Proposal to Improve Information Availability at Carrollton Farmers Branch ISD

1. Introduction and Project Background

Carrollton Farmers Branch ISD and VAST Data Systems (VAST Data Systems) have been discussing the application of Storage Centralization and Server Virtualization products and design best practices. As a result of these discussions, Carrollton Farmers Branch ISD has requested a proposal to provide hardware, software and services to implement a High Availability (HA) implementation around Dell EqualLogic and VMware technology. This document is being submitted in response to that request.

The proposed engagement will provide a basis for improved IT Service Levels by accomplishing the following:

- Centralizing both education and administration information on enterprise class iSCSI SAN storage systems from Dell\EqualLogic.

- Implement server virtualization technology via VMware server virtualization technology.

- Optionally, propose resources and services sufficient to replicate all data and virtualized servers to a remote site. Further elevate service levels by implementing rule based server fail-over technology from VMware.

1.1. Company Information

VAST Data Systems, a Texas based IT solutions provider, will provide all hardware software and services required to satisfy the deliverables described in this document. VAST Data Systems' primary business partner for this project will be Dell Inc.

1.2. VAST Data Systems Solutions

VAST Data Systems is dedicated to providing solutions that enable our clients to meet their business objectives. VAST Data Systems's Business Information Strategies and Solutions cover the entire Information Life-cycle from strategy and design through operational "Best Practices". VAST Data Systems provides these solutions to companies in industries including aerospace, banking, telecommunications, government, web internet, energy, software and many others. VAST Data Systems's solutions combine our deep industry knowledge with technology expertise that brings real, tangible enterprise value to our clients.

1.3. Dell Inc.

Today's competitive business environment demands that IT managers run their organizations leaner, faster and smarter—with fewer people and lower costs. These challenges requires IT solutions that deliver results straight to the bottom line. These challenges require IT solutions that provide a low Total Cost of Ownership (TCO) and high Return on Investment (ROI). Dell can provide these IT solutions.

Dell Enterprise solutions leverage industry-standard technology. Industry-standard platforms are both scalable and stable over time, and are replacing many proprietary technologies in the enterprise. Standards-based solutions have the flexibility, reliability, availability and manageability that were previously found primarily in their proprietary counterparts. A standards-based strategy is ideal for small enterprises and can scale to support the largest global customers as well.

2. Dell EqualLogic Storage Arrays

Dell EqualLogic PS Series Storage Arrays are built on patented peer storage architecture to create a virtualized iSCSI SAN that combines intelligence and automation with fault tolerance to provide simplified administration, rapid deployment, enterprise performance and reliability, and seamless scalability.

The EqualLogic PS Series of Internet SCSI (iSCSI) storage arrays offers a fundamental change in the way enterprises think about purchasing and managing storage. Built on Dell's patented peer storage architecture, these solutions offer enterprise-class performance and reliability, intelligent automation, and seamless virtualization of a single pool of storage for simplified storage management. The PS Series combines an intelligent, automated management framework and a comprehensive set of enterprise data services with a fault-tolerant hardware architecture that supports most major operating systems. It delivers a modular and cost-effective solution that can be deployed in appropriate increments for small and medium businesses, while also being cost-effective for large enterprises requiring high-end capacity and performance.

2.1. Dell EqualLogic PS Series Models

The Dell EqualLogic PS series offers 4 models which can be combined to provide Pooled and Tiered storage to meet your requirements.

▪ **Dell EqualLogic PS5000XV** - With 15,000 RPM SAS disk drives, the PS5000XV array provides high transactional performance with up to 4.8 TB of storage capacity and fully redundant components.

▪ **Dell EqualLogic PS5000X** - With 10,000 RPM SAS disk drives, the PS5000X array provides outstanding performance with up to 6.4 TB of storage capacity and fully redundant components.

- **Dell EqualLogic PS5500E** - With SATA disk drives, the PS5500E delivers excellent cost-per-gigabyte and up to an amazing 48TBs of high-capacity storage with fully redundant components and optional redundant controllers.

- **Dell EqualLogic PS5000E** - With SATA disk drives, the PS5000E delivers excellent cost-per-gigabyte and up to 16TBs of high-capacity storage with fully redundant components and optional redundant controllers.

2.2. Peer Storage Architecture

The EqualLogic PS Series is based on the unique peer storage architecture. In this context, peer describes the collaboration and equal partnership of a single, simple architecture; components and arrays function as peers, working together to share resources, evenly distribute loads, and collaborate to help optimize application performance and provide comprehensive data protection. The result is an intelligent storage array that can deliver rapid installation, simple management, and seamless expansion. Using patented page-based data mover technology, members in a storage area network (SAN) work together to automatically manage data, load balance across resources, and expand to meet growing storage needs. Because they share this architecture, enterprises can use PS Series arrays as modular building blocks for simple SAN expansion. This architecture provides the basis for numerous features and capabilities, including peer deployment, control, provisioning, protection, and integration.

