SPC BENCHMARK 2™
FULL DISCLOSURE REPORT

IBM CORPORATION
IBM SYSTEM STORAGE
SAN VOLUME CONTROLLER V6.4
WITH IBM STORWIZE® V7000 DISK STORAGE

SPC-2™ V1.3

Submitted for Review: August 1, 2012
Submission Identifier: B00061

First Edition – August 2012

Trademarks

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AUDIT CERTIFICATION

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

July 31, 2012

The SPC Benchmark 2™ Reported Data listed below for the **IBM System Storage SAN Volume Controller v6.4 with IBM Storwize® V7000 disk storage** was produced in compliance with the SPC Benchmark 2™ V1.3 Remote Audit requirements.

SPC Benchmark 2™ V1.3 Reported Data	
Tested Storage Product (TSP) Name: IBM System Storage SAN Volume Controller v6.4 with IBM Storwize® V7000 disk storage	
Metric	**Reported Result**
SPC-2 MBPS™	14,581.03
SPC-2 Price-Performance	$129.14/SPC-2 MBPS™
ASU Capacity	74,491.913 GB
Data Protection Level	Protected *(RAID-5)*
Total Price (including three-year maintenance)	$1,883,036.58

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.
- The Application Storage Unit (ASU) Capacity was filled with random data using Vdbench 5.03 prior to the execution of the SPC-2 Tests.

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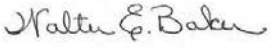
AUDIT CERTIFICATION *(CONT.)*

- 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 that no customer tunable parameter or option was changed from its default value.
- The following Host System items were verified by documentation supplied by IBM Corporation:
  - ✓ Required Host System configuration information.
  - ✓ The TSC boundary within the 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 from IBM Corporation for each of the following were authentic, accurate, and compliant with all of the requirements and constraints of Clauses 6 and 7 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, if applied to the Tested Storage Configuration, would not have a negative impact on the reported SPC-2 performance.
- 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
SPC Auditor

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LETTER OF GOOD FAITH

Vice President and Disk Storage Business Line Executive

IBM Technology & Systems Group
650 Harry Road, Almaden Research Center
San Jose CA 95120-6099

Phone: 1-408-927-0623

June 20, 2012

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 System Storage SAN Volume Controller Version 6.4.

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 1.4 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,

Laura Guio
Vice President, Business Line Executive Storage Systems
IBM Systems and Technology Group

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 IBM ARC 650 Harry Road San Jose, CA 95120
Test Sponsor Alternate Contact	IBM Corporation – http://www.ibm.com Yijie Zhang – yijie@us.ibm.com 9000 Rita Road IBM Mail Drop 9042-2 Tucson, AZ 85744
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	V1.1
Date Results were first used publicly	August 1, 2012
Date FDR was submitted to the SPC	August 1, 2012
Date the TSC will be available for shipment to customers	currently available
Date the TSC completed audit certification	July 31, 2012

Tested Storage Product (TSP) Description

The IBM System Storage SAN Volume Controller (SVC) enables a single point of control for disparate, heterogeneous storage resources to help support improved business application availability and greater resource utilization. SAN Volume Controller is designed to pool storage volumes from IBM and non-IBM storage systems into a single reservoir of capacity for centralized management.

SVC Version 6.4 is the latest level of software, implemented using CG8 storage engines. Each CG8 storage engine is equipped with 24 GB of cache and four 8 Gbps fibre channel ports. The storage engine also features the optional capability, to add 10 Gbps Ethernet or SSD drives managed with EasyTier.

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 SAN Volume Controller v6.4 w/IBM Storwize® V7000 disk storage				
SPC-2 MBPS™	**SPC-2 Price-Performance**	**ASU Capacity (GB)**	**Total Price**	**Data Protection Level**
14,581.03	$129.14	74,491.913	$1,883,036.58	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	13,309.02			$141.49
Write Only:				
1024 KiB Transfer	9,719.50	256	37.97	
256 KiB Transfer	9,352.97	256	36.54	
Read-Write:				
1024 KiB Transfer	12,303.82	256	48.06	
256 KiB Transfer	12,207.29	256	47.68	
Read Only:				
1024 KiB Transfer	17,962.89	128	140.34	
256 KiB Transfer	18,307.67	128	143.03	
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	17,851.22			$105.49
1024 KiB Transfer Size				
4 I/Os Outstanding	17,039.33	128	133.12	
1 I/O Outstanding	17,889.36	128	139.76	
64 KiB Transfer Size				
4 I/Os Outstanding	18,015.02	128	140.74	
1 I/O Outstanding	18,461.17	256	72.11	
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**
	12,582.86	16,000	0.79	$149.65

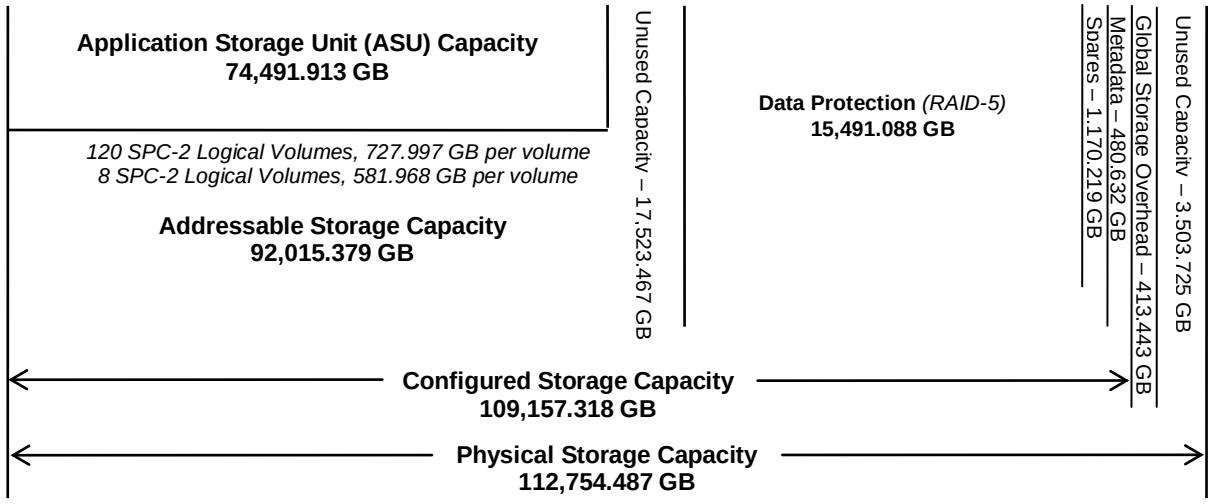
SPC-2 MBPS™ represents the aggregate data rate, in megabytes per second, of all three SPC-2 workloads: Large File Processing (LFP), Large Database Query (LDQ), and Video on Demand (VOD).

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-2 Storage Capacity Utilization	
Application Utilization	66.07%
Protected Application Utilization	79.80%
Unused Storage Ratio	18.36%

Application Utilization: Total ASU Capacity *(74,491.913 GB)* divided by Physical Storage Capacity *(112,754.487 GB)*

Protected Application Utilization: Total ASU Capacity *(74,491.913 GB)* plus total Data Protection Capacity *(15,491.088 GB)* minus unused Data Protection Capacity *(0.000 GB)* divided by Physical Storage Capacity *(112,754.487 GB)*.

Unused Storage Ratio: Total Unused Capacity *(20,707.192 GB)* divided by Physical Storage Capacity *(112,754.487 GB)* and may not exceed 45%.

Detailed information for the various storage capacities and utilizations is available on pages 23-24 in the Full Disclosure Report.

Priced Storage Configuration Pricing

Component	Quantity	Unit Price	Unit Maint	List w/ Maint	% discount	Total Price
SVC 3550 Storage Engine (2145-CG8)	8	16,500.00	2,616.00	152,928.00	39	93,286.08
UPS (2145-CG8 8115)	8	1,000.00	1,656.00	21,248.00	39	12,961.28
SVC Software license (base) up to 100 TB	1	248,280.00	0.00	248,280.00	39	151,450.80
SVC Software maintenance 3 yr SWMA	1	0.00	99,312.00	99,312.00	0	99,312.00
19 inch rack (7014-T42)	3	5,715.00	888.00	19,809.00	50	9,904.50
24 port fibre channel switch (2498-B24) w/ 24 SFP, 24 ports enabled	4	15,940.00	10,800.00	106,960.00	20	85,568.00
V7000 controller (2076-124) w/ 4 SFP, 24x15K RPM, 146 GB	8	51,764.00	3,500.00	442,112.00	39	269,688.32
V7000 expansion (2076-224) w/ 2 SAS cables, 24x15K RPM, 146 GB	24	31,534.00	2,016.00	805,200.00	39	491,172.00
V7000 base software for Cont. + Exp.	32	18,000.00	0.00	576,000.00	39	351,360.00
V7000 software maintenance 3 yr SWMA	32	0.00	7,200.00	230,400.00	0	230,400.00
Ethernet switch 78Y6611	2	320.00	60.00	760.00	20	608.00
1m fibre channel cable (2076-124 5301)	32	79.00	0.00	2,528.00	20	2,022.40
5m fibre channel cable (2076-124 5305)	32	129.00	0.00	4,128.00	20	3,302.40
25m fibre channel cable (2076-124 5625)	32	189.00	0.00	6,048.00	20	4,838.40
14ft ethernet cable (30R-6650)	30	7.00	0.00	210.00	20	168.00
8 Gbps dual port FC adapter (9117-5735)	24	4,583.00	0.00	109,992.00	30	76,994.40
Total Price						**1,883,036.58**

