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	PAGE
STO12007	1

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

VENDOR
RFQ COPY
TYPE NAME/ADDRESS HERE

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
0001	1	LS		205-05		

COMPUTER NETWORK INFRASTRUCTURE

REQUEST FOR PROPOSAL
(RFP)

THE WEST VIRGINIA PURCHASING DIVISION, FOR THE THE WEST VIRGINIA STATE TREASURER'S OFFICE, IS SOLICITING PROPOSALS FOR REPLACEMENT OF NETWORK INFRASTRUCTURE COMPONENTS PER THE ATTACHED SPECIFICATIONS.

MANDATORY PRE-BID

A MANDATORY PRE-BID WILL BE HELD ON 3/16/12 AT 10:30 A RM EB96, BLDG. 1, 1900 KANAWHA BLVD. E. CHARLESTON. ALL INTERESTED PARTIES ARE REQUIRED TO ATTEND THIS MEETING. FAILURE TO ATTEND THE MANDATORY PRE-BID SHALL RESULT IN DISQUALIFICATION OF THE BID. NO ONE PERSON MAY REPRESENT MORE THAN ONE BIDDER.

AN ATTENDANCE SHEET WILL BE MADE AVAILABLE FOR ALL POTENTIAL BIDDERS TO COMPLETE. THIS WILL SERVE AS THE OFFICIAL DOCUMENT VERIFYING ATTENDANCE AT THE MANDATORY PRE-BID. FAILURE TO PROVIDE YOUR COMPANY AND REPRESENTATIVE NAME ON THE ATTENDANCE SHEET WILL RESULT IN DISQUALIFICATION OF THE BID. THE STATE WILL NOT ACCEPT ANY OTHER DOCUMENTATION TO VERIFY ATTENDANCE. THE BIDDER IS RESPONSIBLE FOR ENSURING THEY HAVE COMPLETED THE INFORMATION REQUIRED ON THE ATTENDANCE SHEET. THE PURCHASING DIVISION AND THE STATE AGENCY WILL NOT ASSUME ANY RESPONSIBILITY FOR A BIDDER-S FAILURE TO COMPLETE THE PRE-BID ATTENDANCE SHEET. IN

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'

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).

State of West Virginia
Department of Administration
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2019 Washington Street East
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ADDITION, WE REQUEST THAT ALL POTENTIAL BIDDERS INCLUDE THEIR E-MAIL ADDRESS AND FAX NUMBER.

ALL POTENTIAL BIDDERS ARE REQUESTED TO ARRIVE PRIOR TO THE STARTING TIME FOR THE PRE-BID. BIDDERS WHO ARRIVE LATE, BUT PRIOR TO THE DISMISSAL OF THE TECHNICAL PORTION OF THE PRE-BID WILL BE PERMITTED TO SIGN IN. BIDDERS WHO ARRIVE AFTER CONCLUSION OF THE TECHNICAL PORTION OF THE PRE-BID, BUT DURING ANY SUBSEQUENT PART OF THE PRE-BID WILL NOT BE PERMITTED TO SIGN THE ATTENDANCE SHEET.

ALL TECHNICAL QUESTIONS MUST BE SUBMITTED IN WRITING TO FRANK WHITTAKER IN THE WV PURCHASING DIVISION VIA EMAIL AT FRANK.M.WHITTAKER@WV.GOV OR VIA FAX AT 304-558-4115. DEADLINE FOR ALL TECHNICAL QUESTIONS IS 03/20/12 AT 4:00 PM. ALL TECHNICAL QUESTIONS WILL BE ADDRESSED BY ADDENDUM AFTER THE DEADLINE.

NOTICE TO PROCEED: THE SOLUTION IS TO BE INSTALLED AND OPERATIONAL WITHIN 75 CALENDAR DAYS AFTER THE NOTICE TO PROCEED IS RECEIVED. UNLESS OTHERWISE SPECIFIED, THE FULLY EXECUTED PURCHASE ORDER WILL BE CONSIDERED NOTICE TO PROCEED.

LIFE OF CONTRACT: THE ANNUAL MAINTENANCE WILL BE ADDED BY CHANGE ORDER AND EXTEND FOR A PERIOD OF ONE (1) YEAR OR UNTIL SUCH "REASONABLE TIME" THEREAFTER AS IS NECESSARY TO OBTAIN A NEW CONTRACT OR RENEW THE ORIGINAL CONTRACT. THE "REASONABLE TIME" PERIOD SHALL NOT EXCEED TWELVE (12) MONTHS. DURING THIS "REASONABLE TIME" THE VENDOR MAY TERMINATE THIS CONTRACT FOR ANY REASON UPON GIVING THE DIRECTOR OF PURCHASING 30 DAYS WRITTEN NOTICE.

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE	TELEPHONE	DATE

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UNLESS SPECIFIC PROVISIONS ARE STIPULATED ELSEWHERE IN THIS CONTRACT DOCUMENT BY THE STATE OF WEST VIRGINIA, ITS AGENCIES, OR POLITICAL SUBDIVISIONS, THE TERMS, CONDITIONS, AND PRICING SET FORTH HEREIN ARE FIRM FOR THE LIFE OF THE CONTRACT.

RENEWAL: THIS CONTRACT MAY BE RENEWED UPON THE MUTUAL WRITTEN CONSENT OF THE SPENDING UNIT AND VENDOR, SUBMITTED TO THE DIRECTOR OF PURCHASING THIRTY (30) DAYS PRIOR TO THE EXPIRATION DATE. SUCH RENEWAL SHALL BE IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THE ORIGINAL CONTRACT AND SHALL BE LIMITED TO FOUR (4) ONE (1) YEAR PERIODS.

CANCELLATION: THE DIRECTOR OF PURCHASING RESERVES THE RIGHT TO CANCEL THIS CONTRACT IMMEDIATELY UPON WRITTEN NOTICE TO THE VENDOR IF THE COMMODITIES AND/OR SERVICE SUPPLIED ARE OF AN INFERIOR QUALITY OR DO NOT CONFORM TO THE SPECIFICATIONS OF THE BID AND CONTRACT HEREIN.

OPEN MARKET CLAUSE: THE DIRECTOR OF PURCHASING MAY AUTHORIZE A SPENDING UNIT TO PURCHASE ON THE OPEN MARKET, WITHOUT THE FILING OF A REQUISITION OR COST ESTIMATE, ITEMS SPECIFIED ON THIS CONTRACT FOR IMMEDIATE DELIVERY IN EMERGENCIES DUE TO UNFORESEEN CAUSES (INCLUDING BUT NOT LIMITED TO DELAYS IN TRANS-PORTATION OR AN UNANTICIPATED INCREASE IN THE VOLUME OF WORK.)

BANKRUPTCY: IN THE EVENT THE VENDOR/CONTRACTOR FILES FOR BANKRUPTCY PROTECTION, THE STATE MAY DEEM THE CONTRACT NULL AND VOID, AND TERMINATE SUCH CONTRACT WITHOUT FURTHER ORDER.

THE TERMS AND CONDITIONS CONTAINED IN THIS CONTRACT

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

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Department of Administration
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SHALL SUPERSEDE ANY AND ALL SUBSEQUENT TERMS AND CONDITIONS WHICH MAY APPEAR ON ANY ATTACHED PRINTED DOCUMENTS SUCH AS PRICE LISTS, ORDER FORMS, SALES AGREEMENTS OR MAINTENANCE AGREEMENTS, INCLUDING ANY ELECTRONIC MEDIUM SUCH AS CD-ROM.

REV. 01/17/2012

NOTICE

A SIGNED BID MUST BE SUBMITTED TO:

DEPARTMENT OF ADMINISTRATION
PURCHASING DIVISION
BUILDING 15
2019 WASHINGTON STREET, EAST
CHARLESTON, WV 25305-0130

THE BID SHOULD CONTAIN THIS INFORMATION ON THE FACE OF THE ENVELOPE OR THE BID MAY NOT BE CONSIDERED:

SEALED BID

BUYER: 44

RFQ. NO.: STO12007

BID OPENING DATE: 04/10/2012

BID OPENING TIME: 1:30 PM

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE	TELEPHONE	DATE

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Department of Administration
Purchasing Division
2019 Washington Street East
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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
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WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

Rev. 8/1/11

REQUEST FOR PROPOSAL
WV State Treasurer's Office
RFP# STO12007

TABLE OF CONTENTS

SECTION ONE: GENERAL INFORMATION

1.1 Purpose: The Purchasing Division, hereinafter referred to as the "State," is soliciting proposals pursuant to **West Virginia Code** §5A-310b, for the WV State Treasurer's Office, hereinafter referred to as the "Agency", for a new data center infrastructure, to replace the existing equipment that is described in section 2.2. The proposed data center infrastructure will need to meet the technical requirements outlined in this document as well as fulfill the business needs and goals described in section 2.4.

1.2 By signing and submitting its proposal, the successful Vendor agrees to be bound by all the terms contained in this RFP.

A Request for Proposal (RFP) is generally used for the procurement of services in situations where price is not the sole determining factor and the award will be based on a combination of cost and technical factors (Best Value). Through its proposal, the bidder offers a solution to the objectives, problem, or need specified in the RFP, and defines how it intends to meet (or exceed) the RFP requirements.

1.2.1 Compliance with Laws and Regulations: The Vendor shall procure all necessary permits and licenses to comply with all applicable Federal, State, or municipal laws, along with all regulations, and ordinances of any regulating body.

The Vendor shall pay any applicable sales, use or personal property taxes arising out of this contract and the transactions contemplated thereby. Any other taxes levied upon this contract shall be borne by the Vendor. It is clearly understood that the State of West Virginia is exempt from any taxes regarding performance of the scope of work of this contract.

1.3 Schedule of Events:

Vendors Written Questions Submission Deadline	03/20/2012
Mandatory Pre-bid Conference	03/16/2012
Addendum Issued	TBD
Bid Opening Date	04/10/12
Oral Presentation *(Agency Option) TBD*	TBD

1.4 **Mandatory Pre-bid Conference**: A mandatory pre-bid will be conducted on the date listed below:

Date: Friday, March 16, 2012

Time: 10:30am EST

Location: WV State Treasurer's Office
Capitol Complex Bldg. 1, Room EB-54
1900 Kanawha Blvd. E
Charleston, WV 25305
Telephone Number: 304.341-0723

All interested Vendors are required to be represented at this meeting. **Failure to attend the mandatory pre-bid shall result in the disqualification of the bid.** No one person may represent more than one Vendor.

