state agencies we would prefer to continue utilizing Cisco networking equipment within our data center for Ethernet connectivity. Does the proposed solution include Cisco network equipment?	Yes
b.	Does the proposed solution include licenses for VMware distributed virtual switch modules to allow both the physical and virtual network infrastructure to be managed through a common interface (whether command line, browser-based GUI, etc.)?	Yes

2.4.3.1 Expansion Capabilities
Does the network equipment for server connectivity in the proposed solution have expansion capabilities (port modules, etc.), and, are those expansion slots available for future use or populated as part of the proposed solution? If yes, response should detail the expansion capabilities of the proposed network switches.

Vendor Response:
Yes. The proposed solution contains two (2) Cisco 5548 switches which include 48 ports per switch.

2.4.3.2 Multi-protocol Support
Does the proposed network equipment include, or have the capability to support, other network protocols, specifically FCoE (fibre channel over Ethernet) and iSCSI? If yes, response should outline any additional modules or license costs to enable the support of these protocols on the proposed network switches.

Vendor Response:
Yes

2.4.4 General Solution

The following sets of questions are explanation based concerning the **General Solution** being proposed. Each question should be responded to on Attachment A. Some questions will require a "yes or no" response while others will require a more detailed response on Attachment A.

a.	Does the proposed solution include a centralized, unified monitoring system that gives overall status information about the hardware included in the solution (switches, storage and servers)?	Yes
b.	Does the proposed solution include a single point of contact for all support issues (hardware and software) when utilized to run a vSphere environment?	Yes
c.	Does the propose solution include direct OEM support from the vendors of each component utilized in the solution to allow escalation of support issues to the OEM technicians by either the WVSTO or our single point of support for the propose solution?	Yes
d.	Does the proposed solution include regular (quarterly or bi-annually), pre-tested and validated firmware updates direct from a single source to allow the WVSTO to keep all hardware in the solution up-to-date without having to go through internal research, testing and validation of firmware as it is released by the OEMs?	Yes
e.	The proposed solution should take into consideration existing WVSTO licensing and should only include software licensing that is necessary to support the proposed solution that is not already owned by the WVSTO (see appendix for list of current VMware licensing). Have you taken existing WVSTO licensing into account and only included additional licenses, not already owned by the WVSTO in your proposed solution?	Yes

2.4.4.1 Form of Shipment

Does the proposed solution ship as a single unit (all hardware racked, all internal power, network, SAN and other cables connected) ready to connect to power and core networking equipment and begin deployment and configuration of storage, networking and the vSphere environment?

> Vendor Response:
> The VBlock arrives at the customer site with a full physical and logical factory build of the storage, network, server and virtualization components.

2.4.4.2 Separation of Network Traffic

The WVSTO would like to keep the network traffic for the hosts, the network traffic for hardware management and the storage network traffic separated. This serves a few purposes, the first being segregation of traffic with dedicated resources for each type of traffic, to try and insure peak performance of the solution; the second being the ability to keep the management traffic on high performance (gigabit), but lower-cost switches that don't need the capabilities of the switches used to connect the VMware hosts to the network.

> Vendor Response:
> Network traffic in the Vblock™ is physically separated from the fiber interconnects for network and storage via dedicated ports and uplinks to the Layer 2 switches, dedicated ports and links to the MDS switches and dedicated switches for management hardware.

2.4.4.2.1 Does the propose solution include separate switch infrastructure for the hosts, the hardware management interfaces and storage (fibre channel) networks? If yes, response should provide some details on the internal network layout of the proposed solution and how it meets this goal.

> Vendor Response:
> Yes. Data flow and management infrastructure has been separated and is supported by its own unique switches.

2.4.4.3 Centralized Management System

Does the proposed solution include a centralized, unified management system that allows baseline configuration tasks to be performed? If it does, can the following tasks be performed through this management system? If so, response should outline the following capabilities to perform that function.

Vendor Response:
Yes. Foundation provisioning is performed to provide virtual storage for unique workloads.

2.4.4.3.1 Define VLANs available (trunked) into the network switches from the core network.

Vendor Response:
Data flow and management infrastructure has been separated and is supported by its own unique switches. This separation is configurable in many ways using the equipment being proposed.

2.4.4.3.2 Define storage available to the various vSphere clusters.

Vendor Response: N/A

2.4.4.3.3 Deployment of operating system (vSphere, Windows, etc.) to the physical servers included in the solution from user-provided ISO images.

Vendor Response: N/A

2.4.4.3.4 Creation of vCenter instances to manage vSphere hosts.

Vendor Response: N/A

2.4.4.3.5 Does the management system provide any additional capabilities not outlined above? If it does, response should detail any notable capabilities.

Vendor Response:
While this solution provides provisioning, any additional features will be discussed during our oral presentation.

ATTACHMENT B: MANDATORY SPECIFICATION CHECKLIST

2.5 MANDATORY REQUIREMENTS

AdvizeX validates that your mandatory requirements have been met by our response to this RFP. We look forward to discussing the technical details and actual findings that we used to build our solution during the oral presentation.

2.5.1 Unified Storage Platform

2.5.1.1	The unified storage systems must allow presentation of storage through block and file level protocols and meet the following requirements for usable capacity.	Yes
2.5.1.1.1	The storage array for the production center must provide a minimum usable capacity of at least 17TB for virtualized servers in a dedicated physical or virtual storage pool.	Yes
2.5.1.1.2	The storage array for the production data center must provide a minimum useable capacity of 5 TB for NAS file shares in a dedicated physical or virtual storage pool.	Yes
2.5.1.1.3	The storage array for the production data center must provide a minimum useable capacity of 3 TB for virtual desktops in a dedicated physical or virtual storage pool. Affirm:	Yes
2.5.1.1.4	The storage array for the disaster recovery data center must provide a minimum useable capacity of 17 TB for replicated virtual servers.	Yes
2.5.1.1.5	The storage array for the disaster recovery data center must provide a minimum useable capacity of 5 TB for replicated NAS file shares.	Yes
2.5.1.1.6	The storage array for the DR data center must provide a min useable capacity of 3 TB for replicated virtual desktops.	Yes
2.5.1.1.7	The storage array for the disaster recovery data center must provide a minimum additional useable capacity of 10 TB.	Yes
2.5.1.2	The proposed storage array must be a unified storage array that allows presentation of storage via block (Fibre Channel) and file (CIFS, NFS) protocols.	Yes
2.5.1.3	The proposed storage array must have a minimum of 4Gbps fibre channel connectivity to the SAN switch infrastructure.	Yes

2.5.1.4	The proposed storage array must have two storage controllers for the block level protocol in an active/active configuration with at least two fibre channel connections to the SAN switch infrastructure providing a total of 4 paths to the storage array.	Yes
2.5.1.5	The proposed storage array must have two filers for the file level protocols in an active/passive or active/active configuration with at least two (2) 1Gbps or two (2) 10Gbps Ethernet connections per filer to the network infrastructure.	Yes
2.5.1.6	The proposed storage array for the production data center must provide a minimum of 20,000 IOPS dedicated to the virtualized server environment.	Yes
2.5.1.7	The proposed storage array for the production data center must provide a minimum of 8,000 IOPS dedicated to the virtual desktop environment.	Yes
2.5.1.8	The proposed storage array for the production data center must provide dedicated capacity to support NAS file shares for up 120 users and 3 TB of data.	Yes
2.5.1.9	The proposed storage array for the disaster recovery site must provide a minimum of 60% of the total 10Ps of the production storage array.	Yes
2.5.1.10	The proposed storage array must support Solid State Drives (SSD) or Enterprise Flash Drives (EFD) (Tier 0).	Yes
2.5.1.11	The proposed storage array must support high speed (10K and 15K RPM) Fibre Channel (FC) or Serial Attached SCSI (SAS) drivers (Tier 1 and Tier 2).	Yes
2.5.1.12	The proposed storage array must support 7.2K RPM near-line SAS or ATA drives (Tier 3).	Yes
2.5.1.13	The proposed storage array must support virtual (thin) provisioning for volumes presented via block level (FC) protocol.	Yes
2.5.1.14	The unified storage systems must support the ability to do snapshots and clones of volumes presented via block level protocols. It must also support the ability to do snapshots of the file systems presented via file level protocols.	Yes
2.5.1.15	The proposed storage array must include the ability to make clones of volumes presented via block-level (FC) protocol.	Yes
2.5.1.16	The proposed storage array must include the ability to take snapshots of volumes presented via block-level (FC) protocol.	Yes
2.5.1.17	The proposed storage array must include the ability to take snapshots of file systems presented via file-level protocols (CIFS, NFS).	Yes

2.5.1.18	The proposed storage array must include IP-based, asynchronous replication for the storage presented via block level (FC) protocol.	Yes
2.5.1.19	The proposed storage array must include IP-based, asynchronous replication for the file systems presented via file level (CIFS, NFS) protocols.	Yes
2.5.1.20	The proposed storage array must have the capability to support data-at-rest encryption. *(Oral presentation discussion needs to take place)*	No
2.5.1.21	The proposed storage array must have a single, unified management tool that allows the configuration and monitoring of all features and functionality of the array.	Yes
2.5.1.22	The proposed storage array must support all of the primitives defined in the VMware vSphere API for Array Integration (VAAI) specifications for vSphere 5.0 for storage presented via block level (FC) protocol.	Yes
2.5.1.23	The proposed storage array must include full, active-active, load balanced multi-path support for connected VMware vSphere 5.0 hosts (not the default most recently used or round robin provided by VMware).	Yes
2.5.1.24	The proposed storage array must include plug-ins for VMware vCenter to enable the creation and management of LUNs (from assigned storage pools) for the vSphere environment to ensure proper alignment and optimization of the LUNs.	Yes
2.5.1.25	The proposed array must include replication technology that integrates with VMware Site Recovery Manager (SRM) 5.0 to allow SRM to leverage the native replication technologies of the array to copy data to the disaster recovery site.	Yes
2.5.1.26	The proposed array must have the capability to enable call-home functionality for sending hardware alerts to the OEM when failures are detected on the array to enable rapid, pro-active response from technical support to replace or repair defective hardware.	Yes
2.5.1.27	The unified storage systems must have an expected product life of at least 5 years.	Yes
2.5.1.28	The unified storage systems must include 5 years of support with a guaranteed response time of 4 hours and 24x7x365 availability coverage.	Yes

2.5.2 Fibre Channel Switches

2.5.2.1	The proposed solution shall include two independent fibre channel switches at each site.	Yes
2.5.2.2	The fibre channel switches must have autosensing 8 Gbp/s ports (support 8/4/2 Gbp/s).	Yes
2.5.2.3	The proposed fibre channel switches must have management capabilities via a command line interface (telnet/SSH).	Yes
2.5.2.4	The proposed fibre channel switches must have a browser-based management interface.	Yes
2.5.2.5	The proposed fibre channel switches must include some internal diagnostics.	Yes
2.5.2.6	The proposed fibre channel switches must include native alerting and reporting (without the need for a monitoring server).	Yes
2.5.2.7	The proposed fibre channel switches must include a native way to display performance Metrics.	Yes
2.5.2.8	The proposed fibre channel switch configuration must support non-disruptive firmware upgrades.	Yes
2.5.2.9	The proposed fibre channel switches must have the capability to be either an NPV edge device or an NPIV core device.	Yes
2.5.2.10	The proposed fibre channel switches must have the capability to support multiple fabric environments in a single physical switch.	Yes
2.5.2.11	The proposed fibre channel switches must support aggregated 1SL (inter-switch link) connectivity; i.e., several physical ISLs behaving as one virtual 1SL,	Yes
2.5.2.12	The proposed fibre channel switches must support traffic engineering using FSPF.	Yes
2.5.2.13	The fibre channel switches must have at least 12 ports active each.	Yes
2.5.2.14	The fibre channel switches must have at least 24 ports total each.	Yes
2.5.2.15	The fibre channel switches must have redundant power supplies and fans.	Yes
2.5.2.16	The fibre channel switches must have an expected product life of at least 5 years.	Yes
2.5.2.17	The fibre channel switches must include 5 years of support with a guaranteed response time of 4 hours and 24x7x365 coverage.	Yes

2.5.3 Network Switches

2.5.3.1	The network switch(es) must support both 10Gbp/s and 1Gbp/s connectivity.	Yes
2.5.3.2	The network switch(es) must have a minimum of 16 ports available for connection of additional network devices not included in the proposed solution.	Yes
2.5.3.3	The network switch(es) must have redundant power supplies and fans.	Yes
2.5.3.4	The network switch(es) used for server connectivity must include layer 3 support (if a dedicated management network is present it does not need to support layer 3). **A more detailed discussion of these features will take place during our oral presentation.**	Yes
2.5.3.5	The network switch(es) must support Link Aggregation Control Protocol (LACP): IEEE 802.3ad.	Yes
2.5.3.6	The network switch(es) must support VLAN trunking.	Yes
2.5.3.7	The network switch(es) must support IEEE 802.1Q VLAN encapsulation.	Yes
2.5.3.8	The network switch(es) must support Jumbo Frames on all ports (up to 9216 bytes).	Yes
2.5.3.9	The network switch(es) must support CLI management (console, telnet and/or SSH).	Yes
2.5.3.10	The network switch(es) must support SNMP.	Yes
2.5.3.11	The network switches must have an expected product life of at least 5 years.	Yes
2.5.3.12	The network switches must include 5 years of support with a guaranteed response time of 4 hours and 24x7x365 coverage.	Yes

2.5.4 Server Hardware

2.5.4.1	There must be at least 7 identically configured servers per site (production and DR), 14 servers in total.	Yes
2.5.4.2	The proposed servers must be dual CPU socket servers.	Yes
2.5.4.3	The proposed servers must use 6-core Intel 5600 series or 10-core Intel E7 series processors or superior.	Yes
2.5.4.4	Each server must have at least 192GB of RAM installed with all RAM running at full clock speed (no clock speed step down across memory channels).	Yes
2.5.4.5	Each server must include a minimum of two (2) 10Gbp/s network connections.	Yes
2.5.4.6	Each server must include a minimum of two (2) 8Gbp/s fibre channel (SAN) connections.	Yes
2.5.4.7	The servers must include remote management capabilities (DRAC, ILO or equivalent).	Yes
2.5.4.8	The servers must have fully redundant internal components (power supplies, fans, etc.).	Yes
2.5.4.9	The servers must have an expected product life of at least 5 years.	Yes
2.5.4.10	The servers must include 5 years of support with a guaranteed response time of 4 hours and 24x7x365 coverage.	Yes

2.5.5 Rack Mount Servers (If this solution is proposed)

2.5.5.1	All of the PCI-Express slots in the servers must run at a minimum of 4x speed.	N/A
2.5.5.2	The servers must have at least two available PCI-Express slots for expansion capabilities.	N/A

2.5.6 Blade Servers (If this solution is proposed)

2.5.6.1	In the proposed blade solution the individual blade servers at each site must be split as evenly as possible across two blade chassis (elimination of single point of failure and provide extra expansion capabilities through number of available slots for blades).	Yes
2.5.6.2	Each blade chassis must include fully redundant I/O and management modules.	Yes

2.5.7 Certification of Compliance

I certify that the proposal submitted meets or exceeds all the mandatory specifications of this Request for Proposal. Additionally, I agree to provide any additional documentation deemed necessary by the State of West Virginia to demonstrate compliance with said mandatory specifications.

AdvizeX Technologies, LLC	Company
Rob Myers	Representative
Solution Architect	Title
216-901-1818	Contact Phone Number
216-901-1447	Contact FAX Number
4/10/2012	Date

APPENDIX 1 – WHAT IS VCE AND VBLOCK?

