



**SPC BENCHMARK 2<sup>TM</sup>**  
**FULL DISCLOSURE REPORT**

**FUJITSU LIMITED**  
**FUJITSU STORAGE SYSTEMS**  
**ETERNUS4000 MODEL 500**

**SPC-2<sup>TM</sup> V1.2.1**

**Submitted for Review: November 2, 2006**  
**Submission Identifier: B00013**

## **First Edition – November 2006**

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# AUDIT CERTIFICATION



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November 2, 2006

The SPC Benchmark 2™ results listed below for the Fujitsu Storage Systems ETERNUS4000 Model 500 were produced in compliance with the SPC Benchmark 2™ V1.2.1 Remote Audit requirements.

SPC Benchmark 2™ V1.2.1 Results	
Tested Storage Product (TSP) Name: Fujitsu Storage Systems ETERNUS4000 Model 500	
Metric	Reported Result
SPC-2 MBPS™	1,985.63
SPC-2 Price-Performance	\$114.72/SPC-2 MBPS™
Total ASU Capacity	2,284,923 GB
Data Protection Level	Mirroring
Total Price (including three-year maintenance)	\$227,783

The following SPC Benchmark 2™ Remote Audit requirements were reviewed and found compliant with V1.2.1 of the SPC Benchmark 2™ specification:

- A Letter of Good Faith, signed by a senior executive.
- The following Data Repository storage items were verified by documentation supplied by Fujitsu Limited:
  - ✓ Physical Storage Capacity and related requirements.
  - ✓ Configured Storage Capacity and related requirements.
  - ✓ Addressable Storage Capacity and related requirements.
  - ✓ Capacity of each Logical Volume and related requirements.
  - ✓ Capacity of the Application Storage Unit (ASU) and related requirements.
- An appropriate diagram of the Benchmark Configuration (BC)/Tested Storage Configuration (TSC).
- Listings and commands to create and configure the Benchmark Configuration/Tested Storage Configuration, including each customer tunable parameter or option that was changed from its default value.

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## **AUDIT CERTIFICATION (CONT.)**

Fujitsu Storage Systems ETERNUS4000 Model 500  
SPC-2 Audit Certification

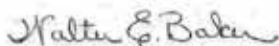
Page 2

- The following Host System items were verified by documentation supplied by Fujitsu Limited:
  - ✓ Required Host System configuration information.
  - ✓ The TSC boundary within each Host System.
- The following SPC-2 Workload Generator information was verified by documentation supplied by Fujitsu Limited:
  - ✓ The presence and version number of the Workload Generator on each Host System.
  - ✓ Commands and parameters used to configure the SPC-2 Workload Generator.
- The Test Results Files and resultant Summary Results Files received for each of the following were authentic, accurate, and compliant with all of the requirements and constraints of Clauses 5 and 6 of the SPC-2 Benchmark Specification:
  - ✓ Data Persistence Test
  - ✓ Large File Processing Test
  - ✓ Large Database Query Test
  - ✓ Video on Demand Delivery Test
- The difference documented between the Tested Storage Configuration (TSC) used for the benchmark and Priced Storage Configuration would have no performance impact if the TSC was configured identical to the Priced Storage Configuration.
- The final version of the pricing spreadsheet met all of the requirements and constraints of Clause 9 of the SPC-2 Benchmark Specification.
- The Full Disclosure Report (FDR) met all of the requirements in Clause 10 of the SPC-2 Benchmark Specification.

### **Audit Notes:**

There were no additional audit notes or exceptions.

Respectfully,



Walter E. Baker  
SPC Auditor

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## **LETTER OF GOOD FAITH**



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Date: Oct-26-2006

From: Fujitsu Limited, Test Sponsor

Submitted by: Tetsuro Kudo,

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To: Walter E. Baker, SPC Auditor  
Gradient Systems, Inc.  
643 Bair Island Road, Suite 103  
Redwood City, CA 94063-2755, U.S.A.

Subject: SPC-2 Letter of Good Faith for the ETERNUS4000 Model 500

Fujitsu Limited is the SPC-2 Test Sponsor for the above listed product. To the best of our knowledge and belief, the required SPC-2 benchmark results and materials we have submitted for that product are complete, accurate, and in full compliance with V1.2.1 of the SPC-2 benchmark specification.

In addition, we have reported any items in the Benchmark Configuration and execution of the benchmark necessary to reproduce the reported results even if the items are not explicitly required to be disclosed by the SPC-2 benchmark specification.

Signed: Tetsuro Kudo Date: 10/26/06

## **EXECUTIVE SUMMARY**

### **Test Sponsor and Contact Information**

<b>Test Sponsor and Contact Information</b>	
<b>Test Sponsor Primary Contact</b>	Fujitsu Limited – <a href="http://www.fujitsu.com/services/computing/storage/">http://www.fujitsu.com/services/computing/storage/</a> Fujitsu Computer Systems Corp. C.A. (Sandy) Wilson <a href="mailto:Sandy_Wilson@us.fujitsu.com">Sandy_Wilson@us.fujitsu.com</a> 1250 East Arques Ave PO Box 3470 Sunnyvale, CA 94088-3470 Phone: (916) 434-8593
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### **Revision Information and Key Dates**

<b>Revision Information and Key Dates</b>	
<b>SPC-2 Specification revision number</b>	V1.2.1
<b>SPC-2 Workload Generator revision number</b>	spc2rc9g
<b>Date Results were first used publicly</b>	November 2, 2006
<b>Date FDR was submitted to the SPC</b>	November 2, 2006
<b>Date the TSC will be available for shipment to customers</b>	December 31, 2006
<b>Date the TSC completed audit certification</b>	November 1, 2006

### **Tested Storage Product (TSP) Description**

The Fujitsu ETERNUS4000 Model 500 is a flexible, highly reliable storage array, equipped with redundant components to provide uncompromised availability. Any mixture of disk drives ranging from 36GB/15krpm to 300GB/10krpm Fibre Channel drives as well as 500GB/7.2krpm Nearline FC drive is supported in the form of RAID1, 1+0, 5 and 6. Up to 16 FC Host Interface channels can be configured, with options for iSCSI Host Interface channels. On top of these, it supports variety of snapshots and mirroring capability, MAID and native disk data encryption.

## SPC-2 Reported Data

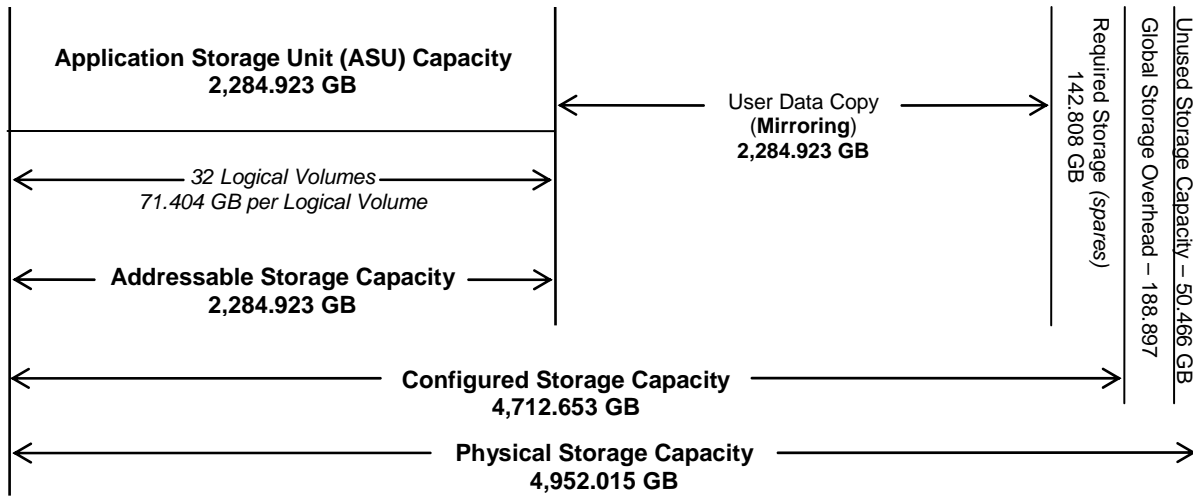
SPC-2 Reported Data consists of three groups of information:

- The following SPC-2 Primary Metrics, which characterize the overall benchmark result:
  - SPC-2 MBPS™
  - SPC-2 Price Performance
  - Application Storage Unit (ASU) Capacity
- Supplemental data to the SPC-2 Primary Metrics.
  - Total Price
  - Data Protection Level
- Reported Data for each SPC Test: Large File Processing (LFP), Large Database Query (LDQ), and Video on Demand Delivery (VOD) Test.

SPC-2 Reported Data				
Fujitsu Storage Systems ETERNUS4000 Model 500				
SPC-2 MBPS™	SPC-2 Price-Performance	ASU Capacity (GB)	Total Price	Data Protection Level
1,985.63	\$114.72	2,284.923	\$227,783	Mirroring
<i>The above SPC-2 MBPS™ value represents the aggregate data rate of all three SPC-2 workloads: Large File Processing (LFP), Large Database Query (LDQ), and Video On Demand (VOD)</i>				
SPC-2 Large File Processing (LFP) Reported Data				
	Data Rate (MB/second)	Number of Streams	Data Rate per Stream	Price-Performance
LFP Composite	1,701.51			\$133.87
Write Only:				
1024 KiB Transfer	1,114.80	32	34.84	
256 KiB Transfer	1,083.75	32	33.87	
Read-Write:				
1024 KiB Transfer	1,630.33	32	50.95	
256 KiB Transfer	1,623.97	32	50.75	
Read Only:				
1024 KiB Transfer	2,377.25	32	74.29	
256 KiB Transfer	2,378.97	32	74.34	
<i>The above SPC-2 Data Rate value for LFP Composite represents the aggregate performance of all three LFP Test Phases: (Write Only, Read-Write, and Read Only).</i>				
SPC-2 Large Database Query (LDQ) Reported Data				
	Data Rate (MB/second)	Number of Streams	Data Rate per Stream	Price-Performance
LDQ Composite	2,305.02			\$98.82
1024 KiB Transfer Size				
4 I/Os Outstanding	2,361.89	32	73.81	
1 I/O Outstanding	2,362.93	32	73.84	
64 KiB Transfer Size				
4 I/Os Outstanding	2,289.38	32	71.54	
1 I/O Outstanding	2,205.87	32	68.93	
<i>The above SPC-2 Data Rate value for LDQ Composite represents the aggregate performance of the two LDQ Test Phases: (1024 KiB and 64 KiB Transfer Sizes).</i>				
SPC-2 Video On Demand (VOD) Reported Data				
	Data Rate (MB/second)	Number of Streams	Data Rate per Stream	Price-Performance
	1,950.37	2,480	0.79	\$116.79

### Storage Capacities and Relationships

The following diagram (not to scale) documents the various storage capacities and their relationships, used in this SPC-2 benchmark measurement.



**Tested Storage Configuration Pricing (Priced Storage Configuration)**

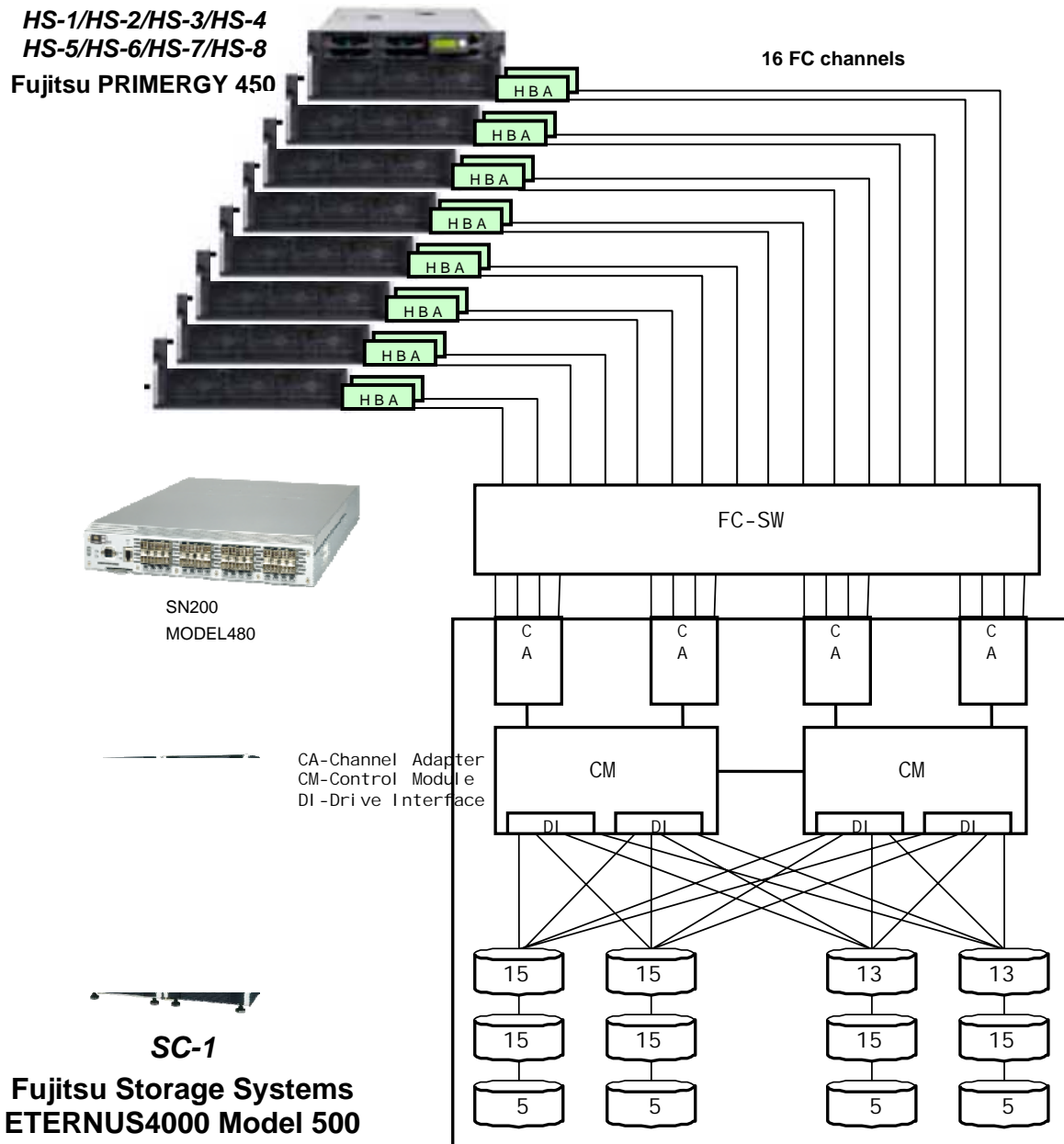
Fujitsu ETERNUS4000 Model 500					
Item	Product Id	Description	Qty	Unit \$	Extd \$
1	E450S20AU	ETERNUS4000 M500 Base Unit (floor stand) Includes: - 1x controller enclosure - 2x controller - 2x power supply unit - 3x battery unit - 2x drive enclosure - no cache memory - no host interface - no disk drive - 1x 1800mm rack - 1x Power Supply Enclosure (AC200V) - 1x Power distribution unit (AC200V) - 4x AC 200V power cord (NEMA:L6-30P 4m) - 1x ETERNUSmgr and drivers	1	\$61,075	\$61,075
2	E400CR1U	Expansion Rack for E4KM500 - 1x 1, 800 mm expansion rack - 2x Power distribution unit (AC200V) - 4x AC 200V power cord (NEMA:L6-30P 4m)	1	\$4,450	\$4,450
3	E400CE31U	Additional drive enclosure pair (2xDE) FC (Op) E4KM500 - 2x drive enclosure - 8x optical FC cable - 16x SFP module	2	\$7,358	\$14,716
4	E400CE22U	Additional drive enclosure pair (2xDE) E4KM500 - 2x drive enclosure	3	\$7,358	\$22,074
5	E400CM24U	16GB Cache Memory (2x 4GB x 2CM) E4KM500 - 4x 4GB DIMM Total 16GB (2x 4GB DIMM x2CM)	2	\$36,384	\$72,768
6	E400CH24U	FC (4Gbps) host interface (4-port x 2CA) E4KM300/500 - 2x 4-port FC (4Gbps) CA	2	\$6,558	\$13,116
7	E400CB2U	36GB/15Krpm (4Gbps) disk drive(set of 2) RAID1E4KM300/M500 - Pre-formatted as RAID1(1D+1M)	2	\$1,098	\$2,196
8	E400CC2U	36GB/15Krpm (4Gbps) disk drive(set of 8) RAID0+1E4KM300/M500 - Pre-formatted as RAID0+1(4D+4M)	16	\$4,392	\$70,272
9	E400CA2U	36GB/15Krpm (4Gbps) disk drive (single) E4KM300/M500 - Defined as a hot-spare	4	\$549	\$2,196
10	61-343827-015	Fibre Channel Cable - LC-LC, 15 m	32	\$125	\$3,996
11	BR-240E-R0001-A	Brocade Silkworm 200E Fabric Switch 16 ports, 16 SFP, AWT, ADZ, Full Fabric	2	\$7,967	\$15,934
12	LP11000-M4	Emulex 4Gb PCI-X Single HBA (per quote from InfoX dated 10/26/2006)	16	\$778	\$12,448
13	ETE4M5-W001360-K001110	ETE4000 M500 Standard Warranty, 36 Months	1	\$0	\$0
14	ETE4M5-U004362-K001110	ETE4000 M500 Enhanced + 24 x 7 Phone Support; 24 x 7 4-hour On-Site Resp. (Sev-1), Warranty Uplift Maintenance, 36 Months	1	\$13,331	\$13,331
15	BR200E-P004121-000	Brocade 200E, Enhanced Plus Maintenance, Post Warranty, 1 Year Prepaid Phone 24x7, On-site 24x7, maintenance service with 4 hour response	2	\$1,186	\$2,372
16	BR200E-P004241-000	Brocade 200E, Enhanced Plus Maintenance, Post Warranty, 2 Year Prepaid Phone 24x7, On-site 24x7, maintenance service with 4 hour response - 1 year Extended Service	2	\$2,372	\$4,744
Total Fujitsu Product List Price					\$282,793
Product Discount				30%	
Net Product Price					\$197,955
Total Service List Price					\$20,447
Service Discount				15%	
Net Service Price					\$17,380
Outside Quoted Product Price					\$12,448
<b>Total Sell Price, including 3 years Service</b>					<b>\$227,783</b>

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

The Tested Storage Configuration (TSC) used a single 32 port Fibre Channel Switch, based on what was available in the test environment. The Priced Storage Configuration includes two smaller 16 port switches, which provide functional equivalence and do not impact the performance of the system



### Benchmark Configuration/Tested Storage Configuration Diagram



**Host System(s) and Tested Storage Configuration Components**

<b>Host Systems:</b>	<b>Tested Storage Configuration (TSC):</b>
8 – Fujitsu PRIMERGY 450	16 – Emulex LP11000-M4 FC HBAs (4 Gbit)
<i><b>HS-1/HS-2/HS-3/HS-4</b></i> each with: 4 – Intel Xeon™ 2.0 GHz CPUs 1 MB iL3 cache per CPU	Fujitsu SN200-M480 FC Switch
<i><b>HS-5/HS-6</b></i> each with 4 – Intel Xeon™ 1.9 GHz CPUs 1 MB iL3 cache per CPU	<b>UID=SC-1:</b>
<i><b>HS-5/HS-6</b></i> each with 4 – Intel Xeon™ 1.6 GHz CPUs 1 MB iL3 cache per CPU	<b>Fujitsu ETERNUS4000 Model 500</b>
4 GB main memory per Host System	2 – Controller Modules (CM) each with 16 GB cache
Windows 2003 Server v5.2 w/SP1	4 – Channel Adapter (CA) Modules
PCI-X	4 – Drive Interfaces (DI)
WG	16 – Front side fibre channels (4 Gbps each)
	16 – Drive side fibre channel switched FC-AL loops (4 Gbps each)
	12 – Drive enclosure modules, each with dual switched FC-AL interfaces and 15 hot swap drive slots
	136 – 36 GB 15K RPM disks including 4 reserved for system use and 4 'hot' spares

## **CONFIGURATION INFORMATION**

This portion of the Full Disclosure Report documents and illustrates the detailed information necessary to recreate the Benchmark Configuration (BC), including the Tested Storage Configuration (TSC), so that the SPC-2 benchmark result produced by the BC may be independently reproduced.

In each of the following sections of this document, the appropriate Full Disclosure Report requirement, from the SPC-2 benchmark specification, is stated in italics followed by the information to fulfill the stated requirement.

### **Benchmark Configuration (BC)/Tested Storage Configuration (TSC) Diagram**

#### *Clause 10.6.5.7*

*The Executive Summary will contain a one page BC/TSC diagram that illustrates all major components of the BC/TSC.*

The Benchmark Configuration (BC)/Tested Storage Configuration (TSC) is illustrated on page 17 (*Benchmark Configuration/Tested Storage Configuration Diagram*).

### **Storage Network Configuration**

#### *Clause 9.2.4.4.2*

*If a storage network was configured as a part of the Tested Storage Configuration and the Benchmark Configuration described in Clause 10.6.5.7 contains a high-level illustration of the network configuration, the Executive Summary will contain a one page topology diagram of the storage network as illustrated in Figure 10.8.*

The Benchmark Configuration (BC)/Tested Storage Configuration (TSC) was configured with local storage and, as such, did not employ a storage network.

### **Host System and Tested Storage Configuration Table**

#### *Clause 10.6.5.9*

*The Executive Summary will contain a table that lists the major components of each Host System and the Tested Storage Configuration.*

The components that comprise each Host System and the Tested Storage Configuration are listed in the table that appears on page 18 (*Host System(s) and Tested Storage Configuration Components*).

## Customer Tunable Parameters and Options

### Clause 10.6.6.1

All Benchmark Configuration (BC) components with customer tunable parameter and options that have been altered from their default values must be listed in the FDR. The FDR entry for each of those components must include both the name of the component and the altered value of the parameter or option. If the parameter name is not self-explanatory to a knowledgeable practitioner, a brief description of the parameter's use must also be included in the FDR entry.

“Appendix B: Customer Tunable Parameters and Options” on page 97 contains the customer tunable parameters and options that have been altered from their default values for this benchmark.

## Tested Storage Configuration (TSC) Description

### Clause 10.6.6.2

The Full Disclosure Report must include sufficient information to recreate the logical representation of the Tested Storage Configuration (TSC). In addition to customer tunable parameters and options (Clause 10.6.6.1), that information must include, at a minimum:

- A diagram and/or description of the following:
  - All physical components that comprise the TSC. Those components are also illustrated in the BC Configuration Diagram in Clause 10.6.5.7 and the Storage Network Configuration Diagram in Clause 10.6.5.8.
  - The logical representation of the TSC, configured from the above components that will be presented to the SPC-2 Workload Generator.
- Listings of scripts used to create the logical representation of the TSC.
- If scripts were not used, a description of the process used with sufficient detail to recreate the logical representation of the TSC.

“Appendix C: Tested Storage Configuration (TSC) Creation” on page 98 contains the detailed information that describes how to create and configure the logical TSC.

## SPC-2 Workload Generator Storage Configuration

### Clause 10.6.6.3

The Full Disclosure Report will include all SPC-2 Workload Generator storage configuration commands and parameters used in the SPC-2 benchmark measurement.

The SPC-2 Workload Generator storage configuration commands and parameters for this measurement appear in “Appendix D: SPC-2 Workload Generator Storage Commands and Parameters” on page 98.

## **SPC-2 DATA REPOSITORY**

This portion of the Full Disclosure Report presents the detailed information that fully documents the various SPC-2 storage capacities and mappings used in the Tested Storage Configuration. “SPC-2 Data Repository Definitions” on page 92 contains definitions of terms specific to the SPC-2 Data Repository.

In each of the following sections of this document, the appropriate Full Disclosure Report requirement, from the SPC-2 benchmark specification, is stated in italics followed by the information to fulfill the stated requirement.

### **SPC-2 Storage Capacities and Relationships**

*Two tables and an illustration documenting the storage capacities and relationships of the SPC-2 Storage Hierarchy (Clause 2.1) shall be included in the FDR.*

#### **SPC-2 Storage Capacities**

<b>SPC-2 Storage Capacities</b>		
<b>Storage Hierarchy Component</b>	<b>Units</b>	<b>Capacity</b>
Total ASU Capacity	Gigabytes (GB)	2,284.923
Addressable Storage Capacity	Gigabytes (GB)	2,284.923
Configured Storage Capacity	Gigabytes (GB)	4,712.653
Physical Storage Capacity	Gigabytes (GB)	4,952.015
Data Protection Overhead (mirror)	Gigabytes (GB)	2,284.923
Required Storage (spares)	Gigabytes (GB)	142.808
Global Storage Overhead	Gigabytes (GB)	188.897
Total Unused Storage	Gigabytes (GB)	50.466

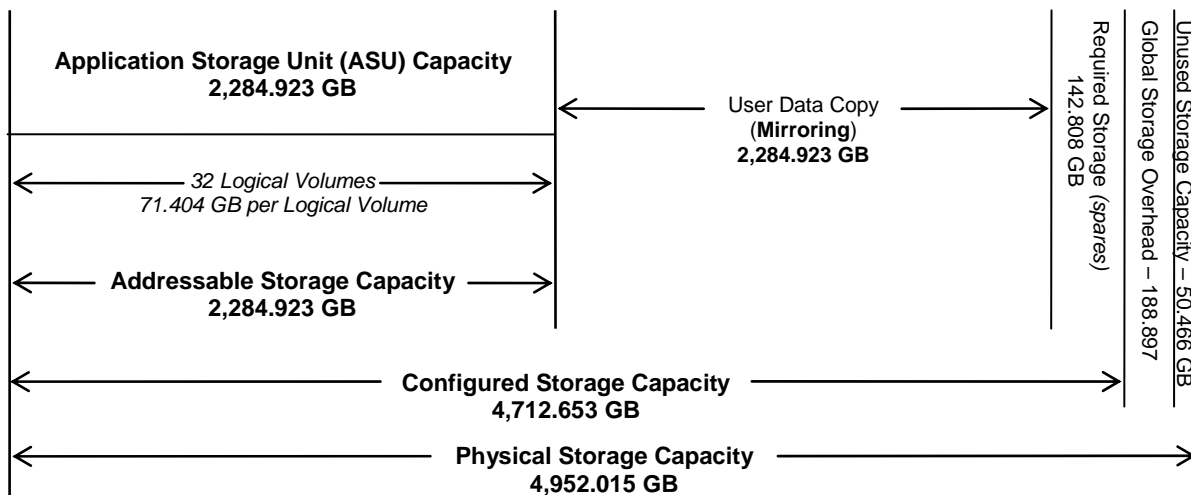
**SPC-2 Storage Hierarchy Ratios**

	Addressable Storage Capacity	Configured Storage Capacity	Physical Storage Capacity
Total ASU Capacity	100.00%	48.48%	46.14%
Required for Data Protection (Mirroring)		48.48%	46.14%
Addressable Storage Capacity		48.48%	46.14%
Required Storage (spares)		3.03%	2.88%
Configured Storage Capacity			95.17%
Global Storage Overhead			3.81%
Unused Storage:			
Addressable	0.00%		
Configured		0.00%	
Physical			1.02%

The Physical Storage Capacity consisted of 4,952.015 GB distributed over 136 disk drives each with a formatted capacity of 36.412 GB. There was 50.466 GB (1.02%) of Unused Storage within the Physical Storage Capacity. Global Storage Overhead consisted of 188.897 GB (3.81%) of Physical Storage Capacity. There was 0.000 GB (0.00%) of Unused Storage within the Configured Storage Capacity. The Total ASU Capacity utilized 100% of the Addressable Storage Capacity resulting in 0.000 GB (0.00%) of Unused Storage within the Addressable Storage Capacity.

**SPC-2 Storage Capacities and Relationships Illustration**

The various storage capacities configured in the benchmark result are illustrated below (not to scale).



## Logical Volume Capacity and ASU Mapping

### Clause 10.6.7.2

A table illustrating the capacity of the Application Storage Unit (ASU) and the mapping of Logical Volumes to ASU will be provided in the FDR. Capacity must be stated in gigabytes (GB) as a value with a minimum of two digits to the right of the decimal point. Each Logical Volume will be sequenced in the table from top to bottom per its position in the contiguous address space of the ASU. Each Logical Volume entry will list its total capacity, the portion of that capacity used for the ASU, and any unused capacity.

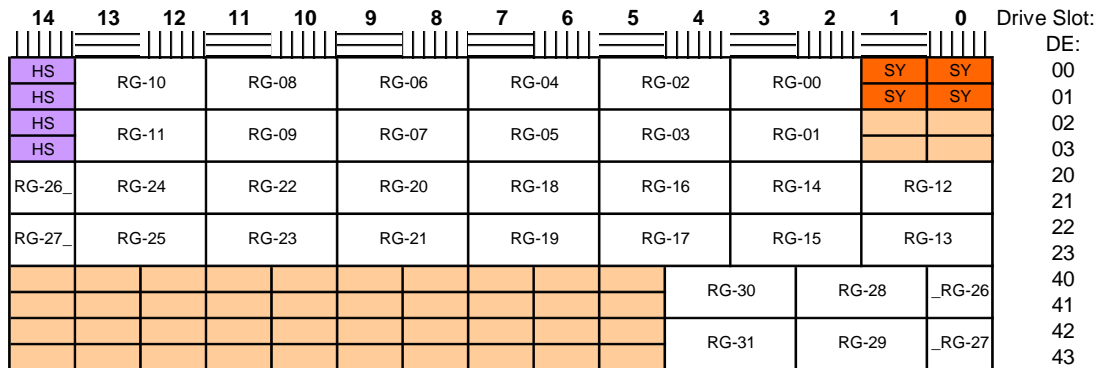
Logical Volume (LV) Capacity and Mapping			
ASU (2,284.923 GB)			
	Total Capacity (GB)	Capacity Used (GB)	Capacity Unused (GB)
Logical Volumes 1-32	71.404 per LV	71.404 per LV	0.000 per LV

See the Storage Definition (sd) entries in “Appendix D: SPC-2 Workload Generator Storage Commands and Parameters” on page 98 for more detailed configuration information.

## Assignment of RAID Groups and LUNs

The 32 RAID Group Assignments are RAID0+1 (2+2) sets, each defined as a single LUN to the servers. Half of the LUNs (16) are presented through 8 Channel Adapter (CA) ports, and the other half presented through the other 8 CA ports.

The RAID Group assignments to drives in the array are illustrated by the following chart.



- System Drives - treated as Global Overhead
- Hot Spare Drives - treated as part of Configured Storage
- Removed Drives - to configure reduced system

The RAID Groups and LUN assignments are set up through a series of actions on the GUI Management Interface (ETERNUSmgr) or optionally using an off-line configuration tool. The task of setting up the configuration for each customer is provided as part of the base system price by Fujitsu. Different techniques are applied, depending upon the needs of the customer. This configuration reflects the customary techniques that are applied when a high performance requirement dominates the customer environment. Other techniques are

applied when the primary requirement is for maximum capacity. In the case of high performance sequential access demands, it is effective to define RAID Groups arranged in RAID0+1 configurations. In this configuration, all of the RAID0+1 Groups are 2+2 arrangements.

There are four (4) drives reserved exclusively for system use, and four (4) Hot Spare drives have been included in the configuration. There are forty-four (44) empty drive slots in this configuration, as well.

The thirty-two (32) LUNs, seen through the sixteen HBAs (two on each of the eight Windows servers) are all presented to the Workload Generator to form the single ASU used by the SPC-2 benchmark. All the LUNs presented are the same size – 71,403.831 MB each.

Two optional facilities in the ETERNUS4000 (SSC and Trace), which are used for collection information during operation, were turned off during this benchmark run. They are normally not enabled during operations. Two secondary enhanced reliability features (Patrol and sampled Read after Write compare), which may be optionally enabled by a customer, were also turned off during this benchmark run.



## **SPC-2 TEST EXECUTION RESULTS**

This portion of the Full Disclosure Report documents the results of the various SPC-2 Test, Test Phases, Test Run Sequences, and Test Runs. “SPC-2 Test Execution Definitions” on page 93 contains definitions of terms specific to the SPC-2 Data Repository.

In each of the following sections of this document, the appropriate Full Disclosure Report requirement, from the SPC-2 benchmark specification, is stated in italics followed by the information to fulfill the stated requirement.

### **SPC-2 Tests, Test Phases, Test Run Sequences, and Test Runs**

The SPC-2 benchmark consists of the following Tests, Test Phases, Test Run Sequences, and Test Runs:

- **Data Persistence Test**
  - Data Persistence Test Run 1
  - Data Persistence Test Run 2
  
- **Large File Processing Test**
  - WRITE ONLY Test Phase
    - Test Run Sequence 1
      - ✓ Test Run 1 – 1024 KiB Transfer – maximum number of Streams
      - ✓ Test Run 2 – 1024 KiB Transfer – 50% of Test Run 1’s Streams value
      - ✓ Test Run 3 – 1024 KiB Transfer – 25% of Test Run 1’s Streams value
      - ✓ Test Run 4 – 1024 KiB Transfer – 12.5% of Test Run 1’s Streams value
      - ✓ Test Run 5 – 1024 KiB Transfer – single (1) Stream
    - Test Run Sequence 2
      - ✓ Test Run 6 – 256 KiB Transfer – maximum number of Streams
      - ✓ Test Run 7 – 256 KiB Transfer – 50% of Test Run 6’s Streams value
      - ✓ Test Run 8 – 256 KiB Transfer – 25% of Test Run 6’s Streams value
      - ✓ Test Run 9 – 256 KiB Transfer – 12.5% of Test Run 6’s Streams value
      - ✓ Test Run 10 – 256 KiB Transfer – single (1) Stream
  - READ-WRITE Test Phase
    - Test Run Sequence 3
      - ✓ Test Run 11 – 1024 KiB Transfer – maximum number of Streams
      - ✓ Test Run 12 – 1024 KiB Transfer – 50% of Test Run 11’s Streams value
      - ✓ Test Run 13 – 1024 KiB Transfer – 25% of Test Run 11’s Streams value
      - ✓ Test Run 14 – 1024 KiB Transfer – 12.5% of Test Run 11’s Streams value
      - ✓ Test Run 15 – 1024 KiB Transfer – single (1) Stream
    - Test Run Sequence 4
      - ✓ Test Run 16 – 256 KiB Transfer – maximum number of Streams
      - ✓ Test Run 17 – 256 KiB Transfer – 50% of Test Run 16’s Streams value
      - ✓ Test Run 18 – 256 KiB Transfer – 25% of Test Run 16’s Streams value
      - ✓ Test Run 19 – 256 KiB Transfer – 12.5% of Test Run 16’s Streams value
      - ✓ Test Run 20 – 256 KiB Transfer – single (1) Stream

- **Large File Processing Test (continued)**
  - READ ONLY Test Phase
    - Test Run Sequence 5
      - ✓ Test Run 21 – 1024 KiB Transfer – maximum number of Streams
      - ✓ Test Run 22 – 1024 KiB Transfer – 50% of Test Run 21's Streams value
      - ✓ Test Run 23 – 1024 KiB Transfer – 25% of Test Run 21's Streams value
      - ✓ Test Run 24 – 1024 KiB Transfer – 12.5% of Test Run 21's Streams value
      - ✓ Test Run 25 – 1024 KiB Transfer – single (1) Stream
    - Test Run Sequence 6
      - ✓ Test Run 26 – 256 KiB Transfer – maximum number of Streams
      - ✓ Test Run 27 – 256 KiB Transfer – 50% of Test Run 26's Streams value
      - ✓ Test Run 28 – 256 KiB Transfer – 25% of Test Run 26's Streams value
      - ✓ Test Run 29 – 256 KiB Transfer – 12.5% of Test Run 26's Streams value
      - ✓ Test Run 30 – 256 KiB Transfer – single (1) Stream
  
- **Large Database Query Test**
  - 1024 KiB TRANSFER SIZE Test Phase
    - Test Run Sequence 1
      - ✓ Test Run 1 – 4 I/O Requests Outstanding – maximum number of Streams
      - ✓ Test Run 2 – 4 I/O Requests Outstanding – 50% of Test Run 1's Streams value
      - ✓ Test Run 3 – 4 I/O Requests Outstanding – 25% of Test Run 1's Streams value
      - ✓ Test Run 4 – 4 I/O Requests Outstanding – 12.5% of Test Run 1's Streams value
      - ✓ Test Run 5 – 4 I/O Requests Outstanding – single (1) Stream
    - Test Run Sequence 2
      - ✓ Test Run 6 – 1 I/O Request Outstanding – maximum number of Streams
      - ✓ Test Run 7 – 1 I/O Request Outstanding – 50% of Test Run 6's Streams value
      - ✓ Test Run 8 – 1 I/O Request Outstanding – 25% of Test Run 6's Streams value
      - ✓ Test Run 9 – 1 I/O Request Outstanding – 12.5% of Test Run 6's Streams value
      - ✓ Test Run 10 – 1 I/O Request Outstanding – single (1) Stream
  - 64 KiB TRANSFER SIZE Test Phase
    - Test Run Sequence 3
      - ✓ Test Run 11 – 4 I/O Requests Outstanding – maximum number of Streams
      - ✓ Test Run 12 – 4 I/O Requests Outstanding – 50% of Test Run 11's Streams value
      - ✓ Test Run 13 – 4 I/O Requests Outstanding – 25% of Test Run 11's Streams value
      - ✓ Test Run 14 – 4 I/O Requests Outstanding – 12.5% of Test Run 11's Streams value
      - ✓ Test Run 15 – 4 I/O Requests Outstanding – single (1) Stream
    - Test Run Sequence 4
      - ✓ Test Run 16 – 1 I/O Request Outstanding – maximum number of Streams
      - ✓ Test Run 17 – 1 I/O Request Outstanding – 50% of Test Run 16's Streams value
      - ✓ Test Run 18 – 1 I/O Request Outstanding – 25% of Test Run 16's Streams value
      - ✓ Test Run 19 – 1 I/O Request Outstanding – 12.5% of Test Run 16's Streams value
      - ✓ Test Run 20 – 1 I/O Request Outstanding – single (1) Stream
  
- **Video on Demand Delivery Test**
  - Video on Demand Delivery Test Run

**Each Test is an atomic unit that must be executed from start to finish before any other Test, Test Phase, or Test Run may be executed. The Tests may be executed in any sequence.**

**The results from each Test, Test Phase, and Test Run are listed below along with a more detailed explanation of each component.**

## Large File Processing Test

### Clause 6.4.2.1

*The Large File Processing Test consists of the I/O operations associated with the type of applications, in a wide range of fields, which require simple sequential processing of one or more large files. Specific examples of those types of applications include scientific computing and large-scale financial processing*

### Clause 6.4.2.2

*The Large File Processing Test has three Test Phases, which shall be executed in the following uninterrupted sequence:*

1. *WRITE ONLY*
2. *READ-WRITE*
3. *READ ONLY*

*The BC shall not be restarted or manually disturbed, altered, or adjusted during the execution of the Large File Processing Test. If power is lost to the BC during this Test all results shall be rendered invalid and the Test re-run in its entirety.*

### Clause 10.6.8.1

*The Full Disclosure Report will contain the following content for the Large File Processing Test:*

1. *A listing of the SPC-2 Workload Generator commands and parameters used to execute each of the Test Runs in the Large File Processing Test.*
2. *The human readable SPC-2 Test Results File for each of the Test Runs in the Large File Processing Test.*
3. *A table that contains the following information for each Test Run in all three Test Phases of the Large File Processing Test:*
  - *The number Streams specified.*
  - *The Ramp-Up duration in seconds.*
  - *The Measurement Interval duration in seconds.*
  - *The average data rate, in MB per second, for the Measurement Interval.*
  - *The average data rate, in MB per second, per Stream for the Measurement Interval.*
4. *Average Data Rate and Average Data Rate per Stream graphs as defined in Clauses 10.1.1 and 10.1.2.*

## SPC-2 Workload Generator Commands and Parameters

The SPC-2 Workload Generator commands and parameters for the Large File Processing Test Runs are documented in “Appendix E: SPC-2 Workload Generator Execution Commands and Parameters” on Page 127.

### SPC-2 Test Results File

A link to the SPC-2 Test Results file generated from the Large File Processing Test Runs is listed below.

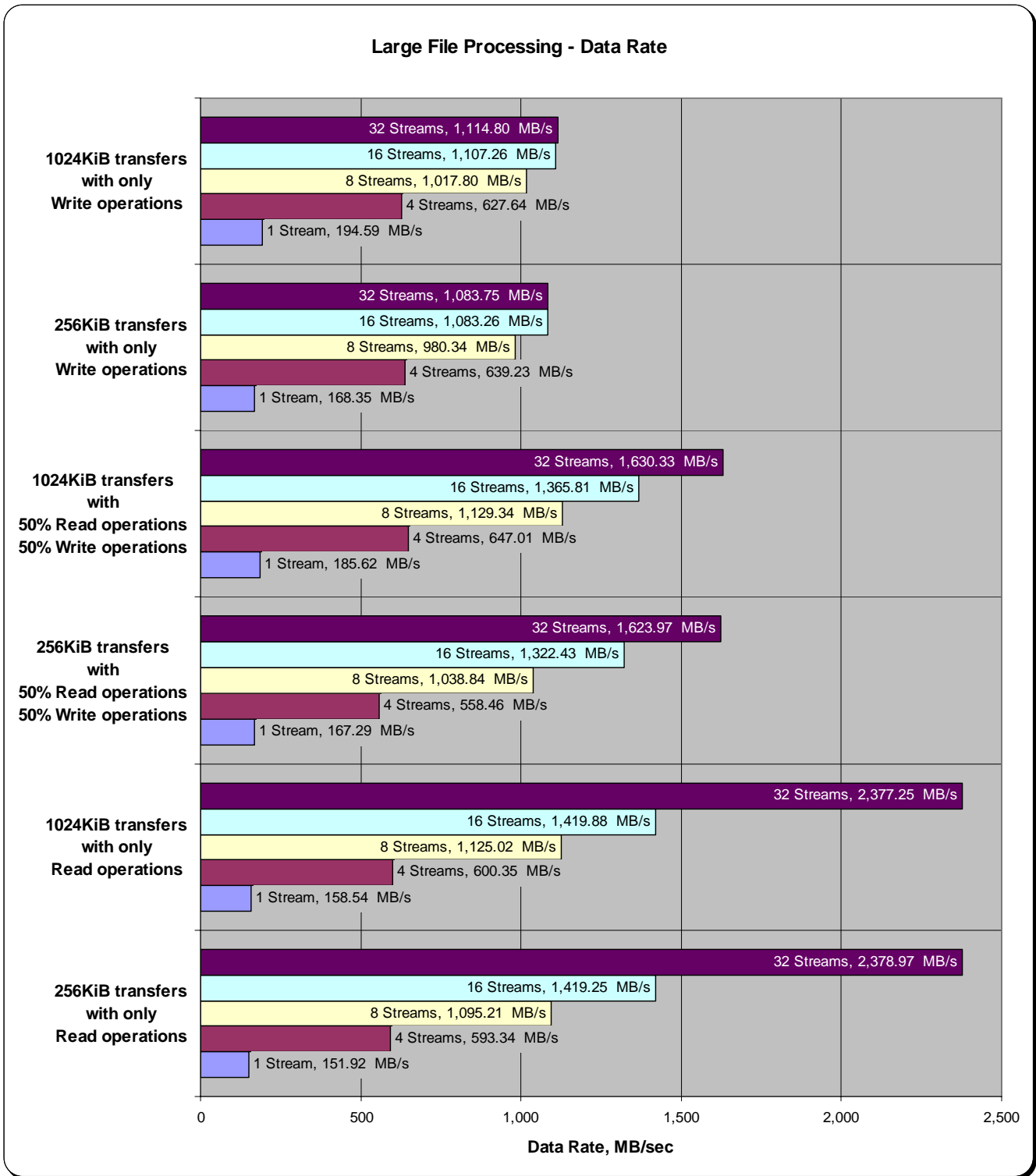
[SPC-2 Large File Processing Test Results File](#)

### SPC-2 Large File Processing Average Data Rates (MB/s)

The average Data Rate (MB/s) for each Test Run in the three Test Phases of the SPC-2 Large File Processing Test is listed in the table below as well as illustrated in the following graph.