All potential Vendors are requested to arrive prior to the starting time for the pre-bid conference. Vendors who arrive late, but prior to the dismissal of the technical portions of the pre-bid conference will be permitted to sign in. Vendors who arrive after conclusion of the technical portion of the pre-bid, but during any subsequent part of the pre-bid will not be permitted to sign the attendance sheet.

An attendance sheet will be made available for all potential Vendors to complete. This will serve as the official document verifying attendance at the mandatory pre-bid. Failure to provide your company and representative name on the attendance sheet will result in the disqualification of your bid. The State will not accept any other documentation to verify attendance. The Vendor is responsible for ensuring they have completed the information required on the attendance sheet. The Purchasing Division and the State Agency will not assume any responsibility for a Vendor's failure to complete the pre-bid attendance sheet. In addition, all potential Vendors are asked to include their email address and fax number.

1.5 **Inquiries:** Inquiries regarding specifications of this RFP must be submitted in writing to the State Buyer with the exception of questions regarding the proposal submission which may be oral. The deadline for written inquiries is identified in the Schedule of Events, Section 1.3. All inquiries of specification clarification must be addressed to:

Frank Whittaker, Senior Buyer
Purchasing Division
2019 Washington Street, East
P.O. Box 50130
Charleston, WV 25305-0130
Fax: (304) 558-4115

No contact between the Vendor and the Agency is permitted without the express written consent of the State Buyer. Violation may result in rejection of the bid. The State Buyer named above is the sole contact for any and all inquiries after this RFP has been released.

1.6 **Verbal Communication:** Any verbal communication between the Vendor and any State personnel is **not** binding, including that made at the mandatory pre-bid conference. Only information issued in writing and added to the RFP specifications by an official written addendum by Purchasing is binding.

1.7 **Addenda:** If it becomes necessary to revise any part of this RFP, an official written addendum will be issued by the Purchasing Division.

SECTION TWO: PROJECT SPECIFICATIONS

2.1 **Location:** The Treasurer's Office is located at 1900 Kanawha Blvd. East, Bldg. 1 Suite E-145, Charleston, WV 25305

Delivery locations for equipment are as follows:

Primary site:
1900 Kanawha Boulevard East
Capitol Complex, Building 6
Charleston, WV 25305
Inside delivery required, exact location to be specified later.

Business Continuance Site:
89 Richard D. Minnich Drive
Sutton, WV 26601
Inside delivery required, exact location to be specified later.

All freight and handling is to be included in the proposed cost and not billed as a separate item on the invoice(s); FOB Destination, Freight Prepaid are the preferred terms. Delivery should be made within 30 days of contract award.

2.2 **Background and Current Operating Environment:**

The West Virginia State Treasurer's Office (WVSTO) purchased an IBM Blade center in late 2003 and it was installed in early 2004. The WVSTO decided at that time to virtualize all physical servers into the new blade center. The WVSTO converted 36 servers at that time. During the purchasing process it was determined to have a storage allowance of 150% of current needs by the office. The WVSTO has strived to keep all systems virtualized since our original conversion, and due to the natural growth of the office and new programs and initiatives within the office, the total number of virtualized servers has increased to 80 and our current storage needs stands at 8 TB of usable space.

When the WVSTO purchased the equipment in 2003 there was also a need to replicate the data and functions of the office to an off-site location. Currently that location is in Flatwoods, WV which is located roughly 70 miles from the main data center located at the Capital complex. The WVSTO currently uses Veeam to perform all the replication and snap-shots to the DR/BC location, based on multiple schedules. The WVSTO had attempted to use a block level replication and found that a large majority of the servers were not functional or stable at the DR/BC location. The WVSTO also uses LTO 3 tape library and a secondary backup for all data on the blade center.

The WVSTO has been very satisfied with the performance, reliability, and support of the current system. However, as with all technology, at some point it must be replaced. With this in mind, the WVSTO is looking for solutions to our current problems, concerning storage and server performance. This RFP will be concerned with the performance needs and concerns of this office.

In an effort to help the vendor community and the WVSTO better assess the issues and problems with the current, dated solution, a solicitation was released in August of 2011 for services to be rendered in performing a health check of both the current SAN and server solution at the WVSTO. The solicitation

language is attached as Appendix B-1 of the document, and the results of the study are attached as an overall graph view as Appendix B-2 of this RFP.

This health check included an assessment of our current virtual infrastructure and storage array during which metrics were collected over the course of several weeks and a baseline was generated for the current performance profile of the WVSTO data center. This assessment found peak IOPS of over 4000 on our production array with a maximum throughput of about 185,000 KB/s. The storage array was noted in the assessment as being at capacity for IOPS performance and noted as a potential bottleneck that may be preventing the virtual environment from achieving higher IOPS and data throughput. This data along with other internal metrics, and the short and long term goals, of the WVSTO were the basis for the development of the technical requirements outlined later in this document.

The following information is provided to give prospective vendors and overview of the functionality the WVSTO is seeking out of the infrastructure acquired through this RFP process as well as a high level overview of how the WVSTO plans to utilize this infrastructure in our environment.

The WVSTO is a mostly virtualized environment running on VMware vSphere 4.0 with a total of about 90 virtual machines. The WVSTO plans to migrate or rebuild the existing virtual machines on the new infrastructure utilizing VMware vSphere 5.0. The WVSTP is also piloting VMware View 4.6 and plans to deploy approximately 60 virtual desktops on the new infrastructure utilizing VMware vSphere 5.0 and VMware View 5.0.

The unified storage array proposed as part of this RFP must be able to support peak loads of at least 20,000 IOPS for the virtualized server environment. The proposed storage array must provide redundant 4 Gbps fibre channel connections (8 Gbps connectivity preferred) to redundant 8 Gbps capable fibre channel switches. This will provide the vSphere hosts adequate bandwidth and I/O to meet the current and projected demands of the virtual server environment.

The unified storage array must provide additional capacity to support at least 60 virtual desktops with the potential to grow up to 100 virtual desktops. This is estimated to require an additional 8,000 IOPS.

The unified storage array must also provide additional capacity to be capable of hosting CIFS file shares consisting of approximately 3 TB of data with concurrent access by up to 120 users in the WVSTO without impact to either the virtual server or virtual desktop environments.

The WVSTO plans to build two clusters of computer resources running vSphere 5.0 to separate the virtual server and virtual desktop workloads. The WVSTO has a need for a minimum of 4 hosts for the virtualized server infrastructure and a minimum of 2 hosts for the virtualized desktop infrastructure. There is also a need to have at least 1 additional spare host for emergency hardware replacement or unexpected growth of the environment.

The WVSTO is seeking a mirrored solution to provide similar capacity and capabilities at both the production data center and the disaster recovery data center. This will allow the WVSTO to sustain business operations in the event of a long term outage at the primary data center.

The first exception to the mirrored requirement is that no solid state drives or flash drives will be required for the disaster recovery storage array. The disaster recovery storage array may utilize a mix of FC/SAS and ATA/NL-SAS to meet capacity requirements while still providing acceptable performance (approximately 60% of production IOPS) in the event of a fail-over to the DR site.

The second exception to the mirrored requirement is that the WVSTO requires at least 10 TB of additional capacity on the DR array. This additional capacity should be approximately an 80/20 split of lower speed (7.2K) and higher speed (10K or 15K) disks respectively. This extra storage should be in a RAID-5 or RAID-6 configuration.

The WVSTO plans to utilize array-based, asynchronous replication with VMware Site Recovery Manager to facilitate the protection and fail-over/fail-back operations of the virtual machines critical to business operations.

The storage array included in the solution (as noted above) must integrate with VMware vSphere and VMware Site Recovery Manager to enable this plan to succeed. The storage array must also include all licensing required to enable replication and protection of data both locally within the array as well as to the remote array at the DR site.

The WVSTO will be moving to 10Gbps Ethernet for the network infrastructure in the vSphere environment. With that goal in mind, the WVSTO would like the NAS functionality of the storage array to utilize 10Gbps Ethernet although 1Gbps will be acceptable.

There are currently no plans to utilize the Ethernet network for storage traffic via either iSCSI or FCoE but support of these protocols within the Ethernet switches is desired to allow the WVSTO the flexibility to utilize these protocols in the future.

The WVSTO is currently not utilizing data-at-rest encryption on the storage array, but this capability has been discussed and may be implemented in the future. As such the proposed storage array should be able to support this feature.

The WVSTO is requesting at least 25 TB of useable capacity in the proposed unified storage array for the production site. This should be split across at least three physical or virtual storage pools configured to meet the specific performance and capacity requirements of their role as outlined above.

The first storage pool will be utilized for the vSphere cluster hosting the virtualized server environment. The second storage pool will be utilized for the vSphere cluster hosting the virtualized desktops for end users. The third storage pool will be utilized for the NAS functionality of the array to present file shares to end users.

The estimated minimum capacity requirements for each storage pool are approximately 17 TB for virtualized servers, 5 TB for file shares (NAS) and 3 TB for virtualized desktops.

The proposed storage array should have the capability to expand to at least double the initial capacity through the addition of drive trays and drives; no storage controller hardware upgrades or license upgrades should be required. Any additional costs to upgrade capacity such as license costs for array features such as data replication or snapshots should be detailed in the proposal.

A glossary of terms is provided as Appendix A just as a matter of reference.

2.3 Qualifications and Experience:

Vendors shall provide in **Attachment A: Vendor Response Sheet,** information as follows:

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

2.3.2 A minimum of three (3) references is requested. At least one (1) of these references should be from the public sector. All references should be from accounts of a similar scope and complexity as the project outlined in this RFP and include telephone number and email address.

2.3.3 Vendor should provide resumes of proposed project team members which provide adequate combined experience in completing similar projects; include copies of any staff certifications or degrees applicable to this project. .

2.3.4 Vendor response should provide a minimum of two (2) successful projects related to the project outlined in this RFP. The referenced projects should have a successfully completed delivery and implementation. Projects that are in process, but not completed, may be used as options. The Vendor should have had primary responsibility (not acting as a sub-contractor) for the various phases of the projects including: analysis, project/process design, pilot/test phases, and implementation. Vendor should clearly include the description of past projects completed entailing the location of the project, project manager name and contact information, type of project, and what the project goals and objectives were and how they were met.