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VBLOCK™ INFRASTRUCTURE PLATFORMS
TECHNICAL OVERVIEW

Executive Summary

The potential of cloud computing is that of a flexible, shared pool of preconfigured and integrated computing resources that enables organizations to deliver better IT services faster, more reliably, and at a lower cost than with traditional data center models. The foundation for cloud computing is pervasive virtualization: the use of virtualized applications and operating systems throughout the enterprise and at every application tier.

Despite the well-understood benefits of virtualization, obstacles remain that slow or prevent implementation. Enterprise IT commonly comprises a large variety of devices and software from many vendors, built over time as requirements change. The result is a fragmented, complex network of underutilized and over-utilized resources. The IT components are costly and time consuming to configure, provision, and manage. Significant time and budget are spent getting the pieces to work together, tuning, devising workarounds, and planning upgrades and enhancements, rather than improving service delivery to end users.

The VCE Difference

VCE simplifies and accelerates deployment of cloud computing by integrating state-of-the art Cisco, EMC and VMware components into Vblock™ Infrastructure Platforms.

- Each Vblock platform is a standard, proven configuration of components that are thoroughly integrated and prequalified as a unit of converged Infrastructure. Each Vblock system is installed, configured, and managed as a single entity rather than a disparate group of components.
- Vblock platforms are optimized for the applications they support. They prioritize traffic, offload network processing, and increase indexing and system cycling while ensuring the accuracy of database structures.
- Each Vblock platform is designed with the future in mind. Each platform can be scaled as a cohesive system, to maintain balanced, measurable and consistent performance as needs change.
- VCE assembles all hardware into racks, and completes all cabling and powering. VCE performs rigorous testing to ensure that the completed assembly is working perfectly. Each rack arrives ready for installation and connection to the network and power grid.
- VCE handles all software release planning and configuration management, pre-testing upgrades and patches to minimize any impact to system uptime and robustness.
- VCE serves as the single go-to point for infrastructure support. Support engineers are experts on the entire infrastructure with direct escalation paths into engineering resources at Cisco, EMC, and VMware.

Vblock Platform Components

Vblock Infrastructure Platforms are scaled for customer technical and business requirements. Each of the components is carefully selected and tested, enabling the customer to run applications on a high performance, stable and supported configuration:

- Virtualization by VMware vSphere™ and VMware vCenter™ Server
- Networking by Cisco Nexus® switches
- Computing by Cisco Unified Computing System™ (UCS)

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- Storage by EMC Symmetrix VMAX and EMC VNX
- Security by RSA enVision® (optional)
- Management by EMC Ionix™ Unified Infrastructure Manager
- Additional hardware required for racking, cabling, uninterruptible power supplies, etc.

Vblock Infrastructure Platforms are currently available in the configurations shown in Table 1.

Table 1

Vblock™ Infrastructure Platforms

	Vblock Series 300				Vblock Series 700
	Vblock HX	Vblock GX	Vblock FX	Vblock EX	
Storage	EMC VNX 7500™ Drive types •• EFD •• SAS •• NL-SAS	EMC VNX 5700 Drive types •• EFD •• SAS •• NL-SAS	EMC VNX 5500 Drive types •• EFD •• SAS •• NL-SAS	EMC VNX 5300 Drive types •• EFD •• SAS •• NL-SAS	EMC Symmetrix VMAX™ Drive types •• EFD •• Fibre Channel •• SATA
Compute	B200 M2 options 3.33GHz w/ 96GB RAM 2.93GHz w/ 48GB RAM 2.66GHz w/ 96GB RAM	B230 M1 options 2.66GHz w/ 256GB RAM 2.00GHz w/ 128GB RAM	B250 M2 options 3.33GHz w/ 384GB RAM 2.93GHz w/ 192GB RAM	B440 M1 options 2.26GHz w/ 256GB RAM 2.00GHz w/ 128GB RAM	UC blade option B200 M2 2.66GHz w/ 48GB RAM
Fabric Interconnect	6140	6140	6140	6120	6140
Networking	Cisco Nexus 5548 Cisco MDS 9148				Cisco Nexus 5548 Cisco MDS 9148 Cisco MDS 9506 Cisco MDS 9513
Raid	Raid 5, 6, 10				
Virtualization	VMware® vSphere™ 4 Enterprise Plus suite; virtualization vSphere ESX 4, 4.1, or ESXi 4.1i				
Security	Individual component security tools and protocols RSA® enVision®, RSA SecurID® (both optional)				
Infrastructure Management	Ionix™ Unified Infrastructure Manager Advanced Management POD (AMP)				
Virtualization Enhancement Layer	vCenter™, Nexus 1000V with per-CPU license, PowerPath/VE for ESX				
Compute/Networking Management	Cisco UCS Manager/Cisco Fabric Manager				
Storage	EMC Unisphere™				EMC Symmetrix® Management Console

NOTES:
• 50% of the UCS blades can be bare metal (cannot run any other hypervisor).
• Nexus 7010 is optional for single Vblock system configurations and is required when aggregating multiple Vblock systems.
• This table shows the major components of Vblock systems. Additional options are available. For specific ordering information or to determine which Vblock is right for your applications, utilization, scale, and topology, please contact your VCE, VMware, Cisco, and/or EMC representative.

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How Vblock Platforms Simplify and Accelerate Pervasive Virtualization

As preconfigured and pretested blocks of IT infrastructure, Vblock Infrastructure Platforms accelerate the move toward pervasive virtualization and cloud computing.

Vblock Infrastructure Platforms Simplify and Accelerate the Acquisition Process

Vblock Infrastructure Platforms are tested and validated units of infrastructure. That means that IT organizations no longer have to evaluate, purchase, and assemble separate components with varying support and license models. Instead, as an integrated offering from a single vendor, Vblock Infrastructure Platforms are easy to evaluate and purchase through VCE, its parent companies, or VCE-authorized resellers.

VCE creates services that are offered through parent companies and an extensive network of partners to help customers understand how to maximize value and accelerate deployment of pervasive virtualization and cloud solutions. Available service offerings include the following:

- Executive and architecture advisory services to help define an organization's cloud vision
- Strategy services to create a cloud strategy that aligns with business needs
- Design and implementation services to help IT plan an architecture and high-level design, and devise a roadmap to deployment

Vblock Infrastructure Platforms Simplify and Accelerate the Deployment Process

Vblock Infrastructure Platforms arrive as integrated units. All of the Vblock components are pre-tested, assembled, and configured to work together, resulting in a unit of IT infrastructure that is primed for virtualization and is production ready.

This integrated approach also helps to simplify data center architecture by reducing the planning and restructuring typically associated with changes in data center design. Vblock Infrastructure Platforms remove the architectural hurdles by providing all the necessary technologies in a single integrated system. And Vblock Infrastructure Platforms can scale easily as the business grows.

Designed to work with almost any application, Vblock Infrastructure Platforms have been tested and validated to work with many major applications, including:

- Microsoft Exchange
- Microsoft SharePoint
- Oracle RAC
- SAP
- VMware View

Because VCE has completed this compatibility and validation work up front, IT can focus on implementing virtualization more broadly throughout the organization.

Vblock Infrastructure Platforms Simplify and Accelerate Adoption and Management of Virtualization Technologies

Vblock Infrastructure Platforms allow IT organizations to focus their attention where it does the most good—delivering services to the business. IT administrators and CIOs understand the potential for dramatic cost savings that virtualization brings, but end users care only that their applications are available when they are needed and that they run as they should. As a result, concerns about consistency and performance of virtualized applications have been barriers to pervasive virtualization.

Vblock Infrastructure Platforms elevate user confidence and satisfaction by delivering predictable performance and operational characteristics. For example, Vblock predetermined storage, memory, and compute capacity enable uniform distribution of workload as well as workload mobility. And deterministic fault and security isolation help ensure the level of business continuity needed for mission-critical applications. Because the platform components are pretested and preconfigured to work together at peak performance, the IT group can focus more on delivering services to end users and less on adjusting the infrastructure components.

Vblock Infrastructure Platforms not only remove obstacles to pervasive virtualization, but they also simplify management of the virtualized infrastructure. EMC Ionix Unified Infrastructure Manager (UIM) is included in every Vblock Infrastructure Platform to manage the configuration, provisioning, and compliance of aggregated Vblock Infrastructure Platforms. UIM simplifies deployment and integration into IT service catalogs and workflow engines, and dramatically simplifies Vblock platform deployment by abstracting the overall provisioning while offering granular access to individual components for troubleshooting and fault management.

In addition to the UIM, administrators can use component-specific management tools and interfaces to provide an extensible, open management framework that enables granular visibility into each system element. The individual element managers are:

- VMware vCenter Server
- Cisco UCS Manager
- EMC Symmetrix Management Console
- EMC Unisphere
- VCE Advanced Management Pod (AMP)

The open management framework also allows IT to use current management tools. The simplified design and the "containerized," preconfigured and tested model means less work for IT staff.

Vblock Infrastructure Platforms are production ready, so IT can focus on migrating applications rather than building and testing a virtualized environment to support them.

Vblock Infrastructure Platforms Simplify and Accelerate Platform Support
Getting help and support is easier with Vblock platforms than with the traditional approach to supporting IT infrastructure products. VCE provides one-stop customer service from Cisco, EMC, and VMware, which means greater levels of service with fewer headaches. VCE's industry-leading support experience is delivered through support engineers who are experts on the entire infrastructure, utilize advanced collaboration capabilities, and have direct access into engineering resources at Cisco, EMC, and VMware. Additionally, VCE implements a unique approach to release and configuration management to further simplify IT operations. VCE makes available on formal release schedules validated and fully regressed software releases and firmware upgrades that cover the entire platform.

Vblock Infrastructure Platforms Accelerate Return on Investment
As prepackaged, tested, and validated units of IT infrastructure, Vblock Infrastructure Platforms lead to lower total costs and accelerate the return on investment (ROI). But the cost benefits of pervasive virtualization enabled by Vblock Infrastructure Platforms extend beyond reduced costs and rapid ROI. Pervasive virtualization allows IT to switch from a fixed cost model to a variable one, paying for IT services as they are consumed instead of merely depreciating underutilized infrastructure over time.

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A Deeper Look Inside Vblock Infrastructure Platforms

Vblock platforms include products that provide all of the layers needed to achieve the benefits of pervasive virtualization. Each layer is composed of best-of-breed technologies that are pretested and preconfigured to work seamlessly together. These layers are:

- Compute
- Network
- Storage
- Virtualization software
- Management

The Compute Layer: Cisco Unified Computing System (UCS)

The computing power of Vblock platforms is provided by a Cisco Unified Computing System. Cisco UCS is a next generation data center platform that unites compute, network, and storage access. Optimized for virtualization, the platform is designed within open industry-standard technologies and reduces total cost of ownership (TCO) and increases business agility. Cisco UCS integrates a low-latency, lossless 10 Gb Ethernet unified network fabric with enterprise-class, x86-based servers (the Cisco B series). It is an integrated, scalable, multi-chassis platform in which all resources participate in a unified management domain.

The Cisco UCS includes:

- Cisco UCS 6100 Series Fabric Interconnects
- Cisco UCS 5100 Series Blade Server Chassis
- Cisco UCS 2100 Series Fabric Extenders
- Cisco UCS B-Series Blade Servers
- Cisco UCS B-Series Network Adapters
- Cisco UCS Manager

These components help provide uniform access to both networks and storage, eliminating the barriers to deploying a fully virtualized environment. Through the UCS, Vblock platforms accelerate the delivery of new services simply, reliably, and securely through end-to-end provisioning and migration support for both virtualized and non-virtualized systems. They provide predictable performance, with the components carefully selected to balance performance with reliability. Vblock Infrastructure Platforms powered by Cisco UCS also feature:

- Built-in redundancy for high availability
- Hot swappable components for serviceability
- Fewer physical components than in a comparable platform built piece-by-piece
- Reduced cabling
- Improved energy efficiency over traditional blade server chassis

The Network Layer: Cisco Nexus 1000V

The Cisco Nexus 1000V is a software switch on a server that delivers Cisco VN-Link services to VMs hosted on that server. VN-Link services bridge the server, storage, and network management domains in Vblock platforms to help ensure that changes in one environment are communicated to the others. The Nexus 1000V takes advantage of the VMware vSphere framework to offer tight integration between server and network environments.

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The Nexus 1000V helps ensure consistent, policy-based network capabilities to all servers in the data center. It allows policies to move with a VM during live migration, which ensures persistent network, security, and storage compliance for improved business continuity and performance management. The Nexus 1000V also aligns management of the operational environment for VMs within the Vblock Infrastructure Platforms, reducing the TCO by providing operational consistency and visibility.

The Storage Layer: Best-of-Breed Technologies from EMC and Cisco
Components that compose the storage layer vary based on the Vblock Infrastructure Platform:

EMC Symmetrix VMAX
The EMC Symmetrix VMAX is a high-end storage system that is purpose built for pervasive virtualization. It brings extensive capability to the Vblock Series 700 model MX, such as unmatched reliability through non-disruptive operations and upgrades that can be performed without storage or application downtime. Built for availability and scalability, Symmetrix VMAX uses specialized engines that provide full redundancy to ensure that access to critical information is never in doubt and that service levels are never compromised. With its speed, capacity, efficiency, and ability to deliver performance on demand, the Symmetrix VMAX can help transparently optimize service levels while lowering TCO.

The EMC Symmetrix VMAX system integrates seamlessly with other Vblock Series 700 model MX components to accelerate and simplify provisioning and deployment. For example, EMC's new PowerPath*/VE support for vSphere optimizes usage on all available paths between VMs and the storage they are using. It also provides proactive failover management.

In addition, the Vblock Series 700MX powered by Symmetrix VMAX, enables massive consolidation and incremental scalability to deliver the benefits of tiered storage on one platform, while providing the flexibility to rapidly address the changing needs of the business.

EMC VNX
The EMC VNX unified storage family delivers industry-leading innovation and enterprise capabilities to the Vblock Series 300. Customers have a choice of file, block and object in a unified scalable, easy-to-use system. This next-generation storage platform combines powerful and flexible hardware with advanced efficiency, management, and protection software to meet the demanding needs of today's enterprises. Vblock Series 300 offers a range of models from entry-point to high-performance petabyte-capacity configurations servicing the most demanding application requirements. This robust platform for consolidation of legacy block storage, file servers and direct attached application storage, cost effectively manages multi-protocol file systems and multiprotocol block storage access. By utilizing a 6-Gb/s SAS drive backend, applications and system performance is significantly improved.

High-Performance SAN: Cisco MDS 9000 Series
The Vblock Series 300 and Vblock Series 700 provide an integrated high-performance SAN solution provided by two Cisco MDS 9148 Multilayer Directors. The MDS 9000 series adds a rich set of features to a high-performance, protocol-independent switch fabric. Integrated with the other layers of the Vblock platforms, the MDS 9148 helps

Data Centers Before and After Vblock Infrastructure Platforms

Vblock Infrastructure Platforms help IT realize the benefits of cloud computing.

Before:
- Not ready for pervasive virtualization
- Complex and costly
- Hybridized infrastructure
- Time consuming to manage
- Slow delivery of IT services

After:
- Pervasive virtualization
- Flexible infrastructure
- Simple management
- One stop for support
- Faster delivery of IT services

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deliver uncompromising high availability, security, scalability, and ease of management. It also supports:

- 48 ports, 1/2/4/8 Gbps Fibre Channel
- Intelligent network services, such as VSAN technology, access control lists for hardware-based intelligent frame processing, and advanced traffic management features
- Intelligent diagnostics, protocol decoding, and network analysis tools for added reliability, faster problem resolution, and reduced service costs

The Virtualization Layer: VMware vSphere

The virtualization layer of Vblock platforms is provided by VMware vSphere Enterprise, the industry's most reliable platform for data center virtualization. vSphere:

- Virtualizes all application servers
- Provides VMware High Availability and Dynamic Resource Scheduling
- Simplifies and accelerates VM provisioning with customizable templates
- Simplifies management of workloads

Centralized, proactive VM management is provided by VMware vCenter Server, which is a scalable and extensible management platform that gives centralized control and visibility at every level of virtual infrastructure.