Test Run Sequence	1 Stream	4 Streams	8 Streams	16 Streams	32 Streams
Write 1024KiB	194.59	627.64	1,017.80	1,107.26	1,114.80
Write 256KiB	168.35	639.23	980.34	1,083.26	1,083.75
Read/Write 1024KiB	185.62	647.01	1,129.34	1,365.81	1,630.33
Read/Write 256KiB	167.29	558.46	1,038.84	1,322.43	1,623.97
Read 1024KiB	158.54	600.35	1,125.02	1,419.88	2,377.25
Read 256KiB	151.92	593.34	1,095.21	1,419.25	2,378.97

**SPC-2 Large File Processing Average Data Rates Graph**

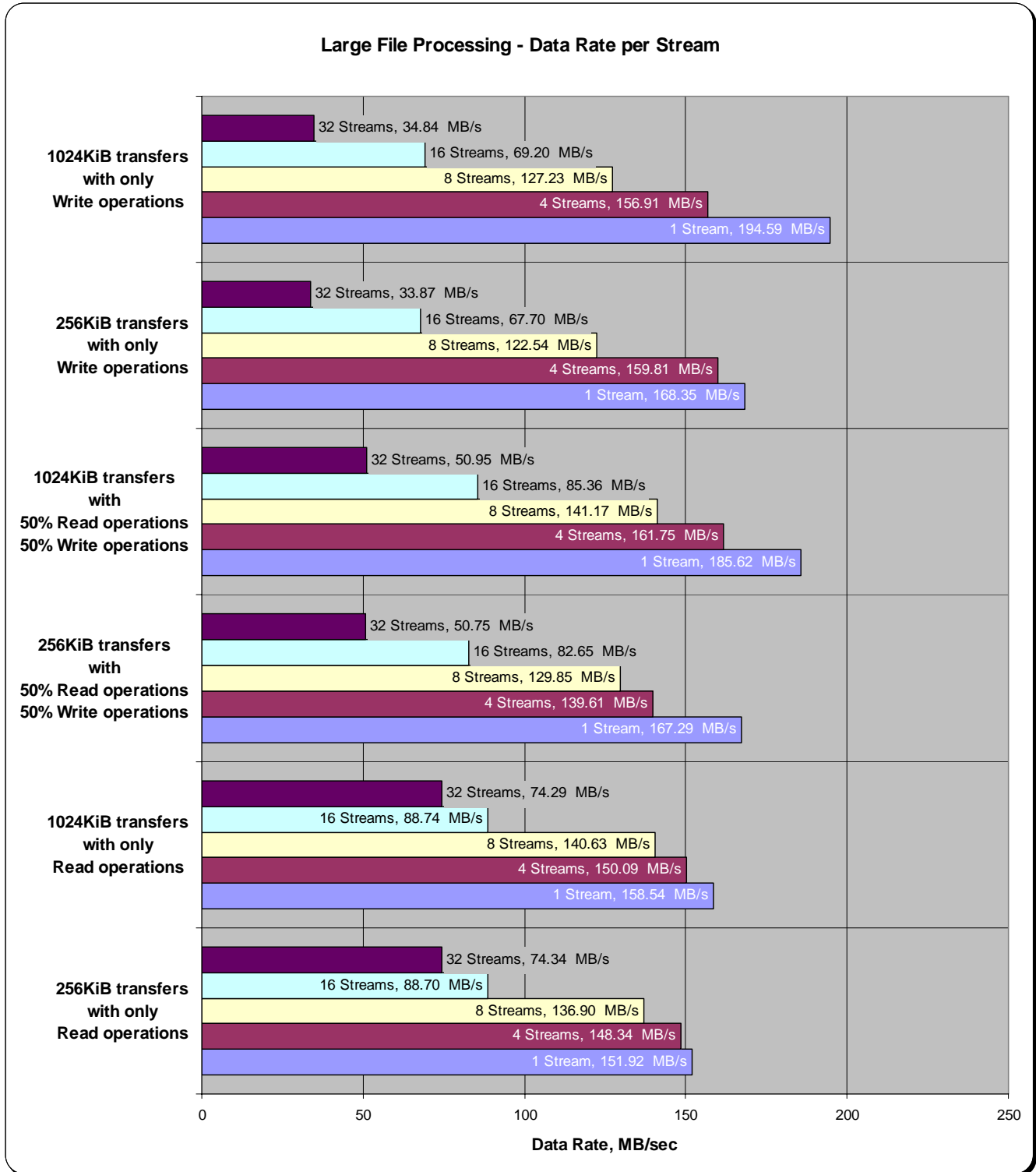


**SPC-2 Large File Processing Average Data Rate per Stream**

The average Data Rate per Stream for each Test Run in the three Test Phases of the SPC-2 Large File Processing Test is listed in the table below as well as illustrated in the following graph.

Test Run Sequence	1 Stream	4 Streams	8 Streams	16 Streams	32 Streams
Write 1024KiB	194.59	156.91	127.23	69.20	34.84
Write 256KiB	168.35	159.81	122.54	67.70	33.87
Read/Write 1024KiB	185.62	161.75	141.17	85.36	50.95
Read/Write 256KiB	167.29	139.61	129.85	82.65	50.75
Read 1024KiB	158.54	150.09	140.63	88.74	74.29
Read 256KiB	151.92	148.34	136.90	88.70	74.34

**SPC-2 Large File Processing Average Data Rate per Stream Graph**



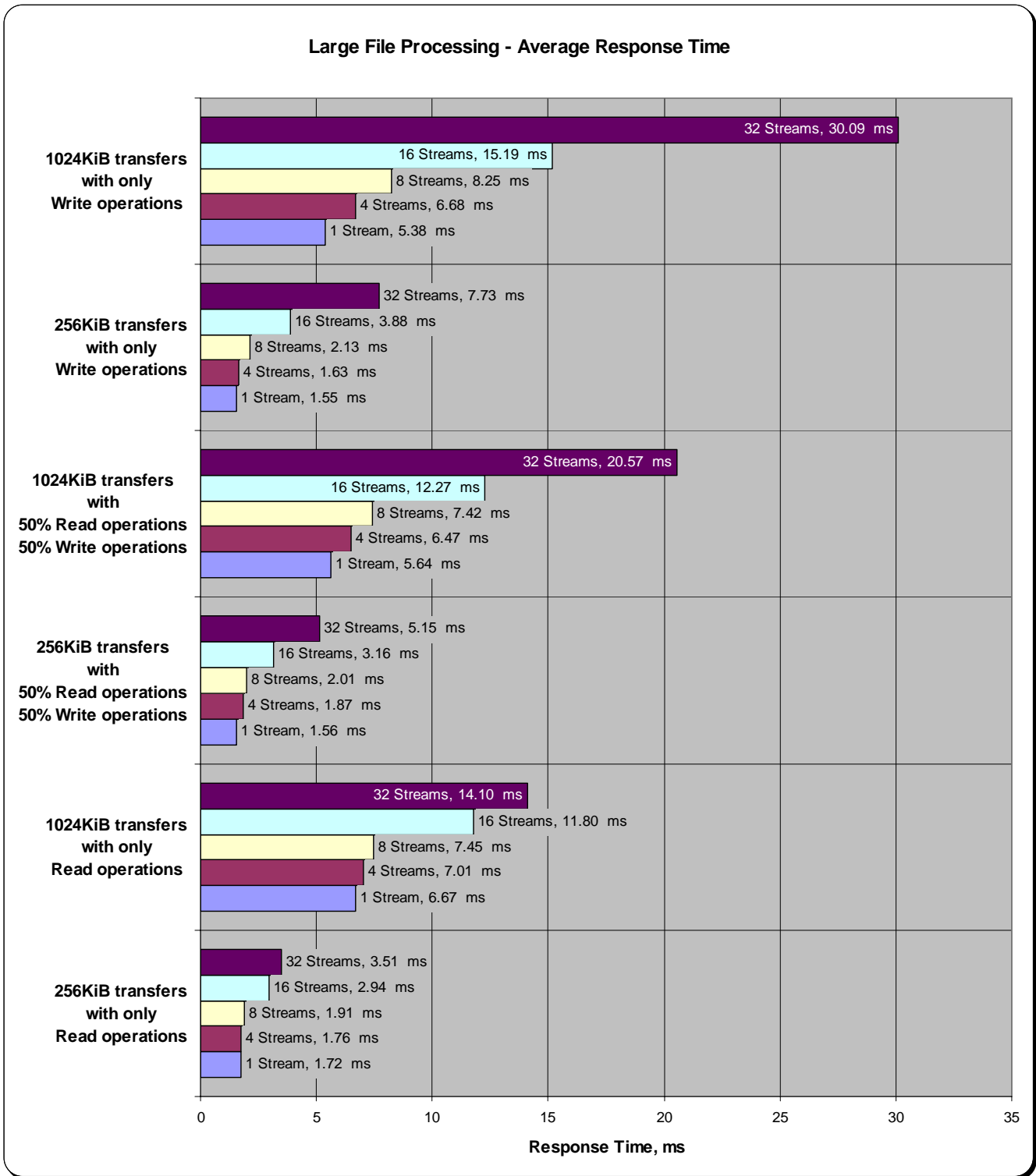


### SPC-2 Large File Processing Average Response Time

The average Response Time, milliseconds (ms), for each Test Run in the three Test Phases of the SPC-2 Large File Processing Test is listed in the table below as well as illustrated in the following graph.

Test Run Sequence	1 Stream	4 Streams	8 Streams	16 Streams	32 Streams
Write 1024KiB	5.38	6.68	8.25	15.19	30.09
Write 256KiB	1.55	1.63	2.13	3.88	7.73
Read/Write 1024KiB	5.64	6.47	7.42	12.27	20.57
Read/Write 256KiB	1.56	1.87	2.01	3.16	5.15
Read 1024KiB	6.67	7.01	7.45	11.80	14.10
Read 256KiB	1.72	1.76	1.91	2.94	3.51

**SPC-2 Large File Processing Average Response Time Graph**



## Large File Processing Test – WRITE ONLY Test Phase

### Clause 10.6.8.1.1

1. A table that will contain the following information for each "WRITE ONLY, 1024 KiB Transfer Size" Test Run:
  - The number of Streams specified.
  - The average data rate, average data rate per stream, and average Response Time reported at five second intervals.
2. Average Data Rate (intervals), Average Data Rate per Stream (intervals), and Average Response Time (intervals) graphs for the "WRITE ONLY, 1024 KiB Transfer Size" Test Runs as specified in Clauses 10.1.4 – 10.1.6.
3. A table that will contain the following information for each "WRITE ONLY, 256 KiB Transfer Size" Test Run:
  - The number of Streams specified.
  - The average data rate, average data rate per stream, and average Response Time reported at five second intervals.
4. Average Data Rate (intervals), Average Data Rate per Stream (intervals), and Average Response Time (intervals) graphs for the "WRITE ONLY, 256 KiB Transfer Size" Test Runs as specified in Clauses 10.1.4 – 10.1.6.

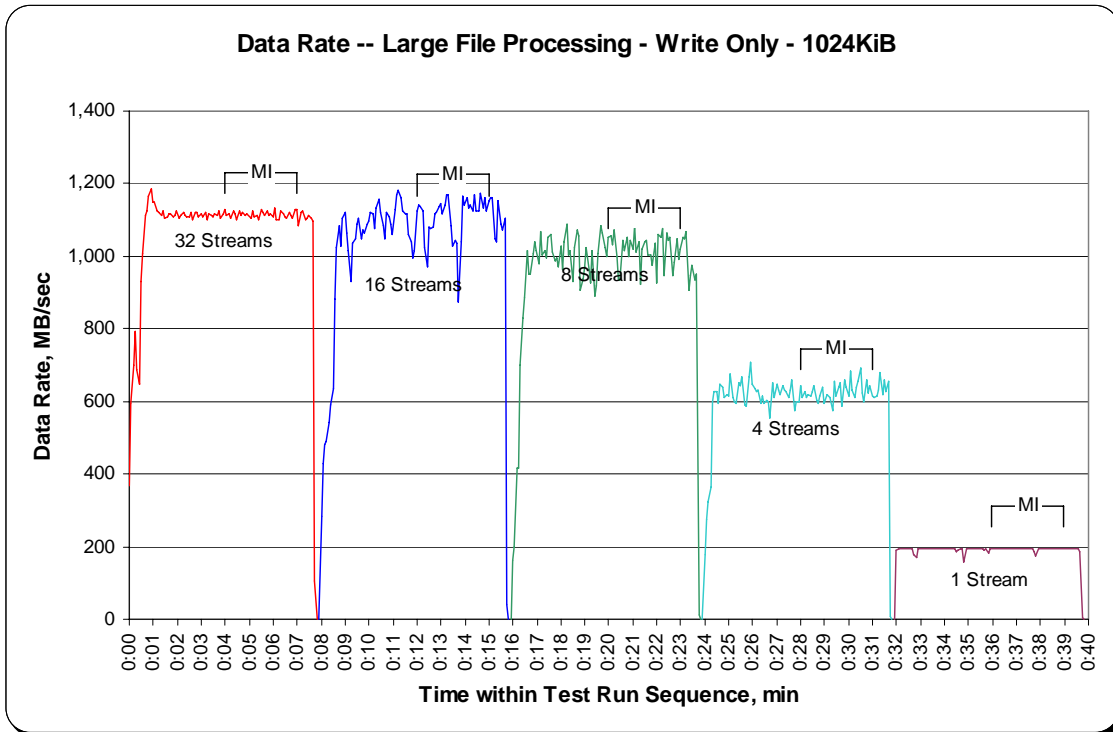
The SPC-2 "Large File Processing/WRITE ONLY/1024 KiB Transfer Size" Test Run data is contained in the table that appears on the next page. That table is followed by graphs illustrating the average Data Rate, average Data Rate per Stream, and average Response Time produced by the same Test Runs. The table and graphs present the data at five-second intervals.

Immediately following the SPC-2 "Large File Processing/WRITE ONLY/1024 KiB Transfer Size" table and graphs will be the SPC-2 "Large File Processing/WRITE ONLY/64 KiB Transfer Size" table and graphs. The table contains the Test Run data and the graphs illustrate the average Data Rate, average Data Rate per Stream, and average Response Time produced by the Test Runs.

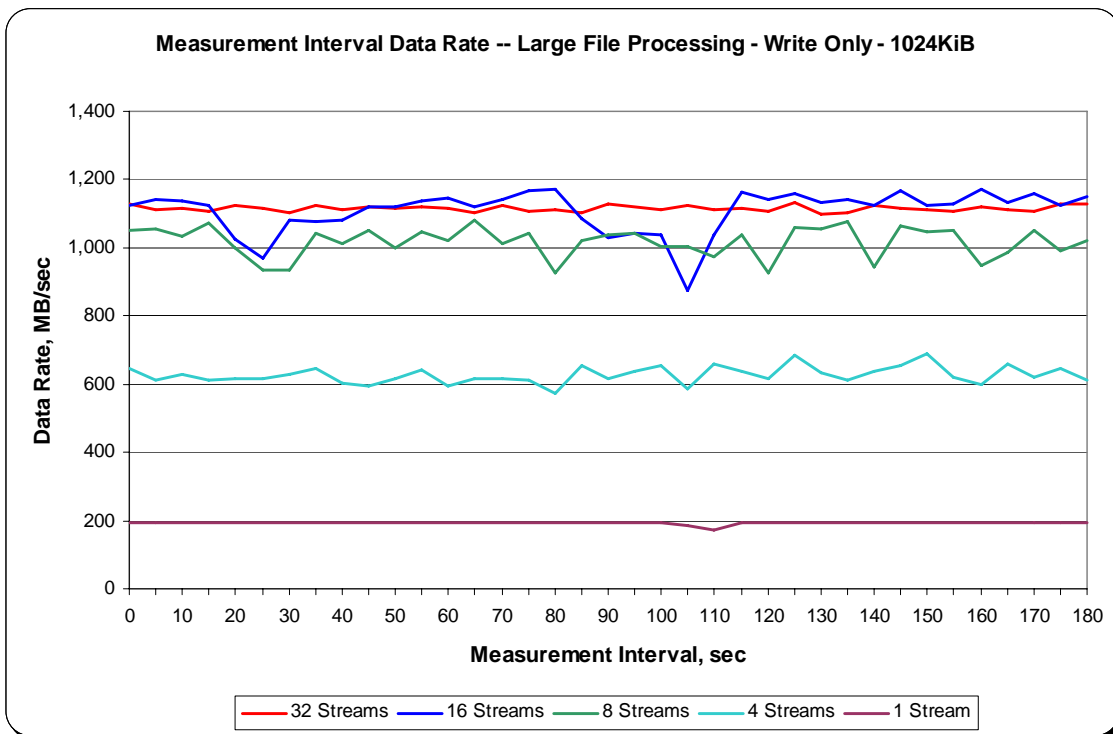




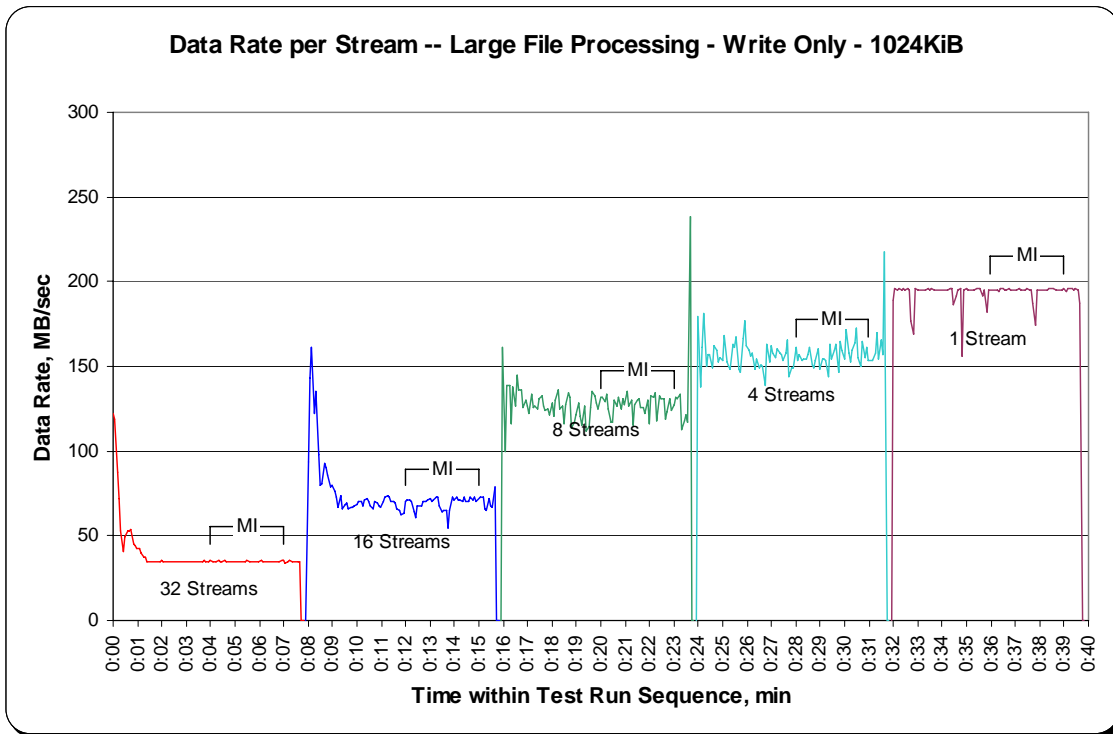
**SPC-2 “Large File Processing/WRITE ONLY/1024 KiB Transfer Size” Average Data Rate Graph – Complete Test Run**



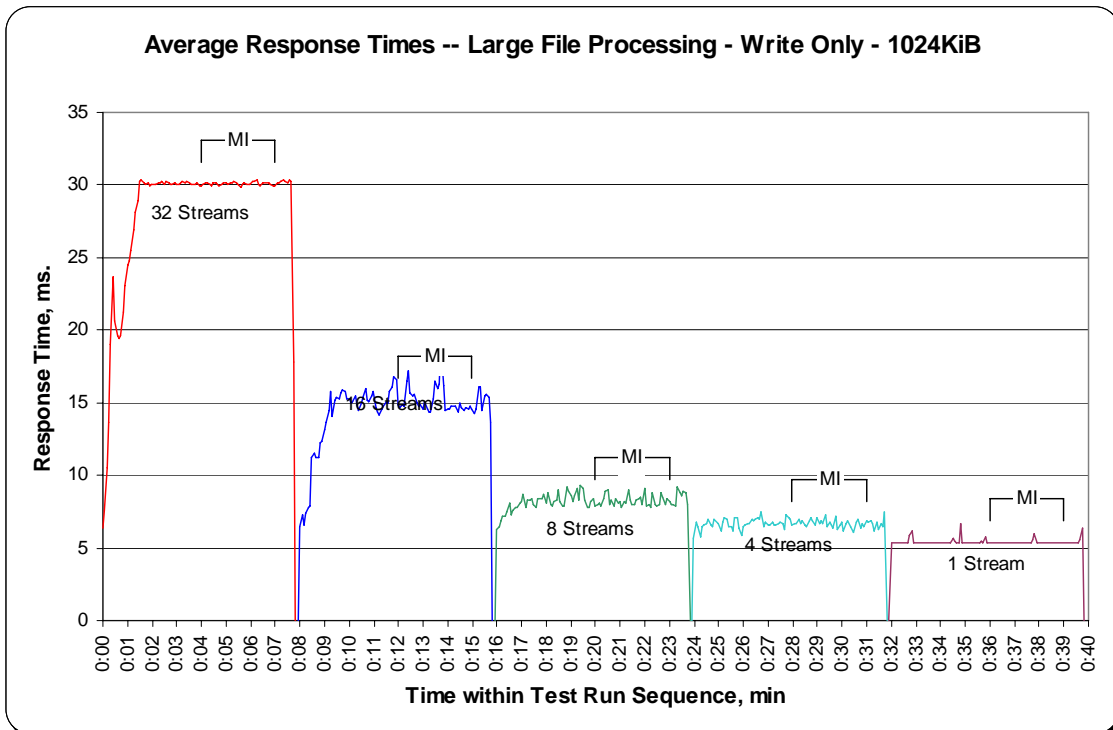
**SPC-2 “Large File Processing/ WRITE ONLY /1024 KiB Transfer Size” Average Data Rate Graph – Measurement Interval (MI) Only**



### SPC-2 “Large File Processing/ WRITE ONLY /1024 KiB Transfer Size” Average Data Rate per Stream Graph



### SPC-2 “Large File Processing/ WRITE ONLY /1024 KiB Transfer Size” Average Response Time Graph

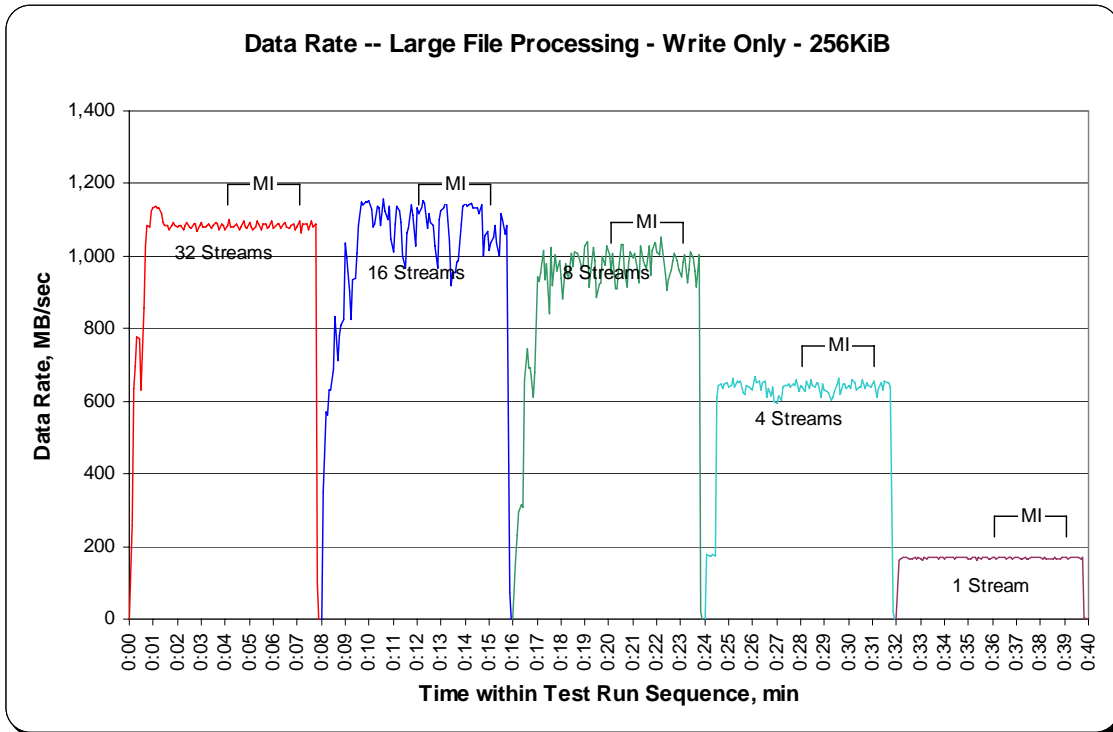




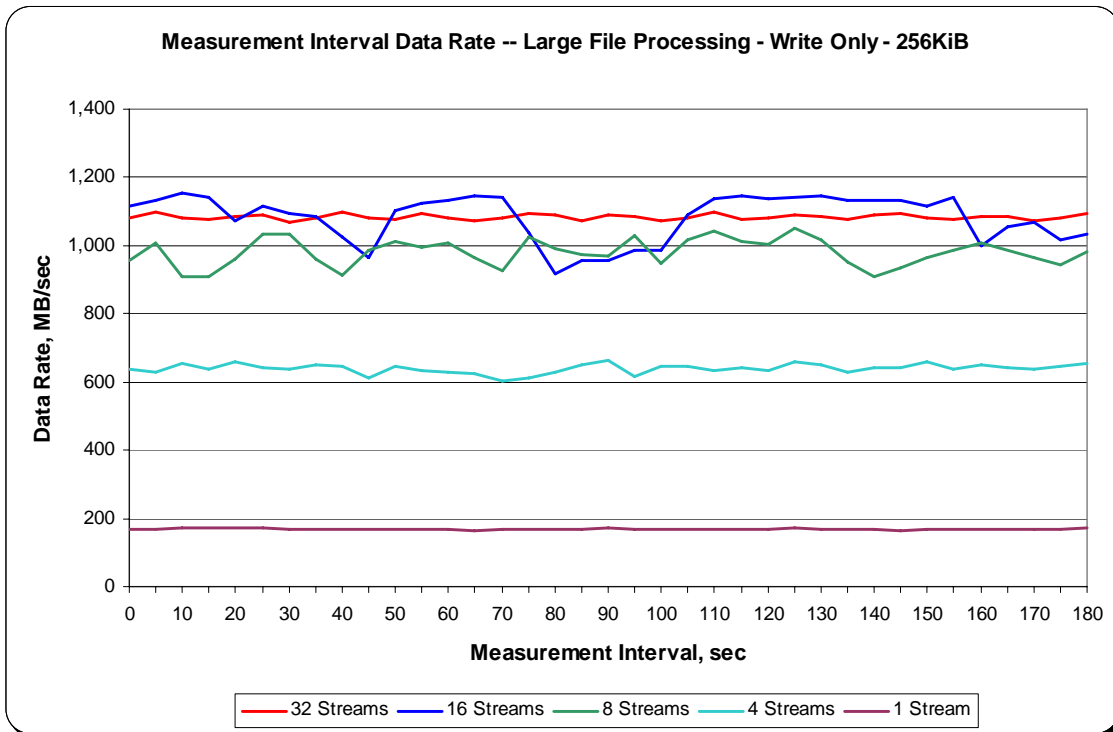




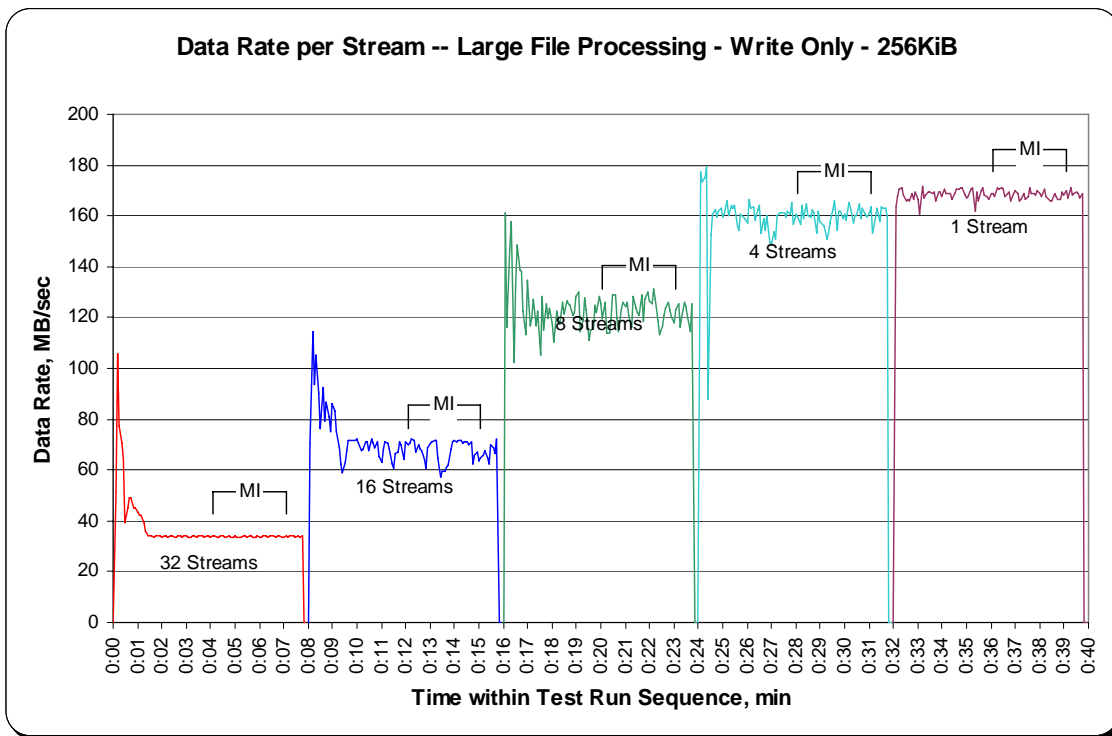
**SPC-2 “Large File Processing/ WRITE ONLY /256 KiB Transfer Size” Average Data Rate Graph – Complete Test Run**



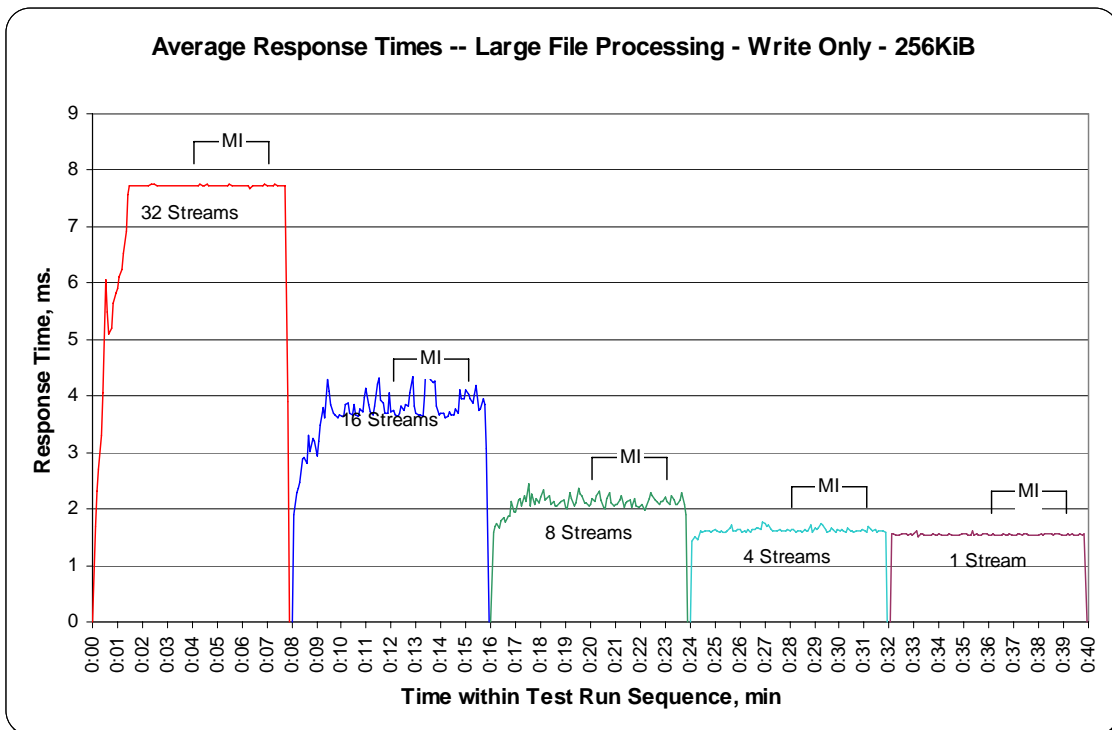
**SPC-2 “Large File Processing/ WRITE ONLY /256 KiB Transfer Size” Average Data Rate Graph – Measurement Interval (MI) Only**



**SPC-2 “Large File Processing/ WRITE ONLY /256 KiB Transfer Size” Average Data Rate per Stream Graph**



**SPC-2 “Large File Processing/ WRITE ONLY /256 KiB Transfer Size” Average Response Time Graph**



## Large File Processing Test – READ-WRITE Test Phase

### Clause 10.6.8.1.2

1. A table that will contain the following information for each "READ-WRITE, 1024 KiB Transfer Size" Test Run:
  - The number of Streams specified.
  - The average data rate, average data rate per stream, and average Response Time reported at five second intervals.
2. Average Data Rate (intervals), Average Data Rate per Stream (intervals), and Average Response Time (intervals) graphs for the "READ-WRITE, 1024 KiB Transfer Size" Test Runs as specified in Clauses 10.1.4 – 10.1.6.
3. A table that will contain the following information for each "READ-WRITE, 256 KiB Transfer Size" Test Run:
  - The number of Streams specified.
  - The average data rate, average data rate per stream, and average Response Time reported at five second intervals.
4. Average Data Rate (intervals), Average Data Rate per Stream (intervals), and Average Response Time (intervals) graphs for the "READ-WRITE, 256 KiB Transfer Size" Test Runs as specified in Clauses 10.1.4 – 10.1.6.

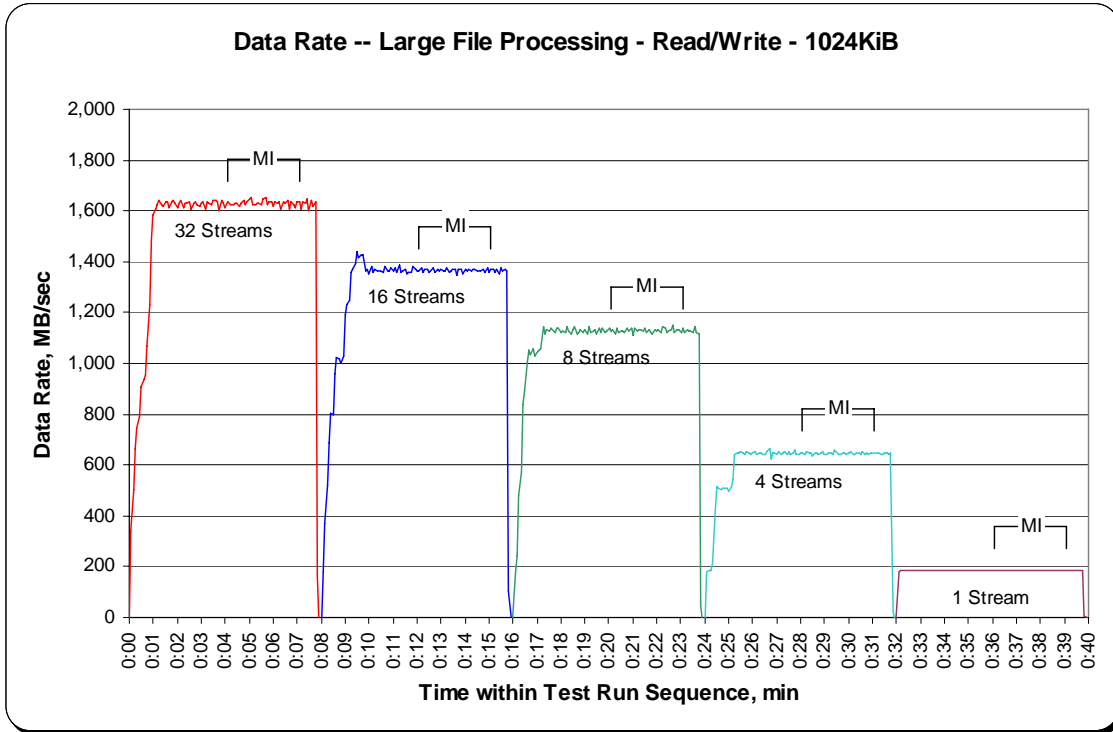
The SPC-2 "Large File Processing/READ-WRITE/1024 KiB Transfer Size" Test Run data is contained in the table that appears on the next page. That table is followed by graphs illustrating the average Data Rate, average Data Rate per Stream, and average Response Time produced by the same Test Runs. The table and graphs present the data at five-second intervals.

Immediately following the SPC-2 "Large File Processing/ READ-WRITE /1024 KiB Transfer Size" table and graphs will be the SPC-2 "Large File Processing/ READ-WRITE /64 KiB Transfer Size" table and graphs. The table contains the Test Run data and the graphs illustrate the average Data Rate, average Data Rate per Stream, and average Response Time produced by the Test Runs.