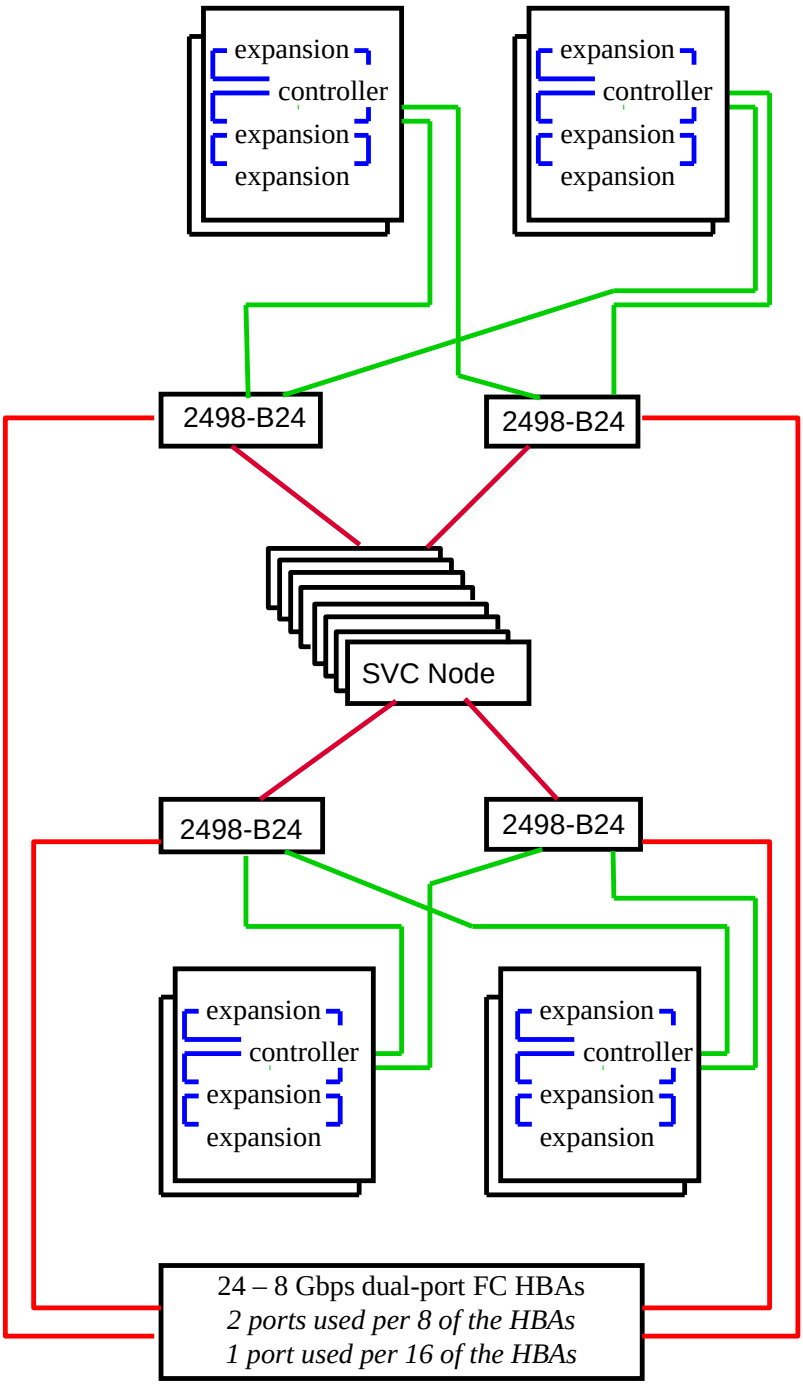
The above pricing includes the following:

- 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.

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

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

Priced Storage Configuration Diagram



SVC Node:
8 – SAN Volume Controller nodes
(each node manages all storage as a single image}

2498-B24:
4 – 24-port FC switches
(each switch has one zone for node-to-storage traffic and two zones for node-to-host traffic)

controller:
8 – V7000 Controller Enclosures
(each enclosure has 24 disks)

expansion:
24 – V7000 Expansion Enclosures
(each enclosure has 24 disks)

768 – 146 GB, 15K RPM disks

SAS link (4x6 Gbps)
Represents 2 FC paths per line drawn
Represents 8 FC paths per line drawn

Priced Storage Configuration Components

Priced Storage Configuration:
24 – 8 Gbps dual port FC HBAs
IBM System Storage SAN Volume Controller ***(8 node SVC 6.4 cluster)***   Each SVC node includes: 24 GB cache   4 – 8 Gbps FC connections *(all 4 used for both node to Host System and node to V7000 connectivity)*
8 – IBM Storwize® V7000 each with 2 nodes   Each V7000 includes: 1 – V7000 Controller with 16 GB cache, 4 SFPs 24 – 2.5” 146 GB, 15K RPM disk drives   2 – front-end 8 Gbps FC connections *(2 used)*   4 – SAS backend 4x6Gbps connections *(4 used)*   4 – V7000 Expansion Enclosures each with 24 – 2.5” 146 GB, 15K RPM disk drives
768 – 2.5” 146 GB, 15K RPM disk drives *(distributed between V7000 Controllers and Expansion Enclosures as described above)*
4 – 24 port Fibre Channel switches each with 24 ports enabled and 24 SFPs
2 – Ethernet switches
8 – UPS *(SVC backup)*
3 – 19 inch racks

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 20.

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) is illustrated on page 19 *(Benchmark Configuration (BC)/Tested Storage Configuration (TSC) Diagram).*

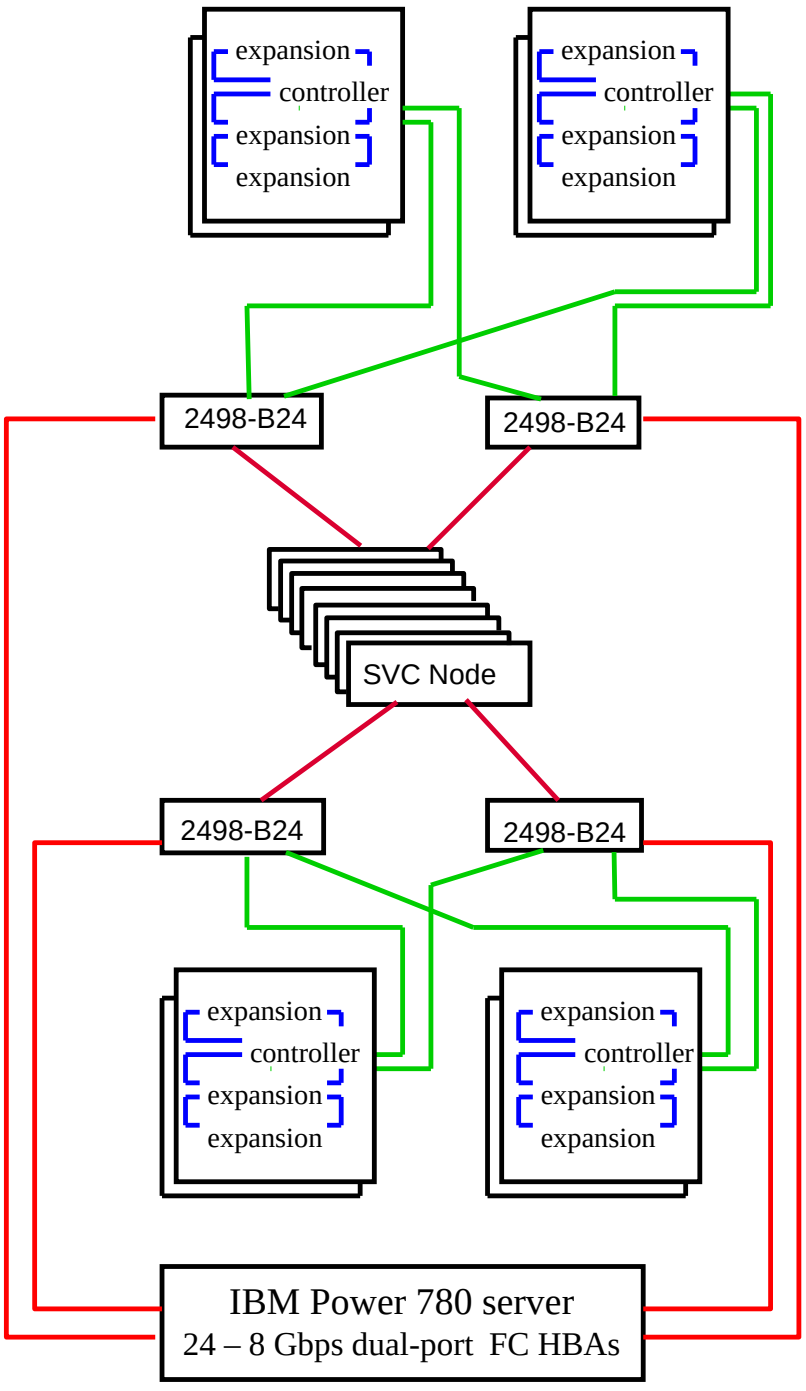
Host System and Tested Storage Configuration Table

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 21.

Benchmark Configuration/Tested Storage Configuration Diagram



SVC Node:
8 – SAN Volume Controller nodes
(each node manages all storage as a single image}

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(each switch has one zone for node-to-storage traffic and two zones for node-to-host traffic)

controller:
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(each enclosure has 24 disks)

expansion:
24 – V7000 Expansion Enclosures
(each enclosure has 24 disks)

768 – 146 GB, 15K RPM disks

SAS link (4x6 Gbps)
Represents 2 FC paths per line drawn
Represents 8 FC paths per line drawn

Host System and Tested Storage Configuration Components

Host System:	Tested Storage Configuration (TSC)
IBM Power® 780 server 4 – 3.92 GHz POWER7 processor modules, 16 cores/processor module *(64 cores total)* 256 KiB L2 cache per core 4 MiB L3 cache per core 440 GiB main memory AIX 7.1 PCIe	32 – 8 Gbps dual port FC HBAs
	IBM System Storage SAN Volume Controller ***(8 node SVC 6.4 cluster)*** Each SVC node includes: 24 GB cache 4 – 8 Gbps FC connections *(all 4 used for both node to Host System and node to V7000 connectivity)*
	16 – IBM Storwize® V7000 each with 2 nodes Each V7000 includes: 1 – V7000 Controller with 16 GB cache, 4 SFPs 24 – 2.5" 146 GB, 15K RPM disk drives 2 – front-end 8 Gbps FC connections *(2 used)* 4 – SAS backend 4x6Gbps connections *(4 used)* 4 – V7000 Expansion Enclosures each with 24 – 2.5" 146 GB, 15K RPM disk drives
	768 – 2.5" 146 GB, 15K RPM disk drives *(distributed between V7000 Controllers and Expansion Enclosures as described above)*
	4 – 24 port Fibre Channel switches each with 24 ports enabled and 24 SFPs
	2 – Ethernet switches
	8 – UPS *(SVC backup)*
	3 – 19 inch racks

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 98 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 99 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 107.

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 93 contains definitions of terms specific to the SPC-2 Data Repository.

