SPC BENCHMARK 1™

EXECUTIVE SUMMARY

XIOTECH CORPORATION

XIOTECH EMPRISE™ 5000

(ISE 9.6 TB/10.2 DATAPAC)

SPC-1 V1.12

Submitted for Review: September 20, 2010
Submission Identifier: A00095

EXECUTIVE SUMMARY

Test Sponsor and Contact Information

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Revision Information and Key Dates

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SPC-1 Specification revision number	V1.12
SPC-1 Workload Generator revision number	V2.1.0
Date Results were first used publicly	September 20, 2010
Date the FDR was submitted to the SPC	September 20, 2010
Date the priced storage configuration is available for shipment to customers	currently available
Date the TSC completed audit certification	September 17, 2010

Tested Storage Product (TSP) Description

Xiotech's Emprise 5000 system is a revolutionary concept in data storage. It is built on patented Intelligent Storage Element (ISE™) technology—a perfectly balanced building block of performance, reliability, and scalability.

Typical SAN systems come with high-level functionality you may not need, and all that functionality adds to the price tag. It also consumes performance and introduces a lot of complexity, which often requires high-priced administrators.

Emprise 5000, on the other hand, is a flexible, foundational building block of storage. It is a complete, self-enclosed virtualized storage solution that you can configure to meet your unique needs or optimize for a specific application.

Typical SAN performance is limited by bottlenecks in the system—from SAN controllers that slow data movement to back-end switches that add another point of contact. Scalability also is restricted by how many drives you can effectively put behind a set of controllers.

Emprise 5000 changes this paradigm. It eliminates the storage controllers on the front end and switches on the back, so data is free to flow at screaming speeds. And because storage is decoupled from the servers, you can add servers solely for processing power.

Summary of Results

SPC-1 Results	
Tested Storage Configuration (TSC) Name: Xiotech Emprise™ 5000 *(ISE 9.6 TB/10.2 DataPac)*	
Metric	**Reported Result**
SPC-1 IOPS™	12,603.65
SPC-1 Price-Performance	$6.70/SPC-1 IOPS™
Total ASU Capacity	9,277.129 GB
Data Protection Level	Protected *(Mirroring)*
Total TSC Price (including three-year maintenance)	$84,479.00

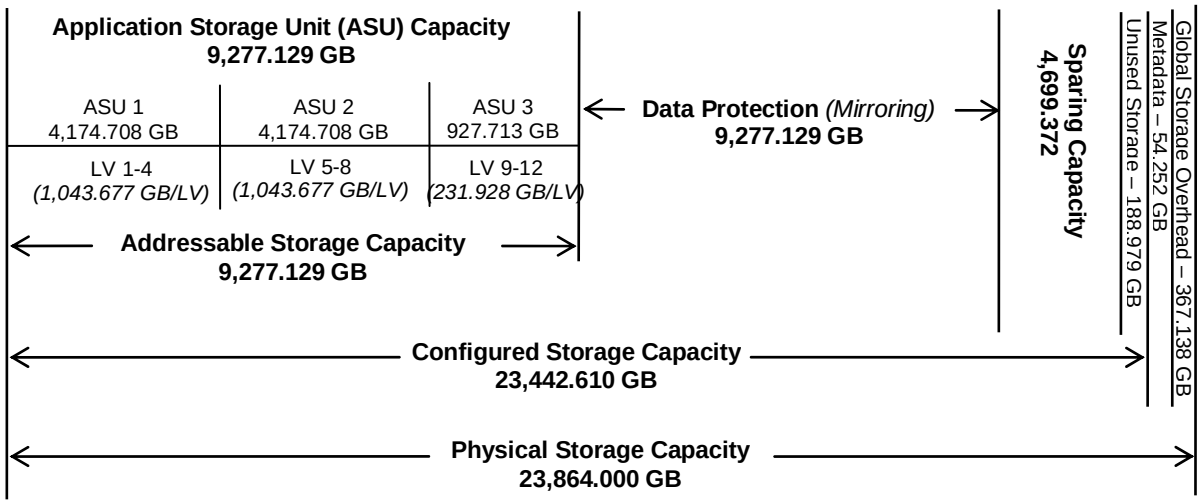
SPC-1 IOPS™ represents the maximum I/O Request Throughput at the 100% load point.

Total ASU (Application Storage Unit) **Capacity** represents the total storage capacity read and written in the course of executing the SPC-1 benchmark.

A **Data Protection Level** of **Protected** using ***Mirroring*** configures two or more identical copies of user data.

Storage Capacities and Relationships

The following diagram and table document the various storage capacities, used in this benchmark, and their relationships, as well as the storage utilization values required to be reported.



SPC-1 Storage Capacity Utilization	
Application Utilization	38.87%
Protected Application Utilization	77.75%
Unused Storage Ratio	0.79%

Application Utilization: Total ASU Capacity *(9,277.129 GB)* divided by Physical Storage Capacity *(23,864.000 GB)*.