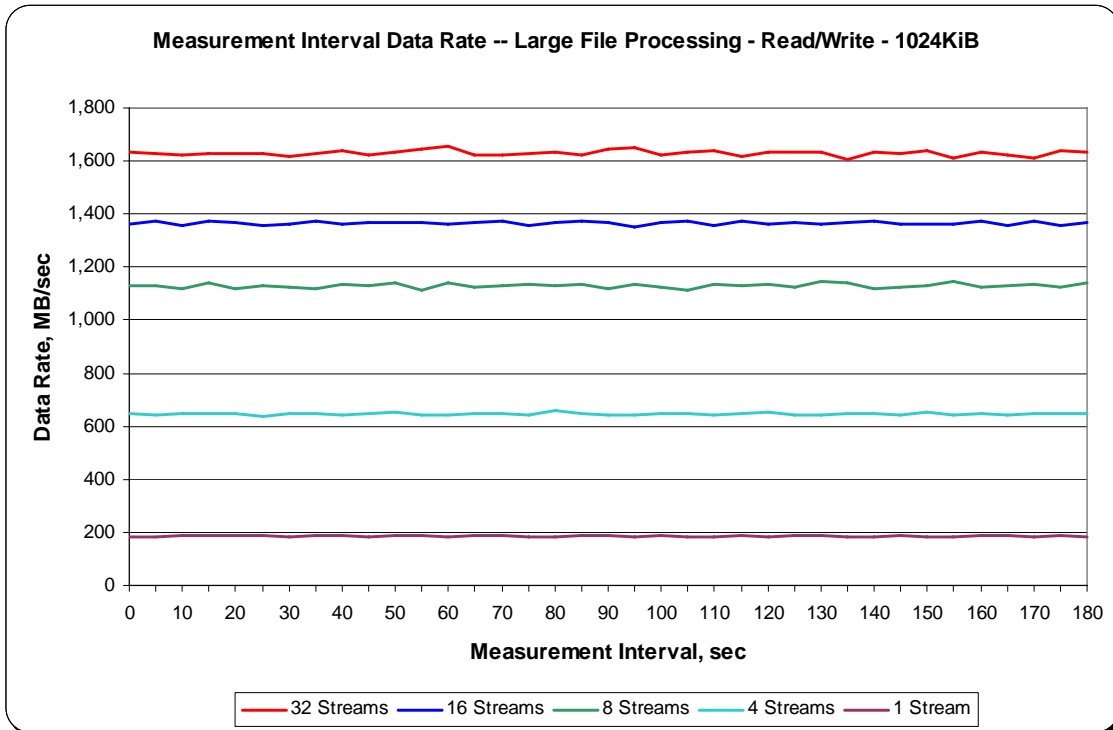




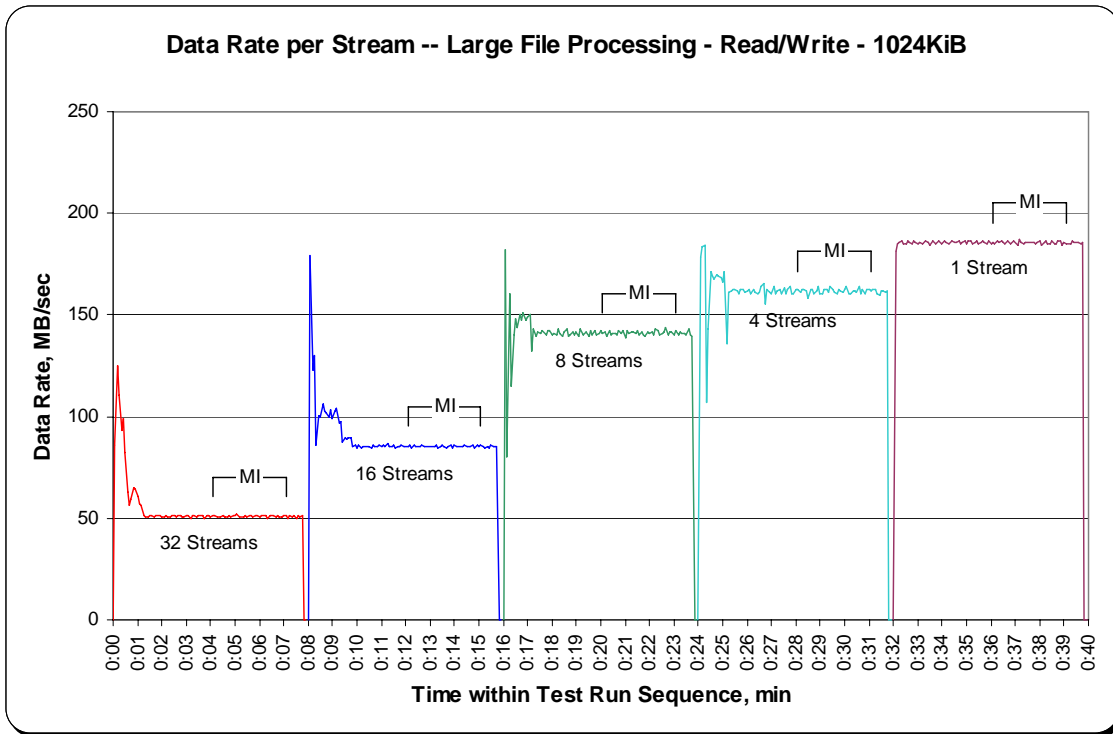
**SPC-2 “Large File Processing/ READ-WRITE/1024 KiB Transfer Size” Average Data Rate Graph – Complete Test Run**



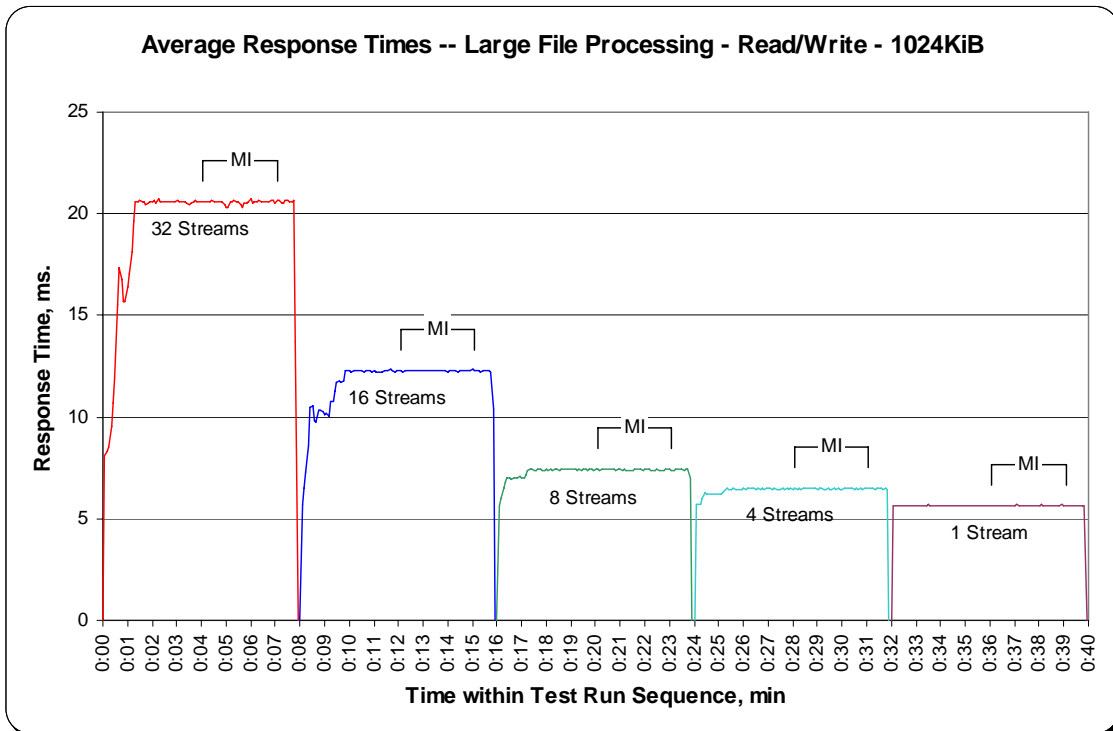
**SPC-2 “Large File Processing/ READ-WRITE/1024 KiB Transfer Size” Average Data Rate Graph – Measurement Interval (MI) Only**



### SPC-2 “Large File Processing/READ-WRITE/1024 KiB Transfer Size” Average Data Rate per Stream Graph



### SPC-2 “Large File Processing/READ-WRITE/1024 KiB Transfer Size” Average Response Time Graph

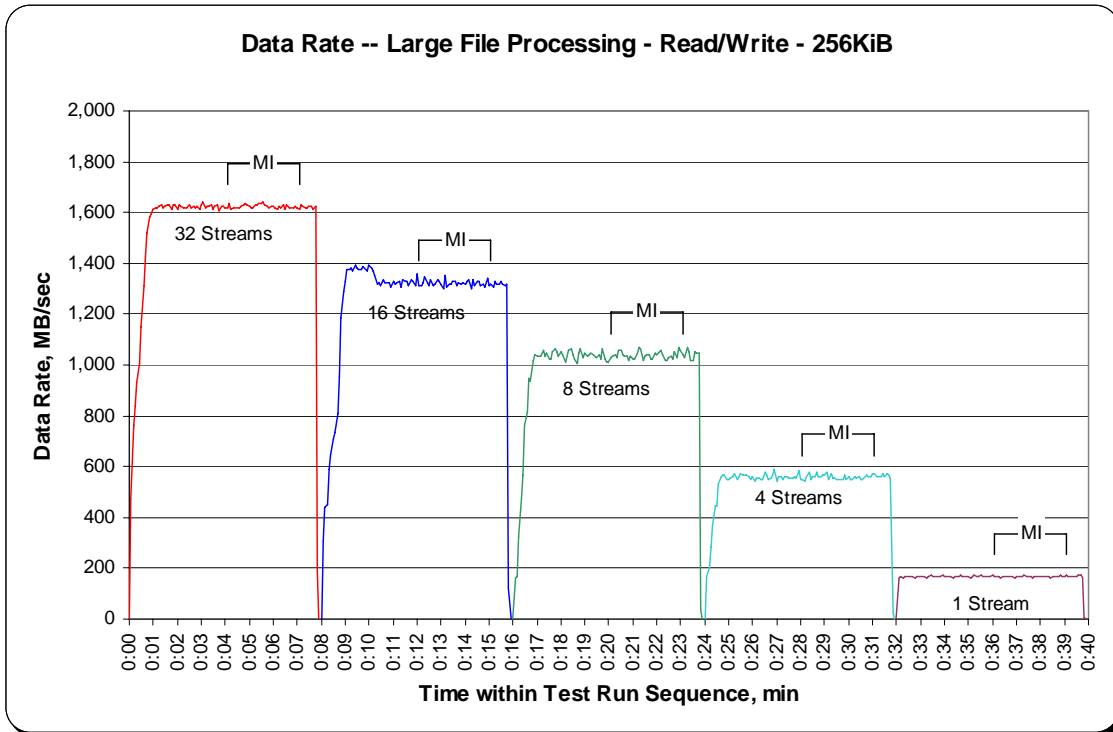




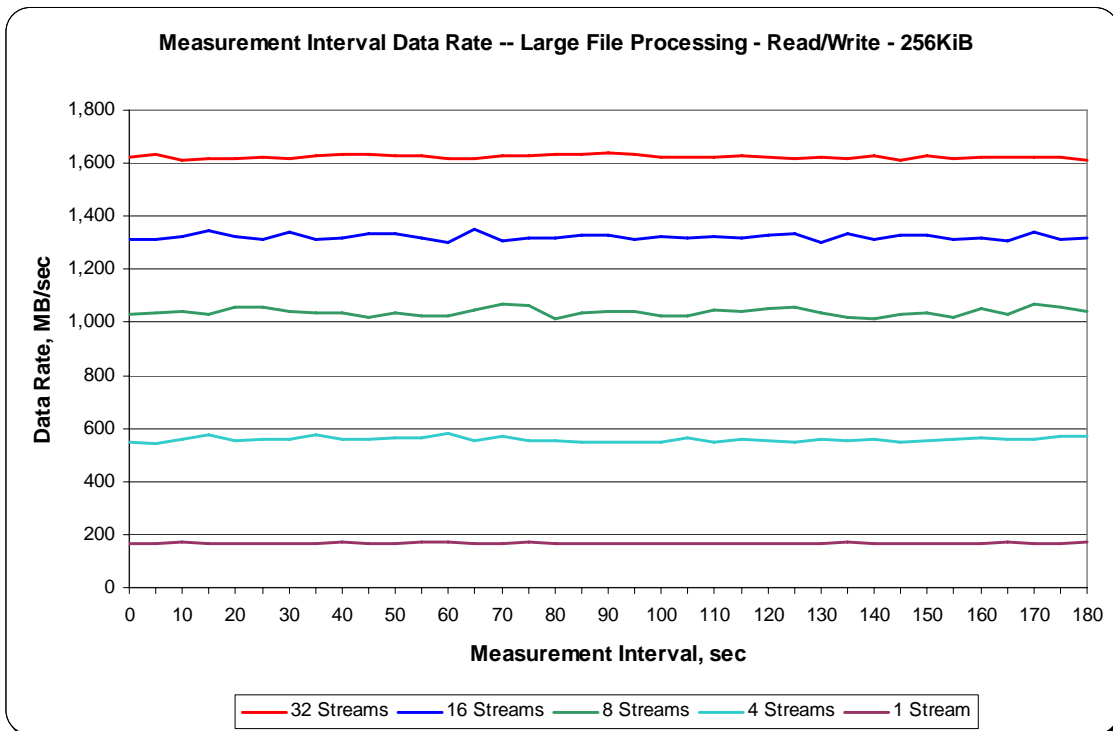




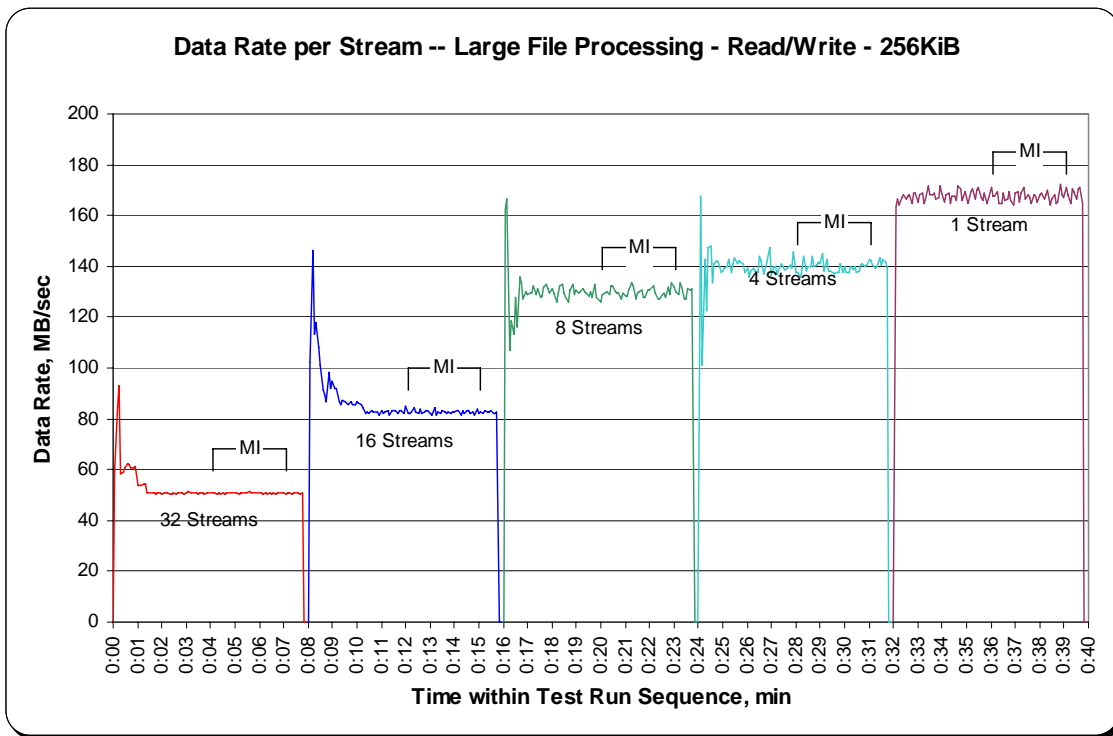
**SPC-2 “Large File Processing/READ-WRITE/256 KiB Transfer Size” Average Data Rate Graph – Complete Test Run**



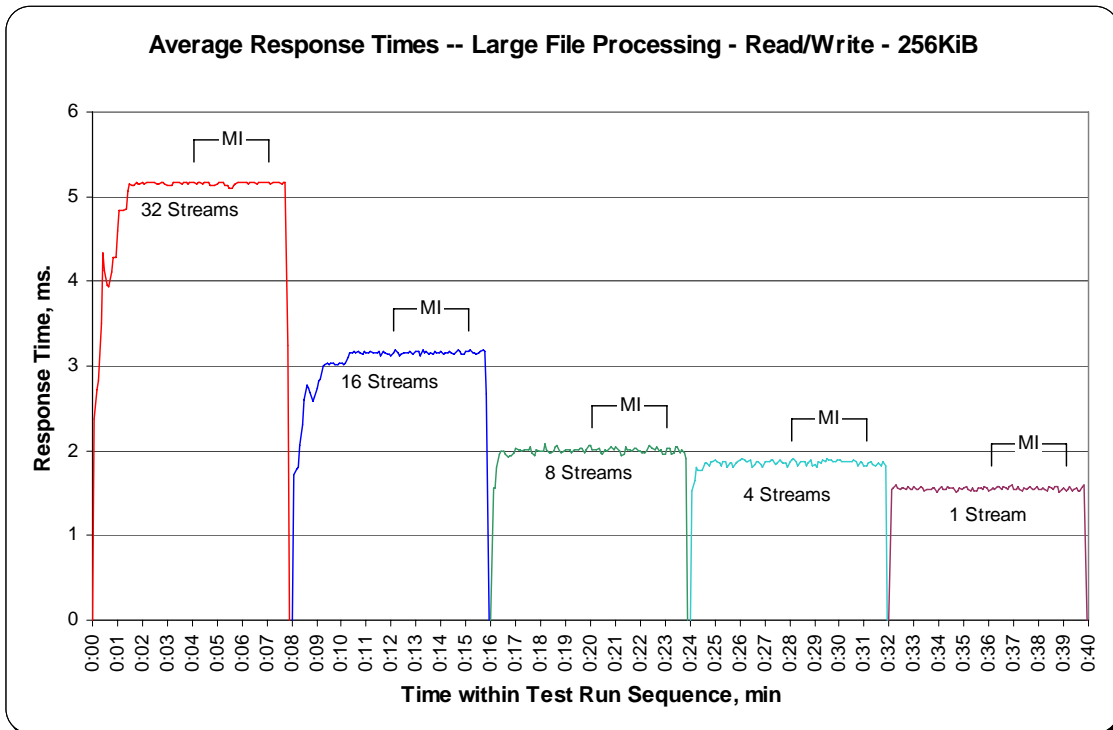
**SPC-2 “Large File Processing/READ-WRITE/256 KiB Transfer Size” Average Data Rate Graph – Measurement Interval (MI) Only**



### SPC-2 “Large File Processing/READ-WRITE/256 KiB Transfer Size” Average Data Rate per Stream Graph



### SPC-2 “Large File Processing/READ-WRITE/256 KiB Transfer Size” Average Response Time Graph



## Large File Processing Test – READ ONLY Test Phase

### Clause 10.6.8.1.3

1. A table that will contain the following information for each "READ ONLY, 1024 KiB Transfer Size" Test Run:
  - The number of Streams specified.
  - The average data rate, average data rate per stream, and average Response Time reported at five second intervals.
2. Average Data Rate (intervals), Average Data Rate per Stream (intervals), and Average Response Time (intervals) graphs for the "READ ONLY, 1024 KiB Transfer Size" Test Runs as specified in Clauses 10.1.4 – 10.1.6.
3. A table that will contain the following information for each "READ ONLY, 256 KiB Transfer Size" Test Run:
  - The number of Streams specified.
  - The average data rate, average data rate per stream, and average Response Time reported at five second intervals.
4. Average Data Rate (intervals), Average Data Rate per Stream (intervals), and Average Response Time (intervals) graphs for the "READ ONLY, 256 KiB Transfer Size" Test Runs as specified in Clauses 10.1.4 – 10.1.6.

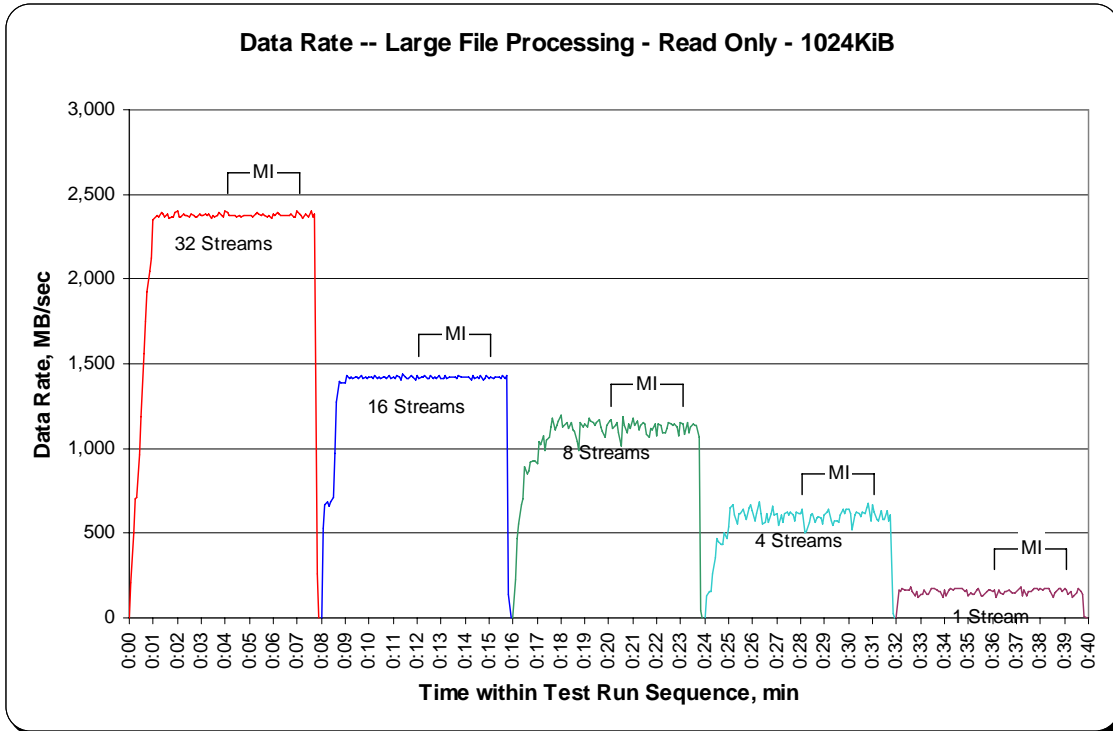
The SPC-2 "Large File Processing/READ ONLY/1024 KiB Transfer Size" Test Run data is contained in the table that appears on the next page. That table is followed by graphs illustrating the average Data Rate, average Data Rate per Stream, and average Response Time produced by the same Test Runs. The table and graphs present the data at five-second intervals.

Immediately following the SPC-2 "Large File Processing/READ ONLY/1024 KiB Transfer Size" table and graphs will be the SPC-2 "Large File Processing/READ ONLY/64 KiB Transfer Size" table and graphs. The table contains the Test Run data and the graphs illustrate the average Data Rate, average Data Rate per Stream, and average Response Time produced by the Test Runs.

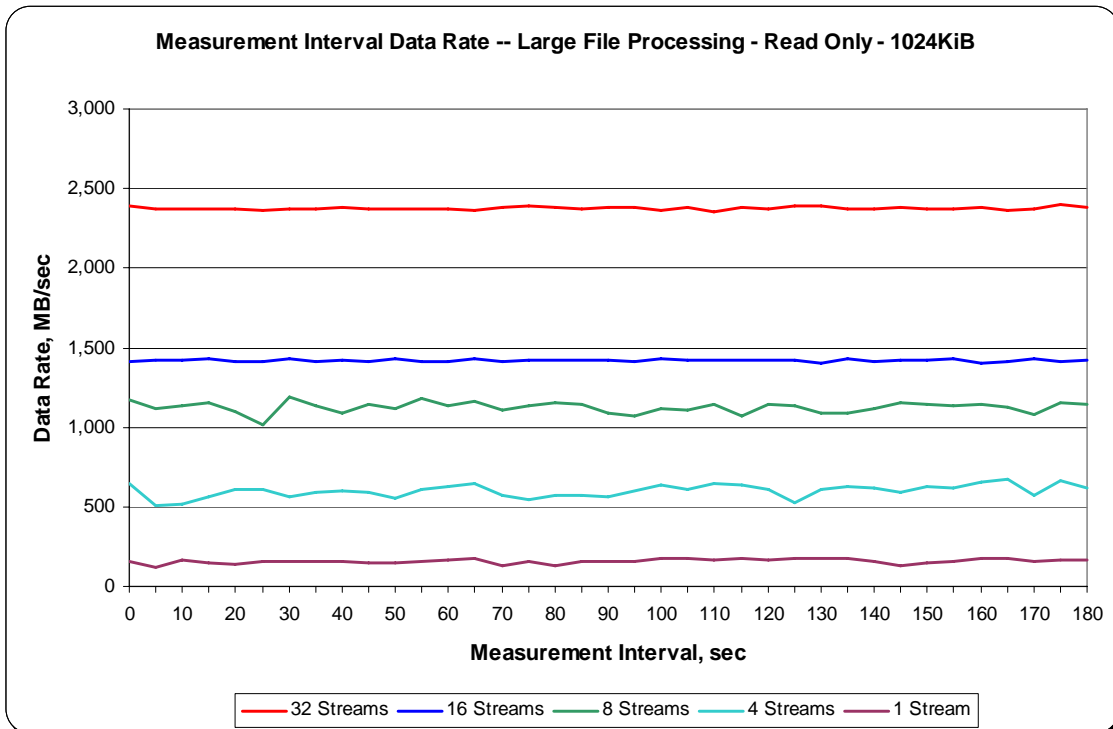




**SPC-2 “Large File Processing/READ ONLY/1024 KiB Transfer Size” Average Data Rate Graph – Complete Test Run**

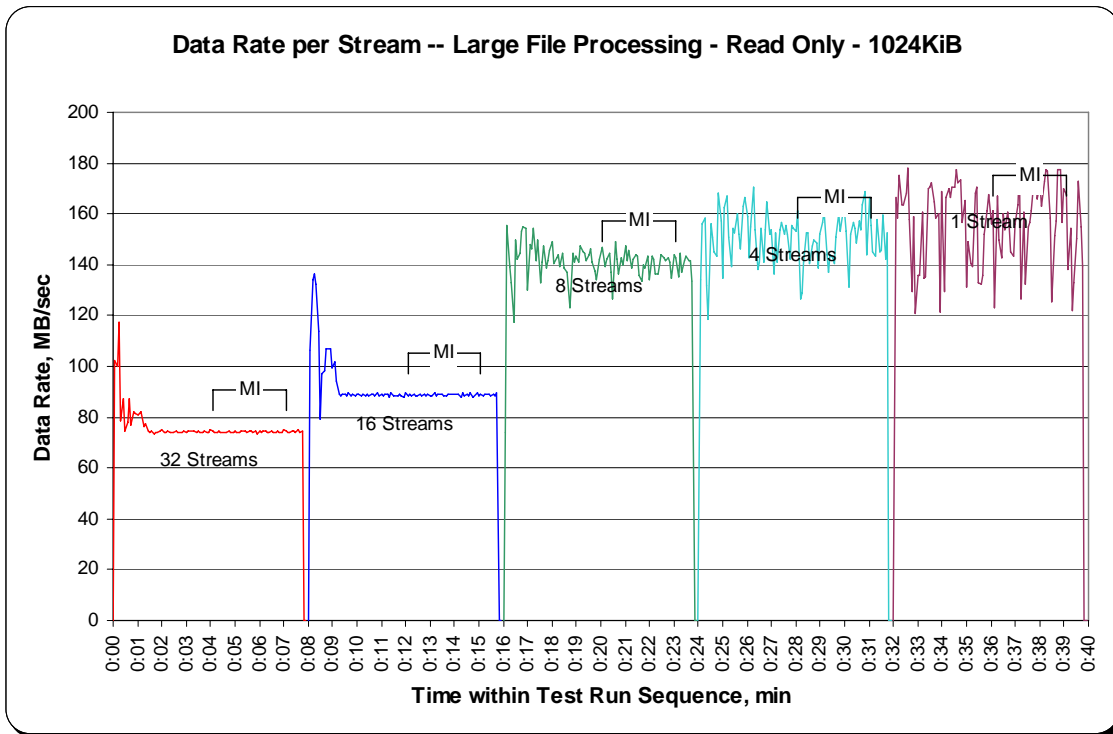


**SPC-2 “Large File Processing/READ ONLY/1024 KiB Transfer Size” Average Data Rate Graph – Measurement Interval (MI) Only**

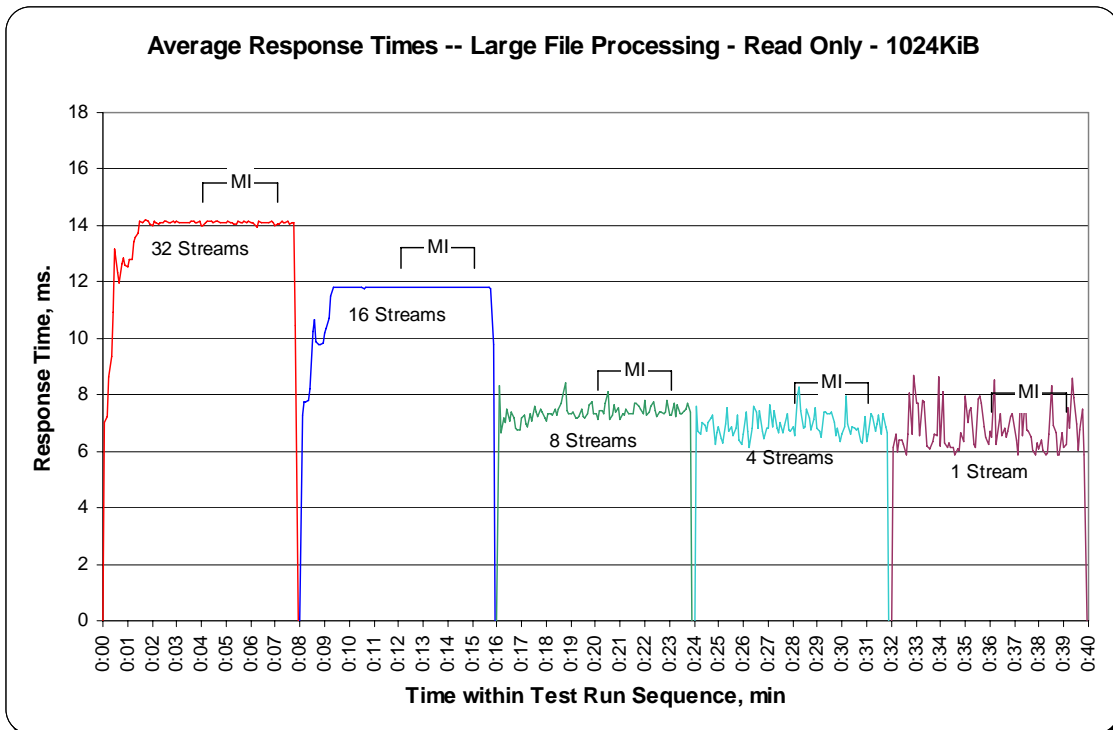




### SPC-2 “Large File Processing/READ ONLY/1024 KiB Transfer Size” Average Data Rate per Stream Graph



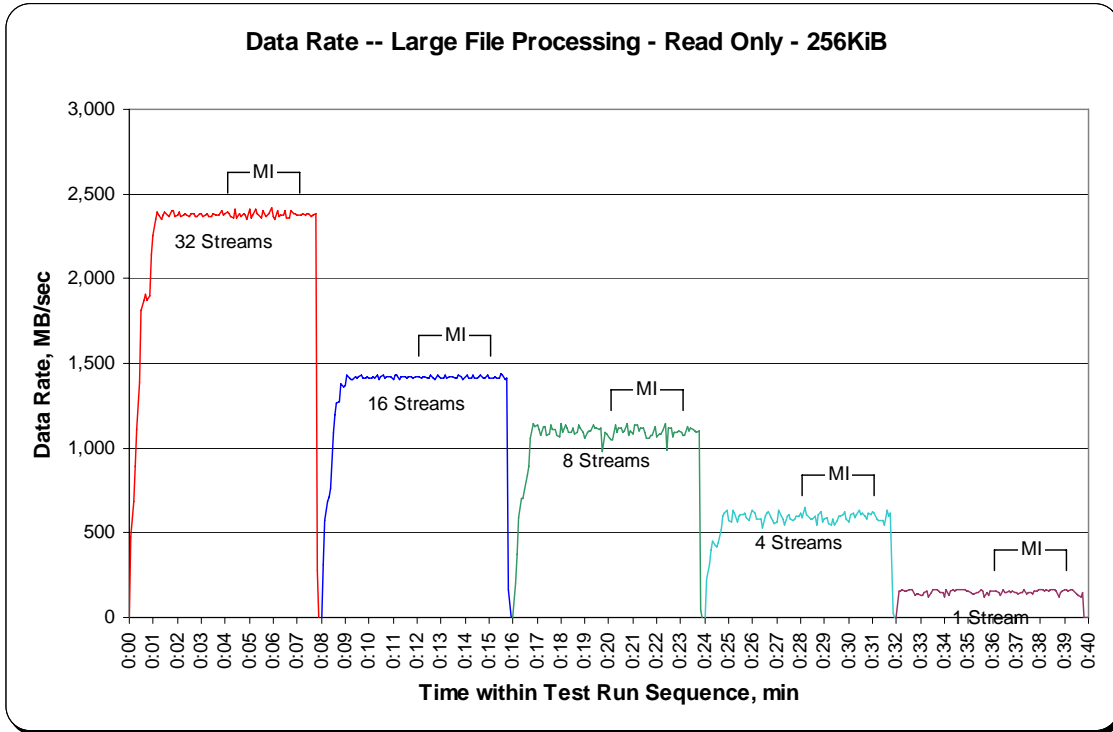
### SPC-2 “Large File Processing/READ ONLY/1024 KiB Transfer Size” Average Response Time Graph



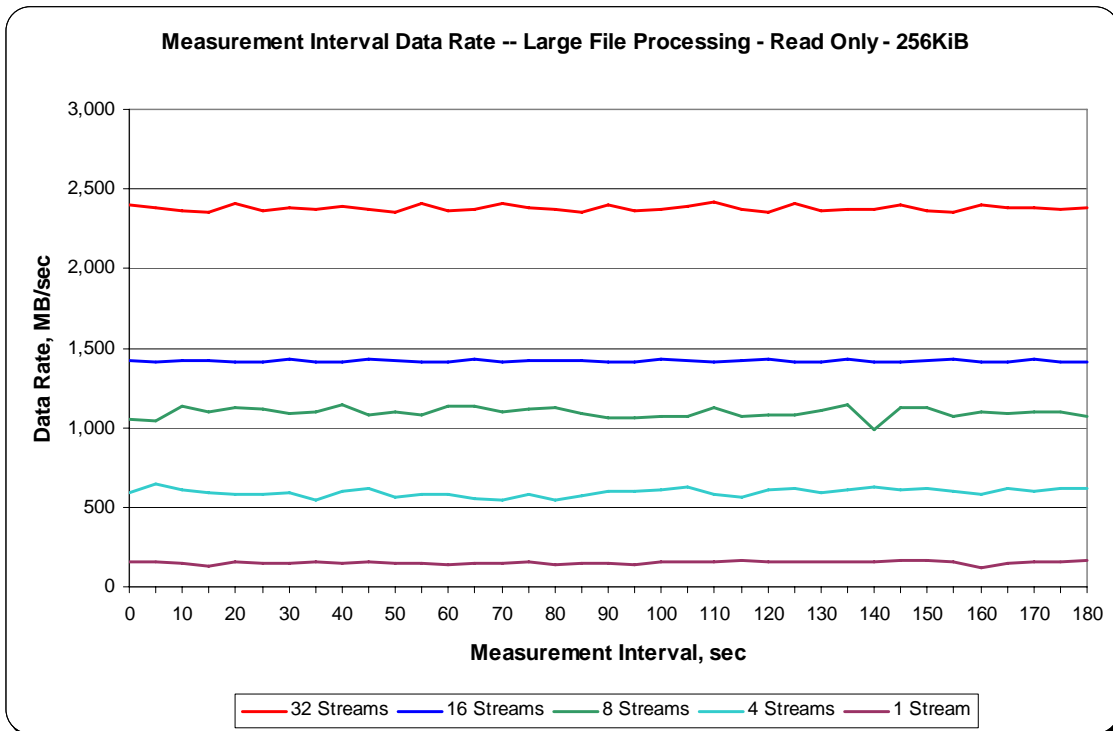




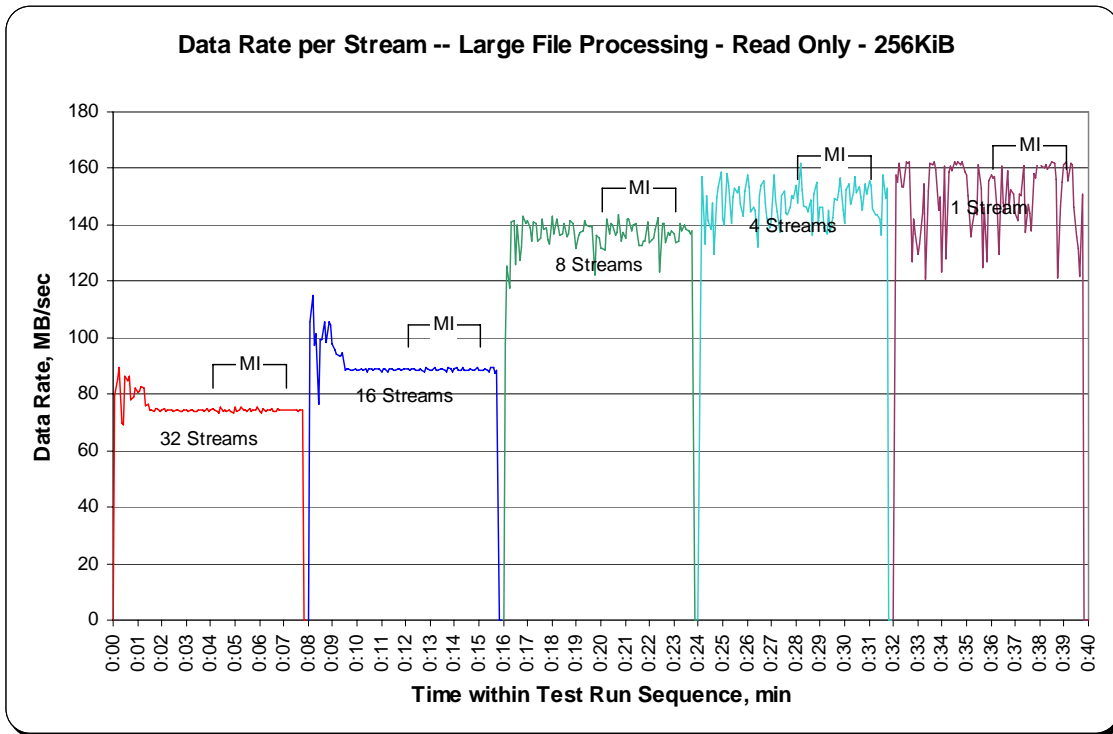
**SPC-2 “Large File Processing/READ ONLY/256 KiB Transfer Size” Average Data Rate Graph – Complete Test Run**



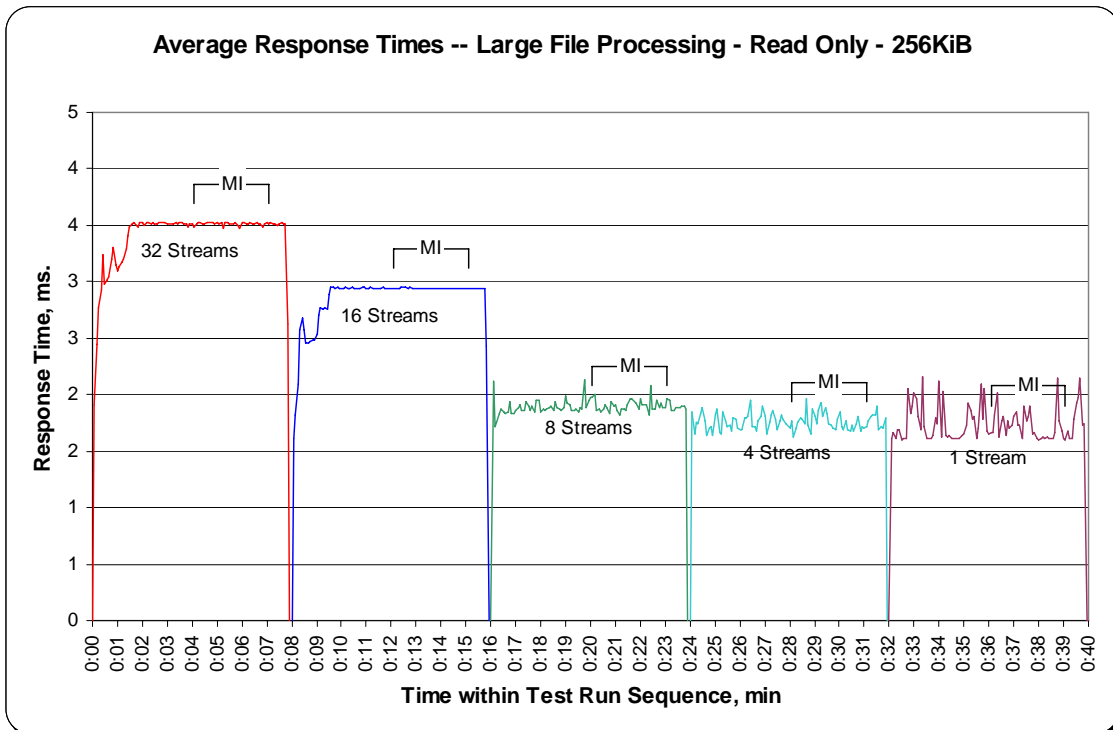
**SPC-2 “Large File Processing/READ ONLY/256 KiB Transfer Size” Average Data Rate Graph – Measurement Interval (MI) Only**



### SPC-2 “Large File Processing/READ ONLY/256 KiB Transfer Size” Average Data Rate per Stream Graph



### SPC-2 “Large File Processing/READ ONLY/256 KiB Transfer Size” Average Response Time Graph



## Large Database Query Test

### Clause 6.4.3.1

*The Large Database Query Test is comprised of a set of I/O operations representative of scans or joins of large relational tables such as those performed for data mining or business intelligence.*

### Clause 6.4.3.2

*The Large Database Query Test has two Test Phases, which shall be executed in the following uninterrupted sequence:*

- 1. 1024 KiB TRANSFER SIZE*
- 2. 64 KiB TRANSFER SIZE*

*The BC shall not be restarted or manually disturbed, altered, or adjusted during the execution of the Large File Processing Test. If power is lost to the BC during this Test all results shall be rendered invalid and the Test re-run in its entirety.*

### Clause 10.6.8.2

*The Full Disclosure Report will contain the following content for the Large Database Query Test:*

- 1. A listing of the SPC-2 Workload Generator commands and parameters used to execute each of the Test Runs in the Large Database Query Test.*
- 2. The human readable SPC-2 Test Results File for each of the Test Runs in the Large Database Query Test.*
- 3. A table that contains the following information for each Test Run in the two Test Phases of the Large Database Query Test:*
  - The number Streams specified.*
  - The Ramp-Up duration in seconds.*
  - The Measurement Interval duration in seconds.*
  - The average data rate, in MB per second, for the Measurement Interval.*
  - The average data rate, in MB per second, per Stream for the Measurement Interval.*
- 4. Average Data Rate and Average Data Rate per Stream graphs as defined in Clauses 10.1.1 and 10.1.2.*

## SPC-2 Workload Generator Commands and Parameters

The SPC-2 Workload Generator commands and parameters for the Large Database Query Test Runs are documented in “Appendix E: SPC-2 Workload Generator Execution Commands and Parameters” on Page 127.

## SPC-2 Test Results File

A link to the SPC-2 Test Results file generated from the Large Database Query Test Runs is listed below.