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

SPC-2 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)	74,491.913
Addressable Storage Capacity	Gigabytes (GB)	92,015.379
Configured Storage Capacity	Gigabytes (GB)	109,157.318
Physical Storage Capacity	Gigabytes (GB)	112,754.487
Data Protection *(RAID-5)*	Gigabytes (GB)	15,491.088
Required Storage *(sparing, metadata)*	Gigabytes (GB)	1,650.851
Global Storage Overhead	Gigabytes (GB)	413.443
Total Unused Storage	Gigabytes (GB)	20,707.192

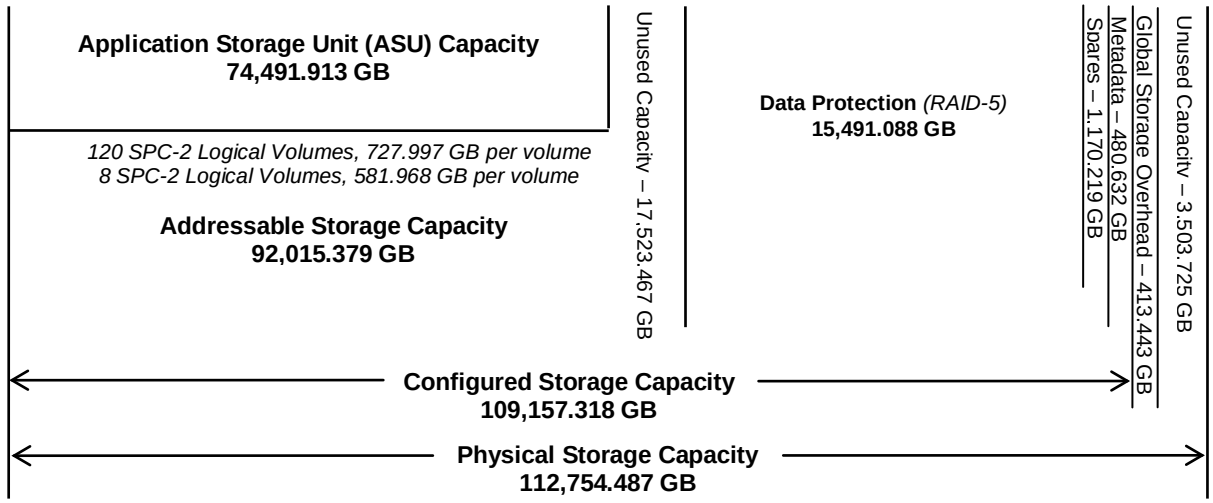
SPC-2 Storage Hierarchy Ratios

	Addressable Storage Capacity	Configured Storage Capacity	Physical Storage Capacity
Total ASU Capacity	80.96%	68.24%	66.07%
Data Protection *(RAID-5)*		14.19%	13.74%
Addressable Storage Capacity		84.30%	81.61%
Required Storage		1.51%	1.46%
Configured Storage Capacity			96.81%
Global Storage Overhead			0.37%
Unused Storage:			
Addressable	19.04%		
Configured		0.00%	
Physical			2.82%

The Physical Storage Capacity consisted of 112,754.487 GB distributed over 768 disk drives each with a formatted capacity of 146.816 GB. There was 3,503.725 GB (3.11%) of Unused Storage within the Physical Storage Capacity. Global Storage Overhead consisted of 413.443 GB (0.37%) of the Physical Storage Capacity. There was 0.000 GB (0.00%) of Unused Storage within the Configured Storage Capacity. The Total ASU Capacity utilized 80.96% of the Addressable Storage Capacity resulting in 17,523.467 GB (19.04%) of Unused Storage within the Addressable Storage Capacity. The Data Protection *(RAID-5)* capacity was 15,491.088 GB of which 15,491.088 GB was utilized. The total Unused Storage was 20,707.192 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-2 Storage Capacity Utilization	
Application Utilization	66.07%
Protected Application Utilization	79.80%
Unused Storage Ratio	18.36%

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 (74,491.913 GB)			
	Total Capacity *(GB)*	Capacity Used *(GB)*	Capacity Unused *(GB)*
Logical Volumes 1-120	727.997 per LV	581.968 per LV	146.029 per LV
Logical Volumes 121-128	581.968 per LV	581.968 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 107 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 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 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 117.

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.

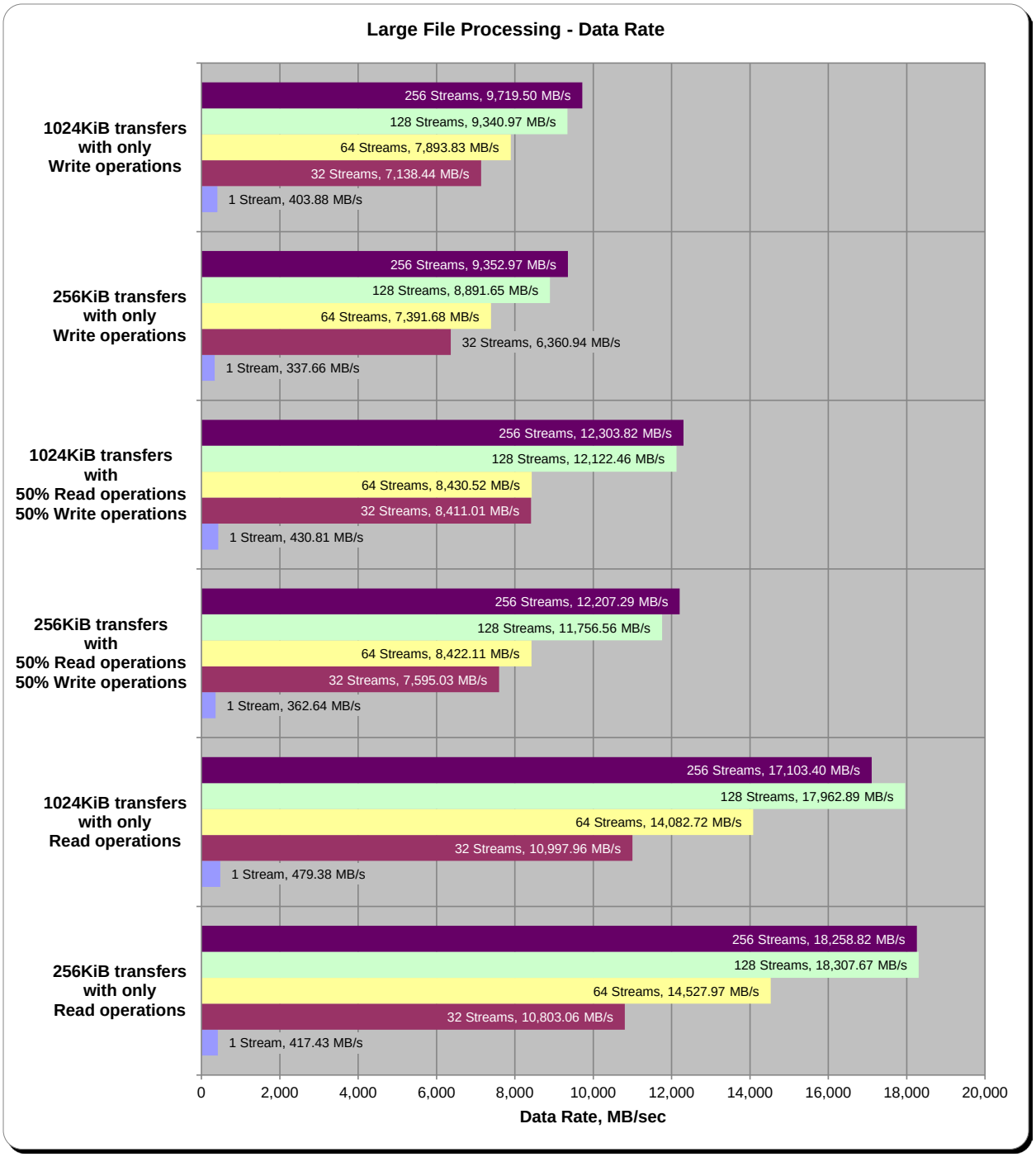
SPC-2 Large File Processing Test Results File

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	32 Streams	64 Streams	128 Streams	256 Streams
Write 1024KiB	403.88	7,138.44	7,893.83	9,340.97	9,719.50
Write 256KiB	337.66	6,360.94	7,391.68	8,891.65	9,352.97
Read/Write 1024KiB	430.81	8,411.01	8,430.52	12,122.46	12,303.82
Read/Write 256KiB	362.64	7,595.03	8,422.11	11,756.56	12,207.29
Read 1024KiB	479.38	10,997.96	14,082.72	17,962.89	17,103.40
Read 256KiB	417.43	10,803.06	14,527.97	18,307.67	18,258.82

SPC-2 Large File Processing Average Data Rates Graph

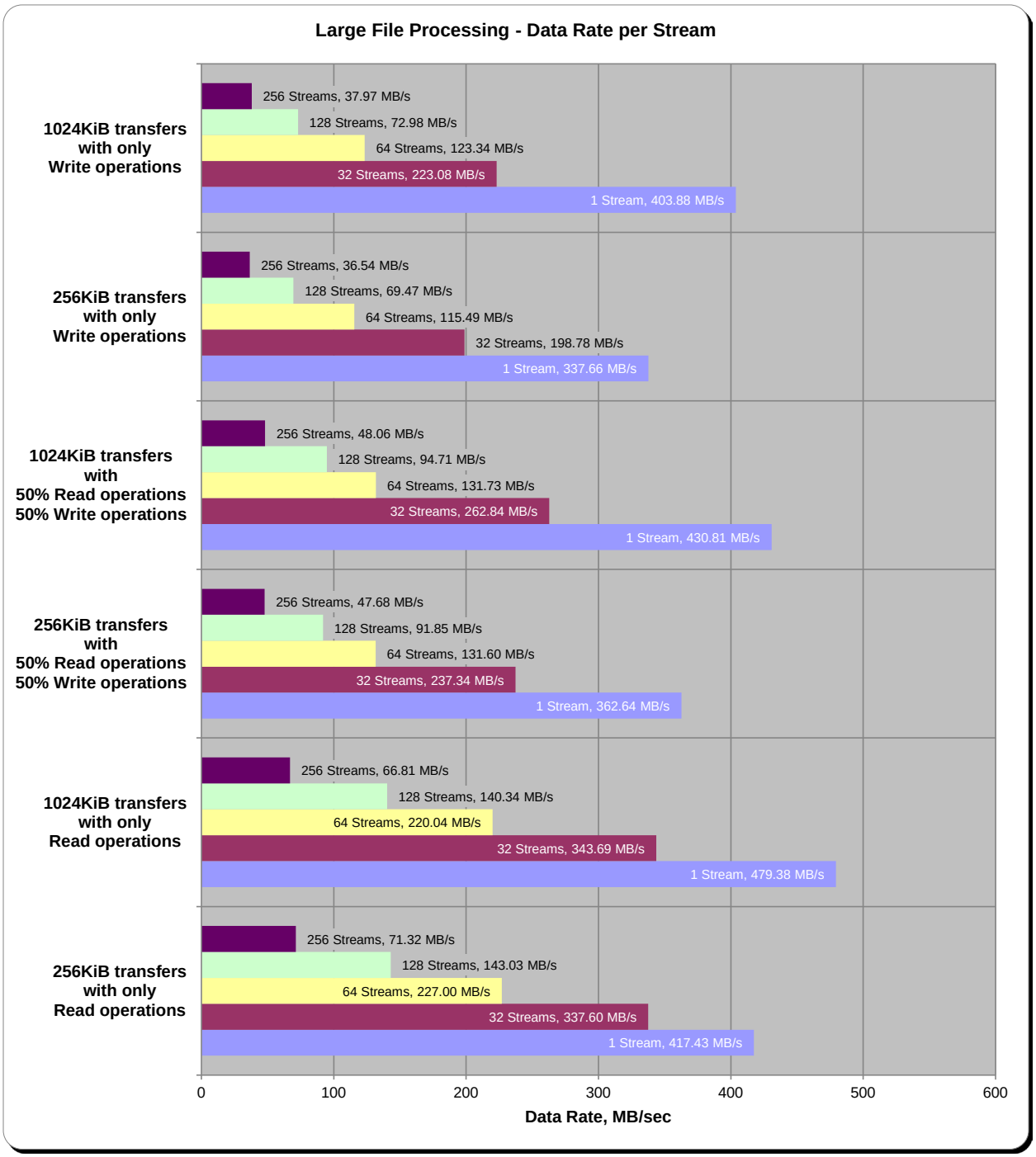


SPC-2 Large File Processing Average Data Rate per Stream

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	32 Streams	64 Streams	128 Streams	256 Streams
Write 1024KiB	403.88	223.08	123.34	72.98	37.97
Write 256KiB	337.66	198.78	115.49	69.47	36.54
Read/Write 1024KiB	430.81	262.84	131.73	94.71	48.06
Read/Write 256KiB	362.64	237.34	131.60	91.85	47.68
Read 1024KiB	479.38	343.69	220.04	140.34	66.81
Read 256KiB	417.43	337.60	227.00	143.03	71.32

