SPC BENCHMARK 2™

FULL DISCLOSURE REPORT

IBM CORPORATION
IBM STORWIZE® V7000

SPC-2™ V1.3

Submitted for Review: December 13, 2010
Submission Identifier: B00052

First Edition – December 2010

Trademarks

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AUDIT CERTIFICATION

Bruce McNutt
IBM Corporation
650 Harry Road
San Jose, CA 95120

December 10, 2010

The SPC Benchmark 2™ results listed below for the IBM Storwize® V7000 produced in compliance with the SPC Benchmark 2™ V1.3 Remote Audit requirements.

SPC Benchmark 2™ V1.3 Results	
Tested Storage Product (TSP) Name: IBM Storwize® V7000	
Metric	**Reported Result**
SPC-2 MBPS™	3,132.87
SPC-2 Price-Performance	$71.32/SPC-2 MBPS™
ASU Capacity	29,914.447 GB
Data Protection Level	Protected *(RAID-5)*
Total Price (including three-year maintenance)	$223,422.08

The following SPC Benchmark 2™ Remote Audit requirements were reviewed and found compliant with V1.3 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 IBM Corporation:
  - ✓ 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 used to create and configure the Benchmark Configuration/Tested Storage Configuration.
- Documentation of each customer tunable parameter or option that was changed from its default value.

Storage Performance Council
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Redwood City, CA 94062
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AUDIT CERTIFICATION *(CONT.)*

- The following Host System items were verified by documentation supplied by IBM Corporation:
  - ✓ 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 IBM Corporation:
  - ✓ 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 differences between the Tested Storage Configuration and Priced Storage Configuration were documented and, if applied to the Tested Storage Configuration, would not have an impact on the audited benchmark measurements.
- The submitted pricing information 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.
- This successfully audited SPC measurement is not subject to an SPC Confidential Review.

Audit Notes:

There were no audit notes or exceptions.

Respectfully,

Walter E. Baker

Walter E. Baker
SPC Auditor

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LETTER OF GOOD FAITH

IBM

Vice President and Disk Storage Business Line Executive

IBM Technology & Systems Group
3039 Cornwallis Road,
Research Triangle Park, NC 27709

Phone: 1-919-543-5345
Fax: 1-919-543-2856

December 1, 2010

Mr. Walter E. Baker, SPC Auditor
Gradient Systems, Inc.
643 Bair Island Road, Suite 103
Redwood City, CA 94063

Subject: SPC-2 Letter of Good Faith for the IBM Storwize V7000.

IBM Corporation 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 Version 1.3 of the SPC-2 benchmark specification.

Our disclosure of the Benchmark configuration and execution of the benchmark includes all items that, to the best of our knowledge and belief, materially affect the reported results, regardless of whether such items are explicitly required to be disclosed by the SPC-2 benchmark specification.

Sincerely,

Doug Balog

EXECUTIVE SUMMARY

Test Sponsor and Contact Information

Test Sponsor and Contact Information	
Test Sponsor Primary Contact	IBM Corporation – http://www.ibm.com Bruce McNutt – bmcnutt@us.ibm.com 650 Harry Road San Jose, CA 95120 Phone: (408) 927-2717 FAX: (408) 927-2050
Test Sponsor Alternate Contact	IBM Corporation – http://www.ibm.com Barry Whyte – barry.whyte@uk.ibm.com IBM Hursley Park Hursley, UK SO212JN Phone: 011-44-196-281-7566 FAX: 011-44-196-281-8915
Auditor	Storage Performance Council – http://www.storageperformance.org Walter E. Baker – AuditService@StoragePerformance.org 643 Bair Island Road, Suite 103 Redwood City, CA 94063 Phone: (650) 556-9384 FAX: (650) 556-9385

Revision Information and Key Dates

Revision Information and Key Dates	
SPC-2 Specification revision number	V1.3
SPC-2 Workload Generator revision number	V1.0
Date Results were first used publicly	December 13, 2010
Date FDR was submitted to the SPC	December 13, 2010
Date the TSC will be available for shipment to customers	currently available
Date the TSC completed audit certification	December 10, 2010

Tested Storage Product (TSP) Description

The IBM Storwize V7000 disk system, IBM's newest midrange disk storage offering, uses IBM System Storage SAN Volume Controller technology to deliver high performance, advanced function, high availability, and modular and scalable storage capacity

- Supports RAID 0, 1, 5, 6, and 10
- Provides SAN-attached 8 Gbps Fibre Channel (FC) host connectivity and 1 GbE iSCSI host connectivity.
- Supports intermix of SAS drives, Nearline SAS drives, and Solid state drives within the IBM Storwize V7000 Control Enclosure and IBM Storwize V7000 Expansion Enclosures (up to twenty-four 2.5-inch disk drives or twelve 3.5 inch disk drives in each Enclosure).
- Includes IBM Easy Tier technology for automatically moving heavily used data extents onto high-performance storage
- Supports attachment of other storage devices via the Fibre Channel interface, just as the SAN Volume Controller
- Supports a complete set of SAN Volume Controller functions including FlashCopy, RemoteCopy, VDisk Mirroring, thin provisioning, and a revised web-based user interface for both products new with this release

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				
IBM Storwize V7000				
SPC-2 MBPS™	**SPC-2 Price-Performance**	**ASU Capacity (GB)**	**Total Price**	**Data Protection Level**
3,132.87	$71.32	29,914.447	$ 223,422.08	Protected *(RAID-5)*
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)				
SPC-2 Large File Processing (LFP) Reported Data				
	Data Rate *(MB/second)*	**Number of Streams**	**Data Rate per Stream**	**Price-Performance**
LFP Composite	2,992.67			$74.66
Write Only:				
1024 KiB Transfer	2,089.54	20	104.48	
256 KiB Transfer	1,898.74	20	94.94	
Read-Write:				
1024 KiB Transfer	2,935.55	20	146.78	
256 KiB Transfer	2,728.91	20	136.45	
Read Only:				
1024 KiB Transfer	4,141.33	20	207.07	
256 KiB Transfer	4,161.93	20	208.10	
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).				
SPC-2 Large Database Query (LDQ) Reported Data				
	Data Rate *(MB/second)*	**Number of Streams**	**Data Rate per Stream**	**Price-Performance**
LDQ Composite	4,046.64			$55.21
1024 KiB Transfer Size				
4 I/Os Outstanding	3,918.33	20	195.92	
1 I/O Outstanding	4,150.02	20	207.50	
64 KiB Transfer Size				
4 I/Os Outstanding	4,115.84	20	205.79	
1 I/O Outstanding	4,002.37	20	200.12	
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).				
SPC-2 Video On Demand (VOD) Reported Data				
	Data Rate *(MB/second)*	**Number of Streams**	**Data Rate per Stream**	**Price-Performance**
	2,359.30	3,000	0.79	$94.70

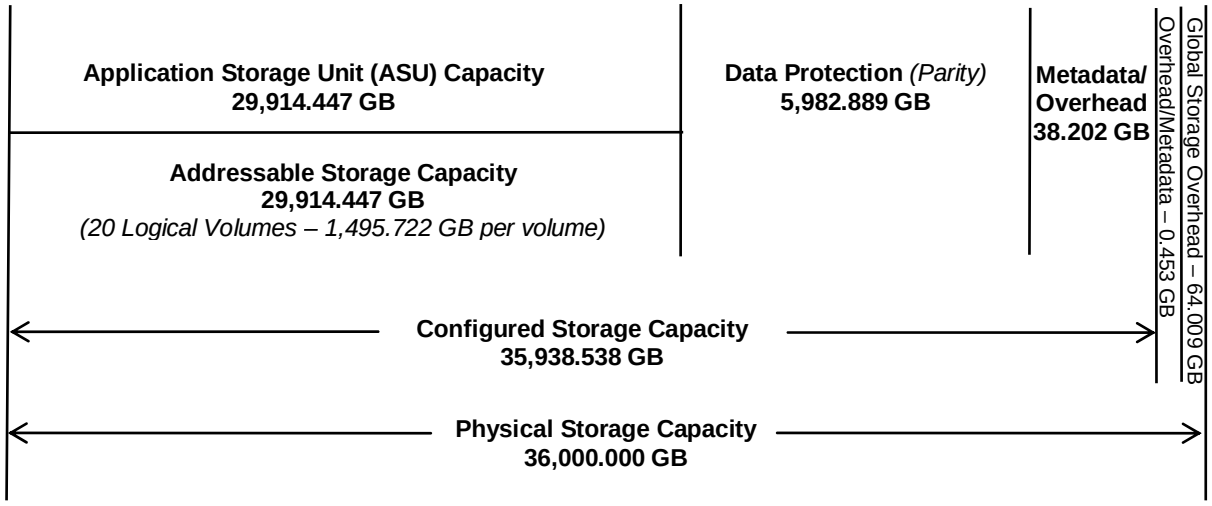
SPC-2 MBPS™ represents the aggregate data rate, in megabytes per second, of all three SPC-2 workloads: Large File Processing (LFP), Large Database Query (LDQ), and Video on Demand (VOD).

ASU (Application Storage Unit) **Capacity** represents the total storage capacity read and written in the course of executing the SPC-2 benchmark.

A **Data Protection Level** of **Protected** using ***RAID-5*** provides data protection by distributing check data corresponding to user data across multiple disks in the form of bit-by-bit parity.

Storage Capacities and Relationships

The following diagram *(not to scale)* and table document the various storage capacities, used in this benchmark, and their relationships, as well as the storage utilization values required to be reported.



SPC-1 Storage Capacity Utilization	
Application Utilization	83.10%
Protected Application Utilization	99.71%
Unused Storage Ratio	0.00%

Application Utilization: Total ASU Capacity *(29,914.447 GB)* divided by Physical Storage Capacity *(36,000.000 GB)*

Protected Application Utilization: (Total ASU Capacity *(29,914.447 GB)* plus total Data Protection Capacity *(5,982.889 GB)* minus unused Data Protection Capacity *(0.000 GB)* divided by Physical Storage Capacity *(29,914.447 GB)*.

Unused Storage Ratio: Total Unused Capacity *(0.000 GB)* divided by Physical Storage Capacity *(29,914.447 GB)* and may not exceed 45%.

Detailed information for the various storage capacities and utilizations is available on pages 24-25 in the Full Disclosure Report.

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

Each of the two 2498 B24 switches in the TSC was enabled for 24 ports and configured with 20 SFPs. The benchmark measurements utilized 8 ports and 8 SFPs in each switch.

Each of the two 2498 B24 switches included in the Priced Storage Configuration was enabled for 8 ports and configured with 8 SFPs. This difference, if applied to the TSC, would not affect the reported benchmark measurements.

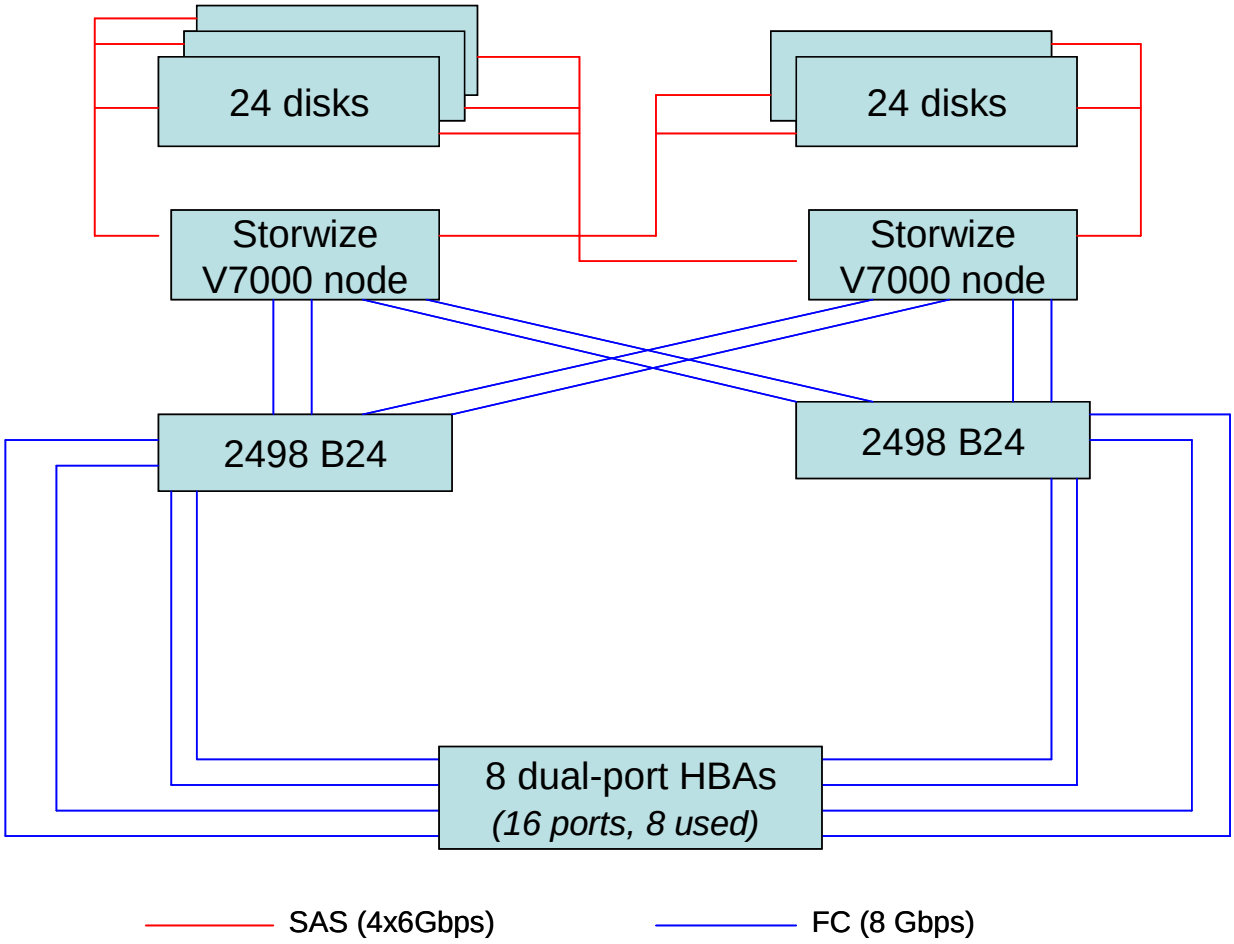
Priced Storage Configuration Pricing

Description		Qty	Unit Price	extended	% discount	discounted price
Storwize V7000 base storage enclosure (2076-124)	8 SFP (8 Gb)	1	$25,000	$25,000	39	15,250.00
Storwize V7000 Base SW		1	$18,000	$18,000	39	10,980.00
Storwize V7000 expansion enclosure (2076-224)		4	$6,000	$24,000	39	14,640.00
Storwize V7000 Base SW		4	$18,000	$72,000	39	43,920.00
SAS 1M Cables to attach Control Enclosures to Expansion Enclosures		16	$59	$944	39	575.84
2.5" 10K 300GB SAS HDD's		120	$1,099	$131,880	39	80,446.80
24 port fibre channel switch (2498-B24)	w/ 8 port actv, 8 SFP (8 Gb)	2	$7,890	$15,780	20	12,624.00
Short wave 5m fibre channel cable (1814-20A 5605)		8	$129	$1,032	20	825.60
Short wave 25 m fibre channel cable (1814-20A 5625)		8	$189	$1,512	20	1,209.60
19 inch rack (7014-T42)		1	$2,970	$2,970	50	1,485.00
Dual port 8 Gbps FC HBA (42D0510)		8	$1,299	$10,392	0	10,392.00
	HW/SW Total					*192,348.84*
Maintenance for Software						
Base SW		5	$7,200	$36,000	39	21,960.00
WSU for Hardware						
Storwize V7000 Controller Enclosure		1	$4,200	$4,200	39	2,562.00
Storwize V7000 Expansion Enclosure		4	$1,921	$7,684	39	4,687.24
Warranty/Maintenance Upgrade to 3 year 24x7x4 for Switch		1	$2,330	$2,330	20	1,864.00
	Total Warranty/Maintenance					*31,073.24*
	Grand Total					**223,422.08**

The following pricing includes the following:

- Acknowledgement of new and existing hardware and/or software problems within four hours.
- Onsite presence of a qualified maintenance engineer or provision of a customer replaceable part within four hours of the above acknowledgement for any hardware failure that results in an inoperative Priced Storage Configuration component.
- Standard IBM field delegation discounts.

Priced Storage Configuration Diagram



2498 B24: 24-port fibre channel switch

24 disks: One Storwize® V7000 base storage enclosure and four Storwize® V7000 Expansion Enclosures, each with 24 10K RPM 300 GB disk drives.

Priced Storage Configuration Components

Priced Storage Configuration:
8 – 8 Gb dual port FC HBAs *(model 42D0510)*
IBM Storwize® V7000 ***(2-node cluster)*** 8 GB memory/cache per node *(16 GB total)* 8 – 8 Gbps switch-to-host FC connections shared by both nodes 2 – 4x6Gbps SAS connections per node 8 – 8 Gb SFPs 24 – 10K RPM 300 GB disk drives 4 – Storwize® V7000 Expansion Enclosures with 24 10K RPM 300 GB disk drives
1 – 19 inch rack with 2 12-plug PDUs
2 – 24-port fibre channel switches *(2498-B24*) with 4 SFPs per switch *(8 total)* and 4 ports enabled per switch *(8 total)*
8 – short wave 5m fibre channel cables
8 – 25m fibre channel cables

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 10.6.6

The FDR 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 18.

Storage Network Configuration

Clause 10.6.6.1

If a storage network was configured as a part of the Tested Storage Configuration and the Benchmark Configuration described in Clause 10.6.6 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 10.11.

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

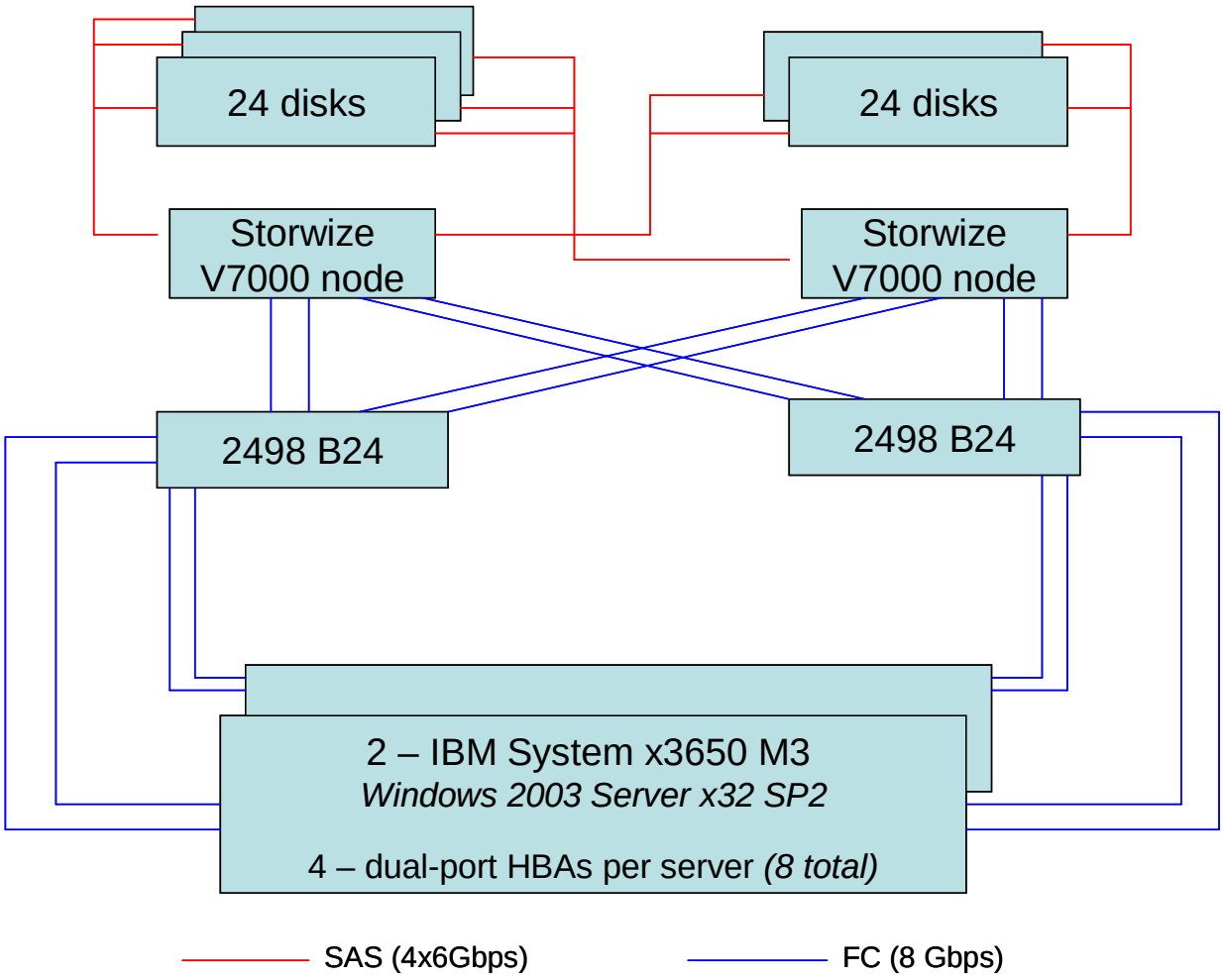
Host System and Tested Storage Configuration Table

Clause 10.6.6.2

The FDR 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.

Benchmark Configuration/Tested Storage Configuration Diagram



2498 B24: 24-port fibre channel switch

24 disks: One Storwize® V7000 base storage enclosure and four Storwize® V7000 Expansion Enclosures, each with 24 10K RPM 300 GB disk drives.

Host Systems and Tested Storage Configuration Components

Host System:	Tested Storage Configuration (TSC):
2 – IBM System X3650 M3	8 – 8 Gb dual port FC HBAs *(model 42D0510)*
1 – Intel Xeon 5600 2.26 GHz 6-core processor with 12 MB shared L3 cache	**IBM Storwize® V7000** ***(2-node cluster)***
28 GB main memory	8 GB memory/cache per node *(16 GB total)*
Windows 2003 Server x64 w/SP2	8 – 8 Gbps switch-to-host FC connections shared by both nodes
SDDDSM – Storwize® V7000 Windows driver providing multipath management	2 – 4x6Gbps SAS connections per node
	8 – 8 Gb SFPs
	24 – 10K RPM 300 GB disk drives
	4 – Storwize® V7000 Expansion Enclosures with 24 10K RPM 300 GB disk drives
PCIe	1 – 19 inch rack with 2 12-plug PDUs
	2 – 24-port fibre channel switches *(2498-B24*) with 20 SFPs per switch *(40 total)* and 24 ports enabled per switch *(48 total)*
	8 – short wave 5m fibre channel cables
	8 – 25m fibre channel cables

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 99 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 (Clause10.6.6.1), 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 100 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 100.

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 94 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

SPC-2 Storage Capacities		
Storage Hierarchy Component	**Units**	**Capacity**
Total ASU Capacity	Gigabytes (GB)	29,914.447
Addressable Storage Capacity	Gigabytes (GB)	29,914.447
Configured Storage Capacity	Gigabytes (GB)	35,935.538
Physical Storage Capacity	Gigabytes (GB)	36,000.000
Data Protection *(RAID-5 parity)*	Gigabytes (GB)	5,982.889
Required Storage *(overhead/metadata)*	Gigabytes (GB)	38.655
Global Storage Overhead	Gigabytes (GB)	64.009
Total Unused Storage	Gigabytes (GB)	0.000

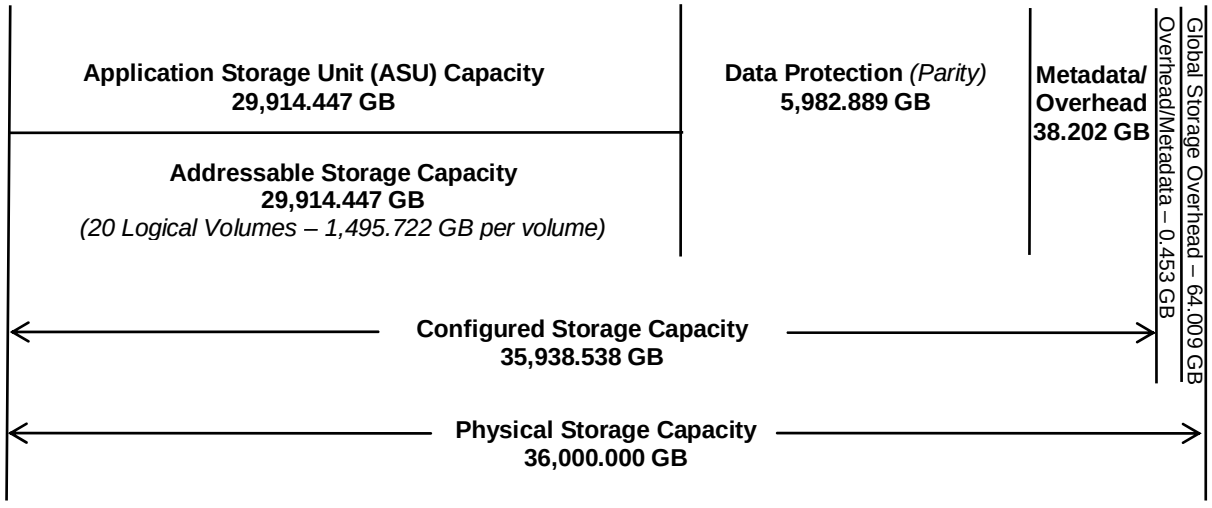
SPC-2 Storage Hierarchy Ratios

	Addressable Storage Capacity	Configured Storage Capacity	Physical Storage Capacity
Total ASU Capacity	100.00%	83.24%	83.10%
Data Protection *(RAID-5 parity)*		16.65%	16.62%
Addressable Storage Capacity		83.24%	83.10%
Required Storage		0.11%	0.11%
Configured Storage Capacity			99.82%
Global Storage Overhead			0.18%
Unused Storage:			
Addressable	0.00%		
Configured		0.00%	
Physical			0.00%

The Physical Storage Capacity consisted of 36,000.00 GB distributed over 120 disk drives each with a formatted capacity of 300.000 GB. There was 0.000 GB (0.00%) of Unused Storage within the Physical Storage Capacity. Global Storage Overhead consisted of 64.009 GB (0.18%) 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. The Data Protection *(RAID-5 parity)* capacity was 5,982.889 GB of which 5,989.256 GB was utilized. The total Unused Storage was 0.000 GB.

SPC-2 Storage Capacities and Relationships Illustration

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



Storage Capacity Utilization

Clause 10.6.8.2

The FDR will include a table illustrating the storage capacity utilization values defined for Application Utilization (Clause 2.8.1), Protected Application Utilization (Clause 2.8.2), and Unused Storage Ratio (Clause 2.8.3).

Clause 2,8.1

***Application Utilization** is defined as Total ASU Capacity divided by Physical Storage Capacity.*

Clause 2,8.2

***Protected Application Utilization** is defined as (Total ASU Capacity plus total Data Protection Capacity minus unused Data Protection Capacity) divided by Physical Storage Capacity.*

Clause 2,8.3

***Unused Storage Ratio** is defined as Total Unused Capacity divided by Physical Storage Capacity and may not exceed 45%.*

SPC-1 Storage Capacity Utilization	
Application Utilization	83.10%
Protected Application Utilization	99.73%
Unused Storage Ratio	0.00%

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 (29,914.447 GB)			
	Total Capacity *(GB)*	Capacity Used *(GB)*	Capacity Unused *(GB)*
Logical Volumes 1-20	1,495.722 per LV	1,495.722 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 100 for more detailed configuration information.

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 95 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 111.

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.

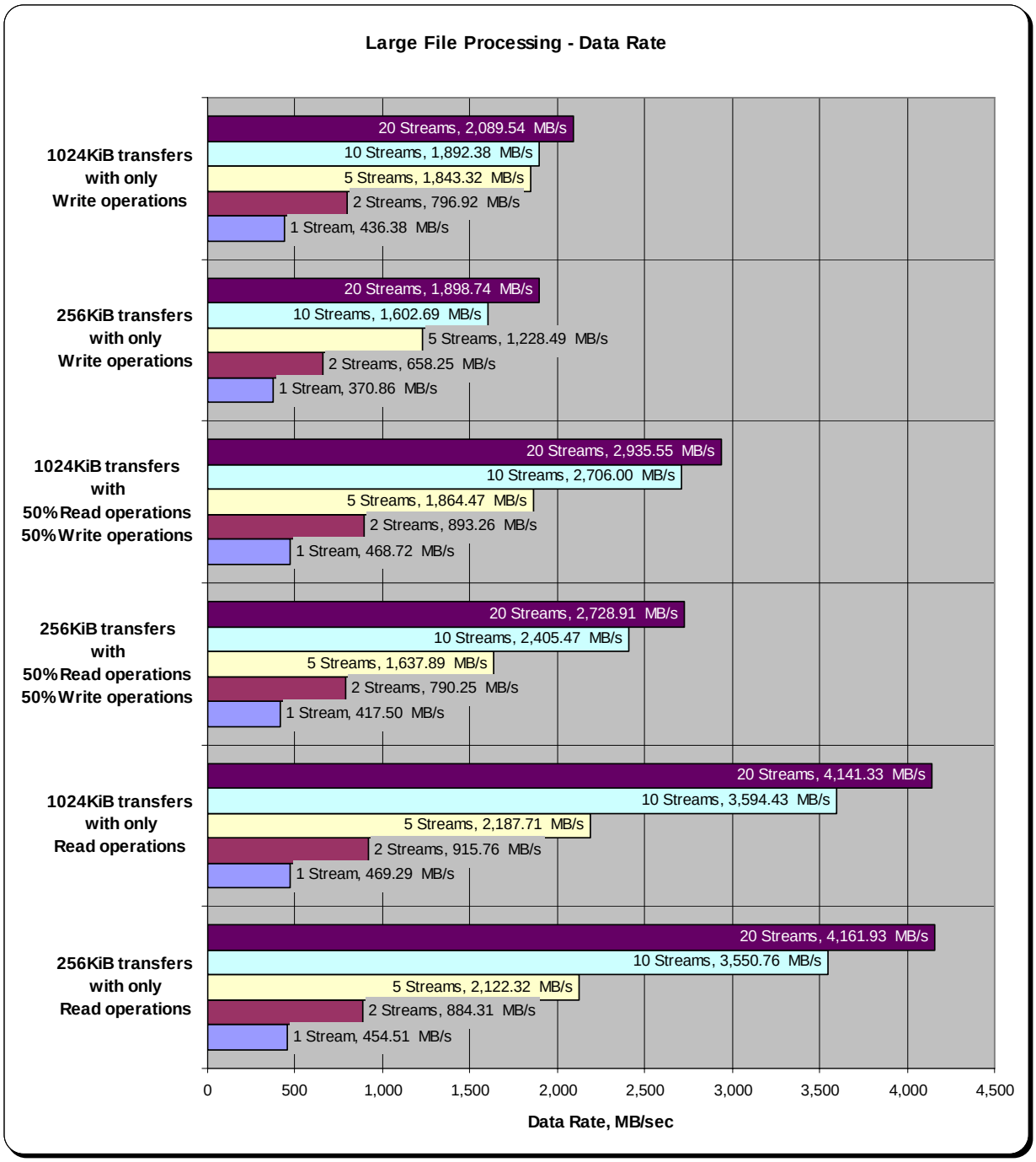
SPC-2 Large File Processing Test Results File

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	2 Streams	5 Streams	10 Streams	20 Streams
Write 1024KiB	436.38	796.92	1,843.32	1,892.38	2,089.54
Write 256KiB	370.86	658.25	1,228.49	1,602.69	1,898.74
Read/Write 1024KiB	468.72	893.26	1,864.47	2,706.00	2,935.55
Read/Write 256KiB	417.50	790.25	1,637.89	2,405.47	2,728.91
Read 1024KiB	469.29	915.76	2,187.71	3,594.43	4,141.33
Read 256KiB	454.51	884.31	2,122.32	3,550.76	4,161.93

SPC-2 Large File Processing Average Data Rates Graph

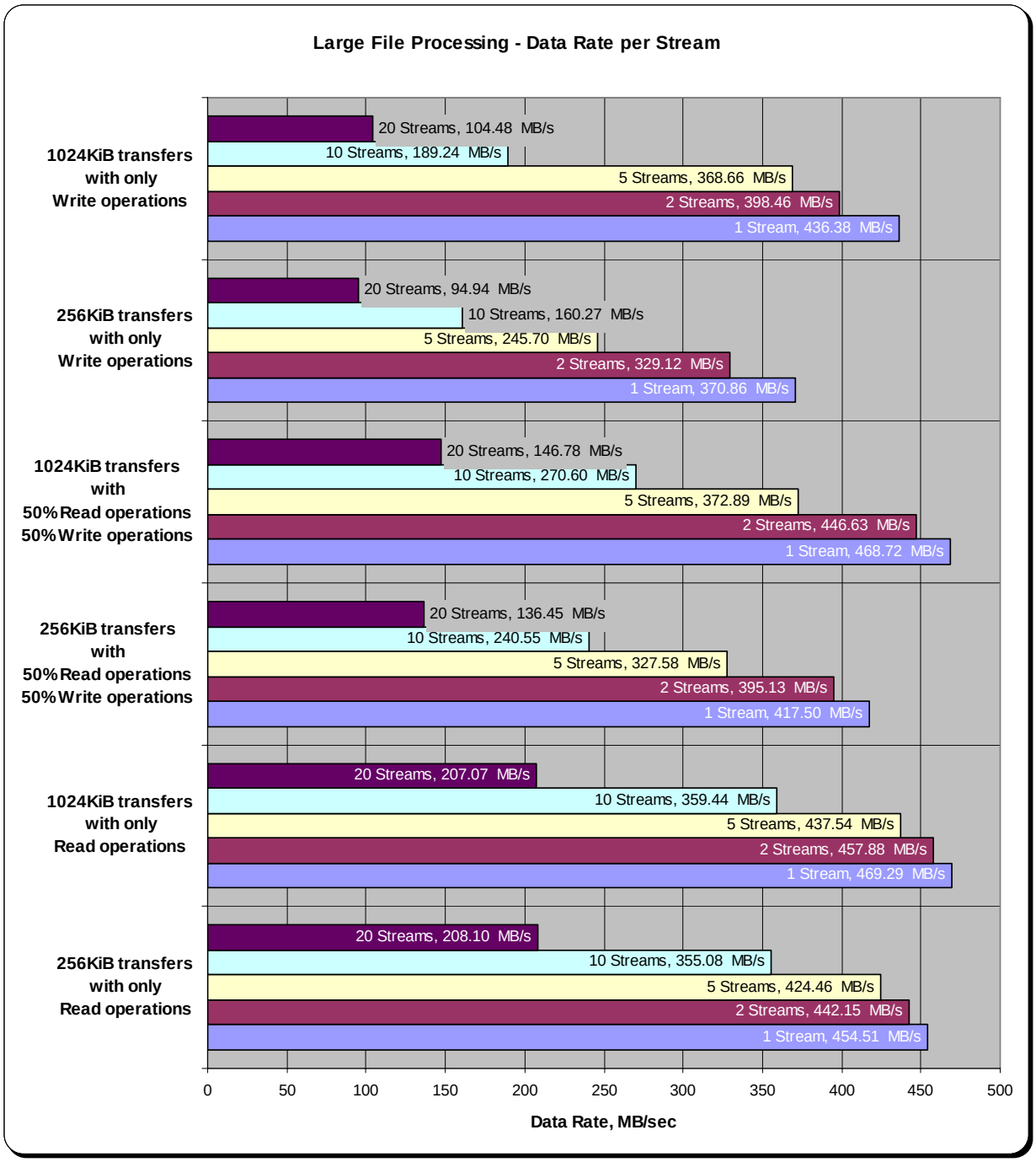


SPC-2 Large File Processing Average Data Rate per Stream

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	2 Streams	5 Streams	10 Streams	20 Streams
Write 1024KiB	436.38	398.46	368.66	189.24	104.48
Write 256KiB	370.86	329.12	245.70	160.27	94.94
Read/Write 1024KiB	468.72	446.63	372.89	270.60	146.78
Read/Write 256KiB	417.50	395.13	327.58	240.55	136.45
Read 1024KiB	469.29	457.88	437.54	359.44	207.07
Read 256KiB	454.51	442.15	424.46	355.08	208.10

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

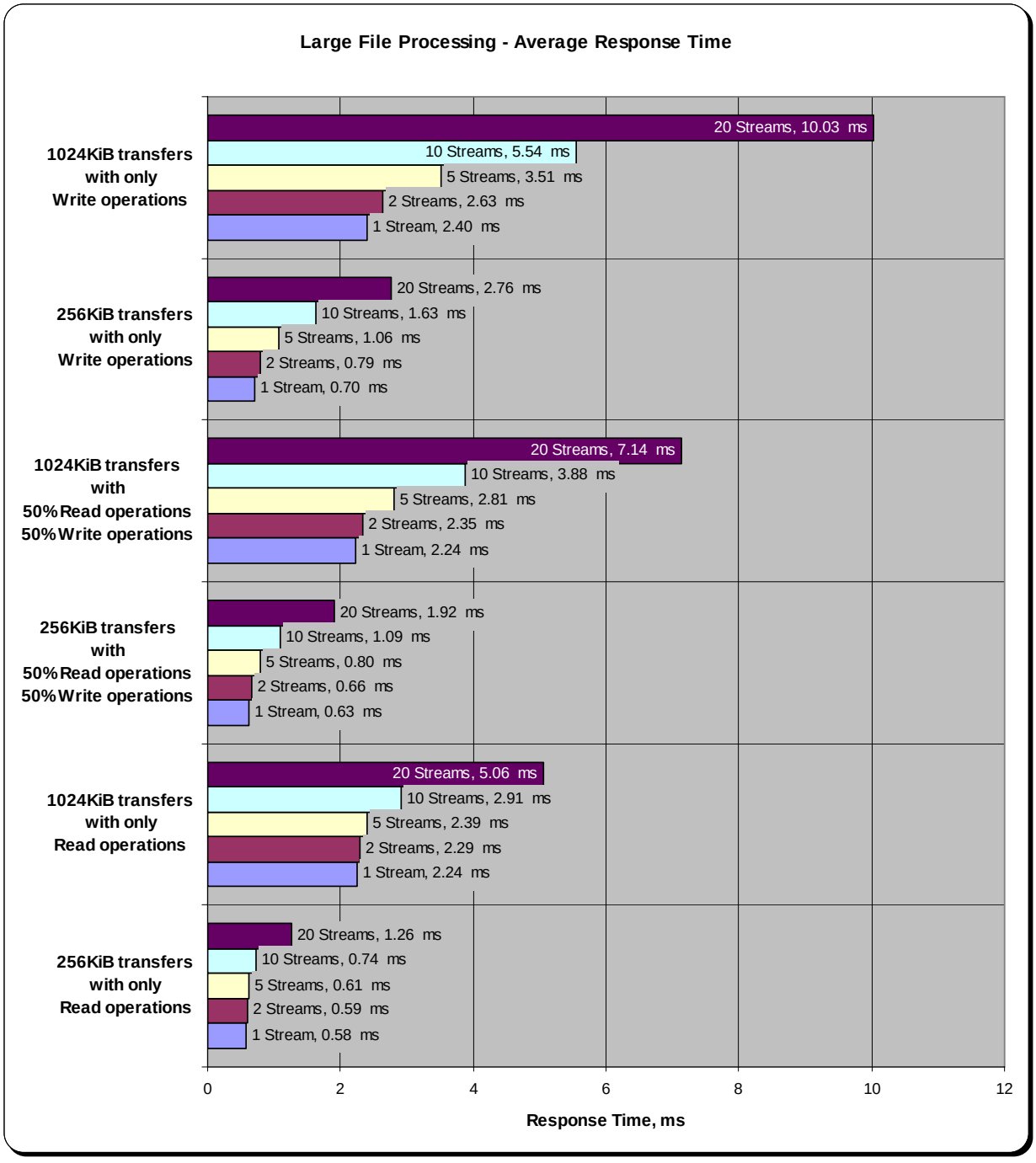


SPC-2 Large File Processing Average Response Time

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	2 Streams	5 Streams	10 Streams	20 Streams
Write 1024KiB	2.40	2.63	3.51	5.54	10.03
Write 256KiB	0.70	0.79	1.06	1.63	2.76
Read/Write 1024KiB	2.24	2.35	2.81	3.88	7.14
Read/Write 256KiB	0.63	0.66	0.80	1.09	1.92
Read 1024KiB	2.24	2.29	2.39	2.91	5.06
Read 256KiB	0.58	0.59	0.61	0.74	1.26

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.

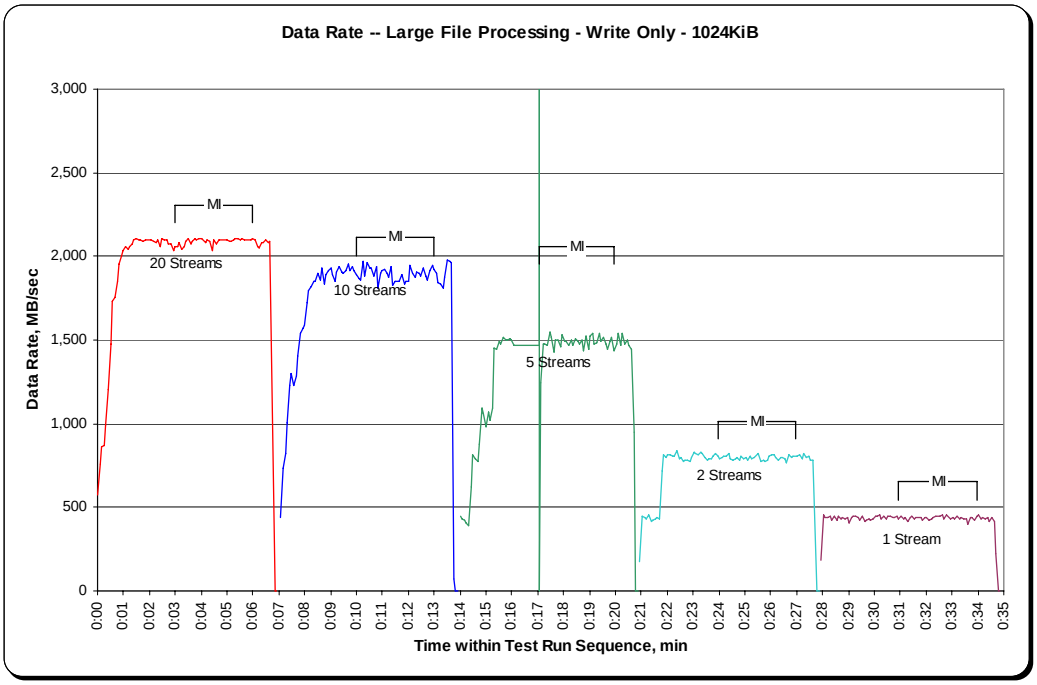
SPC-2 "Large File Processing/WRITE ONLY/1024 KiB Transfer Size" Test Run Data – Ramp-Up Period

TR1	20 Streams			TR2	10 Streams			TR3	5 Streams			TR4	2 Streams			TR5	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	573.57	286.79	2.41	0:07:05	440.19	440.19	2.37	0:14:00	442.92	442.92	2.36	0:20:57	176.16	176.16	2.37	0:27:57	181.40	181.40	2.30
0:00:05	757.49	378.75	2.77	0:07:10	737.15	368.57	2.62	0:14:05	433.69	433.69	2.42	0:21:02	446.90	446.90	2.34	0:28:02	451.31	451.31	2.32
0:00:10	863.40	287.80	3.33	0:07:15	819.99	273.33	2.98	0:14:10	425.30	425.30	2.46	0:21:07	438.72	438.72	2.40	0:28:07	437.26	437.26	2.40
0:00:15	868.43	217.11	3.70	0:07:20	1,007.26	335.75	3.12	0:14:15	405.80	405.80	2.58	0:21:12	434.74	434.74	2.41	0:28:12	442.71	442.71	2.37
0:00:20	989.44	197.89	4.78	0:07:25	1,229.56	307.39	3.03	0:14:20	392.38	392.38	2.67	0:21:17	451.94	451.94	2.32	0:28:17	445.02	445.02	2.35
0:00:25	1,200.83	200.14	4.85	0:07:30	1,302.96	325.74	3.22	0:14:25	619.92	309.96	2.62	0:21:22	415.24	415.24	2.52	0:28:22	426.35	426.35	2.46
0:00:30	1,473.46	163.72	4.78	0:07:35	1,225.37	306.34	3.42	0:14:30	810.55	405.27	2.58	0:21:27	419.22	419.22	2.50	0:28:27	443.55	443.55	2.36
0:00:35	1,727.84	157.08	5.68	0:07:40	1,286.81	321.70	3.26	0:14:35	789.37	394.68	2.65	0:21:32	428.87	428.87	2.44	0:28:32	424.25	424.25	2.47
0:00:40	1,751.75	134.75	6.76	0:07:45	1,403.83	233.97	3.51	0:14:40	770.28	385.14	2.72	0:21:37	438.30	438.30	2.39	0:28:37	450.68	450.68	2.32
0:00:45	1,849.48	132.11	7.78	0:07:50	1,538.89	256.48	4.08	0:14:45	879.55	293.18	2.82	0:21:42	434.53	434.53	2.41	0:28:42	430.55	430.55	2.43
0:00:50	1,957.48	122.34	8.43	0:07:55	1,570.14	261.69	4.00	0:14:50	1,094.71	364.90	2.87	0:21:47	719.11	359.56	2.52	0:28:47	439.56	439.56	2.38
0:00:55	2,005.72	125.36	8.37	0:08:00	1,591.53	198.94	4.78	0:14:55	1,061.58	353.86	2.96	0:21:52	814.53	407.27	2.57	0:28:52	432.01	432.01	2.43
0:01:00	2,030.88	119.46	8.57	0:08:05	1,720.71	215.09	4.87	0:15:00	978.74	326.25	3.21	0:21:57	798.60	399.30	2.62	0:28:57	440.19	440.19	2.38
0:01:05	2,057.94	121.06	8.66	0:08:10	1,795.16	224.40	4.67	0:15:05	1,070.39	356.80	2.94	0:22:02	813.49	406.74	2.58	0:29:02	404.75	404.75	2.59
0:01:10	2,045.77	120.34	8.71	0:08:15	1,818.23	202.03	4.64	0:15:10	1,021.52	340.51	3.07	0:22:07	810.34	405.17	2.58	0:29:07	437.05	437.05	2.40
0:01:15	2,056.26	108.22	9.24	0:08:20	1,853.25	185.33	5.43	0:15:15	1,095.34	273.84	2.92	0:22:12	804.89	402.44	2.60	0:29:12	443.55	443.55	2.36
0:01:20	2,075.55	103.78	9.76	0:08:25	1,851.16	185.12	5.66	0:15:20	1,452.70	290.54	3.36	0:22:17	807.40	403.70	2.60	0:29:17	443.34	443.34	2.36
0:01:25	2,099.04	104.95	9.99	0:08:30	1,895.62	189.56	5.53	0:15:25	1,445.78	289.16	3.62	0:22:22	838.44	419.22	2.50	0:29:22	437.89	437.89	2.39
0:01:30	2,104.28	105.21	9.96	0:08:35	1,858.92	185.89	5.64	0:15:30	1,491.28	298.26	3.51	0:22:27	793.14	396.57	2.64	0:29:27	424.25	424.25	2.47
0:01:35	2,098.20	104.91	9.99	0:08:40	1,928.96	192.90	5.43	0:15:35	1,479.54	295.91	3.54	0:22:32	795.03	397.52	2.64	0:29:32	447.11	447.11	2.34
0:01:40	2,099.67	104.98	9.98	0:08:45	1,834.59	183.46	5.71	0:15:40	1,515.40	303.08	3.46	0:22:37	777.41	388.71	2.70	0:29:37	415.45	415.45	2.52
0:01:45	2,092.33	104.62	10.02	0:08:50	1,891.84	189.18	5.54	0:15:45	1,502.61	300.52	3.49	0:22:42	783.92	391.96	2.67	0:29:42	425.30	425.30	2.46
0:01:50	2,099.88	104.99	9.99	0:08:55	1,912.60	191.26	5.48	0:15:50	1,499.46	299.89	3.49	0:22:47	780.14	390.07	2.68	0:29:47	430.55	430.55	2.43
0:01:55	2,099.88	104.99	9.97	0:09:00	1,934.83	193.48	5.42	0:15:55	1,506.38	301.28	3.48	0:22:52	771.12	385.56	2.72	0:29:52	425.72	425.72	2.46
0:02:00	2,096.73	104.84	10.00	0:09:05	1,887.65	188.76	5.55	0:16:00	1,497.37	299.47	3.50	0:22:57	794.40	397.20	2.64	0:29:57	429.71	429.71	2.44
0:02:05	2,101.56	105.08	9.98	0:09:10	1,852.83	185.28	5.66	0:16:05	1,468.43	293.69	3.57	0:23:02	828.58	414.29	2.53	0:30:02	443.55	443.55	2.36
0:02:10	2,092.96	104.65	10.03	0:09:15	1,903.58	190.36	5.50	0:17:03	1,467.38	293.48	3.57	0:23:07	819.78	409.89	2.56	0:30:07	446.90	446.90	2.34
0:02:15	2,079.75	103.99	10.07	0:09:20	1,941.75	194.18	5.40	0:17:03	15,910.25	3,182.05	3.48	0:23:12	810.34	405.17	2.58	0:30:12	454.87	454.87	2.30
0:02:20	2,101.77	105.09	9.98	0:09:25	1,906.73	190.67	5.50					0:23:17	830.05	415.03	2.52	0:30:17	428.24	428.24	2.45
0:02:25	2,061.29	103.06	10.17	0:09:30	1,902.54	190.25	5.51					0:23:22	818.73	409.36	2.56	0:30:22	448.37	448.37	2.34
0:02:30	2,107.22	105.36	9.94	0:09:35	1,912.39	191.24	5.48					0:23:27	795.24	397.62	2.64	0:30:27	428.87	428.87	2.44
0:02:35	2,098.20	104.91	9.99	0:09:40	1,957.90	195.79	5.35					0:23:32	782.66	391.33	2.68	0:30:32	443.34	443.34	2.36
0:02:40	2,096.31	104.82	10.01	0:09:45	1,911.13	191.11	5.48					0:23:37	786.43	393.22	2.66	0:30:37	447.53	447.53	2.34
0:02:45	2,074.29	103.71	10.09	0:09:50	1,939.03	193.90	5.40					0:23:42	792.72	396.36	2.64	0:30:42	440.19	440.19	2.38
0:02:50	2,070.73	103.54	10.13	0:09:55	1,911.55	191.16	5.47					0:23:47	808.87	404.44	2.59	0:30:47	441.87	441.87	2.37
0:02:55	2,035.08	101.75	10.27									0:23:52	821.24	410.62	2.55	0:30:52	449.21	449.21	2.33

