Attachment B

Requirements Traceability Matrix (RTM)
Request for Proposal Number 5401 Z1

Bidders must respond to the Requirements Traceability Matrix using the matrix format provided and must not change the order or number of the requirements.

The responses in the RTM must indicate how the bidder intends to comply with each individual requirement and the effort required to achieve that compliance. It is not sufficient for the bidder to simply state that it intends to meet the requirements of the RFP. The State will consider any such response to the requirements in this RFP to be non-responsive. The narrative should provide the State with sufficient information to differentiate the bidder's technical solution from other bidders' solutions. Explain each response and describe how the proposed solution meets each requirement.

RTM # (RFP reference)	Technical - Mandatory Requirements
TM-1 (IV.E.1.b.)	The bidder will describe, and provide a diagram of the design and connections, as well as the logical and physical configuration, of the new equipment to provide tape storage for the primary and backup VTLs at both local and remote sites, including physical space requirements.
Bidder Response:	
TM-2 (IV.E.1.c.)	The bidder must describe how a non-disruptive migration of all tape-related data to the new VTL equipment would be performed by the bidder. All VTLs must be loaded with the State's data. As part of the data migration, all pointers, catalogs, and directories must be updated synchronously to ensure that the migrated data is continuously accessible.
Bidder Response:	

RTM # (RFP reference)	Technical - Hardware
TH-1 (IV.E.2.a.)	The proposed technology must meet or exceed the following minimum performance requirements for the VTL, given a workload 65% write; block size 32K; average chain length (bufno) of eight: a) Aggregate data rates greater than or equal to 400 MB/sec (read and write) b) Scratch mount less than or equal to 1 second c) Read mount (time to first byte) less than or equal to 1 second d) Average service time (PEND+DISC+CONN time as measured by RMF) less than or equal to 5 milliseconds The bidder must provide the: a) Aggregate data rates b) Scratch mount time c) Read mount time d) Average service time e) Local and remote replication rates over a one (1) Gb IP link of their last three installations that are similar to the proposed solution. The bidder must describe their ability/strategy to maintain performance standards for the life of the subsystem and describe how specific equipment and software will maintain these performance minimums for the life of the subsystem.
Bidder Response:	
TH-2 (IV.E.2.b.)	The proposed technology must be capable of encrypting data at the internal media level. Compaction of data must be complete prior to encryption. The bidder must describe/specify: a) their implementation of encryption and key management for encryption process b) procedures that z/OS staff will need to employ to manage and safeguard the keys c) how the keys are dispersed across the VTLs.
Bidder Response:	
TH-3 (IV.E.2.c.)	The proposed technology must be configured in such a way as to prevent data loss. The bidder must describe/specify areas of potential data loss and what processes are used within their solution to prevent loss of data.
Bidder Response:	
TH-4 (IV.E.2.d.)	The proposed technology must: a) Have a sufficient number of FICON channel adapters to meet the availability and performance requirements,

RTM # (RFP reference)	Technical - Hardware
	with a minimum of two (2) channel attachments from each VTL to the processor at each site b) Be capable of supporting up to twenty (20) LPARs divided among multiple sysplexes on two processors c) Support all current and future IBM channel commands d) Provide ability to configure new hardware using IBM HCD process The bidder should describe/specify: a) connectivity from each processor, including number of channels, channel adapters, and channel attachments b) capacity for supporting up to twenty (20) LPARs c) ability to support IBM channel commands d) configurability of hardware using IBM HCD process (in the format of CHPID, Control Unit and Device statements) e) number of CHPIDs and control units the State must configure for best performance from the equipment.
Bidder Response:	
TH-5 (IV.E.2.e.)	The proposed technology must have: a) Virtual tape drives that can be moved between multiple z/OS host LPARs, sysplexes, and systems b) Remote diagnosis via IP c) An automated feature that will monitor, detect, and report VTL problems to the manufacturer The bidder must describe the solution's ability/method for allocating drives between multiple z/OS host LPARs, sysplexes, and systems.
Bidder Response:	