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

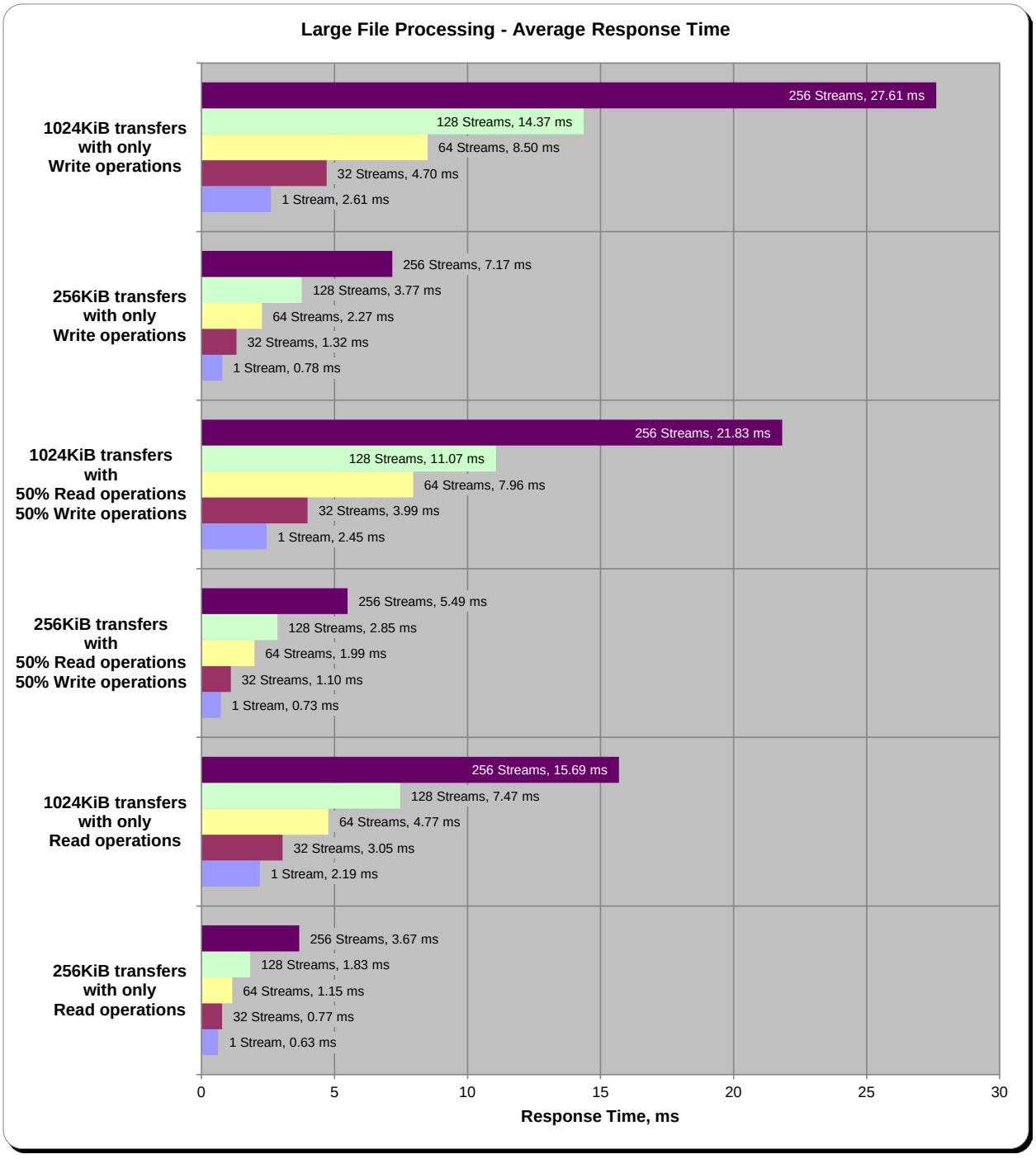


SPC-2 Large File Processing Average Response Time

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	32 Streams	64 Streams	128 Streams	256 Streams
Write 1024KiB	2.61	4.70	8.50	14.37	27.61
Write 256KiB	0.78	1.32	2.27	3.77	7.17
Read/Write 1024KiB	2.45	3.99	7.96	11.07	21.83
Read/Write 256KiB	0.73	1.10	1.99	2.85	5.49
Read 1024KiB	2.19	3.05	4.77	7.47	15.69
Read 256KiB	0.63	0.77	1.15	1.83	3.67

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.

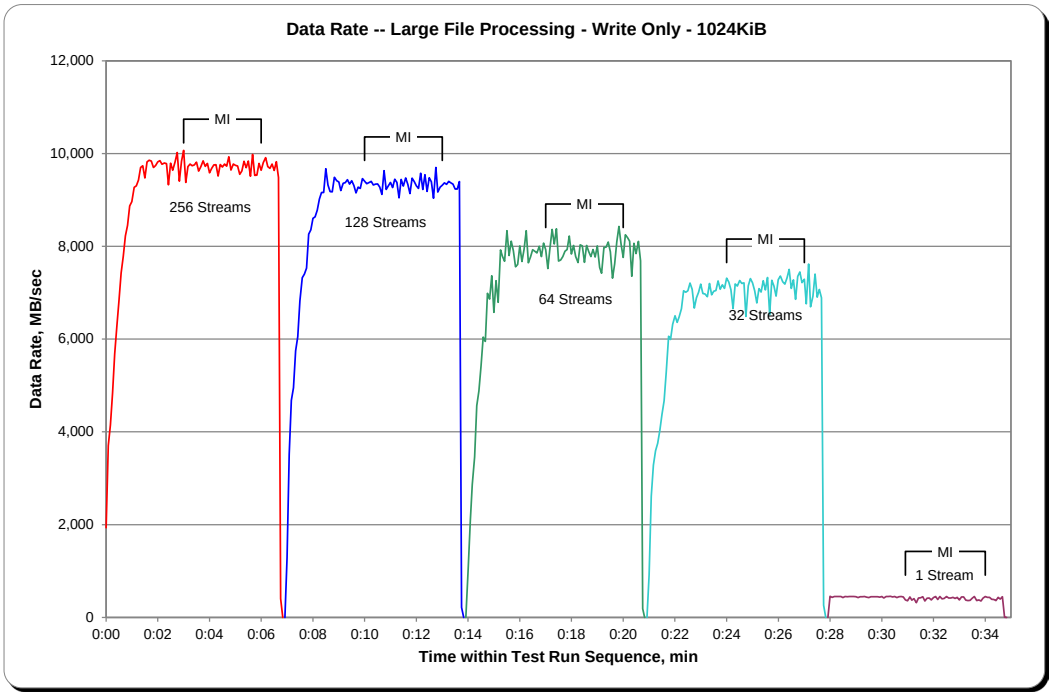
SPC-2 "Large File Processing/WRITE ONLY/1024 KiB Transfer Size" Test Run Data – Ramp-Up Period