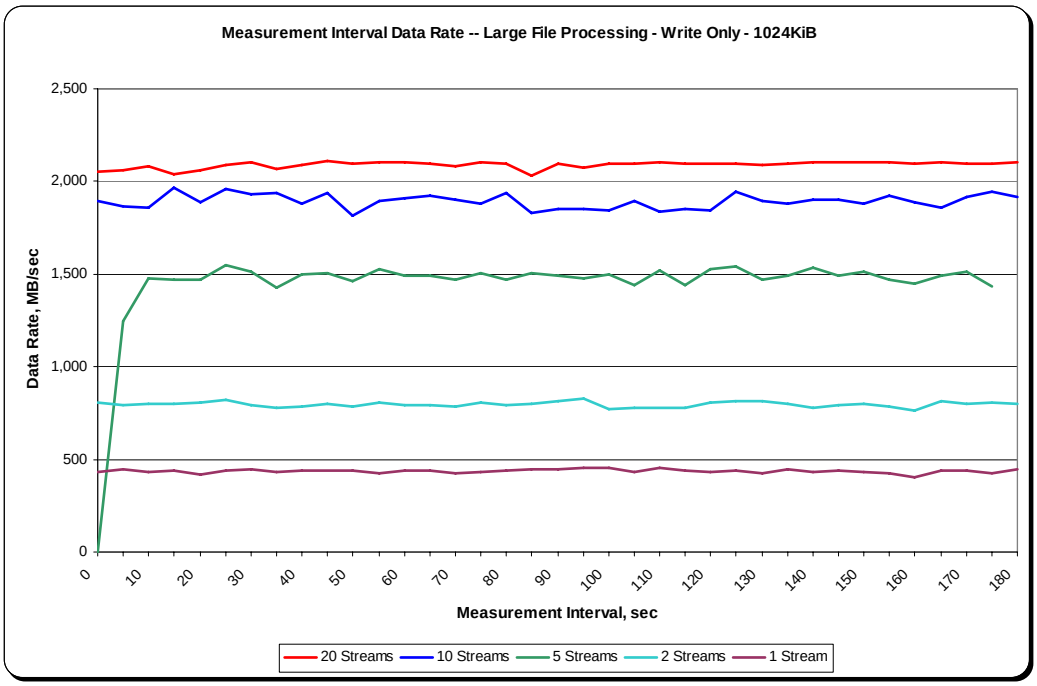
SPC-2 "Large File Processing/WRITE ONLY/1024 KiB Transfer Size" Test Run Data
Measurement Interval, Run-Out, and Ramp-Down Periods

TR1	20 Streams			TR2	10 Streams			TR3	5 Streams			TR4	2 Streams			TR5	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
0:03:00	2,054.79	102.74	10.21	0:10:00	1,893.73	189.37	5.55	0:17:03	0.21	0.04	3.41	0:23:57	805.31	402.65	2.60	0:30:57	432.43	432.43	2.42
0:03:05	2,059.19	102.96	10.17	0:10:05	1,865.84	186.58	5.62	0:17:07	1,248.02	249.60	3.46	0:24:02	793.77	396.89	2.62	0:31:02	446.27	446.27	2.33
0:03:10	2,082.68	104.13	10.08	0:10:10	1,857.03	185.70	5.64	0:17:12	1,475.35	295.07	3.53	0:24:07	801.11	400.56	2.62	0:31:07	434.11	434.11	2.42
0:03:15	2,040.11	102.01	10.27	0:10:15	1,967.97	196.80	5.32	0:17:17	1,473.04	294.61	3.57	0:24:12	802.37	401.19	2.61	0:31:12	437.05	437.05	2.40
0:03:20	2,058.77	102.94	10.18	0:10:20	1,886.18	188.62	5.56	0:17:22	1,469.05	293.81	3.54	0:24:17	807.82	403.91	2.59	0:31:17	418.38	418.38	2.50
0:03:25	2,092.33	104.62	10.03	0:10:25	1,962.72	196.27	5.34	0:17:27	1,546.86	309.37	3.40	0:24:22	824.18	412.09	2.54	0:31:22	438.93	438.93	2.39
0:03:30	2,102.81	105.14	9.97	0:10:30	1,929.80	192.98	5.43	0:17:32	1,512.47	302.49	3.46	0:24:27	793.56	396.78	2.64	0:31:27	445.23	445.23	2.35
0:03:35	2,071.15	103.56	10.12	0:10:35	1,934.83	193.48	5.41	0:17:37	1,424.60	284.92	3.68	0:24:32	779.30	389.65	2.69	0:31:32	434.32	434.32	2.41
0:03:40	2,087.09	104.35	10.04	0:10:40	1,879.47	187.95	5.58	0:17:42	1,500.30	300.06	3.49	0:24:37	786.64	393.32	2.66	0:31:37	440.82	440.82	2.38
0:03:45	2,107.85	105.39	9.95	0:10:45	1,939.66	193.97	5.40	0:17:47	1,502.40	300.48	3.49	0:24:42	799.01	399.51	2.62	0:31:42	436.63	436.63	2.40
0:03:50	2,097.15	104.86	9.99	0:10:50	1,814.25	181.42	5.78	0:17:52	1,461.30	292.26	3.58	0:24:47	785.59	392.80	2.67	0:31:47	438.51	438.51	2.39
0:03:55	2,104.07	105.20	9.96	0:10:55	1,897.92	189.79	5.52	0:17:57	1,528.19	305.64	3.43	0:24:52	805.52	402.76	2.60	0:31:52	422.16	422.16	2.48
0:04:00	2,104.70	105.24	9.97	0:11:00	1,911.76	191.18	5.48	0:18:02	1,493.80	298.76	3.51	0:24:57	793.56	396.78	2.64	0:31:57	442.29	442.29	2.37
0:04:05	2,098.83	104.94	9.99	0:11:05	1,922.88	192.29	5.45	0:18:07	1,489.40	297.88	3.52	0:25:02	795.03	397.52	2.63	0:32:02	436.63	436.63	2.40
0:04:10	2,085.62	104.28	10.05	0:11:10	1,900.44	190.04	5.51	0:18:12	1,470.94	294.19	3.56	0:25:07	783.71	391.85	2.67	0:32:07	425.72	425.72	2.46
0:04:15	2,102.19	105.11	9.97	0:11:15	1,878.84	187.88	5.58	0:18:17	1,503.87	300.77	3.48	0:25:12	808.66	404.33	2.59	0:32:12	432.64	432.64	2.42
0:04:20	2,093.80	104.69	10.01	0:11:20	1,941.54	194.15	5.40	0:18:22	1,468.85	293.77	3.57	0:25:17	792.51	396.26	2.64	0:32:17	441.87	441.87	2.37
0:04:25	2,030.88	101.54	10.33	0:11:25	1,828.09	182.81	5.73	0:18:27	1,504.71	300.94	3.48	0:25:22	798.18	399.09	2.62	0:32:22	445.23	445.23	2.35
0:04:30	2,096.94	104.85	10.00	0:11:30	1,849.27	184.93	5.67	0:18:32	1,493.17	298.63	3.51	0:25:27	815.37	407.69	2.57	0:32:27	447.74	447.74	2.34
0:04:35	2,072.41	103.62	10.12	0:11:35	1,850.74	185.07	5.66	0:18:37	1,479.96	295.99	3.54	0:25:32	825.02	412.51	2.54	0:32:32	450.47	450.47	2.32
0:04:40	2,096.94	104.85	10.00	0:11:40	1,847.80	184.78	5.67	0:18:42	1,500.30	300.06	3.49	0:25:37	773.64	386.82	2.71	0:32:37	450.89	450.89	2.32
0:04:45	2,099.04	104.95	9.98	0:11:45	1,892.05	189.21	5.54	0:18:47	1,439.07	287.81	3.64	0:25:42	780.35	390.18	2.69	0:32:42	429.50	429.50	2.44
0:04:50	2,101.77	105.09	9.97	0:11:50	1,835.43	183.54	5.71	0:18:52	1,520.85	304.17	3.44	0:25:47	776.99	388.50	2.70	0:32:47	454.03	454.03	2.31
0:04:55	2,097.15	104.86	10.00	0:11:55	1,851.37	185.14	5.66	0:18:57	1,440.32	288.06	3.64	0:25:52	780.56	390.28	2.68	0:32:52	438.51	438.51	2.39
0:05:00	2,097.36	104.87	10.00	0:12:00	1,847.17	184.72	5.67	0:19:02	1,526.52	305.30	3.43	0:25:57	808.03	404.02	2.59	0:32:57	431.80	431.80	2.43
0:05:05	2,094.01	104.70	10.01	0:12:05	1,944.90	194.49	5.39	0:19:07	1,543.50	308.70	3.39	0:26:02	817.05	408.53	2.56	0:33:02	438.72	438.72	2.39
0:05:10	2,091.28	104.56	10.03	0:12:10	1,897.29	189.73	5.52	0:19:12	1,472.62	294.52	3.56	0:26:07	811.60	405.80	2.58	0:33:07	428.03	428.03	2.45
0:05:15	2,098.41	104.92	9.99	0:12:15	1,877.58	187.76	5.58	0:19:17	1,487.93	297.59	3.52	0:26:12	796.29	398.14	2.63	0:33:12	445.44	445.44	2.35
0:05:20	2,102.39	105.12	9.97	0:12:20	1,903.38	190.34	5.51	0:19:22	1,537.42	307.48	3.41	0:26:17	781.40	390.70	2.68	0:33:17	431.59	431.59	2.43
0:05:25	2,103.65	105.18	9.97	0:12:25	1,902.54	190.25	5.51	0:19:27	1,494.43	298.89	3.51	0:26:22	793.98	396.99	2.64	0:33:22	441.87	441.87	2.37
0:05:30	2,101.14	105.06	9.98	0:12:30	1,879.89	187.99	5.58	0:19:32	1,514.56	302.91	3.46	0:26:27	801.32	400.66	2.61	0:33:27	434.32	434.32	2.41
0:05:35	2,104.07	105.20	9.96	0:12:35	1,926.86	192.69	5.44	0:19:37	1,472.62	294.52	3.56	0:26:32	787.90	393.95	2.66	0:33:32	427.61	427.61	2.45
0:05:40	2,099.25	104.96	9.99	0:12:40	1,885.13	188.51	5.56	0:19:42	1,447.03	289.41	3.62	0:26:37	767.14	383.57	2.73	0:33:37	402.44	402.44	2.60
0:05:45	2,101.35	105.07	9.98	0:12:45	1,861.01	186.10	5.63	0:19:47	1,493.38	298.68	3.51	0:26:42	814.74	407.37	2.57	0:33:42	440.40	440.40	2.38
0:05:50	2,097.36	104.87	10.00	0:12:50	1,915.96	191.60	5.47	0:19:52	1,512.26	302.45	3.46	0:26:47	797.97	398.98	2.63	0:33:47	440.40	440.40	2.38
0:05:55	2,094.85	104.74	9.97	0:12:55	1,944.48	194.45	5.37	0:19:57	1,434.24	286.85	3.65	0:26:52	803.84	401.92	2.61	0:33:52	426.56	426.56	2.46
0:06:00	2,102.81	105.14	10.01	0:13:00	1,919.94	191.99	5.48	0:20:02	1,479.96	295.99	3.54	0:26:57	803.00	401.50	2.61	0:33:57	449.63	449.63	2.32
0:06:05	2,096.52	104.83	9.98	0:13:05	1,895.41	189.54	5.53	0:20:07	1,539.73	307.95	3.40	0:27:02	804.89	402.44	2.60	0:34:02	456.34	456.34	2.29
0:06:10	2,060.45	103.02	10.18	0:13:10	1,843.82	184.38	5.68	0:20:12	1,467.59	293.52	3.57	0:27:07	815.16	407.58	2.57	0:34:07	434.74	434.74	2.41
0:06:15	2,053.95	102.70	10.20	0:13:15	1,832.28	183.23	5.72	0:20:17	1,537.42	307.48	3.41	0:27:12	786.43	393.22	2.66	0:34:12	439.56	439.56	2.38
0:06:20	2,081.42	104.07	10.07	0:13:20	1,809.21	180.92	5.79	0:20:22	1,478.28	295.66	3.54	0:27:17	823.13	411.57	2.55	0:34:17	433.48	433.48	2.42
0:06:25	2,085.62	104.28	10.05	0:13:25	1,873.18	187.32	5.60	0:20:27	1,501.98	300.40	3.49	0:27:22	798.60	399.30	2.62	0:34:22	439.98	439.98	2.38
0:06:30	2,101.98	105.10	9.98	0:13:30	1,976.57	197.66	5.30	0:20:32	1,471.57	294.31	3.56	0:27:27	803.84	401.92	2.61	0:34:27	412.30	412.30	2.54
0:06:35	2,082.68	104.13	10.06	0:13:35	1,968.39	196.84	5.32	0:20:37	1,442.21	288.44	3.63	0:27:32	778.25	389.13	2.69	0:34:32	435.16	435.16	2.41
0:06:40	2,086.67	104.33	10.02	0:13:40	1,959.37	195.94	5.33	0:20:42	946.86	0.00	3.42	0:27:37	779.09	389.55	2.69	0:34:37	418.17	418.17	2.41
0:06:50	0.00	0.00	0.00	0:13:45	68.16	0.00	4.01	0:20:47	0.00	0.00	0.00	0:27:42	505.41	0.00	2.58	0:34:42	220.41	0.00	3.03
0:06:55	0.00	0.00	0.00	0:13:50	0.00	0.00	0.00	0:20:52	0.00	0.00	0.00	0:27:47	0.00	0.00	0.00	0:34:47	0.00	0.00	0.00
				0:13:55	0.00	0.00	0.00					0:27:52	0.00	0.00	0.00	0:34:52	0.00	0.00	0.00

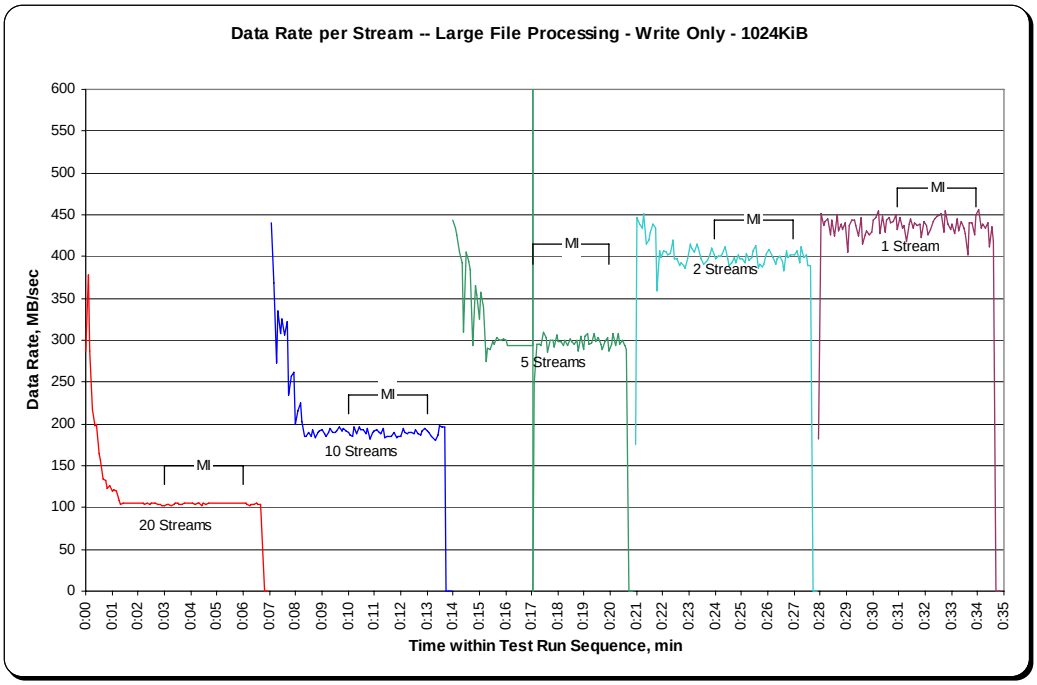
SPC-2 "Large File Processing/WRITE ONLY/1024 KiB Transfer Size" Average Data Rate Graph – Complete Test Run



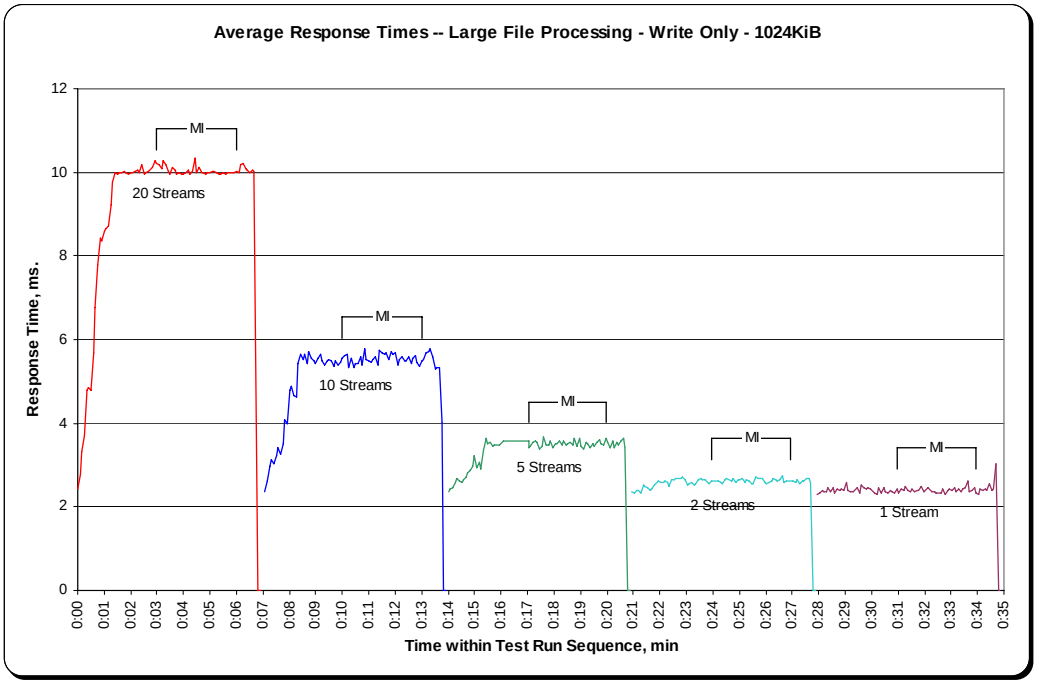
SPC-2 "Large File Processing/ WRITE ONLY /1024 KiB Transfer Size" Average Data Rate Graph – Measurement Interval (MI) Only



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



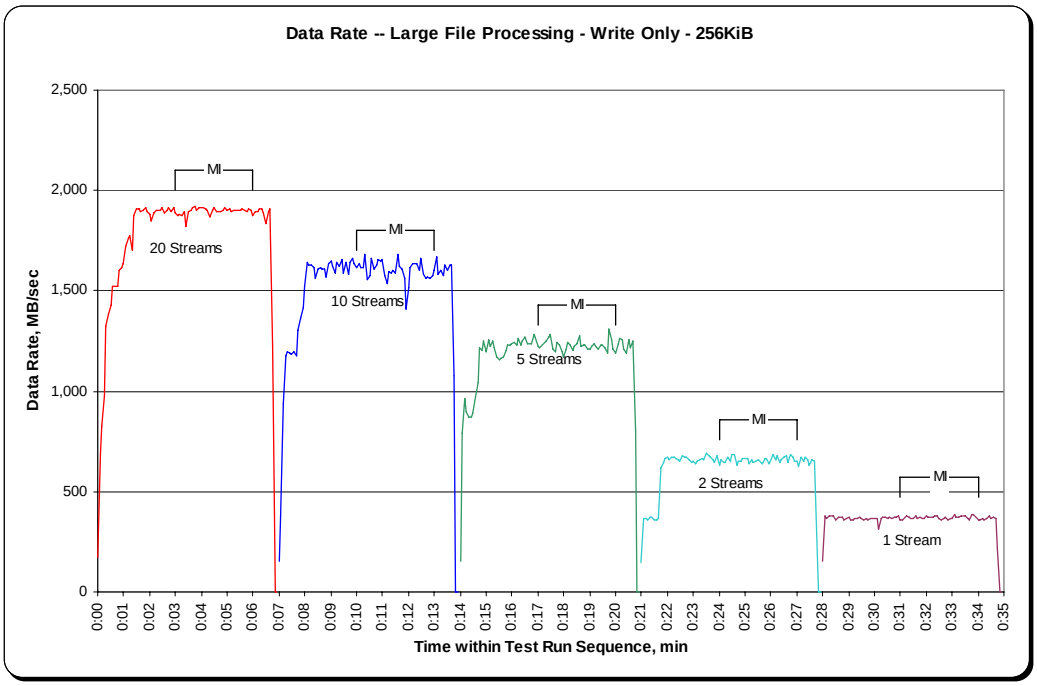
SPC-2 "Large File Processing/ WRITE ONLY /256 KiB Transfer Size" Test Run Data – Ramp-Up Period

TR6	20 Streams			TR7	10 Streams			TR8	5 Streams			TR9	2 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	169.66	84.83	0.67	0:07:00	149.84	149.84	0.70	0:14:00	155.87	155.87	0.67	0:21:00	148.48	148.48	0.70	0:28:00	150.89	150.89	0.69
0:00:05	682.89	341.44	0.77	0:07:05	380.16	380.16	0.69	0:14:05	793.46	264.49	0.78	0:21:05	368.73	368.73	0.71	0:28:05	381.68	381.68	0.68
0:00:10	826.38	206.60	1.09	0:07:10	936.27	234.07	0.87	0:14:10	966.73	322.24	0.81	0:21:10	368.57	368.57	0.71	0:28:10	366.32	366.32	0.71
0:00:15	977.74	139.68	1.44	0:07:15	1,177.39	235.48	1.08	0:14:15	898.32	299.44	0.87	0:21:15	360.55	360.55	0.72	0:28:15	377.70	377.70	0.69
0:00:20	1,322.73	165.34	1.45	0:07:20	1,195.90	239.18	1.09	0:14:20	868.06	289.35	0.90	0:21:20	375.55	375.55	0.70	0:28:20	376.54	376.54	0.69
0:00:25	1,384.49	173.06	1.52	0:07:25	1,190.34	238.07	1.10	0:14:25	871.10	290.37	0.90	0:21:25	369.73	369.73	0.71	0:28:25	377.02	377.02	0.69
0:00:30	1,430.83	143.08	1.60	0:07:30	1,185.83	237.17	1.10	0:14:30	892.34	297.45	0.88	0:21:30	357.25	357.25	0.73	0:28:30	361.23	361.23	0.72
0:00:35	1,522.32	152.23	1.72	0:07:35	1,196.32	239.26	1.09	0:14:35	971.03	242.76	0.91	0:21:35	359.24	359.24	0.73	0:28:35	373.40	373.40	0.70
0:00:40	1,521.69	152.17	1.72	0:07:40	1,175.51	235.10	1.11	0:14:40	1,041.76	260.44	1.00	0:21:40	363.80	363.80	0.72	0:28:40	370.93	370.93	0.70
0:00:45	1,525.73	138.70	1.74	0:07:45	1,303.59	186.23	1.26	0:14:45	1,215.25	243.05	1.06	0:21:45	620.13	310.06	0.77	0:28:45	370.36	370.36	0.71
0:00:50	1,602.22	123.25	1.95	0:07:50	1,364.41	170.55	1.39	0:14:50	1,206.39	241.28	1.08	0:21:50	644.66	322.33	0.81	0:28:50	360.03	360.03	0.73
0:00:55	1,617.90	124.45	2.10	0:07:55	1,419.14	177.39	1.48	0:14:55	1,247.96	249.59	1.05	0:21:55	662.44	331.22	0.79	0:28:55	365.80	365.80	0.71
0:01:00	1,638.77	117.05	2.14	0:08:00	1,521.80	152.18	1.53	0:15:00	1,195.32	239.06	1.09	0:22:00	673.87	336.93	0.78	0:29:00	371.04	371.04	0.70
0:01:05	1,719.25	107.45	2.34	0:08:05	1,641.18	164.12	1.59	0:15:05	1,254.78	250.96	1.04	0:22:05	656.83	328.41	0.80	0:29:05	355.78	355.78	0.73
0:01:10	1,762.34	103.67	2.42	0:08:10	1,631.01	163.10	1.60	0:15:10	1,224.42	244.88	1.07	0:22:10	670.30	335.15	0.78	0:29:10	361.86	361.86	0.72
0:01:15	1,777.81	98.77	2.57	0:08:15	1,627.65	162.77	1.61	0:15:15	1,249.69	249.94	1.05	0:22:15	673.03	336.51	0.78	0:29:15	365.22	365.22	0.72
0:01:20	1,704.04	89.69	2.79	0:08:20	1,613.29	161.33	1.62	0:15:20	1,219.65	243.93	1.07	0:22:20	662.28	331.14	0.79	0:29:20	364.38	364.38	0.72
0:01:25	1,876.11	93.81	2.75	0:08:25	1,561.17	156.12	1.68	0:15:25	1,170.21	234.04	1.12	0:22:25	660.08	330.04	0.79	0:29:25	374.39	374.39	0.70
0:01:30	1,907.41	95.37	2.75	0:08:30	1,606.94	160.69	1.63	0:15:30	1,157.68	231.54	1.13	0:22:30	653.11	326.55	0.80	0:29:30	364.85	364.85	0.72
0:01:35	1,911.08	95.55	2.74	0:08:35	1,618.06	161.81	1.62	0:15:35	1,162.77	232.55	1.12	0:22:35	675.13	337.56	0.77	0:29:35	356.99	356.99	0.73
0:01:40	1,892.57	94.63	2.77	0:08:40	1,608.10	160.81	1.63	0:15:40	1,167.12	233.42	1.12	0:22:40	669.73	334.86	0.78	0:29:40	368.26	368.26	0.71
0:01:45	1,901.12	95.06	2.75	0:08:45	1,609.30	160.93	1.63	0:15:45	1,201.56	240.31	1.09	0:22:45	670.04	335.02	0.78	0:29:45	358.46	358.46	0.73
0:01:50	1,913.02	95.65	2.74	0:08:50	1,567.62	156.76	1.67	0:15:50	1,232.39	246.48	1.06	0:22:50	655.78	327.89	0.80	0:29:50	366.32	366.32	0.71
0:01:55	1,897.19	94.86	2.76	0:08:55	1,635.88	163.59	1.60	0:15:55	1,232.29	246.46	1.06	0:22:55	643.20	321.60	0.81	0:29:55	364.22	364.22	0.72
0:02:00	1,884.03	94.20	2.78	0:09:00	1,648.89	164.89	1.59	0:16:00	1,233.91	246.78	1.06	0:23:00	653.21	326.61	0.80	0:30:00	368.10	368.10	0.71
0:02:05	1,849.79	92.49	2.83	0:09:05	1,619.21	161.92	1.62	0:16:05	1,241.88	248.38	1.05	0:23:05	639.79	319.89	0.82	0:30:05	365.06	365.06	0.72
0:02:10	1,885.50	94.27	2.78	0:09:10	1,587.02	158.70	1.65	0:16:10	1,227.93	245.59	1.06	0:23:10	654.52	327.26	0.80	0:30:10	313.52	313.52	0.83
0:02:15	1,902.01	95.10	2.75	0:09:15	1,639.87	163.99	1.60	0:16:15	1,261.33	252.27	1.04	0:23:15	655.46	327.73	0.80	0:30:15	363.75	363.75	0.72
0:02:20	1,903.69	95.18	2.75	0:09:20	1,621.47	162.15	1.61	0:16:20	1,232.97	246.59	1.06	0:23:20	665.79	332.90	0.79	0:30:20	369.05	369.05	0.71
0:02:25	1,901.80	95.09	2.75	0:09:25	1,654.97	165.50	1.58	0:16:25	1,251.37	250.27	1.04	0:23:25	656.51	328.26	0.80	0:30:25	374.08	374.08	0.70
0:02:30	1,915.54	95.78	2.73	0:09:30	1,590.85	159.08	1.64	0:16:30	1,268.20	253.64	1.03	0:23:30	688.18	344.09	0.76	0:30:30	368.94	368.94	0.71
0:02:35	1,886.44	94.32	2.78	0:09:35	1,639.29	163.93	1.60	0:16:35	1,237.58	247.52	1.06	0:23:35	678.11	339.06	0.77	0:30:35	371.25	371.25	0.70
0:02:40	1,899.08	94.95	2.76	0:09:40	1,580.10	158.01	1.66	0:16:40	1,233.96	246.79	1.06	0:23:40	669.04	334.52	0.78	0:30:40	363.91	363.91	0.72
0:02:45	1,913.49	95.67	2.74	0:09:45	1,640.86	164.09	1.59	0:16:45	1,238.79	247.76	1.06	0:23:45	659.03	329.52	0.79	0:30:45	373.50	373.50	0.70
0:02:50	1,897.40	94.87	2.76	0:09:50	1,662.52	166.25	1.57	0:16:50	1,284.87	256.97	1.02	0:23:50	643.04	321.52	0.81	0:30:50	369.31	369.31	0.71
0:02:55	1,912.66	95.63	2.74	0:09:55	1,632.37	163.24	1.60	0:16:55	1,260.76	252.15	1.04	0:23:55	679.58	339.79	0.77	0:30:55	376.07	376.07	0.69

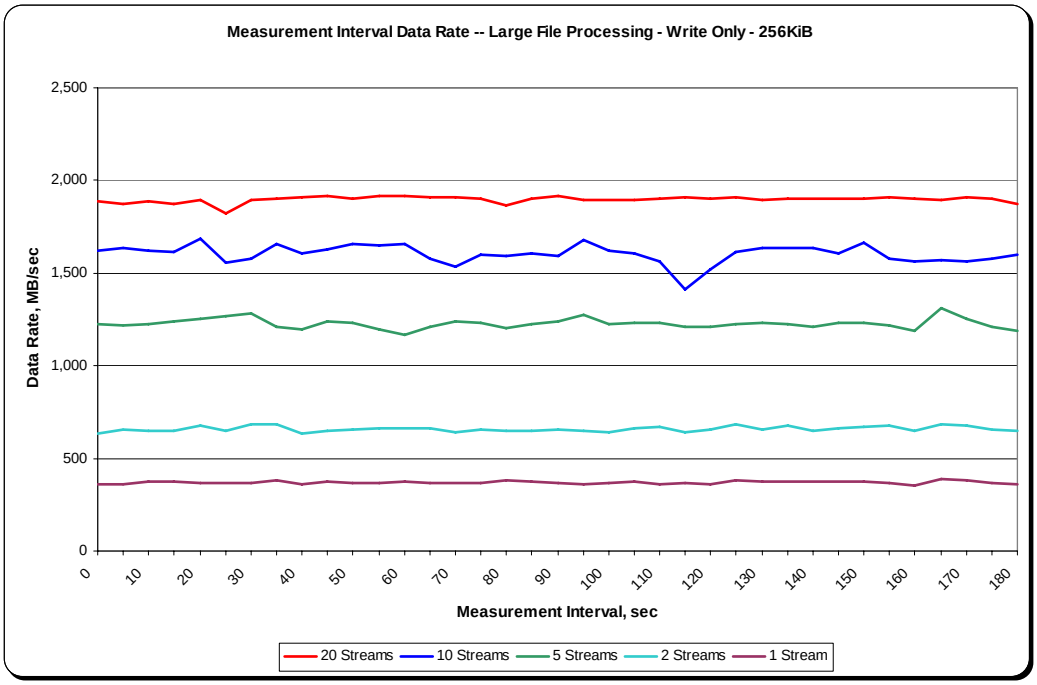
SPC-2 "Large File Processing/ WRITE ONLY /256 KiB Transfer Size" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods

TR6	20 Streams			TR7	10 Streams			TR8	5 Streams			TR9	2 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
0:03:00	1,885.86	94.29	2.78	0:10:00	1,618.95	161.89	1.62	0:17:00	1,223.64	244.73	1.07	0:24:00	632.24	316.12	0.83	0:31:00	358.30	358.30	0.73
0:03:05	1,874.80	93.74	2.79	0:10:05	1,637.30	163.73	1.60	0:17:05	1,219.02	243.80	1.07	0:24:05	658.19	329.10	0.79	0:31:05	358.72	358.72	0.72
0:03:10	1,884.13	94.21	2.78	0:10:10	1,618.63	161.86	1.62	0:17:10	1,227.78	245.56	1.07	0:24:10	647.92	323.96	0.81	0:31:10	372.93	372.93	0.70
0:03:15	1,875.80	93.79	2.79	0:10:15	1,612.87	161.29	1.62	0:17:15	1,240.83	248.17	1.05	0:24:15	645.24	322.62	0.81	0:31:15	376.86	376.86	0.69
0:03:20	1,897.29	94.86	2.76	0:10:20	1,684.90	168.49	1.55	0:17:20	1,253.10	250.62	1.04	0:24:20	674.60	337.30	0.77	0:31:20	370.04	370.04	0.71
0:03:25	1,819.44	90.97	2.88	0:10:25	1,557.92	155.79	1.68	0:17:25	1,267.68	253.54	1.03	0:24:25	648.96	324.48	0.81	0:31:25	368.73	368.73	0.71
0:03:30	1,896.72	94.84	2.76	0:10:30	1,575.43	157.54	1.66	0:17:30	1,283.09	256.62	1.02	0:24:30	682.10	341.05	0.77	0:31:30	367.84	367.84	0.71
0:03:35	1,904.79	95.24	2.75	0:10:35	1,660.58	166.06	1.58	0:17:35	1,211.37	242.27	1.08	0:24:35	685.77	342.88	0.76	0:31:35	380.11	380.11	0.69
0:03:40	1,912.55	95.63	2.74	0:10:40	1,607.31	160.73	1.63	0:17:40	1,195.06	239.01	1.09	0:24:40	634.86	317.43	0.82	0:31:40	362.65	362.65	0.72
0:03:45	1,918.84	95.94	2.73	0:10:45	1,629.49	162.95	1.61	0:17:45	1,242.25	248.45	1.05	0:24:45	648.44	324.22	0.81	0:31:45	374.55	374.55	0.70
0:03:50	1,904.00	95.20	2.75	0:10:50	1,655.18	165.52	1.58	0:17:50	1,230.29	246.06	1.06	0:24:50	652.42	326.21	0.80	0:31:50	366.74	366.74	0.71
0:03:55	1,913.34	95.67	2.74	0:10:55	1,650.98	165.10	1.58	0:17:55	1,195.80	239.16	1.09	0:24:55	665.69	332.84	0.79	0:31:55	367.84	367.84	0.71
0:04:00	1,917.53	95.88	2.73	0:11:00	1,654.29	165.43	1.58	0:18:00	1,166.91	233.38	1.12	0:25:00	665.64	332.82	0.79	0:32:00	377.49	377.49	0.69
0:04:05	1,911.76	95.59	2.74	0:11:05	1,574.49	157.45	1.66	0:18:05	1,210.63	242.13	1.08	0:25:05	663.17	331.59	0.79	0:32:05	369.62	369.62	0.71
0:04:10	1,911.08	95.55	2.74	0:11:10	1,533.86	153.39	1.71	0:18:10	1,240.88	248.18	1.05	0:25:10	640.16	320.08	0.82	0:32:10	369.05	369.05	0.71
0:04:15	1,903.90	95.19	2.75	0:11:15	1,598.34	159.83	1.64	0:18:15	1,229.82	245.96	1.06	0:25:15	656.20	328.10	0.80	0:32:15	370.20	370.20	0.71
0:04:20	1,866.41	93.32	2.81	0:11:20	1,589.43	158.94	1.65	0:18:20	1,205.23	241.05	1.08	0:25:20	645.61	322.80	0.81	0:32:20	378.43	378.43	0.69
0:04:25	1,902.06	95.10	2.75	0:11:25	1,603.74	160.37	1.63	0:18:25	1,225.73	245.15	1.07	0:25:25	648.33	324.17	0.81	0:32:25	377.80	377.80	0.69
0:04:30	1,913.34	95.67	2.74	0:11:30	1,592.11	159.21	1.64	0:18:30	1,239.05	247.81	1.06	0:25:30	658.40	329.20	0.79	0:32:30	367.89	367.89	0.71
0:04:35	1,896.72	94.84	2.76	0:11:35	1,679.61	167.96	1.56	0:18:35	1,274.70	254.94	1.03	0:25:35	651.17	325.58	0.80	0:32:35	356.88	356.88	0.73
0:04:40	1,896.51	94.83	2.76	0:11:40	1,619.26	161.93	1.62	0:18:40	1,224.21	244.84	1.07	0:25:40	640.05	320.03	0.82	0:32:40	368.47	368.47	0.71
0:04:45	1,896.66	94.83	2.76	0:11:45	1,605.89	160.59	1.63	0:18:45	1,232.97	246.59	1.06	0:25:45	662.86	331.43	0.79	0:32:45	372.82	372.82	0.70
0:04:50	1,903.74	95.19	2.75	0:11:50	1,561.75	156.17	1.68	0:18:50	1,229.67	245.93	1.06	0:25:50	667.05	333.53	0.78	0:32:50	361.86	361.86	0.72
0:04:55	1,912.81	95.64	2.74	0:11:55	1,408.55	140.86	1.86	0:18:55	1,207.59	241.52	1.08	0:25:55	641.26	320.63	0.82	0:32:55	366.27	366.27	0.71
0:05:00	1,901.91	95.10	2.75	0:12:00	1,517.24	151.72	1.72	0:19:00	1,208.96	241.79	1.08	0:26:00	653.63	326.81	0.80	0:33:00	362.65	362.65	0.72
0:05:05	1,908.88	95.44	2.74	0:12:05	1,616.90	161.69	1.62	0:19:05	1,222.06	244.41	1.07	0:26:05	682.62	341.31	0.77	0:33:05	385.30	385.30	0.68
0:05:10	1,893.73	94.69	2.77	0:12:10	1,635.36	163.54	1.60	0:19:10	1,233.65	246.73	1.06	0:26:10	658.09	329.04	0.79	0:33:10	371.77	371.77	0.70
0:05:15	1,904.37	95.22	2.75	0:12:15	1,636.46	163.65	1.60	0:19:15	1,225.31	245.06	1.07	0:26:15	675.86	337.93	0.77	0:33:15	375.02	375.02	0.70
0:05:20	1,901.85	95.09	2.75	0:12:20	1,637.14	163.71	1.60	0:19:20	1,213.15	242.63	1.08	0:26:20	645.29	322.65	0.81	0:33:20	376.18	376.18	0.69
0:05:25	1,898.66	94.93	2.76	0:12:25	1,605.11	160.51	1.63	0:19:25	1,232.50	246.50	1.06	0:26:25	659.71	329.86	0.79	0:33:25	376.23	376.23	0.69
0:05:30	1,901.85	95.09	2.75	0:12:30	1,664.88	166.49	1.57	0:19:30	1,228.56	245.71	1.06	0:26:30	671.30	335.65	0.78	0:33:30	377.85	377.85	0.69
0:05:35	1,908.20	95.41	2.74	0:12:35	1,579.78	157.98	1.66	0:19:35	1,216.09	243.22	1.08	0:26:35	677.75	338.87	0.77	0:33:35	367.47	367.47	0.71
0:05:40	1,904.48	95.22	2.75	0:12:40	1,561.75	156.17	1.68	0:19:40	1,190.97	238.19	1.10	0:26:40	646.71	323.35	0.81	0:33:40	355.73	355.73	0.73
0:05:45	1,898.03	94.90	2.76	0:12:45	1,569.98	157.00	1.67	0:19:45	1,310.93	262.19	1.00	0:26:45	681.57	340.79	0.77	0:33:45	386.61	386.61	0.68
0:05:50	1,908.41	95.42	2.74	0:12:50	1,564.16	156.42	1.67	0:19:50	1,254.25	250.85	1.04	0:26:50	674.18	337.09	0.78	0:33:50	383.41	383.41	0.68
0:05:55	1,904.11	95.21	2.75	0:12:55	1,577.06	157.71	1.66	0:19:55	1,211.84	242.37	1.08	0:26:55	653.79	326.89	0.80	0:33:55	370.78	370.78	0.70
0:06:00	1,873.44	93.67	2.79	0:13:00	1,601.59	160.16	1.63	0:20:00	1,191.50	238.30	1.10	0:27:00	651.95	325.98	0.80	0:34:00	360.45	360.45	0.73
0:06:05	1,897.14	94.86	2.76	0:13:05	1,668.23	166.82	1.56	0:20:05	1,239.63	247.93	1.05	0:27:05	622.28	311.14	0.84	0:34:05	360.87	360.87	0.72
0:06:10	1,896.77	94.84	2.76	0:13:10	1,579.99	158.00	1.66	0:20:10	1,263.59	252.72	1.03	0:27:10	670.56	335.28	0.78	0:34:10	366.58	366.58	0.71
0:06:15	1,905.21	95.26	2.75	0:13:15	1,604.95	160.50	1.63	0:20:15	1,253.52	250.70	1.04	0:27:15	654.00	327.00	0.80	0:34:15	356.83	356.83	0.73
0:06:20	1,909.88	95.49	2.74	0:13:20	1,576.59	157.66	1.66	0:20:20	1,209.79	241.96	1.08	0:27:20	669.25	334.63	0.78	0:34:20	366.58	366.58	0.71
0:06:25	1,887.38	94.37	2.77	0:13:25	1,631.90	163.19	1.60	0:20:25	1,188.56	237.71	1.10	0:27:25	658.61	329.31	0.79	0:34:25	381.79	381.79	0.68
0:06:30	1,835.11	91.76	2.85	0:13:30	1,604.37	160.44	1.63	0:20:30	1,253.83	250.77	1.04	0:27:30	632.76	316.38	0.83	0:34:30	367.79	367.79	0.71
0:06:35	1,895.14	94.76	2.76	0:13:35	1,626.29	162.63	1.61	0:20:35	1,219.13	243.83	1.07	0:27:35	657.67	328.83	0.79	0:34:35	373.61	373.61	0.70
0:06:40	1,905.00	95.25	2.75	0:13:40	1,631.90	163.19	1.60	0:20:40	1,251.11	250.22	1.05	0:27:40	649.59	324.80	0.80	0:34:40	362.49	362.49	0.72
0:06:45	1,230.29	0.00	2.69	0:13:45	1,074.95	0.00	1.56	0:20:45	795.45	0.00	1.04	0:27:45	430.49	0.00	0.78	0:34:45	214.49	0.00	0.73
0:06:50	0.00	0.00	0.00	0:13:50	0.00	0.00	0.00	0:20:50	0.00	0.00	0.00	0:27:50	0.00	0.00	0.00	0:34:50	0.00	0.00	0.00
0:06:55	0.00	0.00	0.00	0:13:55	0.00	0.00	0.00	0:20:55	0.00	0.00	0.00	0:27:55	0.00	0.00	0.00	0:34:55	0.00	0.00	0.00

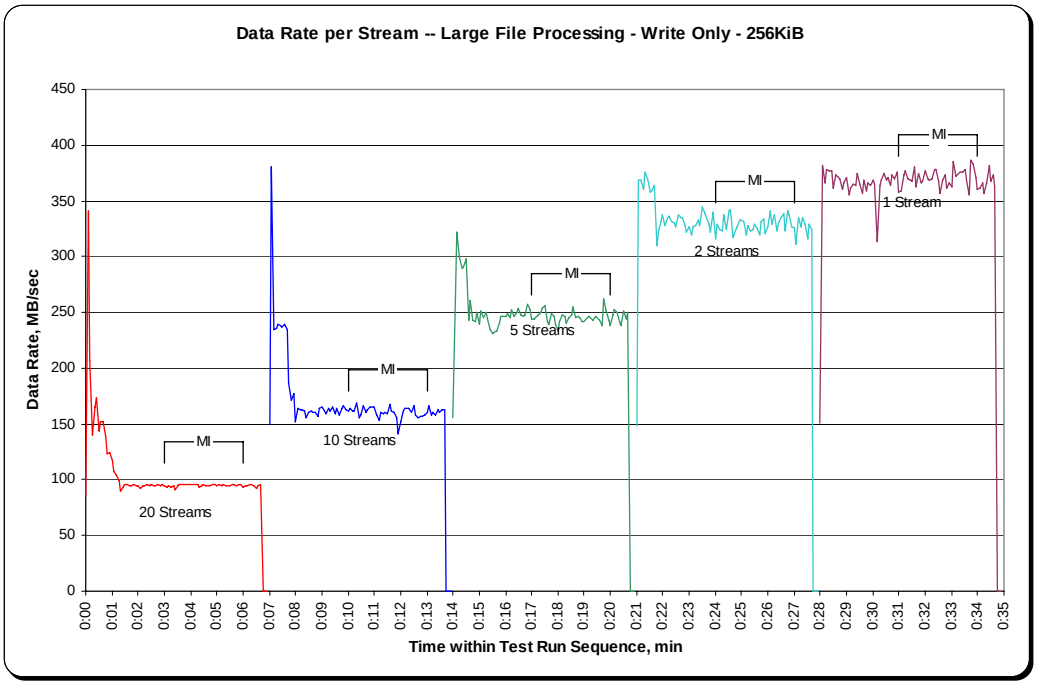
SPC-2 "Large File Processing/ WRITE ONLY /256 KiB Transfer Size" Average Data Rate Graph – Complete Test Run



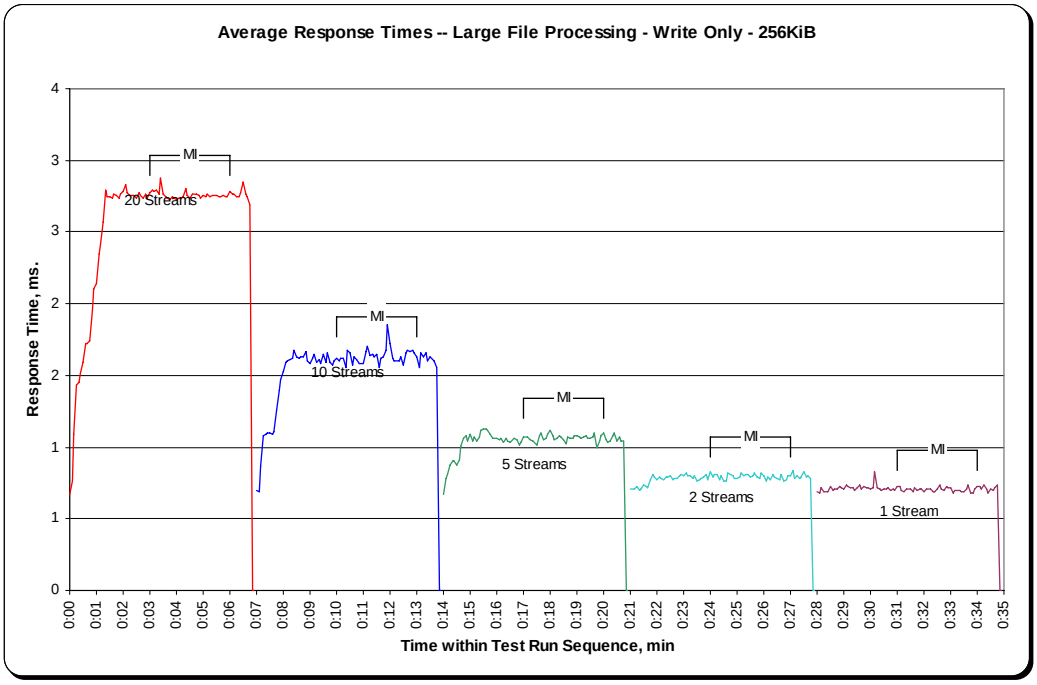
SPC-2 "Large File Processing/ WRITE ONLY /256 KiB Transfer Size" Average Data Rate Graph – Measurement Interval (MI) Only



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.