The Management Layer

IT can manage Vblock Infrastructure Platforms using standard management tools. The tools at each layer allow views of that layer's configurations, resources, and usage. For an added cost, organizations can take advantage of a unified management tool—EMC Ionix Unified Infrastructure Manager (UIM).

UIM manages the configuration, provisioning, and compliance of a single Vblock and pools of aggregated Vblock Infrastructure Platforms, simplifying deployment and integration into IT service catalogs and workflow engines. It thus can dramatically simplify Vblock platform deployment by abstracting the overall provisioning of the Vblock system while offering granular access to individual components for troubleshooting and fault management. In addition, Vblock Infrastructure Platforms have an open management framework that allows organizations to integrate them with their current management tools if they prefer.

Managing the workloads that run on the Vblock Infrastructure Platforms is easy, too, with VMware vCenter Server. From a single console, vCenter Server provides unified management of all the hosts and VMs in the Vblock Infrastructure Platforms with aggregate performance monitoring. And vCenter Server provides:

- Centralized control and deep visibility into virtual infrastructure
- Proactive management of VMware vSphere
- A scalable and extensible management platform
- Distributed resource optimization
- High availability
- Security

vCenter Server provides a simple and efficient way to manage VMware vSphere, in environments scaing from ten VMs to thousands.

VCE
THE VIRTUAL COMPUTING
ENVIRONMENT COMPANY

Summary

The use of pervasive virtualization and cloud computing can bring significant advantages to the business, including lower costs, greater data center agility, and reduced complexity. Despite these benefits, many organizations have delayed their progress because of architectural obstacles. Data centers often include nonintegrated applications and hardware from many different vendors, which complicates the adoption of pervasive virtualization and cloud computing.

With solutions that integrate individual components, enterprise IT can minimize complexity, reduce risk, and deliver reduced cost of ownership. Vblock Infrastructure Platforms from VCE accelerate the move towards pervasive virtualization by combining best-of breed networking, computing, storage, security, and management technologies with end-to-end vendor accountability.

Next Steps

Learn more about how to quickly realize the benefits of pervasive virtualization and cloud technology with Vblock Infrastructure Platforms.

Visit www.vce.com or contact an authorized VCE reseller.

ABOUT VCE

VCE, the Virtual Computing Environment Company formed by Cisco and EMC with investments from VMware and Intel, accelerates the adoption of converged infrastructure and cloud-based computing models that dramatically reduce the cost of IT while improving time to market for our customers. VCE, through the Vblock platform, delivers the industry's first completely integrated IT offering with end-to-end vendor accountability. VCE's prepackaged solutions are available through an extensive partner network, and cover horizontal applications, vertical industry offerings, and application development environments, allowing customers to focus on business innovation instead of integrating, validating and managing IT infrastructure.

For more information, go to www.vce.com.

cisco   EMC²   vmware

APPENDIX 2 – AGREEMENT TO GENERAL TERMS AND CONDITIONS

GENERAL TERMS & CONDITIONS
REQUEST FOR QUOTATION (RFQ) AND REQUEST FOR PROPOSAL (RFP)

1. Awards will be made in the best interest of the State of West Virginia.

2. The State may accept or reject in part, or in whole, any bid.

3. Prior to any award, the apparent successful vendor must be properly registered with the Purchasing Division and have paid the required $125 fee.

4. All services performed or goods delivered under State Purchase Order/Contracts are to be continued for the term of the Purchase Order/Contracts, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise available for these services or goods this Purchase Order/Contract becomes void and of no effect after June 30.

5. Payment may only be made after the delivery and acceptance of goods or services.

6. Interest may be paid for late payment in accordance with the *West Virginia Code.*

7. Vendor preference will be granted upon written request in accordance with the *West Virginia Code.*

8. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.

9. The Director of Purchasing may cancel any Purchase Order/Contract upon 30 days written notice to the seller.

10. The laws of the State of West Virginia and the *Legislative Rules* of the Purchasing Division shall govern the purchasing process.

11. Any reference to automatic renewal is hereby deleted. The Contract may be renewed only upon mutual written agreement of the parties.

12. **BANKRUPTCY:** In the event the vendor/contractor files for bankruptcy protection, the State may deem this contract null and void, and terminate such contract without further order.

13. **HIPAA BUSINESS ASSOCIATE ADDENDUM:** The West Virginia State Government HIPAA Business Associate Addendum (BAA), approved by the Attorney General, is available online at www.state.wv.us/admin/purchase/vrc/hipaa.html and is hereby made part of the agreement provided that the Agency meets the definition of a Cover Entity (45 CFR §160.103) and will be disclosing Protected Health Information (45 CFR §160.103) to the vendor.

14. **CONFIDENTIALITY:** The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in http://www.state.wv.us/admin/purchase/privacy/noticeConfidentiality.pdf.

15. **LICENSING:** Vendors must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, and the West Virginia Insurance Commission. The vendor must provide all necessary releases to obtain information to enable the director or spending unit to verify that the vendor is licensed and in good standing with the above entities.

16. **ANTITRUST:** In submitting a bid to any agency for the State of West Virginia, the bidder offers and agrees that if the bid is accepted the bidder will convey, sell, assign or transfer to the State of West Virginia all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to the bidder.

I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, or person or entity submitting a bid for the same material, supplies, equipment or services and is in all respects fair and without collusion or fraud. I further certify that I am authorized to sign the certification on behalf of the bidder or this bid.

INSTRUCTIONS TO BIDDERS

1. Use the quotation forms provided by the Purchasing Division. Complete all sections of the quotation form.

2. Items offered must be in compliance with the specifications. Any deviation from the specifications must be clearly indicated by the bidder. Alternates offered by the bidder as EQUAL to the specifications must be clearly defined. A bidder offering an alternate should attach complete specifications and literature to the bid. The Purchasing Division may waive minor deviations to specifications.

3. Unit prices shall prevail in case of discrepancy. All quotations are considered F.O.B. destination unless alternate shipping terms are clearly identified in the quotation.

4. All quotations must be delivered by the bidder to the office listed below prior to the date and time of the bid opening. Failure of the bidder to deliver the quotations on time will result in bid disqualifications: Department of Administration, Purchasing Division, 2019 Washington Street East, P.O. Box 50130, Charleston, WV 25305-0130

5. Communication during the solicitation, bid, evaluation or award periods, except through the Purchasing Division, is strictly prohibited (W.Va. C.S.R. §148-1-6.6).

Rev. 11/09/11

APPENDIX 3 – RFP CONTACT INFORMATION VERIFICATION

State of West Virginia Department of Administration Purchasing Division 2019 Washington Street East Post Office Box 50130 Charleston, WV 25305-0130	**Request for Quotation**	RFQ NUMBER STO12007

	PAGE
	5

ADDRESS CORRESPONDENCE TO ATTENTION OF:

FRANK WHITTAKER
304-558-2316

RFQ COPY
TYPE NAME/ADDRESS HERE

VENDOR

SHIP TO

STATE TREASURER
MAIN CAPITOL BUILDING
SUITE E-145
CHARLESTON, WV
25305   304-343-4000

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
03/06/2012				

BID OPENING DATE:	04/10/2012	BID OPENING TIME	01:30PM

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT

PLEASE PROVIDE A FAX NUMBER IN CASE IT IS NECESSARY
TO CONTACT YOU REGARDING YOUR BID:

_216-901-1447_

CONTACT PERSON (PLEASE PRINT CLEARLY):

TODD MAY

****** THIS IS THE END OF RFQ   STO12007 ****** TOTAL: _____

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE		TELEPHONE	DATE
TITLE	FEIN		ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

APPENDIX 4 – VENDOR PREFERENCE CERTIFICATE

AdvizeX has not applied for Vendor Preference

Rev 09/08

State of West Virginia
VENDOR PREFERENCE CERTIFICATE

Certification and application* is hereby made for Preference in accordance with *West Virginia Code*, §5A-3-37. (Does not apply to construction contracts). *West Virginia Code*, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the *West Virginia Code*. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Resident Vendor Preference, if applicable.

1. Application is made for 2.5% resident vendor preference for the reason checked:
   Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; or,
   Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or 80% of the ownership interest of Bidder is held by another individual, partnership, association or corporation resident vendor who has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or,
   Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; or,

2. Application is made for 2.5% resident vendor preference for the reason checked:
   Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,

3. Application is made for 2.5% resident vendor preference for the reason checked:
   Bidder is a nonresident vendor employing a minimum of one hundred state residents or is a nonresident vendor with an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia employing a minimum of one hundred state residents who certifies that, during the life of the contract, on average at least 75% of the employees or Bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,

4. Application is made for 5% resident vendor preference for the reason checked:
   Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; or,

5. Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:
   Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; or,

6. Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:
   Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) reject the bid; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential.

Under penalty of law for false swearing (West Virginia Code, §61-5-3), Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.

Bidder: _____   Signed: _____

Date: _____   Title: _____

*Check any combination of preference consideration(s) indicated above, which you are entitled to receive.

APPENDIX 5 – PURCHASING AFFIDAVIT

RFQ No. _STO12007_

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

West Virginia Code §5A-3-10a states: No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owed is an amount greater than one thousand dollars in the aggregate.

DEFINITIONS:
"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Debtor" means any individual, corporation, partnership, association, limited liability company or any other form or business association owing a debt to the state or any of its political subdivisions. "Political subdivision" means any county commission; municipality; county board of education; any instrumentality established by a county or municipality; any separate corporation or instrumentality established by one or more counties or municipalities, as permitted by law; or any public body charged by law with the performance of a government function or whose jurisdiction is coextensive with one or more counties or municipalities. "Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceed five percent of the total contract amount.

EXCEPTION: The prohibition of this section does not apply where a vendor has contested any tax administered pursuant to chapter eleven of this code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

Under penalty of law for false swearing (*West Virginia Code* §61-5-3), it is hereby certified that the vendor affirms and acknowledges the information in this affidavit and is in compliance with the requirements as stated.

WITNESS THE FOLLOWING SIGNATURE

Vendor's Name: _Advizex Technologies_

Authorized Signature: _Cindy Munley_   Date: _3/30/12_

State of _OHIO_

County of _Cuyahoga_, to-wit:

Taken, subscribed, and sworn to before me this _30th_ day of _March_, 20_12_.

My Commission expires _2/6_, 20_17_.

AFFIX SEAL HERE   NOTARY PUBLIC _____

PATRICIA A. TOMMER
Notary Public
State of Ohio
My Commission Expires February 06, 2017

Purchasing Affidavit (Revised 12/15/09)

West Virginia State Treasurers Office

RFP #STO12007
Network Equipment Infrastructure

RFP No.: STO12007

Bid Opening Date: 4/10/2012

Bid Opening Time: 1:30 PM

April 10, 2012

Frank Whittaker
Purchasing Division
2019 Washington Street East
P.O. Box 50130
Charleston, WV 25305-0130

RE: RFP STO12007

Mr. Whittaker:

AdvizeX Technologies, LLC (AdvizeX) appreciates the opportunity to respond to your RFP related to Computer Network Infrastructures.

I, Todd May, am the authorized contact person that can speak on behalf of AdvizeX.

My contact information is as follows:

Todd May
Client Relationship Manager
AdvizeX
6480 Rockside Woods Blvd. S, Suite 190
Independence, OH 44131
216-901-1818 x4110
tmay@advizex.com

Based upon our review of RFP STO12007, it is confirmed that AdvizeX meets all mandatory requirements established in said RFP.

We are looking forward to the next step in this authorization process.

Sincerely,

Todd May
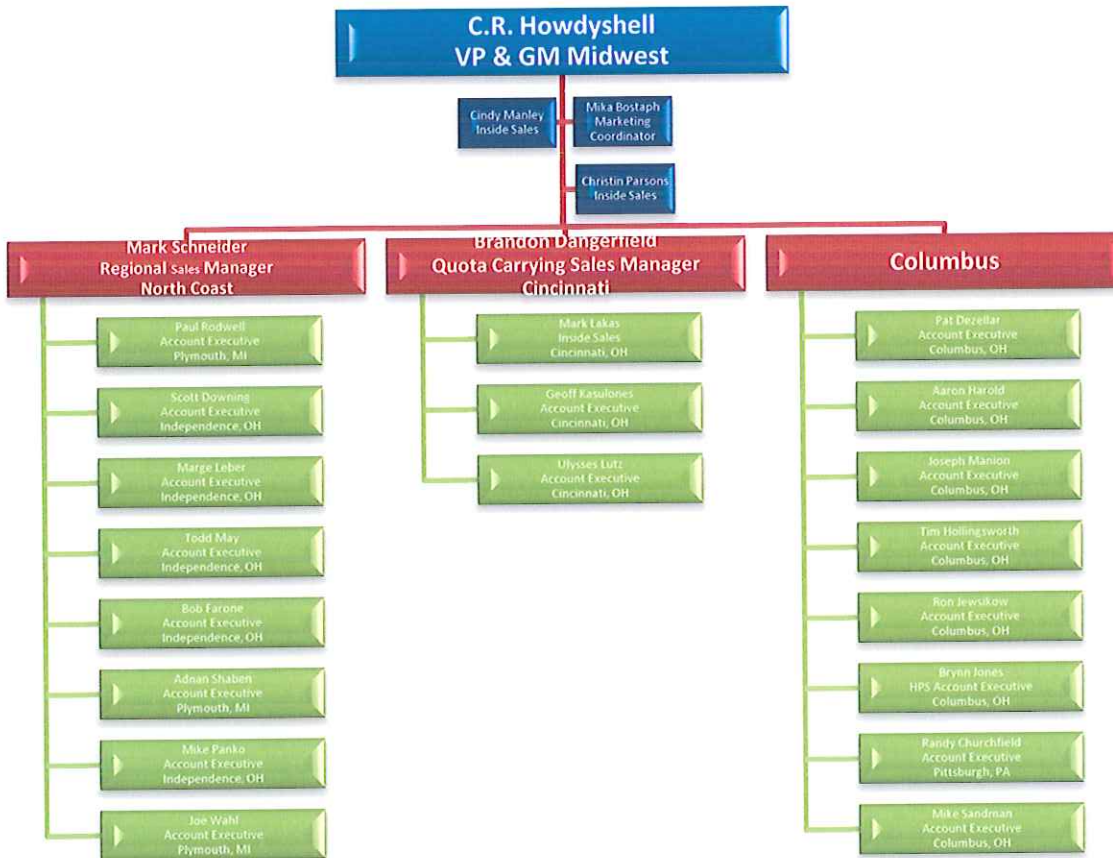Client Relationship Manager

Table of Contents

ATTACHMENT A – VENDOR RESPONSE SHEET

2.3 QUALIFICATIONS AND EXPERIENCE

An organization chart identifying the Vendor's overall business structure and locations, including an explanation of the various services offered by the company.

2.3.1 AdvizeX Organizational Chart

2.3.1.1 Midwest Marketing Organization

2.3.1.2 AdvizeX Management / Officers

AdvizeX Technologies LLC is a privately held information technology company with headquarters in Cleveland, OH. We operate in offices in 9 states. This includes Charleston, WV, Pittsburgh, PA, Columbus, OH, Cincinnati, OH, Nashville, TN, Chicago, IL, Boston, MA, Baltimore, MD, Rochester, NY and Atlanta, GA. We currently employ more than 200 people. The majority of our employees are sales engineers, sales representatives or technical consultants.