TR1	256 Streams			TR2	128 Streams			TR3	64 Streams			TR4	32 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	1,935.88	56.94	10.19	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	3,704.20	75.60	11.79	0:07:00	1,290.38	92.17	4.19	0:14:00	1,055.71	175.95	3.16	0:21:00	921.49	184.30	2.77	0:28:00	456.34	456.34	2.34
0:00:10	4,148.38	63.82	13.98	0:07:05	3,511.89	140.48	6.13	0:14:05	2,092.12	209.21	3.88	0:21:05	2,610.53	290.06	2.75	0:28:05	431.80	431.80	2.34
0:00:15	4,836.45	55.59	16.28	0:07:10	4,679.79	129.99	6.99	0:14:10	2,865.97	204.71	4.26	0:21:10	3,285.40	365.04	2.86	0:28:10	450.26	450.26	2.35
0:00:20	5,683.28	53.11	18.27	0:07:15	4,951.59	103.16	8.69	0:14:15	3,459.88	182.10	5.21	0:21:15	3,593.47	299.46	3.18	0:28:15	449.21	449.21	2.35
0:00:25	6,271.95	51.41	19.22	0:07:20	5,748.71	108.47	9.33	0:14:20	4,564.87	182.59	5.28	0:21:20	3,752.22	288.63	3.53	0:28:20	452.78	452.78	2.33
0:00:30	6,832.31	48.11	20.12	0:07:25	6,049.65	97.58	9.90	0:14:25	4,879.86	157.41	6.22	0:21:25	4,029.89	287.85	3.53	0:28:25	449.84	449.84	2.35
0:00:35	7,422.87	48.20	20.93	0:07:30	6,825.39	97.51	10.28	0:14:30	5,422.82	154.94	6.30	0:21:30	4,376.34	257.43	3.62	0:28:30	429.71	429.71	2.35
0:00:40	7,782.32	46.32	21.51	0:07:35	7,323.88	93.90	10.78	0:14:35	6,042.10	163.30	6.16	0:21:35	4,671.20	259.51	3.76	0:28:35	449.84	449.84	2.34
0:00:45	8,226.08	45.70	22.34	0:07:40	7,401.06	90.26	11.39	0:14:40	5,951.93	145.17	6.77	0:21:40	5,291.11	251.96	3.94	0:28:40	447.11	447.11	2.36
0:00:50	8,451.73	44.25	22.60	0:07:45	7,531.08	81.86	11.64	0:14:45	6,984.77	158.74	6.41	0:21:45	6,061.40	252.56	4.09	0:28:45	449.00	449.00	2.35
0:00:55	8,871.79	43.49	23.66	0:07:50	8,264.46	81.83	12.28	0:14:50	6,861.25	137.23	7.08	0:21:50	5,992.61	239.70	4.19	0:28:50	451.94	451.94	2.34
0:01:00	8,964.70	41.70	24.40	0:07:55	8,355.89	79.58	12.95	0:14:55	7,362.26	141.58	7.36	0:21:55	6,316.62	252.66	4.17	0:28:55	449.00	449.00	2.35
0:01:05	9,272.14	41.58	24.99	0:08:00	8,604.61	79.67	13.05	0:15:00	6,575.20	121.76	8.56	0:22:00	6,502.01	250.08	4.25	0:29:00	445.85	445.85	2.37
0:01:10	9,304.85	39.93	25.48	0:08:05	8,636.70	76.43	13.33	0:15:05	7,260.13	129.65	7.98	0:22:05	6,360.03	227.14	4.36	0:29:05	430.13	430.13	2.35
0:01:15	9,428.59	39.12	26.26	0:08:10	8,778.68	77.01	13.57	0:15:10	6,793.30	113.22	8.45	0:22:10	6,475.59	215.85	4.56	0:29:10	446.06	446.06	2.37
0:01:20	9,699.12	38.49	26.84	0:08:15	9,019.85	77.09	13.50	0:15:15	7,923.04	129.89	8.25	0:22:15	6,653.63	221.79	4.75	0:29:15	447.53	447.53	2.36
0:01:25	9,736.24	38.03	27.43	0:08:20	9,158.89	75.69	13.78	0:15:20	7,784.42	121.63	8.20	0:22:20	7,043.91	227.22	4.59	0:29:20	451.73	451.73	2.34
0:01:30	9,475.77	37.01	27.53	0:08:25	9,159.10	71.56	14.08	0:15:25	7,678.72	119.98	8.79	0:22:25	7,009.52	219.05	4.83	0:29:25	438.30	438.30	2.41
0:01:35	9,818.45	38.35	27.44	0:08:30	9,671.23	75.56	14.33	0:15:30	8,335.97	130.25	8.11	0:22:30	7,039.93	220.00	4.79	0:29:30	429.71	429.71	2.35
0:01:40	9,855.57	38.50	27.40	0:08:35	9,320.58	72.82	14.40	0:15:35	7,804.13	121.94	8.58	0:22:35	7,208.12	225.25	4.58	0:29:35	448.58	448.58	2.35
0:01:45	9,838.79	38.43	27.44	0:08:40	9,177.35	71.70	14.32	0:15:40	8,109.69	126.71	8.45	0:22:40	7,072.23	221.01	4.77	0:29:40	447.32	447.32	2.36
0:01:50	9,697.44	37.88	27.72	0:08:45	9,174.83	71.68	14.48	0:15:45	7,902.49	123.48	8.49	0:22:45	6,669.36	208.42	5.00	0:29:45	447.53	447.53	2.34
0:01:55	9,738.75	38.04	27.50	0:08:50	9,485.84	74.11	14.23	0:15:50	7,556.67	118.07	8.70	0:22:50	6,890.19	215.32	4.85	0:29:50	444.81	444.81	2.37
0:02:00	9,817.61	38.35	27.50	0:08:55	9,412.02	73.53	14.37	0:15:55	7,610.15	118.91	8.86	0:22:55	7,010.78	219.09	4.81	0:29:55	436.21	436.21	2.42
0:02:05	9,847.18	38.47	27.43	0:09:00	9,385.17	73.32	14.38	0:16:00	8,009.86	125.15	8.36	0:23:00	7,186.73	224.59	4.70	0:30:00	450.89	450.89	2.34
0:02:10	9,767.49	38.15	27.47	0:09:05	9,203.77	71.90	14.29	0:16:05	7,673.06	119.89	8.74	0:23:05	6,982.89	218.22	4.83	0:30:05	419.85	419.85	2.41
0:02:15	9,797.47	38.27	27.49	0:09:10	9,358.33	73.11	14.45	0:16:10	7,936.04	124.00	8.32	0:23:10	6,971.77	217.87	4.81	0:30:10	450.26	450.26	2.35
0:02:20	9,780.28	38.20	27.55	0:09:15	9,371.75	73.22	14.37	0:16:15	8,336.60	130.26	8.11	0:23:15	6,914.73	216.09	4.88	0:30:15	450.05	450.05	2.35
0:02:25	9,324.99	36.43	27.82	0:09:20	9,438.44	73.74	14.33	0:16:20	7,646.85	119.48	8.78	0:23:20	7,198.47	224.95	4.68	0:30:20	453.61	453.61	2.33
0:02:30	9,790.76	38.25	27.51	0:09:25	9,342.39	72.99	14.32	0:16:25	7,771.42	121.43	8.61	0:23:25	6,953.95	217.31	4.82	0:30:25	442.29	442.29	2.38
0:02:35	9,637.67	37.65	27.62	0:09:30	9,416.00	73.56	14.38	0:16:30	7,924.30	123.82	8.42	0:23:30	7,034.48	219.83	4.76	0:30:30	451.94	451.94	2.34
0:02:40	9,821.17	38.36	27.49	0:09:35	9,312.40	72.75	14.37	0:16:35	7,893.89	123.34	8.57	0:23:35	7,044.96	220.16	4.75	0:30:35	427.40	427.40	2.36
0:02:45	10,021.03	39.14	27.64	0:09:40	9,151.97	71.50	14.38	0:16:40	7,857.82	122.78	8.47	0:23:40	7,252.16	226.63	4.57	0:30:40	448.37	448.37	2.36
0:02:50	9,404.47	36.74	27.50	0:09:45	9,276.75	72.47	14.30	0:16:45	7,999.17	124.99	8.52	0:23:45	7,074.11	221.07	4.77	0:30:45	450.26	450.26	2.34
0:02:55	9,832.50	38.41	27.47	0:09:50	9,249.91	72.26	14.47	0:16:50	7,780.22	121.57	8.62	0:23:50	7,172.26	224.13	4.70	0:30:50	441.45	441.45	2.38
				0:09:55	9,462.14	73.92	14.31	0:16:55	8,067.32	126.05	8.37	0:23:55	7,093.20	221.66	4.68				

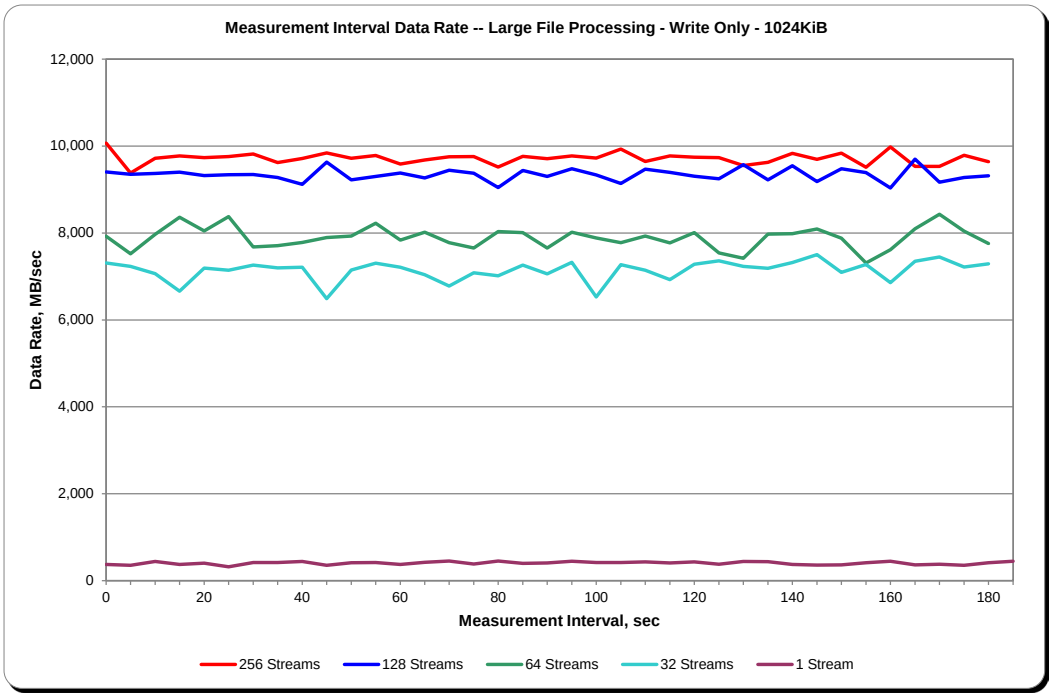
SPC-2 "Large File Processing/WRITE ONLY/1024 KiB Transfer Size" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods