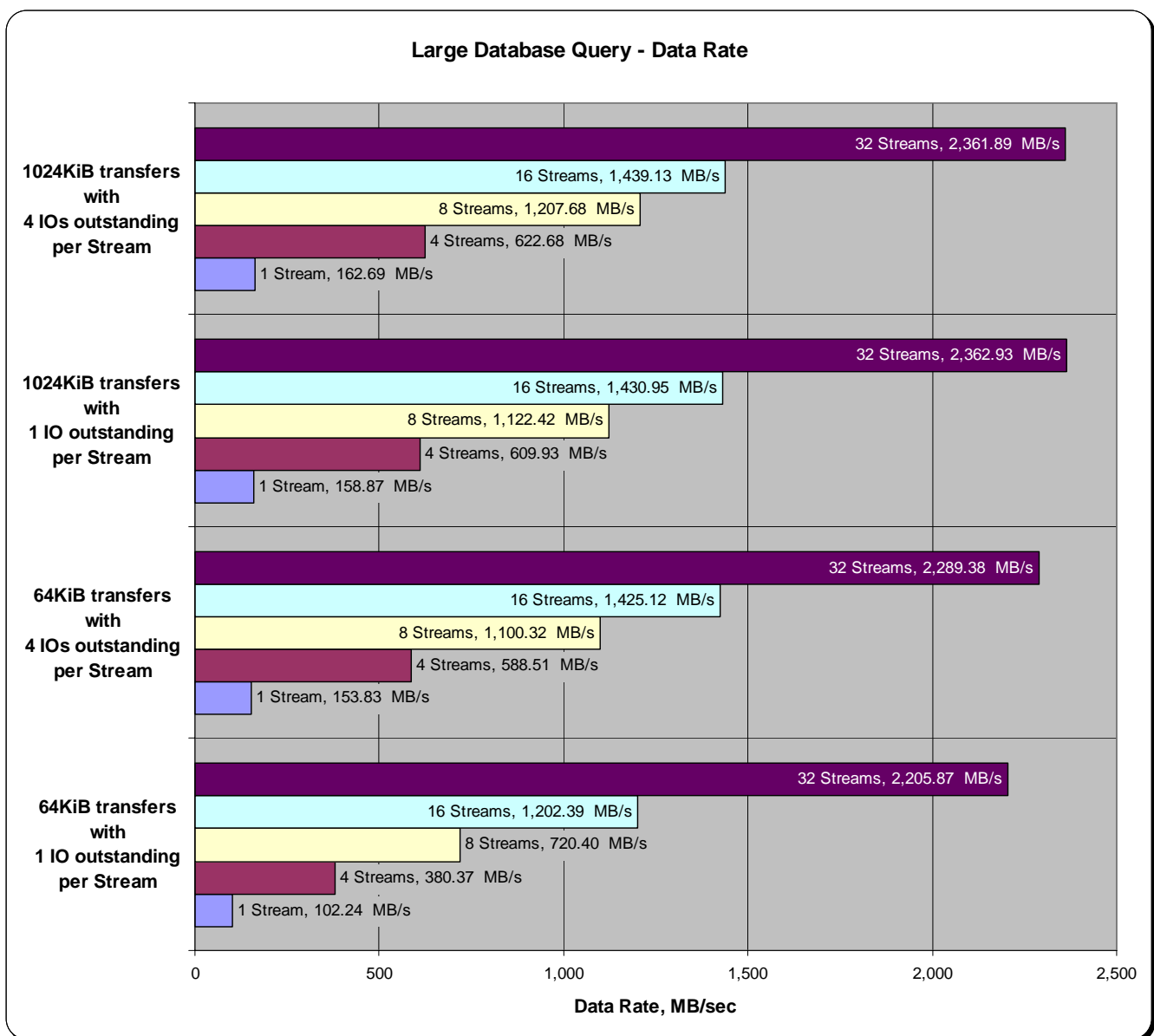
[SPC-2 Large Database Query Test Results File](#)

### SPC-2 Large Database Query Average Data Rates (MB/s)

The average Data Rate (MB/s) for each Test Run in the two Test Phases of the SPC-2 Large Database Query Test is listed in the table below as well as illustrated in the following graph.

Test Run Sequence	1 Stream	4 Streams	8 Streams	16 Streams	32 Streams
1024KiB w/ 4 IOs/Stream	162.69	622.68	1,207.68	1,439.13	2,361.89
1024KiB w/ 1 IO/Stream	158.87	609.93	1,122.42	1,430.95	2,362.93
64KiB w/ 4 IOs/Stream	153.83	588.51	1,100.32	1,425.12	2,289.38
64KiB w/ 1 IO/Stream	102.24	380.37	720.40	1,202.39	2,205.87

### SPC-2 Large Database Query Average Data Rates Graph

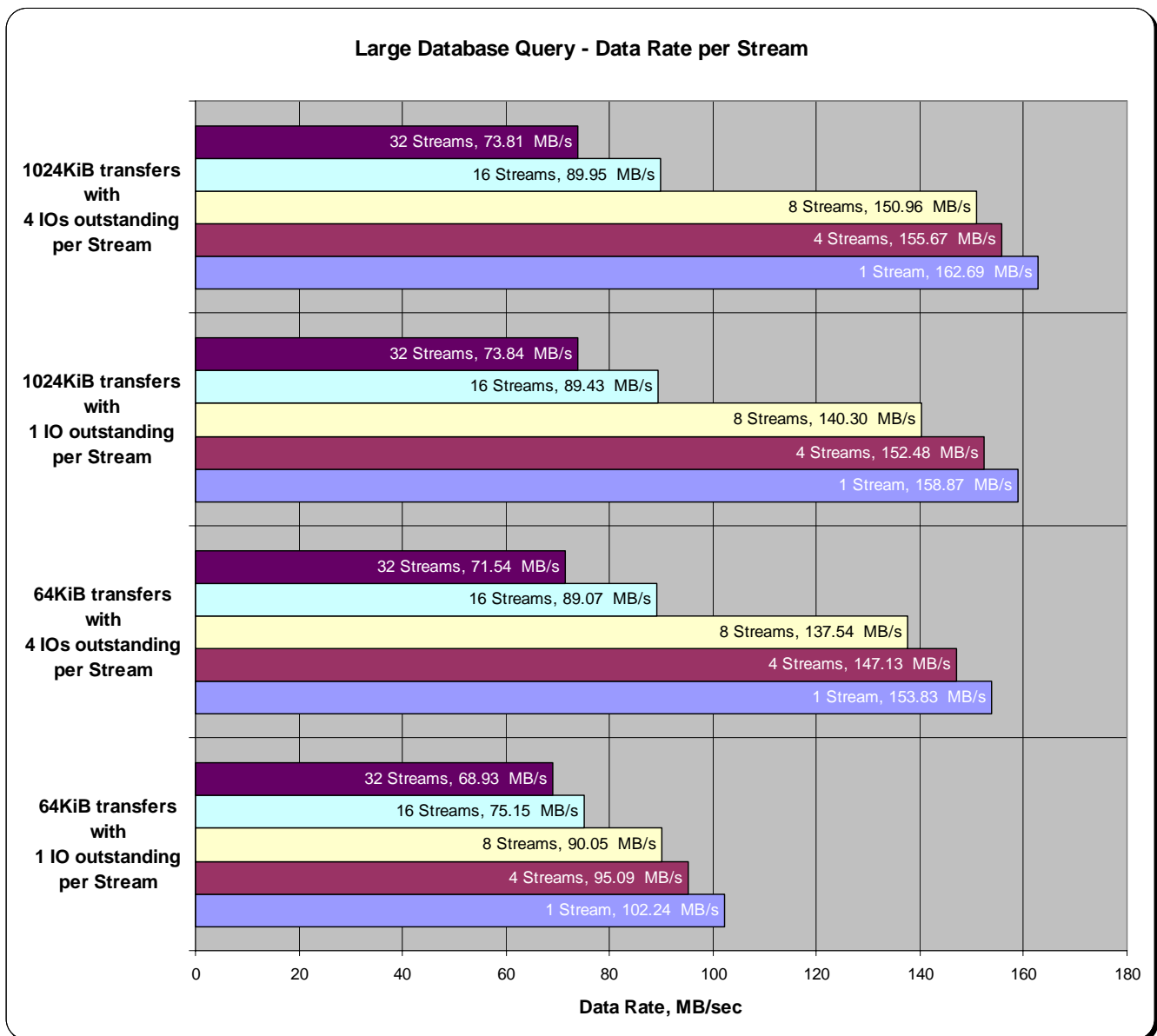


### SPC-2 Large Database Query Average Data Rate per Stream

The average Data Rate per Stream for each Test Run in the two Test Phases of the SPC-2 Large Database Query Test is listed in the table below as well as illustrated in the following graph.

Test Run Sequence	1 Stream	4 Streams	8 Streams	16 Streams	32 Streams
1024KiB w/ 4 IOs/Stream	162.69	155.67	150.96	89.95	73.81
1024KiB w/ 1 IO/Stream	158.87	152.48	140.30	89.43	73.84
64KiB w/ 4 IOs/Stream	153.83	147.13	137.54	89.07	71.54
64KiB w/ 1 IO/Stream	102.24	95.09	90.05	75.15	68.93

### SPC-2 Large Database Query Average Data Rate per Stream Graph



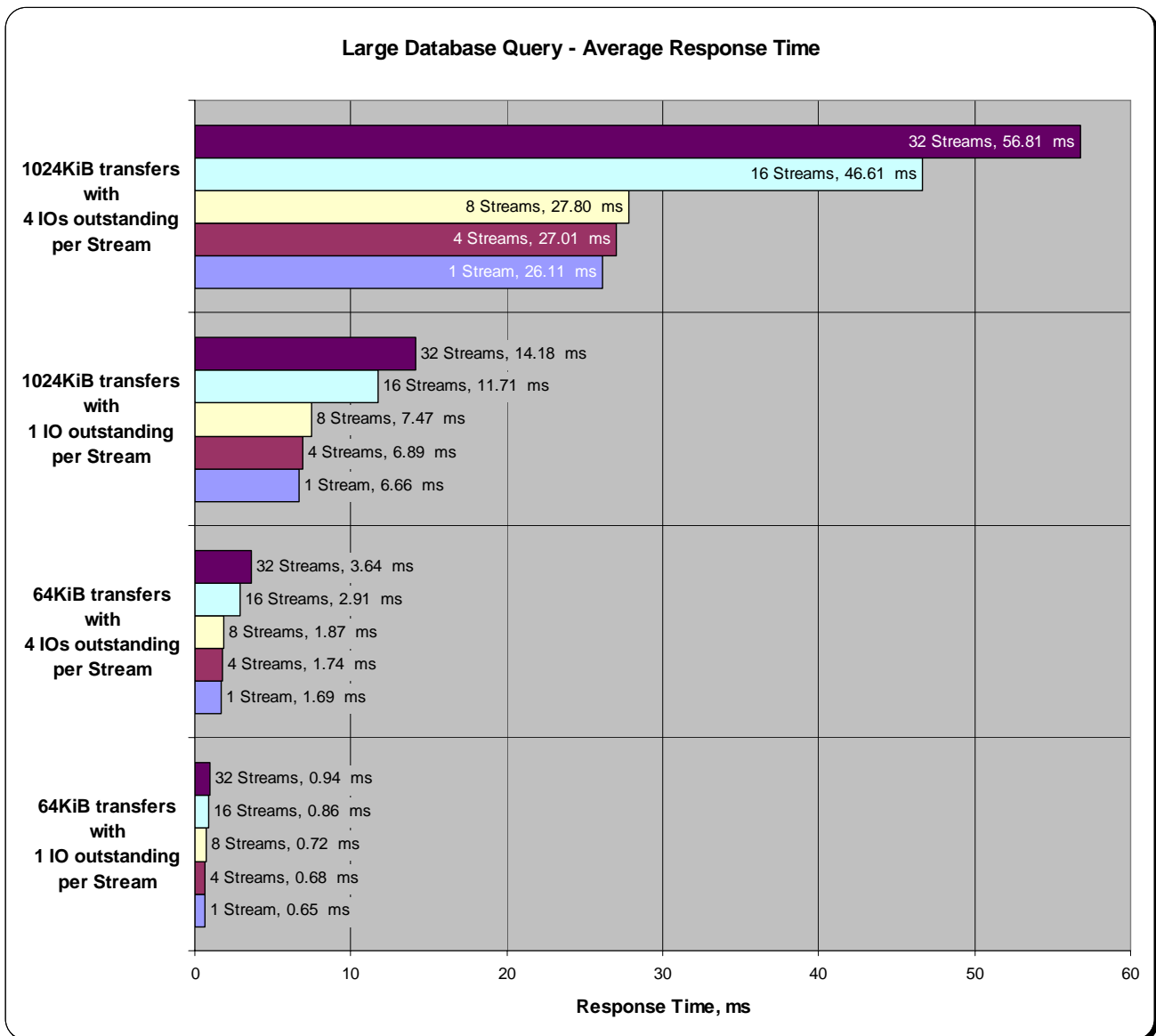


### SPC-2 Large Database Query Average Response Time

The average Response Time, in milliseconds, for each Test Run in the two Test Phases of the SPC-2 Large Database Query Test is listed in the table below as well as illustrated in the following graph.

Test Run Sequence	1 Stream	4 Streams	8 Streams	16 Streams	32 Streams
1024KiB w/ 4 IOs/Stream	26.11	27.01	27.80	46.61	56.81
1024KiB w/ 1 IO/Stream	6.66	6.89	7.47	11.71	14.18
64KiB w/ 4 IOs/Stream	1.69	1.74	1.87	2.91	3.64
64KiB w/ 1 IO/Stream	0.65	0.68	0.72	0.86	0.94

### SPC-2 Large Database Query Average Response Time Graph



## **Large Database Query Test – 1024 KiB TRANSFER SIZE Test Phase**

### Clause 10.6.8.2.1

1. A table that will contain the following information for each "1024 KiB Transfer Size, 4 Outstanding I/Os" Test Run:
  - The number of Streams specified.
  - The average data rate, average data rate per stream, and average Response Time reported at five second intervals.
2. Average Data Rate (intervals), Average Data Rate per Stream (intervals), and Average Response Time (intervals) graphs for the "1024 KiB Transfer Size, 4 Outstanding I/Os" Test Runs as specified in Clauses 10.1.4 – 10.1.6.
3. A table that will contain the following information for each "1024 KiB Transfer Size, 1 Outstanding I/O" Test Run:
  - The number of Streams specified.
  - The average data rate, average data rate per stream, and average Response Time reported at five second intervals.
4. Average Data Rate (intervals), Average Data Rate per Stream (intervals), and Average Response Time (intervals) graphs for the "1024 KiB Transfer Size, 1 Outstanding I/O" Test Runs as specified in Clauses 10.1.4 – 10.1.6.

The SPC-2 "Large DatabaseQuery/1024 KiB TRANSFER SIZE/4 Outstanding I/Os" Test Run data is contained in the table that appears on the next page. That table is followed by graphs illustrating the average Data Rate, average Data Rate per Stream, and average Response Time produced by the same Test Runs. The table and graphs present the data at five-second intervals.

Immediately following the SPC-2 "Large DatabaseQuery/1024 KiB TRANSFER SIZE/4 Outstanding I/Os" table and graphs will be the SPC-2 "Large DatabaseQuery/1024 KiB TRANSFER SIZE/1 Outstanding I/O" table and graphs. The table contains the Test Run data and the graphs illustrate the average Data Rate, average Data Rate per Stream, and average Response Time produced by the Test Runs.

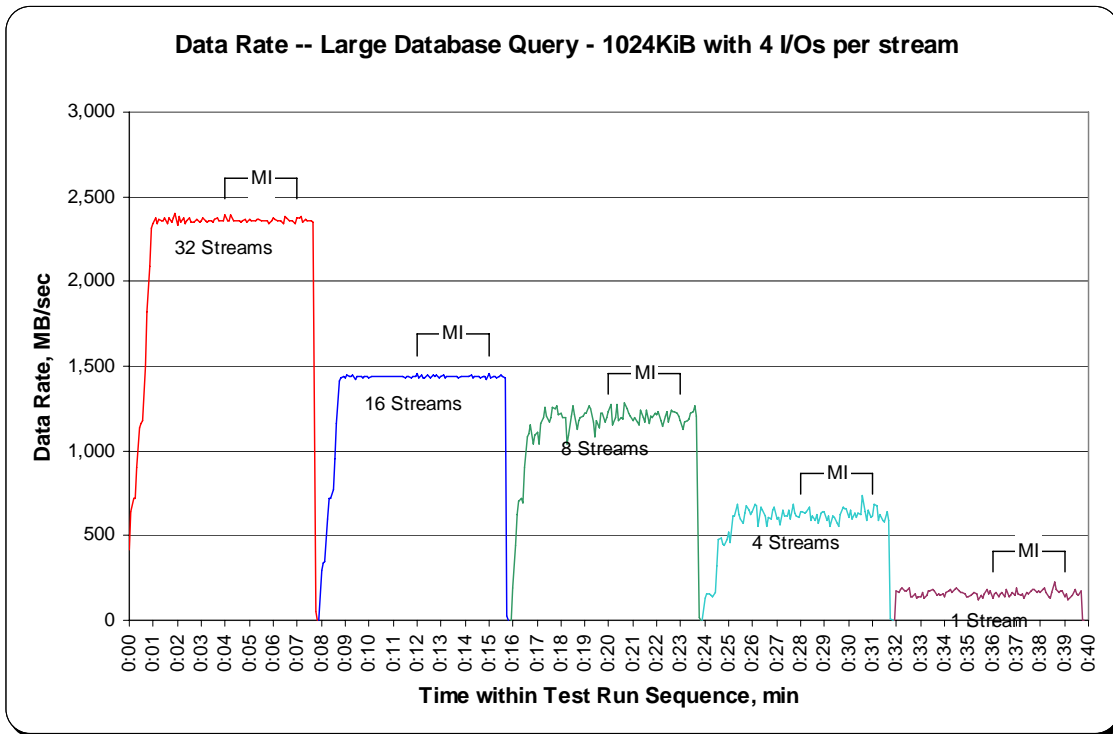
**SPC-2 “Large Database Query/1024 KiB Transfer Size/4 Outstanding I/Os” Test Run Data - Ramp-Up Period**

TR1 Test Run Sequence Time	32 Streams			TR2 Test Run Sequence Time	16 Streams			TR3 Test Run Sequence Time	8 Streams			TR4 Test Run Sequence Time	4 Streams			TR5 Test Run Sequence Time	1 Stream		
	Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms		Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms		Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms		Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms		Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms
0:00:00	413.35	103.34	27.05	0:07:55	0.00	0.00	0.00	0:15:55	0.00	0.00	0.00	0:23:55	0.00	0.00	0.00	0:31:55	0.00	0.00	0.00
0:00:05	643.41	107.23	27.67	0:08:00	299.05	149.53	24.21	0:16:00	191.05	63.68	33.11	0:24:00	134.22	134.22	30.24	0:32:00	169.66	169.66	24.23
0:00:10	721.21	103.03	35.00	0:08:05	334.50	167.25	24.59	0:16:05	445.85	111.46	28.57	0:24:05	153.72	153.72	27.38	0:32:05	161.06	161.06	25.78
0:00:15	718.48	89.81	45.48	0:08:10	350.43	116.81	26.12	0:16:10	620.34	155.08	27.13	0:24:10	157.29	157.29	26.35	0:32:10	180.77	180.77	23.40
0:00:20	900.10	81.83	43.01	0:08:15	599.79	149.95	26.65	0:16:15	699.82	139.96	25.74	0:24:15	151.62	151.62	26.65	0:32:15	190.42	190.42	21.74
0:00:25	1,137.91	94.83	43.50	0:08:20	720.58	90.07	34.26	0:16:20	720.79	144.16	28.93	0:24:20	138.83	138.83	30.08	0:32:20	176.16	176.16	24.03
0:00:30	1,162.66	83.05	43.58	0:08:25	716.39	89.55	46.52	0:16:25	695.42	139.08	29.97	0:24:25	161.69	161.69	26.73	0:32:25	174.69	174.69	23.09
0:00:35	1,179.23	73.70	53.94	0:08:30	768.61	85.40	44.80	0:16:30	901.57	128.80	29.36	0:24:30	321.07	107.02	28.10	0:32:30	186.86	186.86	23.34
0:00:40	1,496.95	78.79	49.51	0:08:35	956.09	95.61	43.05	0:16:35	1,081.50	154.50	26.77	0:24:35	476.26	158.75	26.95	0:32:35	142.82	142.82	29.34
0:00:45	1,824.73	76.03	49.60	0:08:40	1,160.56	96.71	39.33	0:16:40	1,104.36	157.77	26.89	0:24:40	485.49	161.83	25.75	0:32:40	134.43	134.43	30.51
0:00:50	2,085.62	80.22	50.70	0:08:45	1,415.37	108.87	37.59	0:16:45	1,151.13	164.45	25.24	0:24:45	451.31	150.44	26.87	0:32:45	155.19	155.19	27.60
0:00:55	2,319.03	82.82	49.62	0:08:50	1,428.37	109.87	38.52	0:16:50	1,036.83	148.12	28.72	0:24:50	439.35	146.45	29.11	0:32:50	126.67	126.67	33.08
0:01:00	2,341.89	80.75	50.46	0:08:55	1,438.86	110.68	37.76	0:16:55	1,092.20	156.03	26.17	0:24:55	478.57	159.52	26.75	0:32:55	135.69	135.69	30.88
0:01:05	2,375.86	81.93	51.42	0:09:00	1,434.66	102.48	38.67	0:17:00	1,110.02	158.57	26.97	0:25:00	522.40	174.13	23.61	0:33:00	140.72	140.72	29.26
0:01:10	2,342.31	78.08	53.10	0:09:05	1,448.92	96.59	42.98	0:17:05	1,043.54	149.08	27.78	0:25:05	460.95	153.65	27.18	0:33:05	165.47	165.47	25.82
0:01:15	2,366.01	73.94	54.99	0:09:10	1,435.50	89.72	45.81	0:17:10	1,163.29	145.41	27.26	0:25:10	613.63	153.41	25.16	0:33:10	125.83	125.83	31.02
0:01:20	2,361.81	73.81	56.94	0:09:15	1,439.49	89.97	46.61	0:17:15	1,193.49	149.19	28.31	0:25:15	613.00	153.25	27.36	0:33:15	149.32	149.32	30.02
0:01:25	2,359.30	73.73	56.88	0:09:20	1,451.44	90.71	46.64	0:17:20	1,255.36	156.92	26.46	0:25:20	686.40	171.60	24.28	0:33:20	174.48	174.48	23.99
0:01:30	2,373.98	74.19	56.67	0:09:25	1,425.22	89.08	46.63	0:17:25	1,204.18	150.52	28.62	0:25:25	622.22	155.56	27.29	0:33:25	171.76	171.76	23.40
0:01:35	2,337.70	73.05	56.94	0:09:30	1,439.28	89.95	46.59	0:17:30	1,168.53	146.07	28.43	0:25:30	598.53	149.63	27.57	0:33:30	179.31	179.31	23.91
0:01:40	2,379.01	74.34	56.82	0:09:35	1,441.58	90.10	46.66	0:17:35	1,197.47	149.68	27.48	0:25:35	575.88	143.97	28.17	0:33:35	169.66	169.66	23.56
0:01:45	2,352.38	73.51	56.74	0:09:40	1,439.49	89.97	46.65	0:17:40	1,255.98	157.00	26.96	0:25:40	628.73	157.18	27.24	0:33:40	145.75	145.75	30.64
0:01:50	2,375.65	74.24	56.28	0:09:45	1,432.77	89.55	46.66	0:17:45	1,245.92	155.74	27.24	0:25:45	679.48	169.87	24.41	0:33:45	156.87	156.87	26.70
0:01:55	2,397.88	74.93	56.73	0:09:50	1,439.69	89.98	46.65	0:17:50	1,262.49	157.81	26.55	0:25:50	648.23	162.06	25.28	0:33:50	148.27	148.27	28.32
0:02:00	2,328.89	72.78	56.81	0:09:55	1,443.26	90.20	46.62	0:17:55	1,215.51	151.94	27.76	0:25:55	620.97	155.24	27.15	0:33:55	157.29	157.29	25.52
0:02:05	2,380.27	74.38	56.49	0:10:00	1,433.61	89.60	46.63	0:18:00	1,226.00	153.25	27.13	0:26:00	643.20	160.80	26.91	0:34:00	140.30	140.30	29.59
0:02:10	2,350.28	73.45	56.96	0:10:05	1,439.69	89.98	46.60	0:18:05	1,200.20	150.03	27.68	0:26:05	685.35	171.34	24.58	0:34:05	167.35	167.35	26.24
0:02:15	2,374.40	74.20	56.81	0:10:10	1,440.53	90.03	46.69	0:18:10	1,194.75	149.34	28.33	0:26:10	677.80	169.45	23.64	0:34:10	173.22	173.22	24.30
0:02:20	2,341.68	73.18	56.99	0:10:15	1,439.69	89.98	46.59	0:18:15	1,037.25	129.66	31.77	0:26:15	555.12	138.78	31.20	0:34:15	179.31	179.31	22.79
0:02:25	2,358.88	73.71	56.85	0:10:20	1,436.76	89.80	46.57	0:18:20	1,089.05	136.13	31.42	0:26:20	663.54	165.88	25.51	0:34:20	168.61	168.61	25.49
0:02:30	2,377.96	74.31	56.76	0:10:25	1,439.90	89.99	46.56	0:18:25	1,205.23	150.65	28.01	0:26:25	649.91	162.48	25.57	0:34:25	181.40	181.40	23.12
0:02:35	2,347.34	73.35	56.95	0:10:30	1,443.05	90.19	46.61	0:18:30	1,265.63	158.20	26.24	0:26:30	616.77	154.19	27.16	0:34:30	186.86	186.86	21.59
0:02:40	2,349.23	73.41	56.96	0:10:35	1,438.02	89.88	46.54	0:18:35	1,210.69	151.34	27.98	0:26:35	553.65	138.41	30.40	0:34:35	175.74	175.74	24.75
0:02:45	2,357.83	73.68	56.94	0:10:40	1,437.81	89.86	46.67	0:18:40	1,126.80	140.85	29.62	0:26:40	604.19	151.05	27.97	0:34:40	165.68	165.68	23.58
0:02:50	2,367.27	73.98	56.97	0:10:45	1,440.53	90.03	46.69	0:18:45	1,180.70	147.59	28.40	0:26:45	600.62	150.16	28.00	0:34:45	164.00	164.00	26.61
0:02:55	2,345.45	73.30	56.93	0:10:50	1,437.60	89.85	46.64	0:18:50	1,198.10	149.76	27.60	0:26:50	653.68	163.42	24.90	0:34:50	152.04	152.04	27.05
0:03:00	2,360.97	73.78	56.81	0:10:55	1,435.29	89.71	46.64	0:18:55	1,209.43	151.18	28.19	0:26:55	669.83	167.46	25.51	0:34:55	137.78	137.78	31.13
0:03:05	2,372.93	74.15	56.86	0:11:00	1,439.69	89.98	46.57	0:19:00	1,220.96	152.62	27.43	0:27:00	601.46	150.37	26.97	0:35:00	140.09	140.09	30.57
0:03:10	2,354.05	73.56	56.83	0:11:05	1,443.05	90.19	46.63	0:19:05	1,225.16	153.14	26.91	0:27:05	605.45	151.36	28.80	0:35:05	150.16	150.16	27.91
0:03:15	2,349.44	73.42	56.95	0:11:10	1,435.29	89.71	46.58	0:19:10	1,261.86	157.73	27.04	0:27:10	567.07	141.77	29.46	0:35:10	157.71	157.71	26.19
0:03:20	2,356.15	73.63	56.97	0:11:15	1,439.90	89.99	46.62	0:19:15	1,245.29	155.66	26.90	0:27:15	654.52	163.63	25.65	0:35:15	160.64	160.64	26.52
0:03:25	2,362.02	73.81	57.08	0:11:20	1,442.21	90.14	46.65	0:19:20	1,171.47	145.63	28.38	0:27:20	618.66	154.66	26.65	0:35:20	158.96	158.96	24.94
0:03:30	2,350.70	73.46	56.76	0:11:25	1,438.44	89.90	46.62	0:19:25	1,085.91	135.74	30.49	0:27:25	611.74	152.93	27.82	0:35:25	121.22	121.22	34.53
0:03:35	2,364.33	73.89	56.72	0:11:30	1,434.03	89.63	46.65	0:19:30	1,181.75	147.72	28.92	0:27:30	649.28	162.32	26.31	0:35:30	150.99	150.99	28.32
0:03:40	2,374.61	74.21	56.82	0:11:35	1,438.02	89.88	46.64	0:19:35	1,135.61	141.95	29.30	0:27:35	597.27	149.32	27.38	0:35:35	132.54	132.54	32.75
0:03:45	2,355.73	73.62	56.79	0:11:40	1,441.16	90.07	46.69	0:19:40	1,224.74	153.09	27.73	0:27:40	687.03	171.76	24.60	0:35:40	156.24	156.24	26.29
0:03:50	2,356.57	73.64	56.80	0:11:45	1,432.35	89.52	46.71	0:19:45	1,225.79	153.22	27.17	0:27:45	629.57	157.39	26.28	0:35:45	178.26	178.26	23.67
0:03:55	2,357.20	73.66	56.75	0:11:50	1,440.32	90.02	46.58	0:19:50	1,167.07	145.88	28.32	0:27:50	616.14	154.04	27.58	0:35:50	157.08	157.08	27.06
				0:11:55	1,435.08	89.69	46.50	0:19:55	1,197.26	149.66	27.88	0:27:55	608.17	152.04	27.43	0:35:55	170.08	170.08	24.68

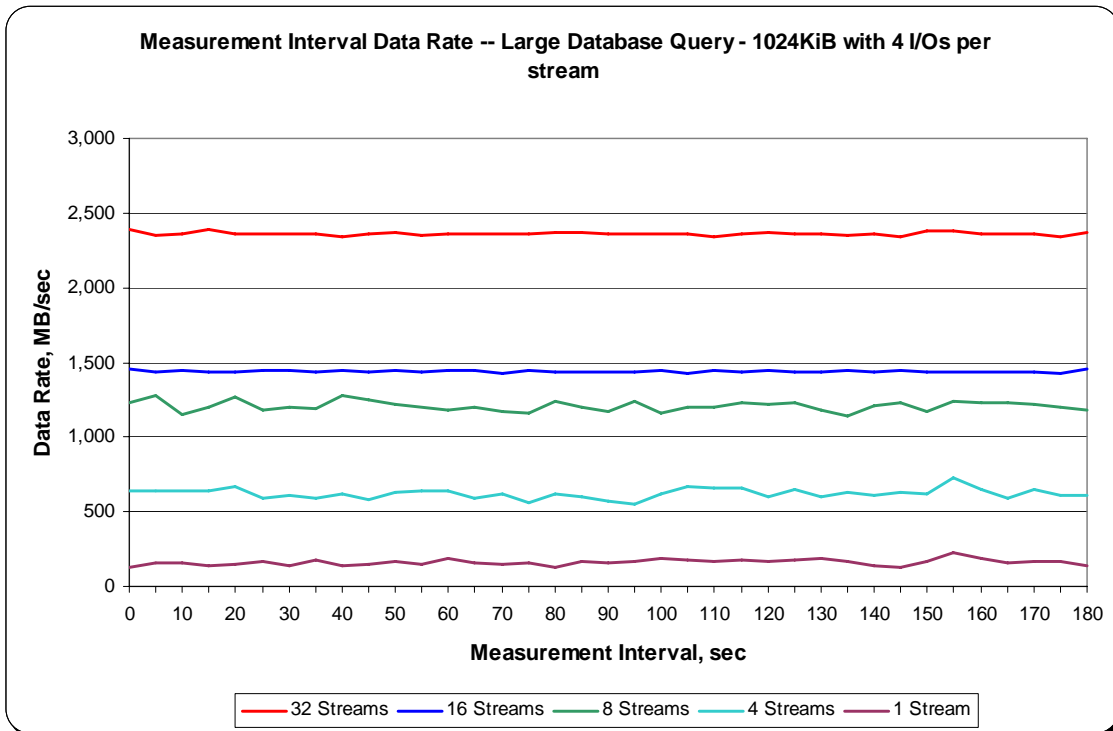
**SPC-2 “Large Database Query/1024 KiB Transfer Size/4 Outstanding I/Os” Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods**

TR1 Test Run Sequence Time	32 Streams			TR2 Test Run Sequence Time	16 Streams			TR3 Test Run Sequence Time	8 Streams			TR4 Test Run Sequence Time	4 Streams			TR5 Test Run Sequence Time	1 Stream		
	Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms		Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms		Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms		Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms		Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms
0:04:00	2,391.80	74.74	56.54	0:12:00	1,455.00	90.94	46.55	0:20:00	1,229.35	153.67	27.90	0:28:00	642.36	160.59	25.53	0:36:00	132.12	132.12	30.81
0:04:05	2,354.89	73.59	56.68	0:12:05	1,434.24	89.64	46.54	0:20:05	1,276.12	159.51	25.92	0:28:05	638.16	159.54	26.53	0:36:05	156.66	156.66	27.55
0:04:10	2,362.65	73.83	56.74	0:12:10	1,449.34	90.58	46.66	0:20:10	1,151.34	143.92	29.62	0:28:10	635.44	158.86	26.46	0:36:10	161.27	161.27	25.96
0:04:15	2,392.85	74.78	56.39	0:12:15	1,434.24	89.64	46.50	0:20:15	1,197.89	149.74	27.80	0:28:15	643.83	160.96	26.22	0:36:15	141.14	141.14	29.40
0:04:20	2,361.81	73.81	56.80	0:12:20	1,434.24	89.64	46.64	0:20:20	1,270.87	158.86	26.68	0:28:20	668.15	167.04	24.80	0:36:20	152.25	152.25	27.80
0:04:25	2,361.39	73.79	56.85	0:12:25	1,444.10	90.26	46.49	0:20:25	1,182.37	147.80	27.54	0:28:25	592.66	148.16	27.80	0:36:25	168.82	168.82	24.85
0:04:30	2,357.41	73.67	56.90	0:12:30	1,441.16	90.07	46.64	0:20:30	1,196.43	149.55	28.00	0:28:30	611.32	152.83	28.61	0:36:30	139.46	139.46	30.07
0:04:35	2,360.55	73.77	56.83	0:12:35	1,431.94	89.50	46.62	0:20:35	1,190.13	148.77	27.65	0:28:35	585.94	146.49	27.89	0:36:35	179.73	179.73	23.31
0:04:40	2,345.45	73.30	56.91	0:12:40	1,443.68	90.23	46.59	0:20:40	1,280.52	160.07	27.31	0:28:40	622.43	155.61	26.99	0:36:40	138.83	138.83	30.18
0:04:45	2,361.60	73.80	56.80	0:12:45	1,436.13	89.76	46.69	0:20:45	1,245.08	155.63	26.57	0:28:45	575.46	143.86	29.42	0:36:45	148.69	148.69	28.20
0:04:50	2,371.04	74.10	56.90	0:12:50	1,443.89	90.24	46.62	0:20:50	1,223.27	152.91	27.37	0:28:50	628.73	157.18	27.07	0:36:50	164.84	164.84	25.44
0:04:55	2,353.84	73.56	56.99	0:12:55	1,434.66	89.67	46.62	0:20:55	1,202.72	150.34	27.87	0:28:55	642.99	160.75	25.92	0:36:55	146.17	146.17	28.24
0:05:00	2,363.07	73.85	56.77	0:13:00	1,443.26	90.20	46.48	0:21:00	1,177.13	147.14	28.87	0:29:00	643.20	160.80	25.99	0:37:00	186.65	186.65	22.64
0:05:05	2,359.93	73.75	56.94	0:13:05	1,444.73	90.30	46.56	0:21:05	1,197.05	149.63	27.92	0:29:05	593.49	148.37	28.42	0:37:05	158.54	158.54	26.61
0:05:10	2,360.76	73.77	56.75	0:13:10	1,431.10	89.44	46.62	0:21:10	1,172.52	146.56	28.20	0:29:10	617.82	154.46	26.84	0:37:10	143.24	143.24	29.16
0:05:15	2,362.23	73.82	56.51	0:13:15	1,443.05	90.19	46.63	0:21:15	1,156.37	144.55	29.34	0:29:15	555.95	138.99	30.32	0:37:15	154.35	154.35	25.68
0:05:20	2,367.47	73.98	56.68	0:13:20	1,438.02	89.88	46.62	0:21:20	1,237.74	154.72	26.85	0:29:20	619.29	154.82	26.93	0:37:20	126.25	126.25	33.55
0:05:25	2,370.41	74.08	56.90	0:13:25	1,440.53	90.03	46.69	0:21:25	1,197.68	149.71	27.95	0:29:25	603.56	150.89	28.21	0:37:25	165.47	165.47	26.57
0:05:30	2,356.57	73.64	56.92	0:13:30	1,437.60	89.85	46.56	0:21:30	1,172.31	146.54	29.15	0:29:30	571.89	142.97	28.72	0:37:30	157.71	157.71	26.58
0:05:35	2,358.88	73.71	56.88	0:13:35	1,440.74	90.05	46.57	0:21:35	1,239.21	154.90	26.68	0:29:35	553.44	138.36	30.69	0:37:35	169.66	169.66	24.70
0:05:40	2,360.55	73.77	56.84	0:13:40	1,441.79	90.11	46.64	0:21:40	1,158.26	144.78	28.96	0:29:40	623.06	155.77	26.61	0:37:40	184.55	184.55	21.59
0:05:45	2,360.55	73.77	56.82	0:13:45	1,429.84	89.36	46.66	0:21:45	1,202.51	150.31	27.36	0:29:45	665.01	166.25	24.98	0:37:45	179.73	179.73	23.27
0:05:50	2,342.52	73.20	56.95	0:13:50	1,442.42	90.15	46.63	0:21:50	1,198.73	149.84	28.88	0:29:50	657.88	164.47	25.65	0:37:50	166.72	166.72	26.45
0:05:55	2,356.15	73.63	56.94	0:13:55	1,440.32	90.02	46.61	0:21:55	1,226.00	153.25	26.61	0:29:55	656.83	164.21	25.38	0:37:55	177.63	177.63	23.60
0:06:00	2,373.98	74.19	56.87	0:14:00	1,443.05	90.19	46.57	0:22:00	1,215.51	151.94	28.20	0:30:00	603.77	150.94	28.38	0:38:00	167.14	167.14	24.94
0:06:05	2,362.86	73.84	56.76	0:14:05	1,435.29	89.71	46.63	0:22:05	1,231.87	153.98	27.43	0:30:05	646.55	161.64	24.93	0:38:05	181.61	181.61	23.20
0:06:10	2,360.34	73.76	56.86	0:14:10	1,440.95	90.06	46.56	0:22:10	1,180.28	147.53	28.23	0:30:10	600.00	150.00	28.65	0:38:10	187.07	187.07	21.11
0:06:15	2,354.68	73.58	56.96	0:14:15	1,443.68	90.23	46.61	0:22:15	1,141.27	142.66	29.43	0:30:15	633.34	158.33	26.89	0:38:15	167.56	167.56	25.39
0:06:20	2,356.99	73.66	56.91	0:14:20	1,432.56	89.54	46.56	0:22:20	1,205.02	150.63	27.52	0:30:20	607.13	151.78	27.44	0:38:20	139.67	139.67	29.73
0:06:25	2,344.20	73.26	56.90	0:14:25	1,441.79	90.11	46.66	0:22:25	1,232.92	154.11	26.84	0:30:25	629.77	157.44	26.71	0:38:25	131.28	131.28	31.45
0:06:30	2,384.04	74.50	56.28	0:14:30	1,438.65	89.92	46.62	0:22:30	1,167.07	145.88	29.38	0:30:30	622.43	155.61	26.74	0:38:30	162.53	162.53	26.84
0:06:35	2,379.01	74.34	56.72	0:14:35	1,440.74	90.05	46.68	0:22:35	1,238.37	154.80	26.64	0:30:35	732.74	183.19	22.99	0:38:35	229.64	229.64	18.51
0:06:40	2,358.04	73.69	56.90	0:14:40	1,434.03	89.63	46.69	0:22:40	1,232.08	154.01	27.61	0:30:40	645.08	161.27	25.85	0:38:40	184.34	184.34	23.04
0:06:45	2,358.46	73.70	56.90	0:14:45	1,436.76	89.80	46.68	0:22:45	1,227.46	153.43	26.54	0:30:45	586.99	146.75	28.88	0:38:45	161.69	161.69	24.70
0:06:50	2,358.67	73.71	56.88	0:14:50	1,438.86	89.93	46.73	0:22:50	1,218.66	152.33	28.20	0:30:50	649.07	162.27	25.90	0:38:50	171.97	171.97	25.52
0:06:55	2,342.52	73.20	56.91	0:14:55	1,426.27	89.14	46.65	0:22:55	1,204.39	150.55	27.70	0:30:55	610.69	152.67	27.12	0:38:55	171.97	171.97	23.18
0:07:00	2,372.30	74.13	56.79	0:15:00	1,452.49	90.78	46.60	0:23:00	1,176.92	147.12	28.57	0:31:00	614.05	153.51	27.27	0:39:00	138.83	138.83	31.63
0:07:05	2,373.77	74.18	56.33	0:15:05	1,427.32	89.21	46.69	0:23:05	1,130.78	141.35	29.66	0:31:05	681.36	170.34	24.45	0:39:05	158.13	158.13	25.39
0:07:10	2,381.95	74.44	56.59	0:15:10	1,442.42	90.15	46.51	0:23:10	1,167.97	145.88	28.85	0:31:10	672.98	168.24	25.23	0:39:10	121.63	121.63	33.54
0:07:15	2,349.86	73.43	56.87	0:15:15	1,440.74	90.05	46.59	0:23:15	1,180.28	147.53	28.36	0:31:15	588.46	147.12	28.32	0:39:15	134.64	134.64	32.90
0:07:20	2,362.86	73.84	56.96	0:15:20	1,430.47	89.40	46.64	0:23:20	1,189.29	148.66	27.99	0:31:20	624.53	156.13	26.69	0:39:20	150.37	150.37	28.25
0:07:25	2,355.73	73.62	56.90	0:15:25	1,443.47	90.22	46.61	0:23:25	1,219.07	152.38	27.91	0:31:25	592.03	148.01	28.76	0:39:25	179.52	179.52	21.65
0:07:30	2,356.99	73.66	56.91	0:15:30	1,443.68	90.23	46.70	0:23:30	1,232.08	154.01	26.61	0:31:30	579.44	144.86	28.28	0:39:30	154.98	154.98	28.84
0:07:35	2,356.15	73.63	56.98	0:15:35	1,441.37	90.09	46.57	0:23:35	1,261.86	157.73	27.28	0:31:35	641.10	160.27	26.65	0:39:35	146.80	146.80	28.76
0:07:40	2,348.60	78.29	56.84	0:15:40	1,432.15	143.21	46.63	0:23:40	1,209.01	302.25	26.85	0:31:40	593.49	296.75	28.16	0:39:40	170.08	170.08	24.63
0:07:45	50.54	0.00	46.99	0:15:45	24.75	0.00	39.85	0:23:45	14.05	0.00	85.34	0:31:45	9.02	0.00	29.12	0:39:45	3.36	0.00	25.88
0:07:50	0.00	0.00	0.00	0:15:50	0.00	0.00	0.00	0:23:50	0.00	0.00	0.00	0:31:50	0.00	0.00	0.00	0:39:50	0.00	0.00	0.00