Since 1975 AdvizeX has been providing organizations with the expertise needed to chart a successful, strategic course towards the next-generation IT systems that will best support your company's business goals. Whether you're exploring virtualization or cloud solutions, undertaking a network refresh, implementing new applications at the desktop, or tackling system upgrades, turn to AdvizeX for deep industry knowledge and best-in-class service and support. AdvizeX designs and implements integrated solutions utilizing best in class products from the industry's best strategic business partners.

Businesses today are searching for the best ways to manage the complexity of the IT challenges they face. Issues like data security, server sprawl, the need for consolidation, automation and virtualization are critical to meeting the levels of productivity, efficiency

and reliability that competitive markets demand. AdvizeX has developed specialization in the following area to address these issues.

They include Virtualization of data centers, servers, storage, networks, desktops, and applications. The very nature of the WVSTO RFP is our specialization. Creating a seamless environment that combines servers, storage, networking and virtualization to enable IT to provide business applications as service is very essence of what we have proposed from the VCE Company. We do it with a common packaging like VCE and as an al carte offer with best of breed products from our partners. Some of our offerings that are relevant to the WVSTO RFP are:

- Virtual Data Centers
- Backup and Recovery Solutions
- Enterprise Networks
- Storage Efficiency and Tiering
- Application and Infrastructure Management
- Solution Centers

Virtual Data Centers

Virtual Data Centers are no longer slide ware. The reality is that IT departments are moving quickly to implement them. AdvizeX can provide your organization with the expertise required to implement a virtual data center, starting with assessment and planning and moving through all stages of implementation and post-migration support. Our team of experts can also advise you on best available solutions from leading virtualization vendors such as HP, EMC, VMware, Microsoft and Oracle that are right sized for your existing IT resources and budget.

In the virtual data center, each of the critical building blocks --- network, servers, applications and storage -- need to be not only optimally virtualized but also working together in a fully integrated and orchestrated fashion. AdvizeX can help your organization move beyond virtualization silos with a comprehensive approach to all four areas using best of breed technology and a knowledge base honed through years of real-world experience.

Providing Innovative Solutions to Backup and Recovery Challenges

As you consider your options for optimizing your operational recovery system, AdvizeX can help. And our approach is by no means limited to point solutions. Our well-certified experts can provide sophisticated levels of assessment using a unique vendor-agnostic methodology called the Advizor™ tool. We can benchmark current configurations to identify critical gaps, map out solid implementation paths, and custom-tailor a solution to address the specific needs of your computing environment. In addition, two strategically located Solution Centers allow you to view simulations of multi-vendor solutions so you can see how your

planned implementation performs before its deployed. Both resources are examples of our comprehensive and holistic approach to IT assessment and implementation.

AdvizeX for Your Enterprise Networking Needs

The costs associated with supporting an enterprise network infrastructure constitute a substantial portion of many IT budgets. But network inefficiencies can hamper even the most robust data center build-outs. AdvizeX networking experts can assess network performance by evaluating current LAN, WAN and SAN configurations, identifying potential bottlenecks, and looking for areas that would benefit from the latest networking innovations.

Designing Storage Efficiency and Performance

As the trend toward more efficient data centers continues, companies have come to understand the value of doing more with less. The same is true of data storage today. By leveraging the latest storage technologies, AdvizeX can reduce costs, enhance computing performance, and create the best solution to fit your needs.

The finely-tuned design of your storage infrastructure is key to your data's reliability. You should depend on nothing less than flawless data availability, protection, and recovery. AdvizeX is a dependable storage partner that incorporates advanced technologies to provide best-in-class solutions. Some of these include thin provisioning, storage virtualization, automated storage tiering

AdvizeX Solution Centers: See How Your Environment Performs *Before* It's Deployed

Today's IT solutions are not only more complex and layered but also heavily dependent on multivendor interoperability. Because suppliers focus mainly on the performance of individual products, the challenge for IT managers is to ensure that a planned implementation can perform optimally up and down stacks and across multiple network domains. AdvizeX Solution Centers are a rich resource and toolset allowing our customers to meet this challenge.

- Synergistically mix and match server, storage, and network elements in standard or customized configurations before you implement. Real-world video simulations and demos show exactly how new applications or emerging technologies fit into your current IT resource configuration.
- IT managers can test drive planned implementations, while minimizing risk and saving valuable planning and preparation time. If you have specialized requirements, AdvizeX can customize a demo to show how your actual data or applications will perform in specified vendor configurations.

2.3.2 Public Sector References

The following references have been attached to this section:

1. State of West Virginia State Court of Appeals
2. State of West Virginia Department of Administration
3. State of West Virginia Supreme Court of Appeals

2.3.2.1 West Virginia State Court of Appeals

SUPREME COURT OF APPEALS
STATE OF WEST VIRGINIA

STEVEN D. CANTERBURY
ADMINISTRATIVE DIRECTOR

ADMINISTRATIVE OFFICE
BUILDING 1, ROOM E-100
1900 KANAWHA BOULEVARD, E.
CHARLESTON, WV 25305-0832
(VOICE) 304/558-0145
(TTY) 304/558-4219
(FAX) 304/558-1212
www.state.wv.us/wvsca/

October 11, 2011

Mr. Greg Kidder
Chief Procurement Officer
WVNET
837 Chestnut Ridge Road
Morgantown, WV 26505

Dear Mr. Kidder:

Please use this letter as confirmation of our business relationship with AdvizeX Technologies. AdvizeX has been a trusted advisor for the West Virginia Supreme Court of Appeals for several years. We purchase nearly all of our Hewlett-Packard infrastructure from AdvizeX. This includes HP Blades, HP Proliants, HP EVA Storage Systems, and HP SAN switches.

AdvizeX provides extensive presales resources to help us choose the best solutions to support the various Court locations throughout the State. They have also assisted with post sales consulting resources.

WVNET can expect a high level of service and support from AdvizeX.

Sincerely,

Scott Harvey
Director, Technology Division
West Virginia Supreme Court of Appeals

SH/seh

2.3.2.2 State of West Virginia Department of Administration

STATE OF WEST VIRGINIA
DEPARTMENT OF ADMINISTRATION
OFFICE OF TECHNOLOGY
Kyle Schafer
Chief Technology Officer

Earl Ray Tomblin
Acting Governor

Robert W. Ferguson,
Jr.
Cabinet Secretary

DATE: October 7, 2011

TO: Whom it May Concern

SUBJECT: Letter of Reference

Please accept this Letter of Reference on behalf of AdvizeX Technologies and their Client Relationship Manager, Todd May. I have personally worked very closely with Todd, on an almost daily basis during the past four years. AdvizeX has proven to be one of the State's very best vendors. The quality of their sales, service and support is unsurpassed among IT vendors.

David L. Shingleton, Administrative Services Manager

Capitol Complex, Bldg 5, 10th Floor Charleston, WV 25305 Phone: (304) 957-8265

2.3.2.3 State of West Virginia Supreme Court of Appeals

SUPREME COURT OF APPEALS
STATE OF WEST VIRGINIA

STEVEN D. CANTERBURY
ADMINISTRATIVE DIRECTOR

ADMINISTRATIVE OFFICE
BUILDING 1, ROOM E-100
1900 KANAWHA BOULEVARD, E.
CHARLESTON, WV 25305-0832
(VOICE) 304/558-0145
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WVNET can expect a high level of service and support from AdvizeX.

Sincerely,

Scott Harvey
Director, Technology Division
West Virginia Supreme Court of Appeals

SH/seh

2.3.3 Resumes of Project Team Members

Please refer to the following pages for the following team references:

- Jhune Marra
- Joseph Stottman
- Armando Centeno

2.3.3.1 Team Member Jhune Marra

Profile Summary

Senior Storage Consultant focused on Storage Area Networking (SAN), Network Attached Storage (NAS) and Content Addressed Storage (CAS), specializing in EMC products and solution sets. Over 17 years of experience in system architecture, planning and design on SAN arrays (EMC Symmetrix, VMax, CLARiiON, VNX Arrays), NAS (EMC Celerra, VNX), Brocade/McData and Cisco SAN infrastructure, as well as Next Generation Backup, Recovery and Archiving (EMC Centera).

Possesses solid architecture and implementation experience in Business Continuity (SRDF, TimeFinder, RecoverPoint, MirrorView, and SnapView), configuration and management of clients' SAN, NAS and CAS arrays using EMC Control Center (ECC), Symmetrix Management Console (SMC), Navisphere, Unisphere, Celerra Manager, Fabric Manager, Device Manager, symcli, naviseccli, and other command line interfaces (CLI)

Provides technical and consultative leadership to deliver EMC focused technologies for client solutions opportunities

Jhune's experience within the solutions practice includes:

- Develops technical strategies to deliver EMC solutions and services including scoping, effort estimates, and client presentations/meetings to support customers' business objectives.
- Implementation, architecture, and design engineering of EMC Symmetrix DMX, VMax, VNX, CX, NS and Centera, including local and remote replication (SnapView, TimeFinder, SRDF, and RecoverPoint)
- Best practice design and layout of Symmetrix, VMax, VNX, CLARiiON and Celerra
- Best practice design and layout of Oracle DB and MS Exchange on EMC Arrays, including performance analysis, and workload profiling.
- Business Continuity solution architecture ensuring clients' RPOs and RTOs are met, including bandwidth analysis for remote replication sizing and solution validation.
- Delivers and has successfully completed several customer onsite transitional and operational residencies focused on migration, implementation, configuration, and management of SAN, NAS and CAS infrastructure using GUI and/or CLI, including knowledge transfer, and documentation.
- Provides the following custom services: EMC Oracle and MS Exchange Data Layout, EMC Symmetrix and CX/VNX performance analysis, SAN Assessment, Transition, Training, Remediation planning, and Resource modeling.

- Extensive experience managing and analyzing EMC's Symmetrix, VMax, CLARiiON, and VNX storage systems using various management software, command line interface and other proprietary tools.
- Multiple EMC Proven Professional Certifications – Specialist EMCIE on Symmetrix, VNX Unified, Celerra, Centera and RecoverPoint.

Technical Experience

Jhune has experience with the design and implementation of EMC best practices, and administration of the following environments:

Operating Systems: Windows, Solaris, HPUX, AIX and Linux

Platforms: EMC Symmetrix (VMAX, DMX), VNX (File and block), CLARiiON, Celerra, and Centera

Software: EMC SRDF, TimeFinder, MirrorView, SnapView, Open Replicator, SAN Copy, RecoverPoint, Ionix ControlCenter, Unisphere, Symmetrix Management Console (SMC), Symmetrix Performance Analyzer (SPA), SymMerge, SymWin, STPNavigator, Performance Manager, Business Continuance Solution Designer (BCSD), Network Storage Designer Unified (NSD-U)

Professional Designations and Certifications

- EMC Implementation Engineer, RecoverPoint Data Replication and Recovery (EMCP/T)
- EMC Implementation Engineer, VNX Solutions Specialist v7.0 (EMCIE)
- EMC Proven Professional Implementation Engineer – Symmetrix Solutions Specialist v6.0 (EMCIE)
- EMC Proven Professional Implementation Engineer – NAS Specialist v5.0 (EMCIE)
- EMC Proven Professional Implementation Engineer – CAS Specialist v5.0 (EMCIE)
- EMC Information Storage Associate (EMCISA)
- EMC Certified Proven Professional – Associate (EMCPA)
- Certified McData Technical Associate (CMTA)

Selected Project Engagement Experience

Jhune is part of the Midwest Division Storage Practice team as a Senior Solutions Consultant leading projects on storage professional services for various clients.

Jones Day, Cleveland, Ohio
- VMax and Unified VNX planning, implementation and migration from legacy CX/DX
- Open Replicator to migrate data from DMX/VMax, and CX/VMax on 2 data centers.
- Implemented SRDF/A and provided level 1 to 3 SRDF/A design including bandwidth sizing using BCSD tool and SymMerge.
- Created Design Workbook, including from-to migration details, hosts remediation, zoning, runbook and detailed procedures.
- Upgraded to latest SMC and SPA versions, including Unisphere multi-domain environment.
- Provided knowledge transfers, design sessions and first-level onsite support.
- Deploying more than 13 VNX5300 File arrays across multiple remote offices, which include site preparation, planning, layout and centralized replication to production VNX at main data center.

MS Exchange Data Layout, AdvizeX/EMC Clients, Midwest Region
- Standardized the processes, deliverables, and methodology for the MS Exchange Data Layout practice in the AdvizeX Midwest region, delivering to AdvizeX direct clients and supporting EMC in providing the service to its customers.
- Mapping the LUNs and backend components in the storage array in relation to the required performance based on the MS Exchange sizing calculator and EMC-Microsoft best practices, working together with the Microsoft Exchange team.
- This includes analysis and iteration of the layout design based on the JetStress results.

EMC Business Continuity Practice, Central Division
- Provided BC solution architecture for several EMC BC projects doing bandwidth analysis, performance analysis, SRDF Level 1-3 design, migration strategy, implementation and test procedure planning, documentation and knowledge transfer.
- Assisted in RecoverPoint solution architecture.

Oracle Data Layout, AdvizeX/EMC Clients, Midwest Region
- Standardized the processes, deliverables, methodology, and led the Oracle Data Layout practice in the AdvizeX Midwest region, delivering to AdvizeX direct clients and supporting EMC in providing the same service to its customers.
- The tasks involve storage array, Oracle database, hosts and operating system performance analysis; best practice data layout and storage array configuration.
- Oracle Database workload profiling on the storage array

SAN Assessment, Cardinal Health, Dublin, Ohio
- Helped Cardinal Health in validating their current issues and challenges in their SAN infrastructure by analyzing data gathered from their SAN switches and directors.

- Provided a report and presentation to Cardinal executives with recommendations based on findings and industry standard best practices.

NAS Remediation and Transition Planning, Cardinal Health, Dublin, Ohio
- Delivered a custom NAS remediation and transition planning service by helping Cardinal teams create strategic transition, training, remediation plans and resource modeling.
- The compiled documents contain the tasks and activities involved in the transition along with the timeline, skill requirements, and effort estimates of the remediation based on criticality and impact.

<u>**Previous Work Experience**</u>
2005 – 2010   EMC Corporation   Central/Midwest Division, US; Southeast Asia
Solution Architect/ Account Technology Consultant / Resident Consultant
- Responsible for customer residencies focused on SAN, NAS, CAS and BuRA.
- Completed several transitional and operational residencies doing SAN migration, deployment and implementation, managing SAN in multiple Data Centers across North America with Petabytes of usable storage capacity, and thousands of SAN switches/ports using command line interface and custom scripts/runbooks. Performed SAN allocation and decommissioning of EMC SAN with TimeFinder and SRDF configuration via CLI.
- Responsible for customer solution architecture, design and technical account management, administration, deployment/implementation, documentation, migration, infrastructure assessment, knowledge transfer/training, solution lead and architecture focused on SAN (Symmetrix/CLARiiON), NAS (Celerra), CAS (Centera), Backup (Legato Networker, ADIC) and Archiving (Centera, Legato DiskXtender, EmailXtender).

1997 – 2004   Hewlett-Packard Corporation   Makati City, Philippines
Systems Engineer/Solution Architect/Principal Consultant/Project Manager
- Responsible for design, development and technical quality of large enterprise solutions in the Telecommunications, Manufacturing and Semiconductor Industries that involve multiple technologies and subsystems, and have a major business impact on the customer.
- Integrated best in class server, storage and networking solutions and custom-developed frameworks to provide a flexible, open architecture as well as turnkey implementation.

