August 11, 2011

Department of Administration
Purchasing Division
Attn: Krista Ferrell
Building 15
2019 Washington Street, East
Charleston, WV 25305-0130

EMC Response to RFQ Number ISCL0093

Krista,

Please accept this as EMC Corporation's formal response to RFQ ISCL0093.   EMC is responding with a solution that meets or exceeds all recovery SLA the state has outlined in the original RFQ and the subsequent two RFQ addendums.

Included with this cover letter:

- EMC's Solution response to the RFQ
- Completed required pricing page
- Signed WV96 Form.
- Signed Debt Affidavit

EMC requests the opportunity to come in and formally present our equal to or better solution as we strongly believe it approaches the State of West Virginia's Mainframe backup and recovery needs in a manner that can scale to meet current and future needs, exceeds current backup and recovery service levels, eliminates risk associated with offline data at a cost competitive price.

Please feel free to contact me or Lori Caldwell for additional information.

Regards,

Chris Judy *Chris Judy*

Chris Judy

Account Executive | Backup Recovery Systems (BRS) Practice | EMC Corporation
(513) 794-5410 [O] | (513) 460-4135 [M] | chris.judy@emc.com | 9825 Kenwood Road, Suite 300 Cincinnati, OH 45242

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
ISCL0093	1

ADDRESS CORRESPONDENCE TO ATTENTION OF:

KRISTA FERRELL
304-558-2596

RFQ COPY
TYPE NAME/ADDRESS HERE

VENDOR
EMC Corporation
102 Centre Court Rd
Charleston WV 25314

SHIP TO
DEPARTMENT OF ADMINISTRATION
IS&C - DATA CENTER MANAGER
BUILDING 6, ROOM B110
1900 KANAWHA BOULEVARD, EAST
CHARLESTON, WV
25305-0135   304-558-5914

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
06/16/2011				

BID OPENING DATE:	07/21/2011		BID OPENING TIME	01:30PM	

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	EA		205-43		

PERIPHERAL DEVICES AND ACCESSORIES, COMPUTER SYSTEM

REQUEST FOR QUOTATION

THE WEST VIRGINIA STATE PURCHASING DIVISION FOR THE
AGENCY, THE WEST VIRGINIA OFFICE OF TECHNOLOGY, IS
SOLICITING BIDS TO PROVIDE THE AGENCY WITH A VIRTUAL
TAPE SOLUTION INCLUDING: A TWO-WAY GRID WITH
REPLICATION BETWEEN ITS PRIMARY DATA CENTER LOCATED IN
CHARLESTON, WEST VIRGINIA AND ITS RECOVERY CENTER
LOCATED IN FLATWOODS, WEST VIRGINIA PER THE ATTACHED
SPECIFICATIONS.
TECHNICAL QUESTIONS CONCERNING THIS SOLICITATION MUST
BE SUBMITTED IN WRITING TO KRISTA FERRELL IN THE
WEST VIRGINIA STATE PURCHASING DIVISION VIA FAX AT
304-558-4115 OR VIA EMAIL AT KRISTA.S.FERRELL@WV.GOV.

DEADLINE FOR ALL TECHNICAL QUESTIONS IS 07/06/2011
AT THE CLOSE OF BUSINESS.

ANY TECHNICAL QUESTIONS RECEIVED WILL BE ANSWERED BY
FORMAL WRITTEN ADDENDUM TO BE ISSUED BY THE PURCHASING
DIVISION AFTER THE DEADLINE HAS LAPSED.

VERBAL COMMUNICATION: ANY VERBAL COMMUNICATION BETWEEN
THE VENDOR ANY STATE PERSONNEL IS NOT BINDING. ONLY
INFORMATION ISSUED IN WRITING AND ADDED TO THE RFQ
SPECIFICATIONS BY FORMAL WRITTEN ADDENDUM IS BINDING.

NO CONTACT BETWEEN THE VENDOR AND THE AGENCY IS

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE	TELEPHONE 304 541 3400	DATE 8-11-11
TITLE Senior Acct Exec	FEIN 042680009	ADDRESS CHANGES TO BE NOTED ABOVE

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

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
ISCL0093	2

ADDRESS CORRESPONDENCE TO ATTENTION OF:

KRISTA FERRELL
304-558-2596

RFQ COPY
TYPE NAME/ADDRESS HERE

VENDOR

SHIP TO

DEPARTMENT OF ADMINISTRATION
IS&C - DATA CENTER MANAGER
BUILDING 6, ROOM B110
1900 KANAWHA BOULEVARD, EAST
CHARLESTON, WV
25305-0135   304-558-5914

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
06/16/2011				

BID OPENING DATE:	07/21/2011		BID OPENING TIME	01:30PM

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT

PERMITTED WITHOUT THE EXPRESS WRITTEN CONSENT OF THE
STATE BUYER. VIOLATION MAY RESULT IN THE REJECTION
OF THE BID. THE STATE BUYER NAMED ABOVE IS THE SOLE
CONTACT FOR ANY AND ALL INQUIRIES AFTER THIS RFQ IS
RELEASED.

EXHIBIT 10

                    REQUISITION NO.: ....

ADDENDUM ACKNOWLEDGEMENT

I HEREBY ACKNOWLEDGE RECEIPT OF THE FOLLOWING CHECKED
ADDENDUM(S) AND HAVE MADE THE NECESSARY REVISIONS TO
MY PROPOSAL, PLANS AND/OR SPECIFICATION, ETC.

ADDENDUM NO.'S:

NO. 1 ....

NO. 2 ....

NO. 3 ....

NO. 4 ....

NO. 5 ....

I UNDERSTAND THAT FAILURE TO CONFIRM THE RECEIPT OF
THE ADDENDUM(S) MAY BE CAUSE FOR REJECTION OF BIDS.

VENDOR MUST CLEARLY UNDERSTAND THAT ANY VERBAL
REPRESENTATION MADE OR ASSUMED TO BE MADE DURING ANY
ORAL DISCUSSION HELD BETWEEN VENDOR'S REPRESENTATIVES
AND ANY STATE PERSONNEL IS NOT BINDING. ONLY THE
INFORMATION ISSUED IN WRITING AND ADDED TO THE

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'

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
ISCL0093	3

ADDRESS CORRESPONDENCE TO ATTENTION OF:

KRISTA FERRELL
304-558-2596
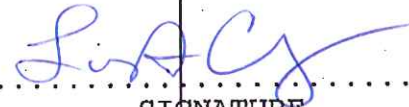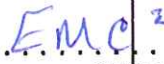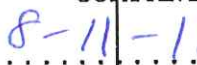
RFQ COPY
TYPE NAME/ADDRESS HERE

VENDOR

SHIP TO

DEPARTMENT OF ADMINISTRATION
IS&C - DATA CENTER MANAGER
BUILDING 6, ROOM B110
1900 KANAWHA BOULEVARD, EAST
CHARLESTON, WV
    25305-0135   304-558-5914

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
06/16/2011				

BID OPENING DATE:	07/21/2011		BID OPENING TIME	01:30PM	

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT

SPECIFICATIONS BY AN OFFICIAL ADDENDUM IS BINDING.

....
                SIGNATURE

EMC²
....
                COMPANY

8-11-11
....
                DATE

NOTE: THIS ADDENDUM ACKNOWLEDGEMENT SHOULD BE SUBMITTED
WITH THE BID.

REV. 09/21/2009

NOTICE TO PROCEED: THIS CONTRACT IS TO BE PERFORMED
WITHIN 30 CALENDAR DAYS AFTER THE NOTICE TO PROCEED
IS RECEIVED. THE AGENCY WILL ISSUE A WRITTEN NOTICE
TO PROCEED TO THE VENDOR AFTER THE INITIAL MEETING
DESCRIBED IN SECTION IV.2 OF THE ATTACHED
SPECIFICATIONS. MAINTENANCE SHALL BE ADDED BY FORMAL
CHANGE ORDER AFTER THE INSTALLATION, TESTING, AND
ACCEPTANCE OF THE SOLUTION BY THE AGENCY.

THE MODEL/BRAND/SPECIFICATIONS NAMED HEREIN ESTABLISH
THE ACCEPTABLE LEVEL OF QUALITY ONLY AND ARE NOT
INTENDED TO REFLECT A PREFERENCE OR FAVOR ANY
PARTICULAR BRAND OR VENDOR. VENDORS WHO ARE BIDDING
ALTERNATES SHOULD SO STATE AND INCLUDE PERTINENT
LITERATURE AND SPECIFICATIONS. FAILURE TO PROVIDE
INFORMATION FOR ANY ALTERNATES MAY BE GROUNDS FOR
REJECTION OF THE BID. THE STATE RESERVES THE RIGHT

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'

State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

ADDRESS CORRESPONDENCE TO ATTENTION OF

KRISTA FERRELL
304-558-2596

RFQ COPY
TYPE NAME/ADDRESS HERE

DEPARTMENT OF ADMINISTRATION
IS&C - DATA CENTER MANAGER
BUILDING 6, ROOM B110
1900 KANAWHA BOULEVARD, EAST
CHARLESTON, WV
25305-0135   304-558-5914

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
06/16/2011				

BID OPENING DATE: 07/21/2011   BID OPENING TIME   01:30PM

LINE	QUANTITY	UOP	CAT NO.	ITEM NUMBER	UNIT PRICE	AMOUNT

TO WAIVE MINOR IRREGULARITIES IN BIDS OR SPECIFICATIONS
IN ACCORDANCE WITH SECTION 148-1-4(F) OF THE WEST
VIRGINIA LEGISLATIVE RULES AND REGULATIONS.

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: KRISTA FERRELL-FILE 21

RFQ. NO.:   ISCL0093

BID OPENING DATE: 07/21/2011

BID OPENING TIME: 1:30 PM

PLEASE PROVIDE A FAX NUMBER IN CASE IT IS NECESSARY
TO CONTACT YOU REGARDING YOUR BID: (513) 745-0324

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'

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
ISCL0093	5

ADDRESS CORRESPONDENCE TO ATTENTION OF:

KRISTA FERRELL
304-558-2596

VENDOR

RFQ COPY
TYPE NAME/ADDRESS HERE

SHIP TO

DEPARTMENT OF ADMINISTRATION
IS&C - DATA CENTER MANAGER
BUILDING 6, ROOM B110
1900 KANAWHA BOULEVARD, EAST
CHARLESTON, WV
   25305-0135   304-558-5914

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
06/16/2011				

BID OPENING DATE: 07/21/2011   BID OPENING TIME   01:30PM

LINE	QUANTITY	UOP	CAT NO.	ITEM NUMBER	UNIT PRICE	AMOUNT

CONTACT PERSON (PLEASE PRINT CLEARLY):

Lori Caldwell

****** THIS IS THE END OF RFQ   ISCL0093 ****** TOTAL: #526,732

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'

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.htm and is hereby made part of the agreement. Provided that the Agency meets the definition of a Cover Entity (45 CFR §160.103) and will be disclosing Protected Health Information (45 CFR §160.103) to the vendor.

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

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

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

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

INSTRUCTIONS TO BIDDERS

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

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

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

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

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

Rev. 12/15/09

I.   SCOPE

The Data Center, West Virginia Office of Technology, identified hereinafter as "the agency", seeks a virtual tape solution that includes a two-way grid with replication between its primary Data Center located in Charleston, W. Va., and its Recovery Center located in Flatwoods, W.Va. This system will replace the current physical tape solution described in Section II, Current Environment.

The agency is seeking a virtual tape solution that replaces the current system, but also includes physical tape drives and an automated tape library at the Recovery Center as a means for feeding the agency's contracted disaster recovery facility (SunGard).

Details for mandatory requirements are described in Section III. The State shall make the award to the lowest-cost response that meets all the mandatory requirements.

II.   CURRENT ENVIRONMENT

The agency currently owns and operates the following tape storage systems:

Qty.	Machine/Product	Product Description
2	9310	StorageTek library storage modules
2	9311	StorageTek library control units
1	4410	StorageTek library storage modules
1	4411	StorageTek library control units
12	3590-B1A	IBM Magstar tape drives
3	3590-A50	IBM Magstar control units
16	9490-M34	StorageTek Timberline tape drives

The agency currently operates a z/10 IBM mainframe utilizing the above-listed tapes hardware at its primary Data Center in Charleston. CA-1's TMS is used to manage the tapes, with HSM also utilized to provide automatic migration of data from disk to physical tape. The agency currently has approximately 42 terabytes of compressed tape data located on 3490 and 3590 tape media.