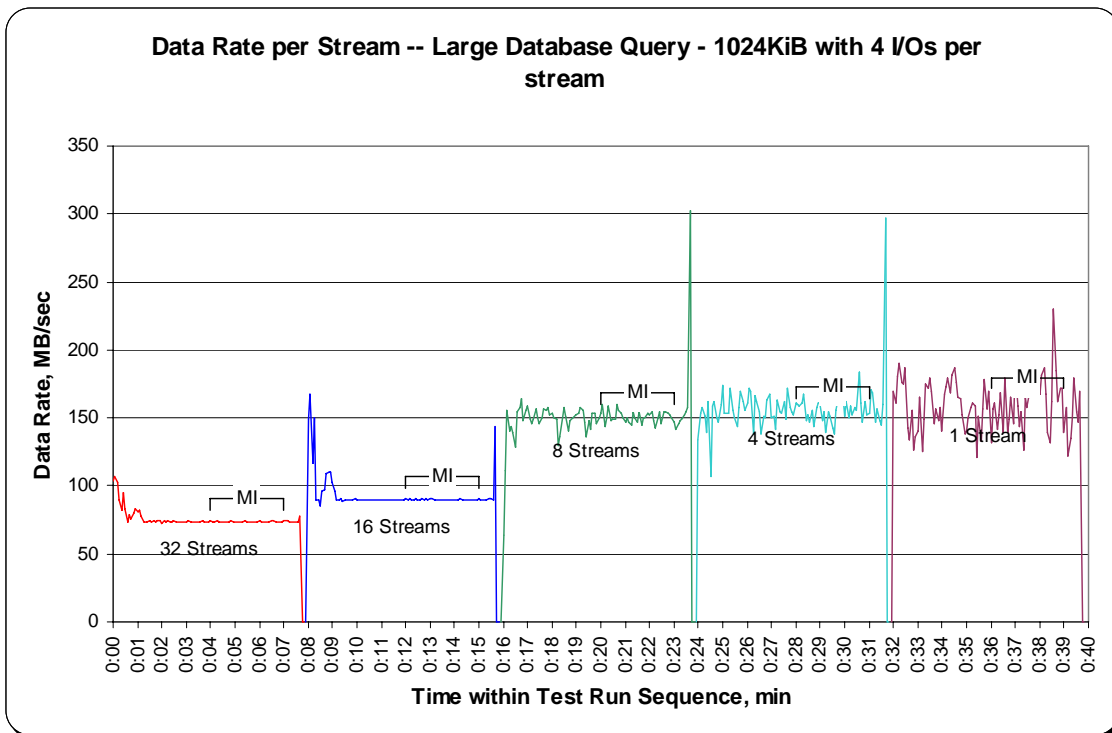
**SPC-2 “Large Database Query/1024 KiB Transfer Size/4 Outstanding I/Os”  
 Average Data Rate Graph – Complete Test Run**



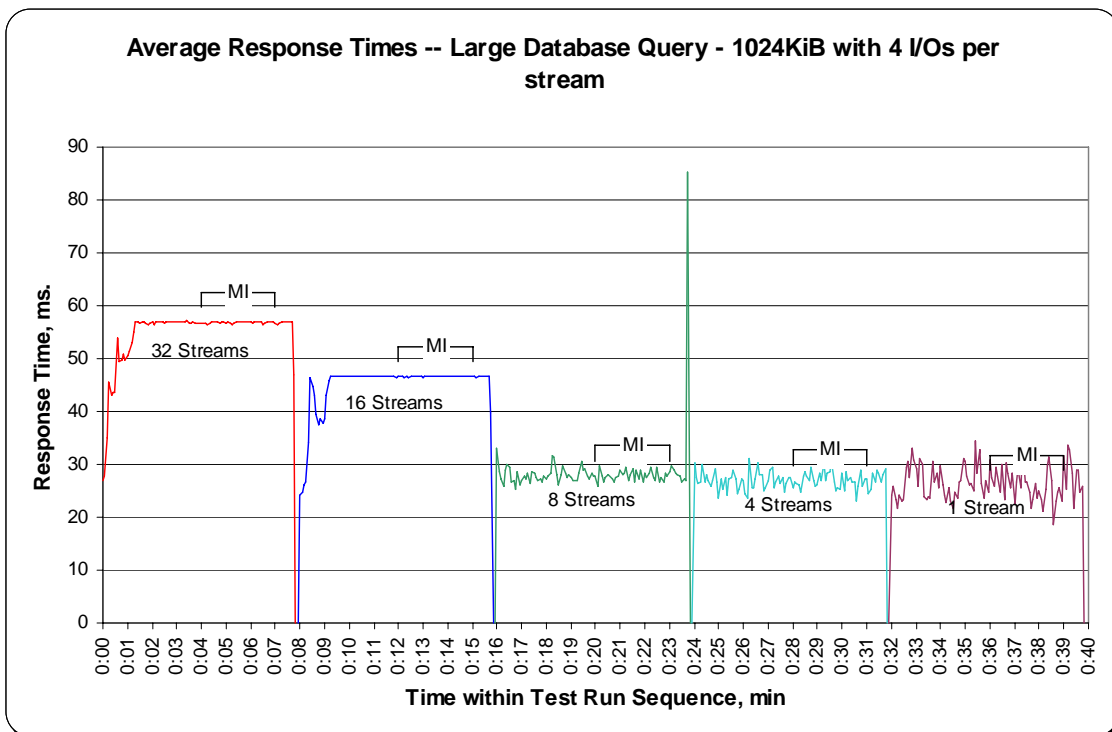
**SPC-2 “Large Database Query/1024 KiB Transfer Size/4 Outstanding I/Os”  
 Average Data Rate Graph – Measurement Interval (MI) Only**



**SPC-2 “Large Database Query/1024 KiB Transfer Size/4 Outstanding I/Os”  
 Average Data Rate per Stream Graph**



**SPC-2 “Large Database Query/1024 KiB Transfer Size/4 Outstanding I/Os”  
 Average Response Time Graph**



**SPC-2 “Large Database Query/1024 KiB Transfer Size/1 Outstanding I/O” Test Run Data – Ramp-Up Period**

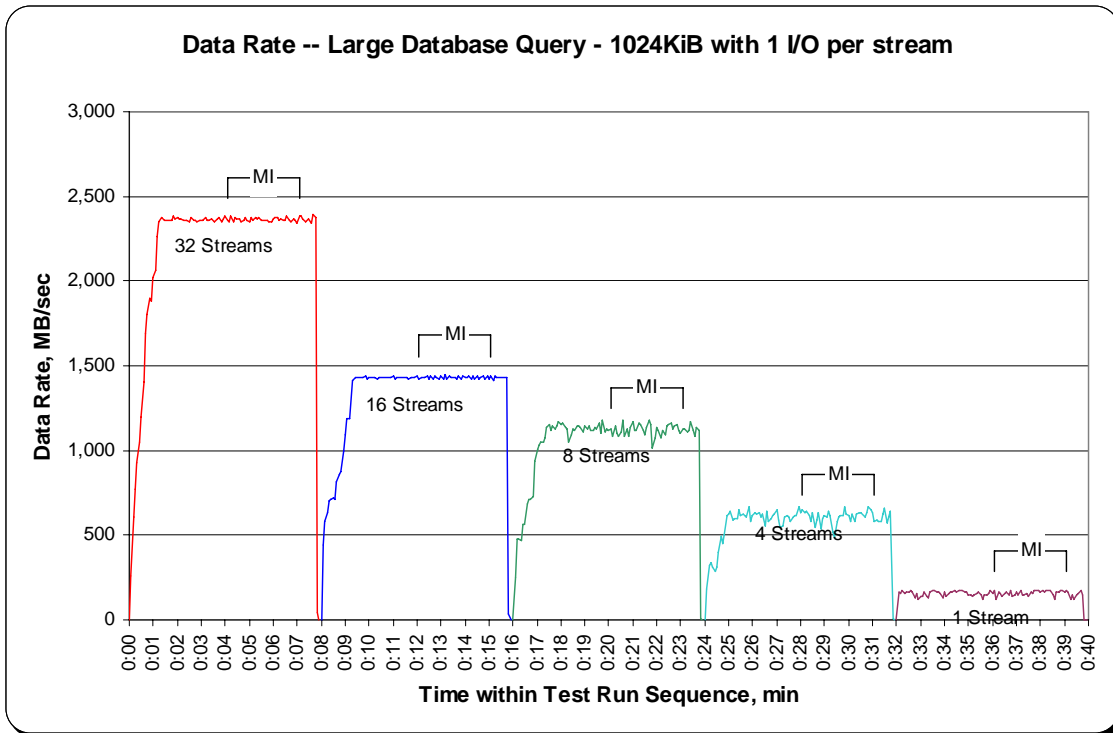
TR6	32 Streams			TR7	16 Streams			TR8	8 Streams			TR9	4 Streams			TR10	1 Stream		
Test Run Sequence Time	Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms	Test Run Sequence Time	Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms	Test Run Sequence Time	Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms	Test Run Sequence Time	Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms	Test Run Sequence Time	Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms
0:00:00	0.00	0.00	0.00	0:08:00	0.00	0.00	0.00	0:16:00	0.00	0.00	0.00	0:24:00	0.00	0.00	0.00	0:32:00	0.00	0.00	0.00
0:00:05	258.16	86.05	6.94	0:08:05	445.44	111.36	6.46	0:16:05	251.87	83.96	8.09	0:24:05	184.34	92.17	7.39	0:32:05	169.03	169.03	6.09
0:00:10	606.08	75.76	7.89	0:08:10	580.07	145.02	7.24	0:16:10	480.88	160.29	6.55	0:24:10	320.65	160.33	6.53	0:32:10	158.75	158.75	6.60
0:00:15	770.70	85.63	11.30	0:08:15	632.29	105.38	7.62	0:16:15	477.73	159.24	6.54	0:24:15	333.87	166.93	6.27	0:32:15	174.90	174.90	5.98
0:00:20	930.30	93.03	11.08	0:08:20	705.48	117.58	8.88	0:16:20	467.66	116.92	6.95	0:24:20	312.27	156.13	6.70	0:32:20	156.24	156.24	6.69
0:00:25	1,047.95	74.85	11.09	0:08:25	713.45	101.92	10.19	0:16:25	566.44	141.61	7.42	0:24:25	285.84	142.92	7.33	0:32:25	161.48	161.48	6.49
0:00:30	1,195.38	70.32	13.41	0:08:30	716.18	102.31	10.28	0:16:30	564.55	141.14	7.44	0:24:30	308.49	154.25	6.79	0:32:30	169.03	169.03	6.19
0:00:35	1,408.87	78.27	12.91	0:08:35	714.50	89.31	10.24	0:16:35	680.95	136.19	6.91	0:24:35	396.36	132.12	7.26	0:32:35	175.95	175.95	5.95
0:00:40	1,686.95	84.35	12.06	0:08:40	813.28	90.36	11.03	0:16:40	711.56	142.31	7.45	0:24:40	494.93	164.98	6.31	0:32:40	163.79	163.79	6.39
0:00:45	1,807.75	82.17	11.93	0:08:45	855.01	95.00	10.97	0:16:45	711.56	142.31	7.39	0:24:45	454.66	151.55	6.92	0:32:45	129.18	129.18	8.10
0:00:50	1,897.71	82.51	12.50	0:08:50	878.50	87.85	10.86	0:16:50	729.39	121.56	7.24	0:24:50	502.27	125.57	6.73	0:32:50	159.59	159.59	6.56
0:00:55	1,885.34	81.97	12.73	0:08:55	993.00	99.30	10.51	0:16:55	935.96	133.71	6.74	0:24:55	619.71	154.93	6.70	0:32:55	120.38	120.38	8.69
0:01:00	2,020.40	80.82	12.95	0:09:00	1,095.34	99.58	9.99	0:17:00	1,001.60	143.09	7.31	0:25:00	625.58	156.40	6.64	0:33:00	138.41	138.41	7.57
0:01:05	2,062.55	79.33	12.73	0:09:05	1,187.62	107.97	9.75	0:17:05	1,028.86	146.98	7.15	0:25:05	641.31	160.33	6.62	0:33:05	136.11	136.11	7.69
0:01:10	2,258.84	80.67	12.52	0:09:10	1,184.89	98.74	9.93	0:17:10	1,051.93	150.28	6.89	0:25:10	586.36	146.59	7.16	0:33:10	160.43	160.43	6.53
0:01:15	2,349.86	81.03	12.80	0:09:15	1,298.98	108.25	9.69	0:17:15	1,050.67	150.10	7.01	0:25:15	599.16	149.79	6.93	0:33:15	139.67	139.67	7.47
0:01:20	2,376.28	79.21	13.20	0:09:20	1,409.71	88.11	11.23	0:17:20	1,076.26	134.53	7.48	0:25:20	597.90	149.47	7.02	0:33:20	131.28	131.28	7.95
0:01:25	2,365.17	73.91	13.68	0:09:25	1,431.94	89.50	11.70	0:17:25	1,133.72	141.72	7.34	0:25:25	650.96	162.74	6.46	0:33:25	167.14	167.14	6.29
0:01:30	2,358.88	73.71	14.22	0:09:30	1,433.40	89.59	11.70	0:17:30	1,150.08	143.76	7.32	0:25:30	619.92	154.98	6.70	0:33:30	172.60	172.60	6.06
0:01:35	2,362.44	73.83	14.18	0:09:35	1,430.47	89.40	11.71	0:17:35	1,119.67	139.96	7.47	0:25:35	621.39	155.35	6.69	0:33:35	171.76	171.76	6.10
0:01:40	2,362.44	73.83	14.19	0:09:40	1,433.82	89.61	11.72	0:17:40	1,145.25	143.16	7.35	0:25:40	616.14	154.04	6.89	0:33:40	168.40	168.40	6.21
0:01:45	2,362.65	73.83	14.19	0:09:45	1,426.48	89.16	11.71	0:17:45	1,124.49	140.56	7.36	0:25:45	606.50	151.62	6.93	0:33:45	162.95	162.95	6.42
0:01:50	2,380.48	74.39	14.05	0:09:50	1,436.34	89.77	11.70	0:17:50	1,143.79	142.97	7.38	0:25:50	671.72	167.93	6.18	0:33:50	153.09	153.09	6.84
0:01:55	2,363.28	73.85	14.18	0:09:55	1,423.13	88.95	11.74	0:17:55	1,166.86	145.86	7.19	0:25:55	583.43	145.86	7.20	0:33:55	127.09	127.09	8.24
0:02:00	2,377.33	74.29	14.18	0:10:00	1,429.63	89.35	11.72	0:18:00	1,151.76	143.97	7.23	0:26:00	614.47	153.62	6.84	0:34:00	165.05	165.05	6.34
0:02:05	2,363.91	73.87	14.14	0:10:05	1,432.15	89.51	11.71	0:18:05	1,158.68	144.83	7.26	0:26:05	629.57	157.39	6.60	0:34:05	137.78	137.78	7.60
0:02:10	2,363.70	73.87	14.18	0:10:10	1,429.63	89.35	11.72	0:18:10	1,131.83	141.48	7.39	0:26:10	623.27	155.82	6.66	0:34:10	159.17	159.17	6.58
0:02:15	2,359.72	73.74	14.21	0:10:15	1,432.98	89.56	11.72	0:18:15	1,123.44	140.43	7.49	0:26:15	634.60	158.65	6.69	0:34:15	166.51	166.51	6.29
0:02:20	2,362.65	73.83	14.18	0:10:20	1,426.27	89.14	11.71	0:18:20	1,048.79	131.10	7.89	0:26:20	607.13	151.78	6.92	0:34:20	165.88	165.88	6.31
0:02:25	2,357.20	73.66	14.18	0:10:25	1,434.87	89.68	11.71	0:18:25	1,096.39	137.05	7.68	0:26:25	622.64	155.66	6.67	0:34:25	174.06	174.06	6.01
0:02:30	2,352.38	73.51	14.25	0:10:30	1,426.69	89.17	11.72	0:18:30	1,130.78	141.35	7.44	0:26:30	557.42	139.36	7.54	0:34:30	168.19	168.19	6.22
0:02:35	2,379.43	74.36	14.17	0:10:35	1,430.26	89.39	11.72	0:18:35	1,116.52	139.57	7.48	0:26:35	642.36	160.59	6.54	0:34:35	175.74	175.74	5.94
0:02:40	2,354.47	73.58	14.19	0:10:40	1,431.10	89.44	11.71	0:18:40	1,142.11	142.76	7.35	0:26:40	581.75	145.44	7.14	0:34:40	173.02	173.02	6.06
0:02:45	2,362.23	73.82	14.19	0:10:45	1,431.10	89.44	11.71	0:18:45	1,142.74	142.84	7.33	0:26:45	599.79	149.95	6.92	0:34:45	173.22	173.22	6.04
0:02:50	2,351.54	73.49	14.25	0:10:50	1,433.82	89.61	11.72	0:18:50	1,137.70	142.21	7.40	0:26:50	613.84	153.46	6.92	0:34:50	162.53	162.53	6.44
0:02:55	2,362.02	73.81	14.19	0:10:55	1,426.69	89.17	11.71	0:18:55	1,109.39	138.67	7.46	0:26:55	624.53	156.13	6.73	0:34:55	165.68	165.68	6.32
0:03:00	2,355.10	73.60	14.19	0:11:00	1,437.18	89.82	11.70	0:19:00	1,141.06	142.63	7.42	0:27:00	648.65	162.16	6.40	0:35:00	143.45	143.45	7.30
0:03:05	2,359.09	73.72	14.22	0:11:05	1,425.64	89.10	11.72	0:19:05	1,126.80	140.85	7.43	0:27:05	585.52	146.38	7.17	0:35:05	146.17	146.17	7.16
0:03:10	2,376.49	74.27	14.18	0:11:10	1,431.94	89.50	11.70	0:19:10	1,145.25	143.16	7.31	0:27:10	549.24	137.31	7.65	0:35:10	138.62	138.62	7.55
0:03:15	2,362.02	73.81	14.15	0:11:15	1,432.35	89.52	11.70	0:19:15	1,116.10	139.51	7.49	0:27:15	555.95	138.99	7.47	0:35:15	145.75	145.75	7.18
0:03:20	2,361.60	73.80	14.20	0:11:20	1,429.42	89.34	11.72	0:19:20	1,116.52	139.57	7.50	0:27:20	607.34	151.83	6.84	0:35:20	160.22	160.22	6.54
0:03:25	2,365.38	73.92	14.17	0:11:25	1,434.66	89.67	11.71	0:19:25	1,137.50	142.19	7.40	0:27:25	616.77	154.19	6.89	0:35:25	168.61	168.61	6.21
0:03:30	2,362.23	73.82	14.19	0:11:30	1,428.58	89.29	11.70	0:19:30	1,124.28	140.54	7.36	0:27:30	604.61	151.15	6.94	0:35:30	149.95	149.95	6.98
0:03:35	2,353.84	73.56	14.20	0:11:35	1,433.82	89.61	11.72	0:19:35	1,164.34	145.54	7.23	0:27:35	580.49	145.12	7.16	0:35:35	118.91	118.91	8.81
0:03:40	2,364.96	73.90	14.18	0:11:40	1,424.39	89.02	11.73	0:19:40	1,097.65	137.21	7.67	0:27:40	607.34	151.83	6.92	0:35:40	150.16	150.16	6.97
0:03:45	2,375.23	74.23	14.19	0:11:45	1,434.03	89.63	11.70	0:19:45	1,176.71	147.09	7.11	0:27:45	613.63	153.41	6.84	0:35:45	143.45	143.45	7.30
0:03:50	2,349.23	73.41	14.23	0:11:50	1,429.84	89.36	11.71	0:19:50	1,108.34	138.54	7.55	0:27:50	612.16	153.04	6.79	0:35:50	155.82	155.82	6.72
0:03:55	2,364.12	73.88	14.18	0:11:55	1,430.05	89.38	11.72	0:19:55	1,127.85	140.98	7.42	0:27:55	664.38	166.09	6.45	0:35:55	173.85	173.85	6.02
0:04:00	2,381.95	74.44	14.06	0:12:00	1,441.37	90.09	11.67	0:20:00	1,120.09	140.01	7.49	0:28:00	631.66	157.92	6.51	0:36:00	156.03	156.03	6.71

**SPC-2 “Large Database Query/1024 KiB Transfer Size/1 Outstanding I/O” Test Run Data  
 Measurement Interval, Run-Out, and Ramp-Down Periods**

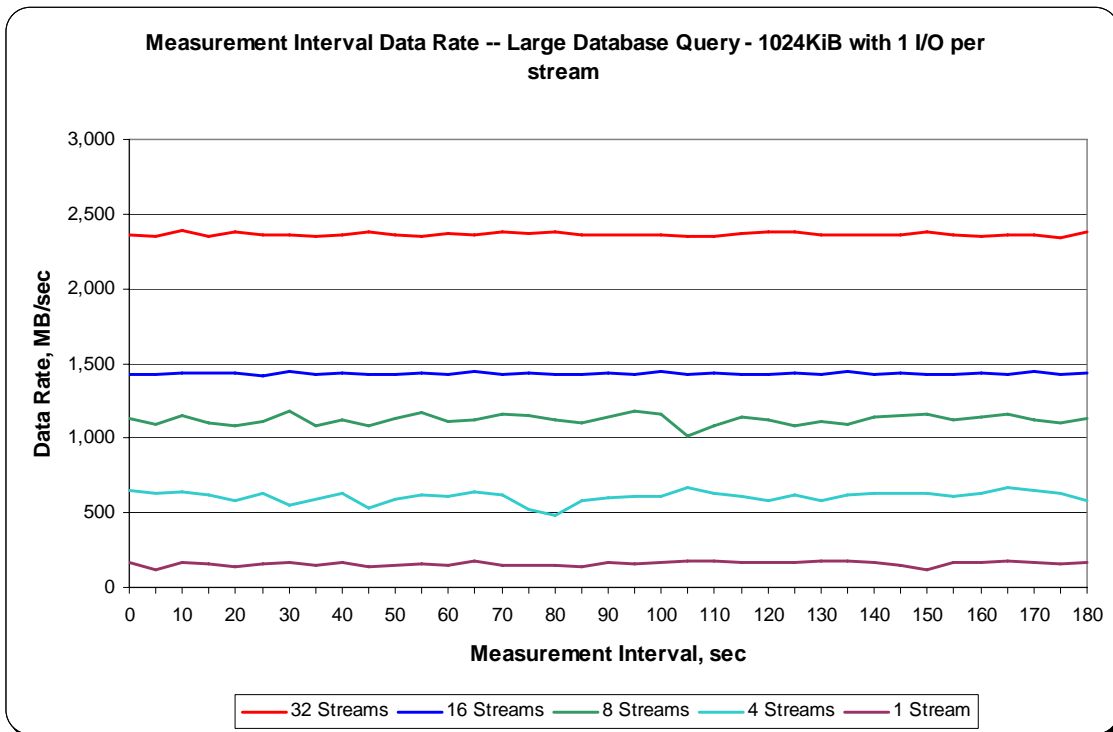
TR6				TR7				TR8				TR9				TR10			
Test Run Sequence Time	Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms	Test Run Sequence Time	Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms	Test Run Sequence Time	Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms	Test Run Sequence Time	Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms	Test Run Sequence Time	Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms
0:04:05	2,360.34	73.76	14.17	0:12:05	1,421.87	88.87	11.71	0:20:05	1,129.95	141.24	7.36	0:28:05	652.21	163.05	6.44	0:36:05	170.92	170.92	6.12
0:04:10	2,349.44	73.42	14.22	0:12:10	1,429.42	89.34	11.71	0:20:10	1,087.16	135.90	7.74	0:28:10	629.57	157.39	6.58	0:36:10	119.75	119.75	8.74
0:04:15	2,385.72	74.55	14.20	0:12:15	1,432.56	89.54	11.71	0:20:15	1,148.40	143.55	7.33	0:28:15	642.15	160.54	6.55	0:36:15	164.21	164.21	6.38
0:04:20	2,349.65	73.43	14.24	0:12:20	1,431.52	89.47	11.70	0:20:20	1,101.63	137.70	7.60	0:28:20	618.03	154.51	6.80	0:36:20	159.38	159.38	6.56
0:04:25	2,377.12	74.29	14.07	0:12:25	1,439.28	89.95	11.68	0:20:25	1,082.13	135.27	7.65	0:28:25	583.64	145.91	7.12	0:36:25	141.14	141.14	7.42
0:04:30	2,363.07	73.85	14.18	0:12:30	1,421.24	88.83	11.72	0:20:30	1,107.93	138.49	7.64	0:28:30	630.61	157.65	6.59	0:36:30	156.45	156.45	6.69
0:04:35	2,363.91	73.87	14.19	0:12:35	1,443.26	90.20	11.71	0:20:35	1,176.08	147.01	7.15	0:28:35	549.66	137.42	7.73	0:36:35	164.84	164.84	6.35
0:04:40	2,349.44	73.42	14.23	0:12:40	1,422.08	88.88	11.72	0:20:40	1,085.91	135.74	7.62	0:28:40	585.94	146.49	7.09	0:36:40	144.07	144.07	7.27
0:04:45	2,358.88	73.71	14.18	0:12:45	1,436.13	89.76	11.70	0:20:45	1,125.54	140.69	7.48	0:28:45	631.87	157.97	6.65	0:36:45	171.55	171.55	6.10
0:04:50	2,377.12	74.29	14.22	0:12:50	1,429.84	89.36	11.71	0:20:50	1,083.18	135.40	7.77	0:28:50	534.35	133.59	7.87	0:36:50	138.62	138.62	7.56
0:04:55	2,358.67	73.71	14.21	0:12:55	1,426.27	89.14	11.73	0:20:55	1,132.88	141.61	7.39	0:28:55	594.75	148.69	7.06	0:36:55	147.22	147.22	7.10
0:05:00	2,351.75	73.49	14.21	0:13:00	1,435.08	89.69	11.71	0:21:00	1,167.27	145.91	7.09	0:29:00	619.08	154.77	6.71	0:37:00	161.69	161.69	6.48
0:05:05	2,371.46	74.11	14.14	0:13:05	1,421.45	88.84	11.73	0:21:05	1,114.85	139.36	7.59	0:29:05	606.71	151.68	6.85	0:37:05	149.11	149.11	7.02
0:05:10	2,358.88	73.71	14.21	0:13:10	1,444.31	90.27	11.70	0:21:10	1,122.40	140.30	7.50	0:29:10	639.00	159.75	6.65	0:37:10	175.53	175.53	5.96
0:05:15	2,379.43	74.36	14.05	0:13:15	1,423.97	89.00	11.70	0:21:15	1,157.84	144.73	7.15	0:29:15	617.82	154.46	6.80	0:37:15	151.62	151.62	6.90
0:05:20	2,365.80	73.93	14.13	0:13:20	1,437.60	89.85	11.69	0:21:20	1,151.34	143.92	7.31	0:29:20	521.56	130.39	7.97	0:37:20	143.65	143.65	7.29
0:05:25	2,379.64	74.36	14.20	0:13:25	1,426.90	89.18	11.71	0:21:25	1,119.04	139.88	7.52	0:29:25	485.07	121.27	8.65	0:37:25	152.25	152.25	6.87
0:05:30	2,360.97	73.78	14.20	0:13:30	1,427.53	89.22	11.74	0:21:30	1,096.81	137.10	7.63	0:29:30	581.33	145.33	7.24	0:37:30	136.73	136.73	7.66
0:05:35	2,355.94	73.62	14.19	0:13:35	1,434.66	89.67	11.72	0:21:35	1,139.80	142.48	7.26	0:29:35	603.77	150.94	6.88	0:37:35	162.95	162.95	6.43
0:05:40	2,359.30	73.73	14.21	0:13:40	1,423.97	89.00	11.70	0:21:40	1,177.34	147.17	7.19	0:29:40	614.47	153.62	6.76	0:37:40	158.33	158.33	6.61
0:05:45	2,358.46	73.70	14.21	0:13:45	1,441.37	90.09	11.72	0:21:45	1,156.37	144.55	7.28	0:29:45	614.05	153.51	6.91	0:37:45	169.45	169.45	6.18
0:05:50	2,353.84	73.56	14.20	0:13:50	1,423.34	88.96	11.71	0:21:50	1,016.91	127.11	8.14	0:29:50	667.94	166.99	6.22	0:37:50	175.95	175.95	5.95
0:05:55	2,351.75	73.49	14.21	0:13:55	1,436.97	89.81	11.70	0:21:55	1,077.10	134.64	7.81	0:29:55	627.89	156.97	6.69	0:37:55	172.39	172.39	6.07
0:06:00	2,370.83	74.09	14.25	0:14:00	1,429.63	89.35	11.69	0:22:00	1,138.75	142.34	7.39	0:30:00	612.79	153.20	6.85	0:38:00	166.09	166.09	6.30
0:06:05	2,375.86	74.25	14.11	0:14:05	1,430.89	89.43	11.70	0:22:05	1,120.51	140.06	7.47	0:30:05	583.22	145.80	7.21	0:38:05	170.92	170.92	6.12
0:06:10	2,378.59	74.33	14.05	0:14:10	1,435.92	89.74	11.71	0:22:10	1,078.77	134.85	7.72	0:30:10	623.69	155.92	6.66	0:38:10	166.30	166.30	6.30
0:06:15	2,357.62	73.68	14.22	0:14:15	1,424.39	89.02	11.70	0:22:15	1,115.89	139.49	7.54	0:30:15	580.49	145.12	7.16	0:38:15	175.11	175.11	5.97
0:06:20	2,363.70	73.87	14.18	0:14:20	1,442.00	90.13	11.72	0:22:20	1,096.39	137.05	7.68	0:30:20	620.55	155.14	6.84	0:38:20	175.32	175.32	5.97
0:06:25	2,356.36	73.64	14.19	0:14:25	1,422.50	88.91	11.72	0:22:25	1,140.85	142.61	7.25	0:30:25	632.08	158.02	6.58	0:38:25	171.76	171.76	6.10
0:06:30	2,359.30	73.73	14.17	0:14:30	1,437.18	89.82	11.69	0:22:30	1,150.50	143.81	7.31	0:30:30	630.61	157.65	6.66	0:38:30	148.48	148.48	7.05
0:06:35	2,383.62	74.49	14.18	0:14:35	1,425.22	89.08	11.72	0:22:35	1,161.82	145.23	7.24	0:30:35	628.52	157.13	6.68	0:38:35	117.86	117.86	8.88
0:06:40	2,362.02	73.81	14.19	0:14:40	1,430.26	89.39	11.71	0:22:40	1,123.44	140.43	7.45	0:30:40	609.85	152.46	6.89	0:38:40	165.05	165.05	6.35
0:06:45	2,350.49	73.45	14.23	0:14:45	1,436.76	89.80	11.70	0:22:45	1,142.74	142.84	7.29	0:30:45	633.97	158.49	6.56	0:38:45	167.56	167.56	6.25
0:06:50	2,364.33	73.89	14.17	0:14:50	1,423.55	88.97	11.72	0:22:50	1,157.21	144.65	7.27	0:30:50	668.36	167.09	6.21	0:38:50	176.16	176.16	5.95
0:06:55	2,359.30	73.73	14.21	0:14:55	1,442.21	90.14	11.71	0:22:55	1,122.82	140.35	7.49	0:30:55	652.21	163.05	6.51	0:38:55	169.87	169.87	6.16
0:07:00	2,342.73	73.21	14.23	0:15:00	1,422.92	88.93	11.69	0:23:00	1,099.54	137.44	7.51	0:31:00	629.57	157.39	6.60	0:39:00	161.06	161.06	6.50
0:07:05	2,381.95	74.44	14.13	0:15:05	1,437.18	89.82	11.71	0:23:05	1,128.06	141.01	7.48	0:31:05	584.27	146.07	7.19	0:39:05	171.55	171.55	6.10
0:07:10	2,387.19	74.60	14.08	0:15:10	1,414.95	88.43	11.71	0:23:10	1,125.96	140.75	7.42	0:31:10	589.30	147.32	7.13	0:39:10	168.40	168.40	6.21
0:07:15	2,368.73	74.02	14.23	0:15:15	1,443.47	90.22	11.71	0:23:15	1,114.01	139.25	7.52	0:31:15	580.49	145.12	7.24	0:39:15	125.62	125.62	8.34
0:07:20	2,350.91	73.47	14.18	0:15:20	1,429.42	89.34	11.72	0:23:20	1,118.20	139.78	7.45	0:31:20	585.11	146.28	7.10	0:39:20	149.11	149.11	7.02
0:07:25	2,359.09	73.72	14.13	0:15:25	1,429.42	89.34	11.73	0:23:25	1,168.74	146.09	7.24	0:31:25	627.05	156.76	6.63	0:39:25	123.31	123.31	8.49
0:07:30	2,371.25	74.10	14.22	0:15:30	1,428.79	89.30	11.70	0:23:30	1,119.67	139.96	7.47	0:31:30	659.55	164.89	6.44	0:39:30	146.38	146.38	7.15
0:07:35	2,339.58	73.11	14.24	0:15:35	1,434.87	89.68	11.71	0:23:35	1,083.39	135.42	7.73	0:31:35	569.38	142.34	7.30	0:39:35	158.33	158.33	6.62
0:07:40	2,389.29	74.67	14.07	0:15:40	1,432.56	89.54	11.73	0:23:40	1,137.50	142.19	7.36	0:31:40	608.38	152.10	6.90	0:39:40	170.71	170.71	6.13
0:07:45	2,371.67	74.82	14.14	0:15:45	1,427.11	101.94	11.69	0:23:45	1,120.30	280.07	7.48	0:31:45	639.00	159.75	6.58	0:39:45	143.86	143.86	7.28
0:07:50	44.88	0.00	10.51	0:15:50	32.30	0.00	10.11	0:23:50	6.08	0.00	9.23	0:31:50	7.76	0.00	6.67	0:39:50	2.31	0.00	7.87
0:07:55	0.00	0.00	0.00	0:15:55	0.00	0.00	0.00	0:23:55	0.00	0.00	0.00	0:31:55	0.00	0.00	0.00	0:39:55	0.00	0.00	0.00



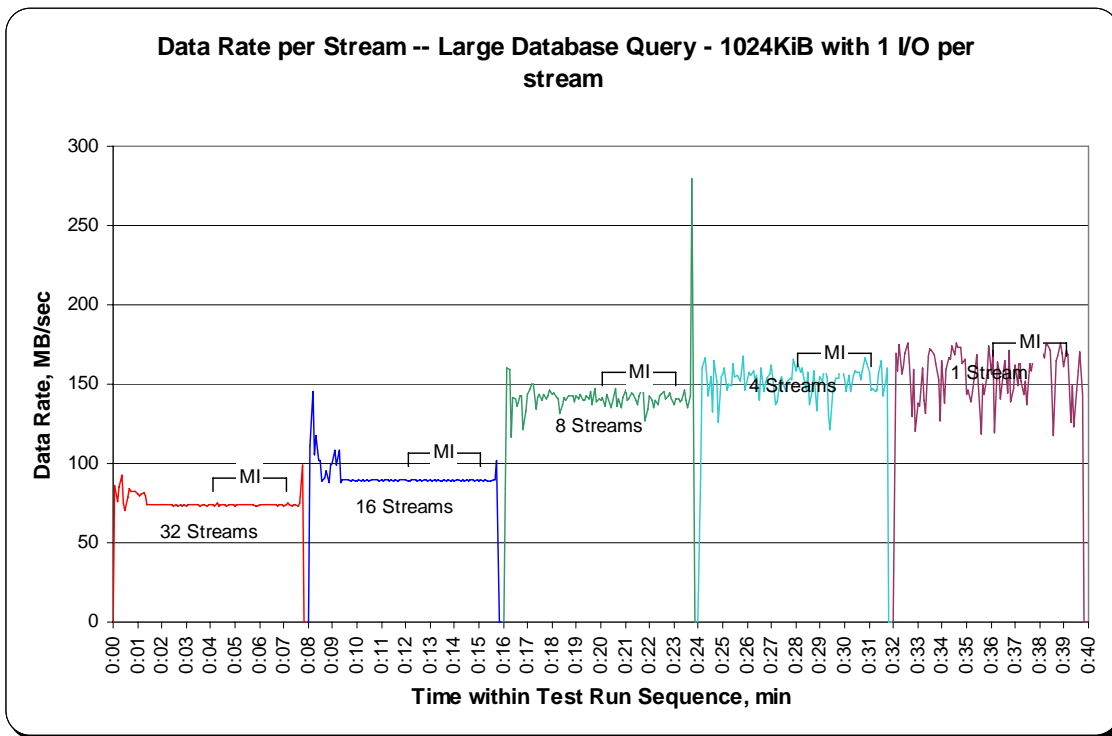
**SPC-2 “Large Database Query/1024 KiB Transfer Size/1 Outstanding I/O” Average Data Rate Graph – Complete Test Run**



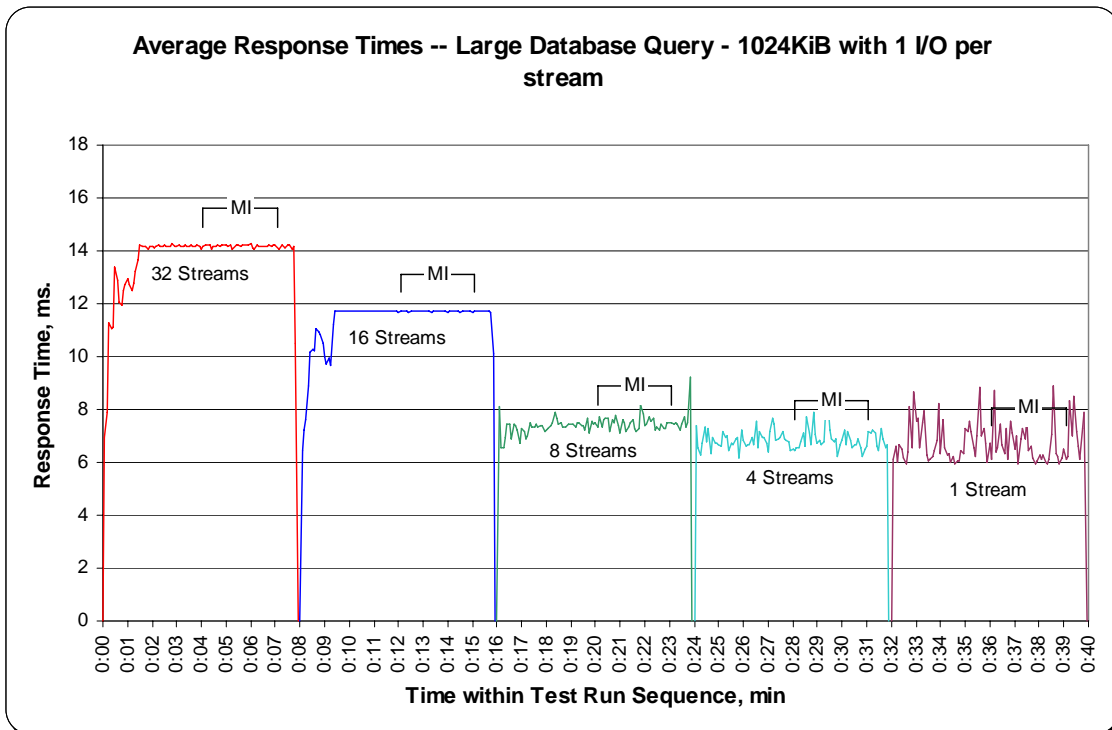
**SPC-2 “Large Database Query/1024 KiB Transfer Size/1 Outstanding I/O” Average Data Rate Graph – Measurement Interval (MI) Only**



### SPC-2 “Large Database Query/1024 KiB Transfer Size/1 Outstanding I/O” Average Data Rate per Stream Graph



### SPC-2 “Large Database Query/1024 KiB Transfer Size/1 Outstanding I/O” Average Response Time Graph



## Large Database Query Test – 64 KiB TRANSFER SIZE Test Phase

### Clause 10.6.8.2.1

5. A table that will contain the following information for each "64 KiB Transfer Size, 4 Outstanding I/Os" Test Run:
  - The number of Streams specified.
  - The average data rate, average data rate per stream, and average Response Time reported at five second intervals.
6. Average Data Rate (intervals), Average Data Rate per Stream (intervals), and Average Response Time (intervals) graphs for the "64 KiB Transfer Size, 4 Outstanding I/Os" Test Runs as specified in Clauses 10.1.4 – 10.1.6.
7. A table that will contain the following information for each "64 KiB Transfer Size, 1 Outstanding I/O" Test Run:
  - The number of Streams specified.
  - The average data rate, average data rate per stream, and average Response Time reported at five second intervals.
8. Average Data Rate (intervals), Average Data Rate per Stream (intervals), and Average Response Time (intervals) graphs for the "64 KiB Transfer Size, 1 Outstanding I/O" Test Runs as specified in Clauses 10.1.4 – 10.1.6.