1995 – 1997   Institute of Advanced Computer Technology (I/ACT)   Makati City, Philippines
Content Advisor / Instructor
- Developed and conducted training on Alpha and Intel-based operating systems (Tru64 Unix, SCO Unix), programming languages (C, C++, shell programming/scripting), data communications, networking and hardware (PC and compatible hardware troubleshooting and assembly) courses.

2.3.3.2 Team Member Joseph Stottmann

Profile Summary

Joseph Stottmann is a Senior Storage Architect focused on Storage Area Networking (SAN) and Network Attached Storage (NAS), specializing in EMC products and solution sets. He has over 10 years of experience in system architecture, planning and design on SAN arrays (EMC Symmetrix, CLARiiON Arrays), NAS (EMC Celerra), Brocade/McData and Cisco SAN infrastructure, as well as Next generation Backup and Recovery.

Joseph has architecture, implementation, configuration and management experience in SAN and NAS arrays using EMC Control Center (ECC), Symmetrix Management Console (SMC), Unisphere, Celerra Manager, Fabric Manager, Device Manager, symcli, naviseccli, and other command line interfaces (CLI) and Business Continuity (SRDF, Timefinder, MirrorView, SnapView). He has completed planned and implemented SAN Health check assessments and remediation. He has performed SAN (Array and Switch) performance analysis and provided the necessary steps to improve performance.

Joseph's experience within the solutions practice includes:
- SAN architecture/design, assessment, remediation, and migration
- Local and remote replication implementation
- Solution architecture planning and design on SAN, NAS and SAN networking
- Custom services: EMC Oracle, Exchange, SQL Server data layouts on VMAX, DMX, and CX/VNX, EMC Symmetrix performance analysis, SAN assessment, migration, training, remediation planning, and resource modeling
- Onsite residency, configuration, and management of SAN and NAS infrastructures using GUI and/or CLI, including knowledge transfer, and documentation.
- Business Continuity solution architecture ensuring clients' RPOs and RTOs are met
- Deployed at a leading AdvizeX/EMC clients doing SAN storage deployment and implementation, consolidating Data Centers from multiple locations to one, including migrating a datacenter from the UK to the USA.

Technical Experience

Joseph has experience with the design and implementation of EMC best practices for the following environments:

Operating Systems: Windows, VMware, Solaris, HPUX, AIX, Linux and Mac OSX

Storage: EMC Symmetrix (VMAX, DMX and earlier). VNX (File and block), CLARiiON, and Celerra (Dedicated and Gateway). RAID: design,

implementation & best practices. Storage Management EMC Unisphere, Navisphere, Celerra Manager, SMC, Ionix Control Center, Solutions Enabler. Navisphere CLI, Connectrix Manager and Fabric Manager.

BURA:

Enterprise design & implementation. EMC SRDF, TimeFinder, Celerra Replicator, ControlCenter and SnapView, MirrorView, Unisphere, Open Replicator, Open Migrator, SAN Copy, DataDomain. Enterprise Software: Veritas Netbackup, EMC Networker, EMC Backup Advisor (EBA) and Tivoli Storage Manager

EMC Tools:

Work Load Analyzer (WLA), STPNavigator, SymmMerge, Symmwin, NaviService taskbar, CAP tool and SVC/SQ Process

Professional Designations and Certifications
- EMC Technology Architect – Networked Storage – SAN Expert (EMCTAe)
- Implementation Engineer – Networked Storage – SAN Expert (EMCIEe)
- Implementation Engineer, VNX Solutions Specialist
- EMC Network Attached Storage (NAS) Specialist (EMCIE)
- EMC Proven Professional Implementation Engineer – Symmetrix Solutions Specialist (EMCIE)
- EMC Speed Certification (EMC Internal Symmetrix Performance Team)
- EMC Technology Foundations – Business Continuity Associate
- EMC Certified Proven Professional – Associate (EMCPA)
- Cisco Data Center Storage Networking Support Specialist (MDS)
- Cisco Data Center Unified Computing Implementation Specialist (DCUCI)
- Cisco Data Center Support for UC Specialist
- Cisco Unified Computing Technology Support Specialist
- Vmware Certified Professional, Vmware Infrastructure 3
- Microsoft Certified Systems Engineer for Windows 2000

Selected Project Engagement Experience
Jones Day, Cleveland, OH
Team Lead for the Storage Team, working on SAN layouts of Cisco MDS directors and switches. Lead the migration of CLARiiON arrays to a new EMC VNX 5700. Utilizing SAN Copy and host based migration tools. Design of the migration plan, instructions and implementation for updating the Cisco switch firmware around the globe. Lead the implementation and testing of Solarwinds Storage Manager monitoring and reporting software. Plan and Implementation of EMC Ionix Control Center environment to UB12 upgrade.

Chiquita, Cincinnati, OH

Oracle data layout on EMC VMAXe. Utilizing the processes, deliverables and methodology of the Oracle Data Layout practice, in the AdvizeX Midwest region, delivering to Chiquita and supporting EMC in providing the same service to its customers. The tasks involve storage array, Oracle database, hosts and operating system performance analysis; best practice data layout and storage array configuration.

AEP, Columbus, OH

Exchange data layout on EMC VNX inside of VMware ESX environment. Utilizing the processes, deliverables and methodology of the Microsoft Layout practice, in the AdvizeX Midwest region, delivering to AEP and supporting EMC in providing the same service to its customers. The tasks involve storage array, Oracle database, hosts and operating system performance analysis; best practice data layout and storage array configuration.

Harvard Library, Cambridge, MA

Implementation of VNX arrays in Primary and Secondary location, utilizing FAST technology. SAN Copy was used to move data from existing CLARiiON arrays to VNX. Setup MirrorView between the two sites for Disaster Recovery. Knowledge transfer to the Harvard Library staff, for ongoing migrations and day to day management of the VNX arrays.

Schectady Radiology, Schectady, NY

Replacement of EMC CLARiiON with EMC VNX. Migration of data from the CLARiiON to the VNX, utilizing SAN Copy. This system supported the PACS system for the Radiology department.

Dawn Foods, Jackson, MI

Primary technical architect and technical leadership for new SAP deployment on EMC VMAX, Cisco UCS blades, Cisco Nexxus switching, EMC Celerra Gateways, VMware 4.1, VMware SRM. Provided technical leadership, architecture, implementation, and guidance for the customer who was new to UCS, EMC storage, and large-scale VMware deployments.

Alcoa, New Kennsington, PA

Performed architecture review and SAN assessment, doing system analysis, performance array analysis and SAN analysis. Moved to Architect role after the assessment was complete, providing remediation strategy, implementation and test procedure planning, documentation and knowledge transfer.

Oracle Data Layout, AdvizeX/EMC Clients, MidWest Region

Utilizing the processes, deliverables, methodology of the Oracle Data Layout practice in the AdvizeX Midwest region, delivering to AdvizeX direct clients and supporting EMC in providing the same service to its customers. The tasks involve storage array, Oracle database, hosts and operating system performance analysis; best practice data layout and storage array configuration.

CLARiiON Perfomance Analysis, EMC/CTC, Canada

Performed performance analysis, for EMC, on CTC's CLARiiON array. Specifically around CTC's Microsoft Exchange 2010 clusters, with recommendations based on findings and industry standard best practices.

V-Max Perfomance Analysis, EMC/RBS, Stamford, CT

Performed performance analysis, for EMC, on RBS' V-Max array, utilizing thin provisioning, with local and remote replication also active. Specifically around RBS' VMware North American farm, with recommendations based on findings and industry standard best practices.

Ohio State University, Columbus, OH

Designed / Implemented Ionix Control Center, entirely in VMware environment.
Designed / Implemented Cisco SANs, 2 sites, each with 2, 9513 directors, Dual Core / Multiple VSANs or fabrics
Detailed V-Max layout
Created migration plan for current SAN attached hosts with Host Remediation, Current Host Volume Layouts, New Host Volume Layouts utilizing multiple migration scenarios, based on host OS, service levels and downtime availability

Brickstreet, Charleston, WV

Detailed V-Max layout
Created migration plan for current SAN attached hosts with Host Remediation, Current Host Volume Layouts, New Host Volume Layouts utilizing multiple migration scenarios, based on host OS, service levels and downtime availability.
Migrated 27 HUPX and Windows hosts via SRDF and 8 ESX hosts utilizing Storage VMotion

Humana, Louisville, KY

Lead V-Max POC testing at client.
Lead migration team consolidating 2 IBM arrays and 2 EMC DMX arrays onto 2 new V-Max arrays.
Detailed V-Max layout for 2 arrays

Created migration plan for current SAN attached hosts with Host Remediation, Current Host Volume Layouts, New Host Volume Layouts utilizing multiple migration scenarios, based on host OS, service levels and downtime availability.
Migrated 23.5 hosts using combination of SRDF, OpenReplicator, OpenMigrator, HP-UX LVM and VMware Storage VMotion

Norton Health Care

Designed / Implemented Ionix Control Center, in a mixed Physical and VMware environment.
Designed / Implemented Cisco SANs, 2 sites, each with 2, 9513 directors utilizing a Dual Core / Multiple VSANs or fabrics
Detailed V-Max layout for 2 arrays
Created migration plan for current SAN attached hosts with Host Remediation, Current Host Volume Layouts, New Host Volume Layouts utilizing multiple migration scenarios, based on host OS, service levels and downtime availability.

Andersen Windows

Staff Augmentation with the following deliverables
Designed / Implemented Ionix Control Center, entirely in VMware environment.
Designed / Implemented Replication Manager for 2 applications.
Created migration plan for current SAN attached hosts
Migrated servers to Cisco SANs
Trouble shooting for existing environment.

CUNA Financial

Staff Augmentation with the following deliverables
Designed / Implemented Cisco SAN
Designed / Implemented Clariion array
Created migration plan for current SAN attached hosts
Migrated 77 hosts using SANCopy, OpenMigrator, AIX LVM and VMware Storage VMotion.

Previous Work Experience

2010 – Present   AdvizeX Technologies, Inc.
Senior Storage Architect
- Provides technical and consultative leadership to deliver EMC focused technologies for client solutions opportunities
- Responsible for customer residencies focused on EMC storage and VBLOCK
- Implementation, architecture, and design engineering for DMX, VMax, CX, NS and Centera, including local and remote replication (SnapView, TimeFinder, and SRDF)

- Develops technical strategies to deliver EMC solutions and services including scoping, effort estimates, and client presentations/meetings to support customers' business objectives.
- Provides the following custom services: EMC Oracle Data Layout, EMC Symmetrix performance analysis, SAN Assessment, Transition, Training, Remediation planning, and Resource modeling.

2006-2010 Senior Solutions Architect, EMC

- SAN design and/or reconfiguration using existing SAN environment and recommending EMC storage products where needed.
- Symmetrix design and implementation for new frames and for existing frames where new storage or directors are installed.
- Design and installation of EMC ControlCenter
- Disaster Recovery scenarios utilizing BCV, TimeFinder and SRDF.
- Team lead resource for VMware projects.
- Technical Team Lead for assigned projects.
- Mentor GSAP resources to enhance their training with 'real world' engagements.
- Storage management services, Clients staff augmentation and training for client's staff so that they may self maintain.

2004-2006   Senior Storage Consultant, Analysts International

- Storage and Backup Assessments. Utilizing Client disaster recovery requirements and EMC best practices..
- SAN design and/or reconfiguration using existing SAN environment and recommending EMC storage products where needed
- Disaster Recovery scenarios utilizing BCV, TimeFinder, SRDF, SnapView and MirrorView
- Implementations of SnapView Integration modules for Exchange and SQL servers
- Team Lead and Implementation specialist for EMC projects

2000- 2004   Storage/Cluster Management, GE - 4 years

- Designed 2 separate SAN environments for different GE businesses. Brocade and McData switches. JNI, Emulex and QLogic cards.
- Manage SANs in Cincinnati OH, Parkersburg WV and Stamford, CT. These SANs use EMC Symmetrix, Brocade switches and McData switches.
- Lead a transition team a DATA Center from one GE business unit to corporate management.
- Manage file systems on multiple OS platforms. Solaris, Microsoft NT, Windows 2000, AIX, Linux and HPUX. Using multiple volume managers, Veritas Volume Manager for Solaris, Microsoft and Linux. Native managers in Windows, Linux, AIX and HP.

- Designed, implemented and maintain multiple cluster servers. Utilizing Veritas Cluster Server, Microsoft Cluster Server and HP Service Guard.

- Maintain backup infrastructure. Tivoli TSM. IBM ATL Libraries 3590 and LTO tape technologies.

- Support multiple EMC devices in several different physical locations Symmetrix, Clariion, Connectrix and Celerra Data movers.

- Managed 2 projects working with offshore technicians for remote management of metro centers.

- Disaster Recovery scenarios utilizing BCV, TimeFinder, SRDF, SnapView and MirrorView

2.3.3.3 Team Member Armando Centeno

Profile Summary

Experienced Information Systems professional with demonstrated expertise in complete storage system infrastructure lifecycle, methodology and practices. Possesses strong analytical thinking, troubleshooting capabilities and excellent interpersonal communication skills. Evaluates stated requirements and expectations in terms of technical feasibility and cost outcomes. Works closely and effectively with all levels of management to satisfy project/productivity requirements. Demonstrates commitment to leadership/teamwork through positive contributions in streamlining systems and providing superior customer service.

Armando's experience within the solutions practice includes:
- Capable of designing, configuring and administering large SANs
- Best practice design and layout of Symmetrix, VNX, Clariion and Celerra
- Best practice design and layout of Oracle db on Symmetrix, VNX, Clariion
- Performance analysis of Oracle db on Symmetrix, VNX, Clariion
- Heterogeneous storage array migrations (DMX to VMAX, DMX to VNX, HDS to VMAX, etc.)
- EMC Proven Professional Certification – Specialist EMCIE and EMCSA
- Extensive experience managing EMC's Symmetrix and Clariion storage systems
- Storage and SAN switch migrations
- Aptitude for analyzing, testing, identifying problems, creating solutions and successful execution
- Proficient at setting priorities and meeting goals.
- Quick learner with ability to rapidly achieve organizational integration, assimilate job requirements, employ new ideas, concepts, methods, and technologies.
- Works strategically to fulfill business need with emphasis on business translation of technology. Capable of rapidly learning new technologies and processes, and successfully applying them to projects and operations.
- Thrives in independent and collaborative work environments

Technical Experience

Armando has experience with the design and implementation of EMC best practices for the following environments:

Operating Systems: Windows, Solaris, HPUX, AIX and Linux

Platforms: EMC Symmetrix (VMAX, DMX), VNX (File and block), Clariion, and Celerra

Software: EMC SRDF, TimeFinder, Celerra Replicator, ControlCenter, SnapView, MirrorView, Unisphere, Open Replicator, Open Migrator, SAN Copy

Professional Designations and Certifications

- EMC Implementation Engineer, Recoverpoint Data Replication and Recovery (EMCP/T)
- EMC Implementation Engineer, VNX Solutions Specialist (EMCIE)
- EMC Implementation Engineer, Clariion Solutions Specialist (EMCIE)
- EMC Implementation Engineer, Network Attached Storage (NAS) Specialist (EMCIE)
- EMC Implementation Engineer, Backup and Recovery – Avamar Specialist (EMCIE)
- EMC Implementation Engineer, Backup and Recovery – DataDomain Specialist (EMCP/T)
- EMC Information Storage Associate (EMCISA)
- EMC Storage Administrator, Network Attached Storage (NAS) Specialist (EMCSA)
- EMC Storage Administrator, Storage Management Specialist (EMCSA)
- EMC Storage Administrator, Storage Management Associate (EMCPA)

Selected Project Engagement Experience

Armando is currently working on the Midwest Division Storage Practice team as a Senior Solutions Consultant with experience on the following projects where he was the lead the implementer for professional services with the client.