On Sunday mornings, a full backup of the operating system and disk is made on 3590 tapes, then they are transported offsite. This backup is kept for two weeks, then rotated back and scratched when the third weekly backup is made. These backups are

the primary means by which a Disaster Recovery system, currently provided by SunGard, is created.

User agencies create copies of their own data on more frequent intervals, and make those tapes available for offsite transport. These tapes are also taken to Sungard in the event of a disaster.

III. REQUIREMENTS

The vendor shall provide a solution that includes systems located in the primary Data Center in Charleston and the Recovery Center in Flatwoods. The system at the Recovery Center shall include physical tape drives. The solution must meet all of the following mandatory requirements.

1. The vendor will supply all the equipment and software specified in Appendix A, or equal.

2. The equipment shall be new. Remanufactured or warranted-as-new equipment is unacceptable.

3. The solution shall support data replication between the primary virtual tape server at the primary Data Center and the Recovery Center. The customer will provide the telecommunication equipment and bandwidth required to enable replication between the Centers.

4. The solution shall allow for creation of physical tapes at the remote location for disaster recovery purposes. Physical tapes must be capable of holding at least 700 GB of uncompressed data.

5. The solution shall allow for removal of physical tapes from the remote location for disaster recovery purposes.

6. The physical tape drives hardware (minimum of 6 drives) shall be capable of selectable encryption, in order for the customer to encrypt data that is on physical tape. All software and hardware required for encryption, including, but not limited to, key management, must be included in the proposal.

7. The automated physical tape library, to be located at the Recovery Center, must to capable of holding a minimum of 210 physical tapes initially (including up to ten cleaning tapes). The tape library must be expandable to allow for future growth.

8. The system shall be capable of handling 70 TB of uncompressed usable data.

9. The solution will support z/OS, z/VM and Linux environments, and shall be capable of defining virtual drives that are usable by applications residing in any of those environments.

10. The solution must allow for remote monitoring and operation of all hardware.

11. The solution must support and be compatible with all other current hardware and software currently in production at the customer's site. A list of the customer's current hardware and software is provided in Appendices B and C.

12. The system must be capable of recovering volume serial numbers in the event of a file system failure.

13. The system must be capable of data compression.

14. The vendor shall specify the bandwidth requirements for replication between the primary Data Center and the Recovery Center.

IV.   INSTALLATION AND MAINTENANCE

1. The vendor shall install the primary virtual tape server at the customer's central site:

   Building 6, Room 110
   1900 Kanawha Blvd. E.
   Charleston, WV 25305

   The vendor shall install the secondary virtual tape server at the Recovery Center located approximately 75 miles from the central site. The address of the secondary location is:

   Braxton Technology Center
   89 Richard D. Minnich Drive STE 103
   Sutton, WV 26601

2. The vendor and agency shall meet, at the agency's primary Data Center, within 15 days after issuance of purchase order, to discuss pre-installation activities as well as the actual installation, and to agree on an installation date.

3. The systems shall be operational within 30 days after they are installed. The virtual tape solution will not be considered fully operational until the offsite component is fully integrated with the central site component and a migration plan for data from existing tapes has been agreed upon and implemented.

4. The vendor shall provide on-site hardware, firmware, and software engineering support, and agency training, at or about the time of systems installation.

5. The systems shall be maintained by the manufacturer or by a representative(s) trained and authorized by the manufacturer.

6. The vendor shall **warrant and maintain** the systems for 48 months after installation. During this 48-month period, the vendor shall make any necessary repairs, replace any defective parts, perform preventative maintenance, install engineering changes and modifications, and otherwise maintain the systems at no cost to the agency.

7. The vendor shall identify any trade-in allowances for existing equipment replaced by the system. All de-installation and shipping costs shall be borne by the vendor.

V.   IMPLEMENTATION OF THE VIRTUAL TAPE SOLUTION

The services specified in the following subsections shall be performed at the agency's sites and shall continue until all the services have been provided to the agency's satisfaction and the system is fully operational.

1. **Assist with System Planning and Preparation**

The vendor shall provide on-site consulting to discuss resource allocation management, storage administration and systems programming requirements. Topics may include the following:

1. DF/SMS allocation methodologies;

2. JCL requirements;

3. DF/SMS ACS utilization;

4. Planning and implementation of library partitioning.

2. **Provide Technical Consultation**

The vendor shall review the following topics with the customer and give detailed instructions and guidance:

1. DF/SMS software support;

2. Data migration considerations, including coexistence with other automation solutions;

3. Interaction between the Virtual Tape Equipment and DF/SMS software support;

4. Interaction between the Virtual Tape Equipment and the TMS tape management system;

5. Interaction between the Virtual Tape Equipment and applicable OEM software;

6. Logical partitioning;

7. Preparation for installation;

8. Interaction between Virtual Engine, the Library Manager and the host, including physical tapes, logical volumes ("LVOLs"), and inventories.

9. Device table generations such as Unit Control Blocks ("UCB") and Eligible Device Table ("EDT");

10. Generation of the Hardware Configuration Definition ("HCD").

3. **Provide Operational Training and Education**

The vendor shall provide sessions to cover the following:

1. System overview of Hosts and Virtual Engine in a grid configuration;

2. Console messages meaning and operator actions;

3. Operator intervention procedures;

4. Abnormal situations and recovery;

5. Interaction between the Virtual Tape environment and TMS

6. Interaction between the Virtual Tape Equipment and other software products;

7. Operator actions with DF/SMS;
   a. System status displays
   b. System commands
   c. Messages and meanings

8. System commands- system status displays- messages and meanings;
9. DF/SMS Definitions;

10. ISMF panels;
    a. Parmlib member changes
    b. Proclib member change
    c. ACS routines

11. Parmlib member changes- Proclib member changes;

12. Tape management system User Exit processing.

VI.   MISCELLANEOUS TERMS AND CONDITIONS

1.   The customer will purchase the systems outright. Other procurement options will not be considered.

2.   The customer will not formally accept a system until it has operated without failure for 30 consecutive days.

3.   The vendor will be considered prime contractor, and shall therefore be solely responsible for satisfying all mandatory requirements of this RFQ, including maintenance. The use of subcontractors will not relieve the vendor of its prime contractor responsibilities.

4.   A manufacturer's business partner submitting a bid independently of the manufacturer, or on behalf of the manufacturer, will have prime contractor responsibilities. The State will not act as a third party in any arrangements between the manufacturer and its business partners.

VII. COSTS

1.   The vendor shall complete the following cost sheet and submit it as part of the bid response. All costs shall be identified on the cost sheet. Costs will be all inclusive including all hourly rates, travel, and all goods/services needed to fulfill the mandatory requirements. **The Grand Total Cost will be the firm bid price.**

COST SHEET

See Attached Proposal

VENDOR NAME _____

VENDOR ADDRESS _____

VENDOR CONTACT _____

VENDOR PHONE NO. _____

COST OF VIRTUAL TAPE EQUIPMENT
(including 48 month warranty) *+ SunGard* $ 451,130

COST OF SOFTWARE
(for 48 months)   *included*

COST OF INSTALLATION   *included*

COST OF SHIPPING $ 834

COST OF VTS IMPLEMENTATION (see Section VI) $ 81,768

TRADE-IN ALLOWANCE $ 7,000

GRAND TOTAL COST $ 526,732

APPENDIX A

Product	Description	Qty
5608-A93	IBM Tivoli Lifecycle Manager Reg:3 Yr	1
0003	TKLM For Storage RVU SWMA 3Y Reg	6
5608-A99	IBM Tivoli Key Lifecycle Manager V2.0	1
0003	TKLM for Storage per RVU	6
5811	IBM Tiv Key Lifecyle Mgr for Storage	1

Product	Description	Qty
3584-L23	TS3500 Tape Library	1
1515	3592 Fibre Drive Mounting Kit	6
1643	Intermediate Capacity on Demand	1
1644	Full Capacity on Demand	1
1659	16 Additional 3592 I/O Slots	1
1692	Entry ALMS	1
1693	Intermediate ALMS	1
1694	Full ALMS	1
1950	Power Distribution Unit	1
2710	Remote Support Facility	1
2732	TS3000 System Console	1
2733	Internal Modem	1
4871	TS7700 BE SW Mounting Hardware	1
4872	TS7700 BE 4Gb Switch	1
9217	Attach to 3953 LM/TS7700	1
9680	Plant Install 3592 E05 in 3584	6
9700	No Host Cables From Plant	1
9900	Encryption Configuration	1
9954	Nema L6-30 Power Cords	1
3592-E05	IBM TS1120 Tape Drive	6
6013	13 Meter LC/LC Fibre Channel Cable	12
9000	zSeries ESCON/FICON Attach	6

8

9592	Encryption Capable - Plant	6
9677	Plant Install 3592 in 3584	6

3599-014	IBM Tape Cartridge 3592 Extended Data with Labeling and Initialization	1
4020	20-Pack 3592 Extended Data Cartridges	7
9003	Alpha prefix background - red	1
9022	Label background: Color/Vibrant	1
9032	Media Identifier Letters 'JB'	1
9082	E3 Format	1
9133	First character of Volser is X	1
9200	Second character of Volser is 6	1
9300	Third character of Volser is 0	1
9400	Fourth character of Volser is 0	1
9500	Fifth character of Volser is 0	1

3599-014	IBM Tape Cartridge 3592 Extended Data with Labeling and Initialization	1
4020	20-Pack 3592 Extended Data Cartridges	3
9004	Alpha prefix background - yellow	1
9022	Label background: Color/Vibrant	1
9032	Media Identifier Letters 'JB'	1
9082	E3 Format	1
9121	First character of Volser is L	1
9200	Second character of Volser is 5	1
9300	Third character of Volser is 0	1
9400	Fourth character of Volser is 0	1
9500	Fifth character of Volser is 0	1

3599-017	3592 Tape Cartridge (cleaning)	1
7005	5-Pack Cleaner Cartridges with Media ID Labels	2

3952-F05	Tape Frame	1
1903	Dual AC Power	1
1904	Redundant AC Power	1
2732	TS3000 System Console	1
2733	Internal Modem	1
5628	Plant Install 3957-V06	1
5640	Plant Install 3956-CC8	1
5759	Integrated Control Path	1

7312	TS7700 Base Frame	1
9954	NEMA L6-30 Power Cord	1

3952-F05	Tape Frame	1
1903	Dual AC Power	1
1904	Redundant AC Power	1
2732	TS3000 System Console	1
2733	Internal Modem	1
5626	Plant Install 3957-VEA	1
5635	Plant Install 3956-CS8	1
5646	Plant Install 3956-XS7	1
5759	Integrated Control Path	1
7322	TS7720 Base Frame	1
9954	NEMA L6-30 Power Cord	1

3956-CC8	TS7740 Cache Controller	1
7123	9.6 TB Fibre Storage	1
9352	Plant Install in F05	1

3956-CS8	TS7720 SATA Cache Controller	1
7114	32 TB SATA Storage	1
9352	Plant Install in F05	1

3956-XS7	TS7720 SATA Cache Module	1
7114	32 TB SATA Storage	1
9354	Plant Install in F05	1

3957-V06	TS7740 Virtualization Engine	1
0201	9 Micron LC/LC 31 Meter	2
1033	1Gb Grid Dual Port Optical SW Connection	2
2715	Console Attachment	1
3442	FICON Long Wavelength Attachment	2
4015	Grid Enablement	1
5240	Dual Port FC HBA	1
5267	1 TB Cache Enablement	3
5268	100 MB/sec Increment	2
9000	Mainframe Attachment	1
9219	TS3500 Attach	1
9350	Plant Install V06 in F05	1
9461	8GB Memory Upgrade - Plant	1
9900	Encryption Configuration	1

3957-VEA	TS7720 Virtualization Engine Server	1
0201	9 Micron LC/LC 31 Meter	2
1033	1Gb Grid Dual Port Optical SW Connection	2
2715	Console Attachment	1
3442	FICON Long Wavelength Attachment	2
4015	Grid Enablement	1
5268	100 MB/sec Increment	1
9000	Mainframe Attachment	1
9268	100 MB/s Throughput - Plant	1
9350	Plant Install V06 in F05	1
9461	8GB Memory Upgrade - Plant	1