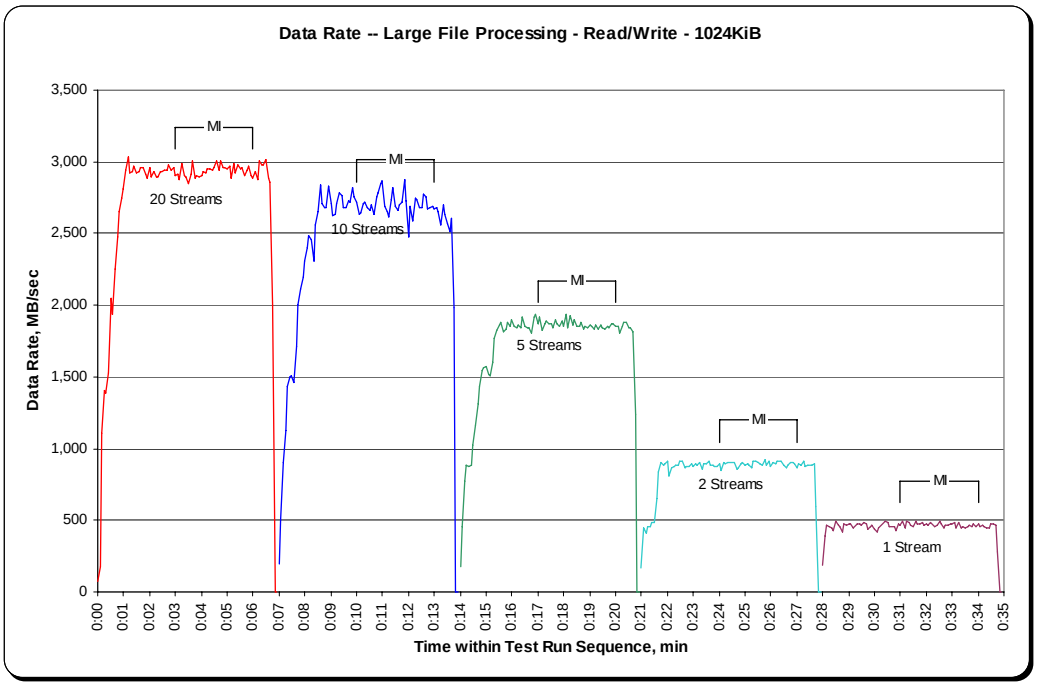
SPC-2 "Large File Processing/READ-WRITE/1024 KiB Transfer Size" Test Run Data – Ramp-Up Period

0:00:00	70.46	70.46	5.94	0:07:00	196.92	196.92	2.12	0:14:00	174.48	174.48	2.40	0:21:00	168.61	168.61	2.48	0:28:00	188.32	188.32	2.22
0:00:05	176.58	176.58	5.93	0:07:05	503.95	251.97	2.18	0:14:05	455.29	227.65	2.55	0:21:05	451.31	451.31	2.32	0:28:05	387.34	387.34	2.70
0:00:10	1,103.10	183.85	4.06	0:07:10	899.68	299.89	2.53	0:14:10	771.96	385.98	2.71	0:21:10	413.14	413.14	2.54	0:28:10	467.25	467.25	2.24
0:00:15	1,408.24	201.18	5.10	0:07:15	1,126.80	375.60	2.79	0:14:15	883.95	441.97	2.37	0:21:15	455.71	455.71	2.30	0:28:15	455.71	455.71	2.30
0:00:20	1,384.33	197.76	5.32	0:07:20	1,429.42	357.35	2.86	0:14:20	876.82	438.41	2.38	0:21:20	459.70	459.70	2.28	0:28:20	449.00	449.00	2.33
0:00:25	1,522.53	138.41	5.38	0:07:25	1,497.37	374.34	2.80	0:14:25	882.90	441.45	2.38	0:21:25	486.33	486.33	2.15	0:28:25	426.98	426.98	2.45
0:00:30	2,050.80	186.44	5.63	0:07:30	1,511.21	377.80	2.77	0:14:30	1,027.60	342.53	2.56	0:21:30	481.09	481.09	2.18	0:28:30	490.10	490.10	2.14
0:00:35	1,931.69	175.61	5.96	0:07:35	1,459.83	364.96	2.87	0:14:35	1,163.92	387.97	2.70	0:21:35	648.65	324.32	2.30	0:28:35	465.78	465.78	2.21
0:00:40	2,251.50	173.19	5.64	0:07:40	1,712.32	285.39	3.01	0:14:40	1,315.12	328.78	2.63	0:21:40	838.44	419.22	2.50	0:28:40	458.23	458.23	2.32
0:00:45	2,478.20	154.89	6.37	0:07:45	2,001.52	333.59	3.14	0:14:45	1,438.02	359.50	2.91	0:21:45	903.45	451.73	2.32	0:28:45	422.37	422.37	2.48
0:00:50	2,654.57	156.15	6.40	0:07:50	2,109.32	301.33	3.08	0:14:50	1,548.12	387.03	2.71	0:21:50	888.35	444.18	2.36	0:28:50	475.00	475.00	2.20
0:00:55	2,749.58	161.74	6.51	0:07:55	2,200.54	314.36	3.33	0:14:55	1,566.99	391.75	2.67	0:21:55	891.92	445.96	2.35	0:28:55	462.42	462.42	2.27
0:01:00	2,808.51	140.43	6.84	0:08:00	2,305.19	288.15	3.61	0:15:00	1,570.14	392.53	2.67	0:22:00	910.37	455.19	2.30	0:29:00	471.65	471.65	2.22
0:01:05	2,944.40	147.22	7.12	0:08:05	2,403.55	300.44	3.49	0:15:05	1,521.27	380.32	2.75	0:22:05	811.81	405.90	2.58	0:29:05	472.91	472.91	2.21
0:01:10	3,035.42	151.77	6.91	0:08:10	2,481.98	310.25	3.38	0:15:10	1,510.79	377.70	2.77	0:22:10	867.38	433.69	2.41	0:29:10	451.31	451.31	2.32
0:01:15	2,926.37	146.32	7.16	0:08:15	2,461.22	307.65	3.41	0:15:15	1,602.43	400.61	2.62	0:22:15	870.74	435.37	2.41	0:29:15	453.19	453.19	2.31
0:01:20	2,929.09	146.45	7.16	0:08:20	2,307.50	288.44	3.63	0:15:20	1,765.38	353.08	2.82	0:22:20	886.68	443.34	2.36	0:29:20	478.78	478.78	2.19
0:01:25	2,971.24	148.56	7.05	0:08:25	2,556.64	284.07	3.69	0:15:25	1,821.80	364.36	2.88	0:22:25	885.63	442.81	2.37	0:29:25	478.57	478.57	2.19
0:01:30	2,924.69	146.23	7.17	0:08:30	2,657.30	265.73	3.72	0:15:30	1,857.24	371.45	2.82	0:22:30	909.33	454.66	2.30	0:29:30	463.05	463.05	2.26
0:01:35	2,930.14	146.51	7.15	0:08:35	2,843.74	284.37	3.68	0:15:35	1,879.05	375.81	2.79	0:22:35	909.33	454.66	2.30	0:29:35	481.51	481.51	2.18
0:01:40	2,964.53	148.23	7.07	0:08:40	2,710.15	271.01	3.87	0:15:40	1,814.88	362.98	2.89	0:22:40	862.35	431.17	2.43	0:29:40	470.39	470.39	2.23
0:01:45	2,959.92	148.00	7.08	0:08:45	2,685.40	268.54	3.90	0:15:45	1,837.31	367.46	2.85	0:22:45	874.51	437.26	2.40	0:29:45	433.06	433.06	2.42
0:01:50	2,910.64	145.53	7.20	0:08:50	2,679.53	267.95	3.90	0:15:50	1,878.63	375.73	2.79	0:22:50	878.92	439.46	2.38	0:29:50	455.50	455.50	2.30
0:01:55	2,888.83	144.44	7.26	0:08:55	2,826.96	282.70	3.71	0:15:55	1,855.98	371.20	2.82	0:22:55	891.50	445.75	2.35	0:29:55	468.50	468.50	2.24
0:02:00	2,963.90	148.20	7.05	0:09:00	2,706.58	270.66	3.87	0:16:00	1,897.92	379.58	2.76	0:23:00	877.87	438.93	2.38	0:30:00	441.03	441.03	2.37
0:02:05	2,899.10	144.96	7.25	0:09:05	2,626.68	262.67	3.99	0:16:05	1,848.22	369.64	2.83	0:23:05	889.82	444.91	2.36	0:30:05	417.96	417.96	2.51
0:02:10	2,932.87	146.64	7.15	0:09:10	2,636.96	263.70	3.97	0:16:10	1,839.20	367.84	2.85	0:23:10	883.74	441.87	2.37	0:30:10	447.11	447.11	2.34
0:02:15	2,890.50	144.53	7.25	0:09:15	2,704.28	270.43	3.87	0:16:15	1,866.26	373.25	2.81	0:23:15	903.24	451.62	2.32	0:30:15	462.42	462.42	2.26
0:02:20	2,891.76	144.59	7.25	0:09:20	2,779.36	277.94	3.77	0:16:20	1,847.38	369.48	2.84	0:23:20	860.67	430.34	2.43	0:30:20	472.07	472.07	2.22
0:02:25	2,931.19	146.56	7.15	0:09:25	2,768.24	276.82	3.78	0:16:25	1,921.41	384.28	2.72	0:23:25	892.34	446.17	2.35	0:30:25	489.06	489.06	2.14
0:02:30	2,934.96	146.75	7.08	0:09:30	2,677.43	267.74	3.91	0:16:30	1,855.98	371.20	2.82	0:23:30	890.87	445.44	2.35	0:30:30	484.23	484.23	2.16
0:02:35	2,941.88	147.09	7.19	0:09:35	2,684.77	268.48	3.90	0:16:35	1,842.56	368.51	2.84	0:23:35	914.36	457.18	2.29	0:30:35	459.70	459.70	2.28
0:02:40	2,942.93	147.15	7.08	0:09:40	2,724.62	272.46	3.83	0:16:40	1,846.75	369.35	2.84	0:23:40	880.80	440.40	2.38	0:30:40	454.03	454.03	2.31
0:02:45	2,979.21	148.96	7.07	0:09:45	2,716.86	271.69	3.87	0:16:45	1,806.07	361.21	2.90	0:23:45	886.89	443.44	2.36	0:30:45	459.28	459.28	2.28
0:02:50	2,937.69	146.88	7.14	0:09:50	2,822.98	282.30	3.71	0:16:50	1,913.44	382.69	2.74	0:23:50	872.42	436.21	2.40	0:30:50	428.87	428.87	2.44
0:02:55	2,958.03	147.90	7.09	0:09:55	2,752.30	275.23	3.76	0:16:55	1,936.51	387.30	2.70	0:23:55	874.09	437.05	2.40	0:30:55	470.60	470.60	2.23

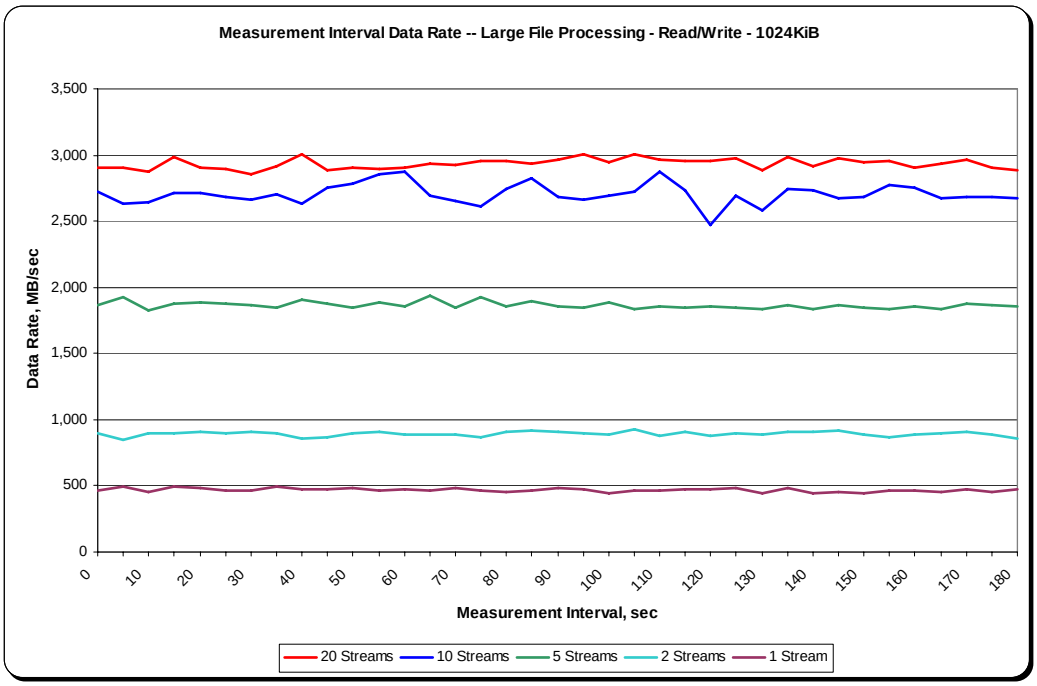
SPC-2 "Large File Processing/READ-WRITE/1024 KiB Transfer Size" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods

TR11	20 Streams			TR12	10 Streams			TR13	5 Streams			TR14	2 Streams			TR15	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
0:03:00	2,902.88	145.14	7.22	0:10:00	2,721.05	272.11	3.90	0:17:00	1,866.67	373.33	2.80	0:24:00	896.11	448.06	2.33	0:31:00	464.73	464.73	2.25
0:03:05	2,909.80	145.49	7.20	0:10:05	2,635.28	263.53	3.98	0:17:05	1,921.62	384.32	2.73	0:24:05	847.46	423.73	2.47	0:31:05	494.72	494.72	2.12
0:03:10	2,874.36	143.72	7.30	0:10:10	2,642.20	264.22	3.97	0:17:10	1,821.17	364.23	2.88	0:24:10	901.57	450.78	2.33	0:31:10	449.42	449.42	2.33
0:03:15	2,987.81	149.39	7.01	0:10:15	2,708.89	270.89	3.87	0:17:15	1,874.43	374.89	2.79	0:24:15	895.48	447.74	2.34	0:31:15	494.51	494.51	2.12
0:03:20	2,907.49	145.37	7.21	0:10:20	2,718.12	271.81	3.85	0:17:20	1,886.39	377.28	2.78	0:24:20	903.87	451.94	2.32	0:31:20	488.43	488.43	2.14
0:03:25	2,891.13	144.56	7.25	0:10:25	2,684.14	268.41	3.90	0:17:25	1,871.50	374.30	2.80	0:24:25	898.42	449.21	2.33	0:31:25	466.62	466.62	2.24
0:03:30	2,850.45	142.52	7.36	0:10:30	2,662.96	266.30	3.94	0:17:30	1,868.77	373.75	2.80	0:24:30	903.24	451.62	2.32	0:31:30	459.49	459.49	2.28
0:03:35	2,916.51	145.83	7.19	0:10:35	2,702.60	270.26	3.88	0:17:35	1,841.09	368.22	2.85	0:24:35	900.31	450.15	2.33	0:31:35	493.25	493.25	2.12
0:03:40	3,007.95	150.40	6.97	0:10:40	2,631.93	263.19	3.98	0:17:40	1,902.96	380.59	2.75	0:24:40	856.48	428.24	2.45	0:31:40	473.75	473.75	2.21
0:03:45	2,881.28	144.06	7.23	0:10:45	2,756.50	275.65	3.80	0:17:45	1,874.64	374.93	2.79	0:24:45	868.43	434.22	2.41	0:31:45	473.75	473.75	2.21
0:03:50	2,907.91	145.40	7.25	0:10:50	2,780.61	278.06	3.77	0:17:50	1,850.32	370.06	2.83	0:24:50	896.53	448.27	2.34	0:31:50	479.83	479.83	2.18
0:03:55	2,895.12	144.76	7.24	0:10:55	2,850.87	285.09	3.67	0:17:55	1,889.95	377.99	2.77	0:24:55	906.18	453.09	2.31	0:31:55	462.63	462.63	2.26
0:04:00	2,900.78	145.04	7.22	0:11:00	2,869.95	287.00	3.66	0:18:00	1,852.41	370.48	2.83	0:25:00	884.37	442.18	2.37	0:32:00	472.28	472.28	2.22
0:04:05	2,935.38	146.77	7.14	0:11:05	2,688.97	268.90	3.90	0:18:05	1,933.15	386.63	2.71	0:25:05	890.03	445.02	2.35	0:32:05	467.04	467.04	2.24
0:04:10	2,920.28	146.01	7.18	0:11:10	2,657.09	265.71	3.94	0:18:10	1,842.14	368.43	2.84	0:25:10	885.21	442.60	2.37	0:32:10	480.46	480.46	2.17
0:04:15	2,952.37	147.62	7.10	0:11:15	2,613.89	261.39	4.01	0:18:15	1,929.17	385.83	2.72	0:25:15	865.49	432.75	2.42	0:32:15	468.29	468.29	2.24
0:04:20	2,953.21	147.66	7.10	0:11:20	2,739.30	273.93	3.82	0:18:20	1,857.45	371.49	2.82	0:25:20	910.58	455.29	2.30	0:32:20	454.45	454.45	2.30
0:04:25	2,937.48	146.87	7.14	0:11:25	2,823.40	282.34	3.71	0:18:25	1,894.99	379.00	2.76	0:25:25	913.52	456.76	2.29	0:32:25	468.08	468.08	2.24
0:04:30	2,963.49	148.17	7.07	0:11:30	2,687.71	268.77	3.90	0:18:30	1,851.16	370.23	2.83	0:25:30	904.29	452.15	2.32	0:32:30	488.85	488.85	2.14
0:04:35	3,009.62	150.48	6.96	0:11:35	2,666.11	266.61	3.93	0:18:35	1,848.64	369.73	2.83	0:25:35	892.97	446.48	2.35	0:32:35	476.05	476.05	2.20
0:04:40	2,943.14	147.16	7.12	0:11:40	2,695.89	269.59	3.89	0:18:40	1,883.45	376.69	2.78	0:25:40	887.31	443.65	2.36	0:32:40	445.85	445.85	2.35
0:04:45	3,002.91	150.15	6.98	0:11:45	2,720.84	272.08	3.85	0:18:45	1,834.80	366.96	2.85	0:25:45	923.17	461.58	2.27	0:32:45	464.31	464.31	2.26
0:04:50	2,961.39	148.07	7.08	0:11:50	2,879.18	287.92	3.64	0:18:50	1,855.56	371.11	2.82	0:25:50	881.85	440.93	2.38	0:32:50	467.46	467.46	2.24
0:04:55	2,956.15	147.81	7.09	0:11:55	2,729.86	272.99	3.84	0:18:55	1,845.49	369.10	2.84	0:25:55	909.95	454.98	2.30	0:32:55	472.49	472.49	2.18
0:05:00	2,952.37	147.62	7.10	0:12:00	2,474.64	247.46	4.23	0:19:00	1,857.87	371.57	2.82	0:26:00	876.19	438.10	2.39	0:33:00	478.99	478.99	2.23
0:05:05	2,972.29	148.61	7.05	0:12:05	2,689.60	268.96	3.90	0:19:05	1,847.80	369.56	2.83	0:26:05	900.31	450.15	2.33	0:33:05	482.97	482.97	2.17
0:05:10	2,882.75	144.14	7.27	0:12:10	2,583.48	258.35	4.06	0:19:10	1,835.22	367.04	2.85	0:26:10	892.55	446.27	2.35	0:33:10	442.71	442.71	2.37
0:05:15	2,988.02	149.40	7.02	0:12:15	2,741.82	274.18	3.82	0:19:15	1,863.53	372.71	2.81	0:26:15	908.70	454.35	2.30	0:33:15	479.83	479.83	2.18
0:05:20	2,918.40	145.92	7.14	0:12:20	2,737.62	273.76	3.83	0:19:20	1,834.38	366.88	2.86	0:26:20	911.42	455.71	2.30	0:33:20	444.60	444.60	2.36
0:05:25	2,974.60	148.73	7.09	0:12:25	2,676.39	267.64	3.91	0:19:25	1,864.58	372.92	2.81	0:26:25	915.41	457.70	2.29	0:33:25	458.86	458.86	2.28
0:05:30	2,947.76	147.39	7.11	0:12:30	2,679.32	267.93	3.91	0:19:30	1,841.09	368.22	2.84	0:26:30	884.58	442.29	2.37	0:33:30	447.95	447.95	2.34
0:05:35	2,959.92	148.00	7.08	0:12:35	2,771.81	277.18	3.78	0:19:35	1,837.94	367.59	2.85	0:26:35	865.70	432.85	2.42	0:33:35	460.32	460.32	2.28
0:05:40	2,900.57	145.03	7.22	0:12:40	2,756.50	275.65	3.77	0:19:40	1,855.77	371.15	2.82	0:26:40	884.16	442.08	2.37	0:33:40	467.04	467.04	2.24
0:05:45	2,938.74	146.94	7.13	0:12:45	2,670.09	267.01	3.95	0:19:45	1,840.04	368.01	2.85	0:26:45	899.26	449.63	2.33	0:33:45	455.08	455.08	2.30
0:05:50	2,968.94	148.45	7.06	0:12:50	2,681.63	268.16	3.91	0:19:50	1,874.22	374.84	2.79	0:26:50	904.92	452.46	2.32	0:33:50	470.39	470.39	2.23
0:05:55	2,906.65	145.33	7.21	0:12:55	2,685.82	268.58	3.90	0:19:55	1,870.66	374.13	2.80	0:26:55	891.29	445.64	2.35	0:33:55	458.44	458.44	2.28
0:06:00	2,886.73	144.34	7.26	0:13:00	2,673.66	267.37	3.92	0:20:00	1,856.40	371.28	2.81	0:27:00	862.14	431.07	2.42	0:34:00	471.23	471.23	2.22
0:06:05	2,931.19	146.56	7.15	0:13:05	2,683.94	268.39	3.88	0:20:05	1,850.53	370.11	2.81	0:27:05	895.69	447.85	2.32	0:34:05	459.70	459.70	2.28
0:06:10	2,880.86	144.04	7.28	0:13:10	2,651.64	265.16	3.96	0:20:10	1,810.26	362.05	2.89	0:27:10	882.06	441.03	2.38	0:34:10	460.95	460.95	2.27
0:06:15	3,002.49	150.12	6.98	0:13:15	2,556.22	255.62	4.10	0:20:15	1,848.22	369.64	2.83	0:27:15	911.84	455.92	2.30	0:34:15	455.71	455.71	2.30
0:06:20	2,974.18	148.71	7.05	0:13:20	2,697.78	269.78	3.88	0:20:20	1,881.36	376.27	2.78	0:27:20	879.55	439.77	2.38	0:34:20	445.85	445.85	2.35
0:06:25	2,980.68	149.03	7.03	0:13:25	2,634.44	263.44	3.98	0:20:25	1,877.37	375.47	2.79	0:27:25	888.56	444.28	2.36	0:34:25	444.81	444.81	2.35
0:06:30	3,019.90	150.99	6.94	0:13:30	2,566.91	256.69	4.06	0:20:30	1,841.51	368.30	2.84	0:27:30	888.77	444.39	2.36	0:34:30	476.89	476.89	2.20
0:06:35	2,887.36	144.37	7.26	0:13:35	2,512.18	251.22	4.19	0:20:35	1,839.20	367.84	2.85	0:27:35	884.58	442.29	2.37	0:34:35	475.00	475.00	2.21
0:06:40	2,861.77	143.09	7.32	0:13:40	2,609.70	260.97	4.02	0:20:40	1,819.70	363.94	2.88	0:27:40	889.40	444.70	2.36	0:34:40	469.55	469.55	2.23
0:06:45	2,000.05	0.00	6.94	0:13:45	1,982.44	0.00	3.52	0:20:45	1,237.32	0.00	2.78	0:27:45	596.85	0.00	2.38	0:34:45	279.34	0.00	2.25
0:06:50	0.00	0.00	0.00	0:13:50	0.00	0.00	0.00	0:20:50	0.00	0.00	0.00	0:27:50	0.00	0.00	0.00	0:34:50	0.00	0.00	0.00
0:06:55	0.00	0.00	0.00	0:13:55	0.00	0.00	0.00	0:20:55	0.00	0.00	0.00	0:27:55	0.00	0.00	0.00	0:34:55	0.00	0.00	0.00

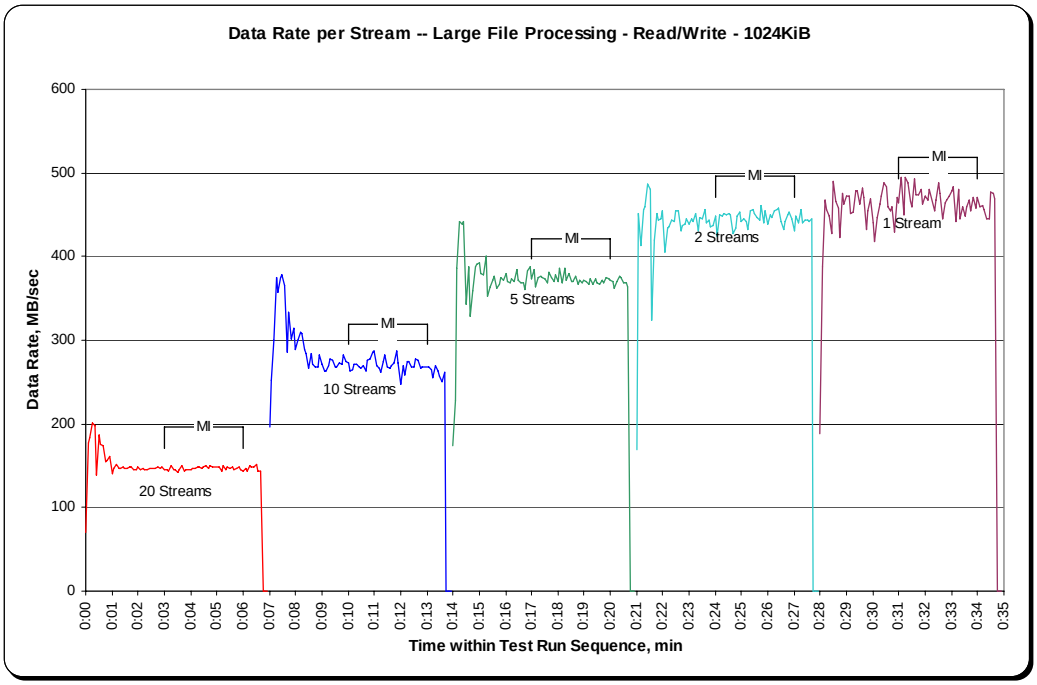
SPC-2 "Large File Processing/ READ-WRITE/1024 KiB Transfer Size" Average Data Rate Graph – Complete Test Run



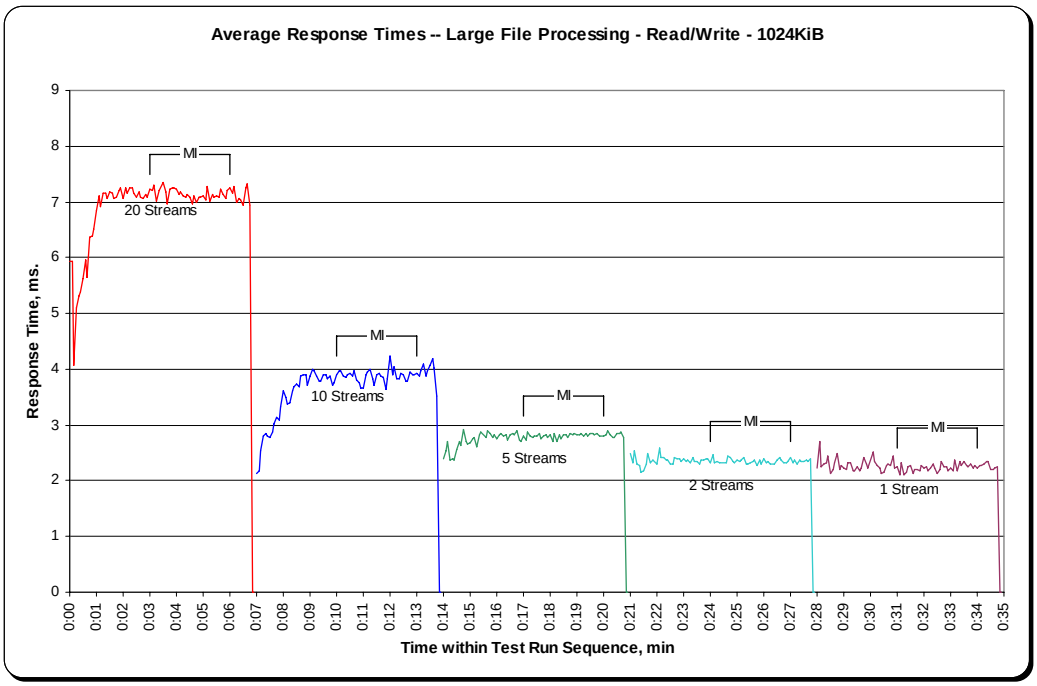
SPC-2 "Large File Processing/ READ-WRITE/1024 KiB Transfer Size" Average Data Rate Graph – Measurement Interval (MI) Only



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" Test Run Data – Ramp-Up Period

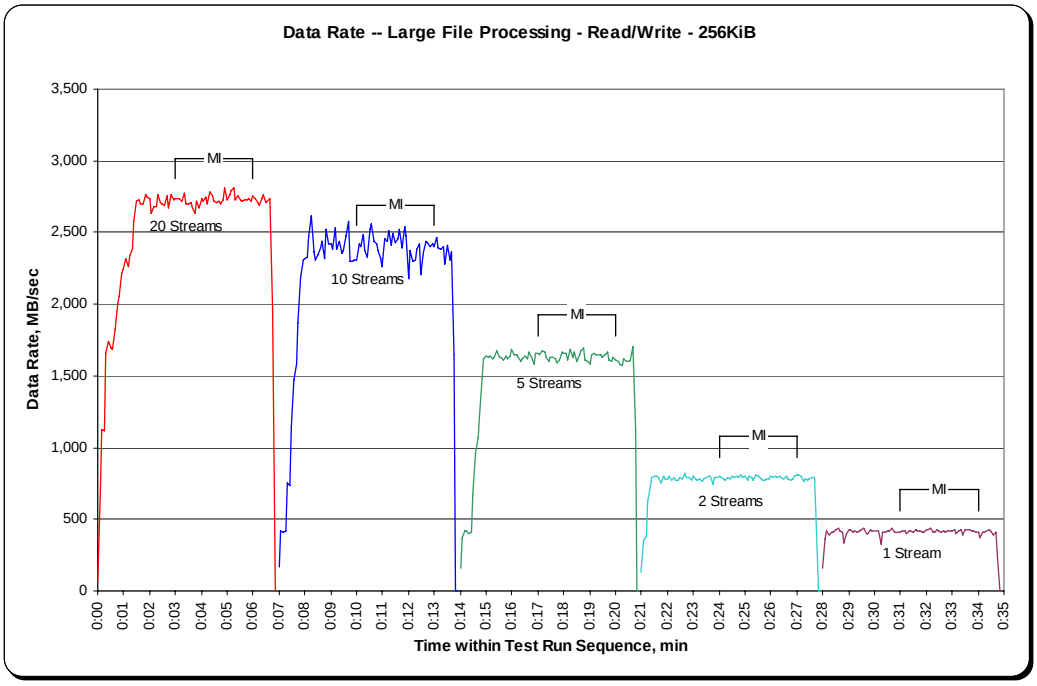
Test Run Sequence - Ramp-Up Interval

TR16	20 Streams			TR17	10 Streams			TR18	5 Streams			TR19	2 Streams			TR20	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	63.49	31.75	1.97	0:07:00	168.87	168.87	0.62	0:14:00	159.49	159.49	0.65	0:21:00	129.92	129.92	0.80	0:28:00	160.59	160.59	0.65
0:00:05	707.16	141.43	1.02	0:07:05	418.91	418.91	0.62	0:14:05	370.93	370.93	0.70	0:21:05	355.99	355.99	0.73	0:28:05	364.01	364.01	0.72
0:00:10	1,125.91	187.65	1.16	0:07:10	408.37	408.37	0.64	0:14:10	414.55	414.55	0.63	0:21:10	379.85	379.85	0.69	0:28:10	418.49	418.49	0.62
0:00:15	1,119.30	124.37	1.52	0:07:15	415.76	207.88	0.63	0:14:15	414.24	414.24	0.63	0:21:15	623.85	311.93	0.64	0:28:15	391.17	391.17	0.67
0:00:20	1,659.90	165.99	1.51	0:07:20	757.65	378.82	0.69	0:14:20	402.76	402.76	0.65	0:21:20	727.92	363.96	0.72	0:28:20	406.32	406.32	0.64
0:00:25	1,743.57	174.36	1.50	0:07:25	731.54	243.85	0.73	0:14:25	408.16	408.16	0.64	0:21:25	786.69	393.35	0.66	0:28:25	413.14	413.14	0.63
0:00:30	1,696.86	169.69	1.54	0:07:30	1,143.89	285.97	0.81	0:14:30	667.63	333.81	0.72	0:21:30	802.37	401.19	0.65	0:28:30	427.09	427.09	0.61
0:00:35	1,686.06	168.61	1.55	0:07:35	1,468.74	293.75	0.80	0:14:35	955.10	318.37	0.69	0:21:35	801.22	400.61	0.65	0:28:35	434.27	434.27	0.60
0:00:40	1,821.64	151.80	1.56	0:07:40	1,579.73	315.95	0.83	0:14:40	1,069.34	356.45	0.73	0:21:40	792.25	396.13	0.66	0:28:40	416.34	416.34	0.63
0:00:45	1,999.16	153.78	1.59	0:07:45	1,868.20	233.52	0.95	0:14:45	1,218.66	304.66	0.74	0:21:45	749.78	374.89	0.70	0:28:45	411.41	411.41	0.63
0:00:50	2,054.16	146.73	1.65	0:07:50	2,188.01	243.11	1.05	0:14:50	1,487.30	297.46	0.85	0:21:50	803.58	401.79	0.65	0:28:50	334.81	334.81	0.78
0:00:55	2,214.28	147.62	1.66	0:07:55	2,305.56	256.17	1.02	0:14:55	1,618.48	323.70	0.81	0:21:55	784.81	392.40	0.67	0:28:55	397.99	397.99	0.66
0:01:00	2,243.80	149.59	1.75	0:08:00	2,314.57	257.17	1.02	0:15:00	1,638.50	327.70	0.80	0:22:00	786.22	393.11	0.66	0:29:00	426.46	426.46	0.61
0:01:05	2,321.39	154.76	1.69	0:08:05	2,325.64	232.56	1.06	0:15:05	1,632.95	326.59	0.80	0:22:05	798.54	399.27	0.65	0:29:05	424.94	424.94	0.61
0:01:10	2,263.82	150.92	1.73	0:08:10	2,465.73	246.57	1.06	0:15:10	1,634.47	326.89	0.80	0:22:10	769.13	384.57	0.68	0:29:10	407.53	407.53	0.64
0:01:15	2,332.14	145.76	1.72	0:08:15	2,611.37	261.14	1.00	0:15:15	1,619.26	323.85	0.81	0:22:15	789.21	394.61	0.66	0:29:15	422.68	422.68	0.62
0:01:20	2,380.63	140.04	1.76	0:08:20	2,364.07	236.41	1.11	0:15:20	1,630.01	326.00	0.80	0:22:20	769.71	384.85	0.68	0:29:20	413.30	413.30	0.63
0:01:25	2,576.98	143.17	1.81	0:08:25	2,305.50	230.55	1.13	0:15:25	1,676.10	335.22	0.78	0:22:25	774.85	387.42	0.67	0:29:25	416.55	416.55	0.63
0:01:30	2,713.71	135.69	1.84	0:08:30	2,343.10	234.31	1.12	0:15:30	1,630.64	326.13	0.80	0:22:30	788.27	394.13	0.66	0:29:30	425.20	425.20	0.61
0:01:35	2,731.12	136.56	1.92	0:08:35	2,391.28	239.13	1.09	0:15:35	1,631.48	326.30	0.80	0:22:35	780.04	390.02	0.67	0:29:35	436.16	436.16	0.60
0:01:40	2,700.56	135.03	1.94	0:08:40	2,437.57	243.76	1.07	0:15:40	1,614.02	322.80	0.81	0:22:40	816.63	408.32	0.64	0:29:40	401.97	401.97	0.65
0:01:45	2,704.02	135.20	1.94	0:08:45	2,316.99	231.70	1.13	0:15:45	1,642.02	328.40	0.80	0:22:45	793.88	396.94	0.66	0:29:45	403.28	403.28	0.65
0:01:50	2,761.48	138.07	1.90	0:08:50	2,523.97	252.40	1.04	0:15:50	1,619.32	323.86	0.81	0:22:50	795.08	397.54	0.66	0:29:50	424.10	424.10	0.62
0:01:55	2,749.10	137.46	1.89	0:08:55	2,417.44	241.74	1.08	0:15:55	1,637.93	327.59	0.80	0:22:55	770.07	385.04	0.68	0:29:55	423.36	423.36	0.62
0:02:00	2,739.82	136.99	1.92	0:09:00	2,422.94	242.29	1.08	0:16:00	1,682.86	336.57	0.78	0:23:00	804.83	402.42	0.65	0:30:00	419.27	419.27	0.62
0:02:05	2,633.45	131.67	1.99	0:09:05	2,382.26	238.23	1.10	0:16:05	1,645.22	329.04	0.79	0:23:05	777.31	388.65	0.67	0:30:05	417.12	417.12	0.63
0:02:10	2,680.11	134.01	1.95	0:09:10	2,530.37	253.04	1.03	0:16:10	1,647.42	329.48	0.79	0:23:10	775.95	387.97	0.67	0:30:10	417.28	417.28	0.63
0:02:15	2,684.51	134.23	1.95	0:09:15	2,387.03	238.70	1.09	0:16:15	1,628.28	325.66	0.80	0:23:15	780.66	390.33	0.67	0:30:15	324.74	324.74	0.80
0:02:20	2,761.27	138.06	1.90	0:09:20	2,441.87	244.19	1.07	0:16:20	1,605.00	321.00	0.81	0:23:20	760.69	380.34	0.69	0:30:20	412.61	412.61	0.63
0:02:25	2,712.35	135.62	1.93	0:09:25	2,354.47	235.45	1.11	0:16:25	1,618.95	323.79	0.80	0:23:25	785.38	392.69	0.67	0:30:25	413.56	413.56	0.63
0:02:30	2,703.65	135.18	1.94	0:09:30	2,369.62	236.96	1.10	0:16:30	1,637.93	327.59	0.80	0:23:30	787.06	393.53	0.66	0:30:30	417.23	417.23	0.63
0:02:35	2,688.34	134.42	1.95	0:09:35	2,477.89	247.79	1.06	0:16:35	1,616.48	323.30	0.81	0:23:35	800.75	400.37	0.65	0:30:35	416.13	416.13	0.63
0:02:40	2,752.41	137.62	1.90	0:09:40	2,573.89	257.39	1.02	0:16:40	1,667.39	333.48	0.78	0:23:40	798.07	399.04	0.65	0:30:40	437.15	437.15	0.60
0:02:45	2,675.91	133.80	1.96	0:09:45	2,300.89	230.09	1.14	0:16:45	1,624.40	324.88	0.80	0:23:45	748.53	374.26	0.70	0:30:45	413.87	413.87	0.63
0:02:50	2,763.99	138.20	1.89	0:09:50	2,299.95	229.99	1.14	0:16:50	1,585.55	317.11	0.82	0:23:50	795.40	397.70	0.66	0:30:50	407.48	407.48	0.64
0:02:55	2,724.57	136.23	1.92	0:09:55	2,308.75	230.88	1.13	0:16:55	1,657.96	331.59	0.79	0:23:55	788.27	394.13	0.66	0:30:55	412.88	412.88	0.63

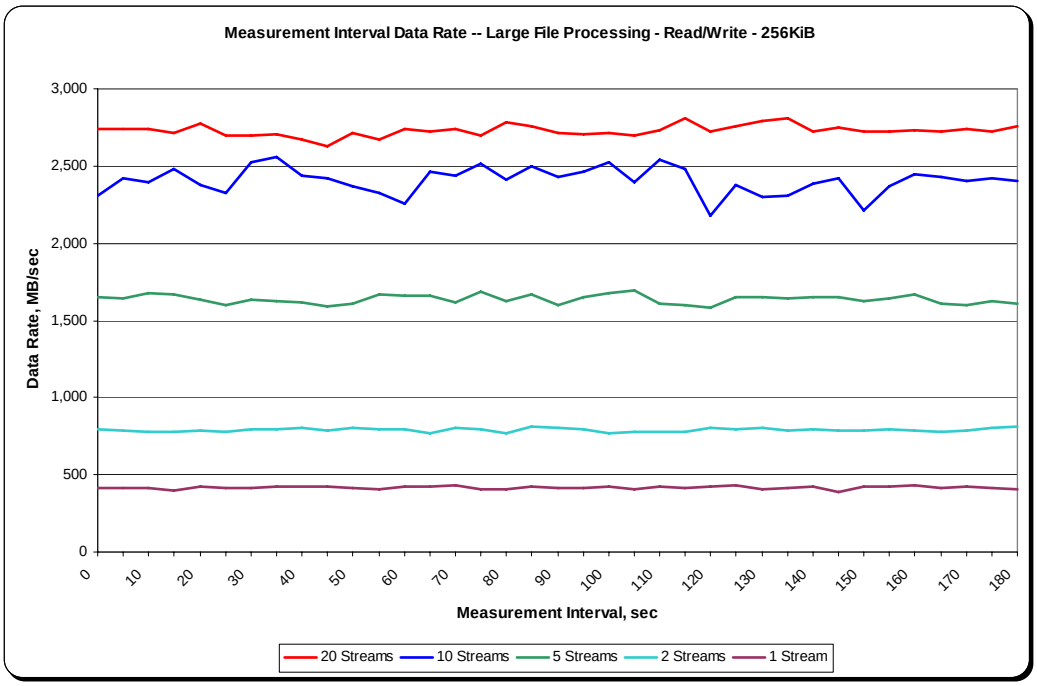
SPC-2 "Large File Processing/READ-WRITE/256 KiB Transfer Size" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods

TR16	20 Streams			TR17	10 Streams			TR18	5 Streams			TR19	2 Streams			TR20	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
0:03:00	2,738.25	136.91	1.91	0:10:00	2,311.69	231.17	1.13	0:17:00	1,653.29	330.66	0.79	0:24:00	796.08	398.04	0.66	0:31:00	412.51	412.51	0.63
0:03:05	2,737.57	136.88	1.91	0:10:05	2,424.26	242.43	1.08	0:17:05	1,645.79	329.16	0.79	0:24:05	788.63	394.32	0.66	0:31:05	414.45	414.45	0.63
0:03:10	2,740.51	137.03	1.91	0:10:10	2,398.41	239.84	1.09	0:17:10	1,676.10	335.22	0.78	0:24:10	779.14	389.57	0.67	0:31:10	414.34	414.34	0.63
0:03:15	2,716.81	135.84	1.93	0:10:15	2,483.55	248.36	1.05	0:17:15	1,668.18	333.64	0.78	0:24:15	775.58	387.79	0.67	0:31:15	401.87	401.87	0.65
0:03:20	2,771.70	138.59	1.89	0:10:20	2,375.71	237.57	1.10	0:17:20	1,632.06	326.41	0.80	0:24:20	788.16	394.08	0.66	0:31:20	423.15	423.15	0.62
0:03:25	2,695.21	134.76	1.94	0:10:25	2,325.90	232.59	1.12	0:17:25	1,598.40	319.68	0.82	0:24:25	778.99	389.49	0.67	0:31:25	418.38	418.38	0.62
0:03:30	2,699.24	134.96	1.94	0:10:30	2,525.39	252.54	1.04	0:17:30	1,633.42	326.68	0.80	0:24:30	799.54	399.77	0.65	0:31:30	412.14	412.14	0.63
0:03:35	2,705.54	135.28	1.93	0:10:35	2,557.90	255.79	1.02	0:17:35	1,625.08	325.02	0.80	0:24:35	791.36	395.68	0.66	0:31:35	424.31	424.31	0.62
0:03:40	2,672.98	133.65	1.96	0:10:40	2,434.69	243.47	1.07	0:17:40	1,620.15	324.03	0.81	0:24:40	803.10	401.55	0.65	0:31:40	423.05	423.05	0.62
0:03:45	2,631.14	131.56	1.99	0:10:45	2,421.74	242.17	1.08	0:17:45	1,591.42	318.28	0.82	0:24:45	790.68	395.34	0.66	0:31:45	421.84	421.84	0.62
0:03:50	2,716.76	135.84	1.93	0:10:50	2,372.46	237.25	1.10	0:17:50	1,606.16	321.23	0.81	0:24:50	805.57	402.78	0.65	0:31:50	412.20	412.20	0.63
0:03:55	2,670.72	133.54	1.96	0:10:55	2,321.76	232.18	1.13	0:17:55	1,668.23	333.65	0.78	0:24:55	795.29	397.65	0.66	0:31:55	408.73	408.73	0.64
0:04:00	2,738.67	136.93	1.91	0:11:00	2,259.73	225.97	1.16	0:18:00	1,658.95	331.79	0.79	0:25:00	796.45	398.22	0.66	0:32:00	424.99	424.99	0.61
0:04:05	2,722.21	136.11	1.92	0:11:05	2,460.27	246.03	1.06	0:18:05	1,659.27	331.85	0.79	0:25:05	771.38	385.69	0.68	0:32:05	424.20	424.20	0.62
0:04:10	2,742.76	137.14	1.91	0:11:10	2,434.37	243.44	1.07	0:18:10	1,613.39	322.68	0.81	0:25:10	800.17	400.08	0.65	0:32:10	433.95	433.95	0.60
0:04:15	2,698.41	134.92	1.93	0:11:15	2,512.60	251.26	1.04	0:18:15	1,685.17	337.03	0.78	0:25:15	795.71	397.86	0.66	0:32:15	407.79	407.79	0.64
0:04:20	2,786.22	139.31	1.88	0:11:20	2,408.21	240.82	1.09	0:18:20	1,628.54	325.71	0.80	0:25:20	773.59	386.79	0.68	0:32:20	409.47	409.47	0.64
0:04:25	2,754.50	137.73	1.90	0:11:25	2,496.71	249.67	1.05	0:18:25	1,664.35	332.87	0.78	0:25:25	812.65	406.32	0.64	0:32:25	425.67	425.67	0.61
0:04:30	2,714.92	135.75	1.93	0:11:30	2,431.23	243.12	1.08	0:18:30	1,599.92	319.98	0.82	0:25:30	801.48	400.74	0.65	0:32:30	414.97	414.97	0.63
0:04:35	2,705.27	135.26	1.93	0:11:35	2,459.91	245.99	1.06	0:18:35	1,649.15	329.83	0.79	0:25:35	795.03	397.52	0.66	0:32:35	411.62	411.62	0.63
0:04:40	2,714.87	135.74	1.92	0:11:40	2,521.20	252.12	1.04	0:18:40	1,675.47	335.09	0.78	0:25:40	768.71	384.36	0.68	0:32:40	419.85	419.85	0.62
0:04:45	2,697.51	134.88	1.95	0:11:45	2,394.95	239.49	1.09	0:18:45	1,696.49	339.30	0.77	0:25:45	773.80	386.90	0.68	0:32:45	409.63	409.63	0.63
0:04:50	2,728.60	136.43	1.92	0:11:50	2,540.33	254.03	1.03	0:18:50	1,609.35	321.87	0.81	0:25:50	780.87	390.44	0.67	0:32:50	422.63	422.63	0.62
0:04:55	2,807.20	140.36	1.86	0:11:55	2,477.16	247.72	1.06	0:18:55	1,597.92	319.58	0.82	0:25:55	778.83	389.41	0.67	0:32:55	415.45	415.45	0.63
0:05:00	2,727.29	136.36	1.92	0:12:00	2,178.63	217.86	1.20	0:19:00	1,582.14	316.43	0.83	0:26:00	804.89	402.44	0.65	0:33:00	422.37	422.37	0.62
0:05:05	2,761.53	138.08	1.90	0:12:05	2,376.81	237.68	1.10	0:19:05	1,652.24	330.45	0.79	0:26:05	793.98	396.99	0.66	0:33:05	432.01	432.01	0.60
0:05:10	2,794.56	139.73	1.87	0:12:10	2,303.62	230.36	1.14	0:19:10	1,652.56	330.51	0.79	0:26:10	803.31	401.66	0.65	0:33:10	403.91	403.91	0.65
0:05:15	2,808.61	140.43	1.86	0:12:15	2,306.92	230.69	1.13	0:19:15	1,646.11	329.22	0.79	0:26:15	789.26	394.63	0.66	0:33:15	415.55	415.55	0.63
0:05:20	2,725.35	136.27	1.92	0:12:20	2,385.72	238.57	1.10	0:19:20	1,648.47	329.69	0.79	0:26:20	797.97	398.98	0.65	0:33:20	423.99	423.99	0.62
0:05:25	2,751.94	137.60	1.90	0:12:25	2,417.70	241.77	1.08	0:19:25	1,648.89	329.78	0.79	0:26:25	789.58	394.79	0.66	0:33:25	392.27	392.27	0.67
0:05:30	2,726.61	136.33	1.92	0:12:30	2,210.14	221.01	1.18	0:19:30	1,627.23	325.45	0.80	0:26:30	783.02	391.51	0.67	0:33:30	424.20	424.20	0.62
0:05:35	2,721.95	136.10	1.92	0:12:35	2,367.21	236.72	1.10	0:19:35	1,645.79	329.16	0.79	0:26:35	796.87	398.43	0.66	0:33:35	427.14	427.14	0.61
0:05:40	2,731.28	136.56	1.92	0:12:40	2,443.39	244.34	1.07	0:19:40	1,666.40	333.28	0.78	0:26:40	786.17	393.08	0.66	0:33:40	430.28	430.28	0.60
0:05:45	2,725.77	136.29	1.92	0:12:45	2,430.34	243.03	1.08	0:19:45	1,609.09	321.82	0.81	0:26:45	776.47	388.24	0.67	0:33:45	416.97	416.97	0.63
0:05:50	2,736.73	136.84	1.91	0:12:50	2,403.60	240.36	1.09	0:19:50	1,602.17	320.43	0.82	0:26:50	786.06	393.03	0.66	0:33:50	421.21	421.21	0.62
0:05:55	2,721.53	136.08	1.91	0:12:55	2,422.63	242.26	1.08	0:19:55	1,626.55	325.31	0.80	0:26:55	800.64	400.32	0.65	0:33:55	412.88	412.88	0.63
0:06:00	2,757.02	137.85	1.91	0:13:00	2,400.30	240.03	1.09	0:20:00	1,607.52	321.50	0.81	0:27:00	812.54	406.27	0.64	0:34:00	410.10	410.10	0.64
0:06:05	2,732.38	136.62	1.92	0:13:05	2,462.63	246.26	1.06	0:20:05	1,603.64	320.73	0.81	0:27:05	814.38	407.19	0.64	0:34:05	375.81	375.81	0.70
0:06:10	2,705.54	135.28	1.93	0:13:10	2,390.44	239.04	1.09	0:20:10	1,581.51	316.30	0.83	0:27:10	801.22	400.61	0.65	0:34:10	407.48	407.48	0.64
0:06:15	2,691.01	134.55	1.95	0:13:15	2,380.58	238.06	1.10	0:20:15	1,571.08	314.22	0.83	0:27:15	761.06	380.53	0.69	0:34:15	412.35	412.35	0.63
0:06:20	2,736.52	136.83	1.91	0:13:20	2,405.22	240.52	1.09	0:20:20	1,622.57	324.51	0.81	0:27:20	782.08	391.04	0.67	0:34:20	416.13	416.13	0.63
0:06:25	2,762.21	138.11	1.90	0:13:25	2,281.60	228.16	1.15	0:20:25	1,605.63	321.13	0.81	0:27:25	768.03	384.01	0.68	0:34:25	429.81	429.81	0.61
0:06:30	2,706.16	135.31	1.93	0:13:30	2,413.56	241.36	1.08	0:20:30	1,598.24	319.65	0.82	0:27:30	780.66	390.33	0.67	0:34:30	416.13	416.13	0.63
0:06:35	2,727.24	136.36	1.92	0:13:35	2,304.67	230.47	1.13	0:20:35	1,608.15	321.63	0.81	0:27:35	788.79	394.40	0.66	0:34:35	391.75	391.75	0.67
0:06:40	2,734.95	136.75	1.91	0:13:40	2,366.11	236.61	1.10	0:20:40	1,702.36	340.47	0.77	0:27:40	790.63	395.31	0.66	0:34:40	410.20	410.20	0.64
0:06:45	1,961.26	0.00	1.83	0:13:45	1,646.32	0.00	1.10	0:20:45	1,125.70	0.00	0.79	0:27:45	561.51	0.00	0.65	0:34:45	245.21	0.00	0.64
0:06:50	0.00	0.00	0.00	0:13:50	0.00	0.00	0.00	0:20:50	0.00	0.00	0.00	0:27:50	0.00	0.00	0.00	0:34:50	0.00	0.00	0.00
0:06:55	0.00	0.00	0.00	0:13:55	0.00	0.00	0.00	0:20:55	0.00	0.00	0.00	0:27:55	0.00	0.00	0.00	0:34:55	0.00	0.00	0.00