Cardinal Health

- Completion of on-site NAS Residency
- Architecture and design for Celerra migration from NS80 to VNX5500
- Runbook creation for migration method and cadence
- Creation of usermapper migration tools to remediate usermapper mismatches across 24 Celerra arrays

Precision Strip, Inc

- Recoverpoint Implementation – Install and configuration with Continuous Remote Replication
- Migrate CX3-20 to VNX5300
- Configure new SAN switches and attach to existing environment
- Migrate Exchange 2003 Cluster
- Assist in migrating HPUX and Xenserver

Emerson Hospital, Concord MA

- VNX5700 Configuration and Data Layout
- Migrate CX4-480 to VNX5700 using Mirrorview/S
- Migrate NS-40G to VNX File shares with Replicator v2

- Runbook creation for SAN configuration, migration method and cadence

Ohio University
- Multiple VNX implementations with FAST suite and FAST Cache
- Host and SAN infrastructure remediation planning in preparation for migration from EVA to VNX
- Reconfiguration of NS-120 to offsite location as replication target from NS40G with DMX back-end storage
- Symmetrix provisioning
- Microsoft Exchange data layout on VNX
- VMware View (VDI) data layout on VNX
- Replicated DataDomain implementation integrated into Networker with DDBOOST

City of Grove City OH and Western Michigan University
- Multi-site replicated Avamar implementation
- Configuration of host agents for VMware, Windows, Linux backup and recovery
- Configuration of NDMP file server backup acceleration

Sinclair Community College
- Multi-site VNX implementation with FAST suite and FAST Cache
- Host and SAN infrastructure remediation planning in preparation for migration from EVA to VNX
- Data Migrations from HP EVA storage for VMware, HP-UX, Microsoft Windows, PolyServe SQL cluster
- Replicated DataDomain implementation integrated into NetBackup
- DDBOOST & OST Netbackup implementations for server-side deduplication acceleration
- VNX Performance Baseline Analysis

City of Strongsville OH
- VNX implementation
- VMware best practices data layout
- DataDomain implementation integrated into Networker

Seattle Swedish Medical Center, Seattle WA
- DMX to VMAX data migrations
- Open Migrator, Open Replicator, SRDF based data migrations
- SAN configuration, zoning, LUN masking, storage provisioning
- Configuration of thin provisioning
- Host remediation

- ControlCenter configuration to manage VMAX environment
- Knowledge transfer to customer on Solutions Enabler CLI installation and usage
- Knowledge transfer to customer on provisioning using SMC and ControlCenter
- Data migration Runbook creation

Alcoa, Pittsburg PA
- Symmetrix analysis and performance review
- Oracle workload profiling on Symmetrix
- Oracle database layout on Symmetrix

Lakeshore Northeast Ohio Computer Association, Independence OH
- Celerra configuration
- Windows CIFS server migration to Celerra
- VMware Data Layout

Anesthesia Business Consultants, Jackson MI
- Clariion configuration
- Oracle Best Practice Data Layout on Clariion
- Exchange Best Practice Data Layout on Clariion
- Brocade switch firmware upgrades
- HBA firmware upgrades
- Data migration planning

Emerson, St Louis MO
- Symmetrix analysis and performance review
- Oracle workload profiling on Symmetrix
- Oracle database layout on Symmetrix

Ohio Health, Columbus OH
- Celerra Replicator v1 to v2 upgrade
- Celerra Replicator one-to-many and cascade configuration
- Celerra Migrations
- Celerra Replicator failover configuration and testing
- Usermapper remediation across three Celerra arrays
- Fail-safe network implementation on primary production Celerra

Kellogg's, Oak Brook IL
- Symmetrix analysis and performance review
- Oracle workload profiling on Symmetrix

- Oracle database layout on Symmetrix

Previous Work Experience

Jun. 2006 – June 2010   JPMorganChase   Westerville, OH
ENGINEER – Global Storage Sustain
General responsibility for sustain activities within the SAN space at JPMC including:
- Upgrades of storage environments
- Migration design and implementation
- Security remediation of all devices
- Global ESRS Implementation
- Global Navisphere Active Directory integration

Jun. 2006 – June 2010   JPMorganChase   Westerville, OH
ENGINEER – Global Storage Technologies Refresh
Overall responsibility for end-to-end ownership of ensuring assigned device is vacated on schedule and within storage technologies refresh program requirements, architect solution, implementation planning, execution verification

Equipment: □ EMC Symmetrix (including VMAX), and Clariion
               □ HDS Enterprise and Modular
               □ IBM XIV
               □ Netapp filers, Celerra Arrays
               □ Brocade, Cisco and McData SAN Directors
               □ SUN, Fujitsu, HP, IBM and Dell servers

Environment: □ Multi-petabyte and international datacenters (Total > 50 PB)
               □ SAN environments from single to 25+ switched fabrics with 60k+ Ports

- Storage allocations using command line and scripts or GUI
- Upgrades of storage environments
- Migration design and implementation
- Security remediation of all devices
- Global ESRS implementation
- Global Navisphere Active Directory Integration

Dec. 2003 – Jun. 2006   Eaton Corporation   Eastlake, OH
LEAD STORAGE ANALYST

Responsible for the architecture, management and maintenance of the storage and backup infrastructure of a premier diversified industrial company

Equipment:
- EMC DMX 2000, Symmetrix 8xxx/5xxx/3xxx, Clariion CX600/700
- Connectrix/McData/Brocade (ED-140M, DS-32M2 and DS-16B),
- CNT InRange FS/9000
- Storagetek Tape Libraries and 9840 Drives
- Sun SunFire Midrange up to V1280 and Qlogic HBAs
- HP 9000 Servers and Tachyon HBAs
- Dell PowerEdge Servers

Environment:
- EMC ControlCenter (v5.2 SP3) HA, Solutions Enabler
- EMC Workload Analyzer/Performance View
- EMC TimeFinder, SRDF and SRDF/CE
- SAN Advisor and StorageScope File Level Reporter
- PowerPath and Navisphere
- Sun Solaris 9 and 8
- HP-UX 11.11, 11.00 and 10.20
- Windows 2003 and 2000
- VMWare ESX v2.x
- Veritas NetBackup Datacenter 4.5 FP5 and NetBackup Enterprise 5.1
- Netbackup Options including Advance Reporter, SSO, Vault and HA.
- ACSLS HA
- Veritas Volume Manager

- Planned, deployed and managed a fully redundant SAN with two mirrored fabrics composed of McData ED-140 Directors and DS-3232 edge switches hosting 792 ports and 165 TB of shared disks employing synchronous SRDF between two data centers to establish a fully redundant failover data center in an active/active mode

2.3.4 Successful Project References

2.3.4.1 West Virginia Office of Technology

The West Virginia Office of Technology is the IT Infrastructure provider for all West Virginia Department of Administration agencies. This encompasses more than 150 agencies. AdvizeX worked with the Office of Technology to develop a storage, server and virtualization infrastructure for production and disaster recovery location. This solution includes an EMC VNX5700 at the production location and an EMC VNX5300 at the DR location. The server platform is HP BL460G7 blades and VMware for server virtualization. OOT will also be deploying EMC RecoverPoint to support array based replication from Charleston to their Disaster Recovery center in Sutton, WV. The network infrastructure is Cisco, but AdvizeX did not design or provide the gear.

The solution is designed to allow the Office of Technology to deploy a common infrastructure that can support the various applications of the supported agencies and provide a business continuity plan for the applications that are deemed to be mission critical. This solution is not yet fully deployed full deployment will take place in Q3 2012. Please contact Todd May, the authorized AdvizeX representative at 216-901-1818 x4110 to schedule a reference interview.

2.3.4.2 Goss International

Goss International is headquartered in Durham, New Hampshire (USA) and has major manufacturing centers in North America, Asia and Europe as well as a global sales and support network. The company supplies presses and finishing systems – including the most automated and productive web offset presses in the world – for magazine, newspaper, packaging, catalog, direct mail and other printing applications. The company is differentiated by its printing process knowledge, engineering expertise, high-tech industrial manufacturing capabilities and ability to execute and support large-scale capital equipment projects. The company employs over the 3000 people and has annual revenues of $1 billion.

Goss engaged with AdvizeX in October 2011 to redesign their IT infrastructure. The initial effort was to deploy a new infrastructure for their Exchange environment. The key decision criteria that drove their decision was the need to do more with fewer IT resources. They also were seeking an infrastructure that would allow them to roll out new applications faster and better collaborate with their business units. Additional benefits include the ability to reduce cost and save time by having a single virtualized pool of resources with common manageability. It is their goal to get to "IT as a service" and the VBlock best met the requirement to achieve their goals.

After an assessment of their environment it was determined that the VCE Company's VBlock unified infrastructure would provide them the safest way to incorporate the technologies they wanted into a single source vendor. The solution included an EMC VNX5X00, Cisco UCS blade servers, Cisco Nexus switches, VMware ESX Enterprise + with SRM. The solution is still being deployed but a proof of concept was done in advance, so the team at Goss already knows the solution will support their loads. They have also recently completed a second POC to virtualize their Tier 1 applications that reside on HP UX based servers. Their data warehouse update that ran for 15 hours was reduced to 5 hours in the VBlock configuration.

The AdvizeX team consisted of Marlon Acuna, Client Relationship Manager, Lisa Hanna, Quotes Specialist and Shane O'Brien, Presales Engineer. Please contact Todd May, the authorized AdvizeX representative at 216-901-1818 x4110 to schedule a reference interview.

2.3.4.3 Dawn Foods

Dawn Foods is a privately held $2B+ global manufacturer and supplier for the bakery industry with a headquarters in Jackson Michigan. They both manufacture packaged finished goods for sale, provide wholesale products and services, and they act as a global distributor of other manufacturers products and services.

They recently made a decision to move their operations off of legacy hardware and software and onto a combination of products from SAP and from Oracle to support their anticipated growth and changing business. AdvizeX was the principal technical architect of the hardware infrastructure to support their environment including using EMC VMAX storage, Cisco Unified Compute System for servers and VMware as the mainstream virtualization platform. The deployed infrastructure design is modeled after the VBLOCK architecture but because of the unique combination of Oracle products and SAP products they choose to self integrate the components instead of purchasing all of the components pre-integrated at the factory. Please contact Todd May, the authorized AdvizeX representative at 216-901-1818 x4110 to schedule a reference interview.

2.3.5 Subcontractors

AdvizeX will not use subcontractors for these services.

2.4 PROJECT AND GOALS

2.4.1 Unified Storage

*The following sets of questions are explanation based, concerning the **Unified Storage Array** that may be proposed.*

a.	Does the array have 8Gbps Fibre Channel connections to the SAN switches?	Yes
b.	Does the array have the capability to support 10Gbps FCoE for storage presentation?	Yes
c.	Does the array have the capability to support 10Gbps iSCSI for storage presentation?	Yes
d.	Does the array support automatic, dynamic read/write memory (cache) allocation?	Yes
e.	Does the array support both 2.5" and 3.5" disk drives?	Yes
f.	Does the array support RAID 1/0 (striped and mirrored)?	Yes
g.	Does the array support RAID 5 (single parity)?	Yes
h.	Does the array support RAID 6 or RAID-DP (double parity)?	Yes
i.	Can the storage administrator choose which tier of disk in a storage pool is used when creating a new LUN?	Yes
j.	Can individual LUNs be expanded "on the fly" without down time on the system using the LUN?	Yes
k.	Can individual LUNs be converted from thick to thin provisioned and vice versa?	Yes
l.	Does the array support space reclamation on existing thin provisioned LUNs?	Yes
m.	Can individual LUNs be manually migrated between disk types in a storage pool without down time on the system using the LUN?	Yes
n.	Does the array support the exclusion of particular LUNs from automatic tiering?	Yes
o.	Are full copies (clones) of LUNs available for use immediately after initiating clone operation?	Yes

p.	Are full copies (clones) mountable by a different host?	Yes
q.	Does the replication technology in the array support both local and remote protection?	Yes
r.	Does the storage array utilize 10Gbps Ethernet for the NAS (CIFS/NFS) functionality?	Yes
s.	Does the storage array support NDMP for backup of raw file systems?	Yes
t.	Does the NDMP support allow for file and folder level restoration without the need to restore the entire NAS file system containing those items?	Yes
u.	Does the CIFS file server support Windows 2008 R2 native-mode Active Directory domains?	Yes
v.	Does the CIFS file server support Volume Shadow Copy to allow end-user or support staff recovery of files and folders using the "Previous Versions" features built into the Windows client operating systems when utilizing snapshot technology on the CIFS file shares?	Yes
w.	Does the CIFS file server support ABE (access-based enumeration)?	Yes
x.	Does the array support de-duplication of data presented via file protocols (CIFS/NFS)?	Yes
y.	Does the array support compression of data presented via file protocols (CIFS/NFS)?	Yes
z.	Does the array provide the ability to administer the system via a command line interface (CLI installed on a remote system or direct SSH/telnet interface)?	Yes
aa.	Does the array provide the ability to script administrative actions for bulk operations?	Yes

2.4.1.1 SSD Support

Does the array support the use of solid state drives (SSD) or enterprise flash drives (EFD) as an extension of read/write cache to enhance performance and alleviate hot spots from sudden, unexpected spikes in workload? If yes, response should provide details on how this works within the array and any limitations of this technology.

Vendor Response:
Y e s. FAST Cache is a performance optimization feature that accelerates application

performance by up to 200 percent. Using Enterprise Flash Drives (EFD) to extend existing cache capacities, FAST Cache automatically absorbs unpredicted "spikes" in application workloads whether the IO is read or write.

Key FAST Cache features include:

- Support for up to 2 TB usable capacity
- Supports read and write operations
- Simple configuration and monitoring via Unisphere
- Non-disruptive integration
- Maintains data contents on failover to avoid re-warming the FAST Cache

2.4.1.2 Total Active Paths

How many total active paths does a host have to an individual LUN?

Vendor Response:
It depends on the number of initiators in the host but a LUN can be accessed from both storage processors in the array via an ALUA.

2.4.1.3 Total Bandwidth Available

What is the total bandwidth available for a host to an individual LUN?

Vendor Response:
The VNX series is specifically designed to allow for simple expansion of connectivity as well as the option to add new interconnect technologies including 8 GB FC and 10Gb iSCSI. With Hot-pluggable Flexible I/O Modules, users can install additional front-end connectivity for up to 32 total ports. The introduction of new I/O types will provide further scalability through greater bandwidth per port.

2.4.1.4 Supported Drives and Enclosures

What is the total number of drives and drive enclosures supported by the array (expandability)?

Vendor Response:
VBlocks are not field upgradeable; 125 drives

2.4.1.5 External Key Management Support

When implementing the data-at-rest encryption does the array provide internal key management system, utilize (or require) an external key management system or rely on drive-based encryption without the need for a key management system?

> Vendor Response:
> Requires an external key management system.

2.4.1.6 Storage Pool Tiers
How many tiers of storage (drive types) may be placed in a single storage pool?

> Vendor Response:
> System must be able to dynamically optimize data placement across 2 or 3 tiers of data storage (e.g. Flash, SAS, and NL-SAS) based on user policy.

2.4.1.7 Automatic Data Tiering
Does the array support automatic data tiering within a configured storage pool to allow migration of data to higher or lower speed disks based on an activity algorithm? If yes, response should explain how the automatic data tiering works in the proposed unified storage array.