APPENDIX B

WVOT DATA CENTER HARDWARE
Effective 11/17/10

CPUs

1   IBM z10 (Model 2098-E10) capacity setting V02 Enterprise Server
also containing one IFL and one zIIP engine

DASD

1   IBM 2105-800 TotalStorage Enterprise Storage Server with 5.2 TB with 6 FICON
Ports, FlashCopy, PAV, and:

2	2124 72.8GB Disk, 8-pack, 10K RPM
4	2125 145.6GB Disk, 8-pack
1	2717 ESS Master Console
1	2924 Operator Panel Lang, US English
7	3013 Dual Port 64 Bit ESCON Adapters
1	4014 16 GB Cache
1	8005 PAV - Up to 6TB
1	8305 FlashCopy - Up to 6TB
7	9770 STD ESCON Cable (MT/RJ-DUP QTY 14)
1	9854 Three-Phase 50/60 Hz, 60 Amp
1	9870 Nominal AC Voltage: 200V240V
1	2240-FLC ESS Function Authorization
1	8305 FlashCopy - Up to 6TB
1	9934 IBM E-server z Series Designator
1	2240-PAV ESS Function Authorization
1	8005 PAV - Up to 6TB
1	9934 IBM E-Server z Series Designator

Tape Units   ***(TO BE REPLACED BY THIS PROCUREMENT)***

2	STK 9310 Library Storage Module
1	STK 9311 Library Control Unit
1	STK 4410 Library Storage Module
1	STK 4411 Library Control Unit
1	STK 4430 Library Management Unit
4	STK 9490 M34 Cartridge Drive (16 Transports)
1	IBM 3590-B1A Cartridge Drive (12 Transports)
3	IBM 3590-A50 Tape Control Unit

Printers

2	IBM InfoPrint 4000 Printer (Models ID1/ID2)
1	STK 5000 Impact Printer

Supplementary Printing Equipment

1	Roll Systems 800152 Unwinder
2	Roll Systems 800162 Folder/Job Separator
1	Roll Systems 501254 Output Unloader
1	Roll Systems 503176 Cutter
1	Roll Systems 503410 Trimmer
1	Roll Systems 500777 Stacker
1	Roll Systems 50386601 Web Handler

Communications Equipment

1	Cisco Systems 7513 Router
1	Cisco Systems AS5200 (used for remote ISDN applications)
1	Cisco Systems Pix Firewall
2	IBM 31741L Cluster Controller

Spectrol 601C Data Analyzer

APPENDIX C

WVOT DATA CENTER ENTERPRISE SERVER SOFTWARE
Effective 02/15/11

VENDOR/SOFTWARE	FUNCTION
IBM	
z/OS Version 1, Release 11 (5751-CS9)	Operating System
RMF V1, R11 (5694-A01)	Provides basis for tuning the system to user requirements and tracks resource utilization
DFSMS/DFP/DSS/HSM V1, R11 (5694-A01)	Provides data management, device support, program library management, utility functions, user and system catalog support, hierarchical storage manager, and dataset services for ESA operating system
SMP/E V3, R5 (5694-A01)	Supports software changes and new functions, corrective and preventative service, and user modifications in ESA
z/OS Security Server (RACF) V1, R11 (5694-A01)	Security server
EREP V1, R11 (5654-260)	Reports on hardware/software exceptions and conditions
SecureWay Communications Server V1, R11 (5694-A01)	Telecommunications access method.
TSO/E V1, R11 (5694-A01)	Allows users to interactively share computer time and resources
z/VM V5, R4.0 (5741-A05)	Operating system (z/VM). NOTE: V6, R1 is undergoing in-house testing.

DB2 V8, R1.0 (V9R1 in-house) (5675-DB2)	Relational database management system that allows definition, access, and recovery of data.
CICS Transaction Server for z/OS R3.2 (5655-M15)	Transaction processor
DB2 Connect Unlimited Edition for Linux & z Series V8.2 (fixpack 7) Part No. D50MQLL	Allows remote access to DB2 mainframe databases.
AFP Collection Fonts V1, R1.0 (5648-113)	Advanced function printing
Page Printer Formatting Aids/370 V1, R1.0 (5688-190)	Advanced function printing
Overlay Generation Language (OGL/370) V1, R1.0 (5688-191)	Advanced function printing
Print Services Facility V4, R3 (5655-M32)	Advanced function printing
ACIF V4, R3 (5655-M32)	Indexing facility for PSF
DFSORT V1, R11 (5694-A01)	Sort and merge
DITTO/ESA V1, R11 (5655-103)	Multipurpose disk and tape utility
Enterprise COBOL for z/OS V3.4.1	Programming language

(5655-G53)

High Level Assembler V1, R9 (5694-A01)	Language base required in operating system
SDSF V1,R11 (5694-A01)	Productivity aid used in conjunction with ISPF/PDF (TSO)
SDFII/CICS V1, R4 (5665-366)	CICS screen definition facility
ISPF V1, R11 (5694-A01)	TSO programmer productivity aid
OS/PL/1 Optimizer, Compiler V2, R3.0 (5668-910)	Pl/1 compiler with optimizer and Library
GDDM/MVS V1, R11 (5694-A01)	Graphical data display manager
HTTP Server V5.3 (5694-A01)	Web Server
Tivoli Storage Manager V5.5.4.2 (5698-A11)	Data Backup
z/OS V1.11 C/C++ Compiler (5694-A01)	Compiler
Ported Tools for z/OS V1.01.04 (5655-M23)	Provides secure encryption for remote login to the z/OS shell and to remote file transfer
DITTO/ESA for MVS V1.03 (5655-103)	Tape utility
XML Toolkit for z/OS	Assists in creating, integrating, and maintaining

V1.10 (5655-J51)	business-tobusiness solutions (open source code)

ASG

The Monitor for CICS V3.1	CICS performance monitor
The Monitor for DB2 V4.0	DB2 performance monitor Upgrade to V4.1 in progress
ViewDirect for MVS V6.4	Report distribution
DocumentDirect V4.2	Report distribution for the client

BMC Software

Control-M V6.2.20	Batch job scheduler
Control-M/Restart V6.2.20	Batch job restart facility

Candle

AF/OPERATOR V340	Data Center Automation
SA IOM V2R1	Enterprise server beeper/pager support

Chicago-Soft

MVS/QuickRef R7.3	Online message and code reference

Computer Associates

CA-UNICENTER TNG R11.5 SP08	Common services and enabling technology for CA systems management solutions

CA-PMA/LOOK R7.1	Real-time system performance measurement
CA-1 R12.0	Tape management system
CA-InterTest R8.0	CICS source code tool
CA-N-VISION/TPX R5.2	VTAM session manager
CA-LIBRARIAN/VS R4.3	User source code library
Plan Analyzer Unicenter PPA 11.5.1 (installing 14.0)	DB2 development aids
Batch Processor Unicenter RBP 11.5.1 (installing 14.0)	DB2 development aids
RC/Migrator Unicenter RCM 11.5.1 (installing 14.0)	DB2 development aids
RC/QUERY Unicenter RCQ 11.5.1 (installing 14.0)	DB2 development aids
RC/Secure Unicenter RCS 11.5.1 (installing 14.0)	DB2 development aids
RC/Update Unicenter RCU 11.5.1 (installing 14.0)	DB2 development aids
Info-Refiner Advantage INFOREF 11.5.1 (installing 14.0)	DB2 development aids
PRF Adv. Rept. Facility 11.5.1 (installing 14.0)	DB2 development aids

VISION:RESULTS R12.0	4GL information management and report generator
VISION:Sixty R12.0	Fixed-form report generator and extended utility

**The following CA products
are for
Tax & Revenue use only**

CA-Datacom/DB Product Pak R11.0 SP04	Database
CA-Datacom Server R3.0	Communications component. Provides SQL access to CA-Datacom/DB mainframe data.
CA-Datacom/CICS Services R11.0 SPO1	Provides communications to programs operating with CA-Datacom/DB
CA-Datacom Datadictionary R9.0	Datadictionary for CA-Datacom/DB
CA-Datacom/DL1 Transparency R2.3 (9912)	Allows programs that were written for IMS/DB or DL/1 to execute unchanged under CA-Datacom/DB
CA-Datacom/Ext SQL R9.0	Extension beyond ANSI standard. Allows SQL queries on a relational database.
CA-Datacom/IMS DC Services R1.0A	Allows interfacing between IMS and Datacom: the ability to write in IMS and read in Datacom
CA-Datacom/VSAM Transparency R2.2	Conversion tool that permits a VSAM-based application to operate under the control of CA-Datacom/DB
CA-Quikserv for VSAM R1.0	Allows VSAM application to access data in Datacom that has been migrated from a VSAM environment

Innovation

FATS/FATAR R4.0	Tape surface verification and copy

Levi, Ray and Shoup

VTAM Printer Support System (VPS) V1, R8.0	Supports remote printers without need for RJE connection
VPS/TCPIP R1, R8.0	Supports TCP/IP Printers
DRS V1, R3.4	Dynamically routes print output
VMCF/TSO V1, R8.1	Facilitates control of printers

MacKinney Systems

Batch To CICS V1, R3	Allows programmers to move all or part of files in and Out of CICS via TSO
KWIK-KEY R3.3	VSAM alternate index builder
CICS/MORNING NEWS R3.1	Broadcasts news to CICS users
CICS/MESSAGE R5.1	Sends messages to terminals, userids, and operator consoles

Novell

Linux SLES 9 and 10	Operating System

Oracle

Oracle 9i and 10G R9.2.0.3.0	Relational data base management system

Pitney Bowes

StreamWeaver	Provides added print design functionality

R6.4.7

PROGINET

Cyberfusion Integration Suite   Data mover

**Software AG
(for DHHR use only)**

ADABAS R8.1.3	Relational database facility Upgrade to R8.2.2 in progress
ADABAS CICS Interface R8.1.3	Relational database facility Upgrade to R8.2.2 in progress
NATURAL R4.2.5	Software development tool Upgrade to R4.2.6 in progress
NATURAL CICS Interface R4.2.5	Software development tool Upgrade to R4.2.6 in progress
NATURAL Security R4.2.5	Software development tool Upgrade to R4.2.6 in progress
NATURAL TSO Interface R4.2.5	Software development tool Upgrade to R4.2.6 in progress
NATURAL for DB2 R4.2.5	Software development tool Upgrade to R4.3.1 in progress
PREDICT R4.5.2	Data dictionary Upgrade to R4.6.1 in progress
SYSTEM MAINTENANCE AID R1.3.1	Software installation tool Upgrade to R2.1.2 in Progress
EntireX Broker V7.2.1	Messaging Server Upgrade to R8.0.1 awaiting user-agency action

SAS Institute

SAS   Statistical analysis, data creation, report writing
R9.2

SAS ACCESS/DB2 R9.2	DB2 interface
SAS/FSP R9.2	Editing procedure for SAS datasets
SAS/SHARE R9.2	SAS file updating tool

Serena International

COMPAREX R6.2.0	Compares, and highlights the difference between, two files of any structure or organization
Serena StarTool FDM V7.7.0	Multipurpose online utility

**Sterling Commerce
(for DHHR use only)**

Connect:Direct for OS/390 V4, R4.04	Host-to-Host file transfer

StorageTek

HSC R6.1	Host software component for automatic cartridge system
PM2 V6.0A	Reports on StorageTek hardware exceptions

Unicom Systems

CARTS-TS R3.6.0	Tape stacking

WV-96
Rev. 10/07

AGREEMENT ADDENDUM

In the event of conflict between this addendum and the agreement, this addendum shall control:

1. **DISPUTES** - Any references in the agreement to arbitration or to the jurisdiction of any court are hereby deleted. Disputes arising out of the agreement shall be presented to the West Virginia Court of Claims.

2. **HOLD HARMLESS** - Any clause requiring the Agency to indemnify or hold harmless any party is hereby deleted in its entirety.

3. **GOVERNING LAW** - The agreement shall be governed by the laws of the State of West Virginia. This provision replaces any references to any other State's governing law.

4. **TAXES** - Provisions in the agreement requiring the Agency to pay taxes are deleted. As a State entity, the Agency is exempt from Federal, State, and local taxes and will not pay taxes for any Vendor including individuals, nor will the Agency file any tax returns or reports on behalf of Vendor or any other party.

5. **PAYMENT** - Any references to prepayment are deleted. Payment will be in arrears.