Protected Application Utilization: Total ASU Capacity *(9,277.129 GB)* plus total Data Protection Capacity *(9,277.129 GB)* minus unused Data Protection Capacity *(0.000 GB)* divided by Physical Storage Capacity *(23,864.000 GB)*.

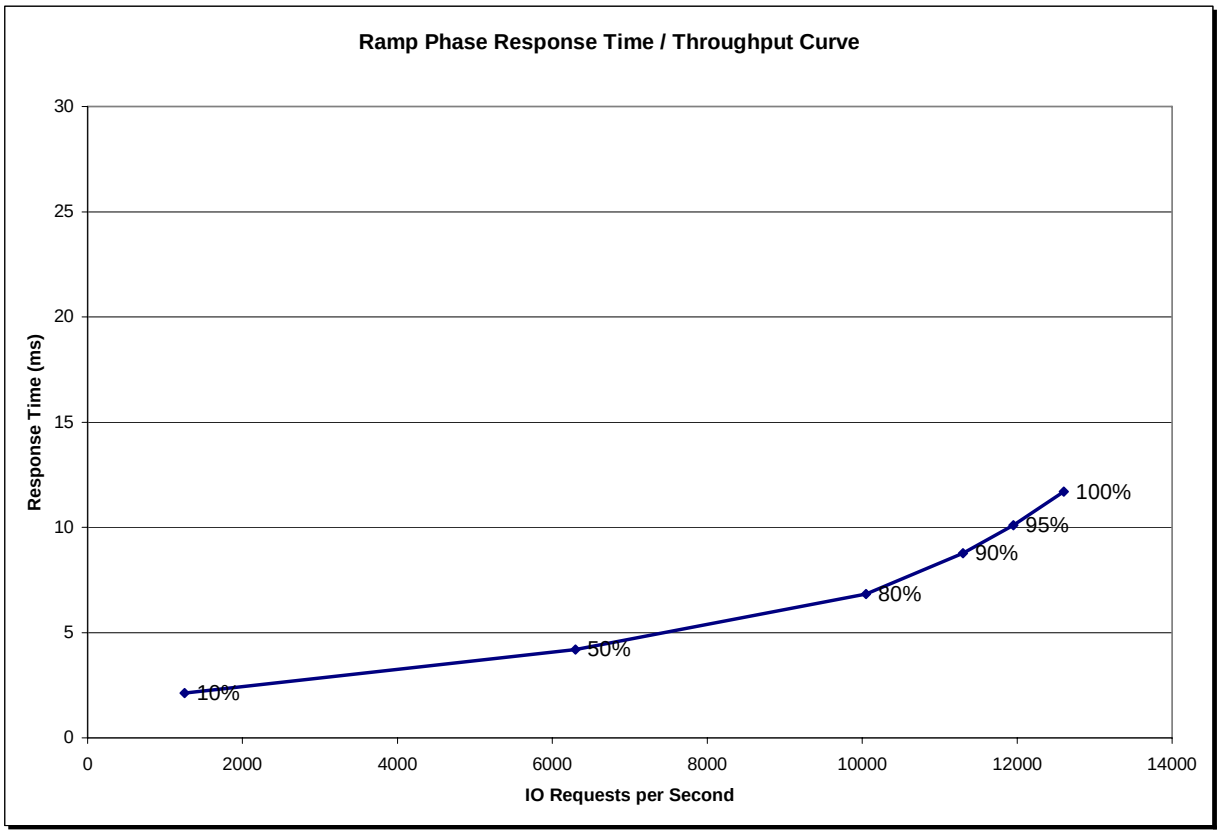
Unused Storage Ratio: Total unused capacity *(188.979 GB)* divided by Physical Storage Capacity *(23,864.000 GB)*. The Unused Storage Ratio cannot exceed 45%.

Detailed information for the various storage capacities and utilizations is available on pages 18-19 in the Full Disclosure Report.

Response Time – Throughput Curve

The Response Time-Throughput Curve illustrates the Average Response Time (milliseconds) and I/O Request Throughput at 100%, 95%, 90%, 80%, 50%, and 10% of the workload level used to generate the SPC-1 IOPS™ metric.

The Average Response Time measured at the any of the above load points cannot exceed 30 milliseconds or the benchmark measurement is invalid.



Response Time – Throughput Data

	10% Load	50% Load	80% Load	90% Load	95% Load	100% Load
I/O Request Throughput	1,249.25	6,300.47	10,046.69	11,300.94	11,953.52	12,603.65
Average Response Time (ms):						
All ASUs	2.12	4.19	6.82	8.77	10.10	11.71
ASU-1	3.01	5.67	8.38	10.16	11.32	12.79
ASU-2	2.24	6.09	14.21	21.32	26.46	32.45
ASU-3	0.18	0.24	0.29	0.33	0.33	0.35
Reads	5.12	10.29	16.88	21.73	25.06	29.06
Writes	0.17	0.22	0.28	0.33	0.35	0.40