2.3.5 Vendor should identify any and all subcontractors that will be involved in the delivery and ongoing support of this procurement. The primary vendor will be responsible for any and all work performed by the subcontractors.

2.4 Project and Goals:

The project should be a turnkey offering of all equipment, related software, applicable installation and training if/as needed. The WVSTO is aware that a single vendor may not be capable of meeting all goals and objectives. Vendors may elect to subcontract certain services. In such an event, the vendor will be solely responsible for all work performed under this contract, and will assume prime contractor responsibility for all services offered ad products to be delivered under the terms of the contract. The State will consider the Vendor to be the sole point of contact with regard to all contractual matters. The Vendor may, with the prior written consent of the State, enter into written subcontracts for performance of work under the contract; however, the Vendor is responsible for payment of all subcontractors. Information/response must be included above, Section 2.3.5.

The WVSTO is aware that there may be multiple solutions that may be proposed as described in section 2.4.2, such as use of Rack Mount Servers or Blade Servers. The WVSTO desires the best solution to meet its current and future needs. If a Vendor plans to submit more than one solution, they may do so but it must be marked accordingly **and** prepared separately as each solution will need to be evaluated on its own capability and costs.

2.4.1 The following sets of questions are explanation based, concerning the **Unified Storage Array** 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. Does the array have 8Gbps Fibre Channel connections to the SAN switches?
b. Does the array have the capability to support 10Gbps FCoE for storage presentation?
c. Does the array have the capability to support 10Gbps iSCSI for storage presentation?
d. Does the array support automatic, dynamic read/write memory (cache) allocation?
e. Does the array support both 2.5" and 3.5" disk drives?
f. Does the array support RAID 1/0 (striped and mirrored)?
g. Does the array support RAID 5 (single parity)?

h. Does the array support RAID 6 or RAID-DP (double parity)?
i. Can the storage administrator choose which tier of disk in a storage pool is used when creating a new LUN?
j. Can individual LUNs be expanded "on the fly" without down time on the system using the LUN?
k. Can individual LUNs be converted from thick to thin provisioned and vice versa?
l. Does the array support space reclamation on existing thin provisioned LUNs?
m. Can individual LUNs be manually migrated between disk types in a storage pool without down time on the system using the LUN?
n. Does the array support the exclusion of particular LUNs from automatic tiering?
o. Are full copies (clones) of LUNs available for use immediately after initiating clone operation?
p. Are full copies (clones) mountable by a different host?
q. Does the replication technology in the array support both local and remote protection?
r. Does the storage array utilize 10Gbps Ethernet for the NAS (CIFS/NFS) functionality?
s. Does the storage array support NDMP for backup of raw file systems?
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?
u. Does the CIFS file server support Windows 2008 R2 native-mode Active Directory domains?
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?
w. Does the CIFS file server support ABE (access-based enumeration)?
x. Does the array support de-duplication of data presented via file protocols (CIFS/NFS)?
y. Does the array support compression of data presented via file protocols (CIFS/NFS)?
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)?
aa. Does the array provide the ability to script administrative actions for bulk operations?

2.4.1.1 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.

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

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

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

2.4.1.5 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?

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

2.4.1.7 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.

2.4.1.8 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.

2.4.1.9 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)

2.4.1.10 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.

2.4.1.11 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.

2.4.1.12 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.

2.4.1.13 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.

2.4.1.14 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.

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

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

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

2.4.1.18 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.

2.4.1.19 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?

2.4.2 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.

a. Do the proposed servers support 16GB DIMMs?
b. Do the servers support 32GB DIMMs?
c. Do the proposed servers contain more than the required minimum of 192GB RAM per server?

2.4.2.1 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.

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

2.4.2.3 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?

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

2.4.2.5 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.

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?

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.

2.4.2.7 If proposing Blade Servers:

2.4.2.7.1 How many total slots are in the proposed chassis?

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?

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

2.4.3 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?

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.)?

2.4.3.1 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.

2.4.3.2 Does the propose 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.

2.4.4 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)?
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?

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?

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?

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 C 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?

2.4.4.1 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?

2.4.4.2 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.

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.

2.4.4.3 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 capabilities to perform the following functions:

2.4.4.3.1 Define VLANs available (trunked) into the network switches from the core network
2.4.4.3.2 Define storage available to the various vSphere clusters

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

2.4.4.3.4 Creation of vCenter instances to manage vSphere hosts

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.

2.5 Mandatory Requirements

The following mandatory requirements must be met by the Vendor as a part of the submitted proposal. Failure on the part of the Vendor to meet any of the mandatory specifications shall result in the disqualification of the proposal. The terms "must", "will", "shall", "minimum", "maximum", or "is/are required" identify a mandatory item or factor. Decisions regarding compliance with any mandatory requirements shall be at the sole discretion of the State.

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 useable capacity.

2.5.1.1.1 The storage array for the production data center must provide a minimum useable capacity of 17 TB for virtualized servers in a dedicated physical or virtual storage pool.

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.

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.

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.

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.

2.5.1.1.6 The storage array for the disaster recovery data center must provide a minimum useable capacity of 3 TB for replicated virtual desktops.

2.5.1.1.7 The storage array for the disaster recovery data center must provide a minimum additional useable capacity of 10 TB.

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.

2.5.1.3 The proposed storage array must have a minimum of 4Gbps fibre channel connectivity to the SAN switch infrastructure.

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.

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 a minimum of two (2) 1Gbps Ethernet connections per filer to the network infrastructure.

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.

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.

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.

2.5.1.9 The proposed storage array for the disaster recovery site must provide a minimum of 60% of the total IOPs of the production storage array.

2.5.1.10 The proposed storage array must support Solid State Drives (SSD) or Enterprise Flash Drives (EFD) (Tier 0).

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).

2.5.1.12 The proposed storage array must support 7.2K RPM near-line SAS or ATA drives (Tier 3).

2.5.1.13 The proposed storage array must support virtual (thin) provisioning for volumes presented via block level (FC) protocol.

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.

2.5.1.15 The proposed storage array must include the ability to make clones of volumes presented via block-level (FC) protocol.

2.5.1.16 The proposed storage array must include the ability to take snapshots of volumes presented via block-level (FC) protocol.

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).

2.5.1.18 The proposed storage array must include IP-based, asynchronous replication for the storage presented via block level (FC) protocol.

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.

2.5.1.20 The proposed storage array must have the capability to support data-at-rest encryption.

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.

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.

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).

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.

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.

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.

2.5.1.27 The unified storage systems must have an expected product life of at least 5 years.

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.

2.5.2 Fibre Channel Switches

2.5.2.1 The proposed solution shall include two independent fibre channel switches at each site.

2.5.2.2 The fibre channel switches must have autosensing 8 Gbps ports (support 8/4/2 Gbps).

2.5.2.3 The proposed fibre channel switches must have management capabilities via a command line interface (telnet/SSH).

2.5.2.4 The proposed fibre channel switches must have a browser-based management interface.

2.5.2.5 The proposed fibre channel switches must include some internal diagnostics.

2.5.2.6 The proposed fibre channel switches must include native alerting and reporting (without the need for a monitoring server).

2.5.2.7 The proposed fibre channel switches must include a native way to display performance metrics.

2.5.2.8 The proposed fibre channel switch configuration must support non-disruptive firmware upgrades.

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.

2.5.2.10 The proposed fibre channel switches must have the capability to support multiple fabric environments in a single physical switch.

2.5.2.11 The proposed fibre channel switches must support aggregated ISL (inter-switch link) connectivity; i.e., several physical ISLs behaving as one virtual ISL.

2.5.2.12 The proposed fibre channel switches must support traffic engineering using FSPF.

2.5.2.13 The fibre channel switches must have at least 12 ports active each.

2.5.2.14 The fibre channel switches must have at least 24 ports total each.

2.5.2.15 The fibre channel switches must have redundant power supplies and fans.

2.5.2.16 The fibre channel switches must have an expected product life of at least 5 years.

2.5.2.17 The fibre channel switches include 5 years of support with a guaranteed response time of 4 hours and 24x7x365 coverage.

2.5.3 Network Switches

2.5.3.1 The network switch(es) must support both 10Gbps and 1Gbps connectivity.

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.

2.5.3.3 The network switch(es) must have redundant power supplies and fans.

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).

2.5.3.5 The network switch(es) must support Link Aggregation Control Protocol (LACP): IEEE 802.3ad.

2.5.3.6 The network switch(es) must support VLAN trunking.

2.5.3.7 The network switch(es) must support IEEE 802.1Q VLAN encapsulation.

2.5.3.8 The network switch(es) must support Jumbo Frames on all ports (up to 9216 bytes).

2.5.3.9 The network switch(es) must support CLI management (console, telnet and/or SSH).

2.5.3.10 The network switch(es) must support SNMP.

2.5.3.11 The network switch(es) must have an expected product life of at least 5 years.

2.5.3.12 The network switch(es) must include 5 years of support with a guaranteed response time of 4 hours and 24x7x365 coverage.

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.

2.5.4.2 The proposed servers must be dual CPU socket servers.

2.5.4.3 The proposed servers must use 6-core Intel 5600 series or 10-core Intel E7 series processors or superior.

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).

2.5.4.5 Each server must include a minimum of two (2) 10Gbps network connections.

2.5.4.6 Each server must include a minimum of two (2) 8Gbps fibre channel (SAN) connections.

2.5.4.7 The servers must include remote management capabilities (DRAC, iLO or equivalent).

2.5.4.8 The servers must have fully redundant internal components (power supplies, fans, etc.).

2.5.4.9 The servers must have an expected product life of at least 5 years.

2.5.4.10 The servers must include 5 years of support with a guaranteed response time of 4 hours and 24x7x365 coverage.

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.

2.5.5.2 The servers must have at least two available PCI-Express slots for expansion capabilities.

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).

2.5.6.2 Each blade chassis must include fully redundant I/O and management modules.

2.6 **Oral Presentations (Agency Option):** State agencies have the option of requiring oral presentations of all Vendors participating in the RFP process. If this option is exercised, it would be listed in the Schedule of Events (Section 1.3) of this RFP. During oral presentations, Vendors may not alter or add to their submitted proposal, but only clarify information. A description of the materials and information to be presented is provided below:

2.6.1 Materials and Information Required at Oral Presentation:

a. Vendor should present information about any technologies being offered, as part of the response(s) to the RFP that include technologies that the Agency may not be currently aware of, or being introduced into the market place.

b. Vendor will have the opportunity to provide insights into technological or other aspects of their proposed solution(s) that may be unique to their solution(s).

c. Vendor will have the opportunity to explain the differences between multiple proposed solutions (such as described in sections 2.4.2.6 and 2.4.2.7 as well as sections 2.5.5 and 2.5.6) when/if a vendor proposes more than one solution, in response to the RFP.