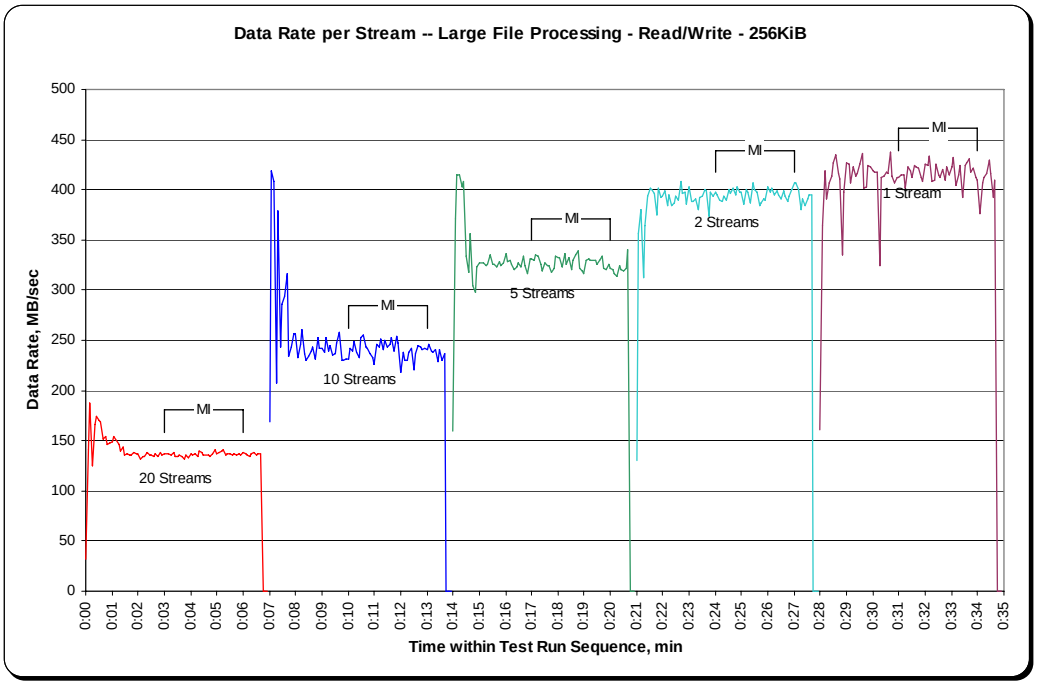
SPC-2 "Large File Processing/READ-WRITE/256 KiB Transfer Size" Average Data Rate Graph – Complete Test Run



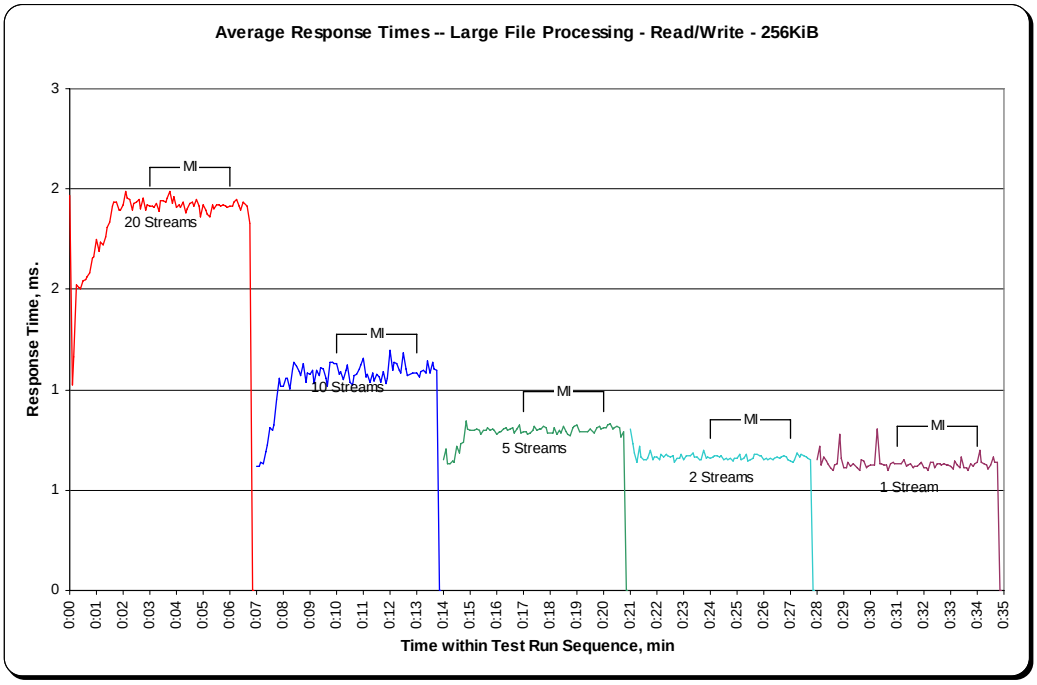
SPC-2 "Large File Processing/READ-WRITE/256 KiB Transfer Size" Average Data Rate Graph – Measurement Interval (MI) Only



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.

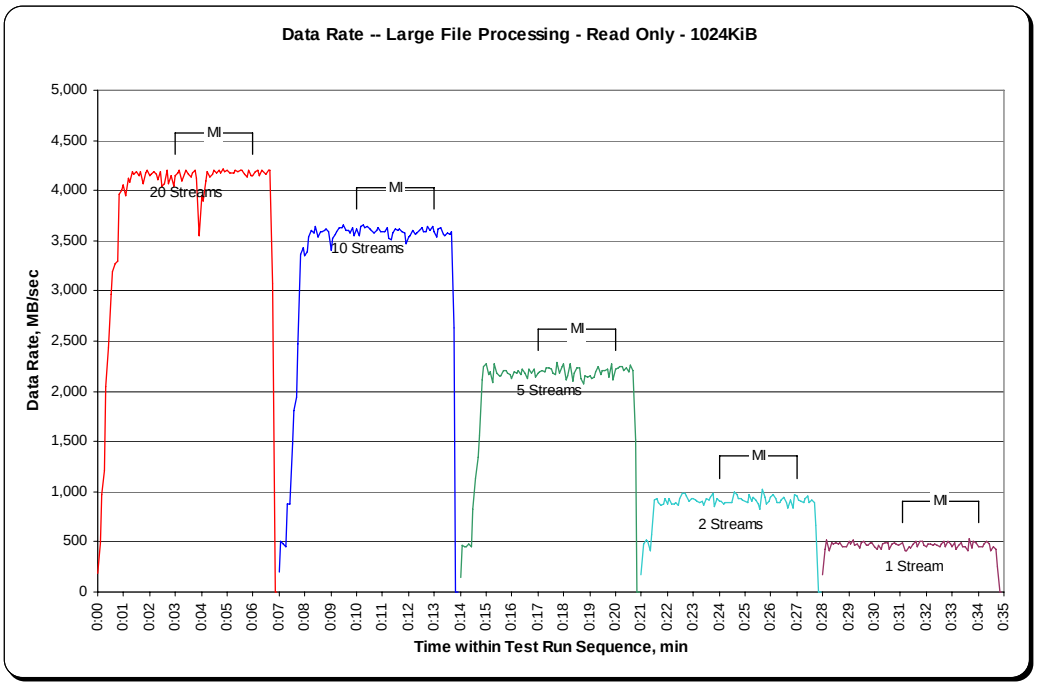
SPC-2 "Large File Processing/READ ONLY/1024 KiB Transfer Size" Test Run Data – Ramp Up Period

TR21	20 Streams			TR22	10 Streams			TR23	5 Streams			TR24	2 Streams			TR25	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	182.87	182.87	2.29	0:07:00	197.55	197.55	2.12	0:14:00	152.88	152.88	2.74	0:21:00	172.18	172.18	2.43	0:28:00	172.60	172.60	2.43
0:00:05	498.07	498.07	2.10	0:07:05	510.87	510.87	2.04	0:14:05	462.84	462.84	2.26	0:21:05	472.70	472.70	2.22	0:28:05	423.83	423.83	2.47
0:00:10	965.11	241.28	2.92	0:07:10	472.70	472.70	2.22	0:14:10	448.79	448.79	2.33	0:21:10	515.69	515.69	2.03	0:28:10	516.11	516.11	2.03
0:00:15	1,212.99	242.60	4.30	0:07:15	454.87	454.87	2.30	0:14:15	452.15	452.15	2.32	0:21:15	503.74	503.74	2.08	0:28:15	410.41	410.41	2.56
0:00:20	2,042.00	226.89	3.70	0:07:20	883.95	441.97	2.31	0:14:20	477.10	477.10	2.20	0:21:20	416.91	416.91	2.51	0:28:20	491.57	491.57	2.13
0:00:25	2,436.26	221.48	4.18	0:07:25	881.22	293.74	2.42	0:14:25	446.48	446.48	2.35	0:21:25	571.47	285.74	2.22	0:28:25	484.86	484.86	2.16
0:00:30	2,970.62	247.55	4.05	0:07:30	1,472.62	368.16	2.48	0:14:30	824.39	412.20	2.28	0:21:30	922.96	461.48	2.27	0:28:30	493.46	493.46	2.12
0:00:35	3,190.61	245.43	4.10	0:07:35	1,802.08	360.42	2.61	0:14:35	1,125.96	375.32	2.33	0:21:35	935.75	467.87	2.24	0:28:35	472.91	472.91	2.21
0:00:40	3,268.83	251.45	4.17	0:07:40	1,943.22	388.64	2.69	0:14:40	1,342.60	447.53	2.34	0:21:40	891.92	445.96	2.35	0:28:40	487.59	487.59	2.15
0:00:45	3,298.19	206.14	4.68	0:07:45	2,470.24	308.78	2.84	0:14:45	1,557.55	389.39	2.29	0:21:45	869.69	434.84	2.41	0:28:45	446.06	446.06	2.34
0:00:50	3,964.88	233.23	4.43	0:07:50	3,369.91	374.43	2.74	0:14:50	2,119.59	423.92	2.39	0:21:50	883.11	441.56	2.37	0:28:50	445.85	445.85	2.36
0:00:55	4,009.13	235.83	4.44	0:07:55	3,426.33	380.70	2.75	0:14:55	2,253.81	450.76	2.32	0:21:55	925.47	462.74	2.26	0:28:55	449.84	449.84	2.32
0:01:00	4,061.13	238.89	4.39	0:08:00	3,344.54	371.62	2.82	0:15:00	2,274.78	454.96	2.30	0:22:00	873.04	436.52	2.40	0:29:00	503.11	503.11	2.08
0:01:05	3,954.60	208.14	4.65	0:08:05	3,388.16	338.82	2.90	0:15:05	2,165.52	433.10	2.42	0:22:05	933.86	466.93	2.24	0:29:05	473.54	473.54	2.21
0:01:10	4,126.78	217.20	4.82	0:08:10	3,535.17	353.52	2.96	0:15:10	2,188.38	437.68	2.39	0:22:10	882.06	441.03	2.38	0:29:10	515.90	515.90	2.03
0:01:15	4,082.11	204.11	5.03	0:08:15	3,605.00	360.50	2.90	0:15:15	2,093.38	418.68	2.50	0:22:15	874.09	437.05	2.40	0:29:15	463.68	463.68	2.26
0:01:20	4,184.66	209.23	5.01	0:08:20	3,575.43	357.54	2.93	0:15:20	2,273.52	454.70	2.30	0:22:20	888.35	444.18	2.36	0:29:20	473.33	473.33	2.22
0:01:25	4,162.01	208.10	5.04	0:08:25	3,640.24	364.02	2.88	0:15:25	2,178.31	435.66	2.40	0:22:25	864.66	432.33	2.42	0:29:25	443.97	443.97	2.36
0:01:30	4,189.69	209.48	5.00	0:08:30	3,531.81	353.18	2.97	0:15:30	2,160.28	432.06	2.43	0:22:30	933.23	466.62	2.24	0:29:30	497.86	497.86	2.11
0:01:35	4,155.09	207.75	5.04	0:08:35	3,595.15	359.51	2.91	0:15:35	2,157.55	431.51	2.43	0:22:35	980.63	490.31	2.14	0:29:35	506.88	506.88	2.07
0:01:40	4,184.24	209.21	5.01	0:08:40	3,585.08	358.51	2.92	0:15:40	2,202.64	440.53	2.37	0:22:40	979.58	489.79	2.14	0:29:40	464.31	464.31	2.25
0:01:45	4,070.36	203.52	5.15	0:08:45	3,603.96	360.40	2.91	0:15:45	2,206.20	441.24	2.38	0:22:45	951.27	475.63	2.20	0:29:45	462.42	462.42	2.27
0:01:50	4,181.30	209.07	5.01	0:08:50	3,611.51	361.15	2.90	0:15:50	2,179.99	436.00	2.40	0:22:50	903.03	451.52	2.32	0:29:50	486.96	486.96	2.15
0:01:55	4,199.97	210.00	4.99	0:08:55	3,589.70	358.97	2.92	0:15:55	2,170.13	434.03	2.41	0:22:55	936.17	468.08	2.24	0:29:55	491.15	491.15	2.13
0:02:00	4,155.09	207.75	5.03	0:09:00	3,399.27	339.93	3.08	0:16:00	2,127.14	425.43	2.46	0:23:00	932.60	466.30	2.25	0:30:00	456.34	456.34	2.30
0:02:05	4,158.44	207.92	5.05	0:09:05	3,524.26	352.43	2.97	0:16:05	2,198.65	439.73	2.38	0:23:05	913.10	456.55	2.29	0:30:05	419.22	419.22	2.50
0:02:10	4,194.51	209.73	5.00	0:09:10	3,566.00	356.60	2.93	0:16:10	2,181.04	436.21	2.40	0:23:10	903.24	451.62	2.32	0:30:10	468.08	468.08	2.23
0:02:15	4,166.83	208.34	5.03	0:09:15	3,588.44	358.84	2.92	0:16:15	2,202.22	440.44	2.38	0:23:15	889.82	444.91	2.36	0:30:15	424.88	424.88	2.47
0:02:20	4,104.55	205.23	5.10	0:09:20	3,628.07	362.81	2.89	0:16:20	2,161.95	432.39	2.42	0:23:20	902.19	451.10	2.32	0:30:20	479.41	479.41	2.18
0:02:25	4,194.30	209.72	5.00	0:09:25	3,628.49	362.85	2.89	0:16:25	2,214.80	442.96	2.36	0:23:25	863.82	431.91	2.43	0:30:25	491.78	491.78	2.13
0:02:30	4,043.10	202.15	5.18	0:09:30	3,650.30	365.03	2.87	0:16:30	2,185.44	437.09	2.40	0:23:30	933.65	466.83	2.24	0:30:30	494.09	494.09	2.13
0:02:35	4,064.49	203.22	5.16	0:09:35	3,603.54	360.35	2.91	0:16:35	2,122.74	424.55	2.47	0:23:35	911.42	455.71	2.30	0:30:35	427.40	427.40	2.43
0:02:40	4,196.82	209.84	4.99	0:09:40	3,600.39	360.04	2.91	0:16:40	2,216.90	443.38	2.36	0:23:40	943.51	471.75	2.22	0:30:40	473.75	473.75	2.22
0:02:45	4,070.78	203.54	5.15	0:09:45	3,571.66	357.17	2.93	0:16:45	2,178.52	435.70	2.40	0:23:45	985.66	492.83	2.12	0:30:45	485.49	485.49	2.16
0:02:50	4,152.36	207.62	5.05	0:09:50	3,626.81	362.68	2.89	0:16:50	2,227.39	445.48	2.35	0:23:50	850.60	425.30	2.46	0:30:50	481.72	481.72	2.17
0:02:55	4,048.97	202.45	5.17	0:09:55	3,545.65	354.57	2.95	0:16:55	2,140.98	428.20	2.45	0:23:55	935.96	467.98	2.24	0:30:55	459.91	459.91	2.28

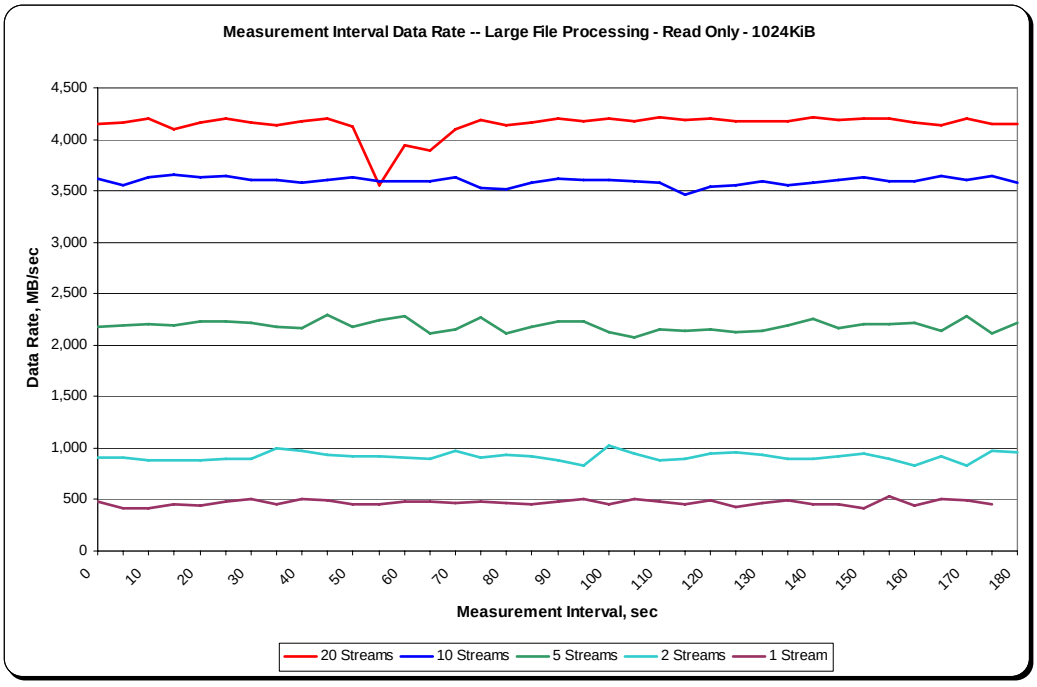
SPC-2 "Large File Processing/READ ONLY/1024 KiB Transfer Size" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods

TR21	20 Streams			TR22	10 Streams			TR23	5 Streams			TR24	2 Streams			TR25	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
0:03:00	4,151.31	207.57	5.03	0:10:00	3,615.70	361.57	2.89	0:17:00	2,177.89	435.58	2.40	0:24:00	906.60	453.30	2.31	0:31:05	485.91	485.91	2.16
0:03:05	4,168.93	208.45	5.03	0:10:05	3,547.96	354.80	2.95	0:17:05	2,187.54	437.51	2.39	0:24:05	903.03	451.52	2.32	0:31:10	416.49	416.49	2.51
0:03:10	4,205.63	210.28	4.98	0:10:10	3,637.51	363.75	2.88	0:17:10	2,210.19	442.04	2.37	0:24:10	880.80	440.40	2.38	0:31:15	413.35	413.35	2.54
0:03:15	4,102.24	205.11	5.11	0:10:15	3,659.95	365.99	2.86	0:17:15	2,194.04	438.81	2.39	0:24:15	886.68	443.34	2.36	0:31:20	456.76	456.76	2.29
0:03:20	4,156.76	207.84	5.04	0:10:20	3,625.98	362.60	2.89	0:17:20	2,236.40	447.28	2.34	0:24:20	886.26	443.13	2.36	0:31:25	443.76	443.76	2.37
0:03:25	4,195.77	209.79	5.00	0:10:25	3,647.58	364.76	2.87	0:17:25	2,230.74	446.15	2.35	0:24:25	894.23	447.11	2.34	0:31:30	476.68	476.68	2.20
0:03:30	4,164.31	208.22	5.03	0:10:30	3,611.30	361.13	2.90	0:17:30	2,222.14	444.43	2.36	0:24:30	896.95	448.48	2.33	0:31:35	507.30	507.30	2.06
0:03:35	4,133.07	206.65	5.08	0:10:35	3,607.94	360.79	2.90	0:17:35	2,181.67	436.33	2.40	0:24:35	1,002.02	501.01	2.09	0:31:40	453.40	453.40	2.31
0:03:40	4,179.20	208.96	5.02	0:10:40	3,574.60	357.46	2.92	0:17:40	2,163.42	432.68	2.42	0:24:40	972.24	486.12	2.15	0:31:45	502.06	502.06	2.08
0:03:45	4,203.32	210.17	4.99	0:10:45	3,601.23	360.12	2.91	0:17:45	2,293.66	458.73	2.28	0:24:45	935.75	467.87	2.24	0:31:50	499.12	499.12	2.10
0:03:50	4,121.32	206.07	5.08	0:10:50	3,631.64	363.16	2.89	0:17:50	2,176.42	435.28	2.41	0:24:50	926.52	463.26	2.26	0:31:55	459.28	459.28	2.28
0:03:55	3,555.30	177.77	5.89	0:10:55	3,592.00	359.20	2.92	0:17:55	2,249.41	449.88	2.33	0:24:55	920.02	460.01	2.28	0:32:00	451.73	451.73	2.32
0:04:00	3,943.27	197.16	5.32	0:11:00	3,596.20	359.62	2.91	0:18:00	2,276.67	455.33	2.30	0:25:00	905.76	452.88	2.31	0:32:05	478.15	478.15	2.19
0:04:05	3,896.09	194.80	5.38	0:11:05	3,586.34	358.63	2.92	0:18:05	2,114.35	422.87	2.48	0:25:05	895.27	447.64	2.34	0:32:10	478.78	478.78	2.19
0:04:10	4,092.59	204.63	5.12	0:11:10	3,625.77	362.58	2.89	0:18:10	2,150.00	430.00	2.44	0:25:10	972.24	486.12	2.15	0:32:15	464.94	464.94	2.25
0:04:15	4,189.69	209.48	5.00	0:11:15	3,521.54	352.15	2.97	0:18:15	2,273.52	454.70	2.30	0:25:15	902.19	451.10	2.32	0:32:20	481.09	481.09	2.18
0:04:20	4,139.36	206.97	5.06	0:11:20	3,514.41	351.44	2.98	0:18:20	2,107.43	421.49	2.49	0:25:20	938.89	469.45	2.23	0:32:25	465.36	465.36	2.26
0:04:25	4,164.11	208.21	5.00	0:11:25	3,581.52	358.15	2.92	0:18:25	2,177.05	435.41	2.41	0:25:25	922.54	461.27	2.27	0:32:30	451.52	451.52	2.32
0:04:30	4,196.19	209.81	5.02	0:11:30	3,611.92	361.19	2.90	0:18:30	2,234.10	446.82	2.34	0:25:30	881.85	440.93	2.38	0:32:35	478.99	478.99	2.19
0:04:35	4,174.17	208.71	5.03	0:11:35	3,607.31	360.73	2.90	0:18:35	2,232.63	446.53	2.35	0:25:35	831.10	415.55	2.52	0:32:40	506.04	506.04	2.07
0:04:40	4,197.87	209.89	4.99	0:11:40	3,610.88	361.09	2.90	0:18:40	2,126.51	425.30	2.45	0:25:40	1,018.59	509.29	2.06	0:32:45	458.65	458.65	2.28
0:04:45	4,181.09	209.05	5.01	0:11:45	3,595.78	359.58	2.91	0:18:45	2,069.47	413.89	2.54	0:25:45	943.93	471.96	2.22	0:32:50	503.95	503.95	2.08
0:04:50	4,212.13	210.61	4.98	0:11:50	3,576.27	357.63	2.92	0:18:50	2,149.58	429.92	2.44	0:25:50	883.32	441.66	2.37	0:32:55	474.17	474.17	2.21
0:04:55	4,195.14	209.76	5.00	0:11:55	3,465.96	346.60	3.03	0:18:55	2,139.51	427.90	2.45	0:25:55	901.15	450.57	2.33	0:33:00	452.78	452.78	2.32
0:05:00	4,195.56	209.78	5.00	0:12:00	3,542.51	354.25	2.96	0:19:00	2,148.53	429.71	2.43	0:26:00	947.70	473.85	2.21	0:33:05	493.04	493.04	2.12
0:05:05	4,169.98	208.50	5.02	0:12:05	3,549.01	354.90	2.95	0:19:05	2,126.51	425.30	2.47	0:26:05	965.53	482.76	2.17	0:33:10	430.96	430.96	2.43
0:05:10	4,172.28	208.61	5.03	0:12:10	3,598.08	359.81	2.91	0:19:10	2,143.50	428.70	2.45	0:26:10	927.36	463.68	2.26	0:33:15	464.73	464.73	2.26
0:05:15	4,179.62	208.98	5.02	0:12:15	3,558.45	355.84	2.94	0:19:15	2,192.36	438.47	2.39	0:26:15	892.55	446.27	2.35	0:33:20	490.52	490.52	2.13
0:05:20	4,208.35	210.42	4.98	0:12:20	3,578.79	357.88	2.93	0:19:20	2,252.76	450.55	2.32	0:26:20	896.32	448.16	2.34	0:33:25	453.40	453.40	2.30
0:05:25	4,183.19	209.16	5.01	0:12:25	3,606.05	360.61	2.91	0:19:25	2,163.63	432.73	2.42	0:26:25	922.54	461.27	2.27	0:33:30	447.53	447.53	2.34
0:05:30	4,205.42	210.27	4.98	0:12:30	3,634.99	363.50	2.88	0:19:30	2,208.72	441.74	2.37	0:26:30	949.17	474.59	2.21	0:33:35	412.93	412.93	2.54
0:05:35	4,202.27	210.11	4.99	0:12:35	3,591.58	359.16	2.92	0:19:35	2,208.93	441.79	2.37	0:26:35	893.60	446.80	2.34	0:33:40	532.47	532.47	1.96
0:05:40	4,163.06	208.15	5.03	0:12:40	3,595.36	359.54	2.91	0:19:40	2,217.74	443.55	2.36	0:26:40	832.57	416.28	2.52	0:33:45	438.93	438.93	2.39
0:05:45	4,135.79	206.79	5.07	0:12:45	3,639.82	363.98	2.88	0:19:45	2,135.53	427.11	2.45	0:26:45	921.91	460.95	2.27	0:33:50	502.06	502.06	2.08
0:05:50	4,198.50	209.92	4.99	0:12:50	3,609.62	360.96	2.90	0:19:50	2,276.46	455.29	2.30	0:26:50	833.41	416.70	2.51	0:33:55	498.28	498.28	2.10
0:05:55	4,155.09	207.75	5.04	0:12:55	3,648.00	364.80	2.87	0:19:55	2,108.69	421.74	2.48	0:26:55	976.85	488.43	2.14	0:34:00	451.31	451.31	2.31
0:06:00	4,149.42	207.47	5.04	0:13:00	3,583.82	358.38	2.92	0:20:00	2,223.40	444.68	2.36	0:27:00	954.20	477.10	2.20	0:34:05	445.85	445.85	2.35
0:06:05	4,192.00	209.60	5.00	0:13:05	3,531.18	353.12	2.97	0:20:05	2,230.95	446.19	2.35	0:27:05	917.08	458.54	2.29	0:34:10	446.27	446.27	2.35
0:06:10	4,203.95	210.20	4.98	0:13:10	3,614.86	361.49	2.90	0:20:10	2,248.36	449.67	2.33	0:27:10	902.82	451.41	2.32	0:34:15	483.60	483.60	2.17
0:06:15	4,150.47	207.52	5.05	0:13:15	3,633.11	363.31	2.88	0:20:15	2,245.63	449.13	2.33	0:27:15	884.37	442.18	2.37	0:34:20	501.22	501.22	2.09
0:06:20	4,197.03	209.85	4.99	0:13:20	3,566.21	356.62	2.94	0:20:20	2,212.91	442.58	2.37	0:27:20	926.94	463.47	2.26	0:34:25	482.97	482.97	2.17
0:06:25	4,188.22	209.41	5.00	0:13:25	3,546.49	354.65	2.95	0:20:25	2,234.10	446.82	2.34	0:27:25	963.22	481.61	2.17	0:34:30	417.12	417.12	2.51
0:06:30	4,163.48	208.17	5.03	0:13:30	3,577.11	357.71	2.93	0:20:30	2,192.36	438.47	2.39	0:27:30	895.27	447.64	2.34	0:34:35	449.84	449.84	2.33
0:06:35	4,197.03	209.85	4.99	0:13:35	3,561.80	356.18	2.94	0:20:35	2,261.36	452.27	2.32	0:27:35	914.15	457.07	2.29	0:34:40	427.19	427.19	2.44
0:06:40	4,198.71	209.94	4.99	0:13:40	3,593.89	359.39	2.91	0:20:40	2,209.77	441.95	2.37	0:27:40	890.24	445.12	2.35	0:34:45	254.38	0.00	2.47
0:06:45	3,072.33	0.00	4.89	0:13:45	2,638.64	0.00	2.86	0:20:45	1,513.72	0.00	2.41	0:27:45	666.27	0.00	2.27	0:34:50	0.00	0.00	0.00
0:06:50	0.00	0.00	0.00	0:13:50	0.00	0.00	0.00	0:20:50	0.00	0.00	0.00	0:27:50	0.00	0.00	0.00	0:34:55	0.00	0.00	0.00
0:06:55	0.00	0.00	0.00	0:13:55	0.00	0.00	0.00	0:20:55	0.00	0.00	0.00	0:27:55	0.00	0.00	0.00				

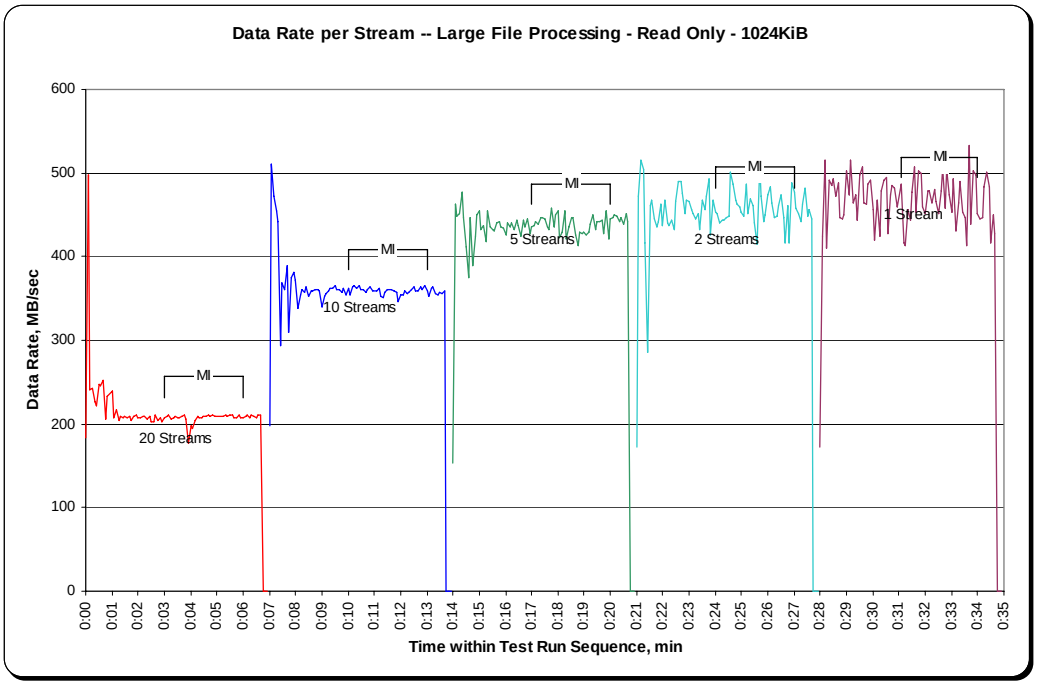
SPC-2 "Large File Processing/READ ONLY/1024 KiB Transfer Size" Average Data Rate Graph – Complete Test Run



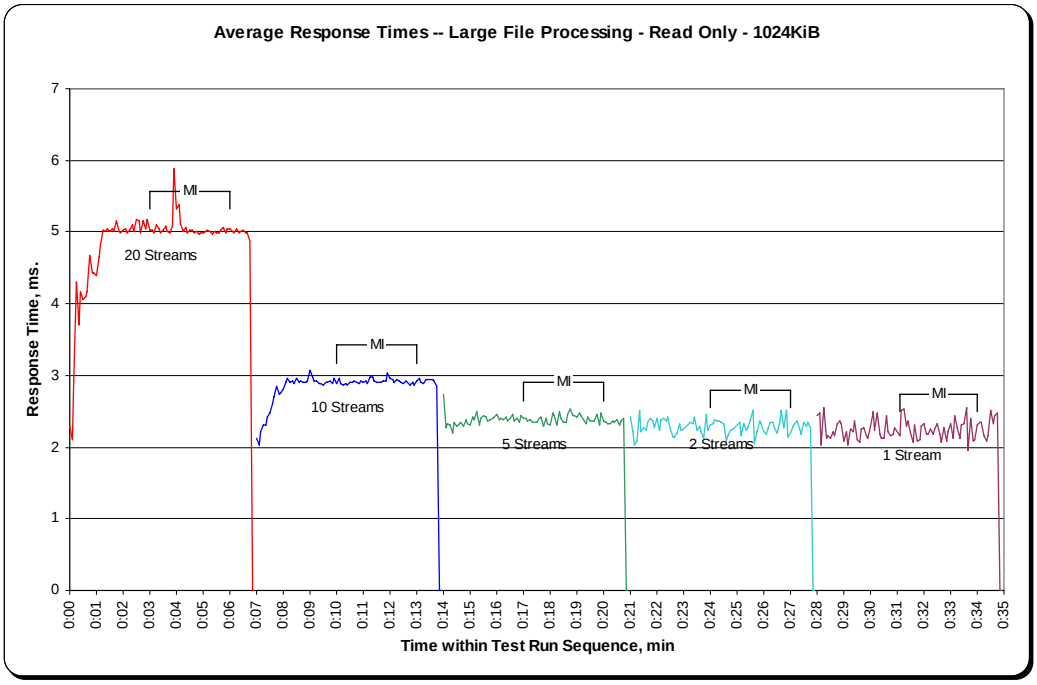
SPC-2 "Large File Processing/READ ONLY/1024 KiB Transfer Size" Average Data Rate Graph – Measurement Interval (MI) Only



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



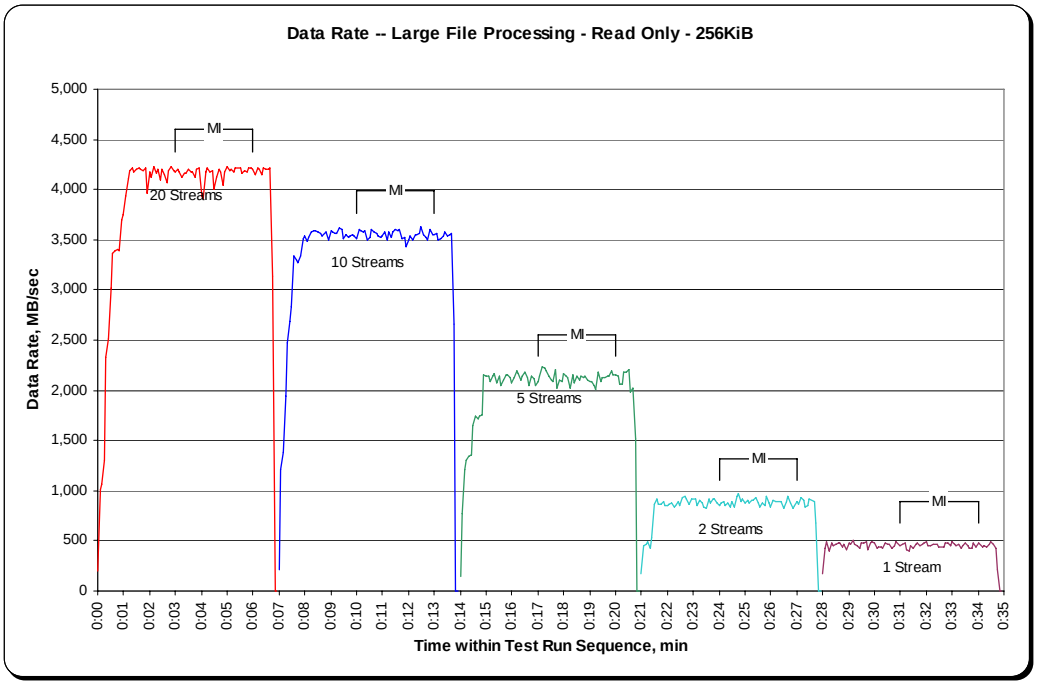
SPC-2 "Large File Processing/READ ONLY/256 KiB Transfer Size" Test Run Data – Ramp-Up Period

TR26	20 Streams			TR27	10 Streams			TR28	5 Streams			TR29	2 Streams			TR30	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	203.90	101.95	0.59	0:07:00	212.13	106.06	0.55	0:14:00	152.04	152.04	0.69	0:21:00	169.97	169.97	0.61	0:28:00	169.82	169.82	0.61
0:00:05	1,012.92	337.64	0.76	0:07:05	1,214.09	404.70	0.63	0:14:05	766.40	383.20	0.59	0:21:05	450.73	450.73	0.58	0:28:05	423.05	423.05	0.62
0:00:10	1,060.48	265.12	0.82	0:07:10	1,380.76	345.19	0.63	0:14:10	1,205.23	401.74	0.57	0:21:10	470.76	470.76	0.55	0:28:10	489.11	489.11	0.53
0:00:15	1,297.61	216.27	0.97	0:07:15	1,947.36	324.56	0.64	0:14:15	1,309.51	436.50	0.60	0:21:15	485.39	485.39	0.54	0:28:15	398.88	398.88	0.65
0:00:20	2,323.07	232.31	0.96	0:07:20	2,469.19	352.74	0.69	0:14:20	1,337.56	445.85	0.59	0:21:20	423.94	423.94	0.62	0:28:20	482.45	482.45	0.54
0:00:25	2,512.07	228.37	1.04	0:07:25	2,679.53	382.79	0.68	0:14:25	1,354.18	451.39	0.58	0:21:25	528.27	264.14	0.58	0:28:25	454.92	454.92	0.57
0:00:30	3,018.85	251.57	0.99	0:07:30	2,836.29	354.54	0.71	0:14:30	1,650.67	412.67	0.60	0:21:30	866.12	433.06	0.60	0:28:30	463.00	463.00	0.56
0:00:35	3,359.59	258.43	1.00	0:07:35	3,344.01	371.56	0.69	0:14:35	1,736.97	434.24	0.60	0:21:35	921.23	460.61	0.57	0:28:35	477.47	477.47	0.55
0:00:40	3,391.46	242.25	1.03	0:07:40	3,302.54	366.95	0.71	0:14:40	1,715.47	428.87	0.61	0:21:40	870.16	435.08	0.60	0:28:40	482.45	482.45	0.54
0:00:45	3,406.19	243.30	1.07	0:07:45	3,272.87	363.65	0.72	0:14:45	1,743.57	435.89	0.60	0:21:45	859.88	429.94	0.61	0:28:45	435.95	435.95	0.60
0:00:50	3,388.58	225.91	1.15	0:07:50	3,338.77	370.97	0.70	0:14:50	1,760.40	352.08	0.61	0:21:50	888.35	444.18	0.59	0:28:50	463.16	463.16	0.56
0:00:55	3,691.35	230.71	1.11	0:07:55	3,508.59	350.86	0.73	0:14:55	2,152.62	430.52	0.61	0:21:55	856.01	428.00	0.61	0:28:55	417.75	417.75	0.63
0:01:00	3,747.09	234.19	1.12	0:08:00	3,536.22	353.62	0.74	0:15:00	2,146.49	429.30	0.61	0:22:00	852.33	426.17	0.61	0:29:00	483.71	483.71	0.54
0:01:05	3,935.25	231.49	1.09	0:08:05	3,486.62	348.66	0.75	0:15:05	2,139.62	427.92	0.61	0:22:05	867.49	433.74	0.60	0:29:05	467.19	467.19	0.56
0:01:10	4,113.14	228.51	1.10	0:08:10	3,526.99	352.70	0.74	0:15:10	2,085.51	417.10	0.63	0:22:10	877.45	438.72	0.60	0:29:10	500.38	500.38	0.52
0:01:15	4,187.96	220.42	1.14	0:08:15	3,581.52	358.15	0.73	0:15:15	2,139.04	427.81	0.61	0:22:15	831.42	415.71	0.63	0:29:15	464.47	464.47	0.56
0:01:20	4,210.87	221.62	1.18	0:08:20	3,592.53	359.25	0.73	0:15:20	2,165.36	433.07	0.60	0:22:20	857.00	428.50	0.61	0:29:20	456.81	456.81	0.57
0:01:25	4,170.92	208.55	1.24	0:08:25	3,588.96	358.90	0.73	0:15:25	2,074.71	414.94	0.63	0:22:25	886.62	443.31	0.59	0:29:25	424.52	424.52	0.62
0:01:30	4,200.75	210.04	1.25	0:08:30	3,579.58	357.96	0.73	0:15:30	2,143.55	428.71	0.61	0:22:30	854.48	427.24	0.61	0:29:30	481.51	481.51	0.54
0:01:35	4,216.38	210.82	1.24	0:08:35	3,562.38	356.24	0.73	0:15:35	2,044.83	408.97	0.64	0:22:35	936.43	468.22	0.56	0:29:35	475.48	475.48	0.55
0:01:40	4,199.44	209.97	1.25	0:08:40	3,541.93	354.19	0.74	0:15:40	2,102.34	420.47	0.62	0:22:40	938.06	469.03	0.56	0:29:40	489.79	489.79	0.53
0:01:45	4,186.65	209.33	1.25	0:08:45	3,562.33	356.23	0.73	0:15:45	2,158.34	431.67	0.60	0:22:45	916.93	458.46	0.57	0:29:45	418.80	418.80	0.62
0:01:50	4,220.78	211.04	1.24	0:08:50	3,572.39	357.24	0.73	0:15:50	2,149.48	429.90	0.61	0:22:50	857.84	428.92	0.61	0:29:50	472.38	472.38	0.55
0:01:55	3,963.04	198.15	1.32	0:08:55	3,501.77	350.18	0.75	0:15:55	2,129.24	425.85	0.61	0:22:55	917.03	458.52	0.57	0:29:55	492.62	492.62	0.53
0:02:00	4,178.58	208.93	1.25	0:09:00	3,586.81	358.68	0.73	0:16:00	2,080.17	416.03	0.63	0:23:00	911.47	455.74	0.57	0:30:00	474.06	474.06	0.55
0:02:05	4,128.51	206.43	1.27	0:09:05	3,583.25	358.32	0.73	0:16:05	2,134.17	426.83	0.61	0:23:05	911.26	455.63	0.57	0:30:05	419.33	419.33	0.62
0:02:10	4,225.24	211.26	1.24	0:09:10	3,558.66	355.87	0.73	0:16:10	2,192.42	438.48	0.60	0:23:10	845.15	422.58	0.62	0:30:10	432.59	432.59	0.60
0:02:15	4,165.63	208.28	1.26	0:09:15	3,563.74	356.37	0.73	0:16:15	2,168.46	433.69	0.60	0:23:15	907.86	453.93	0.57	0:30:15	443.55	443.55	0.59
0:02:20	4,206.78	210.34	1.24	0:09:20	3,613.76	361.38	0.72	0:16:20	2,099.93	419.99	0.62	0:23:20	881.17	440.59	0.59	0:30:20	423.62	423.62	0.62
0:02:25	4,098.20	204.91	1.28	0:09:25	3,600.29	360.03	0.73	0:16:25	2,140.88	428.18	0.61	0:23:25	838.28	419.14	0.63	0:30:25	483.24	483.24	0.54
0:02:30	4,203.90	210.19	1.24	0:09:30	3,505.13	350.51	0.75	0:16:30	2,175.01	435.00	0.60	0:23:30	827.12	413.56	0.63	0:30:30	459.64	459.64	0.57
0:02:35	4,152.36	207.62	1.26	0:09:35	3,547.96	354.80	0.74	0:16:35	2,131.81	426.36	0.61	0:23:35	913.00	456.50	0.57	0:30:35	462.00	462.00	0.57
0:02:40	4,073.88	203.69	1.28	0:09:40	3,517.66	351.77	0.74	0:16:40	2,047.97	409.59	0.64	0:23:40	882.38	441.19	0.59	0:30:40	424.99	424.99	0.61
0:02:45	4,186.13	209.31	1.25	0:09:45	3,538.00	353.80	0.74	0:16:45	2,139.88	427.98	0.61	0:23:45	922.54	461.27	0.57	0:30:45	453.72	453.72	0.58
0:02:50	4,233.57	211.68	1.24	0:09:50	3,556.51	355.65	0.73	0:16:50	2,114.40	422.88	0.62	0:23:50	921.17	460.59	0.57	0:30:50	487.27	487.27	0.54
0:02:55	4,184.34	209.22	1.25	0:09:55	3,534.64	353.46	0.74	0:16:55	2,047.19	409.44	0.64	0:23:55	875.30	437.65	0.60	0:30:55	467.66	467.66	0.56