Priced Storage Configuration Pricing

Qty	Name	Part Number	List Price	Discount	Unit Price	Extended Price
1	Emprise 5000 Virtual Storage System (Base Unit) Emprise 5000 Virtual Storage System (Base Unit) includes 1 Intelligent Storage Element (ISE) chassis for Emprise 5000 with 2 Fibre Channel host ports, power cords, bezel, rail kit, and accessory kit. Holds up to 2 DataPacs.	800864-000	$12,500.00	30%	$8,750.00	$8,750.00
2	Cable - 5m LC Duplex/LC Duplex Fiber Optic Patch Cord Cable - 5m LC Duplex/LC Duplex Fiber Optic Patch Cord	840056-000	$108.00	40%	$65.00	$130.00
1	QLogic - QLA2462 4Gb 64-bit 266MHz PCI-X 2.0 dual port Sever HBA	770814-000	$2,100.00	29%	$1,499.00	$1,499.00
2	ISE 9.6 TB/10.2 DataPac	800972-000	$50,000.00	30%	$35,000.00	$70,000.00
1	Emprise 5000 - Installation	000229-000	$4,083.33	40%	$2,450.00	$2,450.00
1	Emprise 5000 - 5 Year Hardware Warranty Emprise 5000 5 Year Hardware Warranty	020171-001	$0.00	-	$0.00	$0.00
1	Emprise 5000 - Software Warranty (90 Days) Emprise 5000 Software Warranty for 90 Days	020171-004	$0.00	-	$0.00	$0.00
1	Emprise 5000 - Software Maintenance - remainder of 1st year Emprise 5000 Software Maintenance Extension - Remainder of 1st Year. Extends initial Emprise 5000 Software warranty to 12 months.	020171-005	$749.97	40%	$450.00	$450.00
24	Emprise 5000 - Software Maintenance - 1 month Emprise 5000 Software 1 month	020171-006	$83.33	40%	$50.00	$1,200.00
					Total:	**$84,479.00**

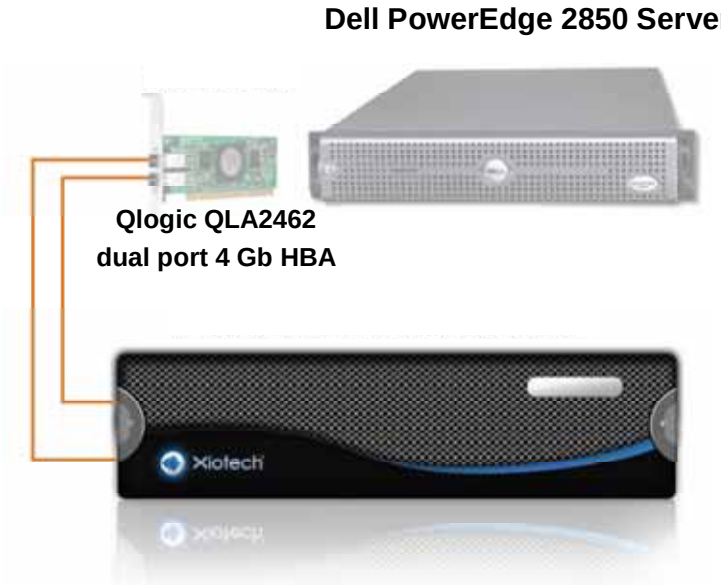
The above pricing includes hardware maintenance and software support for a minimum of three years, 7 days per week, 24 hours per day. The hardware maintenance and software support provides the following:

- Acknowledgement of new and existing problems with four (4) hours.
- Onsite present of a qualified maintenance engineer or provision of a customer replaceable part within four (4) hours of the above acknowledgement for any hardware failure that results in an inoperative Price Storage Configuration that can be remedied by the repair or replacement of a Priced Storage Configuration component.

Differences between the Tested Storage Configuration (TSC) and Priced Storage Configuration

There were no differences between the TSC and Priced Storage Configuration.

Benchmark Configuration (BC)/Tested Storage Configuration (TSC)/ Priced Storage Configuration Diagram



Xiotech Emprise 5000 Virtual Storage System

2 – ISE 9.6 TB/10.2 DataPacs
(20 disk drives per DataPac)

40 – 600 GB 10K RPM disk drives

Benchmark Configuration (BC)/Tested Storage Configuration (TSC)/ Priced Storage Configuration Components

Host System:	Tested Storage Configuration (TSC)/ Priced Storage Configuration:
Dell PowerEdge 2850 Server	1 – dual-ported, 4Gb Qlogic 2462 HBA
2 – 3.6 GHz Xeon CPUs with 2 MB L2 cache per CPU	**Xiotech Emprise 5000 Virtual Storage System** 2 – dual-active controllers each with: 512 MB cache *(1 GB total)* 1 – 4 Gb Fibre Channel front-end host port *(2 total, 2 used)* no backend connections due to the sealed DataPacs
2 GB main memory	
Windows Server 2003 Standard Edition with SP2	
Xiotech MPIO driver	
PCI-X	
	2 – ISE 9.6 TB/10.2 DataPacs *(20 disk drives per DataPac)*
	40 – 600 GB 10K RPM disk drives