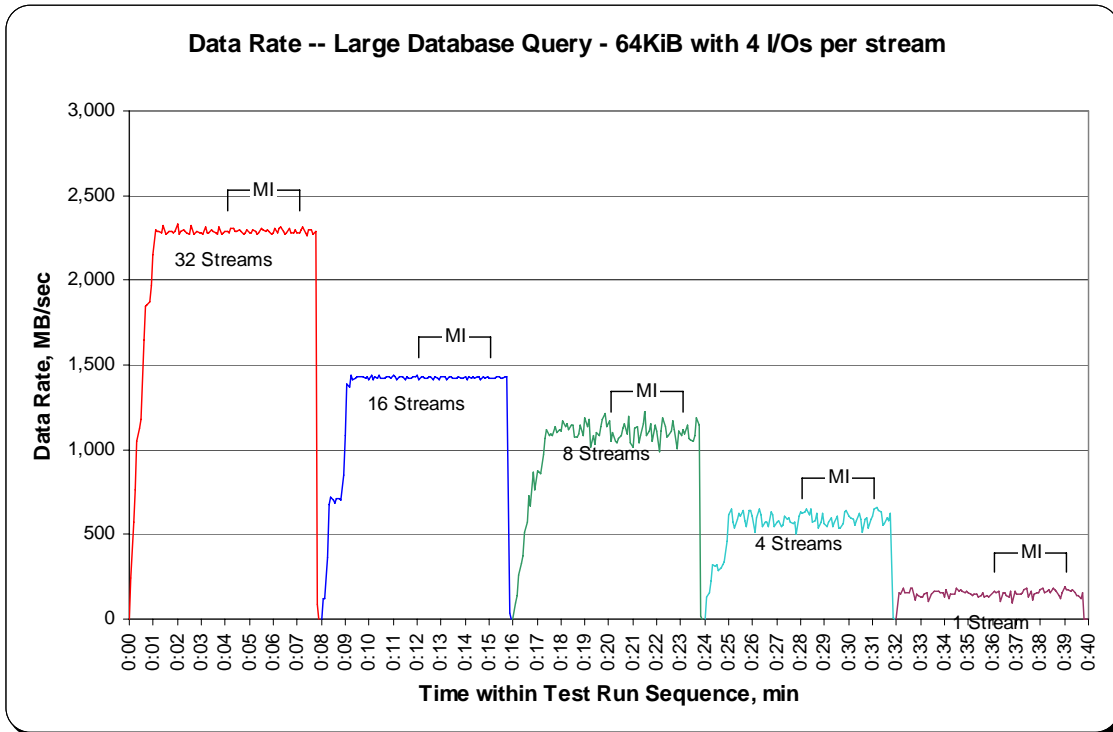
The SPC-2 "Large DatabaseQuery/64 KiB TRANSFER SIZE/4 Outstanding I/Os" Test Run data is contained in the table that appears on the next page. That table is followed by graphs illustrating the average Data Rate, average Data Rate per Stream, and average Response Time produced by the same Test Runs. The table and graphs present the data at five-second intervals.

Immediately following the SPC-2 "Large DatabaseQuery/64 KiB TRANSFER SIZE/4 Outstanding I/Os" table and graphs will be the SPC-2 "Large DatabaseQuery/64 KiB TRANSFER SIZE/1 Outstanding I/O" table and graphs. The table contains the Test Run data and the graphs illustrate the average Data Rate, average Data Rate per Stream, and average Response Time produced by the Test Runs.

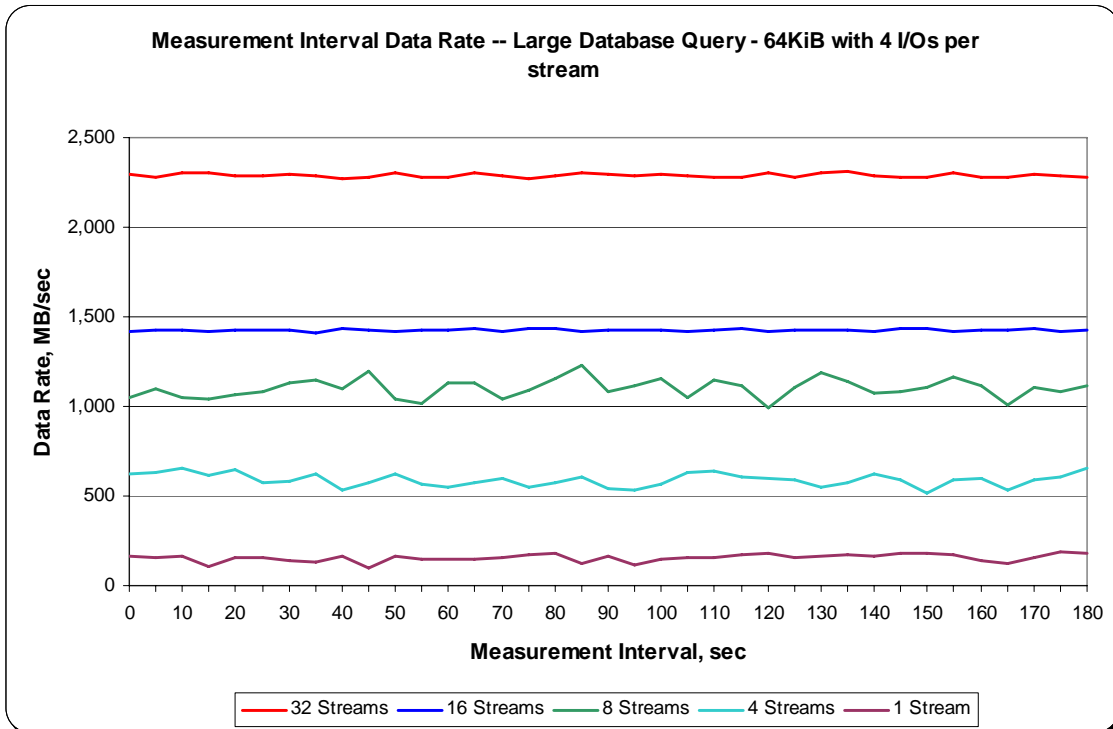




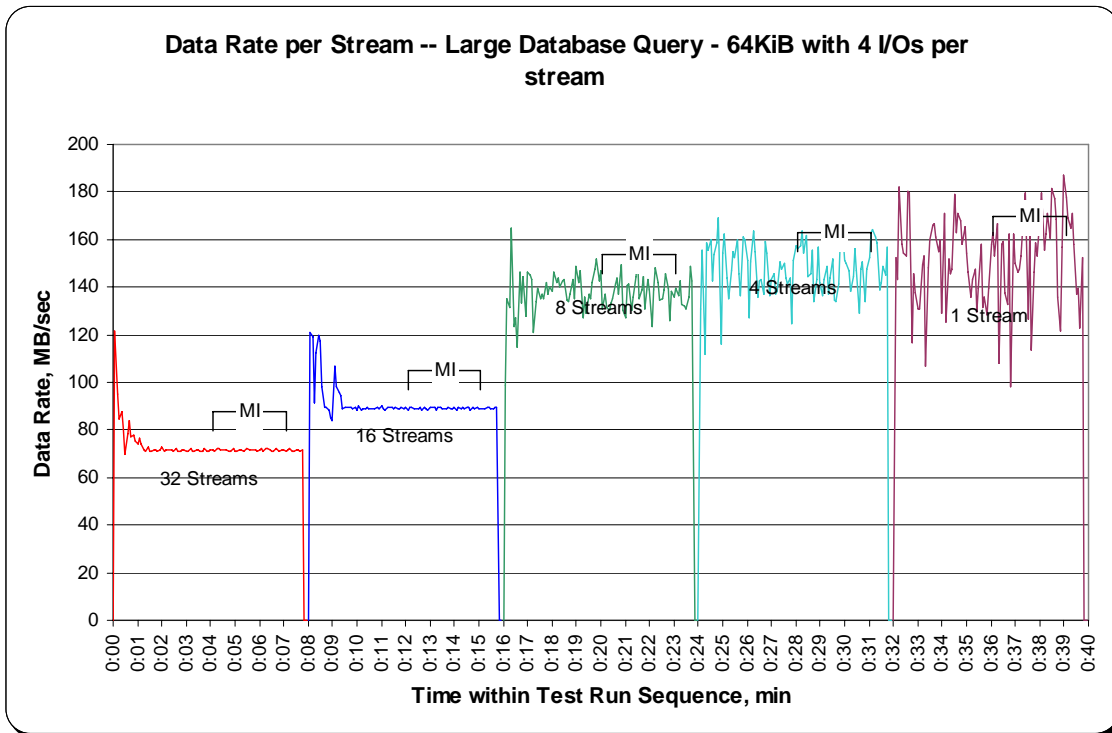
**SPC-2 “Large Database Query/64 KiB Transfer Size/4 Outstanding I/Os” Average Data Rate Graph – Complete Test Run**



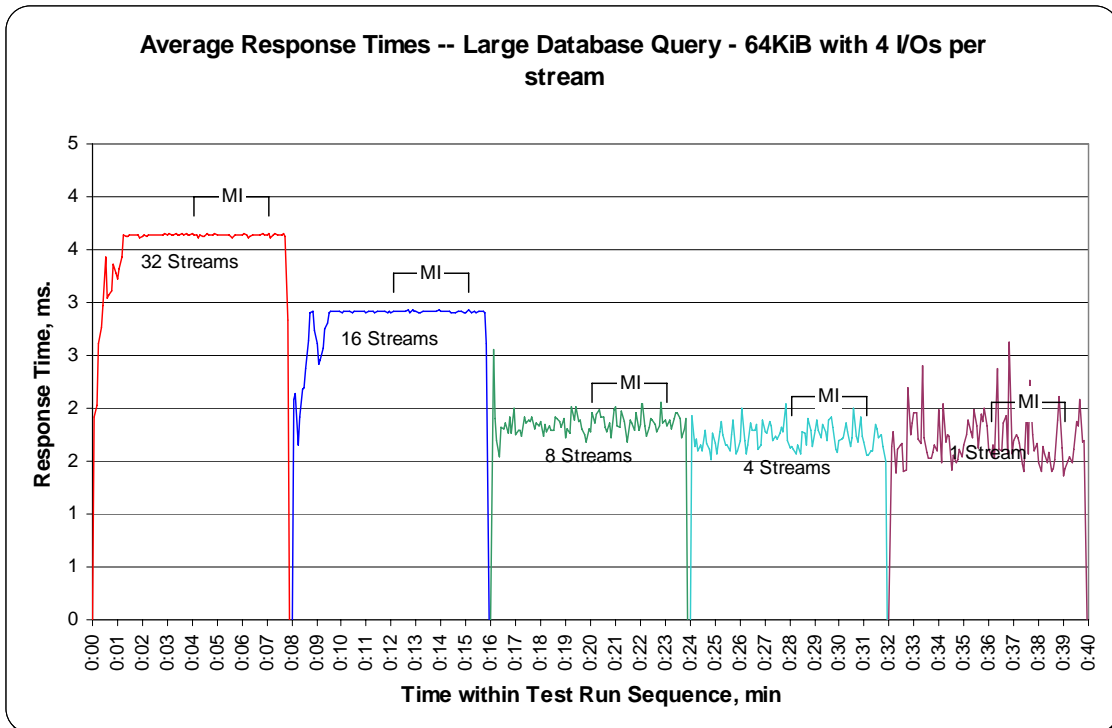
**SPC-2 “Large Database Query/64 KiB Transfer Size/4 Outstanding I/Os” Average Data Rate Graph – Measurement Interval (MI) Only**



**SPC-2 “Large Database Query/64 KiB Transfer Size/4 Outstanding I/Os” Average Data Rate per Stream Graph**



**SPC-2 “Large Database Query/64 KiB Transfer Size/4 Outstanding I/Os” Average Response Time Graph**



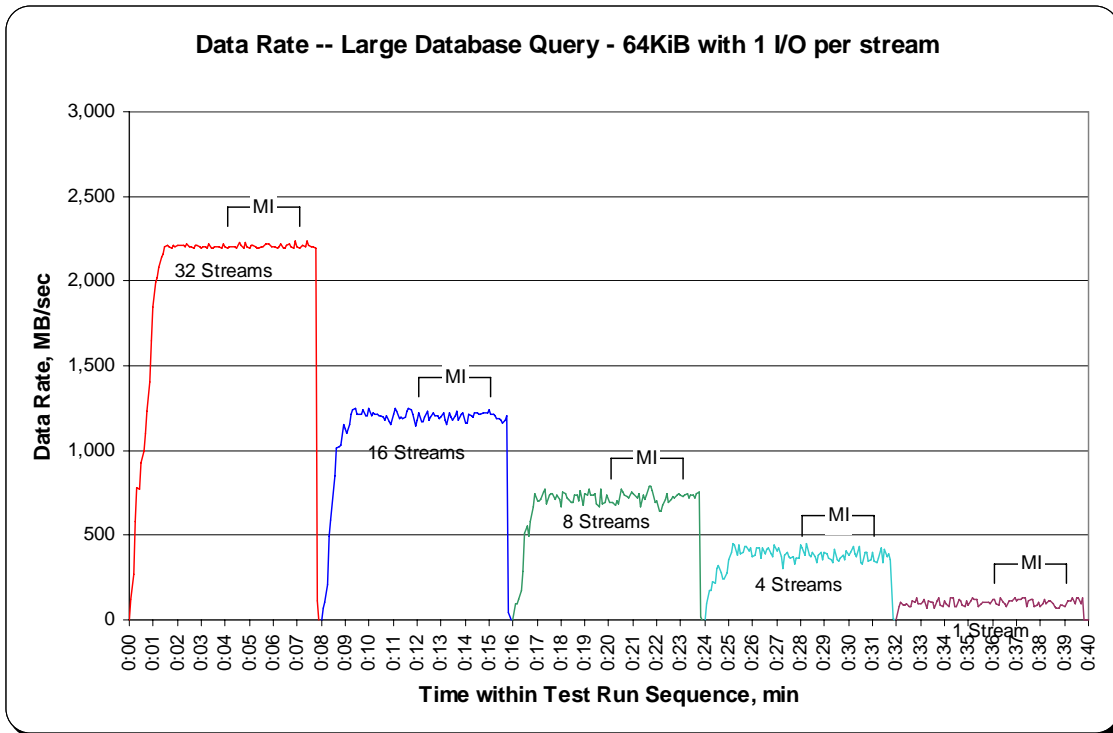




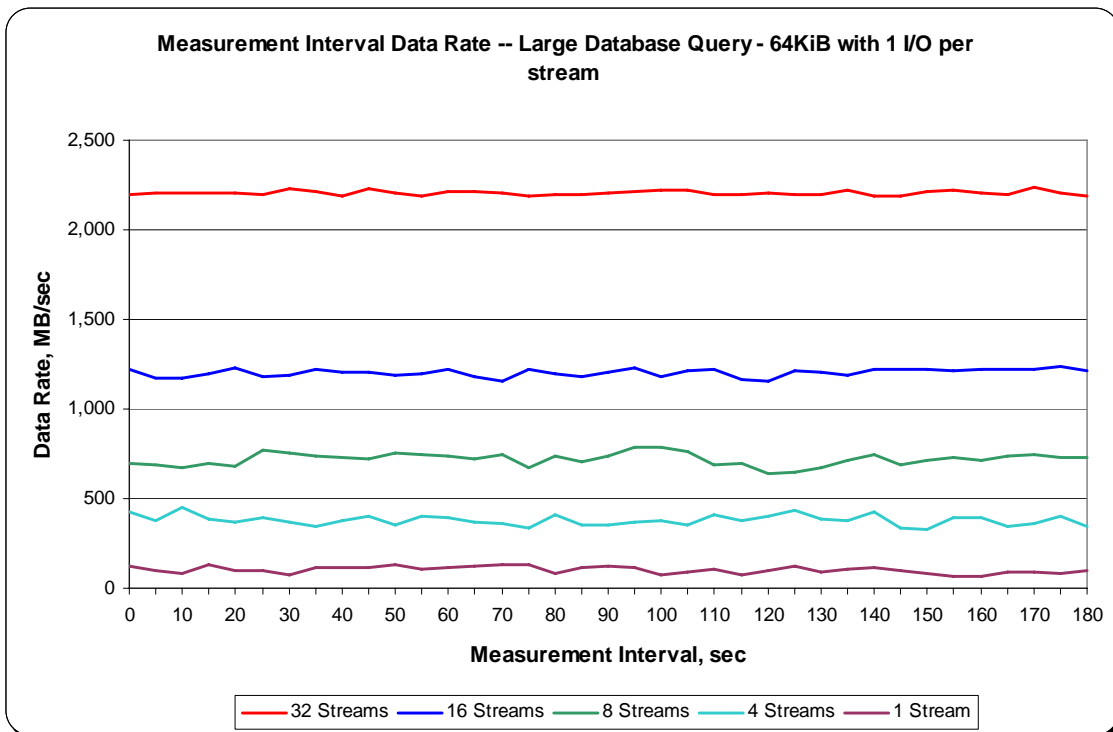
**SPC-2 “Large Database Query/64 KiB Transfer Size/1 Outstanding I/O” Test Run Data  
Measurement Interval, Run-Out, and Ramp-Down Period**

32 Streams				16 Streams				8 Streams				4 Streams				1 Stream			
TR16 Test Run Sequence Time	Data Rate, MB/sec	/ Stream, MB/sec	Response Time, ms	TR17 Test Run Sequence Time	Data Rate, MB/sec	/ Stream, MB/sec	Response Time, ms	TR18 Test Run Sequence Time	Data Rate, MB/sec	/ Stream, MB/sec	Response Time, ms	TR19 Test Run Sequence Time	Data Rate, MB/sec	/ Stream, MB/sec	Response Time, ms	TR20 Test Run Sequence Time	Data Rate, MB/sec	/ Stream, MB/sec	Response Time, ms
0:04:05	2,197.62	68.68	0.94	0:12:05	1,221.05	76.32	0.85	0:20:05	697.84	87.23	0.74	0:28:05	426.06	106.51	0.61	0:36:05	122.81	122.81	0.52
0:04:10	2,202.90	68.84	0.94	0:12:10	1,173.29	73.33	0.88	0:20:10	690.36	86.30	0.75	0:28:10	378.87	94.72	0.68	0:36:10	98.05	98.05	0.66
0:04:15	2,203.54	68.86	0.94	0:12:15	1,173.71	73.36	0.88	0:20:15	675.47	84.43	0.77	0:28:15	453.82	113.46	0.56	0:36:15	85.03	85.03	0.76
0:04:20	2,202.84	68.84	0.94	0:12:20	1,196.87	74.80	0.87	0:20:20	700.23	87.53	0.73	0:28:20	381.72	95.43	0.68	0:36:20	128.19	128.19	0.50
0:04:25	2,201.38	68.79	0.94	0:12:25	1,228.55	76.78	0.84	0:20:25	682.51	85.31	0.75	0:28:25	370.68	92.67	0.71	0:36:25	102.13	102.13	0.63
0:04:30	2,195.24	68.60	0.94	0:12:30	1,180.39	73.77	0.88	0:20:30	770.33	96.29	0.68	0:28:30	394.90	98.73	0.64	0:36:30	97.60	97.60	0.66
0:04:35	2,225.80	69.56	0.94	0:12:35	1,192.38	74.52	0.86	0:20:35	752.55	94.07	0.68	0:28:35	369.26	92.31	0.69	0:36:35	74.24	74.24	0.87
0:04:40	2,214.81	69.21	0.93	0:12:40	1,219.14	76.20	0.85	0:20:40	737.20	92.15	0.71	0:28:40	341.83	85.46	0.76	0:36:40	115.33	115.33	0.56
0:04:45	2,191.58	68.49	0.94	0:12:45	1,208.99	75.56	0.86	0:20:45	727.23	90.90	0.71	0:28:45	378.54	94.63	0.68	0:36:45	115.25	115.25	0.56
0:04:50	2,229.67	69.68	0.93	0:12:50	1,202.02	75.13	0.86	0:20:50	722.30	90.29	0.72	0:28:50	401.50	100.37	0.64	0:36:50	113.52	113.52	0.57
0:04:55	2,205.55	68.92	0.94	0:12:55	1,187.53	74.22	0.87	0:20:55	755.72	94.46	0.68	0:28:55	352.11	88.03	0.74	0:36:55	127.71	127.71	0.50
0:05:00	2,192.13	68.50	0.94	0:13:00	1,193.75	74.61	0.87	0:21:00	746.70	93.34	0.69	0:29:00	399.11	99.78	0.65	0:37:00	110.10	110.10	0.59
0:05:05	2,210.23	69.07	0.94	0:13:05	1,218.30	76.14	0.85	0:21:05	740.88	92.61	0.70	0:29:05	391.10	97.77	0.66	0:37:05	118.24	118.24	0.54
0:05:10	2,214.81	69.21	0.94	0:13:10	1,176.96	73.56	0.88	0:21:10	717.88	89.73	0.71	0:29:10	367.21	91.80	0.70	0:37:10	125.28	125.28	0.51
0:05:15	2,202.73	68.84	0.94	0:13:15	1,156.04	72.25	0.89	0:21:15	746.02	93.25	0.70	0:29:15	358.73	89.68	0.72	0:37:15	127.30	127.30	0.50
0:05:20	2,189.79	68.43	0.94	0:13:20	1,218.93	76.18	0.86	0:21:20	668.19	83.52	0.77	0:29:20	338.18	84.54	0.77	0:37:20	128.14	128.14	0.50
0:05:25	2,195.98	68.62	0.94	0:13:25	1,199.10	74.94	0.86	0:21:25	741.30	92.66	0.70	0:29:25	412.10	103.03	0.62	0:37:25	79.48	79.48	0.81
0:05:30	2,199.80	68.74	0.94	0:13:30	1,182.26	73.89	0.88	0:21:30	708.61	88.58	0.73	0:29:30	352.37	88.09	0.74	0:37:30	116.82	116.82	0.55
0:05:35	2,201.55	68.80	0.94	0:13:35	1,205.96	75.37	0.86	0:21:35	740.63	92.58	0.69	0:29:35	350.10	87.52	0.74	0:37:35	121.57	121.57	0.53
0:05:40	2,215.58	69.24	0.93	0:13:40	1,232.09	77.01	0.84	0:21:40	788.99	98.62	0.66	0:29:40	365.07	91.27	0.71	0:37:40	117.28	117.28	0.55
0:05:45	2,221.88	69.43	0.94	0:13:45	1,177.34	73.58	0.87	0:21:45	785.34	98.17	0.65	0:29:45	379.25	94.81	0.68	0:37:45	77.16	77.16	0.84
0:05:50	2,223.45	69.48	0.93	0:13:50	1,216.45	76.03	0.85	0:21:50	763.09	95.39	0.68	0:29:50	354.88	88.72	0.73	0:37:50	88.76	88.76	0.73
0:05:55	2,200.34	68.76	0.94	0:13:55	1,219.85	76.24	0.86	0:21:55	692.15	86.52	0.75	0:29:55	409.79	102.45	0.63	0:37:55	105.38	105.38	0.61
0:06:00	2,199.08	68.72	0.94	0:14:00	1,164.67	72.79	0.89	0:22:00	698.34	87.29	0.74	0:30:00	380.90	95.22	0.67	0:38:00	77.74	77.74	0.83
0:06:05	2,200.88	68.78	0.94	0:14:05	1,158.11	72.38	0.89	0:22:05	640.97	80.12	0.80	0:30:05	398.83	99.71	0.65	0:38:05	98.73	98.73	0.65
0:06:10	2,195.31	68.60	0.94	0:14:10	1,210.20	75.64	0.85	0:22:10	645.14	80.64	0.80	0:30:10	434.54	108.64	0.60	0:38:10	123.77	123.77	0.52
0:06:15	2,199.28	68.73	0.94	0:14:15	1,200.89	75.06	0.87	0:22:15	676.14	84.52	0.77	0:30:15	387.78	96.95	0.67	0:38:15	93.00	93.00	0.69
0:06:20	2,220.27	69.38	0.94	0:14:20	1,192.53	74.53	0.86	0:22:20	712.71	89.09	0.72	0:30:20	373.30	93.33	0.69	0:38:20	110.48	110.48	0.58
0:06:25	2,190.26	68.45	0.95	0:14:25	1,220.52	76.28	0.85	0:22:25	746.75	93.34	0.70	0:30:25	429.92	107.48	0.60	0:38:25	111.36	111.36	0.58
0:06:30	2,191.83	68.49	0.94	0:14:30	1,223.37	76.46	0.85	0:22:30	690.02	86.25	0.75	0:30:30	336.96	84.24	0.77	0:38:30	98.83	98.83	0.65
0:06:35	2,211.17	69.10	0.94	0:14:35	1,217.93	76.12	0.85	0:22:35	714.07	89.26	0.73	0:30:35	328.81	82.20	0.78	0:38:35	78.34	78.34	0.83
0:06:40	2,222.12	69.44	0.93	0:14:40	1,216.08	76.00	0.85	0:22:40	730.11	91.26	0.70	0:30:40	396.63	99.16	0.65	0:38:40	69.21	69.21	0.94
0:06:45	2,206.33	68.95	0.94	0:14:45	1,223.83	76.49	0.84	0:22:45	715.56	89.44	0.72	0:30:45	394.84	98.71	0.66	0:38:45	67.73	67.73	0.96
0:06:50	2,194.84	68.59	0.94	0:14:50	1,220.00	76.25	0.85	0:22:50	735.93	91.99	0.71	0:30:50	343.40	85.85	0.76	0:38:50	87.57	87.57	0.74
0:06:55	2,235.96	69.87	0.94	0:14:55	1,218.78	76.17	0.84	0:22:55	743.59	92.95	0.69	0:30:55	357.83	89.46	0.72	0:38:55	89.81	89.81	0.72
0:07:00	2,204.71	68.90	0.94	0:15:00	1,238.26	77.39	0.83	0:23:00	733.52	91.69	0.71	0:31:00	402.40	100.60	0.64	0:39:00	78.70	78.70	0.82
0:07:05	2,189.68	68.43	0.94	0:15:05	1,211.94	75.75	0.86	0:23:05	726.22	90.78	0.71	0:31:05	348.19	87.05	0.74	0:39:05	98.25	98.25	0.66
0:07:10	2,202.83	68.84	0.94	0:15:10	1,216.68	76.04	0.86	0:23:10	732.77	91.60	0.71	0:31:10	334.49	83.62	0.77	0:39:10	114.45	114.45	0.56
0:07:15	2,211.68	69.11	0.94	0:15:15	1,205.64	75.35	0.85	0:23:15	743.02	92.88	0.69	0:31:15	364.61	91.15	0.71	0:39:15	115.96	115.96	0.56
0:07:20	2,203.98	68.87	0.94	0:15:20	1,190.36	74.40	0.87	0:23:20	722.16	90.27	0.72	0:31:20	421.62	105.41	0.61	0:39:20	126.73	126.73	0.51
0:07:25	2,238.51	69.95	0.93	0:15:25	1,186.16	74.13	0.88	0:23:25	737.31	92.16	0.70	0:31:25	341.94	85.49	0.74	0:39:25	99.28	99.28	0.65
0:07:30	2,211.34	69.10	0.94	0:15:30	1,175.72	73.48	0.87	0:23:30	734.51	91.81	0.70	0:31:30	416.01	104.00	0.63	0:39:30	126.06	126.06	0.51
0:07:35	2,199.72	68.74	0.94	0:15:35	1,158.04	72.38	0.89	0:23:35	715.44	89.43	0.72	0:31:35	375.34	93.83	0.69	0:39:35	128.37	128.37	0.50
0:07:40	2,198.97	68.72	0.94	0:15:40	1,175.22	73.45	0.88	0:23:40	741.88	92.73	0.70	0:31:40	390.93	97.73	0.66	0:39:40	91.76	91.76	0.70
0:07:45	2,191.38	68.48	0.94	0:15:45	1,202.31	75.14	0.87	0:23:45	757.93	94.74	0.68	0:31:45	354.19	88.55	0.73	0:39:45	127.28	127.28	0.50
0:07:50	113.71	0.00	0.85	0:15:50	43.62	0.00	0.86	0:23:50	15.19	0.00	0.69	0:31:50	9.59	0.00	0.83	0:39:50	2.06	0.00	0.50
0:07:55	0.00	0.00	0.00	0:15:55	0.00	0.00	0.00	0:23:55	0.00	0.00	0.00	0:31:55	0.00	0.00	0.00	0:39:55	0.00	0.00	0.00
																0:40:00	0.00	0.00	0.00

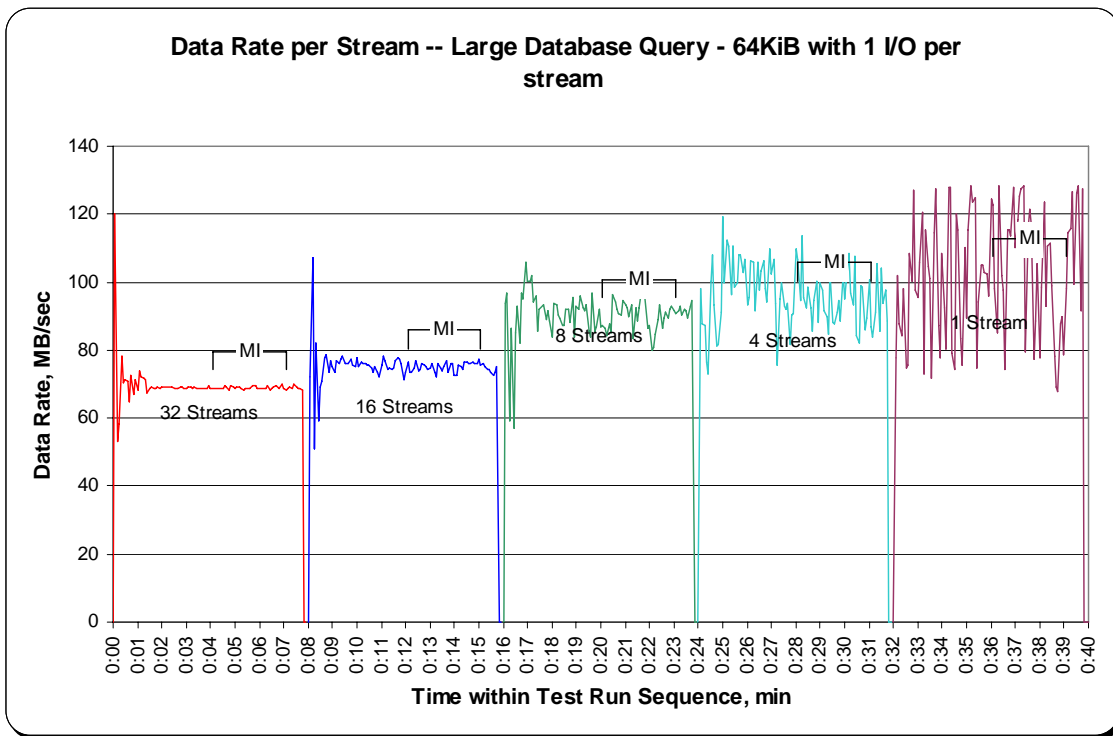
**SPC-2 “Large Database Query/64 KiB Transfer Size/1 Outstanding I/O” Average Data Rate Graph – Complete Test Run**



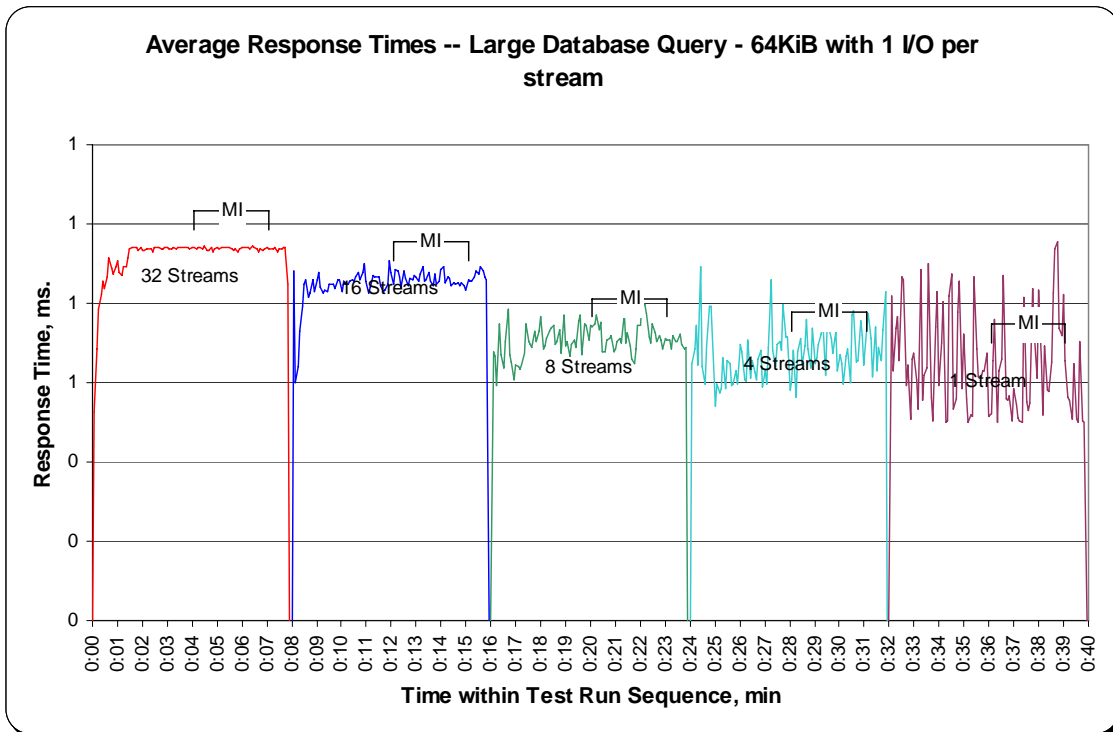
**SPC-2 “Large Database Query/64 KiB Transfer Size/1 Outstanding I/O” Average Data Rate Graph – Measurement Interval (MI) Only**



**SPC-2 “Large Database Query/64 KiB Transfer Size/1 Outstanding I/O” Average Data Rate per Stream Graph**



**SPC-2 “Large Database Query/64 KiB Transfer Size/1 Outstanding I/O” Average Response Time Graph**



## Video on Demand Delivery Test

### Clause 6.4.4.1

*The Video on Demand Delivery Test represents the I/O operations required to enable individualized video entertainment for a community of subscribers, which draw from a digital film library.*

### Clause 6.4.2.2

*The Video on Demand Delivery Test consists of one (1) Test Run.*

*The BC shall not be restarted or manually disturbed, altered, or adjusted during the execution of the Video on Demand Delivery Test. If power is lost to the BC during this Test all results shall be rendered invalid and the Test re-run in its entirety.*

### Clause 10.6.8.3

*The Full Disclosure Report will contain the following content for the Video on Demand Delivery Test:*

- 1. A listing of the SPC-2 Workload Generator commands and parameters used to execute the Test Run in the Video on Demand Delivery Test.*
- 2. The human readable SPC-2 Test Results File for the Test Run in the Video on Demand Delivery Test.*
- 3. A table that contains the following information for the Test Run in the Video on Demand Delivery Test:*
  - The number Streams specified.*
  - The Ramp-Up duration in seconds.*
  - The Measurement Interval duration in seconds.*
  - The average data rate, in MB per second, for the Measurement Interval.*
  - The average data rate, in MB per second, per Stream for the Measurement Interval.*
- 4. A table that contains the following information for the single Video on Demand Delivery Test Run:*
  - The number Streams specified.*
  - The average data rate, average data rate per stream, average Response Time, and Maximum Response Time reported at 60 second intervals.*
- 5. Average Data Rate (intervals), Average Data Rate per Stream (intervals), and Average Response Time (intervals) graphs for the single Video on Demand Delivery Test Run as specified in Clauses 10.1.4-2-10.1.6.*
- 6. A Maximum Response Time (intervals) graph, which will utilize the format defined in Clause 10.1.6, substituting maximum Response Time data for average Response Time data.*

## SPC-2 Workload Generator Commands and Parameters

**The SPC-2 Workload Generator commands and parameters for the Video on Demand Delivery Test Run are documented in “Appendix E: SPC-2 Workload Generator Execution Commands and Parameters” on Page 127.**

### SPC-2 Test Results File

A link to the SPC-2 Test Results file generated from the Video on Demand Delivery Test Run is listed below.

[SPC-2 Video on Demand Delivery Test Results File](#)

### SPC-2 Video on Demand Delivery Test Run Data

The number of Streams specified, Ramp-Up duration in seconds, Measurement Interval duration in seconds, average Data Rate for the Measurement Interval, and average Data Rate per Stream for the Measurement Interval are listed in the following table.

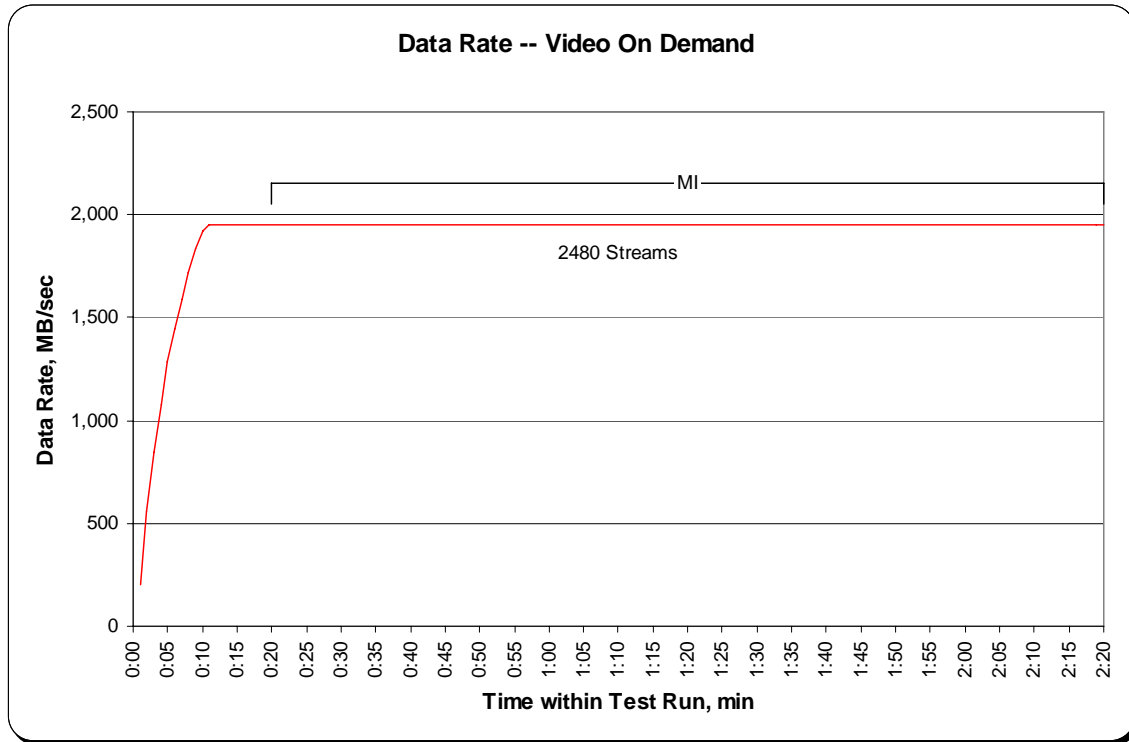
SPC-2-VOD	TR1
Number of Streams	2480
Ramp-up Time, sec	1200
Measurement Interval, sec	7200
Average Data Rate, MB/sec	1,950.37
Per Stream Data Rate, MB/sec	0.79
Average Response Time, ms	16.37
Average Max Response Time, ms	139.45

**Video on Demand Delivery Test – TEST RUN DATA BY INTERVAL**

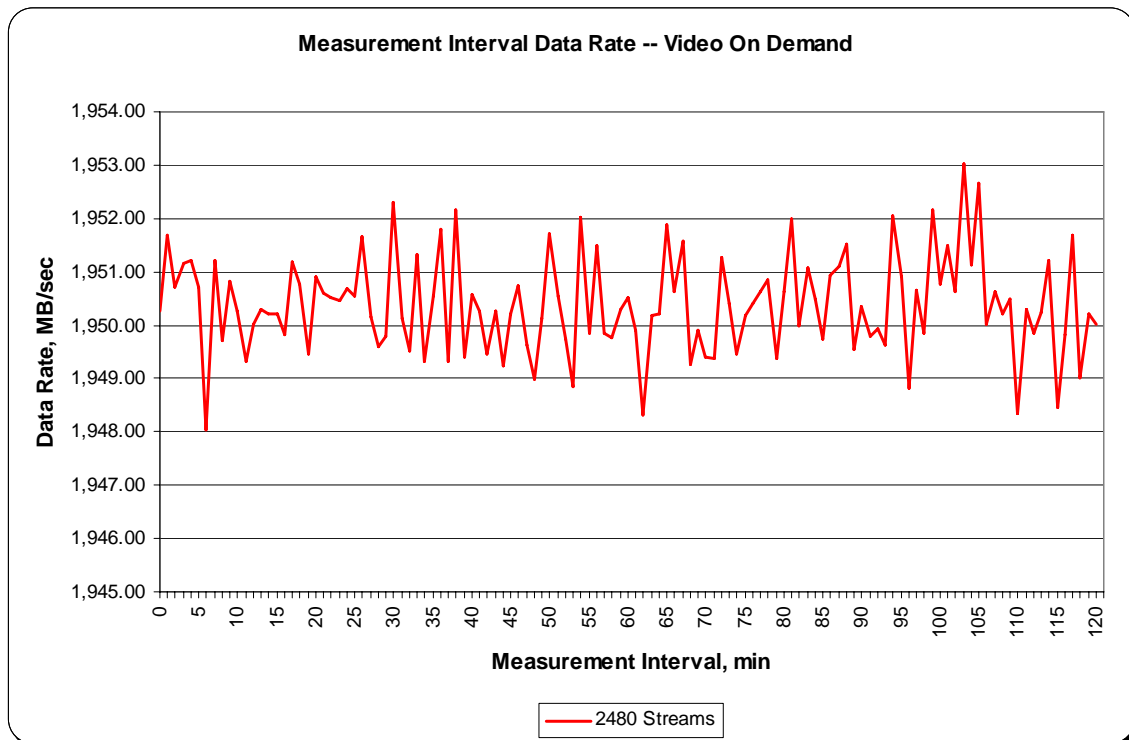
The SPC-2 Video on Demand Delivery Test Run data is contained in the table that appears on the next page. That table is followed by graphs illustrating the average Data Rate and average Data Rate per Stream produced by the same Test Runs. The table and graphs present the data at sixty second intervals.