> Vendor Response:
> The expansion is simply done by adding enough drives of a particular tier to form a standard private RAID group. We recommend increments of 5 for RAID-5 and increments of 8 for RAID-6.

2.4.1.8 Automatic Tiering Policies
Does the array support policies on automatic tiering to allow SAN administrators to designate particular LUNs that should only be migrated to higher (or lower) speed disks? If yes, response should explain how this functionality is implemented in the proposed array.

> Vendor Response:
> For FastVP a heat map is maintained for 1GB chunks across the storage array. The monitoring is continuous and the heat map is essentially a geometric moving average, which favors recent data over older data and ranks each slice in the pool.

2.4.1.9 Scheduled Policy Changes
Does the array allow scheduled policy changes for the automatic tiering of individual LUNs based on regularly occurring events? (An example would be the ability to schedule a particular LUN to only be migrated to higher speed disks during a time period that is known to be very busy).

> Vendor Response:
> **Yes.** Customers can define data movement schedules to minimize FAST management responsibilities.

2.4.1.10 Dynamic Storage Pool Expansion

Does the array allow dynamic expansion of storage pools through the addition or more drives and/or RAID arrays into the storage pool? If yes, response should provide details on how this feature is implemented and any limitations imposed on this process.

> Vendor Response:
> Yes, virtual provisioned pools can be expanded non-disruptively.

2.4.1.11 Support for De-eduplication

Does the array support de-duplication of data contained on LUNs presented via block level protocol (FC/FCoE/iSCSI)? If yes, response should explain this functionality on the proposed array.

> Vendor Response:
> No.

2.4.1.12 Snapshot Counts

How many snapshots of a single LUN can be made? Response should include any details on performance degradation when utilizing multiple snapshots on a LUN.

> Vendor Response:
> Yes. RecoverPoint is able to capture 1000+ snapshot of a single LUN with no performance degradation

2.4.1.13 Snapshot Requirements

Please outline the typical storage requirement for snapshots, both individual and multiple incremental snapshots of the same LUN? Also, response should provide a brief explanation of how snapshot technology is implemented on the array.

> Vendor Response:
> Yes. RecoverPoint uses a journal to capture consistent restartable snapshots. The journal size depends on the amount of time (rollback) required to capture snapshots and the write change rates from production. Typically a 24 hour rollback can be

support by 15-20% of the production capacity.

2.4.1.14 Snapshot Capabilities

Does the replication technology in the array have the ability to take multiple snapshots of the LUNs to enable recovery or testing with copies of those LUNs at a user configurable interval? If yes, response should provide details on how this technology is implemented in the array.

Vendor Response:
Yes. RecoverPoint CDP is capable of creating 1000+ snapshots of each LUN protected with journaling. User are able to select any point in time snapshot visible in the journal, bring the image online to an alternate host, determine if this is the correct data to be recovered, then restore that data to production. Other options would be to click a button and failover to the alternate host or extract data from the mount data and copy back to production.

Testing can be done by leveraging image access which allows virtual access to the target replica, while replication continues with no impact (snapshots continue to be capture in the journal). SRM automates testing and leverages this function via the EMC SRA for SRM and tight integration with RecoverPoint. SRM management of a RecoverPoint consistency group can be selected from within the RecoverPoint GUI for simple configuration. All of the above is user configurable.

2.4.1.15 Bandwidth Requirements

What are the typical bandwidth requirements of the replication technology after initial seeding of the data to the remote site has been completed?

Vendor Response:
Yes. RecoverPoint offer significant bandwidth reduction technologies. It offers three levels of compression; write folding, and Avamar-based deduplication that provide typical bandwidth reduction of 9:1. Although there is no typical bandwidth requirement (based on write rate and change rate), RecoverPoint has been proven very effective in environments where bandwidth is scarce, supporting real-time replication over links as small as 3Mbit/s.

2.4.1.16 Replicated Data Compressed or De-duplicated for Bandwidth
Is the data being replicated compressed or de-duplicated to reduce bandwidth requirements?

Vendor Response:
Yes. RecoverPoint is user configurable to leverage compression and deduplication, and has granularity per consistency group.

2.4.1.17 Replicated Data Encrypted Between Arrays
Is the data being replicated encrypted between the source and destination arrays?

Vendor Response:
No. RecoverPoint does not encrypt data natively.

2.4.1.18 Replication and RPO Goals
Does the replication technology support RPO goals of 15 minutes or less using asynchronous replication to a remote site? Response should detail any bandwidth or latency requirements to meet this goal.

Vendor Response:
Yes. RecoverPoint support both synchronous and asynchronous replication and can architected and granularly configured per consistency group for an RPO of 15 minutes for less.

2.4.1.19 CAS/WORM Array Support
Does the array have the capability to serve as a CAS/WORM device to replace optical storage systems? If so, what level of compliance does the CAS functionality provide?

Vendor Response:
Yes, the VNX platform supports FLR (File Level Retention). FLR-E protects data content from changes made by users through CIFS, NFS, and FTP. FLR-C protects data content from changes made by users through CIFS, NFS, and FTP, from changes made by administrators, and also meets the requirements of SEC rule17a-4(f).

2.4.2 Server Hardware

The following sets of questions are explanation based, concerning the **Server Hardware** that may be proposed. Each question should be responded to on Attachment A. Some questions will require a "yes or no" response while others will require a more detailed response on Attachment A.

The following sets of questions are explanation based, concerning the Server Hardware that may be proposed.

a.	Do the proposed servers support 16GB DIMMs?	Yes
b.	Do the proposed servers support 32GB DIMMs?	No
c.	Do the proposed servers contain more than the required minimum of 192GB RAM per server?	No

2.4.2.1 Total Available Processing Power
What is the total available processing power of the servers in the proposed solution? Response should provide a breakdown on core count, core speed and total processing power (GHz) for the proposed servers.

> Vendor Response:
> 7 blades with 2 Intel Xeon X5690 3.46GHz /6c/130W/12MB cache/DDR3 1333MHz per blade

2.4.2.2 Maximum DIMM Capacity
How many DIMMs can the servers in the proposed solution hold (without add-ons)?

> Vendor Response:
> Total memory supported is 192Gb (six DIMMS per CPU)

2.4.2.3 DIMM Add-on Capability
Are add-ons (drawers, trays, add-on blades, etc.) available to increase the number of DIMMs that can be installed in a server? If so, what is the maximum number of DIMMs that can be installed in the servers with any available add-ons?

> Vendor Response:

Total memory supported is 192Gb (six DIMMS per CPU)

2.4.2.4 Maximum RAM With Add-ons

What is the maximum RAM supported by the servers without add-ons (drawers, trays, etc.)? With add-ons?

Vendor Response:
192Gb; with add-ons N/A

2.4.2.5 DIMM Size and Speed in Proposal

What size and speed DIMMs are being used in the proposed server configuration? Response should provide a detailed description of the RAM layout utilized on the servers.

Vendor Response:
16GB DDR3-1066MHz RDIMM/PC3-8500/quad rank/Low-Dual Volt

2.4.2.6 If proposing Rack Mount Servers:

2.4.2.6.1 How many available PCI-Express slots do the servers in the configuration have?

Vendor Response:
This does not apply since server blade technology is being used.

2.4.2.6.2 What is the speed of the PCI-Express slots in the servers? Please provide a detailed listing of the available PCI-e expansion slots and their speeds and note which are already populated.

Vendor Response:
This does not apply since server blade technology is being used.

2.4.2.7 If proposing Blade Servers:

2.4.2.7.1 How many total slots are in the proposed chassis?

Vendor Response:
8 slots per chassis with 1 chassis included in the solution

2.4.2.7.2 Are the blade chassis in this proposal equipped with all required power supplies, fans and I/O modules/switches to support fully populating the blade chasses without additional cost beyond the purchase of the blade servers?

Vendor Response:
Yes

2.4.2.7.3 How many slots are used by the servers included in this proposal?

Vendor Response:
7

2.4.3 Network Switches

The following sets of questions are explanation based, concerning the **Network Switches** that may be proposed. Each question should be responded to on Attachment A. Some questions will require a "yes or no" response while others will require a more detailed response on Attachment A.

a.	Due to the core competency of the WVSTO staff as well as other WV state agencies we would prefer to continue utilizing Cisco networking equipment within our data center for Ethernet connectivity. Does the proposed solution include Cisco network equipment?	Yes
b.	Does the proposed solution include licenses for VMware distributed virtual switch modules to allow both the physical and virtual network infrastructure to be managed through a common interface (whether command line, browser-based GUI, etc.)?	Yes

2.4.3.1 Expansion Capabilities

Does the network equipment for server connectivity in the proposed solution have expansion capabilities (port modules, etc.), and, are those expansion slots available for future use or populated as part of the proposed solution? If yes, response should detail the expansion capabilities of the proposed network switches.

Vendor Response:
Yes. The proposed solution contains two (2) Cisco 5548 switches which include 48 ports per switch.

2.4.3.2 Multi-protocol Support

Does the proposed network equipment include, or have the capability to support, other network protocols, specifically FCoE (fibre channel over Ethernet) and iSCSI? If yes, response should outline any additional modules or license costs to enable the support of these protocols on the proposed network switches.

Vendor Response:
Yes

2.4.4 General Solution

The following sets of questions are explanation based concerning the **General Solution** being proposed. Each question should be responded to on Attachment A. Some questions will require a "yes or no" response while others will require a more detailed response on Attachment A.

a.	Does the proposed solution include a centralized, unified monitoring system that gives overall status information about the hardware included in the solution (switches, storage and servers)?	No
b.	Does the proposed solution include a single point of contact for all support issues (hardware and software) when utilized to run a vSphere environment?	No
c.	Does the propose solution include direct OEM support from the vendors of each component utilized in the solution to allow escalation of support issues to the OEM technicians by either the WVSTO or our single point of support for the propose solution?	No
d.	Does the proposed solution include regular (quarterly or bi-annually), pre-tested and validated firmware updates direct from a single source to allow the WVSTO to keep all hardware in the solution up-to-date without having to go through internal research, testing and validation of firmware as it is released by the OEMs?	No
e.	The proposed solution should take into consideration existing WVSTO licensing and should only include software licensing that is necessary to support the proposed solution that is not already owned by the WVSTO (see appendix for list of current VMware licensing). Have you taken existing WVSTO licensing into account and only included additional licenses, not already owned by the WVSTO in your proposed solution?	Yes

2.4.4.1 Form of Shipment

Does the proposed solution ship as a single unit (all hardware racked, all internal power, network, SAN and other cables connected) ready to connect to power and core networking equipment and begin deployment and configuration of storage, networking and the vSphere environment?

Vendor Response:
The devices will arrive at the client site and be installed in existing racks.

2.4.4.2 Separation of Network Traffic

The WVSTO would like to keep the network traffic for the hosts, the network traffic for hardware management and the storage network traffic separated. This serves a few purposes, the first being segregation of traffic with dedicated resources for each type of traffic, to try and insure peak performance of the solution; the second being the ability to keep the management traffic on high performance (gigabit), but lower-cost switches that don't need the capabilities of the switches used to connect the VMware hosts to the network.

Vendor Response:
Network traffic is physically separated from the fiber interconnects for network and storage via dedicated ports and uplinks to the Layer 2 switches, dedicated ports and links to the MDS switches and dedicated switches for management hardware.

2.4.4.2.1 Does the propose solution include separate switch infrastructure for the hosts, the hardware and storage (fibre channel) networks? If yes, response should provide some details on the internal network layout of the proposed solution and how it meets this goal.

Vendor Response:
Yes. Data flow and management infrastructure has been separated and is supported by its own unique switches.

2.4.4.3 Centralized Management System

Does the proposed solution include a centralized, unified management system that allows baseline configuration tasks to be performed? If it does, can the following tasks be performed through this management system? If so, response should outline the following capabilities to perform that function.

Vendor Response:
No, with the exception of fibre switches and the host network.

2.4.4.3.1 Define VLANs available (trunked) into the network switches from the core network.

> Vendor Response:
> Data flow and management infrastructure has been separated and is supported by its own unique switches. This separation is configurable in many ways using the equipment being proposed.

2.4.4.3.2 Define storage available to the various vSphere clusters.

> Vendor Response: N/A

2.4.4.3.3 Deployment of operating system (vSphere, Windows, etc.) to the physical servers included in the solution from user-provided ISO images.

> Vendor Response: N/A

2.4.4.3.4 Creation of vCenter instances to manage vSphere hosts.

> Vendor Response: N/A

2.4.4.3.5 Does the management system provide any additional capabilities not outlined above? If it does, response should detail any notable capabilities.

> Vendor Response:
> No.

ATTACHMENT B: MANDATORY SPECIFICATION CHECKLIST

2.5 MANDATORY REQUIREMENTS

AdvizeX validates that your mandatory requirements have been met by our response to this RFP. We look forward to discussing the technical details and actual findings that we used to build our solution during the oral presentation.

2.5.1 Unified Storage Platform

2.5.1.1	The unified storage systems must allow presentation of storage through block and file level protocols and meet the following requirements for usable capacity.	Yes
2.5.1.1.1	The storage array for the production center must provide a minimum usable capacity of at least 17TB for virtualized servers in a dedicated physical or virtual storage pool.	Yes
2.5.1.1.2	The storage array for the production data center must provide a minimum useable capacity of 5 TB for NAS file shares in a dedicated physical or virtual storage pool.	Yes
2.5.1.1.3	The storage array for the production data center must provide a minimum useable capacity of 3 TB for virtual desktops in a dedicated physical or virtual storage pool. Affirm:	Yes
2.5.1.1.4	The storage array for the disaster recovery data center must provide a minimum useable capacity of 17 TB for replicated virtual servers.	Yes
2.5.1.1.5	The storage array for the disaster recovery data center must provide a minimum useable capacity of 5 TB for replicated NAS file shares.	Yes
2.5.1.1.6	The storage array for the DR data center must provide a min useable capacity of 3 TB for replicated virtual desktops.	Yes
2.5.1.1.7	The storage array for the disaster recovery data center must provide a minimum additional useable capacity of 10 TB.	Yes
2.5.1.2	The proposed storage array must be a unified storage array that allows presentation of storage via block (Fibre Channel) and file (CIFS, NFS) protocols.	Yes
2.5.1.3	The proposed storage array must have a minimum of 4Gbps fibre channel connectivity to the SAN switch infrastructure.	Yes

2.5.1.4	The proposed storage array must have two storage controllers for the block level protocol in an active/active configuration with at least two fibre channel connections to the SAN switch infrastructure providing a total of 4 paths to the storage array.	Yes
2.5.1.5	The proposed storage array must have two filers for the file level protocols in an active/passive or active/active configuration with at least two (2) 1Gbps or two (2) 10Gbps Ethernet connections per filer to the network infrastructure.	Yes
2.5.1.6	The proposed storage array for the production data center must provide a minimum of 20,000 IOPS dedicated to the virtualized server environment.	Yes
2.5.1.7	The proposed storage array for the production data center must provide a minimum of 8,000 IOPS dedicated to the virtual desktop environment.	Yes
2.5.1.8	The proposed storage array for the production data center must provide dedicated capacity to support NAS file shares for up 120 users and 3 TB of data.	Yes
2.5.1.9	The proposed storage array for the disaster recovery site must provide a minimum of 60% of the total 10Ps of the production storage array.	Yes
2.5.1.10	The proposed storage array must support Solid State Drives (SSD) or Enterprise Flash Drives (EFD) (Tier 0).	Yes
2.5.1.11	The proposed storage array must support high speed (10K and 15K RPM) Fibre Channel (FC) or Serial Attached SCSI (SAS) drivers (Tier 1 and Tier 2).	Yes
2.5.1.12	The proposed storage array must support 7.2K RPM near-line SAS or ATA drives (Tier 3).	Yes
2.5.1.13	The proposed storage array must support virtual (thin) provisioning for volumes presented via block level (FC) protocol.	Yes
2.5.1.14	The unified storage systems must support the ability to do snapshots and clones of volumes presented via block level protocols. It must also support the ability to do snapshots of the file systems presented via file level protocols.	Yes
2.5.1.15	The proposed storage array must include the ability to make clones of volumes presented via block-level (FC) protocol.	Yes
2.5.1.16	The proposed storage array must include the ability to take snapshots of volumes presented via block-level (FC) protocol.	Yes
2.5.1.17	The proposed storage array must include the ability to take snapshots of file systems presented via file-level protocols (CIFS, NFS).	Yes