6. **INTEREST** - Should the agreement include a provision for interest on late payments, the Agency agrees to pay the maximum legal rate under West Virginia law. All other references to interest or late charges are deleted.

7. **RECOUPMENT** - Any language in the agreement waiving the Agency's right to set-off, counterclaim, recoupment, or other defense is hereby deleted.

8. **FISCAL YEAR FUNDING** - Service performed under the agreement may be continued in succeeding fiscal years for the term of the agreement, contingent upon funds being appropriated by the Legislature or otherwise being available for this service. In the event funds are not appropriated or otherwise available for this service, the agreement shall terminate without penalty on June 30. After that date, the agreement becomes of no effect and is null and void. However, the Agency agrees to use its best efforts to have the amounts contemplated under the agreement included in its budget. Non-appropriation or non-funding shall not be considered an event of default.

9. **STATUTE OF LIMITATION** - Any clauses limiting the time in which the Agency may bring suit against the Vendor, lessor, individual, or any other party are deleted.

10. **SIMILAR SERVICES** - Any provisions limiting the Agency's right to obtain similar services or equipment in the event of default or non-funding during the term of the agreement are hereby deleted.

11. **ATTORNEY FEES** - The Agency recognizes an obligation to pay attorney's fees or costs only when assessed by a court of competent jurisdiction. Any other provision is invalid and considered null and void.

12. **ASSIGNMENT** - Notwithstanding any clause to the contrary, the Agency reserves the right to assign the agreement to another State of West Virginia agency, board or commission upon thirty (30) days written notice to the Vendor and Vendor shall obtain the written consent of Agency prior to assigning the agreement.

13. **LIMITATION OF LIABILITY** - The Agency, as a State entity, cannot agree to assume the potential liability of a Vendor. Accordingly, any provision limiting the Vendor's liability for direct damages to a certain dollar amount or to the amount of the agreement is hereby deleted. Limitations on special, incidental or consequential damages are acceptable. In addition, any limitation is null and void to the extent that it precludes any action for injury to persons or for damages to personal property.

14. **RIGHT TO TERMINATE** - Agency shall have the right to terminate the agreement upon thirty (30) days written notice to Vendor. Agency agrees to pay Vendor for services rendered or goods received prior to the effective date of termination.

15. **TERMINATION CHARGES** - Any provision requiring the Agency to pay a fixed amount or liquidated damages upon termination of the agreement is hereby deleted. The Agency may only agree to reimburse a Vendor for actual costs incurred or losses sustained during the current fiscal year due to wrongful termination by the Agency prior to the end of any current agreement term.

16. **RENEWAL** - Any reference to automatic renewal is hereby deleted. The agreement may be renewed only upon mutual written agreement of the parties.

17. **INSURANCE** - Any provision requiring the Agency to insure equipment or property of any kind and name the Vendor as beneficiary or as an additional insured is hereby deleted.

18. **RIGHT TO NOTICE** - Any provision for repossession of equipment without notice is hereby deleted. However, the Agency does recognize a right of repossession with notice.

19. **ACCELERATION** - Any reference to acceleration of payments in the event of default or non-funding is hereby deleted.

20. **CONFIDENTIALITY:** -Any provision regarding confidentiality of the terms and conditions of the agreement is hereby deleted. State contracts are public records under the West Virginia Freedom of Information Act.

21. **AMENDMENTS** - All amendments, modifications, alterations or changes to the agreement shall be in writing and signed by both parties. No amendment, modification, alteration or change may be made to this addendum without the express written approval of the Purchasing Division and the Attorney General.

ACCEPTED BY:
STATE OF WEST VIRGINIA

Spending Unit: _____

Signed: _____

Title: _____

Date: _____

VENDOR

Company Name: _EMC Corporation_

Signed: _____

Title: _Senior Account Exec_

Date: _8-11-11_

ISCL0093

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: _EMC Corporation_

Authorized Signature: _____   Date: _8-11-11_
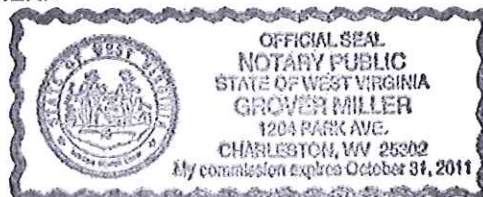
State of _WEST VIRGINIA_

County of _KANAWHA_ , to-wit:

Taken, subscribed, and sworn to before me this _11_ day of _AUG._ , 20_11_.

My Commission expires _Oct. 31_ , 20_11_.

AFFIX SEAL HERE   NOTARY PUBLIC _Gloria Miller_

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
GROVER MILLER
1204 PARK AVE.
CHARLESTON, WV 25302
My commission expires October 31, 2011

Purchasing Affidavit (Revised 12/15/09)

EMC Corporation

State of West Virginia

Disk Library for Mainframe Proposal

RFQ #ISCL0093

Date: August 11,2011

John Wright
BRS Mainframe Technical Consultant
EMC Corporation

Chris Judy
BRS Account Executive
EMC Corporation

Dave Benitez
BRS Technical Consultant
EMC Corporation

Lori Caldwell
Sr. Account Executive
EMC Corporation

Table of Contents

Executive Summary

Customers like State of West Virginia demand consistent service level agreements (SLAs) for their IT resources. In addition, SLA requirements continue to become more stringent: batch and backup windows are getting shorter yet data requirements are growing; customers want to restore their data at more frequent intervals; they want to be able to restore more quickly; and the demand for online information continues to grow.

Traditional tape-based solutions cannot deliver high service levels, primarily because tape libraries, tape drives, and tape media are not built with a focus on reliable restore. In addition, tape media failures are common, and a major cost for IT organizations – they result in extended application downtime and diminished productivity. Some customers keep several copies of data on tape simply to protect against media failure, compounding the problem with more tape infrastructure. Also, sequential access tape and tape robotics have inherent performance limitations that inhibit IT organizations from meeting SLAs. Finally, the process of vaulting or transporting backup tapes between disaster recovery sites and remote offices is a security risk. Lost or stolen backup tapes could result in confidential data falling into the wrong hands.

Disk-based tape solutions provide the highest service level choice for batch processing as well as backup and recovery. Disk Libraries by EMC eliminate most of the ongoing management issues associated with tape. EMC Disk Libraries also lower support costs and improve service levels while maintaining enhanced reliability over Virtual Tape systems. These are the key reasons why EMC helped develop the DLm (Data Library for Mainframe) solution. EMC's DLm requires no changes to existing tape bound applications, little or no process or procedure changes, and requires no JCL changes.

This proposal outlines a configuration that could improve your current mainframe tape infrastructure. EMC feels that the introduction of DLm further enhances your recovery capability and provides significant benefits over traditional tape approaches.

EMC Proposal

EMC has provided a configuration for full tape replacement and a vision for how State of West Virginia could remove dependence on tape thereby improving reliability, functionality, and recoverability.

While tape recovery has served IT organizations well for many years, customers are increasingly finding that tape infrastructure is no longer able to keep pace with the demands of the business. The mounting of tapes, their sequential read only characteristics along with the shrinking batch and backup windows highlight the shortcoming associated with the low performance of tape. Current Virtual Tape Systems (VTS) from several vendors address some of these issues by using a small disk cache to stack tapes and eventually write the information to physical tapes. When the mainframe host needs to retrieve information that is not on the disk cache, the information must be read from the tape drive to the disk cache and only then can it be accessed by the mainframe host. This operation can often take several minutes.

Although tape is considered to be a fairly reliable, cheap media, tape cartridge reliability & stability decreases over time. Tape media does have a shelf live that is shortened every time it is written to or read from. In addition, tape libraries and Virtual Tape Systems include a robotic arm(s) which have mechanical parts and tend to break or have problems.

The following solution from EMC provides State of West Virginia the ability to meet current requirements yet have capability to scale, improve current tape processing without considerable changes to that processes, and enable recovery to their own secondary datacenter thereby removing need for tape transfers and eliminating the risks associated with shipping tapes.

Solution Overview

The Disk Library for Mainframe (DLm) is a purpose-built design to improve service levels over existing tape-based infrastructure. It provides a high performance, highly scalable mainframe tape solution with the following benefits:

◆ Improved performance – Batch windows reduced with no mount delays.

◆ Restore Data Immediately Available – With no tape involved in EMC's solution, backup data is immediately available for use in both Charleston and SunGard.

◆ Performance that scales – Multiple data streams can be running simultaneously, further improving performance. In addition, performance scales with the number of RAID groups, reaching a sustained maximum of about 1200 MB/sec. This aggregate throughput scales even higher when compression is utilized. The write cache consolidation technology within DLm is a performance accelerator for backups, restores, and tape offloads.

◆ Highly reliability – The DLm offers dual engine systems with Active Engine failover capabilities and incorporates a high-reliability architecture and RAID-6 data protection

against dual drive failures. (Tape libraries and drives do not provide high availability and tape media do not have intelligent data protection.)

♦ RAID-6 protection – DLm insures availability, even if two disk drives fail.

♦ Reduced management overhead – This results from having all backup data in a single footprint.

♦ Qualified to work with your environment today and tomorrow – EMC's ELab organization has qualified more than 1 million different combinations of interconnected elements used in backup operations.

♦ Leverage your existing investment – By integrating DLm seamlessly into your existing backup architecture, you can improve utilization or re-purpose legacy tape assets.

♦ Hardware compression – Compression at the individual data stream or virtual tape drive level increases the capacity of real tape cartridges and improves performance.

♦ Dynamic storage allocation – This feature offers efficient utilization of all the storage within your DLm.

♦ Lower cost – The cost-per-megabyte of SATA drives is significantly lower than the price of high performance Fibre Channel drives, allowing more off-line data to be brought online. Plus, utilizing data compression methods can reduce costs even further.

♦ Automated process for offsite long-term storage – The DLm has an optional policy-based function to write out to a physical tape in native tape format for long-term offsite storage. Instead of two processes—one for backup and one for shipping the tapes offsite—the customer enjoys a single automated process.

♦ Advanced disaster-recovery capabilities – EMC has qualified support for the ability to execute backup to multi-site remote copy between DLm subsystems over IP networks. DR testing can be performed without impacting active production backup replication.

♦ Unmatched Replication Capability – Different RPO for different VOLSER ranges

♦ RSA Key Management for Encryption (In Flight or At Rest) – RSA client will be pre-installed in each DLm. The customer can then include the DLm into their existing or new RSA Key Manager and enjoy the benefits of security from the premier provider of security solutions for data protection.

Tape Analysis Summary

EMC requested SMF data to review and characterize the State of West Virginia tape environment. There were two basic steps in the process of creating the proper sizing:

Step 1 Involved collecting data from Mainframe tape activity. State of West Virginia provided SMF 21 records and volume information from the Tape Management Catalogs. The IBM System Management Facility (SMF) record type 21 provided us basic tape workload characteristics including tape I/O and tape error information.

Step 2 Involved running the EMC Tape Tools which provided us the ability to measure existing tape workload and provide required input for sizing the tape replacement solution configured for this proposal.

Following is the summary of the derived data.