RTM # (RFP reference)	Technical - Hardware
TH-6 (IV.E.2.f.)	The State currently has separate Tape Management environments for each sysplex. With the planned initiation of active sysplex configurations at the Disaster Recovery (DR) site, additional tape management subsystems will be required for those execution environments. The bidder must describe how their product could be partitioned, taking into account the State's current environment as noted in paragraph 3 section IV.C and the new environment at the DR site.
Bidder Response:	
TH-7 (IV.E.2.g.)	The VTLs must be directly addressable by all hosts attached to the VTL without requiring additional resources, such as enqueue management software. The bidder must describe how their solution allows the hosts to access the data and maintain data integrity in each VTL.
Bidder Response:	
TH-8 (IV.E.2.h.)	All connections between sites must be over an IP network. Each VTL must have a minimum of two (2) 1-GbE data connections on separate adapters. The bidder must specify the connections required for control between VTLs. The State will supply the switching and DWDM units and the fiber connections between sites. The VTL IP adapters should support long wave single mode fiber cable between sites. All other equipment required (switches, hubs, routers, cables, etc.) to make this solution work and meet the State's requirements must be identified and configured. The bidder must describe the interconnectivity between the units in their solution including the number and types of links and their purpose. The bidder must specify the connections required for control between VTLs. All other equipment required (switches, hubs, routers, cables, etc.) to make this solution work and meet the State's requirements should be identified and configuration documented.
Bidder Response:	
TH-9 (IV.E.2.i.)	The proposed solution must: a) Have a minimum of 256 3490E-type virtual tape units b) Provide for a minimum of 150,000 virtual tape volumes The bidder must describe the virtual tape volume capacities their solution will support. The bidder must describe the amount of VTL cache actually used by the capacities that their solution supports. Describe the amounts used by the volumes at allocation and after the tape is written to (unload).
Bidder Response:	

RTM # (RFP reference)	Technical - Hardware
TH-10 (IV.E.2.j.)	The proposed solution should be available 99.999 percent of the time. Each VTL should be available 99.7 percent of the time. This includes both planned and unplanned outages. The VTL is considered to be unavailable if any component is unavailable, or if performance is so degraded that it results in the inability to read existing virtual tape datasets or to write new virtual tape datasets. The bidder should describe their ability/strategy for maintaining the expected availability in their solution. The bidder should describe situations that would result in interruption(s) in the operation of their solution and describe how to resolve such interruption(s).
Bidder Response:	
TH-11 (IV.E.2.k.)	The bidder must describe all hardware, software (including versions), and microcode required by the proposed solution.
Bidder Response:	
TH-12 (IV.E.2.l.)	Data replication (mirroring tape output to all of the VTLs) both locally and globally must maintain data integrity. All virtual tape activity must be replicated locally for high performance availability and also be replicated remotely for Disaster Recovery (DR) purposes. The bidder must detail how they would accomplish replication, indicating whether replication is done a record or volume at a time, whether priorities can be established to adjust the process, and, if so, whether priorities are specified for data sets or volumes.
Bidder Response:	
TH-13 (IV.E.2.m.)	The communications links between sites must allow for virtual tape creation at both the local and the remote sites. DR testing at the remote site must not impact production data. The bidder must detail how they would accomplish DR testing without impacting production data.
Bidder Response:	
TH-14 (IV.E.2.n.)	The State is using many features of DFSMS. The bidder must describe how their solution would integrate with DFSMS and how DFSMS could assist the implementation of a VTL system. Please provide examples of the use of DFSMS in your proposed solution.
Bidder Response:	

RTM # (RFP reference)	Technical - Hardware
TH-15 (IV.E.2.o.)	The VTL control information and tape data must be recoverable. The bidder must describe how recovery of VTL control information and tape data is accomplished. Describe how a failover will proceed, including commands, messages displayed, and any processes that can be automated. Describe how tape data will be restored after a failover.
Bidder Response:	
TH-16 (IV.E.2.p.)	Tools must be provided that gauge and evaluate performance, including but not limited to, performance utilization, data rate, and system health. The bidder must describe the tools that the z/OS staff will use to manage the VTLs, including the platform on which those tools operate.
Bidder Response:	
TH-17 (IV.E.2.q.)	The State requires the ability to chargeback for data resident on the VTL. The bidder should provide several options for charging metrics, including data residency time (e.g. gigabyte-days), virtual mounts, and any others that are appropriate to their VTL architecture. The bidder should describe the options that are available as well as the process for extracting the metric information from the VTL for input to the State's billing system.
Bidder Response:	
TH-18 (IV.E.2.r.)	The bidder's solution must provide data that will help z/OS staff to monitor, tune, and review the capacity of the proposed equipment, including both real-time and historical reporting methods. The bidder must describe the tool(s) and method(s) used to record data for historical reporting.
Bidder Response:	
TH-19 (IV.E.2.s.)	Appropriately detailed messages about the VTLs' functioning should be available for the console operator. The bidder must describe their solution's console messages about the VTLs' functioning.
Bidder Response:	