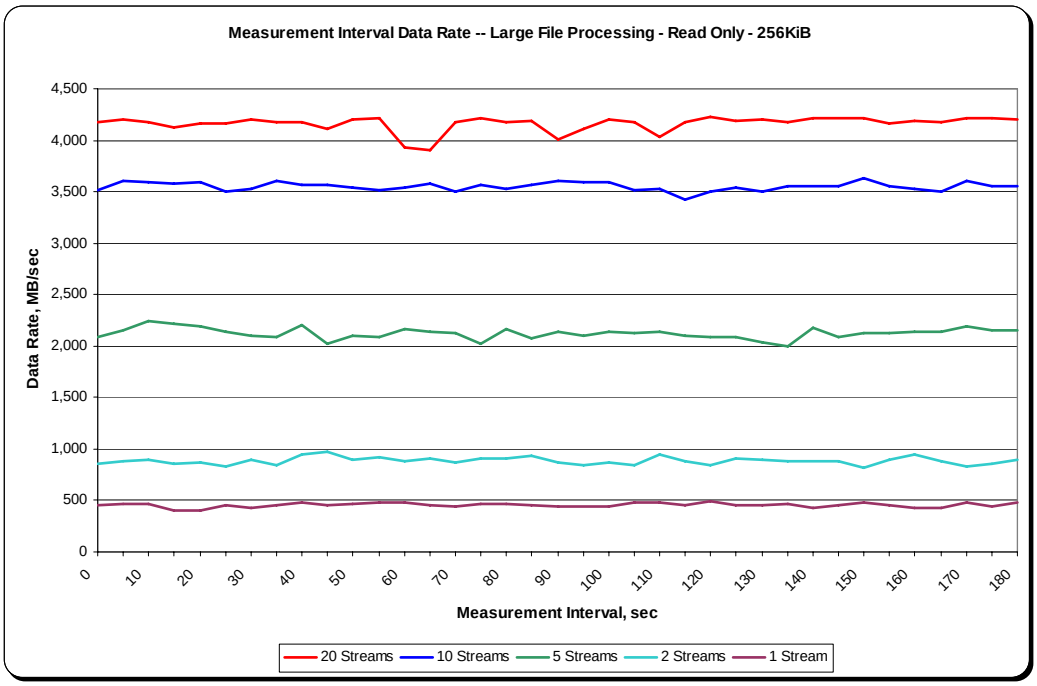
SPC-2 "Large File Processing/READ ONLY/256 KiB Transfer Size" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods

TR26	20 Streams			TR27	10 Streams			TR28	5 Streams			TR29	2 Streams			TR30	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
0:03:00	4,181.56	209.08	1.25	0:10:00	3,508.22	350.82	0.74	0:17:00	2,083.94	416.79	0.62	0:24:00	854.90	427.45	0.61	0:31:00	449.11	449.11	0.58
0:03:05	4,206.68	210.33	1.24	0:10:05	3,608.94	360.89	0.72	0:17:05	2,147.01	429.40	0.61	0:24:05	876.35	438.17	0.60	0:31:05	461.22	461.22	0.57
0:03:10	4,173.80	208.69	1.25	0:10:10	3,592.26	359.23	0.73	0:17:10	2,237.98	447.60	0.58	0:24:10	890.77	445.38	0.59	0:31:10	473.07	473.07	0.55
0:03:15	4,128.72	206.44	1.27	0:10:15	3,576.75	357.67	0.73	0:17:15	2,217.37	443.47	0.59	0:24:15	856.01	428.00	0.61	0:31:15	405.96	405.96	0.64
0:03:20	4,161.59	208.08	1.26	0:10:20	3,586.55	358.65	0.73	0:17:20	2,194.72	438.94	0.59	0:24:20	872.10	436.05	0.60	0:31:20	402.08	402.08	0.65
0:03:25	4,165.84	208.29	1.26	0:10:25	3,495.32	349.53	0.75	0:17:25	2,135.37	427.07	0.61	0:24:25	832.94	416.47	0.63	0:31:25	447.64	447.64	0.58
0:03:30	4,203.37	210.17	1.24	0:10:30	3,526.99	352.70	0.74	0:17:30	2,099.35	419.87	0.62	0:24:30	896.22	448.11	0.58	0:31:30	430.23	430.23	0.61
0:03:35	4,176.79	208.84	1.25	0:10:35	3,602.07	360.21	0.73	0:17:35	2,087.56	417.51	0.63	0:24:35	840.28	420.14	0.62	0:31:35	458.96	458.96	0.57
0:03:40	4,179.10	208.95	1.25	0:10:40	3,571.50	357.15	0.73	0:17:40	2,203.27	440.65	0.59	0:24:40	947.70	473.85	0.55	0:31:40	485.18	485.18	0.54
0:03:45	4,115.71	205.79	1.27	0:10:45	3,562.17	356.22	0.73	0:17:45	2,018.35	403.67	0.65	0:24:45	974.18	487.09	0.54	0:31:45	451.57	451.57	0.58
0:03:50	4,208.04	210.40	1.24	0:10:50	3,540.83	354.08	0.74	0:17:50	2,106.90	421.38	0.62	0:24:50	891.13	445.57	0.59	0:31:50	470.39	470.39	0.55
0:03:55	4,215.17	210.76	1.24	0:10:55	3,520.86	352.09	0.74	0:17:55	2,089.29	417.86	0.62	0:24:55	916.67	458.33	0.57	0:31:55	477.00	477.00	0.55
0:04:00	3,932.37	196.62	1.33	0:11:00	3,543.35	354.33	0.74	0:18:00	2,163.79	432.76	0.60	0:25:00	883.58	441.79	0.59	0:32:00	485.81	485.81	0.54
0:04:05	3,905.00	195.25	1.34	0:11:05	3,572.81	357.28	0.73	0:18:05	2,136.79	427.36	0.61	0:25:05	909.69	454.85	0.57	0:32:05	450.78	450.78	0.58
0:04:10	4,181.09	209.05	1.25	0:11:10	3,502.56	350.26	0.75	0:18:10	2,122.27	424.45	0.62	0:25:10	873.04	436.52	0.60	0:32:10	446.22	446.22	0.59
0:04:15	4,212.18	210.61	1.24	0:11:15	3,572.34	357.23	0.73	0:18:15	2,023.75	404.75	0.64	0:25:15	906.76	453.38	0.58	0:32:15	464.78	464.78	0.56
0:04:20	4,170.03	208.50	1.25	0:11:20	3,529.40	352.94	0.74	0:18:20	2,159.80	431.96	0.60	0:25:20	902.46	451.23	0.58	0:32:20	471.60	471.60	0.55
0:04:25	4,190.84	209.54	1.25	0:11:25	3,571.34	357.13	0.73	0:18:25	2,079.90	415.98	0.63	0:25:25	931.35	465.67	0.56	0:32:25	459.59	459.59	0.57
0:04:30	4,004.67	200.23	1.31	0:11:30	3,603.22	360.32	0.72	0:18:30	2,143.60	428.72	0.61	0:25:30	871.58	435.79	0.60	0:32:30	435.37	435.37	0.60
0:04:35	4,116.45	205.82	1.27	0:11:35	3,593.16	359.32	0.73	0:18:35	2,102.24	420.45	0.62	0:25:35	839.39	419.69	0.62	0:32:35	441.77	441.77	0.59
0:04:40	4,206.05	210.30	1.24	0:11:40	3,597.35	359.73	0.73	0:18:40	2,139.04	427.81	0.61	0:25:40	873.31	436.65	0.60	0:32:40	440.40	440.40	0.59
0:04:45	4,177.05	208.85	1.25	0:11:45	3,515.98	351.60	0.74	0:18:45	2,123.00	424.60	0.61	0:25:45	848.35	424.18	0.62	0:32:45	482.71	482.71	0.54
0:04:50	4,038.91	201.95	1.30	0:11:50	3,527.30	352.73	0.74	0:18:50	2,134.80	426.96	0.61	0:25:50	946.71	473.35	0.55	0:32:50	476.00	476.00	0.55
0:04:55	4,179.20	208.96	1.25	0:11:55	3,427.32	342.73	0.76	0:18:55	2,097.83	419.57	0.62	0:25:55	877.19	438.59	0.60	0:32:55	447.53	447.53	0.58
0:05:00	4,225.66	211.28	1.24	0:12:00	3,500.09	350.01	0.75	0:19:00	2,086.25	417.25	0.63	0:26:00	839.12	419.56	0.62	0:33:00	486.43	486.43	0.54
0:05:05	4,190.48	209.52	1.25	0:12:05	3,536.32	353.63	0.74	0:19:05	2,083.31	416.66	0.63	0:26:05	907.28	453.64	0.58	0:33:05	459.17	459.17	0.57
0:05:10	4,206.21	210.31	1.24	0:12:10	3,503.03	350.30	0.75	0:19:10	2,041.68	408.34	0.64	0:26:10	894.80	447.40	0.58	0:33:10	448.48	448.48	0.58
0:05:15	4,176.95	208.85	1.25	0:12:15	3,552.31	355.23	0.74	0:19:15	2,001.84	400.37	0.65	0:26:15	884.42	442.21	0.59	0:33:15	464.99	464.99	0.56
0:05:20	4,210.61	210.53	1.24	0:12:20	3,557.14	355.71	0.73	0:19:20	2,180.41	436.08	0.60	0:26:20	887.57	443.78	0.59	0:33:20	421.58	421.58	0.62
0:05:25	4,217.37	210.87	1.24	0:12:25	3,557.87	355.79	0.73	0:19:25	2,094.01	418.80	0.62	0:26:25	886.89	443.44	0.59	0:33:25	454.09	454.09	0.58
0:05:30	4,209.72	210.49	1.24	0:12:30	3,632.32	363.23	0.72	0:19:30	2,125.57	425.11	0.61	0:26:30	823.24	411.62	0.63	0:33:30	477.78	477.78	0.55
0:05:35	4,166.62	208.33	1.26	0:12:35	3,551.74	355.17	0.74	0:19:35	2,124.62	424.92	0.61	0:26:35	895.22	447.61	0.59	0:33:35	452.72	452.72	0.58
0:05:40	4,192.57	209.63	1.25	0:12:40	3,525.26	352.53	0.74	0:19:40	2,139.88	427.98	0.61	0:26:40	944.71	472.36	0.55	0:33:40	431.70	431.70	0.61
0:05:45	4,176.53	208.83	1.25	0:12:45	3,498.42	349.84	0.75	0:19:45	2,139.46	427.89	0.61	0:26:45	881.80	440.90	0.59	0:33:45	422.94	422.94	0.62
0:05:50	4,213.55	210.68	1.24	0:12:50	3,610.19	361.02	0.72	0:19:50	2,189.01	437.80	0.60	0:26:50	823.55	411.78	0.63	0:33:50	484.18	484.18	0.54
0:05:55	4,212.92	210.65	1.24	0:12:55	3,554.20	355.42	0.73	0:19:55	2,149.69	429.94	0.61	0:26:55	853.80	426.90	0.61	0:33:55	443.34	443.34	0.59
0:06:00	4,204.48	210.22	1.24	0:13:00	3,550.27	355.03	0.73	0:20:00	2,150.16	430.03	0.61	0:27:00	893.81	446.90	0.58	0:34:00	481.82	481.82	0.54
0:06:05	4,151.36	207.57	1.26	0:13:05	3,567.73	356.77	0.73	0:20:05	2,143.50	428.70	0.61	0:27:05	859.31	429.65	0.61	0:34:05	471.07	471.07	0.55
0:06:10	4,210.40	210.52	1.24	0:13:10	3,503.76	350.38	0.75	0:20:10	2,065.43	413.09	0.63	0:27:10	926.47	463.23	0.56	0:34:10	438.57	438.57	0.60
0:06:15	4,196.30	209.81	1.25	0:13:15	3,516.87	351.69	0.74	0:20:15	2,057.73	411.55	0.63	0:27:15	898.42	449.21	0.58	0:34:15	453.77	453.77	0.58
0:06:20	4,144.86	207.24	1.26	0:13:20	3,539.05	353.90	0.74	0:20:20	2,185.97	437.19	0.60	0:27:20	840.70	420.35	0.62	0:34:20	440.72	440.72	0.59
0:06:25	4,215.64	210.78	1.24	0:13:25	3,573.65	357.37	0.73	0:20:25	2,186.81	437.36	0.60	0:27:25	846.99	423.49	0.62	0:34:25	466.98	466.98	0.56
0:06:30	4,203.16	210.16	1.25	0:13:30	3,533.28	353.33	0.74	0:20:30	2,204.53	440.91	0.59	0:27:30	923.80	461.90	0.57	0:34:30	498.07	498.07	0.52
0:06:35	4,205.05	210.25	1.24	0:13:35	3,549.22	354.92	0.74	0:20:35	1,985.22	397.04	0.66	0:27:35	900.46	450.23	0.58	0:34:35	464.52	464.52	0.56
0:06:40	4,221.04	211.05	1.24	0:13:40	3,560.91	356.09	0.73	0:20:40	2,015.42	403.08	0.65	0:27:40	895.64	447.82	0.58	0:34:40	424.46	424.46	0.62
0:06:45	3,143.26	0.00	1.21	0:13:45	2,665.17	0.00	0.72	0:20:45	1,511.63	0.00	0.62	0:27:45	674.97	0.00	0.57	0:34:45	217.74	0.00	0.72
0:06:50	0.00	0.00	0.00	0:13:50	0.00	0.00	0.00	0:20:50	0.00	0.00	0.00	0:27:50	0.00	0.00	0.00	0:34:50	0.00	0.00	0.00
0:06:55	0.00	0.00	0.00	0:13:55	0.00	0.00	0.00	0:20:55	0.00	0.00	0.00	0:27:55	0.00	0.00	0.00	0:34:55	0.00	0.00	0.00

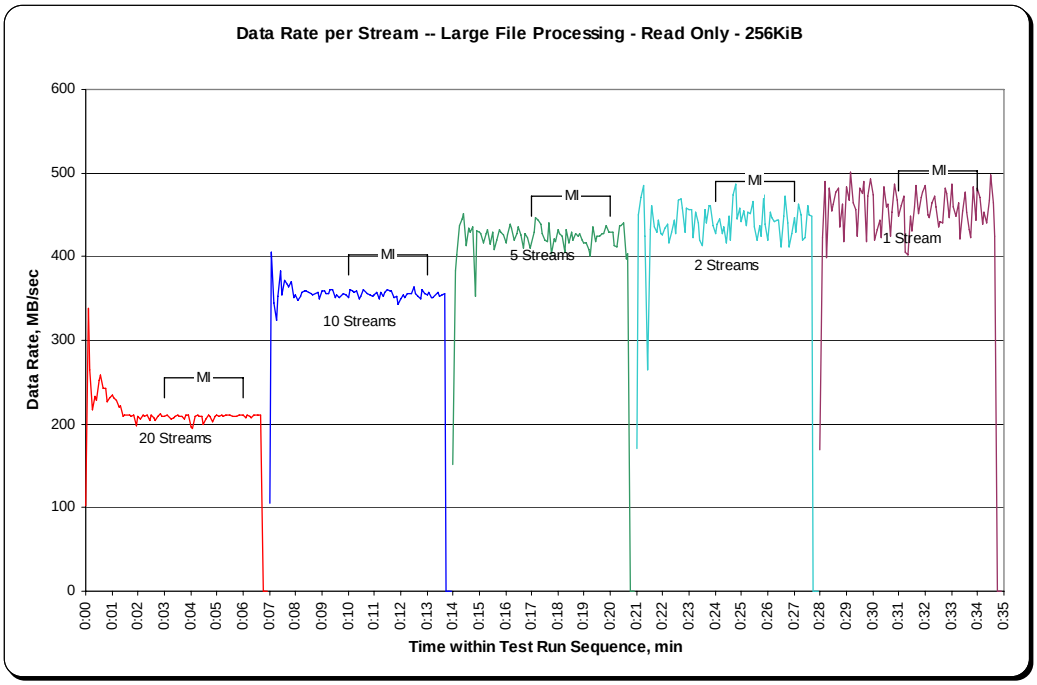
SPC-2 "Large File Processing/READ ONLY/256 KiB Transfer Size" Average Data Rate Graph – Complete Test Run



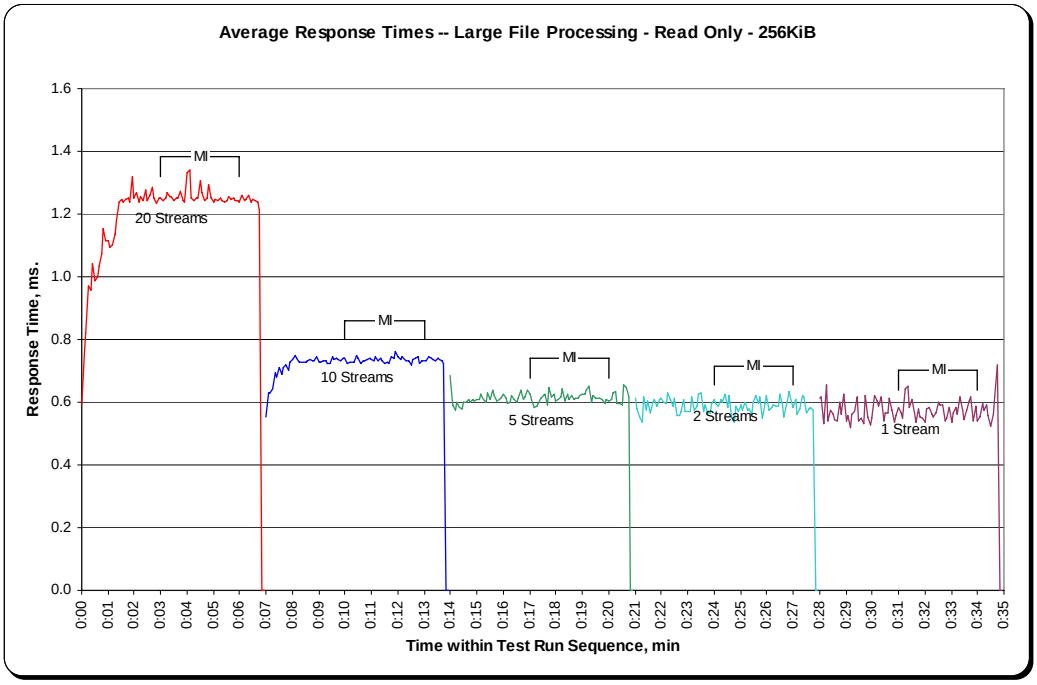
SPC-2 "Large File Processing/READ ONLY/256 KiB Transfer Size" Average Data Rate Graph – Measurement Interval (MI) Only



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 111.

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.

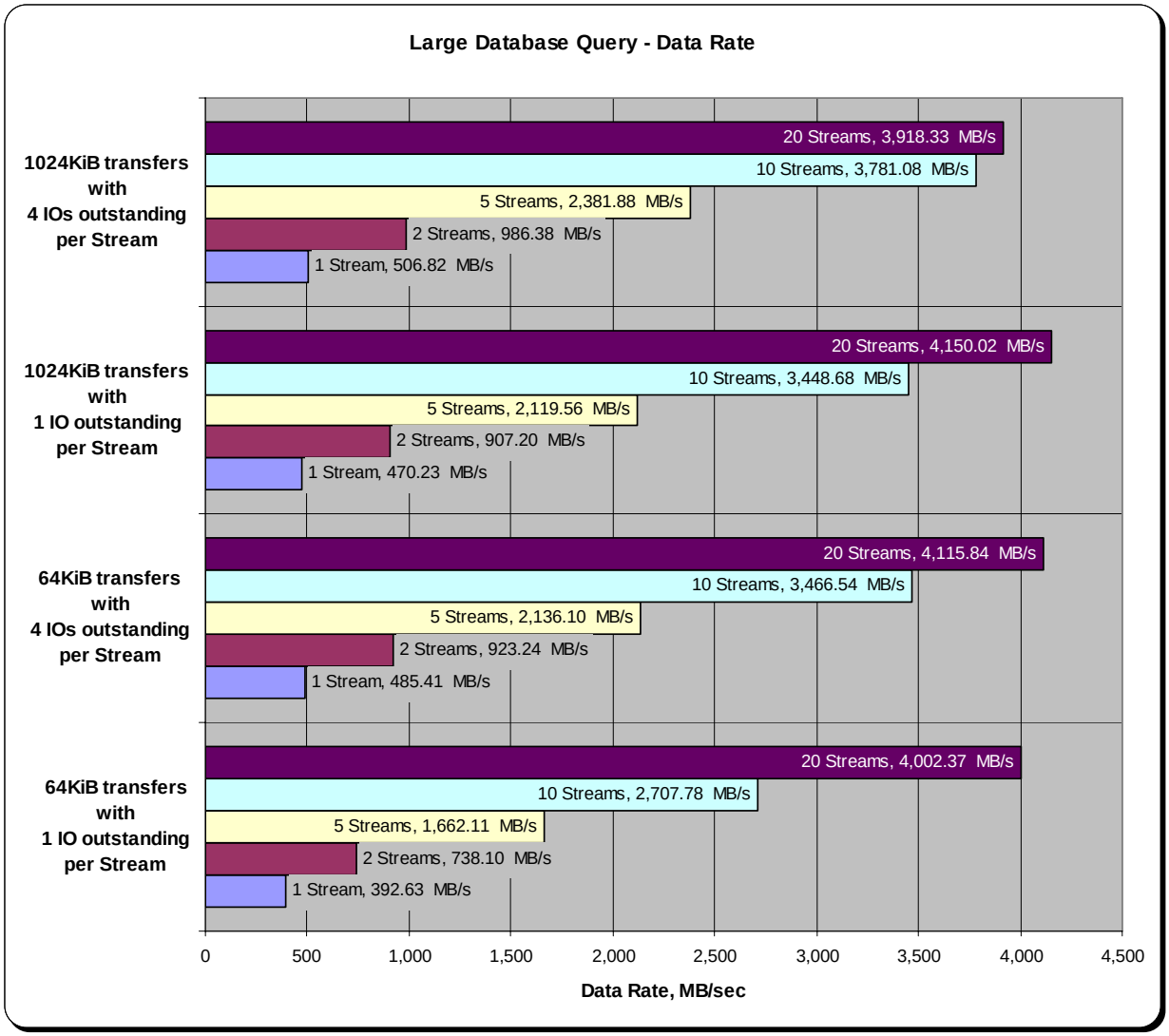
SPC-2 Large Database Query Test Results File

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	2 Streams	5 Streams	10 Streams	20 Streams
1024KiB w/ 4 IOs/Stream	506.82	986.38	2,381.88	3,781.08	3,918.33
1024KiB w/ 1 IO/Stream	470.23	907.20	2,119.56	3,448.68	4,150.02
64KiB w/ 4 IOs/Stream	485.41	923.24	2,136.10	3,466.54	4,115.84
64KiB w/ 1 IO/Stream	392.63	738.10	1,662.11	2,707.78	4,002.37

SPC-2 Large Database Query Average Data Rates Graph

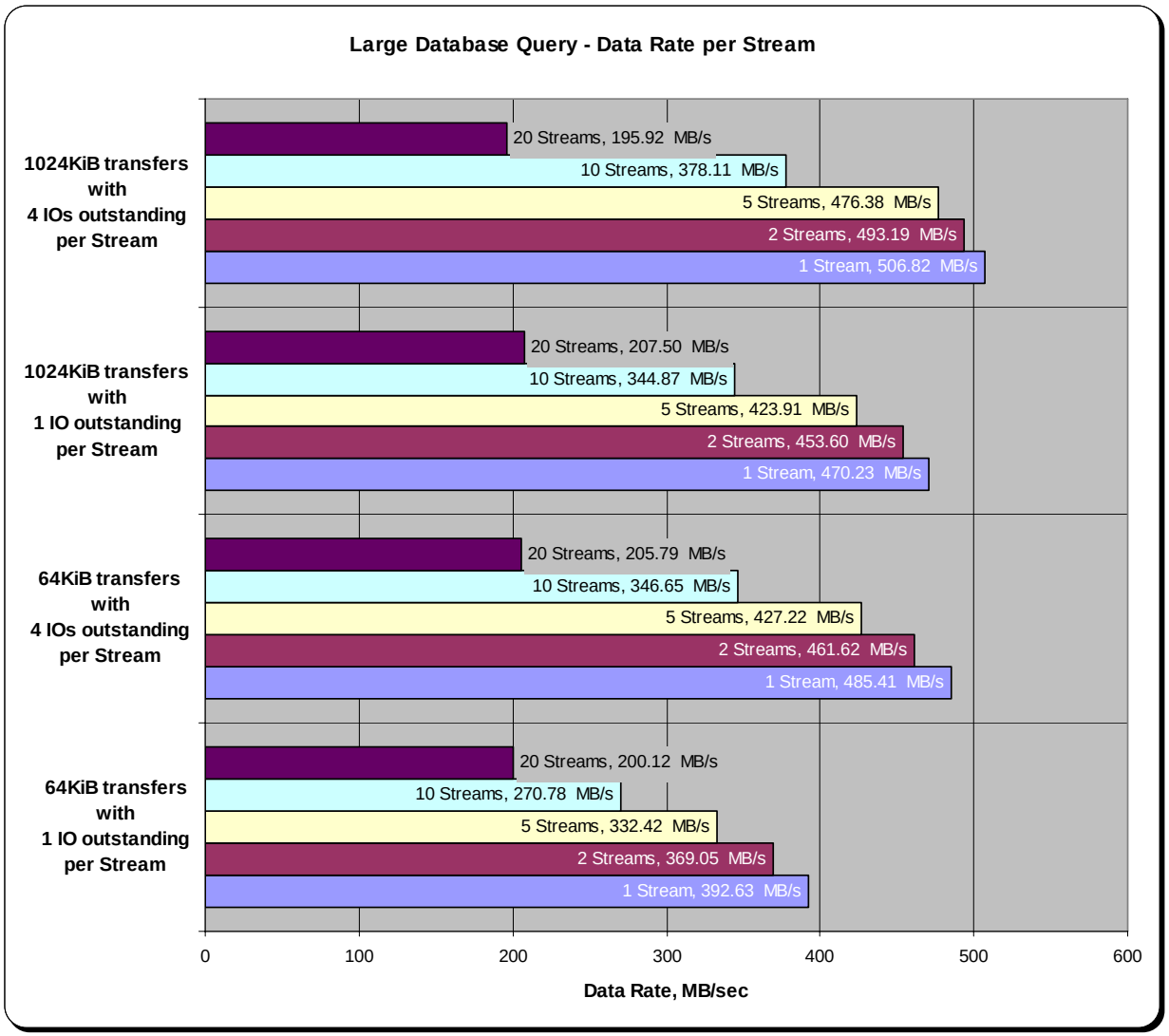


SPC-2 Large Database Query Average Data Rate per Stream

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	2 Streams	5 Streams	10 Streams	20 Streams
1024KiB w/ 4 IOs/Stream	506.82	493.19	476.38	378.11	195.92
1024KiB w/ 1 IO/Stream	470.23	453.60	423.91	344.87	207.50
64KiB w/ 4 IOs/Stream	485.41	461.62	427.22	346.65	205.79
64KiB w/ 1 IO/Stream	392.63	369.05	332.42	270.78	200.12

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

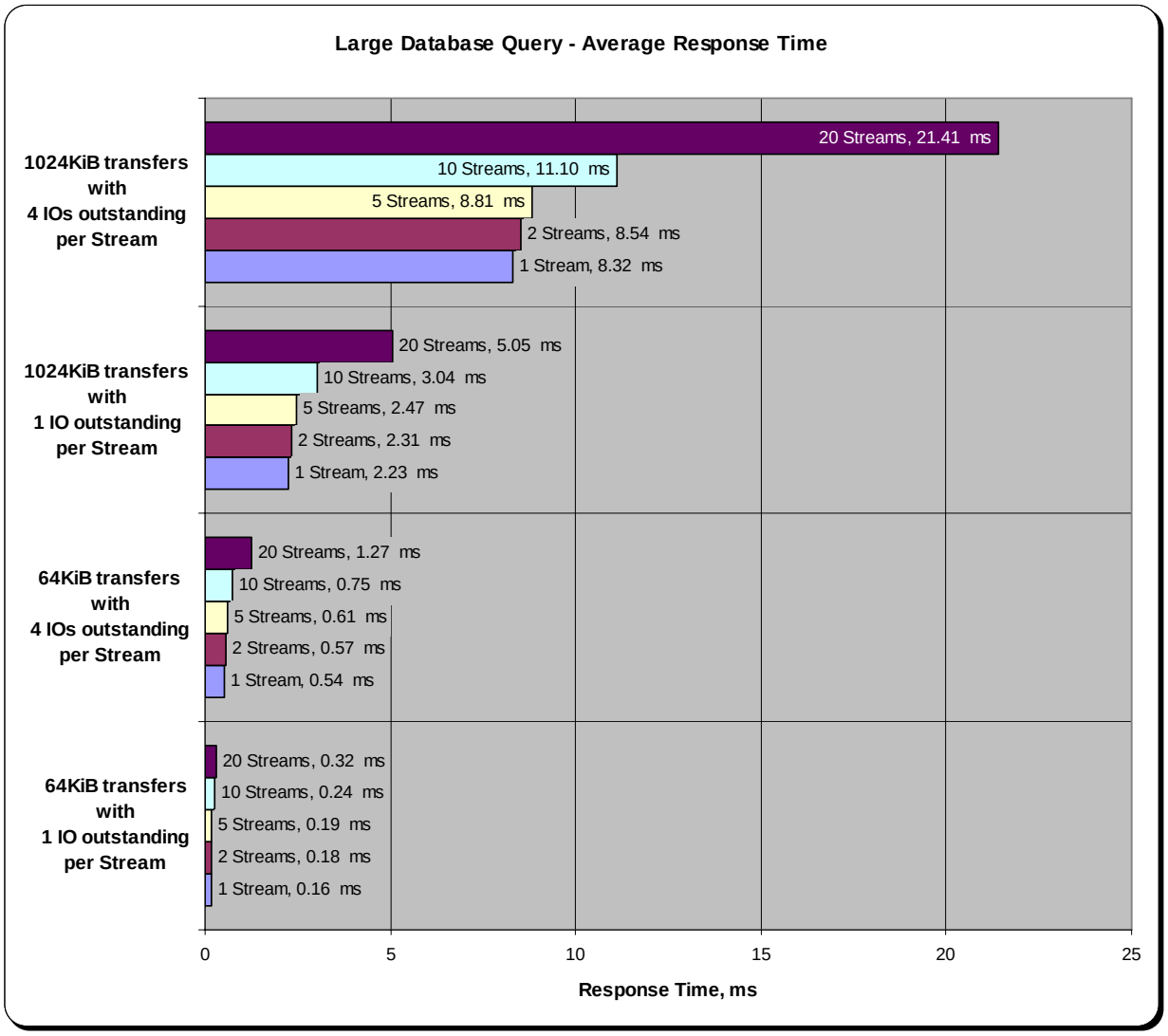


SPC-2 Large Database Query Average Response Time

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	2 Streams	5 Streams	10 Streams	20 Streams
1024KiB w/ 4 IOs/Stream	8.32	8.54	8.81	11.10	21.41
1024KiB w/ 1 IO/Stream	2.23	2.31	2.47	3.04	5.05
64KiB w/ 4 IOs/Stream	0.54	0.57	0.61	0.75	1.27
64KiB w/ 1 IO/Stream	0.16	0.18	0.19	0.24	0.32

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.

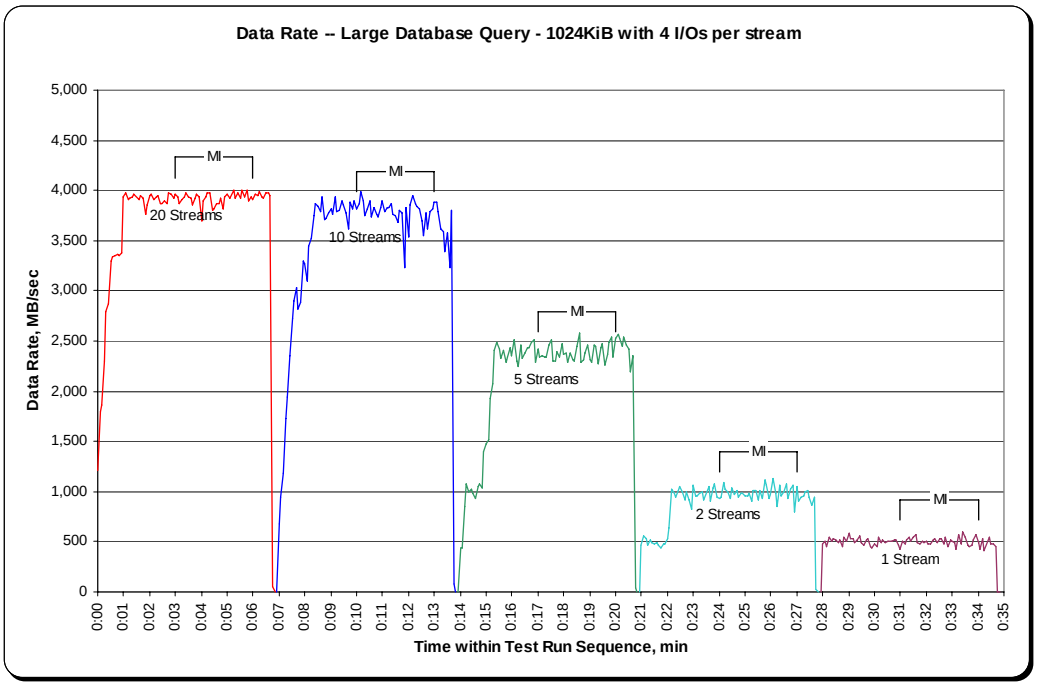
SPC-2 "Large Database Query/1024 KiB Transfer Size/4 Outstanding I/Os" Test Run Data – Ramp-Up Period

TR1	20 Streams			TR2	10 Streams			TR3	5 Streams			TR4	2 Streams			TR5	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	1,214.46	202.41	13.79	0:06:55	0.00	0.00	0.00	0:13:55	0.00	0.00	0.00	0:20:55	0.00	0.00	0.00	0:27:55	0.00	0.00	0.00
0:00:05	1,798.10	299.68	13.99	0:07:00	681.36	340.68	7.94	0:14:00	443.13	443.13	9.47	0:21:00	470.18	470.18	8.89	0:28:00	472.28	472.28	8.89
0:00:10	1,866.47	311.08	13.48	0:07:05	950.01	475.00	8.83	0:14:05	435.37	435.37	9.57	0:21:05	557.21	557.21	7.52	0:28:05	509.61	509.61	8.18
0:00:15	2,306.66	256.30	13.54	0:07:10	1,183.00	394.33	9.80	0:14:10	848.93	424.46	8.57	0:21:10	536.03	536.03	7.82	0:28:10	450.89	450.89	9.33
0:00:20	2,790.47	279.05	14.08	0:07:15	1,732.04	433.01	9.02	0:14:15	1,072.06	536.03	7.82	0:21:15	466.20	466.20	8.98	0:28:15	542.95	542.95	7.72
0:00:25	2,870.79	260.98	14.97	0:07:20	1,946.16	389.23	10.27	0:14:20	1,000.34	500.17	8.38	0:21:20	516.95	516.95	8.11	0:28:20	507.30	507.30	8.27
0:00:30	3,291.90	274.32	15.06	0:07:25	2,355.73	392.62	9.83	0:14:25	1,024.67	512.33	8.18	0:21:25	497.03	497.03	8.44	0:28:25	527.85	527.85	7.94
0:00:35	3,338.25	238.45	16.59	0:07:30	2,726.30	389.47	9.97	0:14:30	977.48	488.74	8.58	0:21:30	472.70	472.70	8.87	0:28:30	524.92	524.92	7.98
0:00:40	3,348.94	239.21	17.52	0:07:35	2,892.60	413.23	10.08	0:14:35	925.47	462.74	9.06	0:21:35	492.83	492.83	8.50	0:28:35	489.27	489.27	8.57
0:00:45	3,362.57	240.18	17.47	0:07:40	3,033.74	433.39	9.70	0:14:40	1,051.30	525.65	7.97	0:21:40	459.91	459.91	9.11	0:28:40	513.38	513.38	8.17
0:00:50	3,350.83	223.39	17.55	0:07:45	2,821.09	403.01	10.41	0:14:45	1,081.71	540.86	7.76	0:21:45	441.66	441.66	9.50	0:28:45	455.50	455.50	9.20
0:00:55	3,372.22	210.76	18.56	0:07:50	2,881.28	411.61	10.18	0:14:50	1,041.87	520.93	8.05	0:21:50	475.84	475.84	8.81	0:28:50	549.45	549.45	7.63
0:01:00	3,939.08	231.71	18.04	0:07:55	3,291.27	411.41	10.06	0:14:55	1,392.51	464.17	8.80	0:21:55	476.05	476.05	8.79	0:28:55	500.59	500.59	8.37
0:01:05	3,971.59	220.64	18.84	0:08:00	3,270.51	408.81	10.24	0:15:00	1,470.94	490.31	8.55	0:22:00	533.10	533.10	7.88	0:29:00	585.52	585.52	7.16
0:01:10	3,914.12	195.71	19.69	0:08:05	3,097.07	344.12	11.22	0:15:05	1,514.35	378.59	9.04	0:22:05	641.73	320.86	8.15	0:29:05	531.00	531.00	7.90
0:01:15	3,926.92	196.35	21.24	0:08:10	3,444.99	382.78	10.97	0:15:10	1,926.23	481.56	8.70	0:22:10	1,019.85	509.92	8.21	0:29:10	537.92	537.92	7.79
0:01:20	3,938.87	196.94	21.23	0:08:15	3,529.09	352.91	11.12	0:15:15	2,073.24	414.65	8.88	0:22:15	979.79	489.89	8.56	0:29:15	497.44	497.44	8.43
0:01:25	3,961.31	198.07	21.23	0:08:20	3,753.48	375.35	11.17	0:15:20	2,403.55	480.71	8.66	0:22:20	940.99	470.50	8.91	0:29:20	515.06	515.06	8.14
0:01:30	3,940.55	197.03	21.28	0:08:25	3,870.08	387.01	10.84	0:15:25	2,487.01	497.40	8.43	0:22:25	1,015.65	507.83	8.25	0:29:25	564.76	564.76	7.42
0:01:35	3,913.08	195.65	21.42	0:08:30	3,840.10	384.01	10.92	0:15:30	2,423.47	484.69	8.65	0:22:30	1,055.71	527.85	7.93	0:29:30	488.64	488.64	8.57
0:01:40	3,948.94	197.45	21.25	0:08:35	3,791.23	379.12	11.06	0:15:35	2,322.39	464.48	9.02	0:22:35	996.36	498.18	8.41	0:29:35	468.08	468.08	8.96
0:01:45	3,920.21	196.01	21.39	0:08:40	3,936.98	393.70	10.65	0:15:40	2,411.72	482.34	8.69	0:22:40	912.26	456.13	9.19	0:29:40	522.19	522.19	8.02
0:01:50	3,763.13	188.16	22.28	0:08:45	3,715.73	371.57	11.27	0:15:45	2,285.90	457.18	9.17	0:22:45	991.11	495.56	8.45	0:29:45	528.06	528.06	7.94
0:01:55	3,853.94	192.70	21.76	0:08:50	3,725.38	372.54	11.23	0:15:50	2,343.78	468.76	8.95	0:22:50	913.73	456.86	9.17	0:29:50	446.90	446.90	9.38
0:02:00	3,953.97	197.70	21.17	0:08:55	3,781.79	378.18	11.09	0:15:55	2,432.70	486.54	8.62	0:22:55	830.05	415.03	10.10	0:29:55	437.47	437.47	9.59
0:02:05	3,964.67	198.23	21.22	0:09:00	3,819.12	381.91	11.01	0:16:00	2,359.93	471.99	8.88	0:23:00	1,070.18	535.09	7.85	0:30:00	475.42	475.42	8.82
0:02:10	3,913.91	195.70	21.40	0:09:05	3,757.47	375.75	11.15	0:16:05	2,506.73	501.35	8.36	0:23:05	959.66	479.83	8.73	0:30:05	448.58	448.58	9.35
0:02:15	3,933.84	196.69	21.35	0:09:10	3,940.13	394.01	10.65	0:16:10	2,300.37	460.07	9.11	0:23:10	959.03	479.51	8.75	0:30:10	542.95	542.95	7.72
0:02:20	3,950.61	197.53	21.23	0:09:15	3,785.57	378.56	10.99	0:16:15	2,249.20	449.84	9.32	0:23:15	990.28	495.14	8.46	0:30:15	487.59	487.59	8.59
0:02:25	3,869.04	193.45	21.67	0:09:20	3,809.48	380.95	11.09	0:16:20	2,456.60	491.32	8.53	0:23:20	991.53	495.77	8.46	0:30:20	520.30	520.30	8.06
0:02:30	3,872.81	193.64	21.60	0:09:25	3,891.27	389.13	10.78	0:16:25	2,329.94	465.99	8.99	0:23:25	911.63	455.82	9.20	0:30:25	488.64	488.64	8.58
0:02:35	3,897.14	194.86	21.58	0:09:30	3,858.97	385.90	10.85	0:16:30	2,378.59	475.72	8.81	0:23:30	985.45	492.73	8.52	0:30:30	509.82	509.82	8.23
0:02:40	3,863.58	193.18	21.69	0:09:35	3,779.91	377.99	11.11	0:16:35	2,432.28	486.46	8.62	0:23:35	1,047.11	523.55	7.99	0:30:35	507.72	507.72	8.25
0:02:45	3,970.54	198.53	21.15	0:09:40	3,612.55	361.26	11.59	0:16:40	2,431.65	486.33	8.62	0:23:40	909.33	454.66	9.23	0:30:40	500.80	500.80	8.38
0:02:50	3,965.71	198.29	21.14	0:09:45	3,878.68	387.87	10.82	0:16:45	2,482.61	496.52	8.45	0:23:45	1,035.57	517.79	8.10	0:30:45	520.72	520.72	8.05
0:02:55	3,926.71	196.34	21.34	0:09:50	3,811.78	381.18	11.00	0:16:50	2,511.55	502.31	8.34	0:23:50	1,072.06	536.03	7.82	0:30:50	524.50	524.50	7.99
				0:09:55	3,890.64	389.06	10.74	0:16:55	2,282.75	456.55	9.16	0:23:55	943.51	471.75	8.86	0:30:55	462.00	462.00	9.04

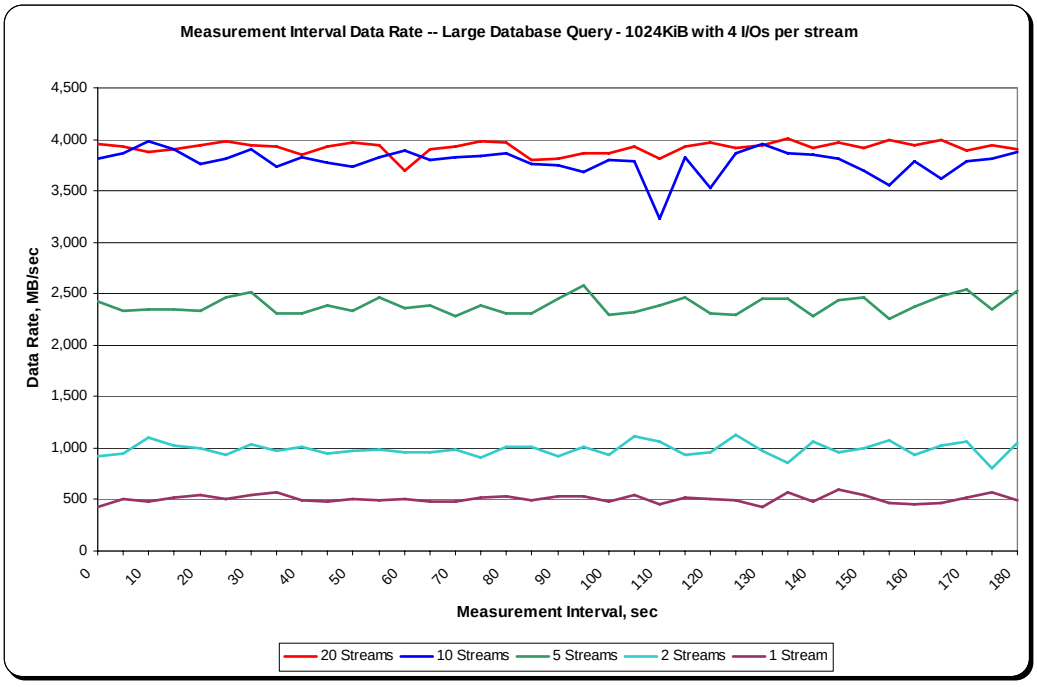
SPC-2 "Large Database Query/1024 KiB Transfer Size/4 Outstanding I/Os" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods

TR1	20 Streams			TR2	10 Streams			TR3	5 Streams			TR4	2 Streams			TR5	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
0:03:00	3,960.68	198.03	21.17	0:10:00	3,811.36	381.14	11.03	0:17:00	2,422.00	484.40	8.65	0:24:00	927.15	463.58	9.07	0:31:00	431.80	431.80	9.74
0:03:05	3,930.69	196.53	21.36	0:10:05	3,865.68	386.57	10.85	0:17:05	2,340.00	468.00	8.96	0:24:05	943.30	471.65	8.89	0:31:05	507.30	507.30	8.27
0:03:10	3,873.44	193.67	21.64	0:10:10	3,983.54	398.35	10.52	0:17:10	2,349.44	469.89	8.92	0:24:10	1,097.02	548.51	7.64	0:31:10	473.75	473.75	8.85
0:03:15	3,903.43	195.17	21.49	0:10:15	3,901.33	390.13	10.74	0:17:15	2,341.26	468.25	8.95	0:24:15	1,030.12	515.06	8.14	0:31:15	519.67	519.67	8.07
0:03:20	3,937.82	196.89	21.29	0:10:20	3,755.37	375.54	11.16	0:17:20	2,336.44	467.29	8.97	0:24:20	1,003.91	501.95	8.35	0:31:20	545.05	545.05	7.69
0:03:25	3,982.70	199.14	21.07	0:10:25	3,815.77	381.58	10.98	0:17:25	2,457.86	491.57	8.53	0:24:25	927.99	463.99	9.04	0:31:25	502.06	502.06	8.35
0:03:30	3,942.02	197.10	21.27	0:10:30	3,900.91	390.09	10.75	0:17:30	2,510.50	502.10	8.34	0:24:30	1,036.62	518.31	8.09	0:31:30	545.47	545.47	7.69
0:03:35	3,926.71	196.34	21.36	0:10:35	3,733.98	373.40	11.18	0:17:35	2,306.03	461.21	9.09	0:24:35	976.22	488.11	8.59	0:31:35	570.01	570.01	7.35
0:03:40	3,849.95	192.50	21.79	0:10:40	3,827.30	382.73	11.00	0:17:40	2,305.82	461.16	9.09	0:24:40	1,011.04	505.52	8.30	0:31:40	493.25	493.25	8.50
0:03:45	3,929.22	196.46	21.35	0:10:45	3,768.58	376.86	11.12	0:17:45	2,389.29	477.86	8.77	0:24:45	941.83	470.92	8.89	0:31:45	476.68	476.68	8.79
0:03:50	3,966.34	198.32	21.14	0:10:50	3,737.96	373.80	11.22	0:17:50	2,333.92	466.78	8.99	0:24:50	977.48	488.74	8.59	0:31:50	510.24	510.24	8.22
0:03:55	3,940.13	197.01	21.28	0:10:55	3,830.66	383.07	10.95	0:17:55	2,469.82	493.96	8.48	0:24:55	988.39	494.19	8.48	0:31:55	491.78	491.78	8.52
0:04:00	3,690.99	184.55	22.70	0:11:00	3,891.48	389.15	10.77	0:18:00	2,363.91	472.78	8.87	0:25:00	961.12	480.56	8.72	0:32:00	509.61	509.61	8.22
0:04:05	3,901.54	195.08	21.51	0:11:05	3,794.17	379.42	11.05	0:18:05	2,382.36	476.47	8.80	0:25:05	960.71	480.35	8.72	0:32:05	474.59	474.59	8.84
0:04:10	3,932.16	196.61	21.29	0:11:10	3,827.93	382.79	10.95	0:18:10	2,287.78	457.56	9.16	0:25:10	987.97	493.98	8.49	0:32:10	482.14	482.14	8.69
0:04:15	3,979.77	198.99	21.13	0:11:15	3,832.55	383.25	10.93	0:18:15	2,384.25	476.85	8.79	0:25:15	908.70	454.35	9.24	0:32:15	521.98	521.98	8.03
0:04:20	3,970.54	198.53	21.13	0:11:20	3,869.04	386.90	10.84	0:18:20	2,312.32	462.46	9.06	0:25:20	1,013.55	506.78	8.26	0:32:20	537.50	537.50	7.79
0:04:25	3,804.65	190.23	22.04	0:11:25	3,766.28	376.63	11.12	0:18:25	2,305.19	461.04	9.09	0:25:25	1,016.91	508.45	8.25	0:32:25	487.80	487.80	8.59
0:04:30	3,818.91	190.95	21.96	0:11:30	3,748.03	374.80	11.12	0:18:30	2,449.05	489.81	8.56	0:25:30	915.20	457.60	9.15	0:32:30	535.61	535.61	7.82
0:04:35	3,868.20	193.41	21.68	0:11:35	3,680.50	368.05	11.46	0:18:35	2,575.30	515.06	8.14	0:25:35	1,013.13	506.57	8.28	0:32:35	536.45	536.45	7.82
0:04:40	3,866.94	193.35	21.69	0:11:40	3,801.30	380.13	11.02	0:18:40	2,293.86	458.77	9.13	0:25:40	929.25	464.62	9.03	0:32:40	481.72	481.72	8.70
0:04:45	3,924.82	196.24	21.37	0:11:45	3,780.33	378.03	11.10	0:18:45	2,317.56	463.51	9.05	0:25:45	1,114.64	557.32	7.51	0:32:45	542.95	542.95	7.72
0:04:50	3,811.78	190.59	22.00	0:11:50	3,230.24	323.02	12.97	0:18:50	2,384.67	476.93	8.79	0:25:50	1,058.01	529.01	7.93	0:32:50	457.18	457.18	9.17
0:04:55	3,933.21	196.66	21.32	0:11:55	3,829.61	382.96	10.95	0:18:55	2,459.75	491.95	8.52	0:25:55	930.30	465.15	9.01	0:32:55	518.42	518.42	8.09
0:05:00	3,963.83	198.19	21.15	0:12:00	3,533.28	353.33	11.86	0:19:00	2,308.54	461.71	9.08	0:26:00	965.53	482.76	8.68	0:33:00	501.43	501.43	8.36
0:05:05	3,918.53	195.93	21.40	0:12:05	3,861.70	386.17	10.86	0:19:05	2,289.04	457.81	9.16	0:26:05	1,124.49	562.25	7.46	0:33:05	487.80	487.80	8.59
0:05:10	3,943.07	197.15	21.20	0:12:10	3,955.23	395.52	10.57	0:19:10	2,455.35	491.07	8.53	0:26:10	978.11	489.06	8.57	0:33:10	428.87	428.87	9.78
0:05:15	4,007.03	200.35	20.99	0:12:15	3,865.26	386.53	10.86	0:19:15	2,445.49	489.10	8.57	0:26:15	850.81	425.41	9.85	0:33:15	575.67	575.67	7.28
0:05:20	3,922.72	196.14	21.39	0:12:20	3,847.23	384.72	10.91	0:19:20	2,276.46	455.29	9.20	0:26:20	1,063.68	531.84	7.89	0:33:20	481.93	481.93	8.70
0:05:25	3,974.52	198.73	21.10	0:12:25	3,818.49	381.85	10.98	0:19:25	2,439.41	487.88	8.59	0:26:25	963.64	481.82	8.69	0:33:25	598.74	598.74	7.00
0:05:30	3,922.51	196.13	21.37	0:12:30	3,697.91	369.79	11.34	0:19:30	2,468.77	493.75	8.49	0:26:30	1,000.55	500.28	8.38	0:33:30	540.65	540.65	7.75
0:05:35	3,996.54	199.83	20.97	0:12:35	3,556.77	355.68	11.79	0:19:35	2,254.02	450.80	9.30	0:26:35	1,078.15	539.07	7.77	0:33:35	464.31	464.31	9.03
0:05:40	3,936.98	196.85	21.32	0:12:40	3,782.42	378.24	11.08	0:19:40	2,371.67	474.33	8.84	0:26:40	929.46	464.73	9.02	0:33:40	458.23	458.23	9.15
0:05:45	3,998.43	199.92	20.98	0:12:45	3,615.49	361.55	11.60	0:19:45	2,480.30	496.06	8.45	0:26:45	1,018.17	509.08	8.24	0:33:45	470.60	470.60	8.91
0:05:50	3,892.52	194.63	21.48	0:12:50	3,789.34	378.93	11.07	0:19:50	2,536.72	507.34	8.26	0:26:50	1,064.51	532.26	7.87	0:33:50	517.16	517.16	8.10
0:05:55	3,936.56	196.83	21.29	0:12:55	3,811.78	381.18	10.97	0:19:55	2,343.36	468.67	8.92	0:26:55	801.95	400.98	10.35	0:33:55	567.28	567.28	7.36
0:06:00	3,907.62	195.38	21.48	0:13:00	3,877.63	387.76	10.84	0:20:00	2,526.65	505.33	8.29	0:27:00	1,047.95	523.97	8.06	0:34:00	495.98	495.98	8.48
0:06:05	3,964.46	198.22	20.99	0:13:05	3,886.23	388.62	10.73	0:20:05	2,569.85	513.97	8.16	0:27:05	907.65	453.82	9.18	0:34:05	429.71	429.71	9.76
0:06:10	3,954.18	197.71	21.36	0:13:10	3,786.83	378.68	11.09	0:20:10	2,528.33	505.67	8.29	0:27:10	940.57	470.29	8.93	0:34:10	531.21	531.21	7.89
0:06:15	3,987.32	199.37	21.02	0:13:15	3,618.01	361.80	11.58	0:20:15	2,440.25	488.05	8.60	0:27:15	961.75	480.88	8.72	0:34:15	416.91	416.91	10.06
0:06:20	3,942.23	197.11	21.28	0:13:20	3,597.04	359.70	11.66	0:20:20	2,544.06	508.81	8.24	0:27:20	992.79	496.40	8.44	0:34:20	479.41	479.41	8.74
0:06:25	3,925.45	196.27	21.37	0:13:25	3,394.24	339.42	12.31	0:20:25	2,454.30	490.86	8.54	0:27:25	1,015.86	507.93	8.25	0:34:25	544.84	544.84	7.70
0:06:30	3,975.57	198.78	21.12	0:13:30	3,579.00	357.90	11.75	0:20:30	2,426.40	485.28	8.62	0:27:30	939.73	469.87	8.92	0:34:30	482.14	482.14	8.69
0:06:35	3,973.68	198.68	21.11	0:13:35	3,225.63	322.56	13.00	0:20:35	2,198.23	439.65	9.55	0:27:35	860.88	430.44	9.69	0:34:35	481.72	481.72	8.70
0:06:40	3,945.16	197.26	21.18	0:13:40	3,796.68	379.67	11.01	0:20:40	2,355.52	471.10	8.87	0:27:40	947.91	473.96	8.85	0:34:40	452.15	452.15	9.25
0:06:45	53.90	0.00	19.41	0:13:45	77.59	0.00	9.98	0:20:45	40.06	0.00	10.14	0:27:45	27.68	0.00	9.92	0:34:45	1.05	0.00	6.97
0:06:50	0.00	0.00	0.00	0:13:50	0.00	0.00	0.00	0:20:50	0.00	0.00	0.00	0:27:50	0.00	0.00	0.00	0:34:50	0.00	0.00	0.00