State of West Virginia
- 42.55TBs of active data on tape
- 31.68TBs of active data has no vault code
- 106,954 (10.53TB) active tape entries for 36 track tape
- 7,406(32.02TB) active tape entries for 128 track tape
- Peak MB/sec on tape is 150MB/sec
- Average approximately 139 tape mounts per hour peaking at 258 per hour
- Average approximately 1,712 tape mounts daily
- 15.8TB good DeDupe Candidates

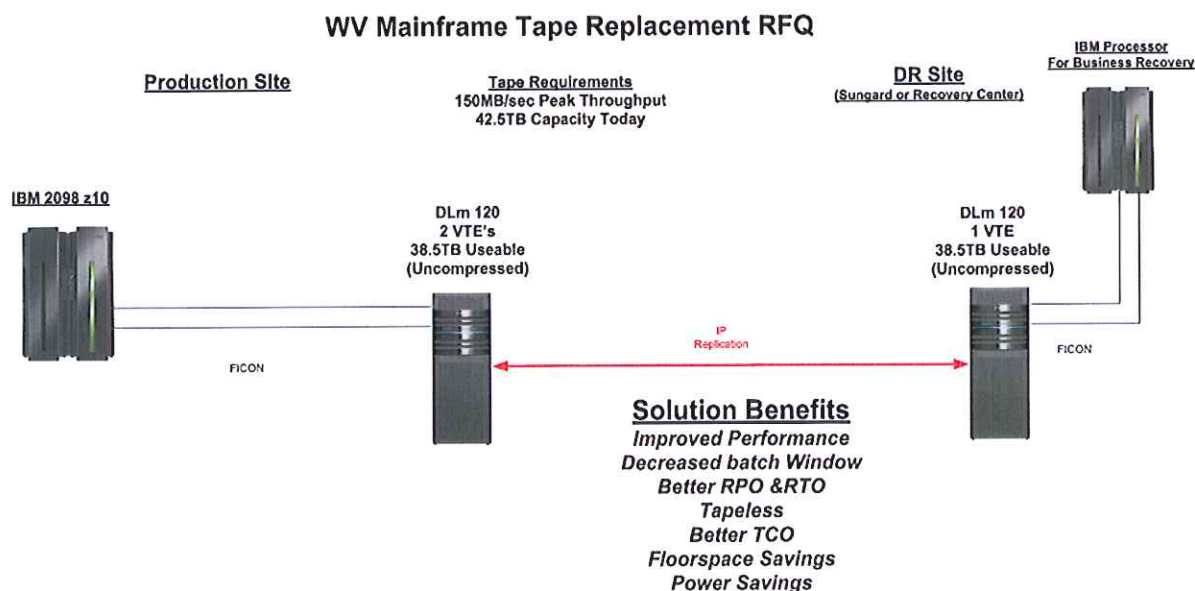Detailed output of tape analysis will be provided on request.

Proposed Solution

The following architecture was designed to take in to account the results of EMC's Tape Analysis conducted for State of West Virginia. The detailed quote for this option includes capacity and throughput capabilities for production processing at each site. Each DLm also includes capacities to act as a secondary for the production data with the use of bi-directional IP replication. We assumed that replication of all tape data was a requirement. If replication of all tape data is not a requirement the configurations can be adjusted to reduce capacities and reduce bandwidth required.

EMC is recommending that the State of West Virginia modify the current process of keeping tape data at the recovery center at Flatwoods in Sutton, WV with shipment to Sungard for a DR or DR test. The proposed alternative would be to place a DLm on the WV production floor as well as the DR floor at SunGard and replicate production data directly to the DR site. This eliminates the possibility of lost or stolen tapes, greatly improves and simplifies the recovery and testing process, and replication is not interrupted while testing is occurring. With the reduction in expense related to telecomm bandwidth and rented floorspace customers are able to experience the benefits of the second data center without the costs associated with building their own. If a small Z processor could be made available at the recovery center at Flatwoods then EMC would recommend placing the DR DLm120 on the Recovery Center floor.

Included in the EMC proposal are the professional services to implement, document, train, and test the full solution.

The 48 month cost of rented floor space at SunGard has been included in our solution. The cost of IP connectivity, circuit or any additional optional managed service for connectivity, have not been included in the proposal. Based on data from our tape study, if all tape data is to be replicated to the SunGard DR site, a circuit with 150 megabits per second bandwidth is required for a Recovery Point Objective (RPO) of 24 hours or better.

WV Mainframe Tape Replacement RFQ

Production Site

Tape Requirements
150MB/sec Peak Throughput
42.5TB Capacity Today

DR Site
(Sungard or Recovery Center)

IBM Processor
For Business Recovery

IBM 2098 z10

DLm 120
2 VTE's
38.5TB Useable
(Uncompressed)

DLm 120
1 VTE
38.5TB Useable
(Uncompressed)

FICON

IP
Replication

FICON

Solution Benefits
Improved Performance
Decreased batch Window
Better RPO &RTO
Tapeless
Better TCO
Floorspace Savings
Power Savings

Sizing of Solutions

The sizing effort for this solution was executed as described in the Data Collection section. EMC utilized a four step methodology to determine the requirements of the proposed solution. These four (4) steps included information derived from data provided by State of West Virginia. This solution would be customized to the business needs of State of West Virginia.

The results provided the proposed solution and connectivity that EMC feels will meet the current requirements for State of West Virginia business needs as well as incorporating "best practices" for performance and redundancy in the solution.

The configuration allows for easy on-line addition of capacity for future storage with the minimum cost per upgrade, it allows for a reduction in FICON channels while still providing sufficient bandwidth while not impacting redundancy in connectivity. The bandwidth into the DLm was configured to meet current workloads with some additional room for growth.

The replication of the data is IP based allowing for easy and economical replication without the need of host based software or channel extension equipment.

 All components of the solution are redundant within the configuration and have redundancy configured in the total implementation.

Operational Savings

EMC can assist in building a TCO / ROI analysis based on State of West Virginia's actual data. This analysis is proven and has been conducted by many existing customers in justifying a lower TCO & better ROI in comparison to other tape based virtual tape systems. EMC can develop a TCO with information provided by State of West Virginia and using industry numbers for costs. A sample TCO is provided in Appendix section D – TCO analysis.

Proposed Technology

Overview

EMC® Disk Library for Mainframe (EMC DLm), is the industry's first 'tapeless' virtual tape system for use in IBM zSeries environments. EMC DLm enables high-performance disk-based tape processing (production / backup and recovery / batch processing, etc…), eliminating the challenges associated with traditional tape-based operations, and lowers customers' tape TCO.

EMC first introduced our Disk Library portfolio four years ago and today we have the largest open systems VTL installation base in the industry, built on the strength of our advanced capabilities and systems design. With the EMC DLm, we are leveraging our rich mainframe technology heritage and proven expertise with VTLs to introduce a system that is easier to use, more scalable and higher performing than the current traditional tape library solution used by Norfolk Southern.

EMC has found that VTLs which utilize physical tapes on the back-end perpetuate the management overhead and costs associated with tape media handling and limiting the scalability of the VTL infrastructure. The EMC DLm is today the only virtual tape system on the market which provides a fully integrated, 'tapeless' alternative to tape-based mainframe VTLs, enabling customers to process and retrieve information at disk speed and scale their VTL infrastructure as workloads increase without the need for additional subsystems, tape libraries, or specialized network adapters.

EMC DLm & Bus-Tech MDL Family

	DLm-960	DLm-120	MDL-2000	MDL-1000
Number of VTEs	2 - 6	1 or 2	1 or 2	1 or 2
Connectivity	FICON/ESCON	FICON/ESCON	FICON Only	FICON/ESCON
Number of channels to host	4-12 / 3-18(E)	2 or 4 / 3-6(E)	2	1 / 2 (E)
Number of virtual tape drives	Up to 1,536	Up to 512	Up to 64	Up 32
Maximum capacity (usable non-dedupe)	28.5 TB -1.2 PB	9.5 TB – 95 TB	N/A	N/A
Performance	Up to 1 2 GB/s	Up to 400 MB/s	Up to 300 MB/s	Up to 174 MB/s
Deduplication storage	Yes – DD880 (1)	N/A	Yes – current DD	Yes – current DD
Deduplication capacity	Up to 3.8PB	N/A	Up to 7.6PB(a)	Up to 1.5PB(b)
Number of Cabinets	2-9	1	1	1
Replication	Yes	Yes	Yes	Yes

The DLm120 and DLm960 have two distinct advantages when it comes to scaling capacity.

One advantage is their low number of VTE (Virtual Tape Engine) and terabyte starting points and easy, economical upgrades. You can start as small as one VTE and as little as 9.5 TB of usable capacity for the DLm120 or one VTE with as little as 28.5 TB for the DLm960.

The systems can scale to accommodate higher throughput or capacity by adding more VTEs and more storage in increments of 9.5 or 19TB of usable capacity in one system.

The DLm120 can provide up to two VTEs and up to 95 TB of usable capacity, whereas the DLm960 can provide up six VTEs and up to 1.2 PB of usable capacity in one system, which is close to 3 PB of tape information with the typical compression rate.

The proposed solution in this proposal leverage cost-efficient 2 terabyte SATA II disk drives with RAID 6 protection, advanced tape emulation, and hardware compression to provide a high-capacity mainframe tape replacement solution that delivers increased application availability and shortens batch processing windows.

The EMC DLm will connect directly to IBM zSeries mainframes using FICON channels, and appear to the mainframe operating system as standard IBM tape drives. All tape commands are transparently supported by the DLm, enabling State of West Virginia Financial to utilize current work processes and applications without making any modifications. In accordance to the design requirements specified above the EMC DLm enables asynchronous replication of data over State of West Virginia Financial for Lutherans' existing IP networks, extending the benefits of array-based replication to mainframe data protection operations.

DLm120 and DLm960 Architecture
Disk Library for mainframe includes two major components.

Virtual tape emulation controller (VTEC)
- Includes the virtual tape engines (VTEs)
- Emulates IBM 3480/3490/3590 tape drives
  - 256 tape drives per VTE
  - Up to 1,536 with six VTEs
- FICON/ESCON connectivity
  - Throughput of 1.2 GB/s with six VTEs (FICON)
- Transparent to mainframe tape management systems
- Virtual cartridge size up to 16 TB
- Disk consumption is based on data, not cartridge size
- Supports hardware compression

Back-end storage
- Leverages 1 TB SATA II drives
- RAID 6 (12+2) configuration
  - Hot spare for every disk tray
- Stores all tape images as files
- Shares all tape volumes between all VTEs
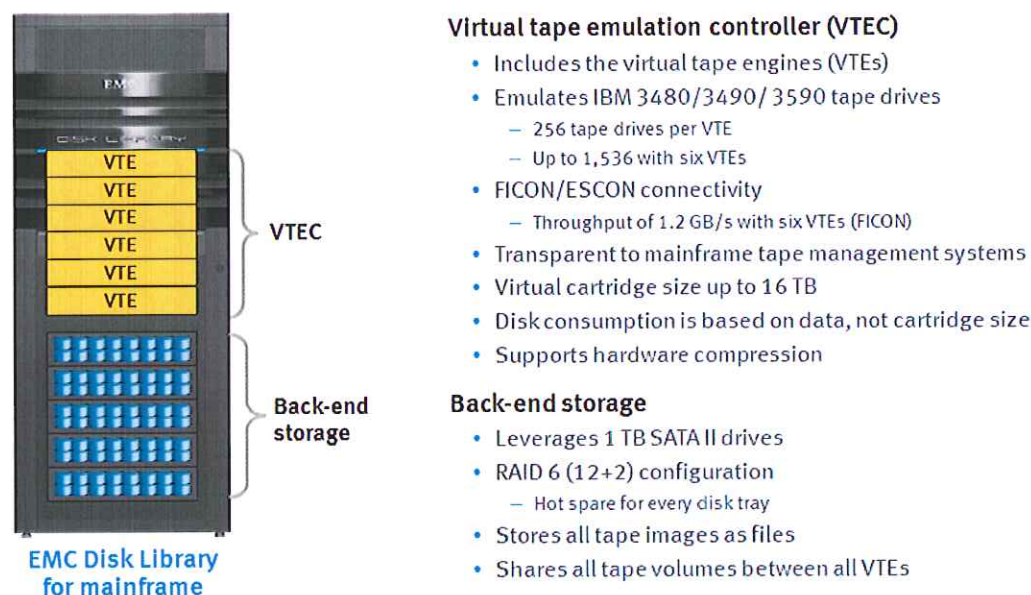
EMC Disk Library for mainframe

Figure 1 Disk Library for Mainframe Architecture

The first component is the virtual tape emulation controller (VTEC). The VTEC includes the virtual tape engines (VTEs), which perform all the tape emulation activities when reading tape information from disk, or writing tape volume to disk.

- Each of the VTEs provided with Disk Library for mainframe can emulate up to 256 tape drives per VTE, and with two VTEs the DLm120 provides 512 tape drives.
- The VTEs support ESCON and FICON connectivity to the mainframe host, and each VTE provides a maximum throughput of 200 MB/s with FICON. The DLm120 can accommodate up to two VTEs, providing throughput of 400 MB/s.
- The VTE is transparent to the mainframe host; the host sees it as another tape device just like a physical tape library.
- The VTE writes each VOLSER (volume serial number) as a file on the back-end storage.
- Each tape cartridge can be up to 16 TB in size; however, the disk space that is consumed is based only on the physical data that is written to disk and not based on the cartridge size.
- The VTE supports hardware compression, which typically is 2.4:1 to 3:1; however, since compression depends on data, higher compression rates are possible. In our estimates for capacity we have used 3:1 as we are seeing this in most accounts.