RTM # (RFP reference)	Technical - Hardware
TH-20 (IV.E.2.t.)	The State's clients expect our services to be available twenty-four (24) hours per day, seven (7) days per week. The proposed technology must be fully redundant and have a fault tolerant design. All redundant components must be reparable non-disruptively. The bidder should describe redundancy features that ensure their solution's availability. The bidder should list all steps taken in the proposed solution to increase availability over that found in standard implementations and installations. The bidder should list all single points of failure in the proposed solution.
Bidder Response:	
TH-21 (IV.E.2.u.)	The bidder must provide a configuration list of everything included in their proposed solution.
Bidder Response:	
TH-22 (IV.E.2.v.)	VTL storage must be expandable. The bidder must describe the extent to which the VTL storage can be increased.
Bidder Response:	
TH-23 (IV.E.2.w.)	The bidder must indicate the maximum capacity of uncompressed data supported in each VTL by the proposed configuration.
Bidder Response:	
TH-24 (IV.E.2.x.)	The bidder should describe any software required in the proposed solution and describe the purpose it serves..
Bidder Response:	

RTM # (RFP reference)	Technical – Services
TS-1 (IV.E.3.a., (IV.E.3.b.)	The contractor must provide three (3) onsite training sessions for z/OS Operations staff. The State has three (3) operations shifts, so the State may require that two classes be scheduled outside of normal working hours This training can occur after the hardware is installed, prior to Production. All expenses are the responsibility of the contractor. The contractor must provide onsite education and training for the z/OS Storage Administration staff. This education and training should equip the staff with the knowledge and skills necessary for not only normal and expected activities, but also for recovery scenarios they might be expected to address. The bidder must describe all education and training offerings necessary for the successful implementation and operation of the proposed solution, together with a training schedule, indicating which offerings are mandatory and which are optional.
Bidder Response:	
TS-2 (IV.E.3.c.)	Onsite support must be made available throughout the installation, acceptance period, and the eight (8) days after all data is migrated to new VTL in the production environment. The bidder must describe their onsite Systems/Storage Engineering support as required to assist with software and hardware installation, replication, and recovery, specifying parameters, performance tuning, and knowledge transfers to the z/OS Operations and Storage Administrators.
Bidder Response:	
TS-3 (IV.E.3.d.)	The contractor must provide any additional services that will be needed to help the State exploit the new technology at no additional cost to the State.
Bidder Response:	

RTM # (RFP reference)	Project Planning and Management
PPM-1	The State's expectation is that full implementation will be completed within ninety (90) days after contract award. The bidder must provide an initial project work plan that identifies all major tasks, time frames, and responsibilities of involved parties to achieve a successful implementation and to maximize system availability during implementation. The plan should include the number of hours required by z/OS staff to support the installation.
Bidder Response:	

RTM # (RFP reference)	Installation
INS-1 (IV.G.5.)	An acceptance test period will be required. To be accepted by the State, the new equipment must perform in accordance with its technical specifications for twenty-eight (28) consecutive days without an unscheduled interruption. A test of data migration will be included as a part of this acceptance period. Should the contractor fail the acceptance test, the State has the option of 1) removing the subsystems at the State's convenience without charge to the State; or 2) upgrading the installed subsystems at the contractor's expense and then submitting the subsystems for reevaluation. Bidder must describe their plan for the most effective and efficient use of this acceptance period.
Bidder Response:	
INS-2 (IV.G.7.)	The State must be advised of the electrical power, floor cutouts, connectors, cooling requirements, and network requirements. The State will provide and install the power cables, connectors, and network equipment.
Bidder Response:	
INS-3 (IV.G.8.)	At the time of this implementation either processor will support all of the LPARs, all of the sysplexes, and all of the workloads. VTLs will be located at the two sites. . The bidder must describe how they would implement their solution. a) if one z13 is at each site and b) if both z13's are still at the local site.
Bidder Response:	