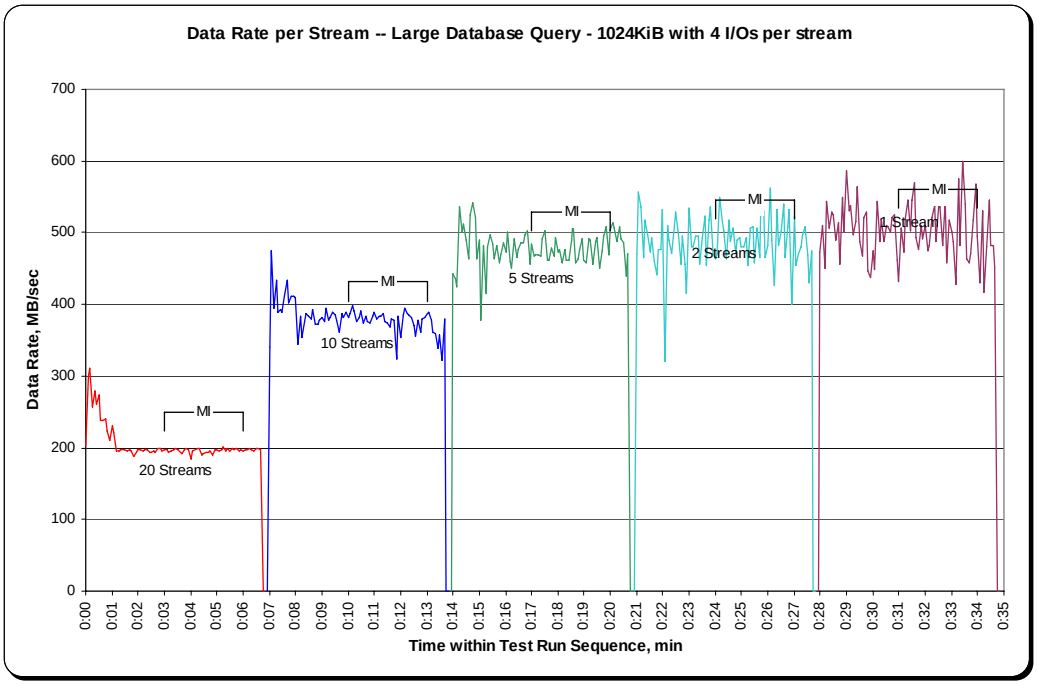
SPC-2 "Large Database Query/1024 KiB Transfer Size/4 Outstanding I/Os" Average Data Rate Graph – Complete Test Run



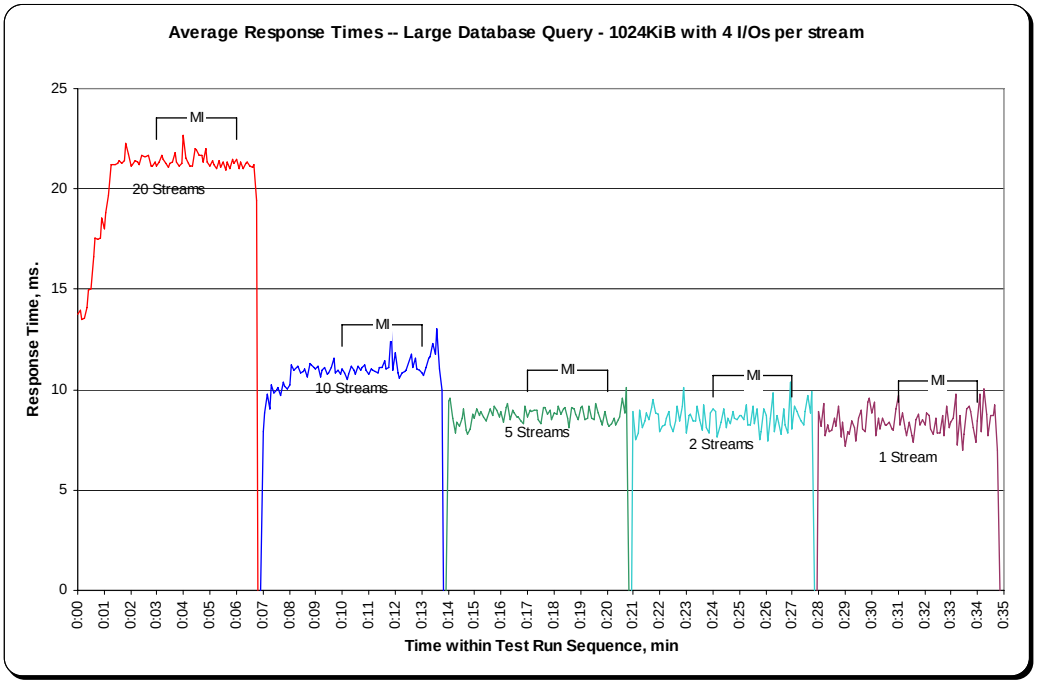
SPC-2 "Large Database Query/1024 KiB Transfer Size/4 Outstanding I/Os" Average Data Rate Graph – Measurement Interval (MI) Only



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



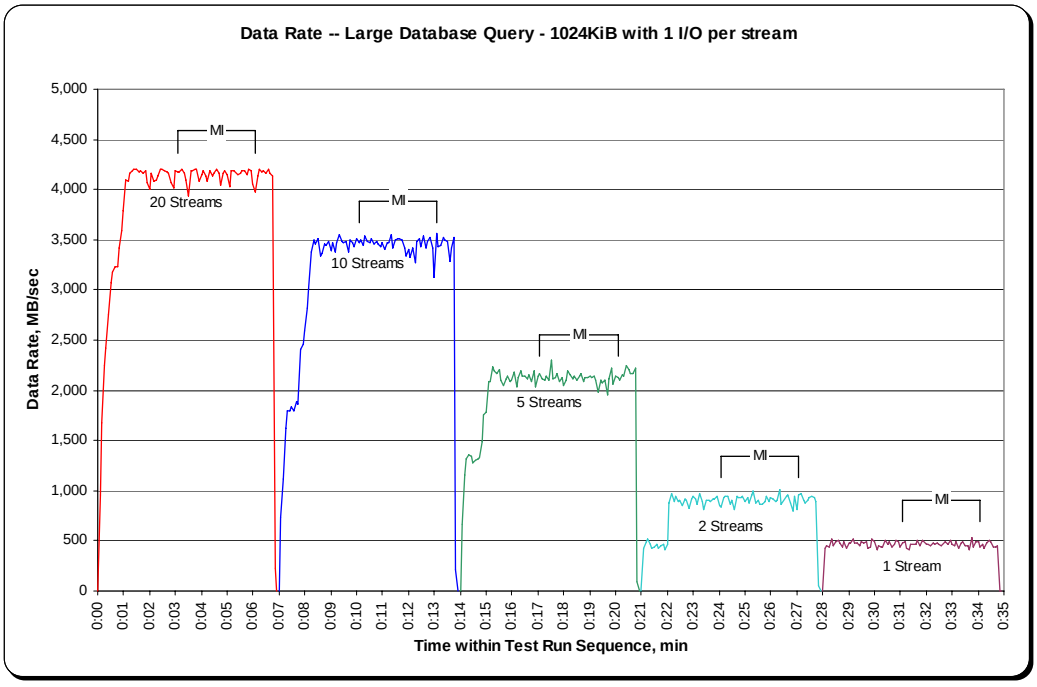
SPC-2 "Large Database Query/1024 KiB Transfer Size/1 Outstanding I/O" Test Run Data – Ramp-Up Period

TR6	20 Streams			TR7	10 Streams			TR8	5 Streams			TR9	2 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	0:07:00	0.00	0.00	0.00	0:14:00	0.00	0.00	0.00	0:21:00	0.00	0.00	0.00	0:28:00	0.00	0.00	0.00
0:00:05	956.09	191.22	4.13	0:07:05	725.61	362.81	2.38	0:14:05	659.55	329.78	2.60	0:21:05	429.71	429.71	2.44	0:28:05	422.37	422.37	2.49
0:00:10	1,670.17	208.77	3.99	0:07:10	1,111.49	277.87	2.66	0:14:10	1,155.95	385.32	2.32	0:21:10	495.77	495.77	2.10	0:28:10	457.81	457.81	2.27
0:00:15	2,250.87	250.10	3.84	0:07:15	1,624.24	324.85	2.58	0:14:15	1,320.58	440.19	2.38	0:21:15	520.93	520.93	2.02	0:28:15	441.66	441.66	2.38
0:00:20	2,419.48	219.95	4.26	0:07:20	1,801.24	360.25	2.90	0:14:20	1,356.86	452.29	2.32	0:21:20	471.86	471.86	2.22	0:28:20	519.88	519.88	2.01
0:00:25	2,759.01	250.82	4.18	0:07:25	1,793.48	358.70	2.92	0:14:25	1,345.11	448.37	2.34	0:21:25	429.29	429.29	2.44	0:28:25	453.40	453.40	2.31
0:00:30	3,067.71	255.64	4.06	0:07:30	1,835.64	367.13	2.85	0:14:30	1,282.20	427.40	2.45	0:21:30	439.35	439.35	2.38	0:28:30	488.64	488.64	2.14
0:00:35	3,172.15	244.01	4.12	0:07:35	1,794.53	358.91	2.92	0:14:35	1,309.25	436.42	2.40	0:21:35	464.94	464.94	2.25	0:28:35	511.29	511.29	2.05
0:00:40	3,230.66	230.76	4.27	0:07:40	1,881.77	376.35	2.78	0:14:40	1,311.35	437.12	2.40	0:21:40	429.08	429.08	2.44	0:28:40	477.73	477.73	2.19
0:00:45	3,233.18	230.94	4.54	0:07:45	1,858.50	371.70	2.82	0:14:45	1,334.42	444.81	2.35	0:21:45	449.21	449.21	2.33	0:28:45	441.87	441.87	2.37
0:00:50	3,419.20	213.70	4.67	0:07:50	2,401.24	343.03	2.83	0:14:50	1,491.28	372.82	2.45	0:21:50	462.84	462.84	2.26	0:28:50	498.07	498.07	2.10
0:00:55	3,587.18	224.20	4.65	0:07:55	2,463.11	351.87	2.98	0:14:55	1,756.99	439.25	2.38	0:21:55	417.96	417.96	2.51	0:28:55	430.13	430.13	2.44
0:01:00	3,784.73	222.63	4.56	0:08:00	2,598.16	371.17	2.82	0:15:00	1,776.92	355.38	2.40	0:22:00	463.68	231.84	2.49	0:29:00	476.68	476.68	2.20
0:01:05	4,098.25	227.68	4.56	0:08:05	2,824.23	353.03	2.95	0:15:05	2,087.09	417.42	2.50	0:22:05	881.43	440.72	2.38	0:29:05	475.63	475.63	2.20
0:01:10	4,076.44	214.55	4.69	0:08:10	3,018.43	335.38	2.94	0:15:10	2,094.01	418.80	2.50	0:22:10	973.92	486.96	2.15	0:29:10	515.06	515.06	2.03
0:01:15	4,167.46	208.37	4.94	0:08:15	3,371.80	337.18	3.04	0:15:15	2,230.11	446.02	2.35	0:22:15	896.95	448.48	2.33	0:29:15	484.23	484.23	2.16
0:01:20	4,187.38	209.37	5.01	0:08:20	3,502.45	350.25	2.99	0:15:20	2,199.91	439.98	2.38	0:22:20	950.43	475.21	2.21	0:29:20	474.59	474.59	2.21
0:01:25	4,198.29	209.91	4.99	0:08:25	3,451.70	345.17	3.04	0:15:25	2,172.44	434.49	2.41	0:22:25	885.00	442.50	2.37	0:29:25	445.85	445.85	2.35
0:01:30	4,196.19	209.81	4.99	0:08:30	3,508.95	350.90	2.98	0:15:30	2,205.16	441.03	2.37	0:22:30	905.97	452.98	2.30	0:29:30	494.72	494.72	2.12
0:01:35	4,180.67	209.03	5.01	0:08:35	3,342.65	334.27	3.13	0:15:35	2,105.54	421.11	2.49	0:22:35	845.99	423.00	2.49	0:29:35	482.34	482.34	2.17
0:01:40	4,185.29	209.26	5.01	0:08:40	3,366.14	336.61	3.11	0:15:40	2,043.05	408.61	2.56	0:22:40	917.08	458.54	2.28	0:29:40	488.43	488.43	2.14
0:01:45	4,157.60	207.88	5.04	0:08:45	3,459.25	345.93	3.00	0:15:45	2,113.72	422.74	2.48	0:22:45	900.94	450.47	2.32	0:29:45	429.71	429.71	2.44
0:01:50	4,184.66	209.23	5.01	0:08:50	3,449.19	344.92	3.06	0:15:50	2,146.85	429.37	2.44	0:22:50	825.86	412.93	2.54	0:29:50	444.60	444.60	2.36
0:01:55	4,072.88	203.64	5.13	0:08:55	3,481.69	348.17	3.01	0:15:55	2,091.49	418.30	2.50	0:22:55	917.92	458.96	2.28	0:29:55	520.72	520.72	2.01
0:02:00	4,005.56	200.28	5.25	0:09:00	3,390.89	339.09	3.09	0:16:00	2,105.96	421.19	2.49	0:23:00	941.41	470.71	2.23	0:30:00	488.43	488.43	2.14
0:02:05	4,162.43	208.12	5.03	0:09:05	3,464.29	346.43	3.02	0:16:05	2,176.21	435.24	2.40	0:23:05	923.17	461.58	2.27	0:30:05	413.56	413.56	2.53
0:02:10	4,087.77	204.39	5.13	0:09:10	3,377.67	337.77	3.10	0:16:10	2,035.29	407.06	2.58	0:23:10	861.09	430.55	2.43	0:30:10	455.29	455.29	2.30
0:02:15	4,097.63	204.88	5.11	0:09:15	3,466.38	346.64	3.02	0:16:15	2,122.11	424.42	2.47	0:23:15	970.35	485.18	2.16	0:30:15	442.08	442.08	2.37
0:02:20	4,141.04	207.05	5.06	0:09:20	3,552.79	355.28	2.95	0:16:20	2,191.73	438.35	2.39	0:23:20	893.18	446.59	2.34	0:30:20	438.72	438.72	2.39
0:02:25	4,197.87	209.89	4.99	0:09:25	3,486.31	348.63	3.00	0:16:25	2,146.64	429.33	2.44	0:23:25	811.81	405.90	2.58	0:30:25	511.29	511.29	2.05
0:02:30	4,208.35	210.42	4.98	0:09:30	3,468.48	346.85	3.02	0:16:30	2,146.85	429.37	2.43	0:23:30	900.52	450.26	2.33	0:30:30	459.91	459.91	2.28
0:02:35	4,188.85	209.44	5.00	0:09:35	3,481.06	348.11	3.01	0:16:35	2,115.40	423.08	2.48	0:23:35	902.82	451.41	2.32	0:30:35	486.96	486.96	2.15
0:02:40	4,171.86	208.59	5.02	0:09:40	3,374.74	337.47	3.10	0:16:40	2,155.24	431.05	2.43	0:23:40	893.39	446.69	2.35	0:30:40	436.84	436.84	2.40
0:02:45	4,164.52	208.23	5.03	0:09:45	3,493.44	349.34	3.00	0:16:45	2,087.51	417.50	2.51	0:23:45	915.20	457.60	2.29	0:30:45	459.49	459.49	2.28
0:02:50	4,073.09	203.65	5.15	0:09:50	3,469.11	346.91	3.02	0:16:50	2,191.73	438.35	2.39	0:23:50	923.38	461.69	2.27	0:30:50	508.77	508.77	2.06
0:02:55	4,012.90	200.65	5.22	0:09:55	3,427.79	342.78	3.06	0:16:55	2,028.16	405.63	2.58	0:23:55	943.51	471.75	2.22	0:30:55	492.83	492.83	2.12
0:03:00	4,189.69	209.48	4.99	0:10:00	3,510.84	351.08	2.97	0:17:00	2,140.98	428.20	2.44	0:24:00	845.78	422.89	2.47	0:31:00	440.40	440.40	2.37

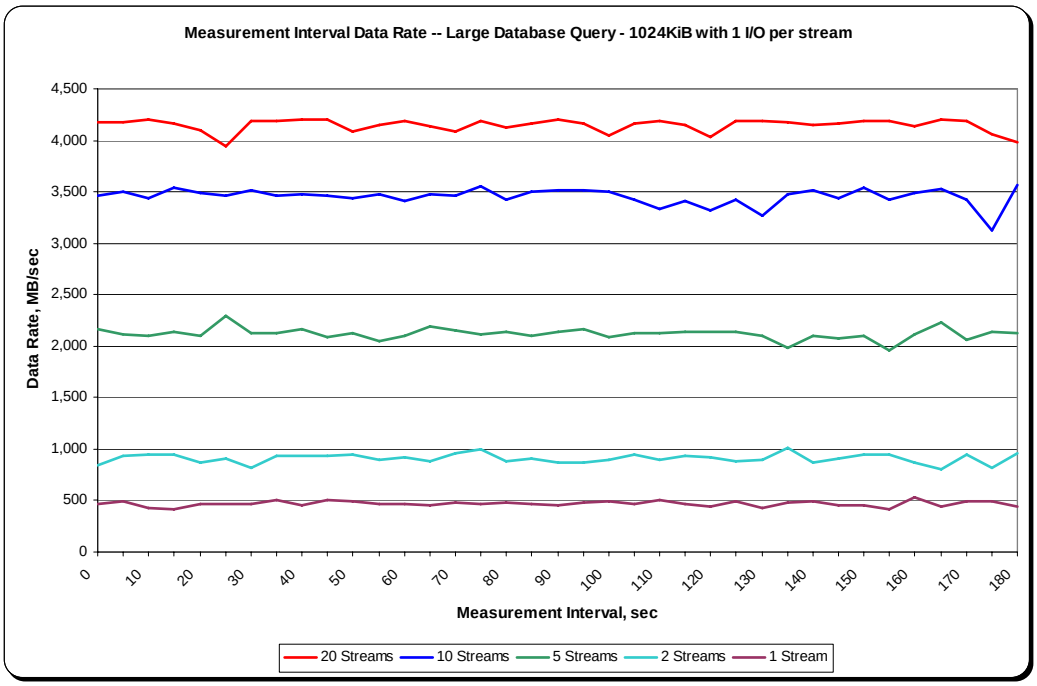
SPC-2 "Large Database Query/1024 KiB Transfer Size/1 Outstanding I/O" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods

TR6	20 Streams			TR7	10 Streams			TR8	5 Streams			TR9	2 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
0:03:05	4,169.77	208.49	5.03	0:10:05	3,466.38	346.64	3.02	0:17:05	2,166.99	433.40	2.42	0:24:05	843.47	421.74	2.49	0:31:05	473.12	473.12	2.22
0:03:10	4,172.07	208.60	5.01	0:10:10	3,498.26	349.83	2.99	0:17:10	2,117.91	423.58	2.46	0:24:10	931.97	465.99	2.25	0:31:10	488.43	488.43	2.14
0:03:15	4,198.92	209.95	5.00	0:10:15	3,437.65	343.77	3.05	0:17:15	2,101.56	420.31	2.50	0:24:15	944.98	472.49	2.22	0:31:15	427.19	427.19	2.45
0:03:20	4,161.17	208.06	5.04	0:10:20	3,534.75	353.47	2.96	0:17:20	2,140.56	428.11	2.45	0:24:20	940.36	470.18	2.23	0:31:20	412.30	412.30	2.54
0:03:25	4,093.85	204.69	5.12	0:10:25	3,490.50	349.05	3.00	0:17:25	2,097.15	419.43	2.50	0:24:25	864.66	432.33	2.42	0:31:25	464.10	464.10	2.26
0:03:30	3,937.61	196.88	5.32	0:10:30	3,464.70	346.47	3.02	0:17:30	2,296.38	459.28	2.28	0:24:30	905.55	452.78	2.31	0:31:30	462.00	462.00	2.26
0:03:35	4,194.72	209.74	5.00	0:10:35	3,514.20	351.42	2.98	0:17:35	2,120.64	424.13	2.47	0:24:35	812.86	406.43	2.58	0:31:35	465.15	465.15	2.25
0:03:40	4,183.82	209.19	5.01	0:10:40	3,459.25	345.93	3.03	0:17:40	2,122.32	424.46	2.47	0:24:40	939.94	469.97	2.23	0:31:40	502.69	502.69	2.08
0:03:45	4,195.98	209.80	4.99	0:10:45	3,478.13	347.81	3.01	0:17:45	2,161.32	432.26	2.42	0:24:45	927.78	463.89	2.26	0:31:45	457.18	457.18	2.29
0:03:50	4,203.53	210.18	4.97	0:10:50	3,458.41	345.84	3.03	0:17:50	2,081.84	416.37	2.51	0:24:50	929.04	464.52	2.25	0:31:50	504.78	504.78	2.07
0:03:55	4,080.01	204.00	5.15	0:10:55	3,435.76	343.58	3.05	0:17:55	2,124.62	424.92	2.47	0:24:55	942.88	471.44	2.22	0:31:55	490.94	490.94	2.13
0:04:00	4,150.89	207.54	5.05	0:11:00	3,474.14	347.41	3.01	0:18:00	2,044.51	408.90	2.56	0:25:00	895.27	447.64	2.34	0:32:00	468.29	468.29	2.24
0:04:05	4,182.35	209.12	5.01	0:11:05	3,405.57	340.56	3.08	0:18:05	2,098.62	419.72	2.49	0:25:05	924.21	462.11	2.27	0:32:05	469.13	469.13	2.23
0:04:10	4,139.15	206.96	5.06	0:11:10	3,473.93	347.39	3.01	0:18:10	2,191.73	438.35	2.40	0:25:10	881.85	440.93	2.38	0:32:10	456.97	456.97	2.29
0:04:15	4,083.57	204.18	5.12	0:11:15	3,467.43	346.74	3.02	0:18:15	2,147.90	429.58	2.44	0:25:15	961.75	480.88	2.18	0:32:15	476.68	476.68	2.20
0:04:20	4,186.96	209.35	5.01	0:11:20	3,547.54	354.75	2.94	0:18:20	2,116.45	423.29	2.47	0:25:20	998.66	499.33	2.10	0:32:20	472.07	472.07	2.22
0:04:25	4,130.34	206.52	5.07	0:11:25	3,419.41	341.94	3.07	0:18:25	2,141.19	428.24	2.45	0:25:25	878.50	439.25	2.38	0:32:25	483.81	483.81	2.16
0:04:30	4,164.52	208.23	5.03	0:11:30	3,498.47	349.85	3.00	0:18:30	2,103.02	420.60	2.49	0:25:30	906.18	453.09	2.31	0:32:30	465.15	465.15	2.25
0:04:35	4,197.24	209.86	4.99	0:11:35	3,511.05	351.11	2.98	0:18:35	2,138.26	427.65	2.45	0:25:35	865.49	432.75	2.42	0:32:35	450.47	450.47	2.33
0:04:40	4,160.75	208.04	5.02	0:11:40	3,512.31	351.23	2.98	0:18:40	2,161.53	432.31	2.42	0:25:40	870.11	435.05	2.41	0:32:40	484.86	484.86	2.16
0:04:45	4,040.58	202.03	5.20	0:11:45	3,496.79	349.68	3.00	0:18:45	2,090.65	418.13	2.50	0:25:45	891.08	445.54	2.35	0:32:45	495.98	495.98	2.11
0:04:50	4,156.56	207.83	5.04	0:11:50	3,420.66	342.07	3.06	0:18:50	2,133.01	426.60	2.45	0:25:50	943.51	471.75	2.22	0:32:50	464.31	464.31	2.26
0:04:55	4,190.95	209.55	5.00	0:11:55	3,336.99	333.70	3.14	0:18:55	2,125.88	425.18	2.46	0:25:55	893.39	446.69	2.35	0:32:55	506.67	506.67	2.07
0:05:00	4,147.54	207.38	5.05	0:12:00	3,408.29	340.83	3.07	0:19:00	2,141.61	428.32	2.45	0:26:00	930.09	465.04	2.25	0:33:00	469.76	469.76	2.23
0:05:05	4,027.79	201.39	5.21	0:12:05	3,317.90	331.79	3.15	0:19:05	2,133.85	426.77	2.45	0:26:05	922.54	461.27	2.27	0:33:05	447.11	447.11	2.34
0:05:10	4,183.82	209.19	5.01	0:12:10	3,420.04	342.00	3.06	0:19:10	2,140.35	428.07	2.45	0:26:10	885.00	442.50	2.37	0:33:10	488.22	488.22	2.14
0:05:15	4,194.72	209.74	5.00	0:12:15	3,272.82	327.28	3.20	0:19:15	2,097.15	419.43	2.50	0:26:15	901.15	450.57	2.32	0:33:15	423.62	423.62	2.48
0:05:20	4,174.80	208.74	5.01	0:12:20	3,477.50	347.75	3.01	0:19:20	1,982.44	396.49	2.64	0:26:20	1,010.62	505.31	2.07	0:33:20	480.04	480.04	2.18
0:05:25	4,155.09	207.75	5.05	0:12:25	3,509.58	350.96	2.98	0:19:25	2,105.54	421.11	2.49	0:26:25	870.11	435.05	2.41	0:33:25	497.03	497.03	2.11
0:05:30	4,161.38	208.07	5.04	0:12:30	3,432.20	343.22	3.05	0:19:30	2,072.41	414.48	2.53	0:26:30	909.95	454.98	2.30	0:33:30	456.34	456.34	2.30
0:05:35	4,193.88	209.69	5.00	0:12:35	3,533.91	353.39	2.97	0:19:35	2,104.07	420.81	2.49	0:26:35	947.70	473.85	2.21	0:33:35	453.40	453.40	2.31
0:05:40	4,187.80	209.39	5.00	0:12:40	3,424.02	342.40	3.06	0:19:40	1,953.29	390.66	2.68	0:26:40	951.90	475.95	2.20	0:33:40	409.36	409.36	2.56
0:05:45	4,142.92	207.15	5.06	0:12:45	3,484.63	348.46	3.01	0:19:45	2,117.28	423.46	2.47	0:26:45	872.62	436.31	2.40	0:33:45	531.63	531.63	1.97
0:05:50	4,206.47	210.32	4.98	0:12:50	3,528.46	352.85	2.97	0:19:50	2,226.97	445.39	2.35	0:26:50	798.81	399.40	2.63	0:33:50	445.23	445.23	2.35
0:05:55	4,194.51	209.73	5.00	0:12:55	3,419.20	341.92	3.06	0:19:55	2,065.90	413.18	2.53	0:26:55	948.96	474.48	2.20	0:33:55	497.23	497.23	2.11
0:06:00	4,054.84	202.74	5.15	0:13:00	3,121.82	312.18	3.35	0:20:00	2,139.30	427.86	2.44	0:27:00	816.21	408.11	2.56	0:34:00	487.17	487.17	2.14
0:06:05	3,977.04	198.85	5.28	0:13:05	3,566.42	356.64	2.95	0:20:05	2,121.90	424.38	2.47	0:27:05	953.78	476.89	2.20	0:34:05	437.05	437.05	2.40
0:06:10	4,139.99	207.00	5.06	0:13:10	3,431.57	343.16	3.03	0:20:10	2,096.31	419.26	2.51	0:27:10	965.32	482.66	2.17	0:34:10	461.79	461.79	2.27
0:06:15	4,199.13	209.96	4.99	0:13:15	3,445.20	344.52	3.04	0:20:15	2,148.32	429.66	2.44	0:27:15	898.00	449.00	2.33	0:34:15	425.30	425.30	2.46
0:06:20	4,178.58	208.93	5.02	0:13:20	3,523.84	352.38	2.98	0:20:20	2,141.61	428.32	2.45	0:27:20	878.08	439.04	2.39	0:34:20	479.20	479.20	2.19
0:06:25	4,187.17	209.36	5.00	0:13:25	3,495.32	349.53	3.00	0:20:25	2,248.57	449.71	2.33	0:27:25	899.05	449.52	2.33	0:34:25	510.03	510.03	2.05
0:06:30	4,165.36	208.27	5.03	0:13:30	3,477.92	347.79	3.01	0:20:30	2,201.38	440.28	2.38	0:27:30	929.46	464.73	2.25	0:34:30	493.04	493.04	2.12
0:06:35	4,197.03	209.85	4.99	0:13:35	3,281.41	328.14	3.19	0:20:35	2,172.23	434.45	2.41	0:27:35	947.28	473.64	2.21	0:34:35	441.03	441.03	2.37
0:06:40	4,161.59	208.08	5.04	0:13:40	3,413.32	341.33	3.07	0:20:40	2,170.76	434.15	2.41	0:27:40	928.62	464.31	2.26	0:34:40	433.69	433.69	2.41
0:06:45	4,140.62	207.03	5.05	0:13:45	3,528.67	352.87	2.96	0:20:45	2,221.51	444.30	2.35	0:27:45	895.06	447.53	2.33	0:34:45	452.78	452.78	2.31
0:06:50	220.41	0.00	4.07	0:13:50	209.09	0.00	2.60	0:20:50	87.87	0.00	2.48	0:27:50	54.32	0.00	2.05	0:34:50	0.21	0.00	3.50
0:06:55	0.00	0.00	0.00	0:13:55	0.00	0.00	0.00	0:20:55	0.00	0.00	0.00	0:27:55	0.00	0.00	0.00	0:34:55	0.00	0.00	0.00

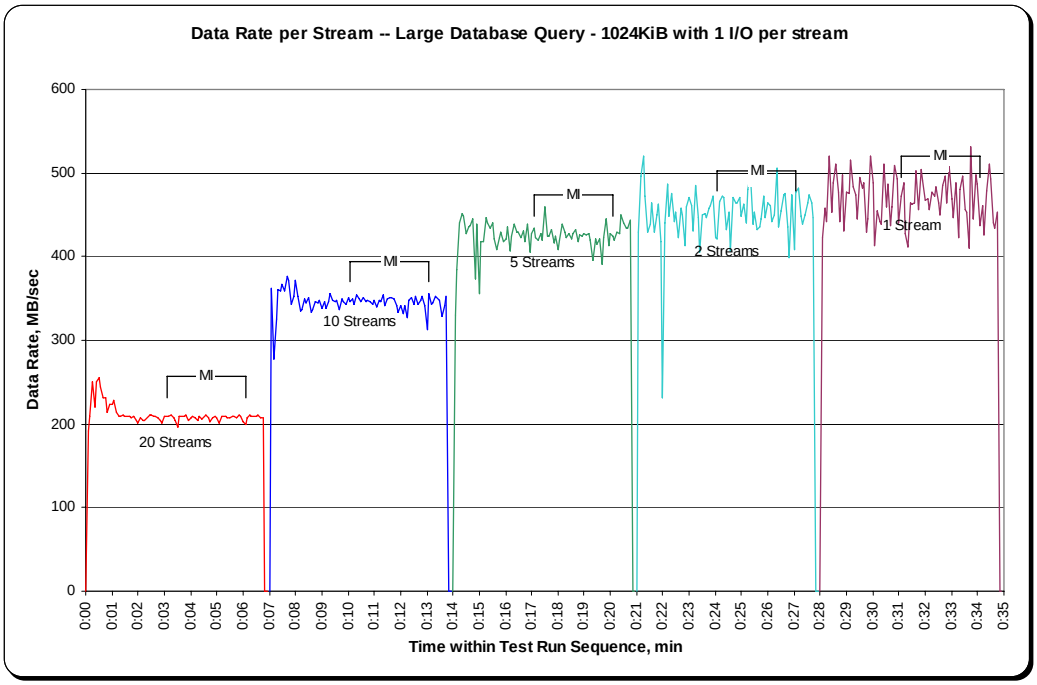
SPC-2 "Large Database Query/1024 KiB Transfer Size/1 Outstanding I/O" Average Data Rate Graph – Complete Test Run



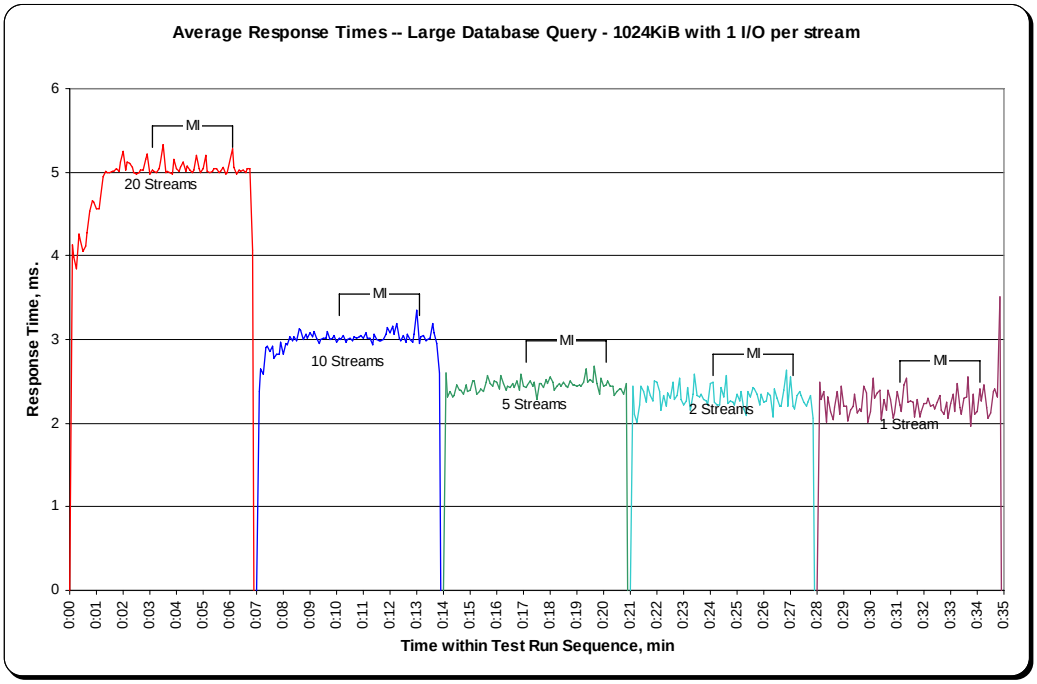
SPC-2 "Large Database Query/1024 KiB Transfer Size/1 Outstanding I/O" Average Data Rate Graph – Measurement Interval (MI) Only



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.

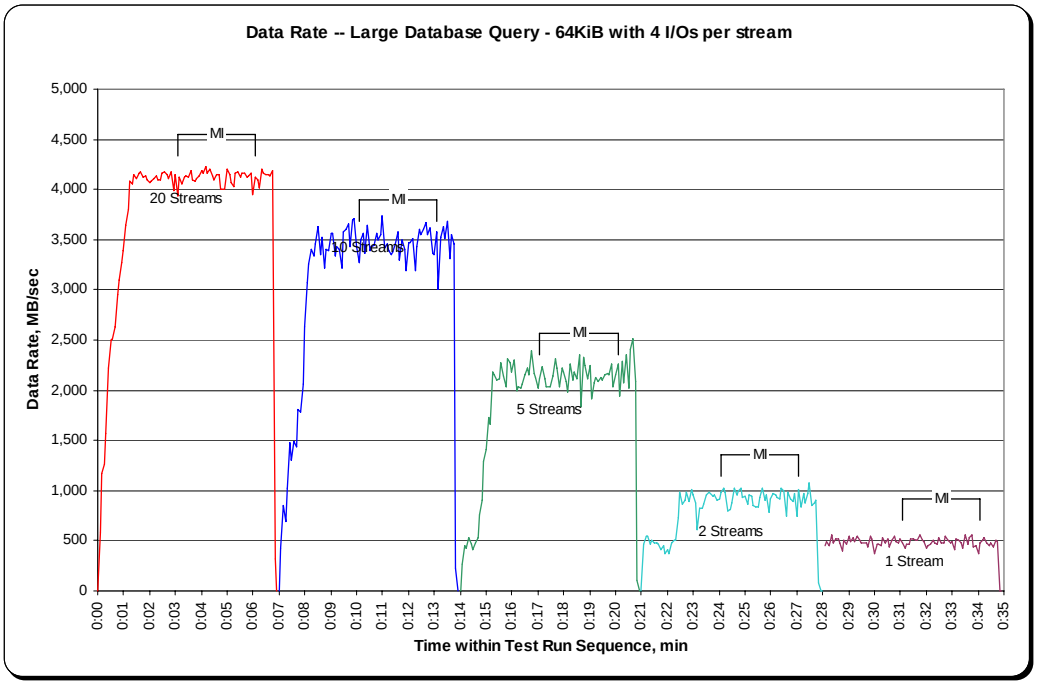
SPC-2 "Large Database Query/64 KiB Transfer Size/4 Outstanding I/Os" Test Run Data – Ramp-Up Period

TR11	20 Streams			TR12	10 Streams			TR13	5 Streams			TR14	2 Streams			TR15	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	0:07:00	0.00	0.00	0.00	0:14:00	0.00	0.00	0.00	0:21:00	0.00	0.00	0.00	0:28:05	450.34	450.34	0.58
0:00:05	588.56	196.19	0.79	0:07:05	429.97	214.98	0.70	0:14:05	261.84	261.84	1.00	0:21:05	466.81	466.81	0.56	0:28:10	497.07	497.07	0.52
0:00:10	1,170.99	234.20	1.02	0:07:10	855.80	427.90	0.61	0:14:10	449.93	449.93	0.57	0:21:10	540.96	540.96	0.48	0:28:15	446.04	446.04	0.58
0:00:15	1,267.20	253.44	1.03	0:07:15	696.57	348.28	0.75	0:14:15	427.03	427.03	0.61	0:21:15	541.55	541.55	0.48	0:28:20	554.49	554.49	0.47
0:00:20	1,566.93	223.85	0.99	0:07:20	1,023.88	255.97	0.74	0:14:20	526.71	526.71	0.49	0:21:20	463.30	463.30	0.56	0:28:25	473.66	473.66	0.55
0:00:25	2,218.30	246.48	0.92	0:07:25	1,476.09	369.02	0.70	0:14:25	469.54	469.54	0.55	0:21:25	511.13	511.13	0.51	0:28:30	519.88	519.88	0.50
0:00:30	2,501.65	277.96	0.94	0:07:30	1,305.74	326.43	0.80	0:14:30	407.33	407.33	0.64	0:21:30	474.17	474.17	0.55	0:28:35	521.44	521.44	0.50
0:00:35	2,515.31	279.48	0.93	0:07:35	1,495.06	373.76	0.70	0:14:35	480.88	480.88	0.54	0:21:35	473.90	473.90	0.55	0:28:40	478.38	478.38	0.54
0:00:40	2,637.94	239.81	0.92	0:07:40	1,435.92	287.18	0.75	0:14:40	533.52	266.76	0.49	0:21:40	462.63	462.63	0.56	0:28:45	394.45	394.45	0.66
0:00:45	2,952.94	268.45	0.97	0:07:45	1,811.01	362.20	0.72	0:14:45	758.35	379.18	0.69	0:21:45	407.96	407.96	0.64	0:28:50	510.29	510.29	0.51
0:00:50	3,094.35	257.86	0.97	0:07:50	1,782.67	356.53	0.73	0:14:50	906.10	453.05	0.58	0:21:50	448.20	448.20	0.58	0:28:55	462.69	462.69	0.56
0:00:55	3,272.97	233.78	1.05	0:07:55	2,064.94	294.99	0.78	0:14:55	1,291.00	430.33	0.58	0:21:55	368.70	368.70	0.71	0:29:00	548.01	548.01	0.47
0:01:00	3,391.91	211.99	1.13	0:08:00	2,633.54	292.62	0.75	0:15:00	1,411.47	352.87	0.57	0:22:00	412.59	412.59	0.63	0:29:05	487.84	487.84	0.53
0:01:05	3,641.64	227.60	1.14	0:08:05	3,072.44	341.38	0.77	0:15:05	1,726.63	431.66	0.60	0:22:05	377.15	377.15	0.69	0:29:10	534.05	534.05	0.49
0:01:10	3,798.94	211.05	1.17	0:08:10	3,263.27	362.59	0.72	0:15:10	1,668.45	417.11	0.62	0:22:10	477.67	477.67	0.54	0:29:15	495.88	495.88	0.52
0:01:15	4,084.99	204.25	1.24	0:08:15	3,407.92	340.79	0.74	0:15:15	2,180.98	436.20	0.58	0:22:15	501.54	501.54	0.52	0:29:20	545.48	545.48	0.48
0:01:20	4,059.19	202.96	1.28	0:08:20	3,334.31	333.43	0.78	0:15:20	2,148.33	429.67	0.61	0:22:20	505.94	505.94	0.51	0:29:25	502.99	502.99	0.52
0:01:25	4,145.80	207.29	1.26	0:08:25	3,456.93	345.69	0.75	0:15:25	2,106.12	421.22	0.62	0:22:25	733.63	366.81	0.53	0:29:30	480.08	480.08	0.54
0:01:30	4,106.64	205.33	1.27	0:08:30	3,629.21	362.92	0.72	0:15:30	2,116.97	423.39	0.61	0:22:30	984.20	492.10	0.53	0:29:35	479.91	479.91	0.54
0:01:35	4,161.18	208.06	1.25	0:08:35	3,349.16	334.92	0.78	0:15:35	2,277.98	455.60	0.57	0:22:35	870.23	435.12	0.60	0:29:40	476.21	476.21	0.55
0:01:40	4,180.82	209.04	1.25	0:08:40	3,526.17	352.62	0.74	0:15:40	2,137.02	427.40	0.61	0:22:40	906.23	453.12	0.58	0:29:45	434.78	434.78	0.60
0:01:45	4,125.66	206.28	1.27	0:08:45	3,215.04	321.50	0.81	0:15:45	2,039.25	407.85	0.64	0:22:45	979.67	489.84	0.53	0:29:50	539.40	539.40	0.48
0:01:50	4,133.32	206.67	1.26	0:08:50	3,400.74	340.07	0.77	0:15:50	2,309.71	461.94	0.56	0:22:50	894.07	447.03	0.58	0:29:55	518.27	518.27	0.50
0:01:55	4,096.12	204.81	1.27	0:08:55	3,387.48	338.75	0.77	0:15:55	2,269.49	453.90	0.57	0:22:55	1,004.37	502.18	0.52	0:30:00	373.93	373.93	0.70
0:02:00	4,062.82	203.14	1.29	0:09:00	3,569.94	356.99	0.73	0:16:00	2,179.88	435.98	0.60	0:23:00	961.31	480.66	0.54	0:30:05	459.21	459.21	0.57
0:02:05	4,076.44	203.82	1.28	0:09:05	3,558.66	355.87	0.73	0:16:05	2,300.73	460.15	0.57	0:23:05	877.32	438.66	0.59	0:30:10	459.79	459.79	0.57
0:02:10	4,104.94	205.25	1.27	0:09:10	3,340.35	334.04	0.78	0:16:10	1,992.65	398.53	0.65	0:23:10	613.69	306.84	0.85	0:30:15	447.57	447.57	0.58
0:02:15	4,138.11	206.91	1.26	0:09:15	3,433.26	343.33	0.76	0:16:15	2,032.30	406.46	0.64	0:23:15	825.82	412.91	0.63	0:30:20	538.29	538.29	0.48
0:02:20	4,100.72	205.04	1.27	0:09:20	3,410.24	341.02	0.76	0:16:20	2,022.79	404.56	0.64	0:23:20	826.49	413.24	0.63	0:30:25	474.29	474.29	0.55
0:02:25	4,097.85	204.89	1.27	0:09:25	3,215.67	321.57	0.81	0:16:25	2,061.76	412.35	0.63	0:23:25	869.70	434.85	0.60	0:30:30	513.29	513.29	0.51
0:02:30	4,167.05	208.35	1.25	0:09:30	3,576.73	357.67	0.73	0:16:30	2,152.64	430.53	0.60	0:23:30	953.32	476.66	0.55	0:30:35	441.95	441.95	0.59
0:02:35	4,176.69	208.83	1.25	0:09:35	3,607.68	360.77	0.72	0:16:35	2,224.54	444.91	0.58	0:23:35	980.64	490.32	0.53	0:30:40	499.56	499.56	0.52
0:02:40	4,150.18	207.51	1.26	0:09:40	3,652.40	365.24	0.71	0:16:40	2,155.25	431.05	0.60	0:23:40	977.06	488.53	0.53	0:30:45	540.71	540.71	0.48
0:02:45	4,113.99	205.70	1.27	0:09:45	3,436.45	343.64	0.76	0:16:45	2,398.62	479.72	0.54	0:23:45	950.14	475.07	0.55	0:30:50	488.87	488.87	0.53
0:02:50	4,169.98	208.50	1.25	0:09:50	3,699.22	369.92	0.70	0:16:50	2,162.22	432.44	0.60	0:23:50	960.85	480.43	0.54	0:30:55	480.60	480.60	0.54
0:02:55	3,983.98	199.20	1.31	0:09:55	3,709.99	371.00	0.70	0:16:55	2,123.36	424.67	0.61	0:23:55	907.35	453.68	0.57	0:31:00	516.05	516.05	0.50
0:03:00	4,145.17	207.26	1.26	0:10:00	3,428.43	342.84	0.76	0:17:00	2,018.35	403.67	0.64	0:24:00	917.62	458.81	0.57				