SECTION THREE: VENDOR PROPOSAL

3.1 **Economy of Preparation:** Proposals should be prepared simply and economically providing a straightforward, concise description of the Vendor's abilities to satisfy the requirements of the RFP. Emphasis should be placed on completeness and clarity of the content.

3.2 **Incurring Cost:** Neither the State nor any of its employees or officers shall be held liable for any expenses incurred by any Vendor responding to this RFP, including but not limited to preparation, delivery, or travel.

3.3 **Proposal Format:** Vendors should provide responses in the format listed below:

Title Page: State the RFP subject, number, Vendor's name, business address, the telephone number, fax number, name of contact person, e-mail address, and Vendor signature and date.

Table of Contents: Clearly identify the material by section and page number.

Attachment A: Within the attached response sheet (**Attachment A: Vendor Response Sheet**), provide the following: firm and staff qualifications and experience in completing similar projects; references; copies of any staff certifications or degrees applicable to this project; proposed staffing plan; descriptions of past projects completed entailing the location of the project, project manager name and contact information, type of project, and what the project goals and objectives were and how they were met.

Also, describe the approach and methodology proposed for this project. This should include how each of the goals and objectives listed is to be met.

Attachment B: Complete **Attachment B: Mandatory Specification Checklist**. By signing and dating this attachment, the Vendor acknowledges that they meet or exceed each of these specifications as outlined in 2.5 of Section Two: Project Specifications. The State reserves the right to require documentation detailing how each is met at its discretion.

Attachment C: Complete **Attachment C: Cost Sheet** included in this RFP and submit it in a separately sealed envelope. "Cost" should be clearly marked on envelope.

Oral Presentations: If established by the Agency in the Schedule of Events (Section 1.3), all Vendors participating in this RFP will be required to provide an oral presentation, based on the criteria set in Section 2.6. During oral presentations, Vendors may not alter or add to their submitted proposal, but only to clarify information.

3.4 **Proposal Submission:** Proposals must be received in **two distinct parts**: technical and cost.

- **Technical proposals** must not contain any cost information relating to the project.
- **Cost proposal** shall be sealed in a separate envelope and will not be opened initially.

All proposals must be submitted to the Purchasing Division **prior** to the date and time stipulated in the RFP as the opening date. All bids will be dated and time stamped to verify official time and date of receipt.

3.4.1 Vendors should allow sufficient time for delivery. In accordance with ***West Virginia Code*** §5A-3-11, the Purchasing Division cannot waive or excuse late receipt of a proposal, which is delayed or late for any reason. Any proposal received after the bid opening date and time will be immediately disqualified in accordance with State law.

Vendors responding to this RFP shall submit:
One original technical and cost proposal plus 5 convenience copies to, along with 1 exact copy on a USB key or CD/DVD media:

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

The outside of the envelope or package(s) for both the technical and the cost should be clearly marked:

Vendor: _____
Buyer: _____
Req #: STO12007
Opening Date: April 10, 2012
Opening Time: 1:30 p.m.

3.5 **Purchasing Affidavit:** ***West Virginia Code*** §5A-3-10a requires that all bidders submit an affidavit regarding any debt owed to the State. The affidavit must be signed and submitted prior to award. It is preferred that the affidavit be submitted with the proposal.

3.6 **Resident Vendor Preference**: In accordance with ***West Virginia Code*** §5A-3-37, Vendors may make application for Resident Vendor Preference. Said application must be made on the attached Resident Vendor Certification form at the time of proposal submission.

3.7 **Technical Bid Opening**: The Purchasing Division will open and announce only the technical proposals received prior to the date and time specified in the Request for Proposal. The technical proposals shall then be provided to the Agency evaluation committee.

3.8 **Cost Bid Opening**: The Purchasing Division shall schedule a date and time to publicly open and announce cost proposals when the Purchasing Division has approved the technical recommendation of the evaluation committee. All cost bids for qualifying proposals will be opened. Cost bids for non-qualifying proposals will not be opened. A proposal may be deemed non-qualifying for a number of reasons including, but not limited to, the bidder's technical proposal failing to meet the minimum acceptable score and the bidder's technical proposal failing to meet a mandatory requirement of the contract. Certain information, such as technical scores and reasons for disqualification, will not be available until after the contract award, pursuant to ***West Virginia Code*** §5A-3-11(h) and ***West Virginia Code of State Rules*** §148-1-6.2.5.

SECTION FOUR: EVALUATION AND AWARD

4.1 **Evaluation Process**: Proposals will be evaluated by a committee of three (3) or more individuals against the established criteria with points deducted for deficiencies. The Vendor who demonstrates that they meet all of the mandatory specifications required; and has appropriately presented within their written response and/or during the oral demonstration (if applicable) their

understanding in meeting the goals and objectives of the project; and attains the highest overall point score of all Vendors shall be awarded the contract. The selection of the successful Vendor will be made by a consensus of the evaluation committee.

4.2 **Evaluation Criteria**: All evaluation criteria is defined in the specifications section and based on a 1,000 point total score. Cost shall represent a minimum of 300 of the 1,000 total points.

The following are the evaluation factors and maximum points possible for technical point scores:

• Qualifications and experience	10 Points Possible
• Approach and methodology	600 Points Possible
• (Oral interview, if applicable)	90 Points Possible
• Cost	300 Points Possible
Total	1,000 Points Possible

Each cost proposal cost will be scored by use of the following formula for all Vendors who attained the minimum acceptable score:

$$\frac{\textbf{Lowest price of all proposals}}{\textbf{Price of Proposal being evaluated}} \textbf{ X 300 = Price Score}$$

4.2.1 Technical Evaluation: The Agency evaluation committee will review the technical proposals, deduct points where appropriate, and make a final written recommendation to the Purchasing Division.

4.2.2 Minimum Acceptable Score: Vendors must score a minimum of 70% (420 points) of the total technical points possible. All Vendors not attaining the minimum acceptable score (MAS) shall be considered as non-qualifying; therefore, the cost bids will not be opened. A proposal may be deemed non-qualifying for a number of reasons including, but not limited to, the bidder's technical proposal failing to meet the minimum acceptable score and the bidder's technical proposal failing to meet a mandatory requirement of the contract. Certain information, such as technical scores and reasons for disqualification, will not be available until after the contract award, pursuant to ***West Virginia Code*** §5A-3-11(h) and ***West Virginia Code of State Rules*** §148-1-6.2.5.

4.2.3 Cost Evaluation: The Agency evaluation committee will review the cost proposals, assign appropriate points, and make a final recommendation to the Purchasing Division.

4.3 **Independent Price Determination:** A proposal will not be considered for award if the price in the proposal was not arrived at independently without collusion, consultation, communication, or agreement as to any matter relating to prices with any competitor unless the proposal is submitted as a joint venture.

4.4 **Rejection of Proposals:** The State reserves the right to accept or reject any or all proposals, in part or in whole at its discretion. The State further reserves the right to withdraw this RFP at any time and for any reason. Submission of or receipt of proposals by the State confers no rights upon the bidder nor obligates the State in any manner.

4.5 **Vendor Registration:** Vendors participating in this process should complete and file a Vendor Registration and Disclosure Statement (Form WV-1) and remit the registration fee. Vendor is not required to be a registered Vendor in order to submit a proposal, but the **successful bidder must** register and pay the fee prior to the award of an actual purchase order or contract.

SECTION FIVE: CONTRACT TERMS AND CONDITIONS

5.1 **Contract Provisions:** The RFP and the Vendor's response will be incorporated into the contract by reference. The order of precedence shall be the contract, the RFP and any addendum, and the vendor's proposal in response to the RFP.

5.2 **Public Record:** All documents submitted to the State Purchasing Division related to purchase orders or contracts are considered public records. All bids, proposals, or offers submitted by Vendors shall become public information and are available for inspection during normal official business hours in the Purchasing Division Records and Distribution center after the bid opening. Certain information, such as technical scores and reasons for disqualification, will not be available until after the contract award, pursuant to ***West Virginia Code*** §5A-3-11(h) and ***West Virginia Code of State Rules*** §148-1-6.2.5.

5.2.1 Risk of Disclosure: The only exemptions to disclosure of information are listed in ***West Virginia Code*** §29B-1-4. Any information considered a trade secret must be separated from the Vendor submission and clearly labeled as such. Primarily, only trade secrets, as submitted by a bidder, are exempt from public disclosure. The submission of any information to the State by a Vendor puts the risk of disclosure on the Vendor. The State does not guarantee non-disclosure of any information to the public.

5.2.2 Written Release of Information: All public information may be released with or without a Freedom of Information request; however, only a written request will be acted upon with duplication fees paid in advance. Duplication fees shall apply to all requests for copies of any document. Currently, the fees are 50 cents per page, or a minimum of $10.00 per request, whichever is greater.

5.3 **Conflict of Interest:** Vendor affirms that neither it nor its representatives have any interest nor shall acquire any interest, direct or indirect, which would compromise the performance of its services hereunder. Any such interests shall be promptly presented in detail to the Agency.

5.4 **Vendor Relationship:** The relationship of the Vendor the State shall be that of an independent contractor and no principal-agent relationship or employer-employee relationship is contemplated or created by this contract. The Vendor as an independent contractor is solely liable for the acts and omissions of its employees and agents.

Vendor shall be responsible for selecting, supervising, and compensating any and all individuals employed pursuant to the terms of this RFP and resulting contract. Neither the Vendor, nor any employees or subcontractors of the Vendor, shall be deemed to be employees of the State for any purpose whatsoever.

Vendor shall be exclusively responsible for payment of employees and contractors for all wages and salaries, taxes, withholding payments, penalties, fees, fringe benefits, professional liability insurance premiums, contributions to insurance and pension, or other deferred compensation plans, including but not limited to, Workers' Compensation and Social Security obligations, licensing fees, *et cetera* and the filing of all necessary documents, forms and returns pertinent to all of the foregoing.

Vendor shall hold harmless the State, and shall provide the State and Agency with a defense against any and all claims including, but not limited to, the foregoing payments, withholdings, contributions, taxes, Social Security taxes, and employer income tax returns.