2.3. Exceptional Ease of Use

The PS Series is an intelligent storage array that is designed to provide rapid installation, simple management, and seamless expansion. All PS Series storage arrays include SAN configuration features and capabilities that sense network topology, automatically build RAID sets, and conduct system health checks to help ensure that all components are fully functional. A PS series array is designed to be installed, configured, and serving storage in less than one hour.

2.4. Flexibility with Low Cost of Ownership

Dell EqualLogic PS Series arrays represent a breakthrough in storage economics, from purchase and setup to operation and upgrades. Unlike traditional SANs, the PS Series comes complete with the available software and applications expected from an enterprise-level SAN. The PS Series scales on-demand — and online — allowing storage growth without disrupting applications. As a result, EqualLogic PS Series arrays provide exceptional flexibility at a low total cost of ownership.

Whether used to consolidate a direct attach storage infrastructure, migrate data from an existing SAN, streamline data protection processes, or just add capacity, the EqualLogic PS Series offers a family of high-performance, self-managing storage arrays designed to meet the requirements of SAN or network-attached storage environments for organizations of all sizes. Based on the patented peer storage architecture, the PS Series of storage arrays is designed to be comprehensively interoperable and upgradable, seamlessly scaling arrays without disrupting application or data availability.

2.5. Designed for the Data Center

Designed to meet and exceed the rugged requirements of the data center, EqualLogic engineered fault tolerance into the PS Series hardware design. Its components are fully redundant and hot swappable with dual controllers, standard dual fan trays, and dual power supplies standard. The hot-swappable controller module features high-performance dual-core 64-bit processors with a high-speed HyperTransport™ I/O bus and twin 64-bit double data rate (DDR) channels. Each control module is equipped with 1GB of high-speed battery-backed DRAM. Each disk drive is interconnected with its own independent, hot-swappable serial channel and secured mechanically with an inertial dampening chassis that helps eliminate drive vibrations. Self-tuning controller caches are battery-backed and mirrored across controllers to help protect these components without compromising performance. EqualLogic PS Series arrays support Serial Attached SCSI (SAS) and Serial ATA (SATA) disk drives with a variety of performance and capacity options. Enterprise-class RAID protection governs hot-swappable disk drives, including RAID-5, RAID-10, and RAID-50 support; hot sparing; automatic rebuilds; accelerated rebuild times; advanced stripe integrity algorithms; online RAID set expansion; geometry transformation; and patent-pending predictive media-error detection and correction. Not only can administrators service the arrays without taking them offline, but the PS Series array isolates faults to help prevent cascading failures or loss of protection during service. The result is a high level of data protection and performance even during service procedures. The redundancy of the design eliminates single points of failure, helping to provide greater than 99.999 percent availability.

2.6. Knowledge Transfer

Dell EqualLogic technical training sessions will empower Carrollton Farmers Branch ISD IT Staff to gain an understanding of your business and technical requirements associated with your storage infrastructure. Training is built around a series of exercises in real-world networking environments that will provide your staff with realistic and practical experience. Currently, following training courses are available at Dell training facilities:

- Dell EqualLogic PS Series Storage Array - Basic Operation and Maintenance

- Dell EqualLogic PS- Series - Advance Features Operation and Maintenance

- Integrating EqualLogic Storage within VMware Virtual Infrastructure 3 Workshop

- Dell EqualLogic PS Series - Advance Features Operation and Maintenance

- Optimizing the iSCSI SAN Infrastructure for Dell EqualLogic PS Series Storage Arrays

- Auto-Snapshot Manager / Business Continuity and Disaster Recovery Workshop

In addition VAST Data Systems' professional services experts will provide field training regarding Carrollton Farmers Branch ISD's specific Dell EqualLogic storage infrastructure.