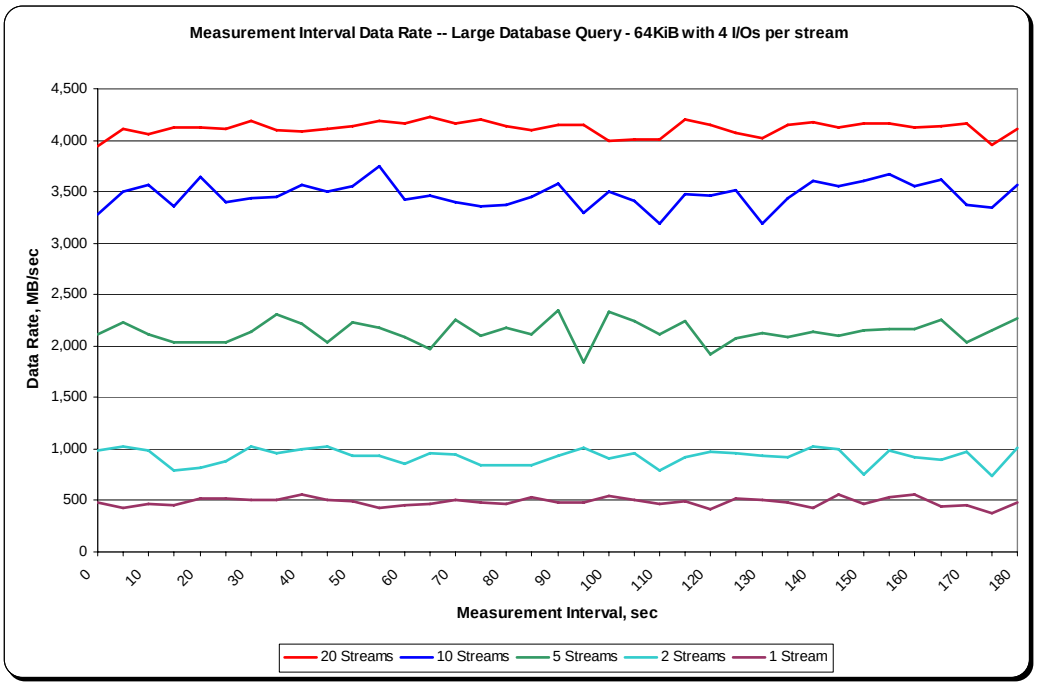
SPC-2 "Large Database Query/64 KiB Transfer Size/4 Outstanding I/Os" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods

TR11	20 Streams			TR12	10 Streams			TR13	5 Streams			TR14	2 Streams			TR15	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
0:03:05	3,940.87	197.04	1.32	0:10:05	3,274.72	327.47	0.80	0:17:05	2,111.00	422.20	0.62	0:24:05	982.33	491.16	0.53	0:31:05	481.71	481.71	0.54
0:03:10	4,116.44	205.82	1.27	0:10:10	3,496.54	349.65	0.75	0:17:10	2,235.47	447.09	0.58	0:24:10	1,019.42	509.71	0.51	0:31:10	423.78	423.78	0.61
0:03:15	4,058.79	202.94	1.29	0:10:15	3,570.42	357.04	0.73	0:17:15	2,114.50	422.90	0.62	0:24:15	984.00	492.00	0.53	0:31:15	467.62	467.62	0.56
0:03:20	4,123.54	206.18	1.27	0:10:20	3,358.46	335.85	0.78	0:17:20	2,031.29	406.26	0.64	0:24:20	795.98	397.99	0.65	0:31:20	459.47	459.47	0.57
0:03:25	4,129.04	206.45	1.26	0:10:25	3,644.38	364.44	0.71	0:17:25	2,038.43	407.69	0.64	0:24:25	815.91	407.95	0.64	0:31:25	513.64	513.64	0.51
0:03:30	4,116.13	205.81	1.27	0:10:30	3,392.37	339.24	0.77	0:17:30	2,034.81	406.96	0.64	0:24:30	884.24	442.12	0.59	0:31:30	512.54	512.54	0.51
0:03:35	4,183.97	209.20	1.25	0:10:35	3,436.29	343.63	0.76	0:17:35	2,138.80	427.76	0.61	0:24:35	1,028.85	514.43	0.51	0:31:35	506.14	506.14	0.51
0:03:40	4,098.77	204.94	1.27	0:10:40	3,443.21	344.32	0.76	0:17:40	2,312.66	462.53	0.56	0:24:40	958.07	479.04	0.54	0:31:40	507.46	507.46	0.51
0:03:45	4,083.13	204.16	1.28	0:10:45	3,563.10	356.31	0.73	0:17:45	2,221.57	444.31	0.59	0:24:45	996.38	498.19	0.52	0:31:45	560.37	560.37	0.46
0:03:50	4,108.66	205.43	1.27	0:10:50	3,496.48	349.65	0.75	0:17:50	2,035.37	407.07	0.64	0:24:50	1,020.89	510.45	0.51	0:31:50	501.37	501.37	0.52
0:03:55	4,140.94	207.05	1.26	0:10:55	3,554.34	355.43	0.73	0:17:55	2,226.33	445.27	0.58	0:24:55	936.96	468.48	0.56	0:31:55	493.83	493.83	0.53
0:04:00	4,189.31	209.47	1.25	0:11:00	3,742.63	374.26	0.70	0:18:00	2,179.84	435.97	0.60	0:25:00	939.13	469.56	0.55	0:32:00	429.69	429.69	0.61
0:04:05	4,164.68	208.23	1.25	0:11:05	3,422.19	342.22	0.76	0:18:05	2,093.50	418.70	0.62	0:25:05	857.79	428.89	0.61	0:32:05	451.85	451.85	0.58
0:04:10	4,225.18	211.26	1.24	0:11:10	3,461.01	346.10	0.75	0:18:10	1,975.99	395.20	0.66	0:25:10	955.24	477.62	0.54	0:32:10	467.90	467.90	0.56
0:04:15	4,158.54	207.93	1.26	0:11:15	3,391.98	339.20	0.77	0:18:15	2,259.32	451.86	0.58	0:25:15	948.60	474.30	0.55	0:32:15	501.37	501.37	0.52
0:04:20	4,201.25	210.06	1.24	0:11:20	3,352.31	335.23	0.78	0:18:20	2,101.41	420.28	0.62	0:25:20	845.28	422.64	0.61	0:32:20	483.39	483.39	0.54
0:04:25	4,140.30	207.02	1.26	0:11:25	3,372.30	337.23	0.77	0:18:25	2,178.94	435.79	0.60	0:25:25	841.96	420.98	0.62	0:32:25	467.34	467.34	0.56
0:04:30	4,095.62	204.78	1.28	0:11:30	3,455.57	345.56	0.75	0:18:30	2,110.68	422.14	0.62	0:25:30	842.32	421.16	0.62	0:32:30	531.65	531.65	0.49
0:04:35	4,143.70	207.18	1.26	0:11:35	3,575.46	357.55	0.73	0:18:35	2,348.86	469.77	0.55	0:25:35	932.33	466.17	0.56	0:32:35	477.67	477.67	0.54
0:04:40	4,145.71	207.29	1.26	0:11:40	3,295.15	329.52	0.79	0:18:40	1,839.79	367.96	0.71	0:25:40	1,017.50	508.75	0.51	0:32:40	479.46	479.46	0.54
0:04:45	4,000.47	200.02	1.31	0:11:45	3,495.53	349.55	0.74	0:18:45	2,328.52	465.70	0.56	0:25:45	907.31	453.66	0.57	0:32:45	541.40	541.40	0.48
0:04:50	4,007.56	200.38	1.30	0:11:50	3,408.41	340.84	0.76	0:18:50	2,249.49	449.90	0.58	0:25:50	953.99	477.00	0.55	0:32:50	509.46	509.46	0.51
0:04:55	4,006.36	200.32	1.30	0:11:55	3,191.01	319.10	0.82	0:18:55	2,118.69	423.74	0.61	0:25:55	785.78	392.89	0.66	0:32:55	472.38	472.38	0.55
0:05:00	4,198.45	209.92	1.24	0:12:00	3,476.36	347.64	0.75	0:19:00	2,241.37	448.27	0.58	0:26:00	921.64	460.82	0.56	0:33:00	495.99	495.99	0.52
0:05:05	4,154.72	207.74	1.26	0:12:05	3,466.89	346.69	0.75	0:19:05	1,914.43	382.89	0.68	0:26:05	974.28	487.14	0.53	0:33:05	417.40	417.40	0.62
0:05:10	4,074.10	203.70	1.28	0:12:10	3,510.44	351.04	0.74	0:19:10	2,073.23	414.65	0.63	0:26:10	956.28	478.14	0.54	0:33:10	515.52	515.52	0.50
0:05:15	4,026.58	201.33	1.30	0:12:15	3,194.44	319.44	0.82	0:19:15	2,132.34	426.47	0.61	0:26:15	931.97	465.99	0.56	0:33:15	506.97	506.97	0.51
0:05:20	4,155.98	207.80	1.26	0:12:20	3,431.98	343.20	0.76	0:19:20	2,085.36	417.07	0.62	0:26:20	920.66	460.33	0.57	0:33:20	479.28	479.28	0.54
0:05:25	4,171.15	208.56	1.25	0:12:25	3,609.73	360.97	0.72	0:19:25	2,134.04	426.81	0.61	0:26:25	1,028.63	514.32	0.51	0:33:25	423.40	423.40	0.61
0:05:30	4,121.30	206.07	1.27	0:12:30	3,550.78	355.08	0.73	0:19:30	2,105.35	421.07	0.62	0:26:30	994.99	497.50	0.52	0:33:30	557.99	557.99	0.47
0:05:35	4,159.78	207.99	1.25	0:12:35	3,602.74	360.27	0.72	0:19:35	2,154.56	430.91	0.60	0:26:35	748.95	374.47	0.70	0:33:35	470.81	470.81	0.55
0:05:40	4,164.36	208.22	1.25	0:12:40	3,672.86	367.29	0.71	0:19:40	2,163.07	432.61	0.60	0:26:40	983.50	491.75	0.53	0:33:40	538.15	538.15	0.48
0:05:45	4,124.46	206.22	1.27	0:12:45	3,550.25	355.02	0.73	0:19:45	2,159.87	431.97	0.60	0:26:45	919.31	459.65	0.57	0:33:45	561.61	561.61	0.46
0:05:50	4,132.25	206.61	1.26	0:12:50	3,616.16	361.62	0.72	0:19:50	2,257.11	451.42	0.58	0:26:50	888.58	444.29	0.59	0:33:50	440.13	440.13	0.59
0:05:55	4,158.81	207.94	1.26	0:12:55	3,369.23	336.92	0.77	0:19:55	2,037.26	407.45	0.64	0:26:55	974.99	487.49	0.53	0:33:55	450.34	450.34	0.58
0:06:00	3,949.48	197.47	1.32	0:13:00	3,349.68	334.97	0.78	0:20:00	2,156.44	431.29	0.60	0:27:00	742.75	371.37	0.70	0:34:00	375.76	375.76	0.69
0:06:05	4,115.76	205.79	1.27	0:13:05	3,570.77	357.08	0.73	0:20:05	2,266.03	453.21	0.58	0:27:05	1,016.36	508.18	0.51	0:34:05	481.66	481.66	0.54
0:06:10	4,098.94	204.95	1.27	0:13:10	3,005.37	300.54	0.87	0:20:10	1,937.15	387.43	0.67	0:27:10	837.16	418.58	0.62	0:34:10	499.95	499.95	0.52
0:06:15	4,011.64	200.58	1.30	0:13:15	3,519.76	351.98	0.74	0:20:15	2,290.87	458.17	0.57	0:27:15	977.08	488.54	0.53	0:34:15	530.88	530.88	0.49
0:06:20	4,207.45	210.37	1.24	0:13:20	3,636.58	363.66	0.72	0:20:20	2,070.08	414.02	0.63	0:27:20	875.08	437.54	0.60	0:34:20	479.24	479.24	0.54
0:06:25	4,161.75	208.09	1.26	0:13:25	3,505.93	350.59	0.74	0:20:25	2,348.12	469.62	0.55	0:27:25	976.21	488.11	0.53	0:34:25	445.59	445.59	0.58
0:06:30	4,147.91	207.40	1.26	0:13:30	3,677.92	367.79	0.71	0:20:30	2,016.39	403.28	0.65	0:27:30	1,083.01	541.51	0.48	0:34:30	476.35	476.35	0.55
0:06:35	4,149.01	207.45	1.26	0:13:35	3,307.11	330.71	0.79	0:20:35	2,405.07	481.01	0.54	0:27:35	845.61	422.81	0.62	0:34:35	441.53	441.53	0.59
0:06:40	4,141.83	207.09	1.26	0:13:40	3,554.15	355.41	0.73	0:20:40	2,519.15	503.83	0.52	0:27:40	880.03	440.01	0.59	0:34:40	499.74	499.74	0.52
0:06:45	4,184.96	209.25	1.24	0:13:45	3,460.76	346.08	0.75	0:20:45	2,085.84	417.17	0.62	0:27:45	902.13	451.07	0.58	0:34:45	490.16	490.16	0.53
0:06:50	319.84	0.00	1.00	0:13:50	219.91	0.00	0.78	0:20:50	110.71	0.00	0.64	0:27:50	80.89	0.00	0.43	0:34:50	0.19	0.00	0.55
0:06:55	0.00	0.00	0.00	0:13:55	0.00	0.00	0.00	0:20:55	0.00	0.00	0.00	0:27:55	0.00	0.00	0.00	0:34:55	0.00	0.00	0.00
												0:28:00	0.00	0.00	0.00				

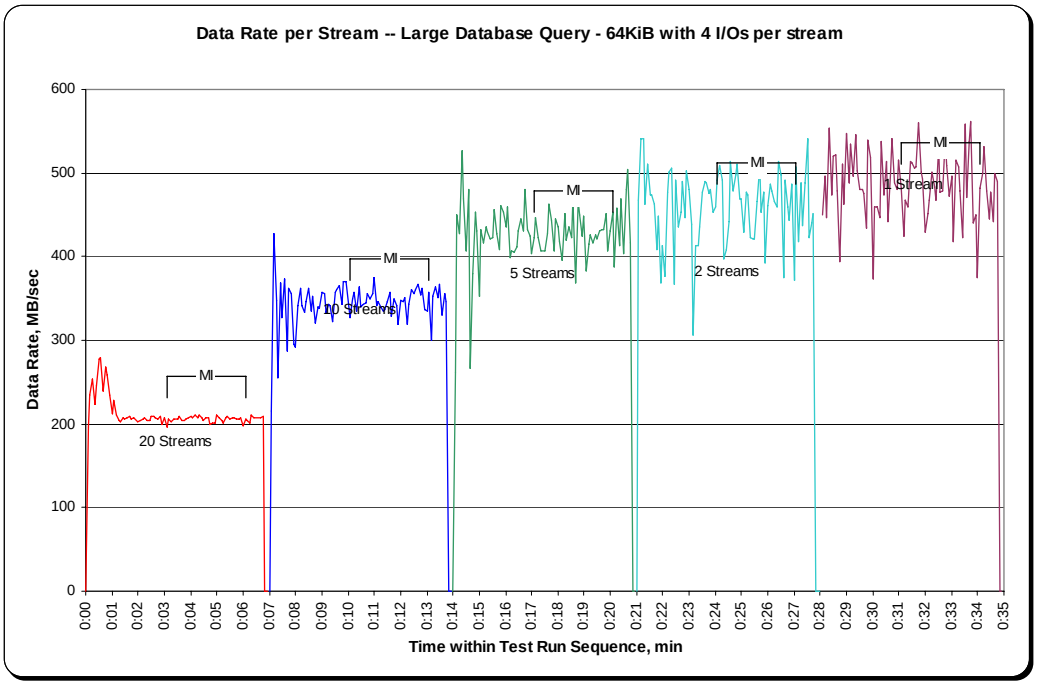
SPC-2 "Large Database Query/64 KiB Transfer Size/4 Outstanding I/Os" Average Data Rate Graph – Complete Test Run



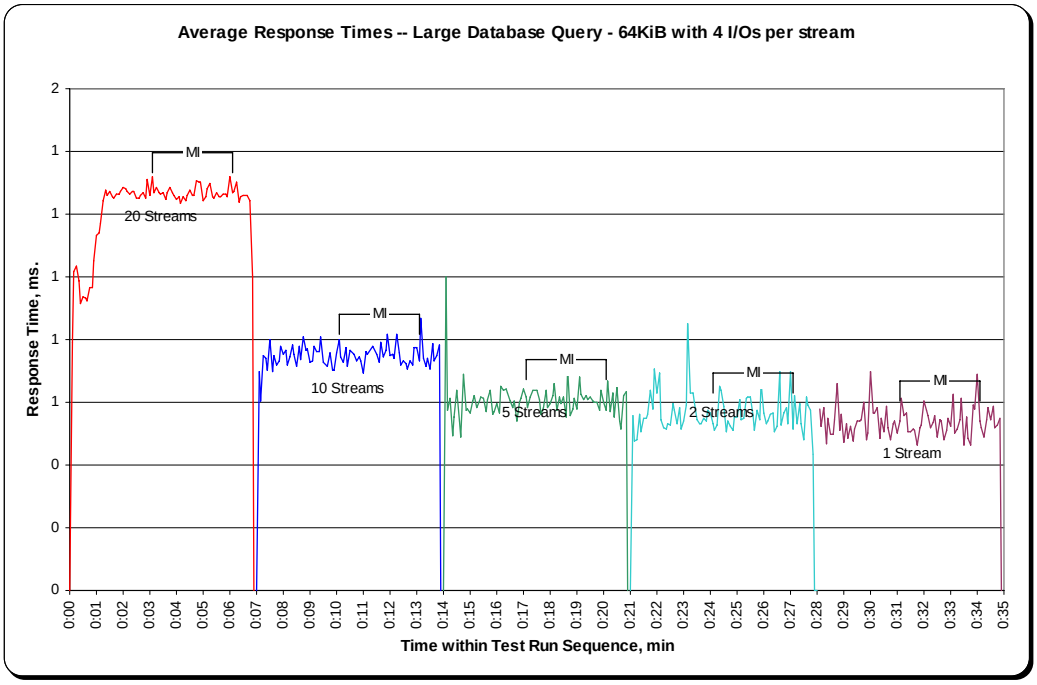
SPC-2 "Large Database Query/64 KiB Transfer Size/4 Outstanding I/Os" Average Data Rate Graph – Measurement Interval (MI) Only



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



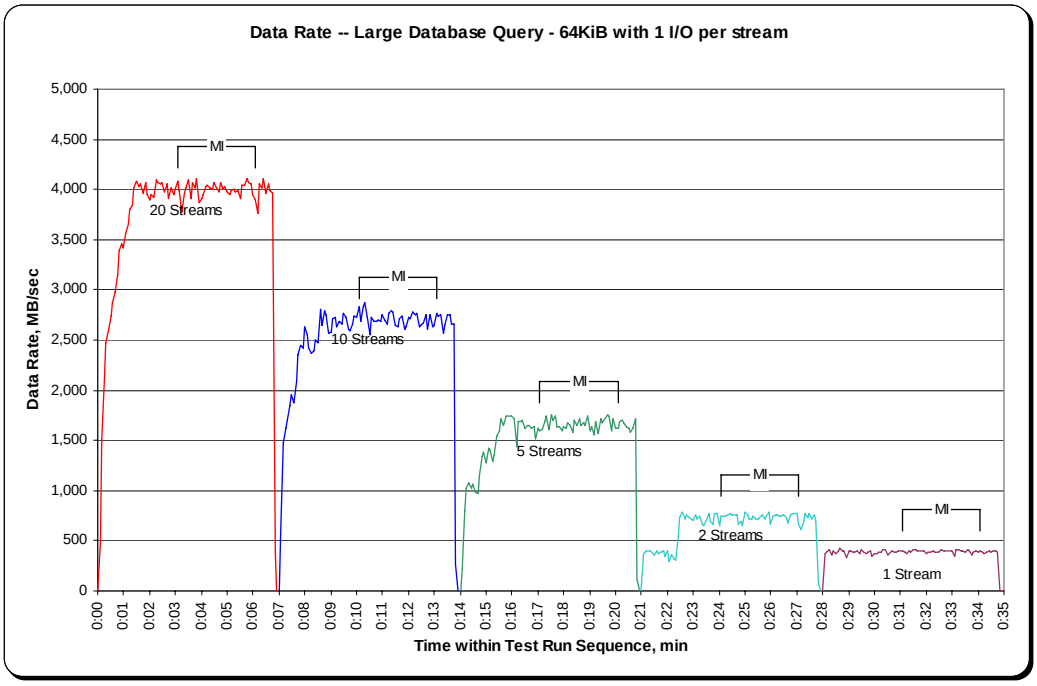
SPC-2 "Large Database Query/64 KiB Transfer Size/1 Outstanding I/O" Test Run Data – Ramp-Up Period

TR16	20 Streams			TR17	10 Streams			TR18	5 Streams			TR19	2 Streams			TR20	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	0:07:00	0.00	0.00	0.00	0:14:00	0.00	0.00	0.00	0:21:00	0.00	0.00	0.00	0:28:00	0.00	0.00	0.00
0:00:05	486.98	162.33	0.24	0:07:05	554.58	184.86	0.21	0:14:05	215.39	107.69	0.31	0:21:05	373.65	373.65	0.17	0:28:05	371.17	371.17	0.17
0:00:10	1,502.91	166.99	0.31	0:07:10	1,479.69	246.61	0.22	0:14:10	796.16	265.39	0.20	0:21:10	395.99	395.99	0.16	0:28:10	389.17	389.17	0.17
0:00:15	2,119.13	192.65	0.29	0:07:15	1,624.43	270.74	0.24	0:14:15	1,020.29	340.10	0.19	0:21:15	399.17	399.17	0.16	0:28:15	410.27	410.27	0.16
0:00:20	2,478.04	225.28	0.29	0:07:20	1,704.03	284.01	0.23	0:14:20	1,078.37	359.46	0.18	0:21:20	401.38	401.38	0.16	0:28:20	364.08	364.08	0.18
0:00:25	2,595.52	216.29	0.29	0:07:25	1,844.18	263.45	0.24	0:14:25	1,024.45	341.48	0.19	0:21:25	381.28	381.28	0.17	0:28:25	402.21	402.21	0.16
0:00:30	2,740.40	228.37	0.28	0:07:30	1,957.05	279.58	0.23	0:14:30	1,067.07	355.69	0.18	0:21:30	365.06	365.06	0.18	0:28:30	376.35	376.35	0.17
0:00:35	2,872.01	220.92	0.28	0:07:35	1,879.01	268.43	0.24	0:14:35	978.21	326.07	0.20	0:21:35	395.21	395.21	0.16	0:28:35	399.05	399.05	0.16
0:00:40	2,981.99	213.00	0.29	0:07:40	2,092.59	261.57	0.23	0:14:40	971.41	323.80	0.20	0:21:40	375.10	375.10	0.17	0:28:40	418.89	418.89	0.15
0:00:45	3,148.02	196.75	0.31	0:07:45	2,354.42	261.60	0.24	0:14:45	1,158.58	289.65	0.20	0:21:45	386.76	386.76	0.17	0:28:45	403.50	403.50	0.16
0:00:50	3,397.29	212.33	0.31	0:07:50	2,447.71	271.97	0.24	0:14:50	1,346.12	336.53	0.19	0:21:50	395.30	395.30	0.16	0:28:50	394.60	394.60	0.16
0:00:55	3,453.82	215.86	0.30	0:07:55	2,424.21	269.36	0.24	0:14:55	1,388.94	347.24	0.19	0:21:55	349.34	349.34	0.19	0:28:55	330.72	330.72	0.20
0:01:00	3,415.13	213.45	0.30	0:08:00	2,634.35	292.71	0.22	0:15:00	1,278.69	319.67	0.20	0:22:00	397.83	397.83	0.16	0:29:00	403.22	403.22	0.16
0:01:05	3,570.20	210.01	0.31	0:08:05	2,548.90	283.21	0.23	0:15:05	1,429.50	357.38	0.18	0:22:05	292.07	292.07	0.22	0:29:05	395.30	395.30	0.16
0:01:10	3,659.95	203.33	0.31	0:08:10	2,414.26	268.25	0.24	0:15:10	1,402.18	350.54	0.18	0:22:10	353.75	353.75	0.18	0:29:10	383.93	383.93	0.17
0:01:15	3,802.67	211.26	0.31	0:08:15	2,364.76	262.75	0.25	0:15:15	1,289.29	322.32	0.20	0:22:15	316.00	316.00	0.21	0:29:15	379.92	379.92	0.17
0:01:20	3,840.78	213.38	0.30	0:08:20	2,399.14	266.57	0.24	0:15:20	1,362.31	340.58	0.19	0:22:20	311.74	311.74	0.21	0:29:20	402.97	402.97	0.16
0:01:25	4,015.19	200.76	0.31	0:08:25	2,498.28	249.83	0.25	0:15:25	1,541.08	308.22	0.19	0:22:25	547.84	273.92	0.17	0:29:25	366.74	366.74	0.18
0:01:30	4,083.24	204.16	0.32	0:08:30	2,475.16	247.52	0.26	0:15:30	1,599.91	319.98	0.20	0:22:30	725.93	362.96	0.18	0:29:30	412.24	412.24	0.16
0:01:35	4,024.97	201.25	0.32	0:08:35	2,805.95	280.59	0.23	0:15:35	1,716.94	343.39	0.19	0:22:35	783.20	391.60	0.17	0:29:35	387.67	387.67	0.17
0:01:40	4,062.10	203.10	0.32	0:08:40	2,645.68	264.57	0.24	0:15:40	1,652.46	330.49	0.20	0:22:40	721.86	360.93	0.18	0:29:40	377.58	377.58	0.17
0:01:45	3,963.61	198.18	0.33	0:08:45	2,794.34	279.43	0.23	0:15:45	1,743.98	348.80	0.19	0:22:45	761.33	380.66	0.17	0:29:45	386.90	386.90	0.17
0:01:50	4,063.91	203.20	0.32	0:08:50	2,750.94	275.09	0.24	0:15:50	1,741.68	348.34	0.19	0:22:50	734.05	367.02	0.18	0:29:50	394.05	394.05	0.16
0:01:55	3,946.38	197.32	0.33	0:08:55	2,567.85	256.78	0.25	0:15:55	1,742.53	348.51	0.19	0:22:55	717.14	358.57	0.18	0:29:55	350.74	350.74	0.18
0:02:00	3,896.60	194.83	0.33	0:09:00	2,583.42	258.34	0.25	0:16:00	1,738.41	347.68	0.19	0:23:00	702.34	351.17	0.18	0:30:00	373.30	373.30	0.17
0:02:05	3,948.47	197.42	0.33	0:09:05	2,708.89	270.89	0.24	0:16:05	1,717.04	343.41	0.19	0:23:05	756.48	378.24	0.17	0:30:05	372.31	372.31	0.17
0:02:10	3,927.29	196.36	0.33	0:09:10	2,727.99	272.80	0.24	0:16:10	1,434.97	286.99	0.23	0:23:10	712.83	356.42	0.18	0:30:10	383.15	383.15	0.17
0:02:15	4,099.10	204.96	0.32	0:09:15	2,638.58	263.86	0.25	0:16:15	1,686.17	337.23	0.19	0:23:15	743.38	371.69	0.17	0:30:15	379.44	379.44	0.17
0:02:20	4,075.10	203.76	0.32	0:09:20	2,680.10	268.01	0.24	0:16:20	1,687.53	337.51	0.19	0:23:20	668.01	334.00	0.19	0:30:20	410.05	410.05	0.16
0:02:25	4,059.45	202.97	0.32	0:09:25	2,659.15	265.91	0.24	0:16:25	1,708.53	341.71	0.19	0:23:25	651.91	325.96	0.20	0:30:25	410.83	410.83	0.16
0:02:30	4,066.58	203.33	0.32	0:09:30	2,762.70	276.27	0.23	0:16:30	1,626.68	325.34	0.20	0:23:30	707.43	353.72	0.18	0:30:30	355.88	355.88	0.18
0:02:35	3,977.35	198.87	0.33	0:09:35	2,729.50	272.95	0.24	0:16:35	1,643.60	328.72	0.20	0:23:35	767.08	383.54	0.17	0:30:35	367.02	367.02	0.18
0:02:40	4,057.20	202.86	0.32	0:09:40	2,609.23	260.92	0.25	0:16:40	1,652.71	330.54	0.20	0:23:40	687.26	343.63	0.19	0:30:40	394.64	394.64	0.16
0:02:45	3,904.92	195.25	0.33	0:09:45	2,591.74	259.17	0.25	0:16:45	1,624.18	324.84	0.20	0:23:45	666.27	333.13	0.19	0:30:45	380.78	380.78	0.17
0:02:50	4,019.42	200.97	0.32	0:09:50	2,653.68	265.37	0.24	0:16:50	1,633.64	326.73	0.20	0:23:50	766.88	383.44	0.17	0:30:50	381.33	381.33	0.17
0:02:55	3,952.60	197.63	0.33	0:09:55	2,740.15	274.01	0.24	0:16:55	1,515.11	303.02	0.21	0:23:55	769.59	384.80	0.17	0:30:55	400.54	400.54	0.16
0:03:00	4,004.36	200.22	0.32	0:10:00	2,720.05	272.00	0.24	0:17:00	1,624.82	324.96	0.20	0:24:00	656.19	328.09	0.20	0:31:00	405.51	405.51	0.16

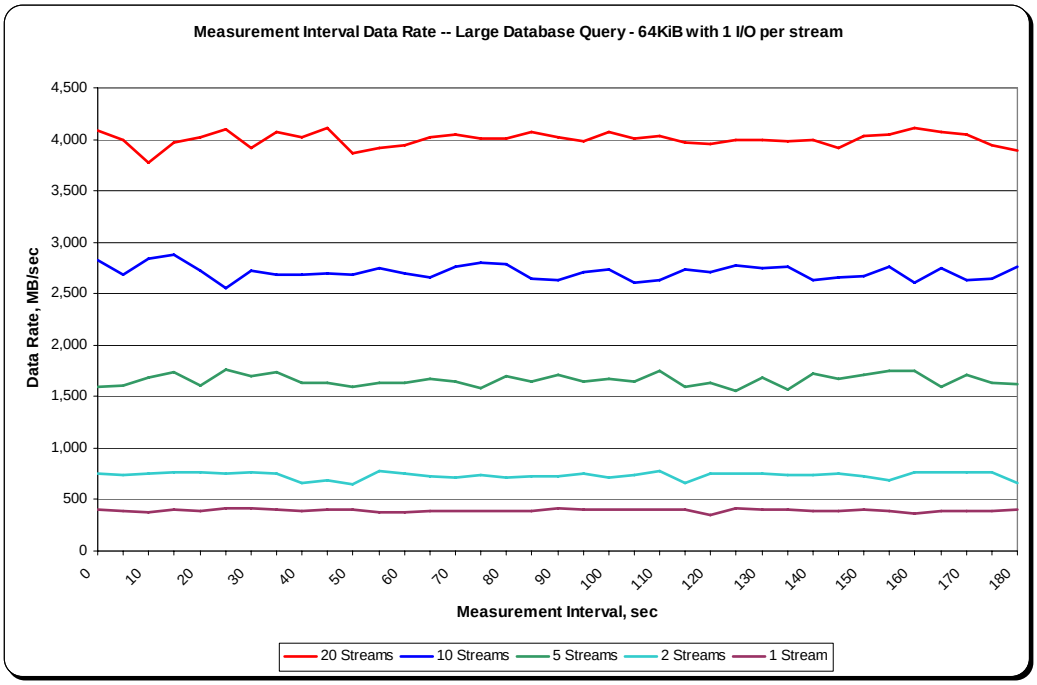
SPC-2 "Large Database Query/64 KiB Transfer Size/1 Outstanding I/O" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Period

TR16	20 Streams			TR17	10 Streams			TR18	5 Streams			TR19	2 Streams			TR20	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
0:03:05	4,084.29	204.21	0.32	0:10:05	2,827.02	282.70	0.23	0:17:05	1,592.95	318.59	0.20	0:24:05	749.05	374.53	0.17	0:31:05	400.66	400.66	0.16
0:03:10	3,994.25	199.71	0.32	0:10:10	2,684.44	268.44	0.24	0:17:10	1,608.46	321.69	0.20	0:24:10	743.96	371.98	0.17	0:31:10	386.10	386.10	0.17
0:03:15	3,779.91	189.00	0.34	0:10:15	2,838.24	283.82	0.23	0:17:15	1,682.21	336.44	0.19	0:24:15	749.86	374.93	0.17	0:31:15	371.09	371.09	0.17
0:03:20	3,963.47	198.17	0.33	0:10:20	2,872.52	287.25	0.23	0:17:20	1,742.25	348.45	0.19	0:24:20	764.22	382.11	0.17	0:31:20	402.30	402.30	0.16
0:03:25	4,018.39	200.92	0.32	0:10:25	2,722.37	272.24	0.24	0:17:25	1,604.76	320.95	0.20	0:24:25	769.08	384.54	0.17	0:31:25	383.84	383.84	0.17
0:03:30	4,092.03	204.60	0.32	0:10:30	2,550.24	255.02	0.25	0:17:30	1,758.84	351.77	0.18	0:24:30	754.28	377.14	0.17	0:31:30	409.00	409.00	0.16
0:03:35	3,914.76	195.74	0.33	0:10:35	2,728.69	272.87	0.24	0:17:35	1,704.12	340.82	0.19	0:24:35	762.00	381.00	0.17	0:31:35	413.66	413.66	0.16
0:03:40	4,071.58	203.58	0.32	0:10:40	2,680.94	268.09	0.24	0:17:40	1,735.79	347.16	0.19	0:24:40	752.19	376.09	0.17	0:31:40	396.67	396.67	0.16
0:03:45	4,015.29	200.76	0.32	0:10:45	2,685.67	268.57	0.24	0:17:45	1,636.00	327.20	0.20	0:24:45	667.48	333.74	0.19	0:31:45	393.72	393.72	0.16
0:03:50	4,109.22	205.46	0.32	0:10:50	2,696.25	269.62	0.24	0:17:50	1,631.07	326.21	0.20	0:24:50	693.13	346.56	0.19	0:31:50	402.56	402.56	0.16
0:03:55	3,870.35	193.52	0.33	0:10:55	2,690.22	269.02	0.24	0:17:55	1,596.54	319.31	0.20	0:24:55	647.98	323.99	0.20	0:31:55	397.43	397.43	0.16
0:04:00	3,910.88	195.54	0.33	0:11:00	2,749.37	274.94	0.24	0:18:00	1,632.12	326.42	0.20	0:25:00	779.35	389.68	0.17	0:32:00	376.82	376.82	0.17
0:04:05	3,947.63	197.38	0.33	0:11:05	2,698.22	269.82	0.24	0:18:05	1,627.83	325.57	0.20	0:25:05	753.97	376.98	0.17	0:32:05	380.19	380.19	0.17
0:04:10	4,023.32	201.17	0.32	0:11:10	2,659.52	265.95	0.24	0:18:10	1,675.77	335.15	0.19	0:25:10	721.34	360.67	0.18	0:32:10	386.35	386.35	0.17
0:04:15	4,040.22	202.01	0.32	0:11:15	2,761.33	276.13	0.23	0:18:15	1,651.52	330.30	0.20	0:25:15	714.49	357.24	0.18	0:32:15	393.49	393.49	0.16
0:04:20	4,013.17	200.66	0.32	0:11:20	2,798.22	279.82	0.23	0:18:20	1,580.22	316.04	0.20	0:25:20	745.56	372.78	0.17	0:32:20	385.98	385.98	0.17
0:04:25	4,005.79	200.29	0.32	0:11:25	2,783.70	278.37	0.23	0:18:25	1,699.62	339.92	0.19	0:25:25	717.94	358.97	0.18	0:32:25	383.88	383.88	0.17
0:04:30	4,065.66	203.28	0.32	0:11:30	2,650.17	265.02	0.24	0:18:30	1,645.62	329.12	0.20	0:25:30	723.36	361.68	0.18	0:32:30	385.90	385.90	0.17
0:04:35	4,018.47	200.92	0.32	0:11:35	2,630.15	263.02	0.25	0:18:35	1,717.15	343.43	0.19	0:25:35	725.08	362.54	0.18	0:32:35	408.59	408.59	0.16
0:04:40	3,976.58	198.83	0.33	0:11:40	2,712.26	271.23	0.24	0:18:40	1,650.76	330.15	0.20	0:25:40	753.55	376.77	0.17	0:32:40	395.85	395.85	0.16
0:04:45	4,075.67	203.78	0.32	0:11:45	2,741.96	274.20	0.24	0:18:45	1,679.35	335.87	0.19	0:25:45	718.37	359.18	0.18	0:32:45	396.32	396.32	0.16
0:04:50	4,001.63	200.08	0.32	0:11:50	2,609.88	260.99	0.25	0:18:50	1,645.95	329.19	0.20	0:25:50	741.26	370.63	0.17	0:32:50	403.59	403.59	0.16
0:04:55	4,028.27	201.41	0.32	0:11:55	2,629.35	262.93	0.25	0:18:55	1,747.57	349.51	0.18	0:25:55	778.65	389.33	0.17	0:32:55	397.95	397.95	0.16
0:05:00	3,972.91	198.65	0.33	0:12:00	2,730.12	273.01	0.24	0:19:00	1,599.33	319.87	0.20	0:26:00	665.79	332.90	0.19	0:33:00	397.66	397.66	0.16
0:05:05	3,953.25	197.66	0.33	0:12:05	2,708.99	270.90	0.24	0:19:05	1,634.83	326.97	0.20	0:26:05	746.86	373.43	0.17	0:33:05	345.76	345.76	0.19
0:05:10	3,991.95	199.60	0.32	0:12:10	2,773.06	277.31	0.23	0:19:10	1,554.74	310.95	0.21	0:26:10	754.44	377.22	0.17	0:33:10	409.30	409.30	0.16
0:05:15	3,999.94	200.00	0.32	0:12:15	2,750.00	275.00	0.24	0:19:15	1,687.64	337.53	0.19	0:26:15	753.51	376.75	0.17	0:33:15	407.04	407.04	0.16
0:05:20	3,976.21	198.81	0.33	0:12:20	2,768.19	276.82	0.23	0:19:20	1,567.94	313.59	0.21	0:26:20	740.74	370.37	0.17	0:33:20	402.85	402.85	0.16
0:05:25	3,994.64	199.73	0.32	0:12:25	2,627.40	262.74	0.25	0:19:25	1,720.27	344.05	0.19	0:26:25	744.95	372.48	0.17	0:33:25	393.93	393.93	0.16
0:05:30	3,914.60	195.73	0.33	0:12:30	2,652.52	265.25	0.24	0:19:30	1,678.72	335.74	0.19	0:26:30	755.08	377.54	0.17	0:33:30	387.35	387.35	0.17
0:05:35	4,039.05	201.95	0.32	0:12:35	2,672.55	267.25	0.24	0:19:35	1,709.50	341.90	0.19	0:26:35	731.21	365.61	0.18	0:33:35	407.75	407.75	0.16
0:05:40	4,041.69	202.08	0.32	0:12:40	2,759.03	275.90	0.23	0:19:40	1,754.56	350.91	0.18	0:26:40	684.64	342.32	0.19	0:33:40	393.36	393.36	0.16
0:05:45	4,112.61	205.63	0.32	0:12:45	2,610.49	261.05	0.25	0:19:45	1,748.03	349.61	0.18	0:26:45	763.85	381.92	0.17	0:33:45	360.97	360.97	0.18
0:05:50	4,069.65	203.48	0.32	0:12:50	2,749.03	274.90	0.24	0:19:50	1,590.56	318.11	0.20	0:26:50	766.40	383.20	0.17	0:33:50	391.60	391.60	0.17
0:05:55	4,050.60	202.53	0.32	0:12:55	2,633.46	263.35	0.25	0:19:55	1,714.84	342.97	0.19	0:26:55	770.22	385.11	0.17	0:33:55	394.45	394.45	0.16
0:06:00	3,947.55	197.38	0.33	0:13:00	2,644.67	264.47	0.24	0:20:00	1,628.35	325.67	0.20	0:27:00	767.73	383.86	0.17	0:34:00	390.72	390.72	0.16
0:06:05	3,892.30	194.62	0.33	0:13:05	2,762.24	276.22	0.23	0:20:05	1,618.96	323.79	0.20	0:27:05	660.56	330.28	0.19	0:34:05	402.03	402.03	0.16
0:06:10	3,760.99	188.05	0.34	0:13:10	2,739.21	273.92	0.24	0:20:10	1,685.21	337.04	0.19	0:27:10	615.87	307.94	0.21	0:34:10	380.38	380.38	0.17
0:06:15	4,061.47	203.07	0.32	0:13:15	2,755.53	275.55	0.23	0:20:15	1,708.56	341.71	0.19	0:27:15	687.57	343.79	0.19	0:34:15	378.12	378.12	0.17
0:06:20	4,010.51	200.53	0.32	0:13:20	2,567.23	256.72	0.25	0:20:20	1,679.02	335.80	0.19	0:27:20	765.24	382.62	0.17	0:34:20	390.02	390.02	0.17
0:06:25	4,106.29	205.31	0.32	0:13:25	2,648.86	264.89	0.24	0:20:25	1,630.87	326.17	0.20	0:27:25	737.65	368.83	0.18	0:34:25	395.23	395.23	0.16
0:06:30	3,960.20	198.01	0.33	0:13:30	2,747.47	274.75	0.24	0:20:30	1,626.29	325.26	0.20	0:27:30	776.58	388.29	0.17	0:34:30	385.13	385.13	0.17
0:06:35	4,051.91	202.60	0.32	0:13:35	2,746.44	274.64	0.24	0:20:35	1,580.36	316.07	0.20	0:27:35	715.63	357.82	0.18	0:34:35	396.98	396.98	0.16
0:06:40	3,990.92	199.55	0.33	0:13:40	2,662.63	266.26	0.24	0:20:40	1,621.40	324.28	0.20	0:27:40	755.17	377.59	0.17	0:34:40	399.63	399.63	0.16
0:06:45	3,964.39	198.22	0.33	0:13:45	2,660.47	266.05	0.24	0:20:45	1,713.18	342.64	0.19	0:27:45	690.79	345.40	0.19	0:34:45	391.84	391.84	0.16
0:06:50	387.71	0.00	0.27	0:13:50	271.36	0.00	0.20	0:20:50	114.53	0.00	0.20	0:27:50	70.32	0.00	0.16	0:34:50	0.04	0.00	0.65
0:06:55	0.00	0.00	0.00	0:13:55	0.00	0.00	0.00	0:20:55	0.00	0.00	0.00	0:27:55	0.00	0.00	0.00	0:34:55	0.00	0.00	0.00
																0:35:00	0.00	0.00	0.00

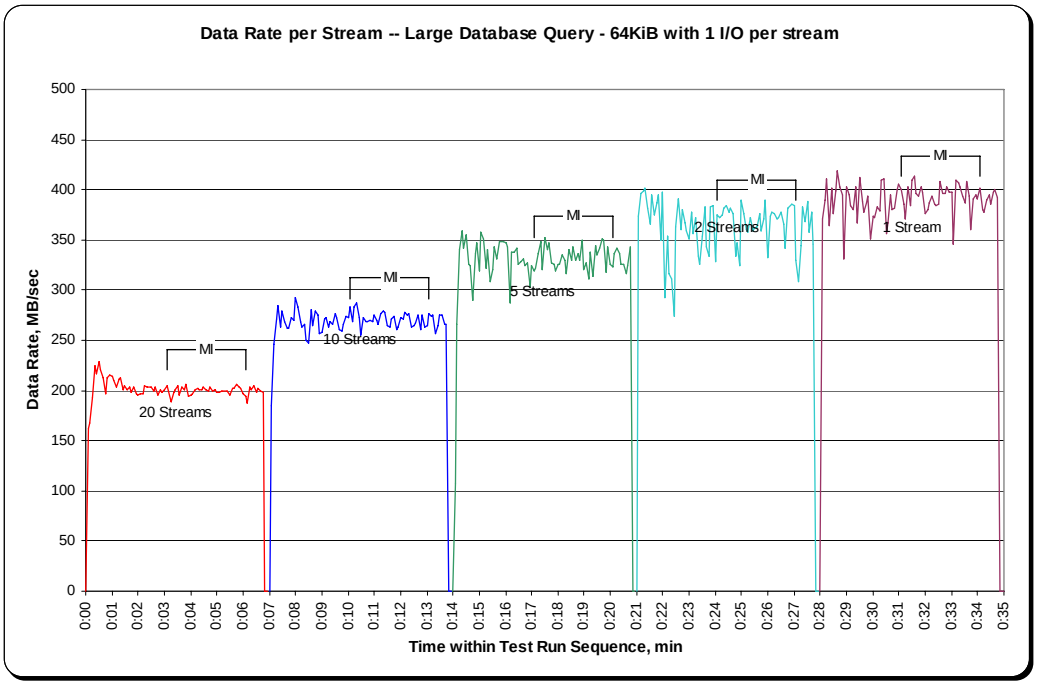
SPC-2 "Large Database Query/64 KiB Transfer Size/1 Outstanding I/O" Average Data Rate Graph – Complete Test Run



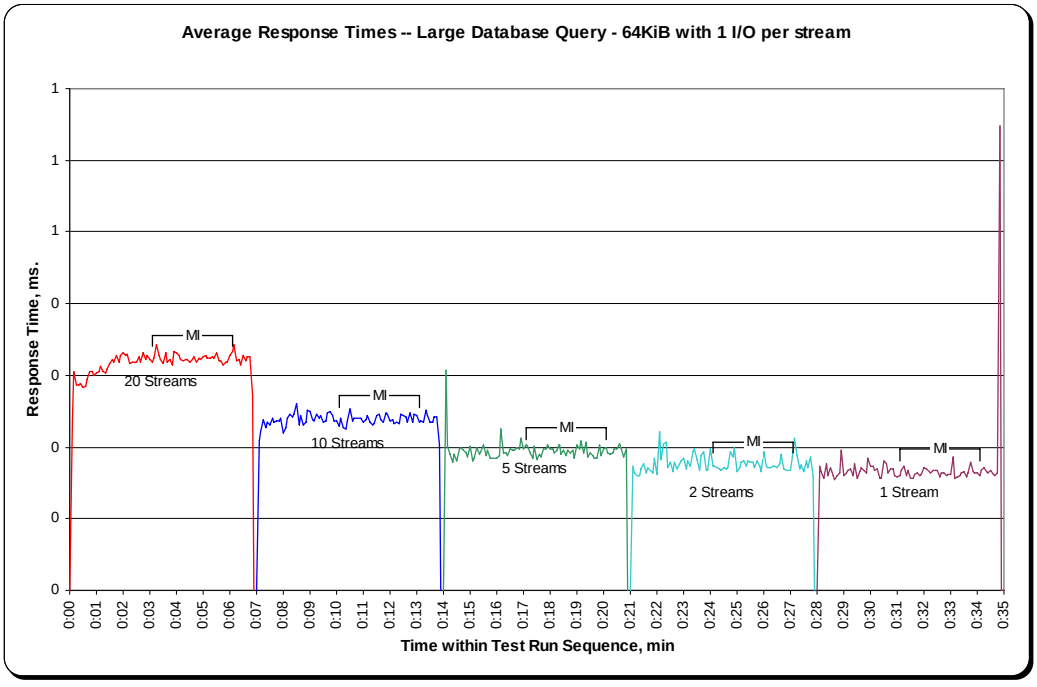
SPC-2 "Large Database Query/64 KiB Transfer Size/1 Outstanding I/O" Average Data Rate Graph – Measurement Interval (MI) Only



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 111.

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.