The Vendor shall not assign, convey, transfer, or delegate any of its responsibilities and obligations under this contract to any person, corporation, partnership, association, or entity without expressed written consent of the Agency.

5.4.1 Subcontracts/Joint Ventures; The Vendor may, with the prior written consent of the State, enter into subcontracts for performance of work under this contract.

5.4.2 Indemnification: The Vendor agrees to indemnify, defend, and hold harmless the State and the Agency, their officers, and employees from and against: (1) Any claims or losses for services rendered by any subcontractor, person, or firm performing or supplying services, materials, or supplies in connection with the performance of the contract; (2) Any claims or losses resulting to any person or entity injured or damaged by the Vendor, its officers, employees, or subcontractors by the publication, translation, reproduction, delivery, performance, use, or disposition of any data used under the contract in a manner not authorized by the contract, or by Federal or State statutes or regulations; and (3) Any failure of the Vendor, its officers, employees, or subcontractors to observe State and Federal laws including, but not limited to, labor and wage laws.

5.4.3 Governing Law: This contract shall be governed by the laws of the State of West Virginia. The Vendor further agrees to comply with the Civil Rights Act of 1964 and all other applicable laws and regulations as provided by Federal, State, and local governments.

5.5. **Term of Contract and Renewals:** This contract will be effective upon award and shall extend for the period of one (1) year, at which time the contract may, upon mutual consent, be renewed. Such renewals are for a period of one (1) year with a maximum of up to four, one (1) year renewal periods, or until such reasonable time thereafter as is necessary to obtain a new contract. The "reasonable time" period shall not exceed twelve (12) months. During the "reasonable time" period, Vendor may terminate the contract for any reason upon giving the Agency ninety (90) days written notice. Notice by Vendor of intent to terminate will not relieve Vendor of the obligation to continue providing services pursuant to the terms of the contract.

5.6 **Non-Appropriation of Funds:** If funds are not appropriated for the Agency in any succeeding fiscal year for the continued use of the services covered by this contract, the State may terminate the contract at the end of the affected current fiscal period without further charge or penalty. The State shall give the Vendor written notice of such non-appropriation of funds as soon as possible after the Agency receives notice. No penalty shall accrue to the Agency in the event this provision is exercised.

5.7 **Changes:** If changes to the contract become necessary, a formal contract change order will be negotiated by the State, the Agency, and the Vendor.

As soon as possible, but not to surpass thirty (30) days after receipt of a written change request from the Agency, the Vendor shall determine if there is an impact on price with the change requested and provide the Agency a written Statement identifying any price impact on the contract. The Vendor shall provide a description of any price change associated with the implementation.

NO CHANGE SHALL BE IMPLEMENTED BY THE VENDOR UNTIL SUCH TIME AS THE VENDOR RECEIVES AN APPROVED WRITTEN CHANGE ORDER FROM THE PURCHASING DIVISION.

5.8 **Price Quotations:** The price(s) quoted in the Vendor's proposal will not be subject to any increase and will be considered firm for the life of the contract unless specific provisions have been provided in the original specifications.

5.9 **Invoices and Progress Payments:** The Vendor shall submit invoices, in arrears, to the Agency at the address on the face of the purchase order labeled "Invoice To." Progress payments may be made at the option of the Agency on the basis of percentage of work completed if so defined in the final contract.

5.10 **Liquidated Damages:** According to ***West Virginia Code*** §5A-3-4(8), Vendor agrees that liquidated damages shall be imposed at the rate of $ N/A (per day, per week, per unit, or some other agreed measure) for failure to provide (deliverables, meet milestones identified to keep the project on target, or failure to meet specified deadlines). This clause shall in no way be considered exclusive and shall not limit the State or Agency's right to pursue any other additional remedy which the State or Agency may have legal cause for action.

5.11 **Contract Termination:** The State may terminate any contract resulting from this RFP immediately at any time the Vendor fails to carry out its responsibilities or to make substantial progress under the terms of this RFP and resulting contract. The State shall provide the Vendor with advance notice of performance conditions which may endanger the contract's continuation. If after such notice the Vendor fails to remedy the conditions within the established timeframe, the State shall order the Vendor to cease and desist any and all work immediately. The State shall be obligated only for services rendered and accepted prior to the date of the notice of termination.

The contract may be terminated by the State with thirty (30) days prior notice pursuant to ***West Virginia Code of State Rules*** § 148-1-7.16.2.

5.12 **Special Terms and Conditions:**

5.12.1 Bid and Performance Bonds: N/A

5.12.2 Insurance Requirements: N/A

5.12.3 License Requirement: Workers' Compensation, Contractor's License, etc. *(List any specific licenses, or other special license requirements for your project, et cetera.)*

5.12.4 Protest Bond: Any bidder that files a protest of an award shall at the time of filing the protest submit a protest bond in the amount equal to one percent of the lowest bid submitted or $5,000, whichever is greater.

The entire amount of the bond shall be forfeited if the hearing officer determines that the protest was filed for frivolous or improper purpose, including but not limited to the purpose of harassing, causing unnecessary delay, or needless expense for the Agency. All protest bonds shall be made payable to the Purchasing Division and shall be signed by the protester and the surety. In lieu of a bond, the protester may submit a cashier's check or bank money order payable to the Purchasing Division. The money will be held in trust in the State Treasurer's office.

If it is determined that the protest has not been filed for frivolous or improper purpose, the bond shall be returned in its entirety.

5.13 **Record Retention (Access and Confidentiality):** Vendor shall comply with all applicable Federal and State rules, regulations, and requirements governing the maintenance of documentation to verify any cost of services or commodities rendered under this contract by the Vendor. The Vendor shall maintain such records a minimum of five (5) years and make such records available to Agency personnel at the Vendor's location during normal business hours upon written request by the Agency within ten (10) days after receipt of the request.

Vendor shall have access to private and confidential data maintained by the Agency to the extent required for the Vendor to carry out the duties and responsibilities defined in this contract. Vendor agrees to maintain confidentiality and security of the data made available and shall indemnify and hold harmless the State and the Agency against any and all claims brought by any party attributed to actions of breach of confidentiality by the Vendor, subcontractors, or individuals permitted access by the Vendor.

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Attachment A: Vendor Response Sheet

Qualifications and Experience contained in Section 2.3:

Provide staff qualifications and experience in completing similar projects, as a part of this section the Vendor should provide:

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

Vendor Response

2.3.2 A minimum of three (3) references is requested. At least one (1) of these references should be from the public sector. All references should be from accounts of a similar scope and complexity as the project outlined in this RFP and include telephone number and email address.

Vendor Response

2.3.3 Vendor should provide resumes of proposed project team members which provide adequate combined experience in completing similar projects; include copies of any staff certifications or degrees applicable to this project.

Vendor Response

2.3.4 Vendor response should provide a minimum of two (2) successful projects related to the project outlined in this RFP. The referenced projects should have a successfully completed delivery and implementation. Projects that are in process, but not completed, may be used as options. The Vendor should have had primary responsibility (not acting as a sub-contractor) for the various phases of the projects including: analysis, project/process design, pilot/test phases, and implementation. Vendor should clearly include the description of past projects completed entailing the location of the project, project manager name and contact information, type of project, and what the project goals and objectives were and how they were met.

Vendor Response

2.3.5 Vendor should identify any and all subcontractors that will be involved in the delivery and ongoing support of this procurement. The primary vendor will be responsible for any and all work performed by the subcontractors.

Vendor Response

Project Goals and Objectives contained in Section 2.4:

The project should be a turnkey offering of all equipment, related software, applicable installation and training if/as needed. The WVSTO is aware that a single vendor may not be capable of meeting all goals and objectives. Vendors may elect to subcontract certain services. In such an event, the vendor will be solely responsible for all work performed under this contract, and will assume prime contractor responsibility for all services offered ad products to be delivered under the terms of the contract. The State will consider the Vendor to be the sole point of contact with regard to all contractual matters. The Vendor may, with the prior written consent of the State, enter into written subcontracts for performance of work

under the contract; however, the Vendor is responsible for payment of all subcontractors. Information/response must be included above, Section 2.3.5.

The WVSTO is aware that there may be multiple solutions that may be proposed as described in section 2.4.2, such as use of Rack Mount Servers or Blade Servers. The WVSTO desires the best solution to meet its current and future needs. If a Vendor plans to submit more than one solution, they may do so but it must be marked accordingly **and** prepared separately as each solution will need to be evaluated on its own capability and costs.

Some items will ask for a simple "yes or no" response while others will require a more detailed response in describing how you propose to meet the goal or requirement.

2.4.1 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?
   Vendor response: yes or no
b. Does the array have the capability to support 10Gbps FCoE for storage presentation?
   Vendor response: yes or no
c. Does the array have the capability to support 10Gbps iSCSI for storage presentation?
   Vendor response: yes or no
d. Does the array support automatic, dynamic read/write memory (cache) allocation?
   Vendor response: yes or no
e. Does the array support both 2.5" and 3.5" disk drives?
   Vendor response: yes or no
f. Does the array support RAID 1/0 (striped and mirrored)?
   Vendor response: yes or no
g. Does the array support RAID 5 (single parity)?
   Vendor response: yes or no
h. Does the array support RAID 6 or RAID-DP (double parity)?
   Vendor response: yes or no
i. Can the storage administrator choose which tier of disk in a storage pool is used when creating a new LUN?
   Vendor response: yes or no
j. Can individual LUNs be expanded "on the fly" without down time on the system using the LUN?
   Vendor response: yes or no
k. Can individual LUNs be converted from thick to thin provisioned and vice versa?
   Vendor response: yes or no
l. Does the array support space reclamation on existing thin provisioned LUNs?
   Vendor response: yes or no
m. Can individual LUNs be manually migrated between disk types in a storage pool without down time on the system using the LUN?
   Vendor response: yes or no
n. Does the array support the exclusion of particular LUNs from automatic tiering?
   Vendor response: yes or no
o. Are full copies (clones) of LUNs available for use immediately after initiating clone operation?
   Vendor response: yes or no
p. Are full copies (clones) mountable by a different host?
   Vendor response: yes or no
q. Does the replication technology in the array support both local and remote protection?
   Vendor response: yes or no
r. Does the storage array utilize 10Gbps Ethernet for the NAS (CIFS/NFS) functionality?
   Vendor response: yes or no

s. Does the storage array support NDMP for backup of raw file systems?
Vendor response: yes or no