3. Project Cost

3.1. Hardware and Software Product Pricing – Production Environment

Pricing for Dell EqualLogic storage arrays for Carrollton Farmers Branch ISD current education and production IT Infrastructure is shown in Table 1 below:

Table 1—Product Pricing Production Environment

Item	Model	Description	Qty	Array Capacity	Price Each	Extended Price
1	PS5000XV	High performance array with 16 - 450GB SAS drives	6	7.2 TB	$56,001	$336,006
2	PS5500	High capacity array with 48 - 1TB ATA drives	1	48 TB	$97,000	$97,000

3.2. Warranty and Support Options – Production Environment

Dell EqualLogic Complete Care Plus support includes 24-hour priority online/telephone access, software maintenance and updates, 4-hour onsite advance hardware replacement of parts, disks and drives. One year and three year options are quoted below:

3.2.1. Complete Care Plus – 1 Year Option

Table 2— One Year Warranty Pricing Production Environment

	Description	Qty	Price Each	Extended Price
Item 1 Support	1 Year – Complete Care Plus	6	$3,600	$21,600
Item 2 Support	1 Year – Complete Care Plus	1	$5,800	$5,800

3.2.2. Complete Care Plus – 3 Year Option

Table 3— Three Year Warranty Pricing Production Environment

	Description	Qty	Price Each	Extended Price
Item 1 Support	3 Year – Complete Care Plus	6	$5,200	$31,200
Item 2 Support	3 Year – Complete Care Plus	1	$13,800	$13,800

3.3. Hardware and Software Product Pricing – DR Environment

Pricing for Dell EqualLogic storage arrays for the proposed off-site Disaster Recovery (DR) facility is shown in Table 4 below:

Table 4—Product Pricing DR Environment

Item	Model	Description	Qty	Array Capacity	Price Each	Extended Price
3	PS5000XV	High performance array with 16 - 450GB SAS drives	4	7.2 TB	$56,001	$224,004
4	PS5500	High capacity array with 48 - 1TB ATA drives	2	48 TB	$97,000	$194,000

3.4. Warranty and Support Options – DR Environment

Dell EqualLogic Complete Care Plus support includes 24-hour priority online/telephone access, software maintenance and updates, 4-hour onsite advance hardware replacement of parts, disks and drives. One year and three year options are quoted below:

3.4.1. Complete Care Plus – 1 Year Option

Table 5— One Year Warranty Pricing DR Environment

	Description	Qty	Price Each	Extended Price
Item 3 Support	1 Year – Complete Care Plus	4	$3,600	$14,400
Item 4 Support	1 Year – Complete Care Plus	2	$5,800	$11,600

3.4.2. Complete Care Plus – 3 Year Option

Table 6— Three Year Warranty Pricing DR Environment

	Description	Qty	Price Each	Extended Price
Item 3 Support	3 Year – Complete Care Plus	4	$5,200	$20,800
Item 4 Support	3 Year – Complete Care Plus	2	$13,800	$27,600

3.5. Professional Services Pricing

4. Assumptions

The following assumptions apply to this document.

4.1. Software and Hardware Resources

Under this proposal, VAST Data Systems is only providing Dell EqualLogic Hardware and Software. Additional hardware and software resources will be necessary to implement the solutions described herein. These resources include:

- **Enterprise class servers**
- **VMware software licenses**
- **iSCSI compatible data switches**

4.2. Access to Personnel

VAST Data Systems will arrange for the project kick off conference upon project approval. VAST Data Systems will have access to key client personnel in order to receive timely input to keep the project on track.

4.3. Access to Critical Data

VAST Data Systems will have access to all relevant documentation on the current systems.

4.4. Project Delays

Delays outside of VAST Data Systems' control that exceed 30 days may increase VAST Data Systems' costs and cause a change in fees.

4.5. Work Site

Some of VAST Data Systems's work may be done off-site. VAST Data Systems will assign a project manager to act as single point of contact for client. Ongoing communication will be handled by phone, fax, and e-mail. Both parties agree to develop and maintain a complete list of project personnel to ensure timely communication.

4.6. Intellectual Property

VAST Data Systems will maintain ownership of its pre-existing intellectual property, including designs and methodologies. Anything created specifically for client will be owned by client. To the extent there is pre-existing VAST Data Systems intellectual property included in the deliverable; VAST Data Systems grants a perpetual right to use by client for same.

4.7. Customer Reference

Upon successful completion of the project, client agrees to act as a reference for VAST Data Systems. This may be in the form of a formal reference letter or contact with VAST Data Systems prospects.

5. Terms and Validity

5.1. Terms

VAST Data Systems' terms are net 30 invoice date.

5.2. Validity

This proposal is valid through December 31, 2008.

5.3. Contact Information

Questions regarding this document should be directed to Vern Bell, at 214-778-2983. Email messages should be sent to vern@VAST Data SystemsSolutions.com.

5.4. Address of Record

VAST Data Systems' address of record is: 6136 Frisco Square Blvd, Suite 400, Frisco, TX 75034.

AGREED AND ACCEPTED BY:

VAST Data Systems

By: Vern Bell, President_____

Signature: _____   Date: December 1, 2008

Carrollton Farmers Branch

By: _____
                        Print Name and Title

Signature: _____   Date: _____