The second component is the back-end storage.

- The back-end storage uses the 1 TB SATA II drives with RAID 6 protection. Each disk tray also includes one hot spare drive for additional protection. Introduction of new 2 TB SATA II drives increases usable capacities to 2x current stated capacities.
- The tape volumes are kept as files on the back-end storage and can be shared among all the VTEs for higher availability.

The Disk Library for mainframe was built with no single point of failure. Each VTE can access all the tape volumes, which ensures that you have access to your tape volumes at all times. If one of the VTEs fails, you will receive the same error as you would get when using physical tape libraries and the job will fail.

You can either access your tape volumes via another tape drive mapped to an active VTE, or upload a new configuration file on another VTE, which includes the tape drives that were mapped to the failing VTE. Since the VTE does not contain any metadata, none of the tape information is lost, and the tape volumes are still available and can be processed.

The disk drives inside the Disk Library for mainframe are protected with RAID 6 and include 12 active disk drives and two parity drives. Each disk tray also includes one hot spare disk drive for additional protection.

Virtual Tape Engine

Each VTE in the VTEC connects to the mainframe through ESCON or FICON channels as well as connecting to the storage array using internal GbE links. When configured, each VTE will operate independently from other VTEs. Tape Drives from all VTEs in a single VTEC can be defined as part of a single library to the mainframe. Any drive can access any volume.

When the tape management software creates a new tape volume, the VTE creates a corresponding file on the storage array. The file name includes the Tape Volume Serial Number (VOLSER), which binds the file to the corresponding tape volume. The array acquires the VOLSER from the special command sent from the mainframe whenever it wants to mount a tape volume for reading or writing. Any emulated tape drive can access any of the tape volumes stored in the DLm4080.

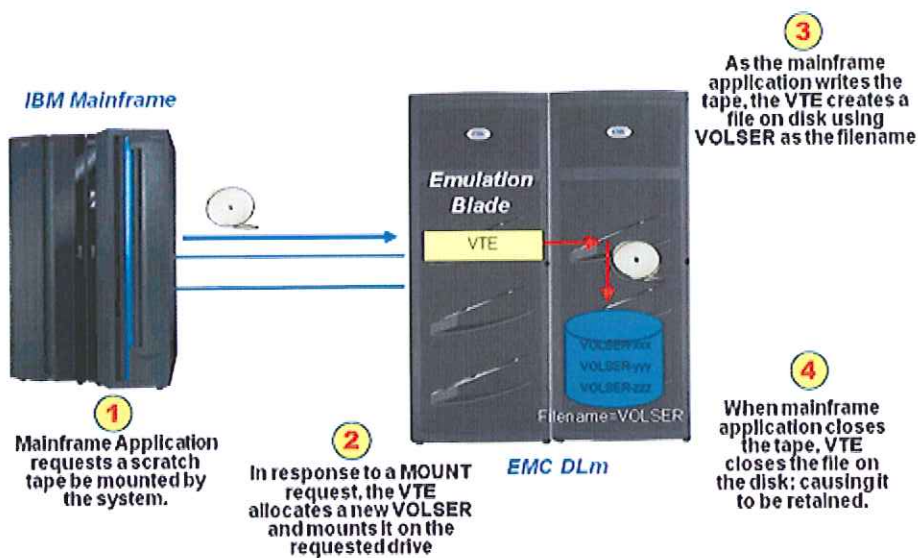The following two diagrams depict the process of writing and reading virtual tapes.

Figure 2 Writing a Tape Volume

IBM Mainframe

Emulation Blade

VTE

VOLSER-xxx
VOLSER-yyy
VOLSER-zzz

Filename=VOLSER

EMC DLm

③ As the Mainframe Application reads the tape, VTE reads the file; re-creating the tape exactly as it was written

④ When the application closes the file, VTE closes the disk file and unmounts the drive

① Mainframe Application Requests a Tape by VOLSER

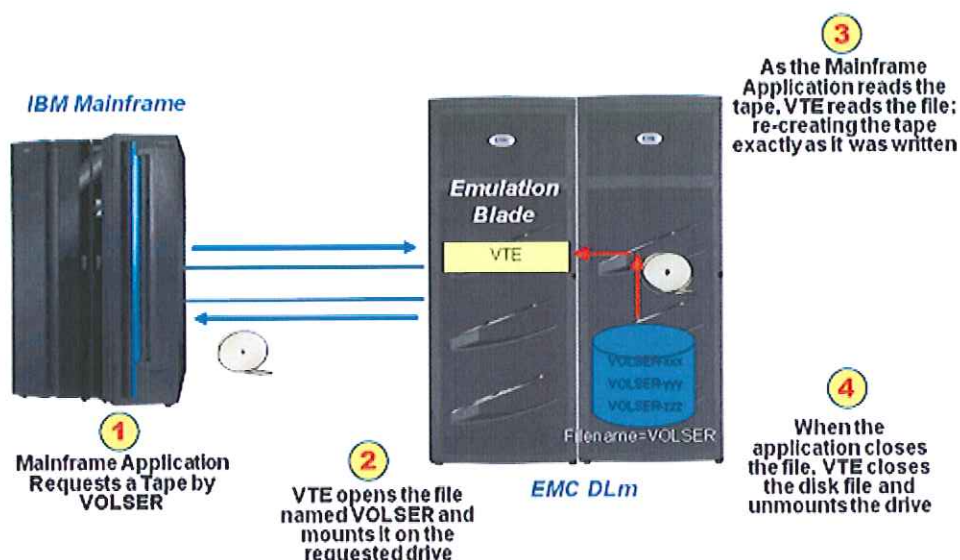② VTE opens the file named VOLSER and mounts it on the requested drive

Figure 3 Reading a Tape Volume

Physical Tape Support

The DLm allows attachment of an external tape to DLm VTE via FC. DLm120 is provided via 3592/TS1120. The ability to provide "tape out" options as well as read in 3590 tapes is available with external drive support.

SNMP Support

Each DLm VTE maintains a log of all messages issued to the virtual tape application's operator's console. The active log file is named EMClog in the directory /var/EMC/log.

Additionally each VTE includes an SNMP agent and MIB files for monitoring and analysis. Once configured, the VTE can send alerts to a designated SNMP manager. This allows operations window messages to be sent to an SNMP Management Console.

Mainframe Management

The Command Passing Facility enables you to submit commands to the Disk Library for mainframe through your mainframe host in batch. These commands include the ability to retrieve information about Disk Library for mainframe, and receive the information from the batch job output.

You can now easily retrieve information such as available space, compression ratios, etc. about your Disk Library for mainframe systems through the mainframe host.

Migration

Migration to the DLm for State of West Virginia is much simpler than traditional tape migrations. EMC's DLm is not constrained by normal replication bottlenecks or cache bottlenecks. There are

no tape transport limits to deal with. EMC can accept data as fast as customers can supply it and can accept it at that speed without impacting any tape operations. Additionally, migration to DLm will be the last physical tape migration customers will need to perform. At the end of the DLm's useful cycle, customers can migrate to a new platform electronically. No worries about maintaining old media for a period of time.

EMC believes its architecture and approach offer unique advantages to State of West Virginia for saving money and improving the service level over the traditional solutions in the mainframe tape space. Only EMC's DLm supports the density, performance and data de-duplication technology to make this a reality.

In addition to product considerations, EMC's team of experts have significant experience in managing successful migrations for customers as large as or larger than State of West Virginia. As EMC has gained significant traction with this solution in the marketplace in the last five years, EMC is very familiar with helping customers migrate to our platform from competitive solutions. As such, EMC can reduce any risk normally associated with migration to a new platform. There are several 3rd party Tape Migration Utilities that are available including Innovation FATSCOPY, OpenTech Tape/Copy and 21st Century Tape/Assist. Temporary software licenses can be purchased and pricing is dependent on duration and the number of TBs to be migrated. These licenses can be extended if needed for additional costs.

Replication / Transport Security

Using EMC DLm allows State of West Virginia to increase their data security over tape at no additional cost. Through the use of EMC replication, State of West Virginia's data is transferred across a private network and doesn't have the security risks of transporting tapes as many organizations see today. Furthermore, EMC DLm supports encryption using static keys. You can define up to seven static keys with Disk Library for mainframe and use them for encryption. Encryption and Key management for the DLm will be converting over to RSA technology early in 2011.

Remote Support Diagnostics and Security

EMC maintains a strong and highly visible commitment to protecting your information infrastructure through the 24x7 availability of remote technical support resources and automated, secure, remote support solutions.

The EMC Secure Remote Services gateway provides a secure, IP-based, distributed, remote service support solution giving you command, control, and visibility of remote support access.

ConnectEMC simplifies and standardizes the way you can set "call home" or have Disk Library for mainframe send an e-mail alert to the Tape Administrator in case of failure. It is also a method that EMC products use to transport event files—error, informational, configuration, and others—from a service workstation to EMC back-office support systems.

Proposal Benefit Summary

Let's review the advantages of Disk Library for mainframe:

- **Eliminates all issues related to traditional tape handling** such as manual intervention, physical movement to tape cartridges, robotic issues, and single points of failure.

- **Reduces CPU**

  The Disk Library for mainframe supports native compression through a hardware compression board on each VTE. Compression ratios vary depending on the data, but typical ratios seen have been approximately 3:1.

  In an HSM ML1 environment, you're already saving your data on disk and compacting it based on your migration strategies. Now, with the Disk Library for mainframe, by storing your tapes on disk and having compression inside the Disk Library for mainframe, you can eliminate your ML1 requirement altogether. This lets you reclaim the host CPU cycles that were used for on-host compression that ML1 was using and reclaim the storage allocated to ML1. The ML1 storage can be repurposed for other needs.

- **Works seamlessly with existing applications** using tape management processes to automate tape vaulting.

- **Disk Library for mainframe currently supports encryption using static keys.**
  You can define up to seven static keys with Disk Library for mainframe and use them for encryption. There is no need to encrypt all the information inside the Disk Library for mainframe. You can decide which information will be encrypted and which will not.

- **Significantly improves performance** by reallocating all the data to disk, reducing batch windows significantly. "Time to first byte" is the time from the request of the tape volume until the information on tape is being read.
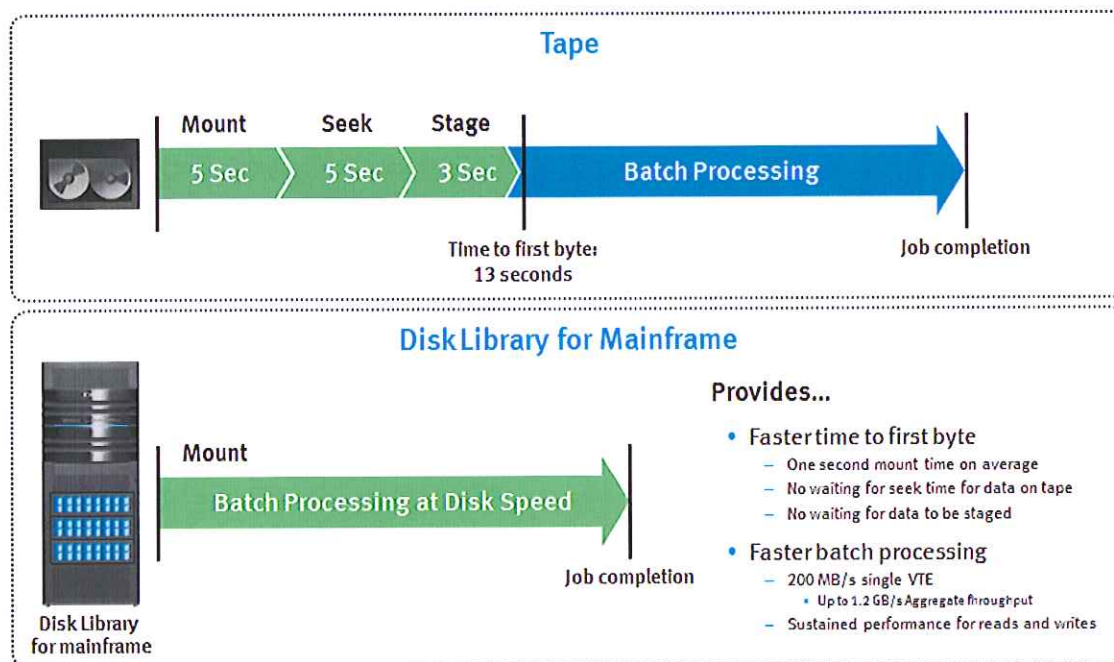
When using physical tapes, the job must wait for the tape to be mounted. Then the tape drive needs to perform the seek and stage operations before starting to process the information on the tape.