TR1	256 Streams			TR2	128 Streams			TR3	64 Streams			TR4	32 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	10,070.10	39.34	27.48	0:10:00	9,403.63	73.47	14.35	0:17:00	7,924.30	123.82	8.56	0:24:00	7,311.93	228.50	4.64	0:30:55	375.39	375.39	2.79
0:03:05	9,379.09	36.64	27.67	0:10:05	9,348.06	73.03	14.35	0:17:05	7,523.11	117.55	8.60	0:24:05	7,231.61	225.99	4.65	0:31:00	357.35	357.35	2.96
0:03:10	9,718.20	37.96	27.62	0:10:10	9,370.49	73.21	14.42	0:17:10	7,969.81	124.53	8.45	0:24:10	7,066.77	220.84	4.77	0:31:05	442.08	442.08	2.39
0:03:15	9,772.52	38.17	27.61	0:10:15	9,400.90	73.44	14.24	0:17:15	8,362.81	130.67	8.08	0:24:15	6,659.09	208.10	4.85	0:31:10	372.24	372.24	2.71
0:03:20	9,734.77	38.03	27.66	0:10:20	9,319.74	72.81	14.31	0:17:20	8,049.92	125.78	8.33	0:24:20	7,191.13	224.72	4.69	0:31:15	403.70	403.70	2.62
0:03:25	9,756.79	38.11	27.60	0:10:25	9,341.76	72.98	14.37	0:17:25	8,375.40	130.87	8.07	0:24:25	7,144.16	223.25	4.78	0:31:20	318.77	318.77	3.31
0:03:30	9,815.72	38.34	27.54	0:10:30	9,344.49	73.00	14.43	0:17:30	7,680.40	120.01	8.77	0:24:30	7,262.86	226.96	4.64	0:31:25	417.96	417.96	2.52
0:03:35	9,621.52	37.58	27.47	0:10:35	9,277.38	72.48	14.47	0:17:35	7,705.99	120.41	8.57	0:24:35	7,197.43	224.92	4.70	0:31:30	421.32	421.32	2.51
0:03:40	9,711.70	37.94	27.65	0:10:40	9,119.68	71.25	14.43	0:17:40	7,781.06	121.58	8.69	0:24:40	7,212.32	225.38	4.66	0:31:35	444.60	444.60	2.37
0:03:45	9,842.14	38.45	27.63	0:10:45	9,631.38	75.25	14.45	0:17:45	7,894.94	123.36	8.33	0:24:45	6,490.06	202.81	4.98	0:31:40	353.58	353.58	2.86
0:03:50	9,720.93	37.97	27.77	0:10:50	9,223.27	72.06	14.34	0:17:50	7,928.70	123.89	8.66	0:24:50	7,147.72	223.37	4.72	0:31:45	413.98	413.98	2.55
0:03:55	9,784.89	38.22	27.52	0:10:55	9,302.76	72.68	14.42	0:17:55	8,222.93	128.48	8.15	0:24:55	7,304.38	228.26	4.59	0:31:50	416.70	416.70	2.53
0:04:00	9,585.66	37.44	27.47	0:11:00	9,378.46	73.27	14.37	0:18:00	7,834.33	122.41	8.43	0:25:00	7,212.11	225.38	4.69	0:31:55	375.81	375.81	2.79
0:04:05	9,679.61	37.81	27.90	0:11:05	9,266.27	72.39	14.31	0:18:05	8,017.62	125.28	8.37	0:25:05	7,040.14	220.00	4.80	0:32:00	426.14	426.14	2.48
0:04:10	9,752.81	38.10	27.56	0:11:10	9,444.31	73.78	14.35	0:18:10	7,778.97	121.55	8.62	0:25:10	6,777.37	211.79	4.98	0:32:05	451.52	451.52	2.34
0:04:15	9,759.10	38.12	27.67	0:11:15	9,375.95	73.25	14.40	0:18:15	7,651.88	119.56	8.77	0:25:15	7,086.28	221.45	4.77	0:32:10	385.25	385.25	2.62
0:04:20	9,517.09	37.18	27.59	0:11:20	9,047.11	70.68	14.38	0:18:20	8,032.30	125.50	8.46	0:25:20	7,014.55	219.20	4.62	0:32:15	452.36	452.36	2.33
0:04:25	9,762.45	38.13	27.48	0:11:25	9,440.75	73.76	14.46	0:18:25	8,007.14	125.11	8.38	0:25:25	7,258.66	226.83	4.74	0:32:20	400.14	400.14	2.63
0:04:30	9,709.81	37.93	27.64	0:11:30	9,300.24	72.66	14.49	0:18:30	7,652.72	119.57	8.76	0:25:30	7,058.38	220.57	4.75	0:32:25	410.20	410.20	2.56
0:04:35	9,773.57	38.18	27.48	0:11:35	9,475.77	74.03	14.35	0:18:35	8,018.88	125.30	8.37	0:25:35	7,326.19	228.94	4.61	0:32:30	449.84	449.84	2.35
0:04:40	9,725.12	37.99	27.64	0:11:40	9,334.42	72.93	14.44	0:18:40	7,884.66	123.20	8.55	0:25:40	6,530.11	204.07	4.96	0:32:35	420.27	420.27	2.51
0:04:45	9,928.97	38.79	27.59	0:11:45	9,138.55	71.39	14.18	0:18:45	7,778.76	121.54	8.52	0:25:45	7,268.52	227.14	4.65	0:32:40	419.64	419.64	2.52
0:04:50	9,642.91	37.67	27.75	0:11:50	9,468.01	73.97	14.25	0:18:50	7,931.85	123.94	8.52	0:25:50	7,143.32	223.23	4.72	0:32:45	433.27	433.27	2.34
0:04:55	9,774.20	38.18	27.52	0:11:55	9,394.61	73.40	14.31	0:18:55	7,770.16	121.41	8.63	0:25:55	6,926.26	216.45	4.78	0:32:50	411.25	411.25	2.50
0:05:00	9,744.42	38.06	27.75	0:12:00	9,304.01	72.69	14.31	0:19:00	8,008.81	125.14	8.53	0:26:00	7,280.68	227.52	4.61	0:32:55	433.48	433.48	2.49
0:05:05	9,732.67	38.02	27.50	0:12:05	9,246.97	72.24	14.40	0:19:05	7,542.83	117.86	8.79	0:26:05	7,358.70	229.96	4.53	0:33:00	378.54	378.54	2.77
0:05:10	9,553.58	37.32	27.49	0:12:10	9,572.87	74.79	14.37	0:19:10	7,419.09	115.92	9.05	0:26:10	7,233.92	226.06	4.63	0:33:05	441.87	441.87	2.37
0:05:15	9,626.14	37.60	27.77	0:12:15	9,222.86	72.05	14.42	0:19:15	7,975.05	124.61	8.43	0:26:15	7,185.26	224.54	4.70	0:33:10	441.03	441.03	2.38
0:05:20	9,831.66	38.40	27.51	0:12:20	9,544.77	74.57	14.35	0:19:20	7,983.65	124.74	8.43	0:26:20	7,319.90	228.75	4.62	0:33:15	372.87	372.87	2.81
0:05:25	9,693.46	37.87	27.73	0:12:25	9,181.75	71.73	14.37	0:19:25	8,091.86	126.44	8.29	0:26:25	7,502.98	234.47	4.51	0:33:20	362.18	362.18	2.89
0:05:30	9,836.69	38.42	27.56	0:12:30	9,479.76	74.06	14.24	0:19:30	7,882.36	123.16	8.51	0:26:30	7,092.99	221.66	4.76	0:33:25	366.37	366.37	2.82
0:05:35	9,511.21	37.15	27.60	0:12:35	9,390.21	73.36	14.40	0:19:35	7,312.14	114.25	9.18	0:26:35	7,274.81	227.34	4.64	0:33:30	415.66	415.66	2.54
0:05:40	9,981.60	38.99	27.69	0:12:40	9,036.84	70.60	14.34	0:19:40	7,615.39	118.99	8.51	0:26:40	6,859.16	214.35	4.72	0:33:35	449.42	449.42	2.35
0:05:45	9,530.93	37.23	27.62	0:12:45	9,700.59	75.79	14.33	0:19:45	8,094.59	126.48	8.34	0:26:45	7,350.73	229.71	4.58	0:33:40	362.60	362.60	2.91
0:05:50	9,533.44	37.24	27.69	0:12:50	9,168.33	71.63	14.39	0:19:50	8,428.87	131.70	8.21	0:26:50	7,445.94	232.69	4.50	0:33:45	378.33	378.33	2.76
0:05:55	9,786.57	38.23	27.64	0:12:55	9,277.80	72.48	14.37	0:19:55	8,044.47	125.69	8.02	0:26:55	7,217.56	225.55	4.73	0:33:50	355.05	355.05	3.00
0:06:00	9,640.40	37.66	27.76	0:13:00	9,316.81	72.79	14.38	0:20:00	7,758.83	121.23	8.70	0:27:00	7,288.86	227.78	4.64	0:33:55	412.72	412.72	2.45
0:06:05	9,806.91	38.31	27.61	0:13:05	9,366.51	73.18	14.40	0:20:05	8,247.89	128.87	8.18	0:27:05	6,760.17	211.26	4.79	0:34:00	450.26	450.26	2.35
0:06:10	9,911.35	38.72	27.46	0:13:10	9,336.73	72.94	14.46	0:20:10	8,190.43	127.98	8.24	0:27:10	7,615.39	237.98	4.56	0:34:05	430.96	430.96	2.44
0:06:15	9,717.36	37.96	27.67	0:13:15	9,398.81	73.43	14.31	0:20:15	8,108.43	126.69	8.23	0:27:15	6,697.46	209.30	4.91	0:34:10	433.69	433.69	2.37
0:06:20	9,681.50	37.82	27.60	0:13:20	9,366.09	73.17	14.44	0:20:20	7,353.45	114.90	9.17	0:27:20	6,923.33	216.35	4.88	0:34:15	391.96	391.96	2.72
0:06:25	9,770.84	38.17	27.68	0:13:25	9,339.88	72.97	14.40	0:20:25	8,066.49	126.04	8.36	0:27:25	7,402.95	231.34	4.56	0:34:20	386.92	386.92	2.71
0:06:30	9,634.32	37.63	27.67	0:13:30	9,236.28	72.16	14.38	0:20:30	7,844.82	122.58	8.59	0:27:30	6,905.50	215.80	4.89	0:34:25	364.07	364.07	2.82
0:06:35	9,822.01	38.37	27.50	0:13:35	9,234.39	72.14	14.59	0:20:35	8,107.17	126.67	8.31	0:27:35	7,070.76	220.96	4.58	0:34:30	434.95	434.95	2.43
0:06:40	9,481.22	37.04	27.78	0:13:40	9,395.66	180.69	14.30	0:20:40	7,685.22	226.04	8.69	0:27:40	6,890.19	215.32	4.89	0:34:35	394.47	394.47	2.68
0:06:45	405.38	0.00	22.50	0:13:45	214.75	0.00	9.22	0:20:45	188.11	0.00	5.61	0:27:45	261.72	0.00	4.36	0:34:40	446.27	446.27	2.33
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	0:34:45	5.45	0.00	2.34
																0:34:50	0.00	0.00	0.00

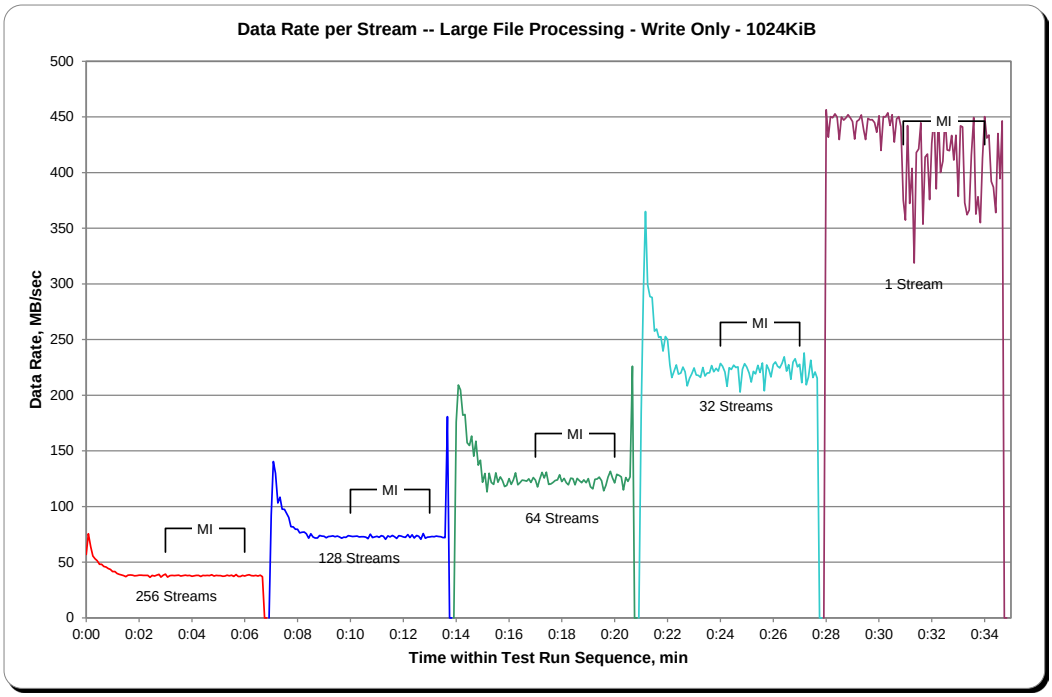
SPC-2 "Large File Processing/WRITE ONLY/1024 KiB Transfer Size" Average Data Rate Graph – Complete Test Run