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?
Vendor response: yes or no

u. Does the CIFS file server support Windows 2008 R2 native-mode Active Directory domains?
Vendor response: yes or no

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?
Vendor response: yes or no

w. Does the CIFS file server support ABE (access-based enumeration)?
Vendor response: yes or no

x. Does the array support de-duplication of data presented via file protocols (CIFS/NFS)?
Vendor response: yes or no

y Does the array support compression of data presented via file protocols (CIFS/NFS)
Vendor response: yes or no

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)?
Vendor response: yes or no

aa. Does the array provide the ability to script administrative actions for bulk operations?
Vendor response: yes or no

2.4.1.1 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:

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

Vendor Response:

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

Vendor Response:

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

Vendor Response:

2.4.1.5 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:

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

Vendor Response:

2.4.1.7 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:

2.4.1.8 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:

2.4.1.9 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:

2.4.1.10 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:

2.4.1.11 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:

2.4.1.12 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:

2.4.1.13 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:

2.4.1.14 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:

2.4.1.15 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:

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

Vendor Response:

2.4.1.17 Is the data being replicated encrypted between the source and destination arrays?
Vendor Response:

2.4.1.18 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:

2.4.1.19 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:

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

a. Do the proposed servers support 16GB DIMMs?
   Vendor response: yes or no
b. Do the servers support 32GB DIMMs?
   Vendor response: yes or no
c. Do the proposed servers contain more than the required minimum of 192GB RAM per server?
   Vendor response: yes or no

2.4.2.1 What is the total available processing power of the servers in the proposed solution? Please provide a breakdown on core count, core speed and total processing power (GHz) for the proposed servers.
Vendor Response:

2.4.2.2 How many DIMMs can the servers in the proposed solution hold (without add-ons)?
Vendor Response:

2.4.2.3 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:

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

2.4.2.5 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:

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:

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

2.4.2.7 **If proposing Blade Servers**:

2.4.2.7.1 How many total slots are in the proposed chassis?
Vendor Response:

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:

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

2.4.3 The following sets of questions are explanation based, concerning the **Network Switches** that may be proposed.

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?
Vendor response: yes or no

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.)?
Vendor response: yes or no

2.4.3.1 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:

2.4.3.2 Does the propose 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:

2.4.4 The following sets of questions are explanation based concerning the **General Solution** being proposed.

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)?
Vendor Response: yes or 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?
Vendor Response: yes or 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?
Vendor Response: yes or 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?
Vendor Response: yes or 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?
Vendor Response: yes or no

2.4.4.1 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:

2.4.4.2 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:

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:

2.4.4.3 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:

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

Vendor Response:

2.4.4.3.2 Define storage available to the various vSphere clusters

Vendor Response:

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:

2.4.4.3.4 Creation of vCenter instances to manage vSphere hosts

Vendor Response:

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:

Attachment B: Mandatory Specification Checklist

The mandatory requirements in Section 2.5 will be deliverables upon award of this RFP.

An affirmation to each requirement is required; if you cannot mark "yes or √" to each requirement, you will be considered non-responsive and disqualified.

2.5 Mandatory Requirements

The following mandatory requirements must be met by the Vendor as a part of the submitted proposal. Failure on the part of the Vendor to meet any of the mandatory specifications shall result in the disqualification of the proposal. The terms "must", "will", "shall", "minimum", "maximum", or "is/are required" identify a mandatory item or factor. Decisions regarding compliance with any mandatory requirements shall be at the sole discretion of the State.

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.
Affirm: _____

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.
Affirm: _____

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.
Affirm: _____

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: _____

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.
Affirm: _____

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.
Affirm: _____

2.5.1.1.6 The storage array for the disaster recovery data center must provide a minimum useable capacity of 3 TB for replicated virtual desktops.
Affirm: _____

2.5.1.1.7 The storage array for the disaster recovery data center must provide a minimum additional useable capacity of 10 TB.
Affirm: _____

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.
Affirm: _____

2.5.1.3 The proposed storage array must have a minimum of 4Gbps fibre channel connectivity to the SAN switch infrastructure.

Affirm: _____

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.

Affirm: _____

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.

Affirm: _____

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.

Affirm: _____

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.

Affirm: _____

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.

Affirm: _____

2.5.1.9 The proposed storage array for the disaster recovery site must provide a minimum of 60% of the total IOPs of the production storage array.

Affirm: _____

2.5.1.10 The proposed storage array must support Solid State Drives (SSD) or Enterprise Flash Drives (EFD) (Tier 0).

Affirm: _____

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).

Affirm: _____

2.5.1.12 The proposed storage array must support 7.2K RPM near-line SAS or ATA drives (Tier 3).

Affirm: _____

2.5.1.13 The proposed storage array must support virtual (thin) provisioning for volumes presented via block level (FC) protocol.

Affirm: _____

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.

Affirm: _____

2.5.1.15 The proposed storage array must include the ability to make clones of volumes presented via block-level (FC) protocol.

Affirm: _____

2.5.1.16 The proposed storage array must include the ability to take snapshots of volumes presented via block-level (FC) protocol.
Affirm: _____

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).
Affirm: _____

2.5.1.18 The proposed storage array must include IP-based, asynchronous replication for the storage presented via block level (FC) protocol.
Affirm: _____

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.
Affirm: _____

2.5.1.20 The proposed storage array must have the capability to support data-at-rest encryption.
Affirm: _____

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.
Affirm: _____

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.
Affirm: _____

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).
Affirm: _____

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.
Affirm: _____

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.
Affirm: _____

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.
Affirm: _____

2.5.1.27 The unified storage systems must have an expected product life of at least 5 years.
Affirm: _____

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.
Affirm: _____

2.5.2 Fibre Channel Switches

2.5.2.1 The proposed solution shall include two independent fibre channel switches at each site.
Affirm: _____

2.5.2.2 The fibre channel switches must have autosensing 8 Gbps ports (support 8/4/2 Gbps).
Affirm: _____

2.5.2.3 The proposed fibre channel switches must have management capabilities via a command line interface (telnet/SSH).
Affirm: _____

2.5.2.4 The proposed fibre channel switches must have a browser-based management interface.
Affirm: _____

2.5.2.5 The proposed fibre channel switches must include some internal diagnostics.
Affirm: _____

2.5.2.6 The proposed fibre channel switches must include native alerting and reporting (without the need for a monitoring server).
Affirm: _____

2.5.2.7 The proposed fibre channel switches must include a native way to display performance metrics.
Affirm: _____

2.5.2.8 The proposed fibre channel switch configuration must support non-disruptive firmware upgrades.
Affirm: _____

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.
Affirm: _____

2.5.2.10 The proposed fibre channel switches must have the capability to support multiple fabric environments in a single physical switch.
Affirm: _____

2.5.2.11 The proposed fibre channel switches must support aggregated ISL (inter-switch link) connectivity; i.e., several physical ISLs behaving as one virtual ISL.
Affirm: _____

2.5.2.12 The proposed fibre channel switches must support traffic engineering using FSPF.
Affirm: _____

2.5.2.13 The fibre channel switches must have at least 12 ports active each.
Affirm: _____

2.5.2.14 The fibre channel switches must have at least 24 ports total each.

Affirm: _____

2.5.2.15 The fibre channel switches must have redundant power supplies and fans.
Affirm: _____

2.5.2.16 The fibre channel switches must have an expected product life of at least 5 years.
Affirm: _____

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.
Affirm: _____

2.5.3 Network Switches

2.5.3.1 The network switch(es) must support both 10Gbps and 1Gbps connectivity.
Affirm: _____

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.
Affirm: _____

2.5.3.3 The network switch(es) must have redundant power supplies and fans.
Affirm: _____

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).
Affirm: _____

2.5.3.5 The network switch(es) must support Link Aggregation Control Protocol (LACP): IEEE 802.3ad.
Affirm: _____

2.5.3.6 The network switch(es) must support VLAN trunking.
Affirm: _____

2.5.3.7 The network switch(es) must support IEEE 802.1Q VLAN encapsulation.
Affirm: _____

2.5.3.8 The network switch(es) must support Jumbo Frames on all ports (up to 9216 bytes).
Affirm: _____

2.5.3.9 The network switch(es) must support CLI management (console, telnet and/or SSH).
Affirm: _____

2.5.3.10 The network switch(es) must support SNMP.
Affirm: _____

2.5.3.11 The network switches must have an expected product life of at least 5 years.
Affirm: _____

2.5.3.12 The network switches must include 5 years of support with a guaranteed response time of 4 hours and 24x7x365 coverage.
Affirm: _____

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.
Affirm: _____

2.5.4.2 The proposed servers must be dual CPU socket servers.
Affirm: _____

2.5.4.3 The proposed servers must use 6-core Intel 5600 series or 10-core Intel E7 series processors or superior.
Affirm: _____

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).
Affirm: _____

2.5.4.5 Each server must include a minimum of two (2) 10Gbps network connections.
Affirm: _____

2.5.4.6 Each server must include a minimum of two (2) 8Gbps fibre channel (SAN) connections.
Affirm: _____

2.5.4.7 The servers must include remote management capabilities (DRAC, iLO or equivalent).
Affirm: _____

2.5.4.8 The servers must have fully redundant internal components (power supplies, fans, etc.).
Affirm: _____

2.5.4.9 The servers must have an expected product life of at least 5 years.
Affirm: _____

2.5.4.10 The servers must include 5 years of support with a guaranteed response time of 4 hours and 24x7x365 coverage.
Affirm: _____

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.
Affirm: _____

2.5.5.2 The servers must have at least two available PCI-Express slots for expansion capabilities.
Affirm: _____

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).
Affirm: _____

2.5.6.2 Each blade chassis must include fully redundant I/O and management modules.
Affirm: _____

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.

_____
(Company)

_____
(Representative Name, Title)

_____
(Contact Phone/Fax Number)

_____
(Date)

Attachment C: Cost Sheet

Cost information is to be inserted below based on mandatory requirements, project objectives and goals as detailed in the Request for Proposal. This sheet must be submitted in a separately sealed envelope. "Cost" should be clearly marked on the sealed envelope along with the RFP document # STO12007.

Invoices and Progress Payments: The Vendor shall submit invoices, in arrears, in an acceptable format to the Agency at the address on the face of the purchase order labeled "Invoice To". Payment will be made upon delivery, acceptance and testing of all equipment.