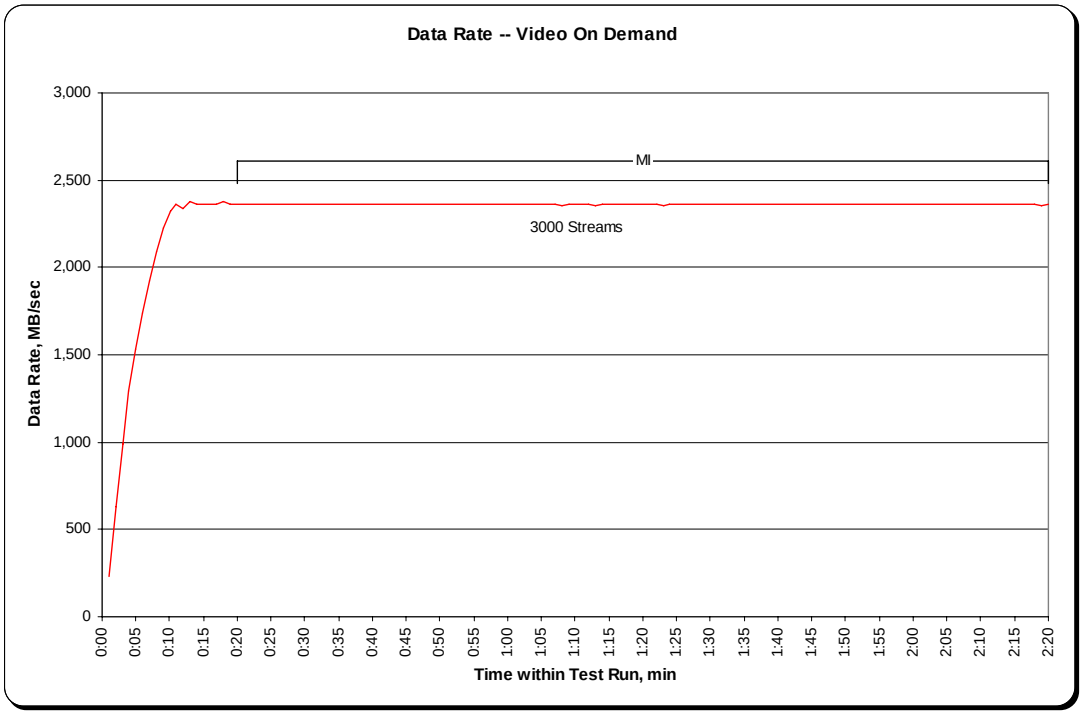
SPC-2-VOD	TR1
Number of Streams	3000
Ramp-up Time, sec	1200
Measurement Interval, sec	7200
Average Data Rate, MB/sec	2,359.30
Per Stream Data Rate, MB/sec	0.79
Average Response Time, ms	24.47
Average Max Response Time, ms	291.48

Video on Demand Delivery Test – TEST RUN DATA BY INTERVAL

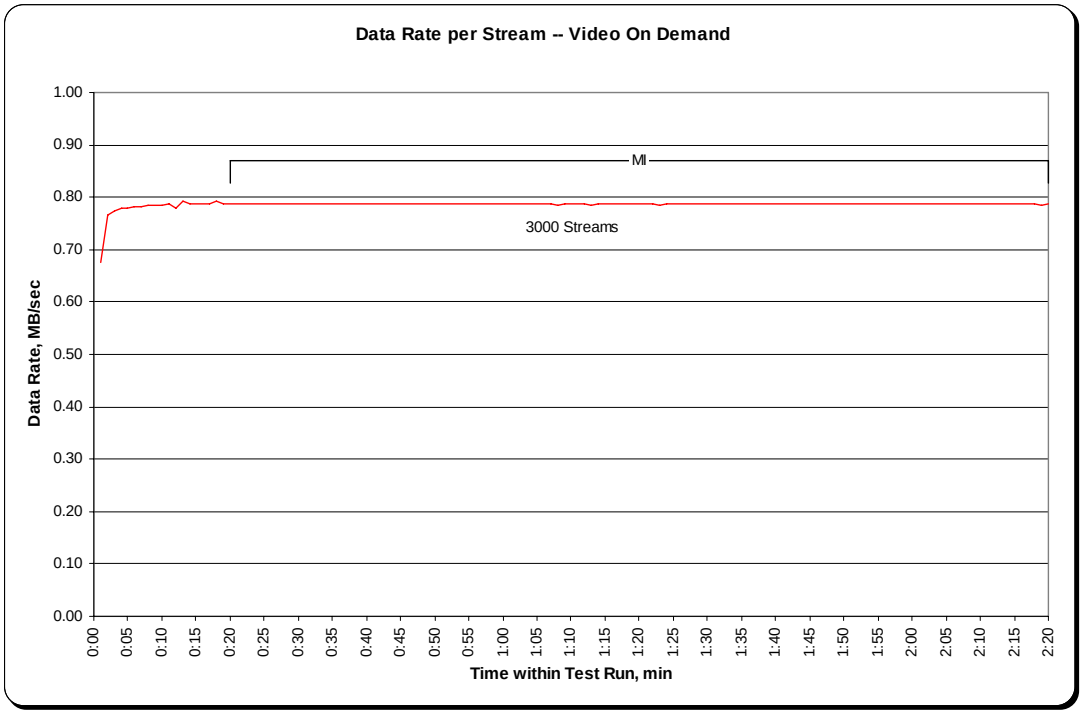
The SPC-2 Video on Demand Delivery Test Run data is contained in the table that appears on the next page. That table is followed by graphs illustrating the average Data Rate and average Data Rate per Stream produced by the same Test Runs. The table and graphs present the data at sixty second intervals.

TR1	3000 Streams				TR1	3000 Streams				TR1	3000 Streams			
Test Run Sequence Time	Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms	Maximum Response Time, ms	Test Run Sequence Time	Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms	Maximum Response Time, ms	Test Run Sequence Time	Data Rate, MB/sec	Data Rate / Stream, MB/sec	Response Time, ms	Maximum Response Time, ms
0:01:00	229.30	0.68	6.92	90.81	0:51:00	2,359.15	0.79	20.66	202.97	1:41:00	2,359.30	0.79	20.31	220.32
0:02:00	628.52	0.77	12.64	173.46	0:52:00	2,359.68	0.79	21.20	271.55	1:42:00	2,359.29	0.79	20.77	300.09
0:03:00	986.32	0.77	13.16	151.96	0:53:00	2,362.48	0.79	41.95	436.04	1:43:00	2,359.99	0.79	20.86	294.59
0:04:00	1,290.89	0.78	14.36	200.44	0:54:00	2,359.46	0.79	20.79	197.28	1:44:00	2,359.33	0.79	34.24	439.91
0:05:00	1,533.89	0.78	15.19	141.24	0:55:00	2,359.28	0.79	21.38	250.32	1:45:00	2,359.63	0.79	20.62	334.05
0:06:00	1,742.81	0.78	16.56	214.06	0:56:00	2,359.31	0.79	20.82	203.21	1:46:00	2,359.33	0.79	20.13	238.38
0:07:00	1,922.90	0.78	36.75	335.24	0:57:00	2,359.34	0.79	21.40	313.88	1:47:00	2,359.12	0.79	20.39	310.48
0:08:00	2,090.72	0.78	18.25	196.79	0:58:00	2,359.32	0.79	41.67	459.43	1:48:00	2,358.37	0.79	20.54	266.23
0:09:00	2,222.14	0.78	19.50	277.98	0:59:00	2,359.29	0.79	20.54	219.02	1:49:00	2,358.35	0.79	27.09	409.06
0:10:00	2,322.70	0.78	20.16	203.66	1:00:00	2,359.38	0.79	21.62	323.53	1:50:00	2,359.39	0.79	20.28	235.55
0:11:00	2,359.34	0.79	21.16	278.92	1:01:00	2,359.50	0.79	21.06	236.09	1:51:00	2,359.37	0.79	20.18	232.39
0:12:00	2,335.43	0.78	38.55	325.33	1:02:00	2,359.54	0.79	21.22	287.73	1:52:00	2,359.28	0.79	21.10	274.03
0:13:00	2,381.52	0.79	34.47	243.59	1:03:00	2,358.98	0.79	44.63	486.01	1:53:00	2,359.27	0.79	20.74	271.25
0:14:00	2,359.34	0.79	20.73	279.34	1:04:00	2,359.32	0.79	20.04	205.52	1:54:00	2,359.44	0.79	38.58	473.01
0:15:00	2,359.31	0.79	20.37	217.33	1:05:00	2,359.39	0.79	20.49	322.28	1:55:00	2,359.31	0.79	20.51	242.07
0:16:00	2,359.32	0.79	22.28	266.70	1:06:00	2,359.34	0.79	20.03	219.25	1:56:00	2,359.56	0.79	20.52	231.94
0:17:00	2,359.31	0.79	21.36	336.61	1:07:00	2,359.30	0.79	20.61	295.81	1:57:00	2,359.35	0.79	21.03	281.47
0:18:00	2,377.10	0.79	103.96	389.09	1:08:00	2,356.09	0.79	25.81	427.69	1:58:00	2,359.72	0.79	20.65	247.56
0:19:00	2,359.78	0.79	20.74	259.28	1:09:00	2,360.30	0.79	20.77	262.37	1:59:00	2,359.33	0.79	30.81	438.90
0:20:00	2,358.50	0.79	20.26	213.61	1:10:00	2,359.32	0.79	20.35	254.20	2:00:00	2,359.29	0.79	20.25	216.98
0:21:00	2,358.93	0.79	20.97	298.11	1:11:00	2,358.59	0.79	19.75	209.69	2:01:00	2,359.45	0.79	20.39	254.09
0:22:00	2,360.03	0.79	21.00	248.87	1:12:00	2,359.31	0.79	20.42	238.35	2:02:00	2,359.21	0.79	20.06	229.84
0:23:00	2,359.18	0.79	109.63	428.51	1:13:00	2,357.13	0.79	24.67	370.88	2:03:00	2,359.20	0.79	20.39	303.44
0:24:00	2,359.24	0.79	20.90	269.43	1:14:00	2,362.03	0.79	22.70	269.59	2:04:00	2,358.16	0.79	28.90	419.64
0:25:00	2,358.82	0.79	20.30	220.44	1:15:00	2,359.26	0.79	20.07	261.84	2:05:00	2,359.38	0.79	19.92	221.75
0:26:00	2,359.27	0.79	20.43	269.21	1:16:00	2,359.32	0.79	19.67	184.70	2:06:00	2,359.41	0.79	20.38	268.27
0:27:00	2,359.45	0.79	20.78	299.49	1:17:00	2,359.32	0.79	20.07	296.96	2:07:00	2,358.92	0.79	19.98	247.17
0:28:00	2,359.64	0.79	83.31	448.73	1:18:00	2,358.72	0.79	21.20	334.24	2:08:00	2,359.37	0.79	20.17	268.56
0:29:00	2,359.32	0.79	20.25	270.69	1:19:00	2,359.00	0.79	26.43	340.66	2:09:00	2,359.29	0.79	27.62	421.90
0:30:00	2,358.92	0.79	19.91	199.43	1:20:00	2,359.38	0.79	20.25	308.94	2:10:00	2,360.32	0.79	20.47	249.07
0:31:00	2,359.66	0.79	20.60	299.38	1:21:00	2,359.29	0.79	19.85	222.77	2:11:00	2,359.29	0.79	20.43	250.40
0:32:00	2,359.30	0.79	20.98	294.34	1:22:00	2,359.40	0.79	20.85	319.55	2:12:00	2,359.34	0.79	19.77	191.46
0:33:00	2,359.28	0.79	78.20	452.40	1:23:00	2,356.89	0.79	22.93	376.55	2:13:00	2,359.32	0.79	20.05	287.80
0:34:00	2,359.29	0.79	20.61	249.61	1:24:00	2,359.51	0.79	30.00	368.19	2:14:00	2,359.71	0.79	24.01	407.94
0:35:00	2,359.59	0.79	20.37	269.63	1:25:00	2,359.44	0.79	20.97	273.76	2:15:00	2,358.30	0.79	24.89	251.49
0:36:00	2,359.68	0.79	20.63	248.93	1:26:00	2,359.28	0.79	20.14	207.23	2:16:00	2,359.34	0.79	20.25	266.96
0:37:00	2,359.42	0.79	20.73	308.09	1:27:00	2,359.02	0.79	20.73	288.47	2:17:00	2,359.26	0.79	19.85	222.38
0:38:00	2,359.38	0.79	56.49	387.52	1:28:00	2,359.31	0.79	20.77	288.52	2:18:00	2,358.80	0.79	20.07	254.91
0:39:00	2,359.24	0.79	20.17	268.94	1:29:00	2,362.79	0.79	30.91	378.10	2:19:00	2,356.76	0.79	25.53	416.36
0:40:00	2,359.95	0.79	20.64	242.05	1:30:00	2,359.32	0.79	20.79	293.18	2:20:00	2,359.62	0.79	21.56	291.98
0:41:00	2,358.49	0.79	20.48	254.36	1:31:00	2,358.70	0.79	20.06	194.37					
0:42:00	2,359.28	0.79	21.20	288.96	1:32:00	2,359.33	0.79	20.50	266.01					
0:43:00	2,359.34	0.79	35.63	373.58	1:33:00	2,359.26	0.79	21.86	270.48					
0:44:00	2,359.31	0.79	20.37	272.22	1:34:00	2,358.58	0.79	34.48	414.25					
0:45:00	2,359.38	0.79	21.00	290.66	1:35:00	2,359.50	0.79	20.77	257.04					
0:46:00	2,359.08	0.79	20.66	231.78	1:36:00	2,359.36	0.79	20.19	200.28					
0:47:00	2,358.07	0.79	21.65	296.21	1:37:00	2,359.32	0.79	20.96	325.36					
0:48:00	2,358.79	0.79	47.96	416.91	1:38:00	2,358.19	0.79	20.68	252.18					
0:49:00	2,359.25	0.79	20.77	232.66	1:39:00	2,359.39	0.79	33.18	392.83					
0:50:00	2,359.32	0.79	21.14	288.20	1:40:00	2,359.39	0.79	20.82	284.57					

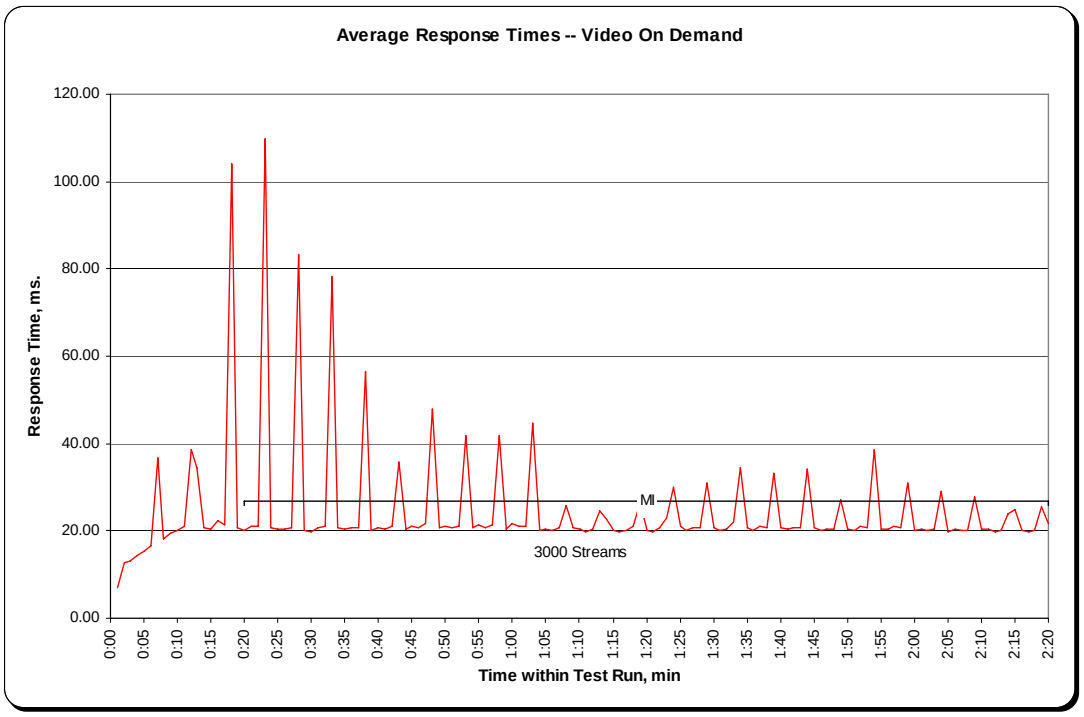
SPC-2 Video on Demand Delivery Average Data Rate Graph



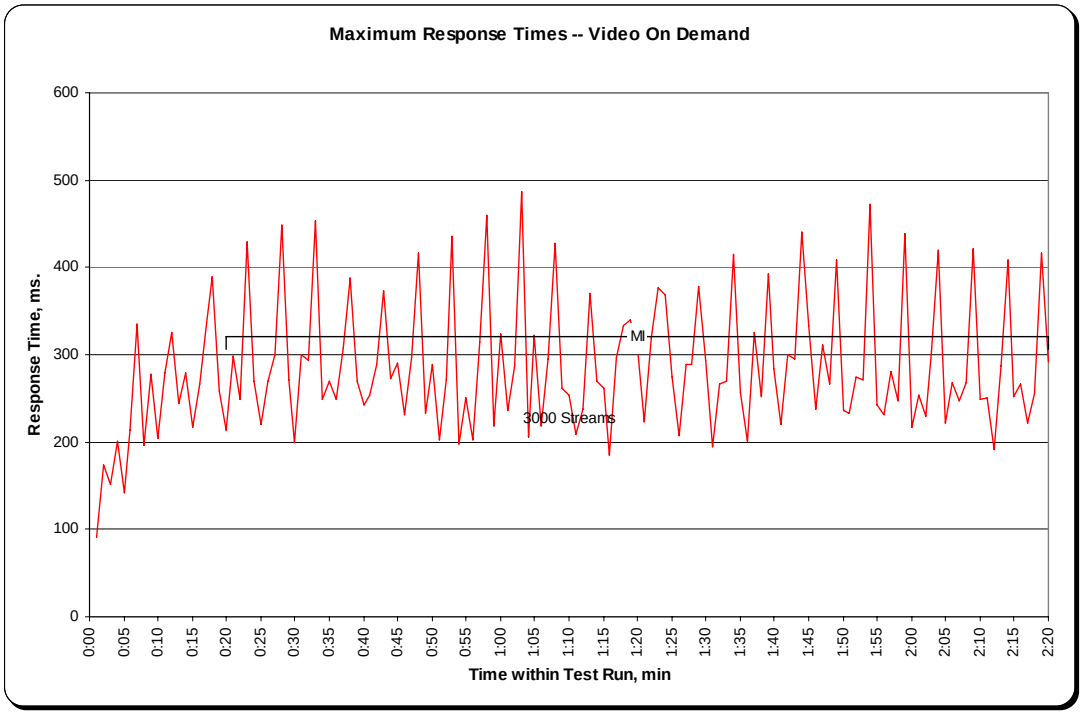
SPC-2 Video on Demand Delivery Average Data Rate per Stream Graph



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 111.

Data Persistence Test Results File

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

Persistence 1 Test Run Results File

Persistence 2 Test Run Results File

Data Persistence Test Results

Data Persistence Test Results	
Data Persistence Test Number: 1	
Total Number of Logical Blocks Written	471,598
Total Number of Logical Blocks Re-referenced	4,136
Total Number of Logical Blocks Verified	467,462
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 IBM Storwize® V7000, as documented in this SPC-2 Full Disclosure Report, is currently available 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 IBM Storwize® V7000.

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 gigibyte (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:

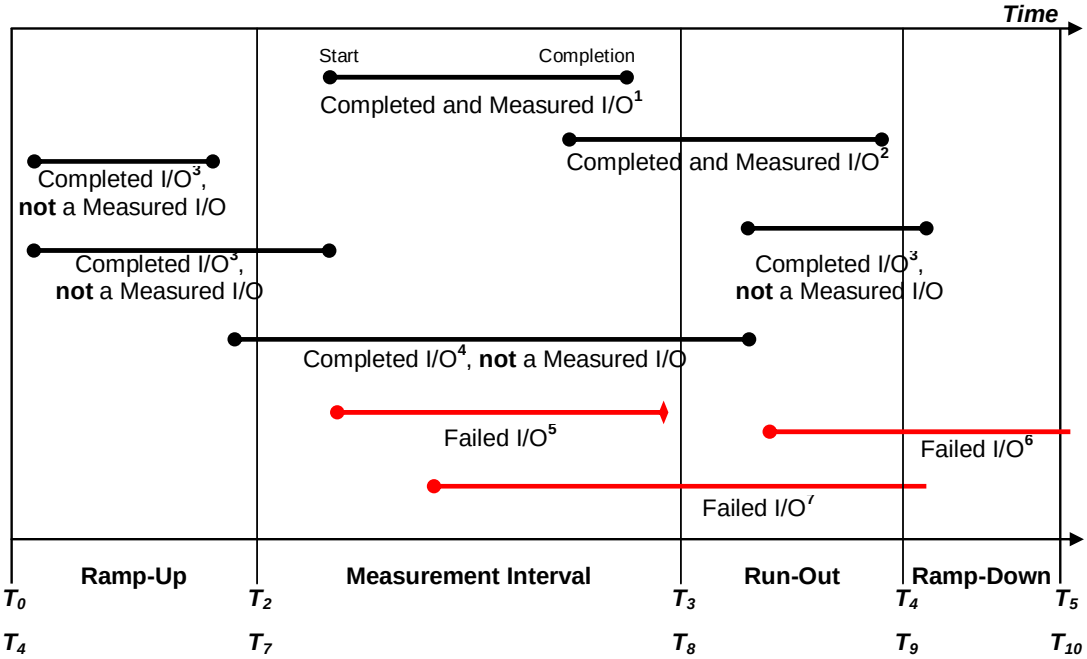
- Test Run 1: Maximum number of Streams, which is selected by the Test Sponsor
- Test Run 2: 50% of the maximum number of Streams used in Test Run 1.
- Test Run 3: 25% of the maximum number of Streams used in Test Run 1.
- Test Run 4: 12.5% of the maximum number of Streams used in Test Run 1.
- Test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

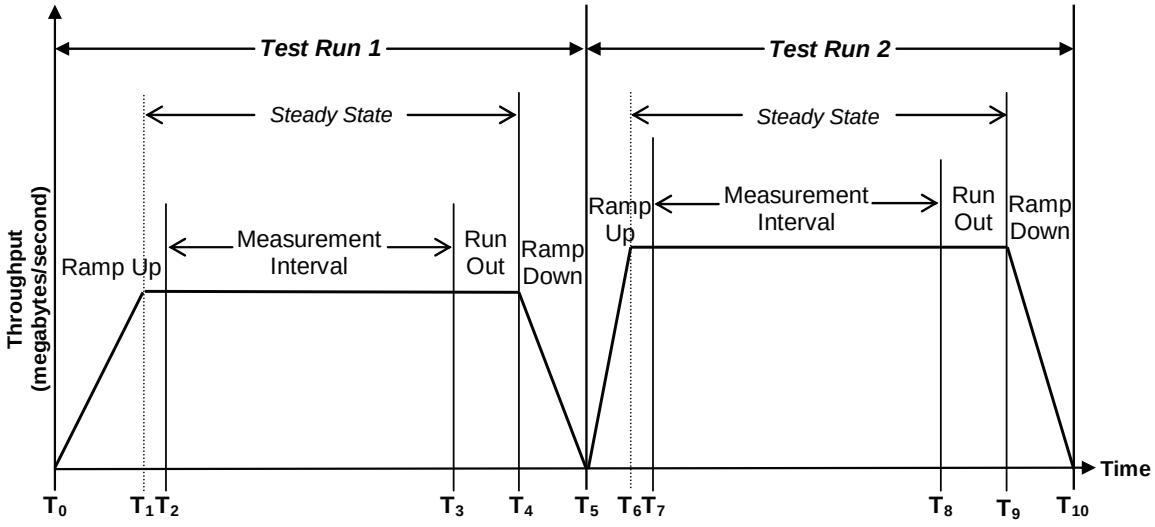
Transfer Size: The Transfer Size parameter specifies the number of bytes in KiB to transfer. *(Clause 3.4.7 of the SPC-2 Benchmark Specification)*

I/O Completion Types



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

SPC-2 Test Run Components



APPENDIX B: CUSTOMER TUNABLE PARAMETERS AND OPTIONS

There were no customer tunable parameter or options changed from their default values for the benchmark measurements.

APPENDIX C: TESTED STORAGE CONFIGURATION (TSC) CREATION

SAN Volume Controller (SVC) Configuration

Each script listed below with the ***cyg*** file descriptor is submitted using PuTTY, a well known freeware package. In each of those scripts ***$plink*** is replaced with the command ***plink name_of_cluster***, where ***name_of_cluster*** is a saved network location for the TSC.

The ***cyg*** scripts require the installation of Cygwin (http://www.cygwin.com/) and are executed as standard shell scripts in a Cygwin command window on the Host System.

All of the referenced scripts appear at the end of this section.

Create RAID-5 Arrays

The ***dochains_separate_6disk.cyg*** script organizes the 120 available disks into a set of 20 RAID-5 arrays with 6 disks each. Each array is comprised of disks taken from one of the two SAS "chains" by which the internal disks are attached to the Storwize V7000 controller.

Define the VDisks

The ***mk20vd_2node_seq.cyg*** script presents each RAID-5 array as a VDisk *(1 to 1 correspondence)*.

Define the host paths

The ***mkhost.cyg*** script defines each path by which VDisks can be presented to a host system. This is done by assigning the wwpn of the path with a name by which the path can be referenced.

Assign VDisk paths

The ***map2host_primaryfirst.cyg*** script assigns 2 host paths by which each VDisk can be accessed from each host system. The preferred paths are defined first, followed by the alternate paths that should be used in the case of failover. The ***map2host_primaryfirst.cyg*** script issues two prompts. The script pauses at these two times for disk rescanning, as described in the following section.

dochains_separate_6disk.cyg

```
#!/usr/bin/bash
# run in cygwin command line
# Creates 20 RAID-5 arrays of 6 disks each, with each array belonging to a single
chain
$plink svctask mkmdiskgrp -name thebiggroup -ext 256
drives=`$plink svcinfo lsdrive -nohdr | awk '{ print $1 }'`
for d in $drives
do
svctask chdrive -use candidate $d
done
#the first 2 elements show enclosures in chain 1, the last 3 those in chain 2
c_enc=( -1 -1   -2 -2 -2 )
n=0
for cnum in 1 2
do
  chain=`$plink svcinfo lssasfabric -nohdr -delim : |  \
```

```
    grep "^[^:]*:[^:]*:[^:]*:[^:]*:[^:]*:$cnum:[^:]*:[^:]*:[^:]*:[^:]*:lode1" | cut
-d: -f1 - | sort -n -`
  for i in $chain
  do
    c_enc[$n]=$i
    let n="n+1"
  done
done
arrcount=0
s0=0
e0=0
while [[ $arrcount -le 7 ]]
  do
  devlist=`for d in 0 1 2 3 4 5; do let s="(s0+d)%24 + 1"; let e="e0+(s0+d)/24"; \
    $plink svcinfo lsenclosureslot -slot $s ${c_enc[$e]} 2>/dev/null | \
    awk '(FNR==8) { print $2 }'; done | awk -v ORS="" '{ print (FNR==1?"":":") $1 }'
`
    echo $devlist
  $plink svctask mkarray -level raid5 -drive $devlist -name md$arrcount thebiggroup
  let e0="e0+(s0+6)/24"
  let s0="(s0+6)%24"
  let arrcount="arrcount+1"
  done
s0=0
e0=0
while [[ $arrcount -le 19 ]]
  do
  devlist=`for d in 0 1 2 3 4 5; do let s="(s0+d)%24 + 1"; let e="e0+(s0+d)/24"; \
    $plink svcinfo lsenclosureslot -slot $s ${c_enc[2+$e]} 2>/dev/null | \
    awk '(FNR==8) { print $2 }'; done | awk -v ORS="" '{ print (FNR==1?"":":") $1 }'
`
    echo $devlist
  $plink  svctask mkarray -level raid5 -drive $devlist -name md$arrcount thebiggroup
  let e0="e0+(s0+6)/24"
  let s0="(s0+6)%24"
  let arrcount="arrcount+1"
  done
```

mk20vd_2node_seq.cyg

```
#!/usr/bin/bash
#execute in cygwin command line
i=0
while [[ $i -le 19 ]]
    do
    let lode="1 + ((i%4) / 2)"
    let iogrp="((i%4) / 4)"
    let k="i%20"
    #20 = no. of mdisks
    let j="(k%5)*4 + (k/5)"
    #5 is fixed, 4*5 = no. of mdisks
    capbytes=`$plink svcinfo lsmdisk -bytes md$j | grep capacity | awk  '{print
$2}'`
    let cap="(capbytes-536870912)/1073741824"
    $plink svctask mkvdisk -vtype seq -mdisk md$j \
       -size $cap -unit gb -mdiskgrp thebiggroup -iogrp io_grp$iogrp \
       -name vd$i -node lode$lode
    let i="i+1"
    done
```

mkhost.cyg

```
$plink svctask mkhost -force -name fcs0 -hbawwpn 21000024ff2fcd73
$plink svctask mkhost -force -name fcs1 -hbawwpn 21000024ff2fcdbd
$plink svctask mkhost -force -name fcs2 -hbawwpn 21000024ff2fcd13
$plink svctask mkhost -force -name fcs3 -hbawwpn 2101001b32a3f44b
$plink svctask mkhost -force -name fcs4 -hbawwpn 2101001b3231f479
$plink svctask mkhost -force -name fcs5 -hbawwpn 21000024ff2fcd49
$plink svctask mkhost -force -name fcs6 -hbawwpn 21000024ff2fcdfb
$plink svctask mkhost -force -name fcs7 -hbawwpn 21000024ff2fcded
```

map2host_primaryfirst.cyg

```
#!/usr/bin/bash
# run in cygwin command line
# Maps 20 vdisks to two fcs's in each of two hosts.
# All preferred mappings are performed first, followed by alternate mappings.

# The following is a map of where the host1 fcs's are in the two switches
(left=lower ports, right=upper)
host1fcs=( \
     4                  5         \
     6                  7         )
# The following is a map of where the host2 fcs's are in the two switches
(left=lower ports, right=upper)
host2fcs=( \
 0                  1             \
 2                  3             )

for nextpos in 1 2
  do
  if [[ $nextpos -eq 1 ]]
  then
    pos=( 0 2 1 3 )
  else
    pos=( 3 1 2 0 )
  fi
  i=0
  while [[ $i -le 19 ]]
    do
    let k="i%4"
    j=${pos[k]}

    $plink svctask mkvdiskhostmap -force -host fcs${host1fcs[j]} vd$i
    $plink svctask mkvdiskhostmap -force -host fcs${host2fcs[j]} vd$i

    let i="i+1"
    done

  echo "Ready for rescan on both hosts"
  read
  done
```

Windows Configuration

In Windows, multipath management was provided by SDDDSM, which is included as the driver for the Storwize V7000.

When prompted by the ***map2host_primaryfirst.cyg*** script, as just described in the previous section, issue the command ***echo rescan | diskpart*** on each host. This causes 20 Windows physical disks to be defined (referred to in the diskpart utility as disk 2, disk 3, …, disk 21). Each physical disk may be accessed by either its preferred or its alternate path.

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

Large File Processing Test *(LFP)*

```
maxlatestart=0
host=localhost,jvms=1,maxstreams=400
host=(9.180.28.199,telesto),
  java=(java,"-Xmx768m -Xms384m -Xss128k"),
  shell=spc2,
  jvms=1,
  maxstreams=400
reportinginterval=5
segmentlength=512m
sd=default,host=localhost,size=1393g
sd=sd1,lun=\\.\PhysicalDrive2
sd=sd2,lun=\\.\PhysicalDrive3
sd=sd3,lun=\\.\PhysicalDrive4
sd=sd4,lun=\\.\PhysicalDrive5
sd=sd5,lun=\\.\PhysicalDrive6
sd=sd6,lun=\\.\PhysicalDrive7
sd=sd7,lun=\\.\PhysicalDrive8
sd=sd8,lun=\\.\PhysicalDrive9
sd=sd9,lun=\\.\PhysicalDrive10
sd=sd10,lun=\\.\PhysicalDrive11
sd=sd11,lun=\\.\PhysicalDrive12
sd=sd12,lun=\\.\PhysicalDrive13
sd=sd13,lun=\\.\PhysicalDrive14
sd=sd14,lun=\\.\PhysicalDrive15
sd=sd15,lun=\\.\PhysicalDrive16
sd=sd16,lun=\\.\PhysicalDrive17
sd=sd17,lun=\\.\PhysicalDrive18
sd=sd18,lun=\\.\PhysicalDrive19
sd=sd19,lun=\\.\PhysicalDrive20
sd=sd20,lun=\\.\PhysicalDrive21


sd=default,host=telesto,size=1393g
sd=sd1,lun=\\.\PhysicalDrive2
sd=sd2,lun=\\.\PhysicalDrive3
sd=sd3,lun=\\.\PhysicalDrive4
sd=sd4,lun=\\.\PhysicalDrive5
sd=sd5,lun=\\.\PhysicalDrive6
sd=sd6,lun=\\.\PhysicalDrive7
sd=sd7,lun=\\.\PhysicalDrive8
sd=sd8,lun=\\.\PhysicalDrive9
sd=sd9,lun=\\.\PhysicalDrive10
sd=sd10,lun=\\.\PhysicalDrive11
sd=sd11,lun=\\.\PhysicalDrive17
sd=sd12,lun=\\.\PhysicalDrive18
sd=sd13,lun=\\.\PhysicalDrive19
sd=sd14,lun=\\.\PhysicalDrive20
sd=sd15,lun=\\.\PhysicalDrive21
sd=sd16,lun=\\.\PhysicalDrive12
sd=sd17,lun=\\.\PhysicalDrive13
sd=sd18,lun=\\.\PhysicalDrive14
sd=sd19,lun=\\.\PhysicalDrive15
sd=sd20,lun=\\.\PhysicalDrive16
```

```
rd=default,rampup=180,measurement=180,runout=45,rampdown=15,buffers=1,periods=90
rd=default,rdpct=0,xfersize=1024k
rd=TR1_SPC-2-FP2.0,streams=20
rd=TR2_SPC-2-FP2.0,streams=10
rd=TR3_SPC-2-FP2.0,streams=5
rd=TR4_SPC-2-FP2.0,streams=2
rd=TR5_SPC-2-FP2.0,streams=1
rd=default,rdpct=0,xfersize=256k
rd=TR6_SPC-2-FP2.0,streams=20
rd=TR7_SPC-2-FP2.0,streams=10
rd=TR8_SPC-2-FP2.0,streams=5
rd=TR9_SPC-2-FP2.0,streams=2
rd=TR10_SPC-2-FP2.0,streams=1
rd=default,rdpct=50,xfersize=1024k
rd=TR11_SPC-2-FP2.0,streams=20
rd=TR12_SPC-2-FP2.0,streams=10
rd=TR13_SPC-2-FP2.0,streams=5
rd=TR14_SPC-2-FP2.0,streams=2
rd=TR15_SPC-2-FP2.0,streams=1
rd=default,rdpct=50,xfersize=256k
rd=TR16_SPC-2-FP2.0,streams=20
rd=TR17_SPC-2-FP2.0,streams=10
rd=TR18_SPC-2-FP2.0,streams=5
rd=TR19_SPC-2-FP2.0,streams=2
rd=TR20_SPC-2-FP2.0,streams=1
rd=default,rdpct=100,xfersize=1024k
rd=TR21_SPC-2-FP2.0,streams=20
rd=TR22_SPC-2-FP2.0,streams=10
rd=TR23_SPC-2-FP2.0,streams=5
rd=TR24_SPC-2-FP2.0,streams=2
rd=TR25_SPC-2-FP2.0,streams=1
rd=default,rdpct=100,xfersize=256k
rd=TR26_SPC-2-FP2.0,streams=20
rd=TR27_SPC-2-FP2.0,streams=10
rd=TR28_SPC-2-FP2.0,streams=5
rd=TR29_SPC-2-FP2.0,streams=2
rd=TR30_SPC-2-FP2.0,streams=1
```

Large Database Query Test *(LDQ)*

```
maxlatestart=0
host=localhost,jvms=1,maxstreams=400
host=(9.180.28.199,telesto),
  java=(java,"-Xmx768m -Xms384m -Xss128k"),
  shell=spc2,
  jvms=1,
  maxstreams=400
reportinginterval=5
segmentlength=512m
sd=default,host=localhost,size=1393g
sd=sd1,lun=\\.\PhysicalDrive2
sd=sd2,lun=\\.\PhysicalDrive3
sd=sd3,lun=\\.\PhysicalDrive4
sd=sd4,lun=\\.\PhysicalDrive5
sd=sd5,lun=\\.\PhysicalDrive6
sd=sd6,lun=\\.\PhysicalDrive7
sd=sd7,lun=\\.\PhysicalDrive8
sd=sd8,lun=\\.\PhysicalDrive9
sd=sd9,lun=\\.\PhysicalDrive10
sd=sd10,lun=\\.\PhysicalDrive11
sd=sd11,lun=\\.\PhysicalDrive12
sd=sd12,lun=\\.\PhysicalDrive13
```

```
sd=sd13,lun=\\.\PhysicalDrive14
sd=sd14,lun=\\.\PhysicalDrive15
sd=sd15,lun=\\.\PhysicalDrive16
sd=sd16,lun=\\.\PhysicalDrive17
sd=sd17,lun=\\.\PhysicalDrive18
sd=sd18,lun=\\.\PhysicalDrive19
sd=sd19,lun=\\.\PhysicalDrive20
sd=sd20,lun=\\.\PhysicalDrive21


sd=default,host=telesto,size=1393g
sd=sd1,lun=\\.\PhysicalDrive2
sd=sd2,lun=\\.\PhysicalDrive3
sd=sd3,lun=\\.\PhysicalDrive4
sd=sd4,lun=\\.\PhysicalDrive5
sd=sd5,lun=\\.\PhysicalDrive6
sd=sd6,lun=\\.\PhysicalDrive7
sd=sd7,lun=\\.\PhysicalDrive8
sd=sd8,lun=\\.\PhysicalDrive9
sd=sd9,lun=\\.\PhysicalDrive10
sd=sd10,lun=\\.\PhysicalDrive11
sd=sd11,lun=\\.\PhysicalDrive17
sd=sd12,lun=\\.\PhysicalDrive18
sd=sd13,lun=\\.\PhysicalDrive19
sd=sd14,lun=\\.\PhysicalDrive20
sd=sd15,lun=\\.\PhysicalDrive21
sd=sd16,lun=\\.\PhysicalDrive12
sd=sd17,lun=\\.\PhysicalDrive13
sd=sd18,lun=\\.\PhysicalDrive14
sd=sd19,lun=\\.\PhysicalDrive15
sd=sd20,lun=\\.\PhysicalDrive16

rd=default,rdpct=99,rampup=180,measurement=180,runout=45,rampdown=15,periods=90
rd=default,xfersize=1024k,buffers=4
rd=TR1_SPC-2-DQ2.0,streams=20
rd=TR2_SPC-2-DQ2.0,streams=10
rd=TR3_SPC-2-DQ2.0,streams=5
rd=TR4_SPC-2-DQ2.0,streams=2
rd=TR5_SPC-2-DQ2.0,streams=1
rd=default,xfersize=1024k,buffers=1
rd=TR6_SPC-2-DQ2.0,streams=20
rd=TR7_SPC-2-DQ2.0,streams=10
rd=TR8_SPC-2-DQ2.0,streams=5
rd=TR9_SPC-2-DQ2.0,streams=2
rd=TR10_SPC-2-DQ2.0,streams=1
rd=default,xfersize=64k,buffers=4
rd=TR11_SPC-2-DQ2.0,streams=20
rd=TR12_SPC-2-DQ2.0,streams=10
rd=TR13_SPC-2-DQ2.0,streams=5
rd=TR14_SPC-2-DQ2.0,streams=2
rd=TR15_SPC-2-DQ2.0,streams=1
rd=default,xfersize=64k,buffers=1
rd=TR16_SPC-2-DQ2.0,streams=20
rd=TR17_SPC-2-DQ2.0,streams=10
rd=TR18_SPC-2-DQ2.0,streams=5
rd=TR19_SPC-2-DQ2.0,streams=2
rd=TR20_SPC-2-DQ2.0,streams=1
```

Video on Demand Delivery Test (VOD)

```
maxlatestart=0
host=localhost,jvms=7,maxstreams=400
host=(9.180.28.199,telesto),
  java=(java,"-Xmx768m -Xms384m -Xss128k"),
  shell=spc2,
  jvms=7,
  maxstreams=400
reportinginterval=5
videosegmentduration=1200
maxlatevod=0
sd=default,host=localhost,size=1393g
sd=sd1,lun=\\.\PhysicalDrive2
sd=sd2,lun=\\.\PhysicalDrive3
sd=sd3,lun=\\.\PhysicalDrive4
sd=sd4,lun=\\.\PhysicalDrive5
sd=sd5,lun=\\.\PhysicalDrive6
sd=sd6,lun=\\.\PhysicalDrive7
sd=sd7,lun=\\.\PhysicalDrive8
sd=sd8,lun=\\.\PhysicalDrive9
sd=sd9,lun=\\.\PhysicalDrive10
sd=sd10,lun=\\.\PhysicalDrive11
sd=sd11,lun=\\.\PhysicalDrive12
sd=sd12,lun=\\.\PhysicalDrive13
sd=sd13,lun=\\.\PhysicalDrive14
sd=sd14,lun=\\.\PhysicalDrive15
sd=sd15,lun=\\.\PhysicalDrive16
sd=sd16,lun=\\.\PhysicalDrive17
sd=sd17,lun=\\.\PhysicalDrive18
sd=sd18,lun=\\.\PhysicalDrive19
sd=sd19,lun=\\.\PhysicalDrive20
sd=sd20,lun=\\.\PhysicalDrive21


sd=default,host=telesto,size=1393g
sd=sd1,lun=\\.\PhysicalDrive2
sd=sd2,lun=\\.\PhysicalDrive3
sd=sd3,lun=\\.\PhysicalDrive4
sd=sd4,lun=\\.\PhysicalDrive5
sd=sd5,lun=\\.\PhysicalDrive6
sd=sd6,lun=\\.\PhysicalDrive7
sd=sd7,lun=\\.\PhysicalDrive8
sd=sd8,lun=\\.\PhysicalDrive9
sd=sd9,lun=\\.\PhysicalDrive10
sd=sd10,lun=\\.\PhysicalDrive11
sd=sd11,lun=\\.\PhysicalDrive17
sd=sd12,lun=\\.\PhysicalDrive18
sd=sd13,lun=\\.\PhysicalDrive19
sd=sd14,lun=\\.\PhysicalDrive20
sd=sd15,lun=\\.\PhysicalDrive21
sd=sd16,lun=\\.\PhysicalDrive12
sd=sd17,lun=\\.\PhysicalDrive13
sd=sd18,lun=\\.\PhysicalDrive14
sd=sd19,lun=\\.\PhysicalDrive15
sd=sd20,lun=\\.\PhysicalDrive16


rd=default,measurement=7200,rampup=1200,runout=45,rampdown=15,periods=600
rd=TR1_SPC-2-VOD11.0,streams=3000,buffers=8
```

Persistence Test Run 1 *(write phase)*

```
*Persistence test run 1
host=localhost,jvms=1,maxstreams=400
host=(9.180.28.199,telesto),
  java=(java,"-Xmx768m -Xms384m -Xss128k"),
  shell=spc2,
  jvms=1,
  maxstreams=400
sd=default,host=localhost,size=1393g
sd=sd1,lun=\\.\PhysicalDrive2
sd=sd2,lun=\\.\PhysicalDrive3
sd=sd3,lun=\\.\PhysicalDrive4
sd=sd4,lun=\\.\PhysicalDrive5
sd=sd5,lun=\\.\PhysicalDrive6
sd=sd6,lun=\\.\PhysicalDrive7
sd=sd7,lun=\\.\PhysicalDrive8
sd=sd8,lun=\\.\PhysicalDrive9
sd=sd9,lun=\\.\PhysicalDrive10
sd=sd10,lun=\\.\PhysicalDrive11
sd=sd11,lun=\\.\PhysicalDrive12
sd=sd12,lun=\\.\PhysicalDrive13
sd=sd13,lun=\\.\PhysicalDrive14
sd=sd14,lun=\\.\PhysicalDrive15
sd=sd15,lun=\\.\PhysicalDrive16
sd=sd16,lun=\\.\PhysicalDrive17
sd=sd17,lun=\\.\PhysicalDrive18
sd=sd18,lun=\\.\PhysicalDrive19
sd=sd19,lun=\\.\PhysicalDrive20
sd=sd20,lun=\\.\PhysicalDrive21

sd=default,host=telesto,size=1393g
sd=sd1,lun=\\.\PhysicalDrive2
sd=sd2,lun=\\.\PhysicalDrive3
sd=sd3,lun=\\.\PhysicalDrive4
sd=sd4,lun=\\.\PhysicalDrive5
sd=sd5,lun=\\.\PhysicalDrive6
sd=sd6,lun=\\.\PhysicalDrive7
sd=sd7,lun=\\.\PhysicalDrive8
sd=sd8,lun=\\.\PhysicalDrive9
sd=sd9,lun=\\.\PhysicalDrive10
sd=sd10,lun=\\.\PhysicalDrive11
sd=sd11,lun=\\.\PhysicalDrive17
sd=sd12,lun=\\.\PhysicalDrive18
sd=sd13,lun=\\.\PhysicalDrive19
sd=sd14,lun=\\.\PhysicalDrive20
sd=sd15,lun=\\.\PhysicalDrive21
sd=sd16,lun=\\.\PhysicalDrive12
sd=sd17,lun=\\.\PhysicalDrive13
sd=sd18,lun=\\.\PhysicalDrive14
sd=sd19,lun=\\.\PhysicalDrive15
sd=sd20,lun=\\.\PhysicalDrive16

maxlatestart=1
reportinginterval=5
segmentlength=512m

rd=default,rampup=180,periods=90,measurement=300,runout=0,rampdown=0,buffers=1

rd=default,rdpct=0,xfersize=1024k
rd=TR1-5s_SPC-2-persist-w,streams=20
```

Persistence Test Run 2 (read phase)

```
*Persistence test run 2
host=localhost,jvms=1,maxstreams=400
host=(9.180.28.199,telesto),
  java=(java,"-Xmx768m -Xms384m -Xss128k"),
  shell=spc2,
  jvms=1,
  maxstreams=400
sd=default,host=localhost,size=1393g
sd=sd1,lun=\\.\PhysicalDrive2
sd=sd2,lun=\\.\PhysicalDrive3
sd=sd3,lun=\\.\PhysicalDrive4
sd=sd4,lun=\\.\PhysicalDrive5
sd=sd5,lun=\\.\PhysicalDrive6
sd=sd6,lun=\\.\PhysicalDrive7
sd=sd7,lun=\\.\PhysicalDrive8
sd=sd8,lun=\\.\PhysicalDrive9
sd=sd9,lun=\\.\PhysicalDrive10
sd=sd10,lun=\\.\PhysicalDrive11
sd=sd11,lun=\\.\PhysicalDrive12
sd=sd12,lun=\\.\PhysicalDrive13
sd=sd13,lun=\\.\PhysicalDrive14
sd=sd14,lun=\\.\PhysicalDrive15
sd=sd15,lun=\\.\PhysicalDrive16
sd=sd16,lun=\\.\PhysicalDrive17
sd=sd17,lun=\\.\PhysicalDrive18
sd=sd18,lun=\\.\PhysicalDrive19
sd=sd19,lun=\\.\PhysicalDrive20
sd=sd20,lun=\\.\PhysicalDrive21

sd=default,host=telesto,size=1393g
sd=sd1,lun=\\.\PhysicalDrive2
sd=sd2,lun=\\.\PhysicalDrive3
sd=sd3,lun=\\.\PhysicalDrive4
sd=sd4,lun=\\.\PhysicalDrive5
sd=sd5,lun=\\.\PhysicalDrive6
sd=sd6,lun=\\.\PhysicalDrive7
sd=sd7,lun=\\.\PhysicalDrive8
sd=sd8,lun=\\.\PhysicalDrive9
sd=sd9,lun=\\.\PhysicalDrive10
sd=sd10,lun=\\.\PhysicalDrive11
sd=sd11,lun=\\.\PhysicalDrive17
sd=sd12,lun=\\.\PhysicalDrive18
sd=sd13,lun=\\.\PhysicalDrive19
sd=sd14,lun=\\.\PhysicalDrive20
sd=sd15,lun=\\.\PhysicalDrive21
sd=sd16,lun=\\.\PhysicalDrive12
sd=sd17,lun=\\.\PhysicalDrive13
sd=sd18,lun=\\.\PhysicalDrive14
sd=sd19,lun=\\.\PhysicalDrive15
sd=sd20,lun=\\.\PhysicalDrive16

maxlatestart=1
reportinginterval=5
segmentlength=512m

maxpersistenceerrors=10
*corruptstreams=3

rd=default,buffers=1,rdpct=100,xfersize=1024k
rd=TR1-5s_SPC-2-persist-r
```

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

Video on Demand Delivery, Large File Processing Test, Large Database Query Tests, and Persistence Test Run 1

The following script was used to execute the Video on Demand Delivery, Large File Processing and Large Database Query Tests, as well as, Persistence Test Run 1.

```
date /T > caplist.txt
time /T >> caplist.txt
plink spc2clus svcinfo lsdrive >> caplist.txt
plink spc2clus svcinfo lsmdisk -bytes >> caplist.txt
type hostcap.bat | diskpart >> caplist.txt
java -Xmx768m -Xms384m -Xss128k vdbench -f vod.cfg -o vod
java -Xmx768m -Xms384m -Xss128k vdbench -f lfp.cfg -o lfp
java -Xmx768m -Xms384m -Xss128k vdbench -f ldq.cfg -o ldq
java -Xmx768m -Xms384m -Xss128k vdbench -f persistw.cfg -o persistw
date /T > caplist2.txt
time /T >> caplist2.txt
plink spc2clus svcinfo lsdrive >> caplist2.txt
plink spc2clus svcinfo lsmdisk -bytes >> caplist2.txt
type hostcap.bat | diskpart >> caplist2.txt
```

Persistence Test Run 2

The following script was used to execute Persistence Test Run 2.

```
java -Xmx768m -Xms384m -Xss128k vdbench -f persistr.cfg -o persistr
```