RTM # (RFP reference)	Installation
INS-4 (IV.G.9.)	There is a plan for future separation of the Production and Development LPARs and associated workloads between the two z13 processors. Each workload requires access to virtual tape storage. The bidder must describe how their solution would support the Production workload in one location and the Development workload in the other location, with both workloads performing tape input-output and routing all data to all VTLs.
Bidder Response:	

RTM # (RFP reference)	Maintenance and Support - Hardware
MSH-1 (IV.H.1.c.)	The proposed technology must be configured and set up for “call home” support over an IP network, and ‘call home’ support shall be provided as part of maintenance and services. Operations staff must also be notified of any ‘call home’ instances. The bidder must describe any requirements for using this “call home” feature (e.g., IP access).
Bidder Response:	
MSH-2 (IV.H.1.e.)	Hardware maintenance support must include: a) Availability of English language telephone support must be available twenty-four (24) hours per day, seven (7) days per week including holidays. b) Target telephone response time not to exceed ten (10) minutes for critical problem calls (as categorized by the State). c) A problem escalation procedure must be in place that assures appropriate management contacts can immediately be made in the event that the support response is not effective. d) Target telephone response time by maintenance personnel with appropriate qualifications not to exceed one (1) hour. e) Target onsite response time by maintenance personnel with appropriate qualifications within an agreed-upon time frame, depending on the situation, on a twenty-four (24) hour per day and seven (7) day per week basis. The State reserves the right to require the contractor to reassign or remove any such personnel. f) Maintenance support availability onsite within two (2) hours in a “hard down” situation. g) Defined points of contact for maintenance issues. h) Monitoring of both soft and hard failures. i) Replacement of components as necessary The bidder must describe their maintenance support and escalation procedures and staffing. The bidder should describe the availability and response time of appropriately qualified maintenance personnel when issues/problems are encountered.
Bidder Response:	
MSH-3 (IV.H.1.f.)	The maintenance agreement will include all parts, labor, and transportation. All replacement parts should be available within one (1) hour on average and a maximum of four (4) hours from the time the need for the replacement part(s) is

RTM # (RFP reference)	Maintenance and Support - Hardware
	identified. The bidder should specify the location of the service centers and parts inventory nearest Lincoln and Omaha, Nebraska. The bidder should indicate what parts are deemed most critical for continuity of operation and describe their strategy for availability and response time of replacement parts.
Bidder Response:	
MSH-4 (IV.H.1.g.)	Any required preventive maintenance must be performed at a time agreed upon with the State. Maintenance and upgrades to any of the VTLs, given this high availability configuration, are not expected to cause an outage to production workload. The bidder must describe how preventive maintenance can be performed without an outage.
Bidder Response:	
MSH-5 (IV.H.1.h.)	Equipment failures must be detected and resolved. The bidder must describe the procedure and methodology for detecting both soft and hard failures. The bidder must also indicate how many soft or hard failures are tolerated before a component is replaced.
Bidder Response:	

RTM # (RFP reference)	Maintenance and Support - Services
MSS-1 (IV.H.2.a.)	The contractor must provide onsite access at the State's request to OEM technical support and product and education specialists. The bidder must describe their maintenance support agreement(s) with OEM technical support and product and education specialists. The bidder should describe the availability and response time of appropriately qualified technical support personnel and product and education specialists when such assistance is requested.
Bidder Response:	
MSS-2 (IV.H.2.b.)	The contractor will provide the State with automation scripts, operating procedures, and documentation that are used during implementation of their solution and necessary for continued operation. The bidder should acknowledge that all such items will become the property of the State
Bidder Response:	
MSS-3 (IV.H.2.c.)	The contractor will provide the installation, modification, and testing procedures that are required to maintain service through subsequent releases of any host software, hardware, hardware features, and tape storage microcode. The bidder must describe their strategies for supporting new host releases of software, hardware, hardware features, and tape storage microcode.
Bidder Response:	