Assuming the tape drives are always available, the typical time to first byte with physical tapes is 13 seconds. Of course, if the drives are busy processing other tapes, there is no knowing how long the time to first byte could be.

With Disk Library for mainframe, the time it takes to locate and mount the tape volume averages one second.

Another major advantage that Disk Library for mainframe provides is fast locate capabilities. One national freight company saw response times drop from an average of 15 to 40 seconds to less than one second 99 percent of the time. This benefits applications such as ViewDirect by Mobius by dramatically reducing the time it takes to retrieve information by the application.

These capabilities allow the Disk Library for mainframe to take advantage of the fact that the information resides on disk, which enables random access directly to the required information without the need to read through the entire tape information.

When writing the tape image, Disk Library for mainframe creates an index that maps the information on the tape image on 5 MB block boundaries.

When the mainframe host sends a read request, Disk Library for mainframe can then access directly to the relative closest block to the required information, taking advantage of the random access method provided by disk for faster response times.

- **Extends disaster recovery capabilities to the tape workload** by utilizing array-based replication processes over IP to seamlessly move tapes offsite

  Disk Library for mainframe provides users with the option to perform asynchronous replication between two or three Disk Library for mainframe systems.   Disk Library for mainframe replication is done by utilizing back-end storage IP replication and does not affect the application running on the mainframe host. Only the changed data will be replicated to the remote site.

  You can set up recovery point objectives (RPOs) and quality of service based on your service level agreements and network bandwidth. The replication cycle will start based on the defined RPOs and will move the changes to the remote site.

You do not need to use Channel Extending for Disk Library for mainframe replication or have a dedicated infrastructure for Disk Library for mainframe replication. In case of WAN outage, Disk Library for mainframe will perform automatic re-sync once the WAN is available again.

The replication is based on VOLSER ranges, and since not all information needs to be replicated, you can self-select which information should be replicated. This means that the DLm120 at the remote site might have less capacity than the DLm120 at the production site—providing a cost savings.

Replication can be bi-directional so a source system can also be a target system for remote Disk Library for mainframe and vice versa.

Disk Library for mainframe provides users with the ability to perform disaster recovery tests while continuing the replication and being protected even during the disaster recovery tests.

You can mount the tapes at the remote site as read-only to check that your disaster recovery procedures work correctly and that you have the required access to the tape information.

If you desire to modify the tape information during your disaster recovery tests, you can take a snapshot of your tape information at the remote site and mount these copies as read-write, modify them during the disaster recovery tests, and discard them once the tests are completed.

- **Introduces a better way to perform business continuance testing that doesn't jeopardize replication.**

  Mainframes keep the most critical information, and you typically need to perform disaster recovery tests once or twice a year. These tests usually take more than one day and are very complex, requiring you to handle hundreds, if not thousands, of tape volumes. Typically with virtual tape libraries, you are required to shut replication down to be able to perform your disaster recovery tests at the remote site, leaving you unprotected for the duration of these tests.

  With Disk Library for mainframe, you do not need to shut down replication, and can perform your disaster recovery tests while continuing to be protected.

  There are two ways you can perform disaster recovery tests with Disk Library for mainframe.
  1) You can mount the Disk Library for mainframe volumes at the remote site as read-only and test that the tapes can be mounted and all data can be read.

2) Since Disk Library for mainframe uses disks as the back-end storage, you can take advantage of this technology and create snapshots of your tape volumes and mount them as read-write at the remote site, perform full disaster recovery tests, including writing to the snapshot tapes. Once the mainframe users are done, they can eliminate the snapshots.

<u>No matter which option you choose to perform disaster recovery tests, you do not need to turn off your replication and can stay protected at all times.</u>

- **Provides a much easier "return home" solution** than competing extended virtual tape solutions.

- **Easily scales as the workload increases** without the complexity of adding additional subsystems, libraries, network connections, etc.

Pricing Summary

Please find the Cost Sheet attached separately with EMC's RFQ Response

Appendix

A. Configuration Detail

Please find the Configuration Detail attached separately with EMC's RFQ Response

B. EMC Services Overview for State of West Virginia

Project Overview

This outline provides the detailed scope and high-level tasks for installation and implementation of EMC DLm solutions for State of West Virginia and Sungard data centers.

The implementation scope includes 2 DLm120 systems (one at each site) which will be deployed for tape processing at each location and set up bi-directional IP replication between the systems.

This will include the design strategy, installation of all hardware, zOS configuration and implementation specific for State of West Virginia's zOS environment.

Project Scope

Design, installation, and implementation of DLm120 in Production and a DLm120 in Sungard data-center. Replication of all production data between sites.

During this engagement, EMC will:

- Development and implementation of NAS architecture for DLm including:
    - o Design for storage architecture of NS storage components for deployment in a DLm implementation with replication between two State of West Virginia sites
    - o Implementation and configuration of NAS storage component hardware
    - o Configuration of file systems for on source and target DLm's
    - o Validation of user authentication
    - o Enabling SNMP and dial home facilities
    - o Creation and execution of test plan for Site A to Site B replication
- Design and implementation of DLm systems at two State of West Virginia sites including:
    - o Determining Addresses (Device, UCBS, CHPIDs, ETC), CPU Channel Paths (CHPIDs) and # of paths to each DLm, desired device type ID (3480, 3490, etc.) to be used
    - o Review and redefine IOCDS changes as needed
    - o Create Level2 and 3 design details and document
    - o Analyze and Design Tape Management System Integration Requirements.
    - o Verify FICON connectivity and hardware implementation
    - o Run sample tape test to verify accessibility and basic functionality
    - o Develop, design, and implement VTEC Design and Configuration (2 Sites)
    - o Assist customer in customization of VTEC scripts for reporting (2 Sites)

- Assist with design strategy for site recovery

- Verify and validate the DLm Environment installations

- Knowledge transfer of all components of DLm with State of West Virginia team

- Documentation of all configurations in config guide to deliver on completion of project

Project Documents and Deliverables

EMC provides the Customer with the following deliverables:

- Completed *Configuration Guide*

- *Test and Acceptance Plan* (Proposed)

- Successfully completed *Test and Acceptance Plan*

- Knowledge transfer for DLm management and control

Customer Responsibilities and Requirements

The Customer acknowledges that its timely provision of and access to office accommodations, facilities, equipment, assistance, cooperation, complete and accurate information and data from the Customer officers, agents, and employees, and suitably configured computer products (collectively, "cooperation") are essential to the performance of any Services set forth in this SOW. The Customer acknowledges that EMC's ability to perform the Services and any financial estimate related thereto depends upon the project assumptions stated in the Assumptions section below and the Customer's fulfillment of the following obligations.

Prior to and during the engagement, the Customer must:

- Provide a test environment (as available) in which to test responses to both planned and unplanned events as stated in the *Test and Acceptance Plan*.

- Ensure that the appropriate staff members attend and participate in the required interviews and are able to discuss the active topics presented. EMC will provide a list of resources and expected work contribution following creation of migration planning. EMC will work closely with State of West Virginia during data gathering processes and then in implementation phases. EMC will require State of West Virginia participation in design review and confirmation, test plan creation and execution, and during migration windows to assist with access to State of West Virginia systems. EMC will require a primary contact from the zOS team and Open Systems storage teams to act as primary State of West Virginia technical contacts.

- Assume responsibility for all network connectivity, performance, and configuration issues.

- Ensure that an adequate backup and restore process exists and is operational.

- Provide sufficient system security clearances to issue the EMC host software commands.

- Sign-off on the *Test and Acceptance Plan* before the implementation occurs.

Problem Resolution

In the event that a problem is encountered while EMC Professional Services resources are engaged they will assist in any way possible to speed problem to resolution however the normal EMC Customer Service processes for support would be followed.

The Customer Service severity levels are as follows:

Remote Technical support
Initial technical response objective, based upon Severity Level, within the following time period after receipt of customer contact or equipment issue dial home issue are:
Severity Level 1 : 30 minutes; on a 7x24 basis
Severity Level 2 : 2 hours; on a 7x24 basis
Severity Level 3 : 3 local business hours
Severity Level 4 : 8 local business hours

Please note that a dial home call will have a severity assigned to it based upon the type of call. When a customer places a call or if a customer calls in reference to an already existing case, the customer sets the priority of that case.

Onsite Support - EMC sends authorized personnel to installation site to work on the problem after EMC has isolated the problem and deemed onsite support necessary. Response objective is 4 hours after EMC deems onsite support is necessary on a 7x24 basis. Onsite support does not apply to Software.

EMC Role and Responsibilities

PM – The Project Manager must have advanced project management skills. Extensive communications skills are required due to the length and complexity of a typical service.

SA – A Solutions Architect has a comprehensive understanding of application performance requirements and storage platforms (Symmetrix, CLARiiON, Centera, and Celerra) to develop a solid design based on the requirements from the customer or from an EMC Consulting Service. The ability to work with multiple storage tiers and heterogeneous server environments is also required. A basic understanding of the impact of Wireless devices and content delivery on the solution is required as well.

IS/Storage Operations – An Implementation Specialist must have advanced knowledge of the storage system(s) that are being deployed as well as comprehensive knowledge of the operating systems in use. Basic application platform knowledge is desirable, but not required. Application partners should be on site and available for help in this area. Communications skills are critical due to the complexity and length of this service).

CE/IDE – A Technology Business Consultant is the lead consultant over a particular practice area, such as finance, operations, marketing, or practice area.

EMC Position and Expected Yrs Experience

Position / Level	Role / Function	Years Experience
Sr. Project Manager	Project management	5+
Sr. Solutions Architect/Consultant	Architecture design (Business Continuance, Platforms) and consultancy.	10+
Solutions Architect	Architecture design (Business Continuance, Platforms)	2-5+
Sr. Storage Operations / Implementation Specialist	Implementation for advanced storage operations including replication, performance reviews, and software installation.	5+
Storage Operations / Implementation Specialist	Implementation for storage operations including provisioning, device mapping, and base configurations.	2-5+
Customer Engineer (CE) / Implementation Delivery Engineer (IDE)	Performs hardware installation, configuration, and onsite support functions.	3+

Project Timeline and Delivery

Project time-line defined as 7 weeks. Time-line will depend on how aggressive State of West Virginia intends to move forward. The first 3 weeks are used to gather data, create plans for installation, and complete configuration guides which lay out all configuration detail for implementation team.

Implementation will generally be completed in phases over course of 2 weeks.

Replication configuration and testing can be set up in 2 day typically if planning is done appropriately.

Final steps in project are completion of all documentation, test and acceptance plans for testing that was performed, knowledge transfer, and project closure meetings.

C. TCO Sample

This TCO was created as an example. This is not State of West Virginia data.