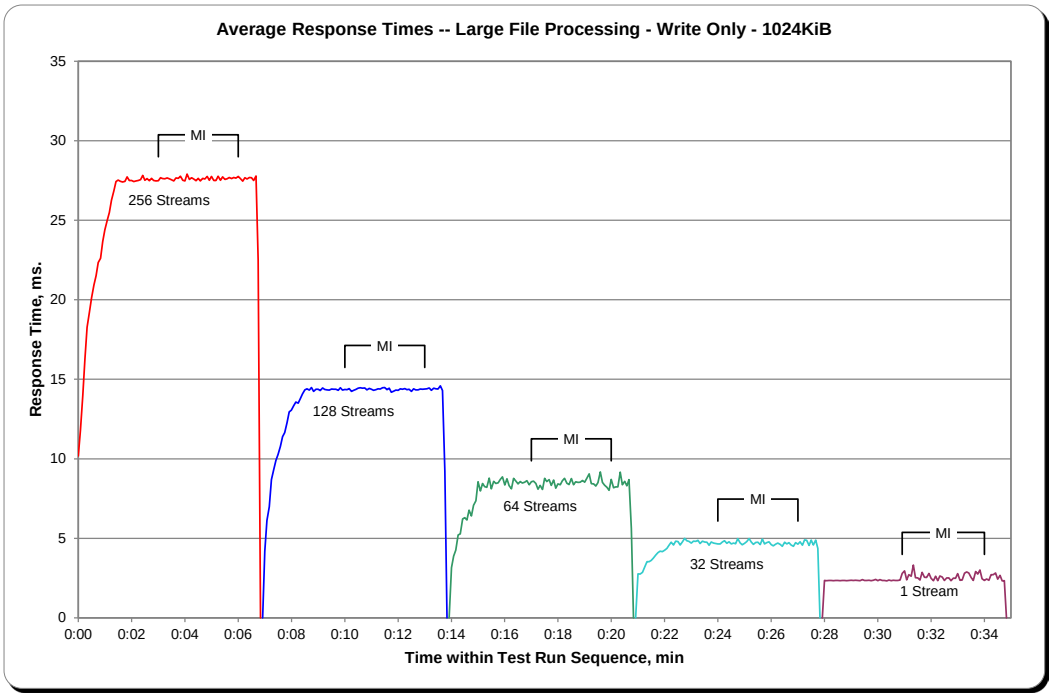
SPC-2 "Large File Processing/ WRITE ONLY /1024 KiB Transfer Size" Average Data Rate Graph – Measurement Interval (MI) Only



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



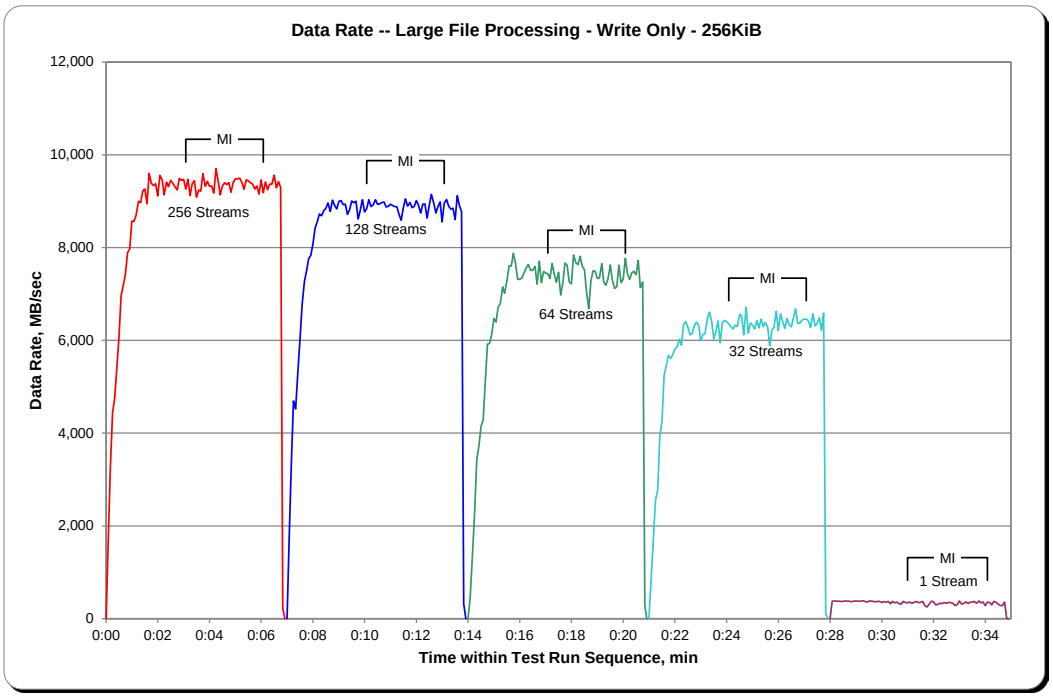
SPC-2 "Large File Processing/ WRITE ONLY /256 KiB Transfer Size" Test Run Data – Ramp-Up Period

TR6	256 Streams			TR7	128 Streams			TR8	64 Streams			TR9	32 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	1,728.84	55.77	2.40	0:07:05	1,751.33	116.76	1.31	0:14:05	437.68	145.89	0.76	0:21:05	900.15	180.03	0.79	0:28:05	379.48	379.48	0.69
0:00:10	3,293.11	65.86	3.17	0:07:10	3,349.99	124.07	1.56	0:14:10	1,380.82	172.60	1.09	0:21:10	1,736.81	217.10	0.79	0:28:10	382.00	382.00	0.69
0:00:15	4,433.90	63.34	3.65	0:07:15	4,694.95	134.14	1.83	0:14:15	2,284.17	207.65	1.11	0:21:15	2,561.72	320.22	0.82	0:28:15	378.33	378.33	0.69
0:00:20	4,764.00	51.23	4.45	0:07:20	4,522.51	102.78	2.22	0:14:20	3,430.42	180.55	1.14	0:21:20	2,762.68	230.22	0.87	0:28:20	378.90	378.90	0.69
0:00:25	5,412.75	49.21	4.86	0:07:25	5,284.19	103.61	2.37	0:14:25	3,724.86	186.24	1.34	0:21:25	3,936.20	262.41	0.93	0:28:25	374.60	374.60	0.69
0:00:30	6,072.72	45.66	5.23	0:07:30	5,990.72	93.61	2.59	0:14:30	4,148.32	165.93	1.45	0:21:30	4,253.60	236.31	1.02	0:28:30	374.92	374.92	0.69
0:00:35	6,963.91	47.37	5.34	0:07:35	6,745.86	88.76	2.69	0:14:35	4,287.89	147.86	1.60	0:21:35	5,244.98	218.54	1.09	0:28:35	381.21	381.21	0.69
0:00:40	7,186.31	46.66	5.45	0:07:40	7,265.85	87.54	2.92	0:14:40	5,122.24	150.65	1.65	0:21:40	5,454.69	209.80	1.17	0:28:40	378.80	378.80	0.69
0:00:45	7,421.98	43.40	5.72	0:07:45	7,498.16	83.31	3.05	0:14:45	5,917.11	155.71	1.62	0:21:45	5,678.35	218.40	1.19	0:28:45	379.58	379.58	0.69
0:00:50	7,890.80	43.12	5.89	0:07:50	7,761.61	81.70	3.13	0:14:50	5,934.94	148.37	1.73	0:21:50	5,608.83	200.32	1.28	0:28:50	362.70	362.70	0.70
0:00:55	7,966.71	40.85	6.18	0:07:55	7,835.01	77.57	3.26	0:14:55	6,134.22	142.66	1.78	0:21:55	5,700.22	203.58	1.29	0:28:55	380.69	380.69	0.69
0:01:00	8,569.02	41.60	6.27	0:08:00	8,085.05	74.86	3.33	0:15:00	6,472.28	134.84	1.85	0:22:00	5,818.71	207.81	1.26	0:29:00	379.48	379.48	0.69
0:01:05	8,562.41	39.46	6.47	0:08:05	8,423.11	75.21	3.44	0:15:05	6,390.86	127.82	1.93	0:22:05	5,861.43	202.12	1.27	0:29:05	380.90	380.90	0.69
0:01:10	8,699.30	38.84	6.61	0:08:10	8,559.00	75.08	3.49	0:15:10	6,720.59	122.19	2.04	0:22:10	6,025.12	200.84	1.29	0:29:10	370.51	370.51	0.69
0:01:15	8,999.40	38.79	6.82	0:08:15	8,723.26	75.20	3.48	0:15:15	6,792.68	117.12	2.23	0:22:15	5,896.72	196.56	1.28	0:29:15	385.46	385.46	0.70
0:01:20	8,965.38	37.20	6.94	0:08:20	8,686.77	71.79	3.61	0:15:20	7,154.01	119.23	2.13	0:22:20	6,340.95	198.15	1.25	0:29:20	377.96	377.96	0.70
0:01:25	9,219.39	37.48	6.95	0:08:25	8,791.47	69.77	3.70	0:15:25	7,013.82	111.33	2.25	0:22:25	6,401.66	200.05	1.32	0:29:25	358.19	358.19	0.70
0:01:30	9,261.65	36.18	7.12	0:08:30	8,841.75	69.08	3.77	0:15:30	7,297.51	114.02	2.29	0:22:30	6,283.91	196.37	1.34	0:29:30	375.39	375.39	0.70
0:01:35	8,943.04	34.93	7.20	0:08:35	8,962.44	70.02	3.75	0:15:35	7,605.64	118.84	2.22	0:22:35	6,119.54	191.24	1.38	0:29:35	381.58	381.58	0.70
0:01:40	9,602.70	37.51	7.18	0:08:40	8,779.67	68.59	3.84	0:15:40	7,598.35	118.72	2.20	0:22:40	6,149.58	192.17	1.37	0:29:40	373.92	373.92	0.71
0:01:45	9,387.01	36.67	7.18	0:08:45	9,020.48	70.47	3.71	0:15:45	7,877.37	123.08	2.12	0:22:45	6,309.86	197.18	1.31	0:29:45	365.80	365.80	0.69
0:01:50	9,335.31	36.47	7.18	0:08:50	8,913.37	69.64	3.76	0:15:50	7,659.95	119.69	2.20	0:22:50	6,391.12	199.72	1.33	0:29:50	371.20	371.20	0.71
0:01:55	9,378.73	36.64	7.14	0:08:55	8,834.57	69.02	3.80	0:15:55	7,318.12	114.35	2.28	0:22:55	6,320.97	197.53	1.32	0:29:55	372.66	372.66	0.71
0:02:00	9,115.38	35.61	7.20	0:09:00	8,992.75	70.26	3.73	0:16:00	7,311.67	114.24	2.26	0:23:00	5,993.35	187.29	1.35	0:30:00	347.76	347.76	0.75
0:02:05	9,557.09	37.33	7.22	0:09:05	9,012.77	70.41	3.74	0:16:05	7,347.11	114.80	2.29	0:23:05	6,119.17	191.22	1.37	0:30:05	370.09	370.09	0.70
0:02:10	9,451.08	36.92	7.12	0:09:10	8,924.90	69.73	3.76	0:16:10	7,458.57	116.54	2.26	0:23:10	6,145.86	192.06	1.37	0:30:10	358.67	358.67	0.76
0:02:15	9,137.40	35.69	7.19	0:09:15	8,936.02	69.81	3.74	0:16:15	7,561.86	118.15	2.23	0:23:15	6,466.04	202.06	1.31	0:30:15	372.51	372.51	0.69
0:02:20	9,409.19	36.75	7.17	0:09:20	8,715.08	68.09	3.81	0:16:20	7,637.20	119.33	2.18	0:23:20	6,607.23	206.48	1.29	0:30:20	320.24	320.24	0.82
0:02:25	9,313.19	36.38	7.11	0:09:25	8,812.91	68.85	3.77	0:16:25	7,510.43	117.35	2.21	0:23:25	6,409.74	200.30	1.31	0:30:25	371.77	371.77	0.70
0:02:30	9,449.24	36.91	7.12	0:09:30	9,002.29	70.33	3.73	0:16:30	7,507.38	117.30	2.25	0:23:30	6,034.55	188.58	1.33	0:30:30	341.42	341.42	0.75
0:02:35	9,383.03	36.65	7.18	0:09:35	8,964.91	70.04	3.78	0:16:35	7,595.67	118.68	2.26	0:23:35	6,189.11	193.41	1.36	0:30:35	358.14	358.14	0.74
0:02:40	9,309.21	36.36	7.14	0:09:40	8,999.72	70.31	3.76	0:16:40	7,211.06	112.67	2.32	0:23:40	6,420.43	200.64	1.35	0:30:40	326.68	326.68	0.79
0:02:45	9,241.36	36.10	7.26	0:09:45	8,618.19	67.33	3.76	0:16:45	7,707.35	120.43	2.18	0:23:45	5,946.74	185.84	1.36	0:30:45	314.99	314.99	0.85
0:02:50	9,490.29	37.07	7.13	0:09:50	8,807.15	68.81	3.82	0:16:50	7,243.72	113.18	2.31	0:23:50	6,381.53	199.42	1.32	0:30:50	373.61	373.61	0.70
0:02:55	9,452.91	36.93	7.12	0:09:55	9,030.23	70.55	3.74	0:16:55	7,482.90	116.92	2.20	0:23:55	6,427.56	200.86	1.32	0:30:55	349.02	349.02	0.74
0:03:00	9,468.69	36.99	7.12	0:10:00	8,769.24	68.51	3.78	0:17:00	7,445.26	116.33	2.26	0:24:00	6,407.85	200.25	1.31				