TR1					TR1					TR1				
Test Run Sequence	2480 Streams Data Rate		Response Time, ms	Maximum Response Time, ms	Test Run Sequence	2480 Streams Data Rate		Response Time, ms	Maximum Response Time, ms	Test Run Sequence	2480 Streams Data Rate		Response Time, ms	Maximum Response Time, ms
	Data Rate, MB/sec	/ Stream, MB/sec				Data Rate, MB/sec	/ Stream, MB/sec				Data Rate, MB/sec	/ Stream, MB/sec		
0:01:00	198.98	0.68	3.29	108.66	0:51:00	1,950.11	0.79	16.39	134.95	1:41:00	1,952.00	0.79	15.69	116.54
0:02:00	559.64	0.77	6.72	93.40	0:52:00	1,949.52	0.79	16.42	133.94	1:42:00	1,949.98	0.79	15.79	130.19
0:03:00	845.48	0.77	9.30	84.09	0:53:00	1,951.32	0.79	16.41	130.07	1:43:00	1,951.07	0.79	16.01	126.21
0:04:00	1,073.57	0.78	10.76	79.80	0:54:00	1,949.31	0.79	16.36	146.05	1:44:00	1,950.49	0.79	16.60	139.52
0:05:00	1,287.42	0.78	11.91	93.38	0:55:00	1,950.55	0.79	16.40	133.11	1:45:00	1,949.74	0.79	16.87	137.95
0:06:00	1,447.52	0.78	12.73	106.24	0:56:00	1,951.80	0.79	16.41	141.33	1:46:00	1,950.95	0.79	16.82	139.62
0:07:00	1,590.49	0.78	13.75	107.26	0:57:00	1,949.33	0.79	16.42	131.75	1:47:00	1,951.10	0.79	16.58	143.68
0:08:00	1,720.85	0.78	14.64	117.61	0:58:00	1,952.17	0.79	16.38	125.37	1:48:00	1,951.51	0.79	16.48	129.66
0:09:00	1,834.52	0.79	15.43	130.29	0:59:00	1,949.39	0.79	16.40	144.27	1:49:00	1,949.56	0.79	16.51	135.73
0:10:00	1,919.93	0.78	16.15	136.47	1:00:00	1,950.57	0.79	16.37	132.90	1:50:00	1,950.34	0.79	16.47	148.18
0:11:00	1,947.85	0.79	16.41	134.42	1:01:00	1,950.28	0.79	16.23	136.63	1:51:00	1,949.79	0.79	16.48	147.44
0:12:00	1,950.34	0.79	16.39	127.89	1:02:00	1,949.45	0.79	16.04	127.70	1:52:00	1,949.93	0.79	16.45	140.27
0:13:00	1,950.35	0.79	16.41	135.21	1:03:00	1,950.27	0.79	16.21	128.98	1:53:00	1,949.64	0.79	16.49	131.13
0:14:00	1,950.51	0.79	16.41	138.69	1:04:00	1,949.24	0.79	16.09	132.35	1:54:00	1,952.05	0.79	16.51	138.23
0:15:00	1,949.75	0.79	16.36	137.14	1:05:00	1,950.21	0.79	16.21	136.29	1:55:00	1,950.91	0.79	16.53	141.86
0:16:00	1,951.62	0.79	16.30	132.97	1:06:00	1,950.73	0.79	16.19	134.82	1:56:00	1,948.81	0.79	16.54	142.70
0:17:00	1,950.63	0.79	16.31	140.05	1:07:00	1,949.64	0.79	16.24	149.57	1:57:00	1,950.67	0.79	16.56	141.55
0:18:00	1,950.88	0.79	16.27	131.39	1:08:00	1,948.98	0.79	16.11	135.21	1:58:00	1,949.84	0.79	16.53	131.60
0:19:00	1,949.86	0.79	16.30	128.58	1:09:00	1,950.12	0.79	16.19	178.83	1:59:00	1,952.17	0.79	16.50	143.02
0:20:00	1,950.26	0.79	16.30	135.55	1:10:00	1,951.71	0.79	16.14	145.31	2:00:00	1,950.76	0.79	16.47	138.92
0:21:00	1,951.70	0.79	16.56	147.71	1:11:00	1,950.54	0.79	16.19	120.03	2:01:00	1,951.48	0.79	16.19	124.41
0:22:00	1,950.71	0.79	17.17	179.76	1:12:00	1,949.73	0.79	16.15	124.46	2:02:00	1,950.62	0.79	15.67	121.54
0:23:00	1,951.16	0.79	17.63	191.47	1:13:00	1,948.85	0.79	16.23	125.43	2:03:00	1,953.03	0.79	15.60	115.71
0:24:00	1,951.22	0.79	17.52	188.80	1:14:00	1,952.02	0.79	16.19	122.50	2:04:00	1,951.13	0.79	15.66	116.14
0:25:00	1,950.70	0.79	17.64	233.23	1:15:00	1,949.84	0.79	16.16	118.19	2:05:00	1,952.67	0.79	15.61	119.92
0:26:00	1,948.03	0.79	17.63	200.29	1:16:00	1,951.50	0.79	16.15	129.08	2:06:00	1,950.02	0.79	15.64	128.29
0:27:00	1,951.22	0.79	17.58	183.70	1:17:00	1,949.86	0.79	16.12	121.24	2:07:00	1,950.63	0.79	15.47	129.46
0:28:00	1,949.70	0.79	17.75	168.77	1:18:00	1,949.76	0.79	16.10	133.17	2:08:00	1,950.22	0.79	15.47	123.58
0:29:00	1,950.82	0.79	17.48	158.85	1:19:00	1,950.30	0.79	16.09	134.25	2:09:00	1,950.48	0.79	15.50	120.49
0:30:00	1,950.28	0.79	17.64	169.66	1:20:00	1,950.52	0.79	16.08	114.50	2:10:00	1,948.33	0.79	15.61	110.16
0:31:00	1,949.32	0.79	17.60	180.19	1:21:00	1,949.91	0.79	16.01	126.88	2:11:00	1,950.30	0.79	15.58	125.57
0:32:00	1,950.01	0.79	17.56	200.67	1:22:00	1,948.32	0.79	16.01	121.11	2:12:00	1,949.85	0.79	15.57	106.22
0:33:00	1,950.28	0.79	17.61	171.23	1:23:00	1,950.18	0.79	16.13	136.29	2:13:00	1,950.25	0.79	15.56	113.85
0:34:00	1,950.22	0.79	17.67	185.02	1:24:00	1,950.21	0.79	16.28	159.39	2:14:00	1,951.22	0.79	15.56	113.27
0:35:00	1,950.21	0.79	17.68	192.20	1:25:00	1,951.88	0.79	16.08	136.39	2:15:00	1,948.47	0.79	15.52	116.64
0:36:00	1,949.83	0.79	17.64	185.15	1:26:00	1,950.64	0.79	15.89	125.59	2:16:00	1,949.82	0.79	15.52	118.45
0:37:00	1,951.18	0.79	17.62	177.42	1:27:00	1,951.59	0.79	16.01	124.30	2:17:00	1,951.69	0.79	15.56	112.81
0:38:00	1,950.78	0.79	17.69	177.41	1:28:00	1,949.27	0.79	16.06	133.24	2:18:00	1,949.01	0.79	15.58	111.49
0:39:00	1,949.45	0.79	17.66	185.18	1:29:00	1,949.91	0.79	16.02	135.04	2:19:00	1,950.20	0.79	15.55	114.91
0:40:00	1,950.90	0.79	17.69	181.03	1:30:00	1,949.41	0.79	16.01	121.07	2:20:00	1,950.03	0.79	15.51	111.31
0:41:00	1,950.61	0.79	17.29	175.22	1:31:00	1,949.38	0.79	16.00	129.42					
0:42:00	1,950.53	0.79	16.59	168.78	1:32:00	1,951.27	0.79	15.96	121.13					
0:43:00	1,950.45	0.79	16.54	140.15	1:33:00	1,950.39	0.79	15.97	122.45					
0:44:00	1,950.69	0.79	16.45	135.20	1:34:00	1,949.46	0.79	15.94	119.62					
0:45:00	1,950.54	0.79	16.64	140.01	1:35:00	1,950.17	0.79	15.95	122.85					
0:46:00	1,951.66	0.79	16.66	140.69	1:36:00	1,950.40	0.79	15.93	123.19					
0:47:00	1,950.14	0.79	16.44	132.97	1:37:00	1,950.63	0.79	15.89	115.15					
0:48:00	1,949.60	0.79	16.33	139.70	1:38:00	1,950.85	0.79	15.81	120.57					
0:49:00	1,949.79	0.79	16.59	147.19	1:39:00	1,949.36	0.79	15.76	112.60					
0:50:00	1,952.29	0.79	16.45	133.32	1:40:00	1,950.64	0.79	15.78	114.24					

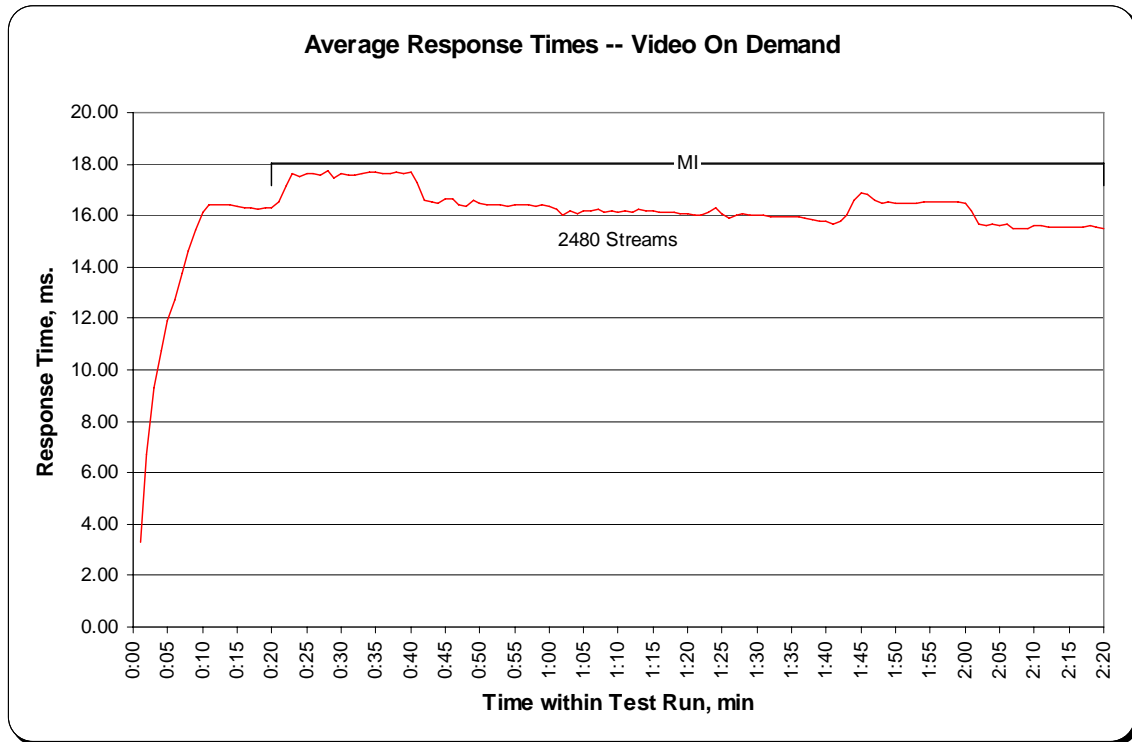
### SPC-2 Video on Demand Delivery Average Data Rate Graph



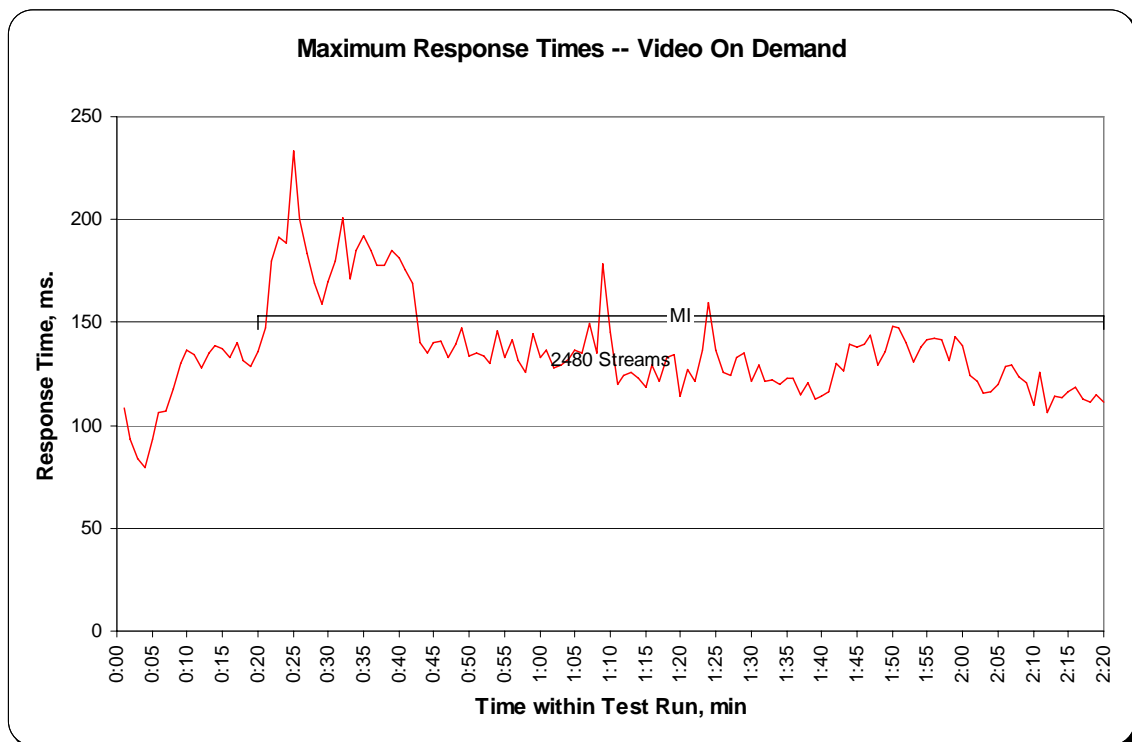
### SPC-2 Video on Demand Delivery Average Data Rate per Stream Graph



### SPC-2 Video on Demand Delivery Average Response Time Graph



### SPC-2 Video on Demand Delivery Maximum Response Time Graph





## Data Persistence Test

### Clause 6

*The Data Persistence Test demonstrates the Tested Storage Configuration (TSC):*

- *Is capable of maintain data integrity across a power cycle.*
- *Ensures the transfer of data between Logical Volumes and host systems occurs without corruption or loss.*

*The SPC-2 Workload Generator will write a specific pattern at randomly selected locations throughout the Total ASU Capacity (Persistence Test Run 1). The SPC-2 Workload Generator will retain the information necessary to later validate the pattern written at each location.*

*The Tested Storage Configuration will be shutdown and restarted using a power off/power on cycle at the end of the above sequence of write operations. In addition, any caches employing battery backup must be flushed/emptied.*

*Restart the TSC, and if the Host System(s) were shutdown and powered off, restart the Host System(s).*

*The SPC-2 Workload Generator will utilize the retained data from Persistence Test Run 1 to verify (Persistence Run 2) the bit patterns written in Persistence Test Run 1 and their corresponding location.*

### Clause 10.6.8.4

*The Full Disclosure Report will contain the following content for the Data Persistence Test:*

1. *A listing of the SPC-2 Workload Generator commands and parameters used to execute each of the Test Runs in the Persistence Test.*
2. *The human readable SPC-2 Test Results File for each of the Test Runs in the Data Persistence Test.*
3. *A table from the successful Persistence Test, which contains the results from the test.*

## SPC-2 Workload Generator Commands and Parameters

The SPC-2 Workload Generator commands and parameters for the Persistence Test Runs are documented in “Appendix E: SPC-2 Workload Generator Execution Commands and Parameters” on Page 127.

## Data Persistence Test Results File

A link to the test result file generated from each Data Persistence Test is listed below.

[Persistence 1 Test Results File](#)

[Persistence 2 Test Results File](#)

**Data Persistence Test Results**

<b>Data Persistence Test Results</b>	
Data Persistence Test Number: 1	
Total Number of Logical Blocks Written	553,234
Total Number of Logical Blocks Re-referenced	64,934
Total Number of Logical Blocks Verified	553,234
Total Number of Logical Blocks that Failed Verification	0
Number of Failed I/O Requests in the process of the Test	0

## **PRICED STORAGE CONFIGURATION AVAILABILITY DATE**

### *Clause 10.6.9*

*The committed delivery date for general availability (Availability Date) of all products that comprise the Priced Storage Configuration must be reported. When the Priced Storage Configuration includes products or components with different availability dates, the reported Availability Date must be the date at which all components are committed to be available. All availability dates, whether for individual components or for the Priced Storage Configuration as a whole, must be disclosed to a precision of one day.*

*The FDR shall state: "The **Priced Storage Configuration**, as documented in this Full Disclosure Report will be available for shipment to customers on MMMM DD, YYYY." Where **Priced Storage Configuration** is the Priced Storage Configuration Name as described in Clause 10.6.5.3, #1 and MM is month, DD is the day, and YY is the year of the date that the Priced Storage Configuration, as documented, is available for shipment to customers as described above.*

The Fujitsu Storage Systems ETERNUS4000 Model 500, as documented in this SPC-2 Full Disclosure Report, will become available December 31, 2006 for customer purchase and shipment.

## **ANOMALIES OR IRREGULARITIES**

### *Clause 10.6.11*

*The FDR shall include a clear and complete description of any anomalies or irregularities encountered in the course of executing the SPC-2 benchmark that may in any way call into question the accuracy, verifiability, or authenticity of information published in this FDR.*

There were no anomalies or irregularities encountered during the SPC-2 Remote Audit of the Fujitsu Storage Systems ETERNUS4000 Model 500.

## **APPENDIX A: SPC-2 GLOSSARY**

### **“Decimal” (*powers of ten*) Measurement Units**

In the storage industry, the terms “kilo”, “mega”, “giga”, “tera”, “peta”, and “exa” are commonly used prefixes for computing performance and capacity. For the purposes of the SPC workload definitions, all of the following terms are defined in “powers of ten” measurement units.

- A kilobyte (KB) is equal to 1,000 ( $10^3$ ) bytes.
- A megabyte (MB) is equal to 1,000,000 ( $10^6$ ) bytes.
- A gigabyte (GB) is equal to 1,000,000,000 ( $10^9$ ) bytes.
- A terabyte (TB) is equal to 1,000,000,000,000 ( $10^{12}$ ) bytes.
- A petabyte (PB) is equal to 1,000,000,000,000,000 ( $10^{15}$ ) bytes
- An exabyte (EB) is equal to 1,000,000,000,000,000,000 ( $10^{18}$ ) bytes

### **“Binary” (*powers of two*) Measurement Units**

The sizes reported by many operating system components use “powers of two” measurement units rather than “power of ten” units. The following standardized definitions and terms are also valid and may be used in this document.

- A kibibyte (KiB) is equal to 1,024 ( $2^{10}$ ) bytes.
- A mebibyte (MiB) is equal to 1,048,576 ( $2^{20}$ ) bytes.
- A gibibyte (GiB) is equal to 1,073,741,824 ( $2^{30}$ ) bytes.
- A tebibyte (TiB) is equal to 1,099,511,627,776 ( $2^{40}$ ) bytes.
- A pebibyte (PiB) is equal to 1,125,899,906,842,624 ( $2^{50}$ ) bytes.
- An exbibyte (EiB) is equal to 1,152,921,504,606,846,967 ( $2^{60}$ ) bytes.

## **SPC-2 Data Repository Definitions**

**Total ASU Capacity:** The total storage capacity read and written in the course of executing the SPC-2 benchmark.

**Application Storage Unit (ASU):** The logical interface between the storage and SPC-2 Workload Generator. The ASU is implemented on one or more Logical Volume.

**Logical Volume:** The division of Addressable Storage Capacity into individually addressable logical units of storage used in the SPC-2 benchmark. Each Logical Volume is implemented as a single, contiguous address space.

**Addressable Storage Capacity:** The total storage (sum of Logical Volumes) that can be read and written by application programs such as the SPC-2 Workload Generator.

**Configured Storage Capacity:** This capacity includes the Addressable Storage Capacity and any other storage (parity disks, hot spares, etc.) necessary to implement the Addressable Storage Capacity.

**Physical Storage Capacity:** The formatted capacity of all storage devices physically present in the Tested Storage Configuration (TSC).

**Data Protection Overhead:** The storage capacity required to implement the selected level of data protection.

**Required Storage:** The amount of Configured Storage Capacity required to implement the Addressable Storage Configuration, excluding the storage required for the ASU.

**Global Storage Overhead:** The amount of Physical Storage Capacity that is required for storage subsystem use and unavailable for use by application programs.

**Total Unused Storage:** The sum of unused storage capacity within the Physical Storage Capacity, Configured Storage Capacity, and Addressable Storage Capacity.

## SPC-2 Data Protection Levels

**RAID5:** User data is distributed across the disks in the array. Check data corresponding to user data is distributed across multiple disks in the form of bit-by-bit parity.

**Mirroring:** Two or more identical copies of user data are maintained on separate disks.

**Other Protection Level:** Any data protection other than **RAID5** or **Mirroring**.

**Unprotected:** There is no data protection provided.

## SPC-2 Test Execution Definitions

**Completed I/O Request:** An I/O Request with a Start Time and a Completion Time (*see "I/O Completion Types" illustrated below*).

**Completion Time:** The time recorded by the Workload Generator when an I/O Request is completed by the Tested Storage Configuration (TSC) as signaled by System Software.

**Data Rate:** The data volume, in MB, transferred by all Measured I/O Requests in an SPC-2 Test Run divided by the length of the Test Run in seconds.

**Failed I/O Request:** Any I/O Request issued by the SPC-2 Workload Generator that meets one of the following conditions (*see "I/O Completion Types" illustrated below*):

- The I/O Request was signaled as failed by System Software.
- The I/O Request started within the Measurement Interval, but did not complete prior to the end of the appropriate Run-Out period..
- The I/O Request started within the Run-Out period, but did not complete prior to the end of the appropriate Ramp-Down period.

**I/O Request Throughput:** The total number of Measured I/O Requests in an SPC-2 Test Run divided by the duration of the Measurement Interval in seconds.

**Measured I/O Request:** A Completed I/O Request that begins (Start Time) within a Measurement Interval and completes (Completion Time) prior to the end of the appropriate Ramp Down (see “I/O Completion Types” illustrated below).

**Measurement Interval:** A specified, contiguous period of time, after the TSC has reached Steady State, when data is collected by the Workload Generator to produce the test results for a SPC-2 Test Run (see “SPC-2 Test Run Components” illustrated below, Test Run 1:  $T_2-T_3$  and Test Run 2:  $T_7-T_8$ ).

**Outstanding I/O Requests:** The Outstanding I/O Requests parameter specifies the maximum number of concurrent I/O Requests, associated with a give Stream, which have been issued but not yet completed. (Clause 3.4.4 of the SPC-2 Benchmark Specification).

**Ramp-Down:** A specified, contiguous period of time in which the TSC is required to complete I/O Requests started but not completed during the preceding Run-Out period. Ramp-Down begins at the end of the preceding Run-Out period (see “SPC-2 Test Run Components” illustrated below, Test Run 1:  $T_4-T_5$  and Test Run 2:  $T_9-T_{10}$ ). The Workload Generator will not submit any I/O Requests during the Ramp-Down.

**Ramp-Up:** A specified, contiguous period of time required for the Benchmark Configuration (BC) to produce Steady State throughput after the Workload Generator begins submitting I/O Requests to the TSC for execution. The Ramp-Up period ends at the beginning of the Measurement Interval (see “SPC-2 Test Run Components” illustrated below, Test Run 1:  $T_0-T_2$  and Test Run 2:  $T_5-T_7$ ).

**Response Time:** The Response Time of a Measured I/O Request is its Completion Time minus its Start Time.

**Run-Out:** A specified, contiguous period of time in which the TSC is required to complete I/O Requests started but not completed during the preceding Measurement Interval. The Run-Out period begins at the end of the preceding Measurement Interval and is a component of the Steady State period (see “SPC-2 Test Run Components” illustrated below, Test Run 1:  $T_3-T_4$  and Test Run 2:  $T_9-T_{10}$ ). The Workload Generator will continue to submit I/O Requests at the Test Run’s specified rate during the Run-Out period.

**Start Time:** The time recorded by the Workload Generator when an I/O Request is submitted, by the Workload Generator, to the System Software for execution on the TSC.

**Steady State:** The period during which the workload presented to the TSC by the SPC-2 Workload Generator is constant and the resulting TSC I/O Request Throughput is both consistent and sustainable. The Steady State period includes both the Measurement Interval and Run-Out periods (see “SPC-2 Test Run Components” illustrated below, Test Run 1:  $T_1-T_4$  and Test Run 2:  $T_6-T_9$ ).

Steady State is achieved only after caches in the TSC have filled and as a result the I/O Request Throughput of the TSC has stabilized.

**Stream:** A collection of Stream Segments that started within a Test Run.

**Stream Segment:** A sequentially organized pattern of I/O requests, which transfers a contiguous range of data.

**Test:** A collection of Test Phases and or Test Runs sharing a common objective.

**Test Phase:** A collection of one or more SPC-2 Test Runs sharing a common objective and intended to be run in a specific sequence.

**Test Run:** The execution of SPC-2 that produces specific SPC-2 test results. SPC-2 Test Runs have specified, measured Ramp-Up, Measurement Interval, Run-Out and Ramp-Down periods. "SPC-2 Test Run Components" (*see below*) illustrates the Ramp-Up, Steady State, Measurement Interval, Run-Out, and Ramp-Down components contained in two uninterrupted SPC-2 Test Runs (*Test Run 1:  $T_0$ - $T_5$  and Test Run 2:  $T_5$ - $T_{10}$* ).

**Test Run Sequence:** A related sequence of Large File Processing (LFP) or Large Database Query (LDQ) Test Runs. Each Test Run Sequence will consist of five Test Runs, which vary the number of Streams as follows:

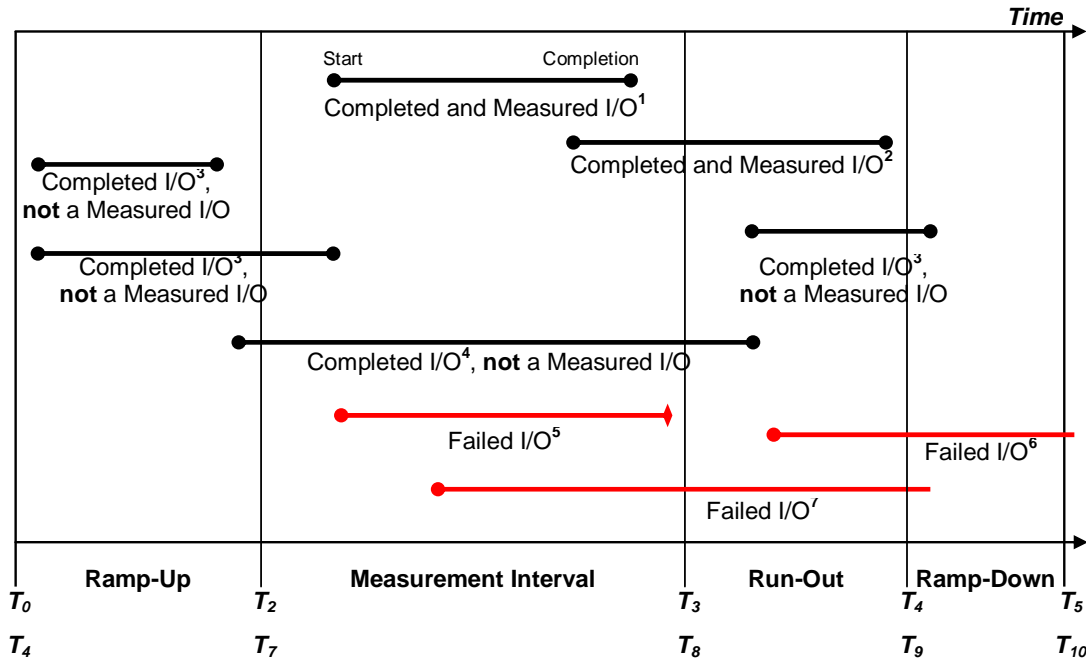
- Test Run 1: Maximum number of Streams, which is selected by the Test Sponsor
- Test Run 2: 50% of the maximum number of Streams used in Test Run 1.
- Test Run 3: 25% of the maximum number of Streams used in Test Run 1.
- Test Run 4: 12.5% of the maximum number of Streams used in Test Run 1.
- Test Run 5: 1 Stream.

Each of the five Test Runs in a Test Run Sequence will share the same attributes with the exception of the number of Streams. For example:

- Large File Processing, Read, 1024 KiB Transfer Size: Maximum Streams
- Large File Processing, Read, 1024 KiB Transfer Size: 50% of Maximum Streams
- Large File Processing, Read, 1024 KiB Transfer Size: 25% of Maximum Streams
- Large File Processing, Read, 1024 KiB Transfer Size: 12.5% of Maximum Streams
- Large File Processing, Read, 1024 KiB Transfer Size: 1 Stream

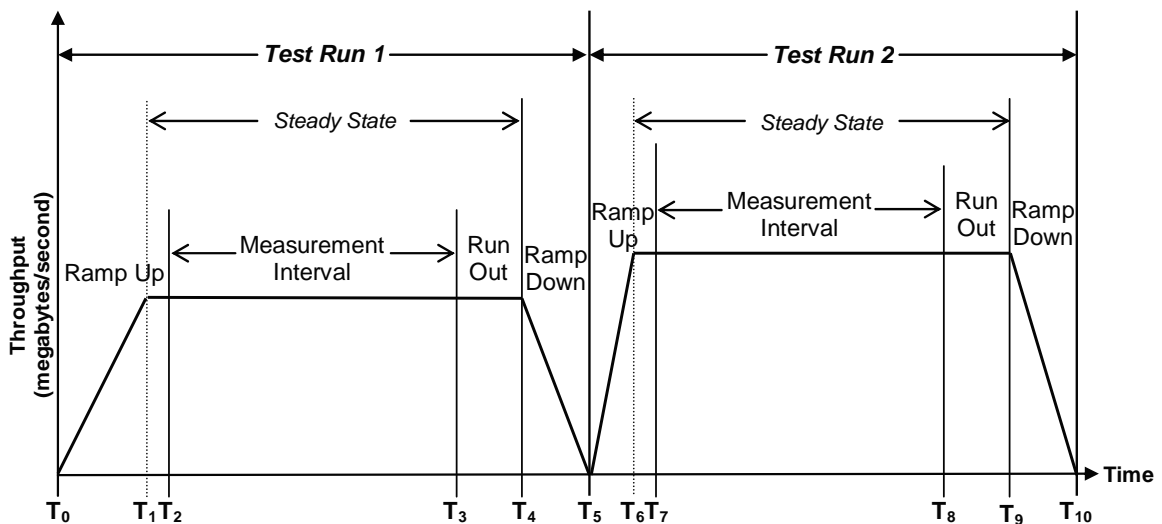
**Transfer Size:** The Transfer Size parameter specifies the number of bytes in KiB to transfer. (*Clause 3.4.7 of the SPC-2 Benchmark Specification*)

### I/O Completion Types



- Completed and Measured I/O<sup>1</sup>:** I/O started and completed within the Measurement Interval.
- Completed and Measured I/O<sup>2</sup>:** I/O started within the Measurement Interval and completed within Ramp Down.
- Completed I/O<sup>3</sup>:** I/O started before or after the Measurement Interval – not measured.
- Completed I/O<sup>4</sup>:** I/O started before and completed after the Measurement Interval – not measured.
- Failed I/O<sup>5</sup>:** Signaled as failed by System Software.
- Failed I/O<sup>6</sup>:** I/O did not complete prior to the end of Ramp-Down.
- Failed I/O<sup>7</sup>:** I/O did not complete prior to the end of Run-Out.

### SPC-2 Test Run Components





## **APPENDIX B: CUSTOMER TUNABLE PARAMETERS AND OPTIONS**

The following customer tunable parameters/options were modified in the Window registry:

```
MaximumSGList=ff  
QueueDepth=255  
Emulex Option=0xD200
```

## **APPENDIX C: TESTED STORAGE CONFIGURATION (TSC) CREATION**

The ETERNUS4000 Storage Array is configured using an interactive on-line tool called ETERNUSmgr. When an ETERNUS4000 unit is delivered from the factory, there are a set of default RAID Groups and LUNs defined, and the tool is used to modify the configuration to that needed in the customer environment. The following paragraphs outline use of this tool to define the configuration outlined within this FDR. The primary definitions for use in making the configuration are provided through an Excel spreadsheet, called a Design Sheet. The Design sheets for the TSC may be accessed via the following URLs:

### **[E4k Design Sheets](#)**

This design sheet is developed by the Fujitsu SE, in consultation with the customer, and is provided to the Fujitsu factory when the order for the system is placed. The factory will configure the system according to this design, using internal Fujitsu tools.

Should a customer need to change the delivered configuration, then a series of steps must be followed, using ETERNUSmgr. The User Guide for the ETERNUSmgr is available for download from:

[http://www.fujitsu.com/downloads/STRSYS/system/e8kmgrm700m1100-e4kmgrm300m500\\_setting.pdf](http://www.fujitsu.com/downloads/STRSYS/system/e8kmgrm700m1100-e4kmgrm300m500_setting.pdf)

To define a new RAID Group the following steps are used:

1. Assuming that there are available drives to assign to a new RAID Group, select “Setting RAID / Setting Host” in the Main menu.
2. Select “Create RAID Group” in the Setting RAID / Setting Host menu
3. The Create RAID Group screen will be presented, with the available drives shown. Select the drives to be included in the RAID Group and the desired RAID Level, leaving the Assigned CM selection to Auto, and click the “Set” button. A confirmation screen is provided before the action is committed.
4. Additional RAID Groups can be defined by repeating the process, or the user may move directly to the Create Logical Volume screen noted below.

It is necessary to define one or more Logical Volumes within each of the defined RAID Groups, using the following steps:

1. Again, select “Setting RAID / Setting Host” in the Main menu.
2. Select “Create Logical Volume” in the Setting RAID / Setting Host menu.
3. The Create Logical Volume screen will be presented, with the current Logical Volume List shown. Select “Register Logical volume”.
4. The Create Logical Volume Screen (Volume Creation) screen will be presented, with a list of the RAID Groups defined, and the capacity of each (in MiB). Select the RAID Group in which a Logical Volume is to be defined.

5. Select an Open type of volume with the Capacity desired. Use the entire RAID Group by putting in the capacity listed for the selected RAID Group, and click the “Set” button. A confirmation screen is provided before the action is committed.
6. Additional Logical Volumes can be defined by repeating the process for other RAID Groups, or the user may return to the Main menu to continue.

The configuration plan for the SPC-2 Benchmark configuration has 8 Windows servers directly connected by two HBAs each to two Channel Adapter ports, 16 CA port connections in all. Each port was set up using the following steps:

1. Again, select “Setting RAID / Setting Host” in the Main menu.
2. Select “Set CA Parameters’ in the Setting RAID / Setting Host menu.
3. The Set CA Parameters CA Selection screen will be presented. Select the CA Port for which the parameters are to be set, based on the configuration plan.
4. The Set CA Parameters screen will be presented. As this is a fabric switch connection from the server HBA port to the storage CA port, select the Fabric mode of operation. The Class 3, and Affinity Mode Off with default Host Response apply. The only item that was changed for the benchmark was the selection of Fabric mode and 4G for the Transfer Rate.
5. With the selections complete, click the “Set” button to reach the confirmation screen – click “OK” to apply the selection for the port.

The configuration plan for the SPC-2 Benchmark configuration assigns the 16 Logical Volumes as LUNs 0-15 on each of the Channel Adapter ports. There are 32 Logical Volumes in the defined configuration, 16 of which are mapped to half of the CAs and the other half mapped to the other CAs according to the configuration plan. The following steps are used to set the LUN mapping for each of the CA ports:

1. Again, select “Setting RAID / Setting Host” in the Main menu.
2. Select “Set LUN Mapping” in the Setting RAID / Setting Host menu.
3. The Set LUN Mapping CA Selection screen will be presented. Select the CA Port that needs the LUNs to be mapped.
4. The Set LUN Mapping Volume Selection screen will be presented. Using the information on the configuration planning sheets, the “Set Range” mode should be selected, the range of LUN#s to be mapped, and the starting Logical Volume# specified, to define the set of mapping to be applied. In this case, where the LUN# are spread over the Logical Volumes, each range selected will consist of only one or two LUNs.
5. The “Open Volume List” facility can be used to identify the Logical Volumes that are defined, and which can be mapped within the CA port. Once the mapping parameters are set, click the “Execute” button to set up this part of the mapping. Additional ranges can be selected and set up for mapping on the port. Once all of the desired mapping has been set up in the list provided, click on the “Set” button to proceed to the confirmation screen – click “OK” to apply the mapping to the port definitions.

The configuration plan also includes Hot Spare drives, which are defined in much the same way as RAID Groups, using the following steps:

1. Select “Setting RAID / Setting Host” in the Main menu
2. Select “Create Hot Spare” in the Setting RAID / Setting Host menu
3. The Create Hot Spare selection screen will be presented. Select the drives to be designated as Hot Spare drives, according to the configuration plan, and click the “Set” button to proceed to the confirmation screen – click “OK” to apply the designations of Hot Spare to the selected drives.

Each step along the way to completing the configuration does a small part, and the configuration plan provides the details of the specific entries that are defined, using the ETERNUSmgr interface. For most customer systems, where the design sheets provide the complete configuration plan, the ETERNUS4000 system is pre-configured at the factory. However, when the plan is not complete or not supplied with an order, a default configuration will be applied by the factory, based on the complement of components ordered.