5 YEAR CONSOLIDATED TCO AND ROI FOR ___

EMC²
where information lives

Project	Initial Investmer		Year 1		Year 2		Year 3		Year 4		Year 5		Avg Month		Total
DLm	$	517,870	$	-	$	-	$	-	$	-	$	-	$	-	$	517,870
Cost SW Maintenance	$	-	$	6,609	$	6,609	$	6,609	$	6,609	$	6,609	$	551	$	33,045
Cost HW Maintenance	$	-	$	-	$	-	$	-	$	83,880	$	83,880	$	2,796	$	167,760
Power and Floor space costs	$	-	$	15,578	$	15,578	$	15,578	$	15,578	$	15,578	$	1,298	$	77,888
services costs	$	140,820	$		$		$		$		$		$	2,347	$	140,820
Total	$	658,690	$	22,187	$	22,187	$	22,187	$	106,067	$	106,067	$	6,992	$	937,383
Savings																
Cost Current Maintenance			$	138,840	$	138,840	$	138,840	$	138,840	$	138,840	$	11,570	$	694,200
Cost Current Power and floor space			$	27,084	$	27,084	$	27,084	$	27,084	$	27,084	$	2,257	$	135,422
Personnel with Burden, Vault Cart and Replacement Cart Costs			$	5,500	$	5,500	$	5,500	$	5,500	$	5,500	$	458	$	27,500
Host based tape emulation (VTEM, CA Disk)			$		$		$		$		$		$		$	
HSM			$	175,200	$	175,200	$	175,200	$	175,200	$	175,200	$	14,600	$	876,000
Other savings (off site, software, channel extension, SW licenses)			$	50,000	$	50,000	$	50,000	$	50,000	$	50,000	$	4,167	$	250,000
Total	$	-	$	396,624	$	396,624	$	396,624	$	396,624	$	396,624	$	33,052	$	1,983,122

			Year 1		Year 2		Year 3		Year 4		Year 5				
Annual Project Savings	$	(658,690)	$	374,438	$	374,438	$	374,438	$	290,558	$	290,558	$	28,060	$	1,045,740
Cumulative Cash Flow	$	(658,690)	$	(284,252)	$	90,186	$	464,624	$	755,182	$	1,045,740				
Cumulative Costs	$	658,690	$	680,877	$	703,063	$	725,250	$	831,316	$	937,383				
Cumulative Savings			$	396,624	$	793,249	$	1,189,873	$	1,586,498	$	1,983,122				

* Does not include Net Present Value, Cost of Terms, Currency Devaluation, or Tax
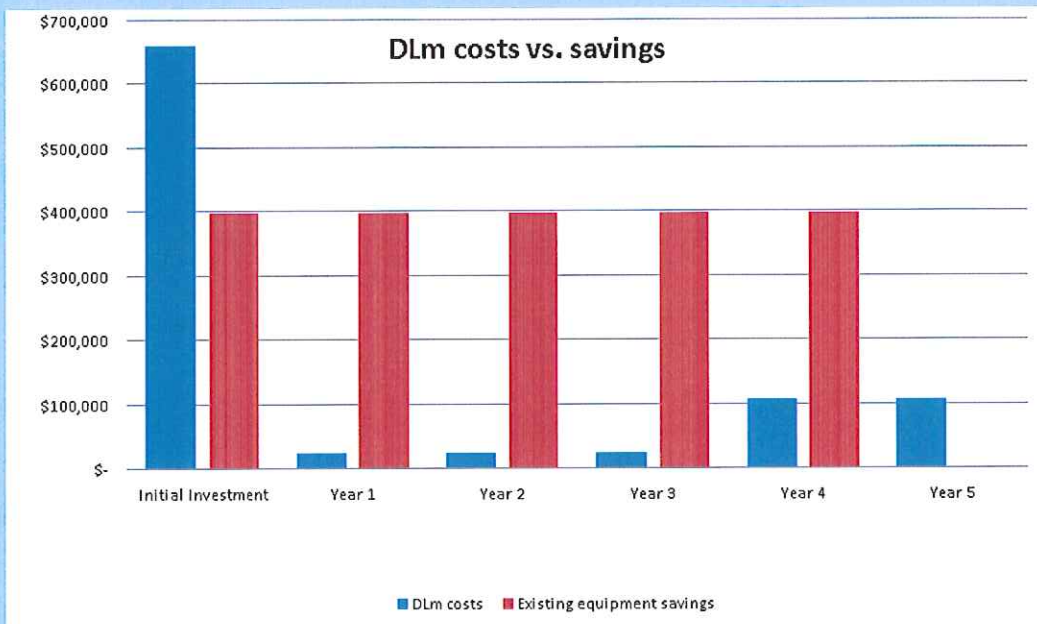* Includes Freight & Hardware Installation

Recovery Months	21

5 year ROI	112%

Graphs

Costs vs Savings

Savings breakdown

Cumulative costs vs savings

Floor space and Power

Cash flow vs savings

DLm costs vs. savings

Chart axis labels: $700,000 / $600,000 / $500,000 / $400,000 / $300,000 / $200,000 / $100,000 / $-

Categories: Initial Investment, Year 1, Year 2, Year 3, Year 4, Year 5

Legend: ■ DLm costs   ■ Existing equipment savings

This graph shows for each year the expected costs and savings.
Use this graph to show your customer the savings he can get every year compared to the yearly DLm expenses

Cumulative costs vs. savings

Chart axis labels: $2,500,000 / $2,000,000 / $1,500,000 / $1,000,000 / $500,000 / $-

Categories: Initial Investment, Year 1, Year 2, Year 3, Year 4, Year 5

Legend: ◆ Cumulative Costs   ■ Cumulative Savings
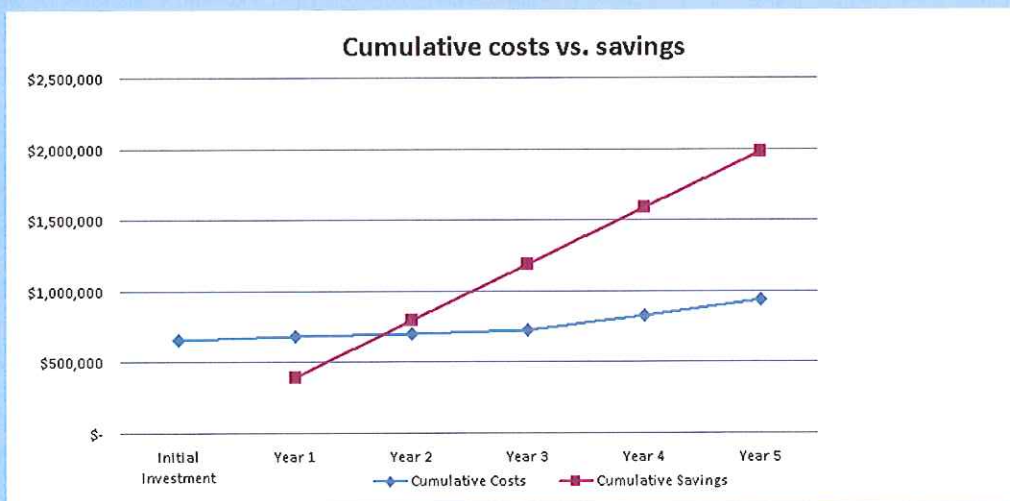
COST SHEET

Vendor Name: EMC Corporation

Vendor Address: 9825 Kenwood Rd, Suite 300, Cincinnati, OH 45242 (Regional)
102 Centre Court Rd Charleston WV 25314 (Local)

Vendor Contact: Lori Caldwell

Vendor Phone No: (304) 541-3400

Cost of Virtual Tape Equipment: (Including 48 Month Warranty)	$307,130
Cost of Software: (For 48 Months)	Included
Cost of SunGard DR Facilities Co-Location: (For 48 Months)	$144,000
Cost of Installation:	$81,768
Cost of Shipping:	$834
Cost of VTL Implementation (see section IV):	Included w/ Installation
Trade-In Allowance: (12x 3590 Drives)	$-7000
GRAND TOTAL:	$526,732

Date: 10-Aug-2011

Prepared For:	Bill To:	Ship To:	Install:
WEST VIRGINIA, STATE OF	WEST VIRGINIA, STATE OF	WEST VIRGINIA, STATE OF	
1900 KANAWHA BLVD E	1900 KANAWHA BLVD E	1900 KANAWHA BLVD E	
CHARLESTON, WV 25305	CHARLESTON, WV 25305	CHARLESTON, WV 25305	
US	US	US	

Line #	Qty	Product ID	Description	Units
1	1	DLM120-4PDAE	DLM120 VAULT DAE	EA
2	1	DLM120-AUX	DLM120 AUX XPE - 1 FC SLIC PER SP	EA
3	2	DLM-2000H-DAE	15 2TB SATA II DRIVES RAID 6 (12+2+1) W/ ENCL	EA
4	1	DLM120-CS	DLM120 CONTROL STATION	EA
5	1	DLM120-CS2	DLM120 BACKUP CONTROL STATION	EA
6	1	DLM120-2DM-A	DLM120 DUAL XBLADE STORAGE CONTROLLER	EA
7	1	DLM120-VAULT	DLM FC VAULT PACK - 300GB; 15K; 4GB DRIVE; QTY: 5	EA
8	1	DLM4G15-300HS	DLM 300 GB 15K 4GB RPM DRIVE -- HOT SPARE FOR VAUL	EA
9	1	DLMP40U-60-US	POWER KIT FOR US POWER	EA
10	1	DLM120-AUXCBL	DLM120 CABLE KIT 2SPS DUAL BLADE	EA
11	1	DLMRK2-VTEC	40U TITAN RACK DOOR W/DL LOGO 1PHASE 4PDP ACCES	EA
12	1	DLMRK-SECURE	40U RACK STABILIZING KIT	EA
13	2	DLM120-DP-CBL	DLM120 1G SWITCH TO VTE ENET CABLE KIT - DATA VLAN	EA
14	2	DLM2-GES	DLM - 1GIG E SWITCH W/ STACKING MODULE	EA
15	2	DLM2-ACP	DLM ACCESS CONTROL POINT	EA
16	4	MODEM-US	UNITED STATES MODEM	EA
17	2	DLM2-VTEFSM	DLM-VIRTUAL TAPE ENGINE W/ 2 FICON SINGLE MODE INT	EA
18	1	M-PRESWL-002	PREMIUM SOFTWARE SUPPORT	EA
19	1	M-PREHWB-001	PREMIUM HARDWARE SUPPORT (ANDL)	EA
20	1	DLM120-SPS	DLM120 ADDT STANDBY POWER SUPPLY	EA
21	2	DLM2-VTEOS	DLM - VTE OPERATING SYSTEM LICENSE	EA
22	1	DLM120-REP2-L	DLM120 REPLICATOR V2 LICENSE	EA
23	1	DLM120-SC-L	DLM120 UNIX NFS LICENSE	EA
24	1	DLM-MGR-L	DLM MANAGER ADVANCED LICENSE	EA
25	1	DLM120-4PDAE	DLM120 VAULT DAE	EA
26	1	DLM120-AUX	DLM120 AUX XPE - 1 FC SLIC PER SP	EA
27	2	DLM-2000H-DAE	15 2TB SATA II DRIVES RAID 6 (12+2+1) W/ ENCL	EA
28	1	DLM120-CS	DLM120 CONTROL STATION	EA
29	1	DLM120-CS2	DLM120 BACKUP CONTROL STATION	EA
30	1	DLM120-2DM-A	DLM120 DUAL XBLADE STORAGE CONTROLLER	EA
31	1	DLM120-VAULT	DLM FC VAULT PACK - 300GB; 15K; 4GB DRIVE; QTY: 5	EA
32	1	DLM4G15-300HS	DLM 300 GB 15K 4GB RPM DRIVE -- HOT SPARE FOR VAUL	EA
33	1	DLMP40U-60-US	POWER KIT FOR US POWER	EA
34	1	DLM120-AUXCBL	DLM120 CABLE KIT 2SPS DUAL BLADE	EA
35	1	DLMRK2-VTEC	40U TITAN RACK DOOR W/DL LOGO 1PHASE 4PDP ACCES	EA
36	1	DLMRK-SECURE	40U RACK STABILIZING KIT	EA
37	1	DLM120-DP-CBL	DLM120 1G SWITCH TO VTE ENET CABLE KIT - DATA VLAN	EA
38	2	DLM2-GES	DLM - 1GIG E SWITCH W/ STACKING MODULE	EA
39	2	DLM2-ACP	DLM ACCESS CONTROL POINT	EA
40	4	MODEM-US	UNITED STATES MODEM	EA
41	1	DLM2-VTEFSM	DLM-VIRTUAL TAPE ENGINE W/ 2 FICON SINGLE MODE INT	EA
42	1	M-PRESWL-002	PREMIUM SOFTWARE SUPPORT	EA
43	1	M-PREHWB-001	PREMIUM HARDWARE SUPPORT (ANDL)	EA
44	1	DLM120-SPS	DLM120 ADDT STANDBY POWER SUPPLY	EA
45	1	DLM2-VTEOS	DLM - VTE OPERATING SYSTEM LICENSE	EA
46	1	DLM120-REP2-L	DLM120 REPLICATOR V2 LICENSE	EA
47	1	DLM120-SC-L	DLM120 UNIX NFS LICENSE	EA
48	1	LRGHOSTING-1	SEL 1YR 22U CAB;220V PWR; 5HR OPS SPRT	EA
49	1	LRGHOSTING-3	SEL 3YR 22U CAB;220V PWR; 5HR OPS SPRT	EA
50	1	PS-CUS-DL	IMPLEMENTATION FOR DISK LIBRARY	EA
51	1	PS-CUS-EXPIPS	BILLABLE EXPENSE IPS	EA