The agency is requesting an all-inclusive, total cost that includes the items below:

As indicated in Section 2.1, there will be two different delivery locations. All freight and handling is to be included in the proposed cost and not billed as a separate item on the invoice(s); FOB Destination, Freight Prepaid are the preferred terms. Delivery should be made within 30 days after contract award.

Per Section 5.5: Term of Contract and Renewals: This contract will be effective upon award and shall extend for the period of one (1) year, at which time the contract may, upon mutual consent, be renewed. Such renewals are for a period of one (1) year with a maximum of up to four, one (1) year renewal periods.

A. All Equipment (agency requests an equipment listing being proposed to be a part of response)
ALL equipment must have an expected product life of at least 5 years. Extended warranty costs must be included to attain this requirement if the manufacturer does not offer a standard full 5 year warranty.

Total Cost of All Equipment: $_____

B. Maintenance and Support shall include:
All equipment/systems must include 5 years of support with a guaranteed response time of 4 hours and 24x7x365 availability coverage, and include all firmware updates.

Support Cost for Year One: $_____

Support Cost for Year Two: $_____

Support Cost for Year Three: $_____

Support Cost for Year Four: $_____

Support Cost for Year Five: $_____

C. **TOTAL COST FOR EQUIPMENT AND SUPPORT YEARS 1 – 5** $_____

The Vendor, who has lowest cost for initial equipment costs, including any extended warranty to achieve a minimum product life of 5 years, and lowest support costs for each year of Support, will be allocated the most points in accordance with the evaluation criteria described in Section 4.2 of the RFP.

Appendix A

Glossary of Terms

CIFS - In computer networking, Common Internet File System (CIFS) operates as an application-layer network protocol mainly used to provide shared access to files, printers, serial ports, and miscellaneous communications between nodes on a network. It also provides an authenticated inter-process communication mechanism. This protocol is mainly used by Microsoft Windows family of operating systems.

NFS - The Network File System (NFS) is a client/server application that lets a computer user view and optionally store and update file on a remote computer as though they were on the user's own computer. This protocol is mainly used by Linux and UNIX operating systems.

iSCSI - In computing, iSCSI, is an abbreviation of Internet Small Computer System Interface, an Internet Protocol (IP)-based storage networking standard for linking data storage facilities. By carrying SCSI commands over IP networks, iSCSI is used to facilitate data transfers over intranets and to manage storage over long distances. iSCSI can be used to transmit data over local area networks (LANs), wide area networks (WANs), or the Internet and can enable location-independent data storage and retrieval. The protocol allows clients (called initiators) to send SCSI commands (CDBs) to SCSI storage devices (targets) on remote servers. It is a Storage Area Network (SAN) protocol, allowing organizations to consolidate storage into data center storage arrays while providing hosts (such as database and web servers) with the illusion of locally-attached disks. Unlike traditional Fibre Channel, which requires special-purpose cabling, iSCSI can be run over long distances using existing network infrastructure.

FCoE - Fibre Channel over Ethernet (FCoE) is an encapsulation of Fibre Channel frames over Ethernet networks. This allows Fibre Channel to use 10 Gigabit Ethernet networks (or higher speeds) while preserving the Fibre Channel protocol. The specification, supported by a large number of network and storage vendors, is part of the International Committee for Information Technology Standards T11 FC-BB-5 standard.

SAN - A storage area network (SAN) is a high-speed special-purpose network (or sub-network) that interconnects different kinds of data storage devices with associated data servers on behalf of a larger network of users.

NAS - Network-attached storage (NAS) consists of hard disk storage, including multi-disk RAID systems, and software for configuring and mapping file locations to the network-attached device. Network-attached storage can be a step toward, and included as part of, a more sophisticated storage system known as a storage area network (SAN).

CAS - Content-addressable storage, also referred to as associative storage or abbreviated CAS, is a mechanism for storing information that can be retrieved based on its content, not its storage location. It is typically used for high-speed storage and retrieval of fixed content, such as documents stored for compliance with government regulations.

WORM - In computer storage media, WORM (write once, read many) is a data storage technology that allows information to be written to a media a single time and prevents the drive from erasing the data. The media is intentionally not rewritable (either due to hardware or software limitations), because they are especially intended to store data that the user does not want to erase accidentally.

SSD - A solid-state drive (SSD), sometimes called a solid-state disk or electronic disk, is a data storage device that uses solid-state memory to store persistent data with the intention of providing access in the

same manner of a traditional block I/O hard disk drive. SSDs are distinguished from traditional magnetic disks such as hard disk drives (HDDs) or floppy disk, which are electromechanical devices containing spinning disks and movable read/write heads. In contrast, SSDs use microchips that retain data in non-volatile memory chips and contain no moving parts. Compared to electromechanical HDDs, SSDs are typically less susceptible to physical shock, are silent, have lower access time and latency, but are more expensive per gigabyte (GB). SSDs use the same interface as hard disk drives, thus easily replacing them in most applications.

EFD - Enterprise flash drives (EFDs) are designed for applications requiring high I/O performance (IOPS), reliability, and energy efficiency. In most cases an EFD is an SSD with a higher set of specifications compared to SSDs that would typically be used in notebook computers. The term was first used in January 2008, to help identify SSD manufacturers who would provide products meeting these higher standards. There are no standards bodies who control the definition of EFDs, so any SSD manufacturer may claim to produce EFDs when they may not actually meet the requirements. Likewise there may be other SSD manufacturers that meet the EFD requirements without being called EFDs.

FC - Fibre Channel, or FC, is a gigabit-speed network technology primarily used for storage networking. Fibre Channel is standardized in the T11 Technical Committee of the International Committee for Information Technology Standards (INCITS), an American National Standards Institute (ANSI)–accredited standards committee. Fibre Channel was primarily used in the supercomputer field, but now, has become the standard connection type for storage area networks (SAN) in enterprise storage. Despite its name, Fibre Channel signaling can run on both twisted pair copper wire and fiber-optic cables.

SAS - Serial Attached SCSI (SAS) is a computer bus used to move data to and from computer storage devices such as hard drives and tape drives. SAS depends on a point-to-point serial protocol that replaces the parallel SCSI bus technology that first appeared in the mid-1980s in data centers and workstations, and it uses the standard SCSI command set. SAS offers backwards-compatibility with second-generation SATA drives. SATA 3 Gbit/s drives may be connected to SAS backplanes, but SAS drives may not be connected to SATA backplanes.

NL-SAS - Nearline SAS or NL-SAS drives are enterprise SATA drives with a SAS interface, head, media, and rotational speed of traditional enterprise-class SATA drives with the fully capable SAS interface typical for classic SAS drives. System and storage vendors like Dell, EMC, Fujitsu, and IBM are offering these disks for SAN arrays, NAS solutions, and server systems.

(S)ATA - Serial ATA (SATA or Serial Advanced Technology Attachment) is a computer bus interface for connecting host bus adapters to mass storage devices such as hard disk drives and optical drives. Serial ATA was designed to replace the older parallel ATA (PATA) standard (often called by the old name IDE), offering several advantages over the older interface: reduced cable size and cost (7 conductors instead of 40), native hot swapping, faster data transfer through higher signaling rates, and more efficient transfer through an (optional) I/O queuing protocol.

LUN - In computer storage, a logical unit number or LUN is a number used to identify a logical unit, which is a device addressed by the SCSI protocol or similar protocols such as Fibre Channel or iSCSI. A LUN may be used with any device which supports read/write operations, such as a tape drive, but is most often used to refer to a logical disk as created on a SAN. Though not technically correct, the term "LUN" is often also used to refer to the drive itself.

IOPs - IOPS is the standard unit of measurement for I/O (Input/Output) operations per second.

RAID - RAID (redundant array of independent disks; originally redundant array of inexpensive disks) is a way of storing the same data in different places (thus, redundantly) on multiple hard disks. By placing data on multiple disks, I/O (input/output) operations can overlap in a balanced way, improving performance. Since multiple disks increase the mean time between failures (MTBF), storing data redundantly also increases fault tolerance.

NDMP - NDMP (Network Data Management Protocol) is an open protocol used to control data backup and recovery communications between primary and secondary storage in a heterogeneous network environment.

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Appendix B-1

NOTE: This Appendix is for information purposes only and does not require a response and is not to be confused with requirements of the overall project/goals of RFP# STO12007

RFQ for VM Ware and SAN Health Check and System Recommendations

The WVSTO strives to use all of its current resources to their fullest extent. In doing so, the WVSTO is able to deliver a high quality product to vendors, state agencies, and the citizens of WV. The WVSTO virtualized its infrastructure in 2004. In doing so, the WVSTO has been able to take advantage of many opportunities to help and move forward the WVSTO, in the services it provides. With this in mind, the WVSTO is requesting a Health Check and System Recommendations for its current VM Ware environment. The service will include:

- Review of twelve (12) ESX 4.0, Update 2 hosts at each of two locations (production and business continuity/disaster recover)
- Review of one virtual center server
- Review of at least fifty servers currently being hosted on the blade center
- Review of the network switching connectivity and configuration
- Review of the existing DS4300 disk storage device

The vendor will provide the following deliverables:

- Documentation, in electronic format, describing all findings and recommendations
- Conduct assessment of VMware Infrastructure (up to twelve ESX™ hosts) using the VMware Health Analyzer virtual appliance to collect inventory, configuration and usage data
- Identify potential opportunities to optimize configuration and improve performance
- Hold an interactive workshop to facilitate knowledge transfer on VMware Infrastructure best practices.
- SAN configuration review
- Resource utilization checks
- Firmware version checks and updates
- Environmental change assessments
- Verify Pre-requisites/Dependencies for firmware levels and any firmware upgrading stepping stones
- Review "Limitations" and "Unsupported Configurations" section of controller firmware readme, for any active restrictions related to the desired firmware level and DS3500/5000 series platform
- Identification of any underlying problems in the SAN environment and a recommended course of action

The vendor shall provide a resume of the proposed consultant with the following criteria:

- VMware Certified Professional – VCP4
- VMware Certified Associate Desktop Technologies VCA4-DT
- Familiarity with VMware, SRM and Storage solutions
- The WVSTO currently has a DS 4300 installed and attached to the Blade center. Please define your experience in this area.

The vendor shall sign the WVSTO security policy to ensure the integrity and security of the system (Attached as Appendix A of this RFQ). The vendor shall include as part of the quote, all travel and per diem costs. The vendor will perform these tasks onsite at 2005 Quarrier Street and/or the Capital Complex, Building 1.