## **APPENDIX D: SPC-2 WORKLOAD GENERATOR STORAGE COMMANDS AND PARAMETERS**

### **Large File Processing Test (LFP)**

\* Large File Processing (LFP)

```
host=localhost,jvms=2,java=(java,"-Xmx1024m -Xms512m -Xss96k")
host=(10.123.216.236,R450-2),java=("C:\Program
Files\Java\jre1.5.0_04\bin\java.exe","-Xmx1024m -Xms512m -
Xss96k"),shell=spc2,jvms=2,output=c:\output\4k-audit-lfp
host=(10.123.216.237,R450-3),java=("C:\Program
Files\Java\jre1.5.0_04\bin\java.exe","-Xmx1024m -Xms512m -
Xss96k"),shell=spc2,jvms=2,output=c:\output\4k-audit-lfp
host=(10.123.216.238,R450-4),java=("C:\Program
Files\Java\jre1.5.0_04\bin\java.exe","-Xmx1024m -Xms512m -
Xss96k"),shell=spc2,jvms=2,output=c:\output\4k-audit-lfp
host=(10.123.216.239,R450-5),java=("C:\Program
Files\Java\jre1.5.0_04\bin\java.exe","-Xmx1024m -Xms512m -
Xss96k"),shell=spc2,jvms=2,output=c:\output\4k-audit-lfp
host=(10.123.216.240,R450-6),java=("C:\Program
Files\Java\jre1.5.0_04\bin\java.exe","-Xmx1024m -Xms512m -
Xss96k"),shell=spc2,jvms=2,output=c:\output\4k-audit-lfp
host=(10.123.216.241,R450-7),java=("C:\Program
Files\Java\jre1.5.0_04\bin\java.exe","-Xmx1024m -Xms512m -
Xss96k"),shell=spc2,jvms=2,output=c:\output\4k-audit-lfp
host=(10.123.216.242,R450-8),java=("C:\Program
Files\Java\jre1.5.0_04\bin\java.exe","-Xmx1024m -Xms512m -
Xss96k"),shell=spc2,jvms=2,output=c:\output\4k-audit-lfp

sd=default,host=localhost,size=66.50g
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
```

```
sd=sd30,lun=\\.\PhysicalDrive30  
sd=sd31,lun=\\.\PhysicalDrive31  
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-2  
sd=sd1,lun=\\.\PhysicalDrive1  
sd=sd2,lun=\\.\PhysicalDrive2  
sd=sd3,lun=\\.\PhysicalDrive3  
sd=sd4,lun=\\.\PhysicalDrive4  
sd=sd5,lun=\\.\PhysicalDrive5  
sd=sd6,lun=\\.\PhysicalDrive6  
sd=sd7,lun=\\.\PhysicalDrive7  
sd=sd8,lun=\\.\PhysicalDrive8  
sd=sd9,lun=\\.\PhysicalDrive9  
sd=sd10,lun=\\.\PhysicalDrive10  
sd=sd11,lun=\\.\PhysicalDrive11  
sd=sd12,lun=\\.\PhysicalDrive12  
sd=sd13,lun=\\.\PhysicalDrive13  
sd=sd14,lun=\\.\PhysicalDrive14  
sd=sd15,lun=\\.\PhysicalDrive15  
sd=sd16,lun=\\.\PhysicalDrive16  
sd=sd17,lun=\\.\PhysicalDrive17  
sd=sd18,lun=\\.\PhysicalDrive18  
sd=sd19,lun=\\.\PhysicalDrive19  
sd=sd20,lun=\\.\PhysicalDrive20  
sd=sd21,lun=\\.\PhysicalDrive21  
sd=sd22,lun=\\.\PhysicalDrive22  
sd=sd23,lun=\\.\PhysicalDrive23  
sd=sd24,lun=\\.\PhysicalDrive24  
sd=sd25,lun=\\.\PhysicalDrive25  
sd=sd26,lun=\\.\PhysicalDrive26  
sd=sd27,lun=\\.\PhysicalDrive27  
sd=sd28,lun=\\.\PhysicalDrive28  
sd=sd29,lun=\\.\PhysicalDrive29  
sd=sd30,lun=\\.\PhysicalDrive30  
sd=sd31,lun=\\.\PhysicalDrive31  
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-3  
sd=sd1,lun=\\.\PhysicalDrive1  
sd=sd2,lun=\\.\PhysicalDrive2  
sd=sd3,lun=\\.\PhysicalDrive3  
sd=sd4,lun=\\.\PhysicalDrive4  
sd=sd5,lun=\\.\PhysicalDrive5  
sd=sd6,lun=\\.\PhysicalDrive6  
sd=sd7,lun=\\.\PhysicalDrive7  
sd=sd8,lun=\\.\PhysicalDrive8  
sd=sd9,lun=\\.\PhysicalDrive9  
sd=sd10,lun=\\.\PhysicalDrive10  
sd=sd11,lun=\\.\PhysicalDrive11  
sd=sd12,lun=\\.\PhysicalDrive12  
sd=sd13,lun=\\.\PhysicalDrive13  
sd=sd14,lun=\\.\PhysicalDrive14  
sd=sd15,lun=\\.\PhysicalDrive15  
sd=sd16,lun=\\.\PhysicalDrive16  
sd=sd17,lun=\\.\PhysicalDrive17  
sd=sd18,lun=\\.\PhysicalDrive18  
sd=sd19,lun=\\.\PhysicalDrive19  
sd=sd20,lun=\\.\PhysicalDrive20  
sd=sd21,lun=\\.\PhysicalDrive21  
sd=sd22,lun=\\.\PhysicalDrive22  
sd=sd23,lun=\\.\PhysicalDrive23  
sd=sd24,lun=\\.\PhysicalDrive24
```

```
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-4
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-5
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
```

```
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-6
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-7
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
```



```
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-8
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
maxlatestart=1
reportinginterval=5
segmentlength=512m
```

```
rd=default,rampup=240,periods=90,measurement=180,runout=45,rampdown=15,buffers=1
```

```
* LFP, Write Phase
```

```
rd=default,rdpct=0,xfersize=1024k
rd=TR1_SPC-2-FP,streams=32
```

```
rd=TR2_SPC-2-FP,streams=16
rd=TR3_SPC-2-FP,streams=8
rd=TR4_SPC-2-FP,streams=4
rd=TR5_SPC-2-FP,streams=1

rd=default,rdpct=0,xfersize=256k
rd=TR6_SPC-2-FP,streams=32
rd=TR7_SPC-2-FP,streams=16
rd=TR8_SPC-2-FP,streams=8
rd=TR9_SPC-2-FP,streams=4
rd=TR10_SPC-2-FP,streams=1

* LFP, Read/Write Phase

rd=default,rdpct=50,xfersize=1024k
rd=TR11_SPC-2-FP,streams=32
rd=TR12_SPC-2-FP,streams=16
rd=TR13_SPC-2-FP,streams=8
rd=TR14_SPC-2-FP,streams=4
rd=TR15_SPC-2-FP,streams=1

rd=default,rdpct=50,xfersize=256k
rd=TR16_SPC-2-FP,streams=32
rd=TR17_SPC-2-FP,streams=16
rd=TR18_SPC-2-FP,streams=8
rd=TR19_SPC-2-FP,streams=4
rd=TR20_SPC-2-FP,streams=1

* LFP, Read Phase

rd=default,rdpct=100,xfersize=1024k
rd=TR21_SPC-2-FP,streams=32
rd=TR22_SPC-2-FP,streams=16
rd=TR23_SPC-2-FP,streams=8
rd=TR24_SPC-2-FP,streams=4
rd=TR25_SPC-2-FP,streams=1

rd=default,rdpct=100,xfersize=256k
rd=TR26_SPC-2-FP,streams=32
rd=TR27_SPC-2-FP,streams=16
rd=TR28_SPC-2-FP,streams=8
rd=TR29_SPC-2-FP,streams=4
rd=TR30_SPC-2-FP,streams=1
```

## Large Database Query Test (LDQ)

```
* Large Database Query Test (LDQ)

host=localhost,jvms=2,java=( java, "-Xmx1024m -Xms512m -Xss96k" )
host=(10.123.216.236,R450-2),java=( "C:\Program
Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
Xss96k" ),shell=spc2,jvms=2,output=c:\output\e4k-audit-ldq
host=(10.123.216.237,R450-3),java=( "C:\Program
Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
Xss96k" ),shell=spc2,jvms=2,output=c:\output\e4k-audit-ldq
host=(10.123.216.238,R450-4),java=( "C:\Program
Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
Xss96k" ),shell=spc2,jvms=2,output=c:\output\e4k-audit-ldq
host=(10.123.216.239,R450-5),java=( "C:\Program
Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
Xss96k" ),shell=spc2,jvms=2,output=c:\output\e4k-audit-ldq
```

```
host=(10.123.216.240,R450-6),java=("C:\Program
Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
Xss96k"),shell=spc2,jvms=2,output=c:\output\e4k-audit-ldq
host=(10.123.216.241,R450-7),java=("C:\Program
Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
Xss96k"),shell=spc2,jvms=2,output=c:\output\e4k-audit-ldq
host=(10.123.216.242,R450-8),java=("C:\Program
Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
Xss96k"),shell=spc2,jvms=2,output=c:\output\e4k-audit-ldq
```

```
sd=default,host=localhost,size=66.50g
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-2
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
```

```
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-3
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-4
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
```

```
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-5
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-6
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
```

```
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
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sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-7
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
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sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-8
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
```

```
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
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sd=sd14,lun=\\.\PhysicalDrive14
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sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
maxlatestart=1
reportinginterval=5
segmentlength=512m
```

```
rd=default,rampup=240,periods=90,measurement=180,runout=45,rampdown=15,rdpct=99
```

```
* LDQ, 1024KiB Phase
```

```
rd=default,buffers=4,xfersize=1024k
rd=TR1_SPC-2-DQ,streams=32
rd=TR2_SPC-2-DQ,streams=16
rd=TR3_SPC-2-DQ,streams=8
rd=TR4_SPC-2-DQ,streams=4
rd=TR5_SPC-2-DQ,streams=1
```

```
rd=default,buffers=1,xfersize=1024k
rd=TR6_SPC-2-DQ,streams=32
rd=TR7_SPC-2-DQ,streams=16
rd=TR8_SPC-2-DQ,streams=8
rd=TR9_SPC-2-DQ,streams=4
rd=TR10_SPC-2-DQ,streams=1
```

```
* LDQ, 64KiB Phase
```

```
rd=default,buffers=4,xfersize=64k
rd=TR11_SPC-2-DQ,streams=32
rd=TR12_SPC-2-DQ,streams=16
rd=TR13_SPC-2-DQ,streams=8
rd=TR14_SPC-2-DQ,streams=4
rd=TR15_SPC-2-DQ,streams=1
```

```
rd=default,buffers=1,xfersize=64k
rd=TR16_SPC-2-DQ,streams=32
```

```
rd=TR17_SPC-2-DQ,streams=16  
rd=TR18_SPC-2-DQ,streams=8  
rd=TR19_SPC-2-DQ,streams=4  
rd=TR20_SPC-2-DQ,streams=1
```

## Video on Demand Delivery Test (VOD)

\* Video On Demand Test (VOD)

```
host=localhost,jvms=4,java=(java,"-Xmx1024m -Xms512m -Xss96k")  
host=(10.123.216.236,R450-2),java=("C:\Program  
Files\Java\jre1.5.0_04\bin\java.exe","-Xmx1024m -Xms512m -  
Xss96k"),shell=spc2,jvms=4,output=c:\output\e4k-audit-vod  
host=(10.123.216.237,R450-3),java=("C:\Program  
Files\Java\jre1.5.0_04\bin\java.exe","-Xmx1024m -Xms512m -  
Xss96k"),shell=spc2,jvms=4,output=c:\output\e4k-audit-vod  
host=(10.123.216.238,R450-4),java=("C:\Program  
Files\Java\jre1.5.0_04\bin\java.exe","-Xmx1024m -Xms512m -  
Xss96k"),shell=spc2,jvms=4,output=c:\output\e4k-audit-vod  
host=(10.123.216.239,R450-5),java=("C:\Program  
Files\Java\jre1.5.0_04\bin\java.exe","-Xmx1024m -Xms512m -  
Xss96k"),shell=spc2,jvms=4,output=c:\output\e4k-audit-vod  
host=(10.123.216.240,R450-6),java=("C:\Program  
Files\Java\jre1.5.0_04\bin\java.exe","-Xmx1024m -Xms512m -  
Xss96k"),shell=spc2,jvms=4,output=c:\output\e4k-audit-vod  
host=(10.123.216.241,R450-7),java=("C:\Program  
Files\Java\jre1.5.0_04\bin\java.exe","-Xmx1024m -Xms512m -  
Xss96k"),shell=spc2,jvms=4,output=c:\output\e4k-audit-vod  
host=(10.123.216.242,R450-8),java=("C:\Program  
Files\Java\jre1.5.0_04\bin\java.exe","-Xmx1024m -Xms512m -  
Xss96k"),shell=spc2,jvms=4,output=c:\output\e4k-audit-vod  
  
sd=default,host=localhost,size=66.50g  
sd=sd1,lun=\\.\PhysicalDrive1  
sd=sd2,lun=\\.\PhysicalDrive2  
sd=sd3,lun=\\.\PhysicalDrive3  
sd=sd4,lun=\\.\PhysicalDrive4  
sd=sd5,lun=\\.\PhysicalDrive5  
sd=sd6,lun=\\.\PhysicalDrive6  
sd=sd7,lun=\\.\PhysicalDrive7  
sd=sd8,lun=\\.\PhysicalDrive8  
sd=sd9,lun=\\.\PhysicalDrive9  
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sd=sd18,lun=\\.\PhysicalDrive18  
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sd=sd22,lun=\\.\PhysicalDrive22  
sd=sd23,lun=\\.\PhysicalDrive23  
sd=sd24,lun=\\.\PhysicalDrive24  
sd=sd25,lun=\\.\PhysicalDrive25  
sd=sd26,lun=\\.\PhysicalDrive26  
sd=sd27,lun=\\.\PhysicalDrive27  
sd=sd28,lun=\\.\PhysicalDrive28  
sd=sd29,lun=\\.\PhysicalDrive29
```



```
sd=sd30,lun=\\.\PhysicalDrive30  
sd=sd31,lun=\\.\PhysicalDrive31  
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-2  
sd=sd1,lun=\\.\PhysicalDrive1  
sd=sd2,lun=\\.\PhysicalDrive2  
sd=sd3,lun=\\.\PhysicalDrive3  
sd=sd4,lun=\\.\PhysicalDrive4  
sd=sd5,lun=\\.\PhysicalDrive5  
sd=sd6,lun=\\.\PhysicalDrive6  
sd=sd7,lun=\\.\PhysicalDrive7  
sd=sd8,lun=\\.\PhysicalDrive8  
sd=sd9,lun=\\.\PhysicalDrive9  
sd=sd10,lun=\\.\PhysicalDrive10  
sd=sd11,lun=\\.\PhysicalDrive11  
sd=sd12,lun=\\.\PhysicalDrive12  
sd=sd13,lun=\\.\PhysicalDrive13  
sd=sd14,lun=\\.\PhysicalDrive14  
sd=sd15,lun=\\.\PhysicalDrive15  
sd=sd16,lun=\\.\PhysicalDrive16  
sd=sd17,lun=\\.\PhysicalDrive17  
sd=sd18,lun=\\.\PhysicalDrive18  
sd=sd19,lun=\\.\PhysicalDrive19  
sd=sd20,lun=\\.\PhysicalDrive20  
sd=sd21,lun=\\.\PhysicalDrive21  
sd=sd22,lun=\\.\PhysicalDrive22  
sd=sd23,lun=\\.\PhysicalDrive23  
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sd=sd26,lun=\\.\PhysicalDrive26  
sd=sd27,lun=\\.\PhysicalDrive27  
sd=sd28,lun=\\.\PhysicalDrive28  
sd=sd29,lun=\\.\PhysicalDrive29  
sd=sd30,lun=\\.\PhysicalDrive30  
sd=sd31,lun=\\.\PhysicalDrive31  
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-3  
sd=sd1,lun=\\.\PhysicalDrive1  
sd=sd2,lun=\\.\PhysicalDrive2  
sd=sd3,lun=\\.\PhysicalDrive3  
sd=sd4,lun=\\.\PhysicalDrive4  
sd=sd5,lun=\\.\PhysicalDrive5  
sd=sd6,lun=\\.\PhysicalDrive6  
sd=sd7,lun=\\.\PhysicalDrive7  
sd=sd8,lun=\\.\PhysicalDrive8  
sd=sd9,lun=\\.\PhysicalDrive9  
sd=sd10,lun=\\.\PhysicalDrive10  
sd=sd11,lun=\\.\PhysicalDrive11  
sd=sd12,lun=\\.\PhysicalDrive12  
sd=sd13,lun=\\.\PhysicalDrive13  
sd=sd14,lun=\\.\PhysicalDrive14  
sd=sd15,lun=\\.\PhysicalDrive15  
sd=sd16,lun=\\.\PhysicalDrive16  
sd=sd17,lun=\\.\PhysicalDrive17  
sd=sd18,lun=\\.\PhysicalDrive18  
sd=sd19,lun=\\.\PhysicalDrive19  
sd=sd20,lun=\\.\PhysicalDrive20  
sd=sd21,lun=\\.\PhysicalDrive21  
sd=sd22,lun=\\.\PhysicalDrive22  
sd=sd23,lun=\\.\PhysicalDrive23  
sd=sd24,lun=\\.\PhysicalDrive24
```

```
sd=sd25,lun=\\.\PhysicalDrive25  
sd=sd26,lun=\\.\PhysicalDrive26  
sd=sd27,lun=\\.\PhysicalDrive27  
sd=sd28,lun=\\.\PhysicalDrive28  
sd=sd29,lun=\\.\PhysicalDrive29  
sd=sd30,lun=\\.\PhysicalDrive30  
sd=sd31,lun=\\.\PhysicalDrive31  
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-4  
sd=sd1,lun=\\.\PhysicalDrive1  
sd=sd2,lun=\\.\PhysicalDrive2  
sd=sd3,lun=\\.\PhysicalDrive3  
sd=sd4,lun=\\.\PhysicalDrive4  
sd=sd5,lun=\\.\PhysicalDrive5  
sd=sd6,lun=\\.\PhysicalDrive6  
sd=sd7,lun=\\.\PhysicalDrive7  
sd=sd8,lun=\\.\PhysicalDrive8  
sd=sd9,lun=\\.\PhysicalDrive9  
sd=sd10,lun=\\.\PhysicalDrive10  
sd=sd11,lun=\\.\PhysicalDrive11  
sd=sd12,lun=\\.\PhysicalDrive12  
sd=sd13,lun=\\.\PhysicalDrive13  
sd=sd14,lun=\\.\PhysicalDrive14  
sd=sd15,lun=\\.\PhysicalDrive15  
sd=sd16,lun=\\.\PhysicalDrive16  
sd=sd17,lun=\\.\PhysicalDrive17  
sd=sd18,lun=\\.\PhysicalDrive18  
sd=sd19,lun=\\.\PhysicalDrive19  
sd=sd20,lun=\\.\PhysicalDrive20  
sd=sd21,lun=\\.\PhysicalDrive21  
sd=sd22,lun=\\.\PhysicalDrive22  
sd=sd23,lun=\\.\PhysicalDrive23  
sd=sd24,lun=\\.\PhysicalDrive24  
sd=sd25,lun=\\.\PhysicalDrive25  
sd=sd26,lun=\\.\PhysicalDrive26  
sd=sd27,lun=\\.\PhysicalDrive27  
sd=sd28,lun=\\.\PhysicalDrive28  
sd=sd29,lun=\\.\PhysicalDrive29  
sd=sd30,lun=\\.\PhysicalDrive30  
sd=sd31,lun=\\.\PhysicalDrive31  
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-5  
sd=sd1,lun=\\.\PhysicalDrive1  
sd=sd2,lun=\\.\PhysicalDrive2  
sd=sd3,lun=\\.\PhysicalDrive3  
sd=sd4,lun=\\.\PhysicalDrive4  
sd=sd5,lun=\\.\PhysicalDrive5  
sd=sd6,lun=\\.\PhysicalDrive6  
sd=sd7,lun=\\.\PhysicalDrive7  
sd=sd8,lun=\\.\PhysicalDrive8  
sd=sd9,lun=\\.\PhysicalDrive9  
sd=sd10,lun=\\.\PhysicalDrive10  
sd=sd11,lun=\\.\PhysicalDrive11  
sd=sd12,lun=\\.\PhysicalDrive12  
sd=sd13,lun=\\.\PhysicalDrive13  
sd=sd14,lun=\\.\PhysicalDrive14  
sd=sd15,lun=\\.\PhysicalDrive15  
sd=sd16,lun=\\.\PhysicalDrive16  
sd=sd17,lun=\\.\PhysicalDrive17  
sd=sd18,lun=\\.\PhysicalDrive18  
sd=sd19,lun=\\.\PhysicalDrive19
```

```
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-6
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-7
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
```

```
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-8
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
maxlatestart=1
reportinginterval=5
maxlatevod=0
videosegmentduration=1200
```

```
rd=default,rampup=1200,periods=600,measurement=7200,runout=45,rampdown=15,buffers=8
```

```
rd=TR1_SPC-2-VOD,streams=2480
```

## Persistence Test Run 1 (write phase)

\* Persistence Test - Write Phase

```
host=localhost,jvms=2,java=( java, "-Xmx1024m -Xms512m -Xss96k" )
host=(10.123.216.236,R450-2),java=( "C:\Program
  Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
  Xss96k" ),shell=spc2,jvms=2,output=c:\output\e4k-audit-pers-w
host=(10.123.216.237,R450-3),java=( "C:\Program
  Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
  Xss96k" ),shell=spc2,jvms=2,output=c:\output\e4k-audit-pers-w
host=(10.123.216.238,R450-4),java=( "C:\Program
  Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
  Xss96k" ),shell=spc2,jvms=2,output=c:\output\e4k-audit-pers-w
host=(10.123.216.239,R450-5),java=( "C:\Program
  Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
  Xss96k" ),shell=spc2,jvms=2,output=c:\output\e4k-audit-pers-w
host=(10.123.216.240,R450-6),java=( "C:\Program
  Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
  Xss96k" ),shell=spc2,jvms=2,output=c:\output\e4k-audit-pers-w
host=(10.123.216.241,R450-7),java=( "C:\Program
  Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
  Xss96k" ),shell=spc2,jvms=2,output=c:\output\e4k-audit-pers-w
host=(10.123.216.242,R450-8),java=( "C:\Program
  Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
  Xss96k" ),shell=spc2,jvms=2,output=c:\output\e4k-audit-pers-w
```

```
sd=default,host=localhost,size=66.50g
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-2
sd=sd1,lun=\\.\PhysicalDrive1
```

```
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-3
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
```

```
sd=sd31,lun=\\.\PhysicalDrive31  
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-4  
sd=sd1,lun=\\.\PhysicalDrive1  
sd=sd2,lun=\\.\PhysicalDrive2  
sd=sd3,lun=\\.\PhysicalDrive3  
sd=sd4,lun=\\.\PhysicalDrive4  
sd=sd5,lun=\\.\PhysicalDrive5  
sd=sd6,lun=\\.\PhysicalDrive6  
sd=sd7,lun=\\.\PhysicalDrive7  
sd=sd8,lun=\\.\PhysicalDrive8  
sd=sd9,lun=\\.\PhysicalDrive9  
sd=sd10,lun=\\.\PhysicalDrive10  
sd=sd11,lun=\\.\PhysicalDrive11  
sd=sd12,lun=\\.\PhysicalDrive12  
sd=sd13,lun=\\.\PhysicalDrive13  
sd=sd14,lun=\\.\PhysicalDrive14  
sd=sd15,lun=\\.\PhysicalDrive15  
sd=sd16,lun=\\.\PhysicalDrive16  
sd=sd17,lun=\\.\PhysicalDrive17  
sd=sd18,lun=\\.\PhysicalDrive18  
sd=sd19,lun=\\.\PhysicalDrive19  
sd=sd20,lun=\\.\PhysicalDrive20  
sd=sd21,lun=\\.\PhysicalDrive21  
sd=sd22,lun=\\.\PhysicalDrive22  
sd=sd23,lun=\\.\PhysicalDrive23  
sd=sd24,lun=\\.\PhysicalDrive24  
sd=sd25,lun=\\.\PhysicalDrive25  
sd=sd26,lun=\\.\PhysicalDrive26  
sd=sd27,lun=\\.\PhysicalDrive27  
sd=sd28,lun=\\.\PhysicalDrive28  
sd=sd29,lun=\\.\PhysicalDrive29  
sd=sd30,lun=\\.\PhysicalDrive30  
sd=sd31,lun=\\.\PhysicalDrive31  
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-5  
sd=sd1,lun=\\.\PhysicalDrive1  
sd=sd2,lun=\\.\PhysicalDrive2  
sd=sd3,lun=\\.\PhysicalDrive3  
sd=sd4,lun=\\.\PhysicalDrive4  
sd=sd5,lun=\\.\PhysicalDrive5  
sd=sd6,lun=\\.\PhysicalDrive6  
sd=sd7,lun=\\.\PhysicalDrive7  
sd=sd8,lun=\\.\PhysicalDrive8  
sd=sd9,lun=\\.\PhysicalDrive9  
sd=sd10,lun=\\.\PhysicalDrive10  
sd=sd11,lun=\\.\PhysicalDrive11  
sd=sd12,lun=\\.\PhysicalDrive12  
sd=sd13,lun=\\.\PhysicalDrive13  
sd=sd14,lun=\\.\PhysicalDrive14  
sd=sd15,lun=\\.\PhysicalDrive15  
sd=sd16,lun=\\.\PhysicalDrive16  
sd=sd17,lun=\\.\PhysicalDrive17  
sd=sd18,lun=\\.\PhysicalDrive18  
sd=sd19,lun=\\.\PhysicalDrive19  
sd=sd20,lun=\\.\PhysicalDrive20  
sd=sd21,lun=\\.\PhysicalDrive21  
sd=sd22,lun=\\.\PhysicalDrive22  
sd=sd23,lun=\\.\PhysicalDrive23  
sd=sd24,lun=\\.\PhysicalDrive24  
sd=sd25,lun=\\.\PhysicalDrive25
```

```
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-6
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-7
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
```



```
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-8
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
maxlatestart=1
reportinginterval=5
segmentlength=512m
```

```
rd=default,rampup=240,periods=90,measurement=300,runout=0,rampdown=0
rd=default,buffers=1,rdpct=0,xfersize=1024k
```

```
rd=TR1_SPC-2-persist-w,streams=32
```

## **Persistence Test Run 2 (read phase)**

\* Persistence Test - Read Phase

```
host=localhost,jvms=2,java=( java, "-Xmx1024m -Xms512m -Xss96k ")
```

```
host=(10.123.216.236,R450-2),java=("C:\Program
Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
Xss96k"),shell=spc2,jvms=2,output=c:\output\e4k-audit-pers-r
host=(10.123.216.237,R450-3),java=("C:\Program
Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
Xss96k"),shell=spc2,jvms=2,output=c:\output\e4k-audit-pers-r
host=(10.123.216.238,R450-4),java=("C:\Program
Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
Xss96k"),shell=spc2,jvms=2,output=c:\output\e4k-audit-pers-r
host=(10.123.216.239,R450-5),java=("C:\Program
Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
Xss96k"),shell=spc2,jvms=2,output=c:\output\e4k-audit-pers-r
host=(10.123.216.240,R450-6),java=("C:\Program
Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
Xss96k"),shell=spc2,jvms=2,output=c:\output\e4k-audit-pers-r
host=(10.123.216.241,R450-7),java=("C:\Program
Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
Xss96k"),shell=spc2,jvms=2,output=c:\output\e4k-audit-pers-r
host=(10.123.216.242,R450-8),java=("C:\Program
Files\Java\jre1.5.0_04\bin\java.exe", "-Xmx1024m -Xms512m -
Xss96k"),shell=spc2,jvms=2,output=c:\output\e4k-audit-pers-r
```

```
sd=default,host=localhost,size=66.50g
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-2
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
```

```
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-3
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-4
sd=sd1,lun=\\.\PhysicalDrive1
```

```
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-5
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
```

```
sd=sd31,lun=\\.\PhysicalDrive31  
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-6  
sd=sd1,lun=\\.\PhysicalDrive1  
sd=sd2,lun=\\.\PhysicalDrive2  
sd=sd3,lun=\\.\PhysicalDrive3  
sd=sd4,lun=\\.\PhysicalDrive4  
sd=sd5,lun=\\.\PhysicalDrive5  
sd=sd6,lun=\\.\PhysicalDrive6  
sd=sd7,lun=\\.\PhysicalDrive7  
sd=sd8,lun=\\.\PhysicalDrive8  
sd=sd9,lun=\\.\PhysicalDrive9  
sd=sd10,lun=\\.\PhysicalDrive10  
sd=sd11,lun=\\.\PhysicalDrive11  
sd=sd12,lun=\\.\PhysicalDrive12  
sd=sd13,lun=\\.\PhysicalDrive13  
sd=sd14,lun=\\.\PhysicalDrive14  
sd=sd15,lun=\\.\PhysicalDrive15  
sd=sd16,lun=\\.\PhysicalDrive16  
sd=sd17,lun=\\.\PhysicalDrive17  
sd=sd18,lun=\\.\PhysicalDrive18  
sd=sd19,lun=\\.\PhysicalDrive19  
sd=sd20,lun=\\.\PhysicalDrive20  
sd=sd21,lun=\\.\PhysicalDrive21  
sd=sd22,lun=\\.\PhysicalDrive22  
sd=sd23,lun=\\.\PhysicalDrive23  
sd=sd24,lun=\\.\PhysicalDrive24  
sd=sd25,lun=\\.\PhysicalDrive25  
sd=sd26,lun=\\.\PhysicalDrive26  
sd=sd27,lun=\\.\PhysicalDrive27  
sd=sd28,lun=\\.\PhysicalDrive28  
sd=sd29,lun=\\.\PhysicalDrive29  
sd=sd30,lun=\\.\PhysicalDrive30  
sd=sd31,lun=\\.\PhysicalDrive31  
sd=sd32,lun=\\.\PhysicalDrive32
```

```
sd=default,host=R450-7  
sd=sd1,lun=\\.\PhysicalDrive1  
sd=sd2,lun=\\.\PhysicalDrive2  
sd=sd3,lun=\\.\PhysicalDrive3  
sd=sd4,lun=\\.\PhysicalDrive4  
sd=sd5,lun=\\.\PhysicalDrive5  
sd=sd6,lun=\\.\PhysicalDrive6  
sd=sd7,lun=\\.\PhysicalDrive7  
sd=sd8,lun=\\.\PhysicalDrive8  
sd=sd9,lun=\\.\PhysicalDrive9  
sd=sd10,lun=\\.\PhysicalDrive10  
sd=sd11,lun=\\.\PhysicalDrive11  
sd=sd12,lun=\\.\PhysicalDrive12  
sd=sd13,lun=\\.\PhysicalDrive13  
sd=sd14,lun=\\.\PhysicalDrive14  
sd=sd15,lun=\\.\PhysicalDrive15  
sd=sd16,lun=\\.\PhysicalDrive16  
sd=sd17,lun=\\.\PhysicalDrive17  
sd=sd18,lun=\\.\PhysicalDrive18  
sd=sd19,lun=\\.\PhysicalDrive19  
sd=sd20,lun=\\.\PhysicalDrive20  
sd=sd21,lun=\\.\PhysicalDrive21  
sd=sd22,lun=\\.\PhysicalDrive22  
sd=sd23,lun=\\.\PhysicalDrive23  
sd=sd24,lun=\\.\PhysicalDrive24  
sd=sd25,lun=\\.\PhysicalDrive25
```

```
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32

sd=default,host=R450-8
sd=sd1,lun=\\.\PhysicalDrive1
sd=sd2,lun=\\.\PhysicalDrive2
sd=sd3,lun=\\.\PhysicalDrive3
sd=sd4,lun=\\.\PhysicalDrive4
sd=sd5,lun=\\.\PhysicalDrive5
sd=sd6,lun=\\.\PhysicalDrive6
sd=sd7,lun=\\.\PhysicalDrive7
sd=sd8,lun=\\.\PhysicalDrive8
sd=sd9,lun=\\.\PhysicalDrive9
sd=sd10,lun=\\.\PhysicalDrive10
sd=sd11,lun=\\.\PhysicalDrive11
sd=sd12,lun=\\.\PhysicalDrive12
sd=sd13,lun=\\.\PhysicalDrive13
sd=sd14,lun=\\.\PhysicalDrive14
sd=sd15,lun=\\.\PhysicalDrive15
sd=sd16,lun=\\.\PhysicalDrive16
sd=sd17,lun=\\.\PhysicalDrive17
sd=sd18,lun=\\.\PhysicalDrive18
sd=sd19,lun=\\.\PhysicalDrive19
sd=sd20,lun=\\.\PhysicalDrive20
sd=sd21,lun=\\.\PhysicalDrive21
sd=sd22,lun=\\.\PhysicalDrive22
sd=sd23,lun=\\.\PhysicalDrive23
sd=sd24,lun=\\.\PhysicalDrive24
sd=sd25,lun=\\.\PhysicalDrive25
sd=sd26,lun=\\.\PhysicalDrive26
sd=sd27,lun=\\.\PhysicalDrive27
sd=sd28,lun=\\.\PhysicalDrive28
sd=sd29,lun=\\.\PhysicalDrive29
sd=sd30,lun=\\.\PhysicalDrive30
sd=sd31,lun=\\.\PhysicalDrive31
sd=sd32,lun=\\.\PhysicalDrive32

maxlatestart=1
reportinginterval=5
segmentlength=512m

maxpersistenceerrors=10

rd=default,buffers=1,rdpct=100,xfersize=1024k

rd=TR1_SPC-2-persist-r
```

## **APPENDIX E: SPC-2 WORKLOAD GENERATOR EXECUTION COMMANDS AND PARAMETERS**

The following commands were executed from the CLI (Command Line Interface):

```
e4k-audit-Prepare-for-Runall.bat
e4k-audit-Runall.bat
e4k-audit-Prepare-for-per-r.bat
e4k-audit-Run-pers-r.bat
```

The contents of each 'batch' (.bat) file is listed below.

### **e4k-audit-Prepare-for-Runall.bat**

```
@echo off

rem Set up logfile directories
mkdir c:\output\e4k-audit-lfp
mkdir c:\output\e4k-audit-lfp\localhost-0
mkdir c:\output\e4k-audit-lfp\localhost-1
mkdir g:\output\e4k-audit-lfp
mkdir g:\output\e4k-audit-lfp\R450-2-2
mkdir g:\output\e4k-audit-lfp\R450-2-3
mkdir h:\output\e4k-audit-lfp
mkdir h:\output\e4k-audit-lfp\R450-3-4
mkdir h:\output\e4k-audit-lfp\R450-3-5
mkdir i:\output\e4k-audit-lfp
mkdir i:\output\e4k-audit-lfp\R450-4-6
mkdir i:\output\e4k-audit-lfp\R450-4-7
mkdir j:\output\e4k-audit-lfp
mkdir j:\output\e4k-audit-lfp\R450-5-8
mkdir j:\output\e4k-audit-lfp\R450-5-9
mkdir k:\output\e4k-audit-lfp
mkdir k:\output\e4k-audit-lfp\R450-6-10
mkdir k:\output\e4k-audit-lfp\R450-6-11
mkdir l:\output\e4k-audit-lfp
mkdir l:\output\e4k-audit-lfp\R450-7-12
mkdir l:\output\e4k-audit-lfp\R450-7-13
mkdir m:\output\e4k-audit-lfp
mkdir m:\output\e4k-audit-lfp\R450-8-14
mkdir m:\output\e4k-audit-lfp\R450-8-15

mkdir c:\output\e4k-audit-ldq
mkdir c:\output\e4k-audit-ldq\localhost-0
mkdir c:\output\e4k-audit-ldq\localhost-1
mkdir g:\output\e4k-audit-ldq
mkdir g:\output\e4k-audit-ldq\R450-2-2
mkdir g:\output\e4k-audit-ldq\R450-2-3
mkdir h:\output\e4k-audit-ldq
mkdir h:\output\e4k-audit-ldq\R450-3-4
mkdir h:\output\e4k-audit-ldq\R450-3-5
mkdir i:\output\e4k-audit-ldq
mkdir i:\output\e4k-audit-ldq\R450-4-6
mkdir i:\output\e4k-audit-ldq\R450-4-7
mkdir j:\output\e4k-audit-ldq
mkdir j:\output\e4k-audit-ldq\R450-5-8
mkdir j:\output\e4k-audit-ldq\R450-5-9
mkdir k:\output\e4k-audit-ldq
```

```
mkdir k:\output\e4k-audit-ldq\R450-6-10
mkdir k:\output\e4k-audit-ldq\R450-6-11
mkdir l:\output\e4k-audit-ldq
mkdir l:\output\e4k-audit-ldq\R450-7-12
mkdir l:\output\e4k-audit-ldq\R450-7-13
mkdir m:\output\e4k-audit-ldq
mkdir m:\output\e4k-audit-ldq\R450-8-14
mkdir m:\output\e4k-audit-ldq\R450-8-15

mkdir c:\output\e4k-audit-vod
mkdir c:\output\e4k-audit-vod\localhost-0
mkdir c:\output\e4k-audit-vod\localhost-1
mkdir c:\output\e4k-audit-vod\localhost-2
mkdir c:\output\e4k-audit-vod\localhost-3
mkdir g:\output\e4k-audit-vod
mkdir g:\output\e4k-audit-vod\R450-2-4
mkdir g:\output\e4k-audit-vod\R450-2-5
mkdir g:\output\e4k-audit-vod\R450-2-6
mkdir g:\output\e4k-audit-vod\R450-2-7
mkdir h:\output\e4k-audit-vod
mkdir h:\output\e4k-audit-vod\R450-3-8
mkdir h:\output\e4k-audit-vod\R450-3-9
mkdir h:\output\e4k-audit-vod\R450-3-10
mkdir h:\output\e4k-audit-vod\R450-3-11
mkdir i:\output\e4k-audit-vod
mkdir i:\output\e4k-audit-vod\R450-4-12
mkdir i:\output\e4k-audit-vod\R450-4-13
mkdir i:\output\e4k-audit-vod\R450-4-14
mkdir i:\output\e4k-audit-vod\R450-4-15
mkdir j:\output\e4k-audit-vod
mkdir j:\output\e4k-audit-vod\R450-5-16
mkdir j:\output\e4k-audit-vod\R450-5-17
mkdir j:\output\e4k-audit-vod\R450-5-18
mkdir j:\output\e4k-audit-vod\R450-5-19
mkdir k:\output\e4k-audit-vod
mkdir k:\output\e4k-audit-vod\R450-6-20
mkdir k:\output\e4k-audit-vod\R450-6-21
mkdir k:\output\e4k-audit-vod\R450-6-22
mkdir k:\output\e4k-audit-vod\R450-6-23
mkdir l:\output\e4k-audit-vod
mkdir l:\output\e4k-audit-vod\R450-7-24
mkdir l:\output\e4k-audit-vod\R450-7-25
mkdir l:\output\e4k-audit-vod\R450-7-26
mkdir l:\output\e4k-audit-vod\R450-7-27
mkdir m:\output\e4k-audit-vod
mkdir m:\output\e4k-audit-vod\R450-8-28
mkdir m:\output\e4k-audit-vod\R450-8-29
mkdir m:\output\e4k-audit-vod\R450-8-30
mkdir m:\output\e4k-audit-vod\R450-8-31

mkdir c:\output\e4k-audit-pers-w
mkdir c:\output\e4k-audit-pers-w\localhost-0
mkdir c:\output\e4k-audit-pers-w\localhost-1
mkdir g:\output\e4k-audit-pers-w
mkdir g:\output\e4k-audit-pers-w\R450-2-2
mkdir g:\output\e4k-audit-pers-w\R450-2-3
mkdir h:\output\e4k-audit-pers-w
mkdir h:\output\e4k-audit-pers-w\R450-3-4
mkdir h:\output\e4k-audit-pers-w\R450-3-5
mkdir i:\output\e4k-audit-pers-w
mkdir i:\output\e4k-audit-pers-w\R450-4-6
mkdir i:\output\e4k-audit-pers-w\R450-4-7
mkdir j:\output\e4k-audit-pers-w
```



```
mkdir j:\output\e4k-audit-pers-w\R450-5-8
mkdir j:\output\e4k-audit-pers-w\R450-5-9
mkdir k:\output\e4k-audit-pers-w
mkdir k:\output\e4k-audit-pers-w\R450-6-10
mkdir k:\output\e4k-audit-pers-w\R450-6-11
mkdir l:\output\e4k-audit-pers-w
mkdir l:\output\e4k-audit-pers-w\R450-7-12
mkdir l:\output\e4k-audit-pers-w\R450-7-13
mkdir m:\output\e4k-audit-pers-w
mkdir m:\output\e4k-audit-pers-w\R450-8-14
mkdir m:\output\e4k-audit-pers-w\R450-8-15
```

### **e4k-audit-Runall.bat**

```
@echo off

rem Windows: start vdbench

rem Directory where this is executed from
set dir=c:\SPC2

set java=java

java -Xmx1024m -Xms512m -Xss96k vdbench -d128 -f e4k-audit-parms-ldq.txt -o
c:\output\e4k-audit-ldq

java -Xmx1024m -Xms512m -Xss96k vdbench -d128 -f e4k-audit-parms-ldq.txt -o
c:\output\e4k-audit-ldq

java -Xmx1024m -Xms512m -Xss96k vdbench -d128 -f e4k-audit-parms-vod.txt -o
c:\output\e4k-audit-vod

java -Xmx1024m -Xms512m -Xss96k vdbench -d128 -f e4k-audit-parms-pers-w.txt -o
c:\output\e4k-audit-pers-w
```

### **e4k-audit-Prepare-for-per-r.bat**

```
@echo off

rem Set up logfile directories
mkdir c:\output\e4k-audit-pers-r
mkdir c:\output\e4k-audit-pers-r\localhost-0
mkdir c:\output\e4k-audit-pers-r\localhost-1
mkdir g:\output\e4k-audit-pers-r
mkdir g:\output\e4k-audit-pers-r\R450-2-2
mkdir g:\output\e4k-audit-pers-r\R450-2-3
mkdir h:\output\e4k-audit-pers-r
mkdir h:\output\e4k-audit-pers-r\R450-3-4
mkdir h:\output\e4k-audit-pers-r\R450-3-5
mkdir i:\output\e4k-audit-pers-r
mkdir i:\output\e4k-audit-pers-r\R450-4-6
mkdir i:\output\e4k-audit-pers-r\R450-4-7
mkdir j:\output\e4k-audit-pers-r
mkdir j:\output\e4k-audit-pers-r\R450-5-8
mkdir j:\output\e4k-audit-pers-r\R450-5-9
mkdir k:\output\e4k-audit-pers-r
mkdir k:\output\e4k-audit-pers-r\R450-6-10
mkdir k:\output\e4k-audit-pers-r\R450-6-11
mkdir l:\output\e4k-audit-pers-r
mkdir l:\output\e4k-audit-pers-r\R450-7-12
mkdir l:\output\e4k-audit-pers-r\R450-7-13
```

```
mkdir m:\output\e4k-audit-pers-r  
mkdir m:\output\e4k-audit-pers-r\R450-8-14  
mkdir m:\output\e4k-audit-pers-r\R450-8-15
```

### **e4k-audit-Run-pers-r.bat**

```
@echo off  
  
rem Windows: start Vdbench  
  
rem Directory where this is executed from  
set dir=c:\SPC2  
  
rem set current class path  
set cp=c:\SPC2\windows  
  
set java=java  
  
java -Xmx1024m -Xms512m -Xss96k vdbench -d128 -f e4k-audit-parms-pers-r.txt -o  
c:\output\e4k-audit-pers-r
```

**APPENDIX F: THIRD-PARTY QUOTATIONS**

**Emulex HBAs**

		<h1>QUOTE</h1>	
<p><b>1 Veterans Place</b>  <b>Whippany, NJ 07981</b>  <b>(973) 386-1411, Fax: (973) 386-0783</b>  <b>(800) 463-9998</b>  <b>Toll Free: (800) 463-9998 - Chris Kowalik Ext. 130</b></p>		<p>ORDER NUMBER: 0124030  ORDER DATE: 10/26/2006   CUSTOMER NO: FUJTS</p>	
<p><b>SOLD TO:</b>  Fujitsu Computer Systems  Account Payable-MS 141  1250 E Arques Avenue  Sunnyvale, CA 94085-3470US</p>		<p><b>SHIP TO:</b>  Fujitsu Computer Systems  Account Payable-MS 141  1250 E Arques Avenue  Sunnyvale, CA 94085-3470US</p>	
<p>CONFIRM TO: Karen Carlson*</p>			
<p>CUSTOMER P.O.</p>		<p>SHIP VIA</p>	
<p>F.O.B.</p>		<p>TERMS Net 30</p>	
<p>ITEM NUMBER</p>		<p>UNIT</p>	
<p>ORDERED</p>		<p>SHIPPED</p>	
<p>BACK ORDE</p>		<p>PRICE</p>	
<p>AMOUNT</p>			
<p>LP11000-M4</p>		<p>EACH 16</p>	
<p>0</p>		<p>0</p>	
<p>778.00</p>		<p>12,448.00</p>	
<p>Emulex 4Gb PCI-X Single 3.3V Signaling, 5V Tolerant  Generic adapter, in stock, retail \$ 1695.00  3yr warranty, 24x7 support, advanced replacement</p>			
<p>Advanced Replacements on all defective HBA products.  24x7x365 Support from our Certified Fibre Channel Engineers.  3 Year Manufacturer Warranty on all Fibre Channel HBAs.</p>			
		<p>Net Order: 12,448.00  Less Discount: 0.00  Shipping &amp; Handling: 0.00  Sales Tax: 0.00  <b>Order Total: 12,448.00</b></p>	
			
<p><b>Call 1-800-463-9998 for all your Fibre Channel Needs</b></p>			
<p>Important Notice: Customers purchasing EMC Certified HBAs must supply Info X with the following information: EMC Storage system (i.e. Symmetrix or CLARION) and the Operating System on the Host Server. Info X will not process orders without this information.</p>			
<p><small>Terms and Conditions:  Shipping and Handling are not included on this Quote. Please ask your sales representative for a freight quote based on the desired shipping method.  Customer is responsible for all applicable taxes and duties.  Prices are in US currency and are subject to change without notice.  Returns will only be accepted after a valid RMA number has been issued. All non-defective returns must be completed within 30 days from the original purchase date. Open items will only be accepted on a case by case basis and are subject to a 15% restocking fee and are not allowed after 30 days from the original purchase date.  Customer is responsible for all freight costs associated with returns or exchanges.  Past Due Invoices will incur a 1% monthly finance charge. In addition, any collection costs associated with past due invoices will be the responsibility of the customer.</small></p>			
<p>Accepted  _____</p>		<p><b>www.info-x.com</b></p>	
		<p>Date Accepted: _____</p>	