2.5.1.18	The proposed storage array must include IP-based, asynchronous replication for the storage presented via block level (FC) protocol.	Yes
2.5.1.19	The proposed storage array must include IP-based, asynchronous replication for the file systems presented via file level (CIFS, NFS) protocols.	Yes
2.5.1.20	The proposed storage array must have the capability to support data-at-rest encryption. *(Oral presentation discussion needs to take place)*	No
2.5.1.21	The proposed storage array must have a single, unified management tool that allows the configuration and monitoring of all features and functionality of the array.	Yes
2.5.1.22	The proposed storage array must support all of the primitives defined in the VMware vSphere API for Array Integration (VAAI) specifications for vSphere 5.0 for storage presented via block level (FC) protocol.	Yes
2.5.1.23	The proposed storage array must include full, active-active, load balanced multi-path support for connected VMware vSphere 5.0 hosts (not the default most recently used or round robin provided by VMware).	Yes
2.5.1.24	The proposed storage array must include plug-ins for VMware vCenter to enable the creation and management of LUNs (from assigned storage pools) for the vSphere environment to ensure proper alignment and optimization of the LUNs.	Yes
2.5.1.25	The proposed array must include replication technology that integrates with VMware Site Recovery Manager (SRM) 5.0 to allow SRM to leverage the native replication technologies of the array to copy data to the disaster recovery site.	Yes
2.5.1.26	The proposed array must have the capability to enable call-home functionality for sending hardware alerts to the OEM when failures are detected on the array to enable rapid, pro-active response from technical support to replace or repair defective hardware.	Yes
2.5.1.27	The unified storage systems must have an expected product life of at least 5 years.	Yes
2.5.1.28	The unified storage systems must include 5 years of support with a guaranteed response time of 4 hours and 24x7x365 availability coverage.	Yes

2.5.2 Fibre Channel Switches

2.5.2.1	The proposed solution shall include two independent fibre channel switches at each site.	Yes
2.5.2.2	The fibre channel switches must have autosensing 8 Gbp/s ports (support 8/4/2 Gbp/s).	Yes
2.5.2.3	The proposed fibre channel switches must have management capabilities via a command line interface (telnet/SSH).	Yes
2.5.2.4	The proposed fibre channel switches must have a browser-based management interface.	Yes
2.5.2.5	The proposed fibre channel switches must include some internal diagnostics.	Yes
2.5.2.6	The proposed fibre channel switches must include native alerting and reporting (without the need for a monitoring server).	Yes
2.5.2.7	The proposed fibre channel switches must include a native way to display performance Metrics.	Yes
2.5.2.8	The proposed fibre channel switch configuration must support non-disruptive firmware upgrades.	Yes
2.5.2.9	The proposed fibre channel switches must have the capability to be either an NPV edge device or an NPIV core device.	Yes
2.5.2.10	The proposed fibre channel switches must have the capability to support multiple fabric environments in a single physical switch.	Yes
2.5.2.11	The proposed fibre channel switches must support aggregated 1SL (inter-switch link) connectivity; i.e., several physical ISLs behaving as one virtual 1SL,	Yes
2.5.2.12	The proposed fibre channel switches must support traffic engineering using FSPF.	Yes
2.5.2.13	The fibre channel switches must have at least 12 ports active each.	Yes
2.5.2.14	The fibre channel switches must have at least 24 ports total each.	Yes
2.5.2.15	The fibre channel switches must have redundant power supplies and fans.	Yes
2.5.2.16	The fibre channel switches must have an expected product life of at least 5 years.	Yes
2.5.2.17	The fibre channel switches must include 5 years of support with a guaranteed response time of 4 hours and 24x7x365 coverage.	Yes

2.5.3 Network Switches

2.5.3.1	The network switch(es) must support both 10Gbp/s and 1Gbp/s connectivity.	Yes
2.5.3.2	The network switch(es) must have a minimum of 16 ports available for connection of additional network devices not included in the proposed solution.	Yes
2.5.3.3	The network switch(es) must have redundant power supplies and fans.	Yes
2.5.3.4	The network switch(es) used for server connectivity must include layer 3 support (if a dedicated management network is present it does not need to support layer 3). **A more detailed discussion of these features will take place during our oral presentation.**	Yes
2.5.3.5	The network switch(es) must support Link Aggregation Control Protocol (LACP): IEEE 802.3ad.	Yes
2.5.3.6	The network switch(es) must support VLAN trunking.	Yes
2.5.3.7	The network switch(es) must support IEEE 802.1Q VLAN encapsulation.	Yes
2.5.3.8	The network switch(es) must support Jumbo Frames on all ports (up to 9216 bytes).	Yes
2.5.3.9	The network switch(es) must support CLI management (console, telnet and/or SSH).	Yes
2.5.3.10	The network switch(es) must support SNMP.	Yes
2.5.3.11	The network switches must have an expected product life of at least 5 years.	Yes
2.5.3.12	The network switches must include 5 years of support with a guaranteed response time of 4 hours and 24x7x365 coverage.	Yes

2.5.4 Server Hardware

2.5.4.1	There must be at least 7 identically configured servers per site (production and DR), 14 servers in total.	Yes
2.5.4.2	The proposed servers must be dual CPU socket servers.	Yes
2.5.4.3	The proposed servers must use 6-core Intel 5600 series or 10-core Intel E7 series processors or superior.	Yes
2.5.4.4	Each server must have at least 192GB of RAM installed with all RAM running at full clock speed (no clock speed step down across memory channels).	Yes
2.5.4.5	Each server must include a minimum of two (2) 10Gbp/s network connections.	Yes
2.5.4.6	Each server must include a minimum of two (2) 8Gbp/s fibre channel (SAN) connections.	Yes
2.5.4.7	The servers must include remote management capabilities (DRAC, ILO or equivalent).	Yes
2.5.4.8	The servers must have fully redundant internal components (power supplies, fans, etc.).	Yes
2.5.4.9	The servers must have an expected product life of at least 5 years.	Yes
2.5.4.10	The servers must include 5 years of support with a guaranteed response time of 4 hours and 24x7x365 coverage.	Yes

2.5.5 Rack Mount Servers (If this solution is proposed)

2.5.5.1	All of the PCI-Express slots in the servers must run at a minimum of 4x speed.	N/A
2.5.5.2	The servers must have at least two available PCI-Express slots for expansion capabilities.	N/A

2.5.6 Blade Servers (If this solution is proposed)

2.5.6.1	In the proposed blade solution the individual blade servers at each site must be split as evenly as possible across two blade chassis (elimination of single point of failure and provide extra expansion capabilities through number of available slots for blades).	Yes
2.5.6.2	Each blade chassis must include fully redundant I/O and management modules.	Yes

2.5.7 Certification of Compliance

I certify that the proposal submitted meets or exceeds all the mandatory specifications of this Request for Proposal. Additionally, I agree to provide any additional documentation deemed necessary by the State of West Virginia to demonstrate compliance with said mandatory specifications.

AdvizeX Technologies, LLC	Company
Rob Myers	Representative
Solution Architect	Title
216-901-1818	Contact Phone Number
216-901-1447	Contact FAX Number
4/10/2012	Date

APPENDIX 1 – AGREEMENT TO GENERAL TERMS AND CONDITIONS

GENERAL TERMS & CONDITIONS
REQUEST FOR QUOTATION (RFQ) AND REQUEST FOR PROPOSAL (RFP)

1. Awards will be made in the best interest of the State of West Virginia.

2. The State may accept or reject in part, or in whole, any bid.

3. Prior to any award, the apparent successful vendor must be properly registered with the Purchasing Division and have paid the required $125 fee.

4. All services performed or goods delivered under State Purchase Order/Contracts are to be continued for the term of the Purchase Order/Contracts, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise available for these services or goods this Purchase Order/Contract becomes void and of no effect after June 30.

5. Payment may only be made after the delivery and acceptance of goods or services.

6. Interest may be paid for late payment in accordance with the *West Virginia Code*.

7. Vendor preference will be granted upon written request in accordance with the *West Virginia Code*.

8. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.

9. The Director of Purchasing may cancel any Purchase Order/Contract upon 30 days written notice to the seller.

10. The laws of the State of West Virginia and the *Legislative Rules* of the Purchasing Division shall govern the purchasing process.

11. Any reference to automatic renewal is hereby deleted. The Contract may be renewed only upon mutual written agreement of the parties.

12. **BANKRUPTCY:** In the event the vendor/contractor files for bankruptcy protection, the State may deem this contract null and void, and terminate such contract without further order.

13. **HIPAA BUSINESS ASSOCIATE ADDENDUM:** The West Virginia State Government HIPAA Business Associate Addendum (BAA), approved by the Attorney General, is available online at www.state.wv.us/admin/purchase/vrc/hipaa.html and is hereby made part of the agreement provided that the Agency meets the definition of a Cover Entity (45 CFR §160.103) and will be disclosing Protected Health Information (45 CFR §160.103) to the vendor.

14. **CONFIDENTIALITY:** The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in http://www.state.wv.us/admin/purchase/privacy/noticeConfidentiality.pdf.

15. **LICENSING:** Vendors must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, and the West Virginia Insurance Commission. The vendor must provide all necessary releases to obtain information to enable the director or spending unit to verify that the vendor is licensed and in good standing with the above entities.

16. **ANTITRUST:** In submitting a bid to any agency for the State of West Virginia, the bidder offers and agrees that if the bid is accepted the bidder will convey, sell, assign or transfer to the State of West Virginia all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to the bidder.

I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, or person or entity submitting a bid for the same material, supplies, equipment or services and is in all respects fair and without collusion or Fraud. I further certify that I am authorized to sign the certification on behalf of the bidder or this bid.

INSTRUCTIONS TO BIDDERS

1. Use the quotation forms provided by the Purchasing Division. Complete all sections of the quotation form.

2. Items offered must be in compliance with the specifications. Any deviation from the specifications must be clearly indicated by the bidder. Alternates offered by the bidder as EQUAL to the specifications must be clearly defined. A bidder offering an alternate should attach complete specifications and literature to the bid. The Purchasing Division may waive minor deviations to specifications.

3. Unit prices shall prevail in case of discrepancy. All quotations are considered F.O.B. destination unless alternate shipping terms are clearly identified in the quotation.

4. All quotations must be delivered by the bidder to the office listed below prior to the date and time of the bid opening. Failure of the bidder to deliver the quotations on time will result in bid disqualifications: Department of Administration, Purchasing Division, 2019 Washington Street East, P.O. Box 50130, Charleston, WV 25305-0130

5. Communication during the solicitation, bid, evaluation or award periods, except through the Purchasing Division, is strictly prohibited (W.Va. C.S.R. §148-1-6.6).

Rev. 11/09/11

APPENDIX 2 – RFP CONTACT INFORMATION VERIFICATION

State of West Virginia Department of Administration Purchasing Division 2019 Washington Street East Post Office Box 50130 Charleston, WV 25305-0130	**Request for Quotation**	RFQ NUMBER STO12007	PAGE 5

ADDRESS CORRESPONDENCE TO ATTENTION OF:
FRANK WHITTAKER
304-558-2316

RFQ COPY
TYPE NAME/ADDRESS HERE

VENDOR

SHIP TO
STATE TREASURER
MAIN CAPITOL BUILDING
SUITE E-145

CHARLESTON, WV
25305   304-343-4000

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
03/06/2012				

BID OPENING DATE: 04/10/2012   BID OPENING TIME   01:30PM

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT

PLEASE PROVIDE A FAX NUMBER IN CASE IT IS NECESSARY
TO CONTACT YOU REGARDING YOUR BID:

CONTACT PERSON (PLEASE PRINT CLEARLY):

*****   THIS IS THE END OF RFQ   STO12007 ****** TOTAL: _____

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE		TELEPHONE	DATE
TITLE	FEIN		ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

APPENDIX 3 – VENDOR PREFERENCE CERTIFICATE

AdvizeX has not applied for Vendor Preference

Rev 09/08

State of West Virginia
VENDOR PREFERENCE CERTIFICATE

Certification and application* is hereby made for Preference in accordance with *West Virginia Code*, §5A-3-37. (Does not apply to construction contracts). *West Virginia Code*, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the *West Virginia Code*. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Resident Vendor Preference, if applicable.

1. Application is made for 2.5% resident vendor preference for the reason checked:
   Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; or,
   Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or 80% of the ownership interest of Bidder is held by another individual, partnership, association or corporation resident vendor who has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or,
   Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; or,

2. Application is made for 2.5% resident vendor preference for the reason checked:
   Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,

3. Application is made for 2.5% resident vendor preference for the reason checked:
   Bidder is a nonresident vendor employing a minimum of one hundred state residents or is a nonresident vendor with an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia employing a minimum of one hundred state residents who certifies that, during the life of the contract, on average at least 75% of the employees or Bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,

4. Application is made for 5% resident vendor preference for the reason checked:
   Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; or,

5. Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:
   Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; or,

6. Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:
   Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) reject the bid; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential.

Under penalty of law for false swearing (West Virginia Code, §61-5-3), Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.

Bidder: _____   Signed: _____

Date: _____   Title: _____

*Check any combination of preference consideration(s) indicated above, which you are entitled to receive.

APPENDIX 4 – PURCHASING AFFIDAVIT

RFQ No. _JT012007_

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

West Virginia Code §5A-3-10a states: No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owed is an amount greater than one thousand dollars in the aggregate.

DEFINITIONS:
"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Debtor" means any individual, corporation, partnership, association, limited liability company or any other form or business association owing a debt to the state or any of its political subdivisions. "Political subdivision" means any county commission; municipality; county board of education; any instrumentality established by a county or municipality; any separate corporation or instrumentality established by one or more counties or municipalities, as permitted by law; or any public body charged by law with the performance of a government function or whose jurisdiction is coextensive with one or more counties or municipalities. "Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceed five percent of the total contract amount.

EXCEPTION: The prohibition of this section does not apply where a vendor has contested any tax administered pursuant to chapter eleven of this code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

Under penalty of law for false swearing (*West Virginia Code* §61-5-3), it is hereby certified that the vendor affirms and acknowledges the information in this affidavit and is in compliance with the requirements as stated.

WITNESS THE FOLLOWING SIGNATURE

Vendor's Name: _Advizex Technologies_
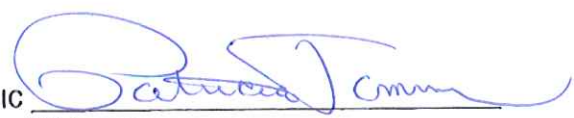
Authorized Signature: _Cindy Manley_   Date: _3/30/12_

State of _OHIO_

County of _Cuyahoga_ , to-wit:

Taken, subscribed, and sworn to before me this _30th_ day of _March_ , 20_12_.

My Commission expires _2\6_ , 20_17_.

AFFIX SEAL HERE   NOTARY PUBLIC _[signature]_

PATRICIA A. TOMMEL
Notary Public
State of Ohio
My Commission Expires February 06 20?

Purchasing Affidavit (Revised 12/15/09)