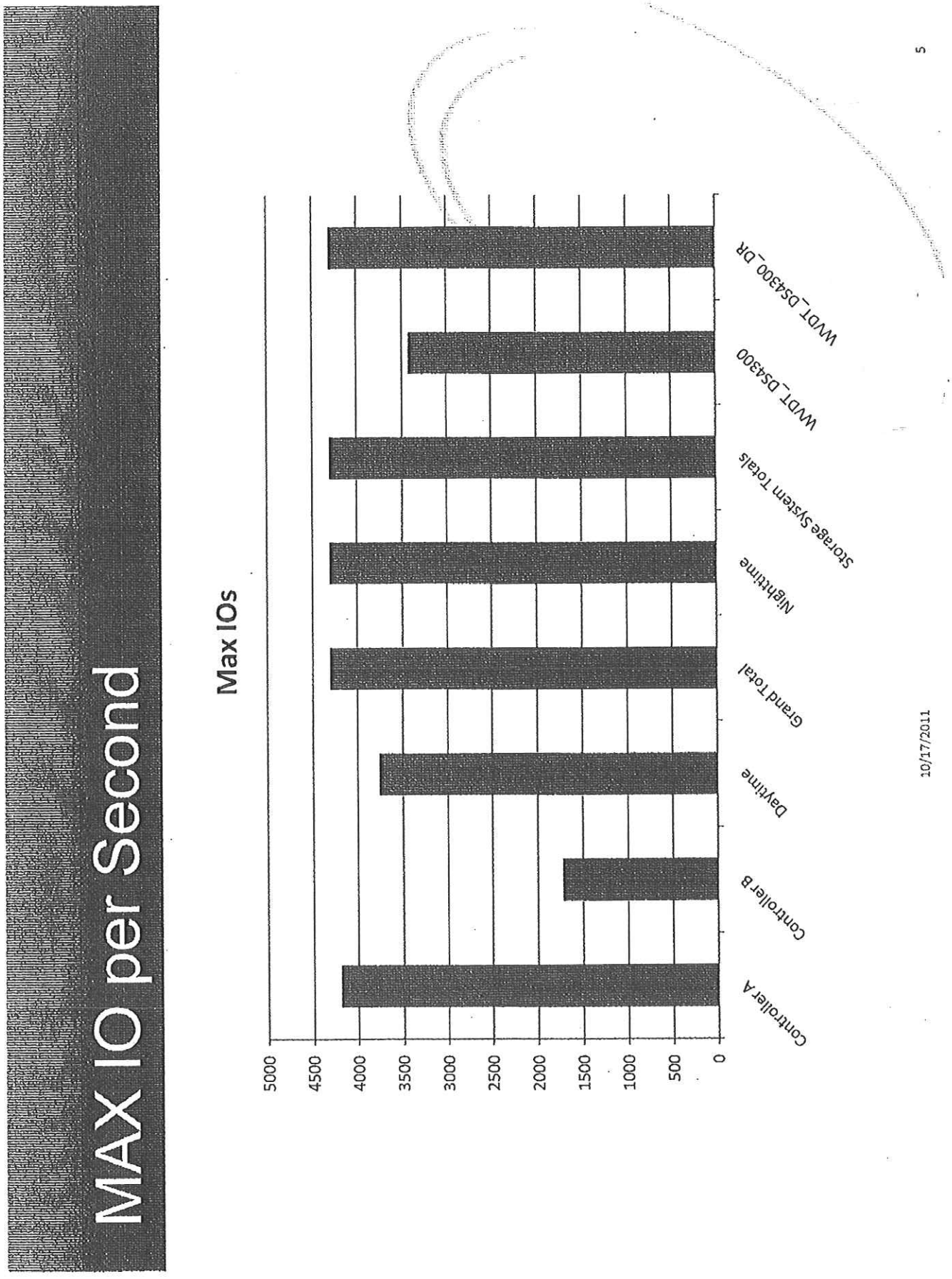
SAN Performance

	Max of IOPS	Max KB/second	CacheHit %	Read %
WVDT_DS4300	**3,425**	**183,057**	**29**	**31**
Controller A	**3,425**	**183,057**	**42**	**35**
Daytime	3,231	155,570	49	34
Nighttime	3,425	183,057	36	36
Controller B	**1,726**	**50,744**	**8**	**21**
Daytime	1,670	42,257	7	24
Nighttime	1,726	50,744	8	18
Storage System Totals	**3,425**	**183,057**	**38**	**36**
Daytime	3,242	155,570	45	34
Nighttime	3,425	183,057	33	37
WVDT_DS4300_DR	**4,305**	**66,730**	**56**	**48**
Controller A	**4,200**	**66,730**	**55**	**47**
Daytime	3,413	64,884	32	28
Nighttime	4,200	66,730	71	61
Controller B	**1,598**	**25,446**	**45**	**39**
Daytime	1,027	25,446	28	27
Nighttime	1,598	25,226	57	48
Storage System Totals	**4,305**	**66,730**	**70**	**57**
Daytime	3,763	64,884	55	43
Nighttime	4,305	66,730	80	68
Grand Total	**4,305**	**183,057**	**43**	**39**

SAN Performance

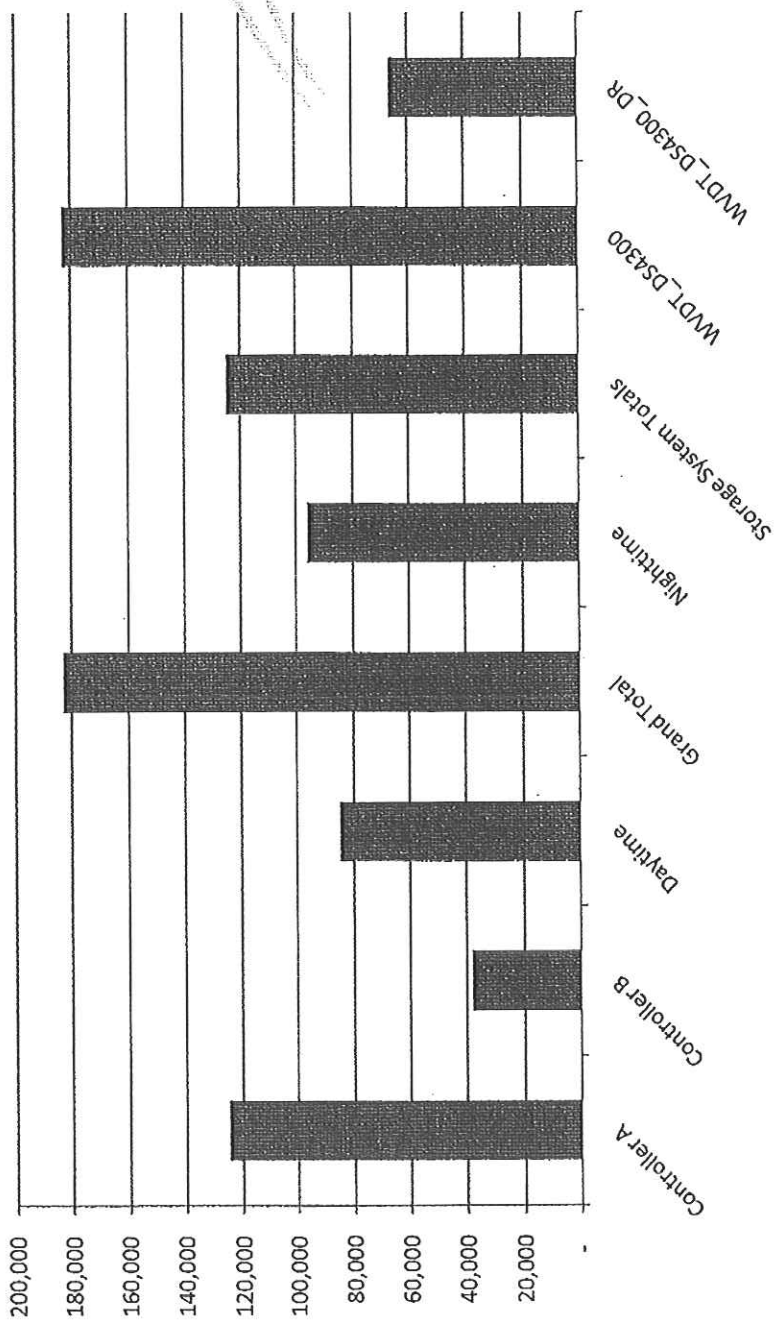
Row Labels	Max of IOPS	Average of IOPS	Max of Throughput KB/s	Average of Throughput KB/s	Average of CacheHit	Average of Read %
Array 1	1,505	4	50,466	116	0.031195705	0.615138279
Array 2	1,716	10	49,323	307	1.771551977	10.68664714
Array 3	1,871	35	118,721	1,817	2.426837482	13.38547584
Array 4	1,598	46	100,255	1,205	6.409912152	11.86937775
Array 5	1,614	34	77,071	648	2.093777452	9.678601757
Array 6	1,107	15	35,861	236	6.825505124	16.41282577
Array 7	2,527	155	147,969	7,579	57.69698389	34.8450366
Array 8	2,823	171	148,763	5,612	39.51767204	28.77674963
(blank)	3,425	408	183,057	14,235	29.10807223	30.56555393
Controller A	3,425	583	183,057	20,745	41.52166911	35.1489019
Controller B	1,726	29	50,744	607	7.68033675	20.55793558
Storage System Totals	3,425	612	183,057	21,352	38.12221083	35.9898243
Grand Total	3,425	61	183,057	2,135	7.10438897	8.332394827

APPENDIX B-2 (page 3 of 4)



APPENDIX B-2 (page 4 of 4)

MAX KB per Second



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.*

RFQ No. _____

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: _____

Authorized Signature: _____ Date: _____

State of _____

County of _____, to-wit:

Taken, subscribed, and sworn to before me this ___ day of _____, 20___.

My Commission expires _____, 20___.

AFFIX SEAL HERE

NOTARY PUBLIC _____

Appendix C

VMware Licensing

The WVSTO is currently licensed for, or entitled to license upgrades to, the following products:

46 CPU Licenses of VMware vSphere 5 Enterprise Plus
2 Instance Licenses of VMware Virtual Center 5 Standard
40 VM License of VMware Site Recovery Manager 5