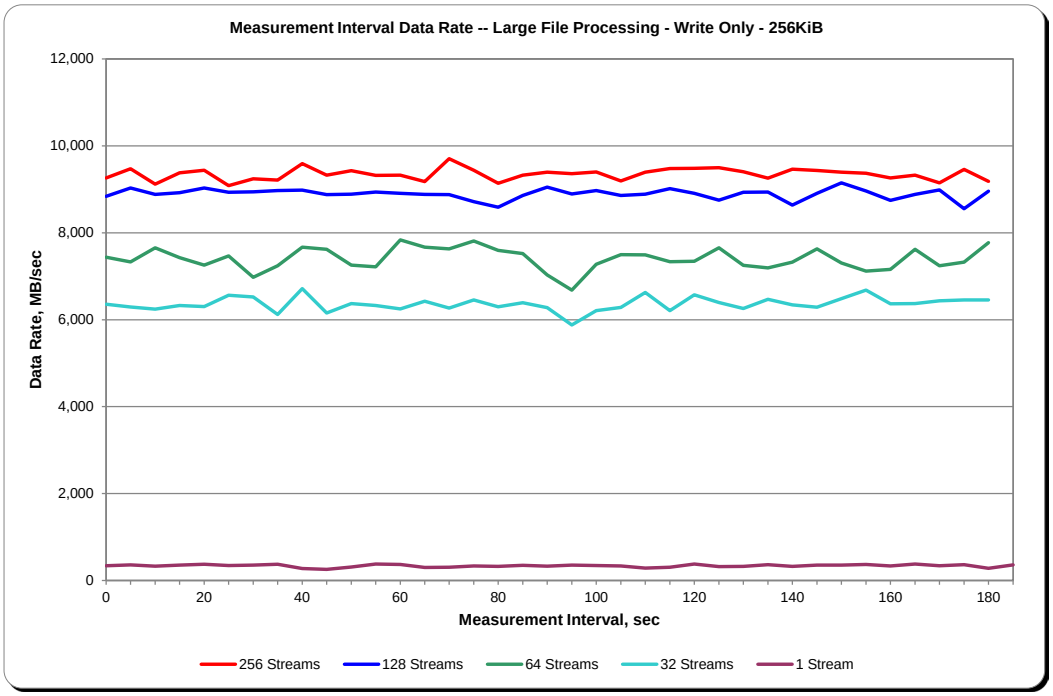
SPC-2 "Large File Processing/ WRITE ONLY /256 KiB Transfer Size" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods

TR6	256 Streams			TR7	128 Streams			TR8	64 Streams			TR9	32 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	9,263.28	36.18	7.25	0:10:05	8,839.18	69.06	3.77	0:17:05	7,436.55	116.20	2.24	0:24:05	6,354.32	198.57	1.29	0:31:00	341.42	341.42	0.76
0:03:10	9,472.15	37.00	7.14	0:10:10	9,032.38	70.57	3.74	0:17:10	7,332.17	114.57	2.29	0:24:10	6,292.03	196.63	1.34	0:31:05	361.29	361.29	0.73
0:03:15	9,118.36	35.62	7.16	0:10:15	8,884.90	69.41	3.78	0:17:15	7,655.08	119.61	2.20	0:24:15	6,244.17	195.13	1.33	0:31:10	331.19	331.19	0.79
0:03:20	9,377.47	36.63	7.20	0:10:20	8,922.49	69.71	3.77	0:17:20	7,429.74	116.09	2.26	0:24:20	6,326.01	197.69	1.32	0:31:15	356.25	356.25	0.73
0:03:25	9,439.54	36.87	7.22	0:10:25	9,031.12	70.56	3.73	0:17:25	7,254.42	113.35	2.33	0:24:25	6,301.94	196.94	1.33	0:31:20	372.66	372.66	0.70
0:03:30	9,086.17	35.49	7.22	0:10:30	8,930.35	69.77	3.75	0:17:30	7,467.07	116.67	2.24	0:24:30	6,563.93	205.12	1.31	0:31:25	344.93	344.93	0.76
0:03:35	9,241.10	36.10	7.26	0:10:35	8,943.20	69.87	3.77	0:17:35	6,975.55	108.99	2.34	0:24:35	6,525.08	203.91	1.28	0:31:30	353.06	353.06	0.75
0:03:40	9,214.31	35.99	7.19	0:10:40	8,971.46	70.09	3.75	0:17:40	7,241.78	113.15	2.30	0:24:40	6,118.65	191.21	1.32	0:31:35	374.45	374.45	0.69
0:03:45	9,591.22	37.47	7.16	0:10:45	8,980.06	70.16	3.76	0:17:45	7,668.13	119.81	2.19	0:24:45	6,714.61	209.83	1.30	0:31:40	276.98	276.98	0.94
0:03:50	9,323.89	36.42	7.15	0:10:50	8,876.46	69.35	3.74	0:17:50	7,618.53	119.04	2.22	0:24:50	6,155.77	192.37	1.33	0:31:45	254.33	254.33	1.03
0:03:55	9,427.43	36.83	7.14	0:10:55	8,890.30	69.46	3.77	0:17:55	7,257.56	113.40	2.32	0:24:55	6,373.77	199.18	1.33	0:31:50	311.37	311.37	0.85
0:04:00	9,320.48	36.41	7.19	0:11:00	8,935.44	69.81	3.75	0:18:00	7,218.24	112.78	2.34	0:25:00	6,328.84	197.78	1.32	0:31:55	377.54	377.54	0.70
0:04:05	9,324.46	36.42	7.13	0:11:05	8,906.45	69.58	3.77	0:18:05	7,837.11	122.45	2.15	0:25:05	6,247.42	195.23	1.35	0:32:00	367.37	367.37	0.71
0:04:10	9,176.09	35.84	7.22	0:11:10	8,884.79	69.41	3.77	0:18:10	7,670.65	119.85	2.19	0:25:10	6,424.94	200.78	1.30	0:32:05	300.42	300.42	0.87
0:04:15	9,703.36	37.90	7.16	0:11:15	8,878.76	69.37	3.79	0:18:15	7,630.07	119.22	2.21	0:25:15	6,270.17	195.94	1.33	0:32:10	306.76	306.76	0.85
0:04:20	9,440.59	36.88	7.13	0:11:20	8,715.19	68.09	3.84	0:18:20	7,809.58	122.02	2.15	0:25:20	6,456.08	201.75	1.28	0:32:15	333.60	333.60	0.76
0:04:25	9,137.66	35.69	7.09	0:11:25	8,589.15	67.10	3.79	0:18:25	7,596.83	118.70	2.19	0:25:25	6,298.01	196.81	1.33	0:32:20	327.84	327.84	0.80
0:04:30	9,325.72	36.43	7.22	0:11:30	8,857.74	69.20	3.82	0:18:30	7,520.81	117.51	2.21	0:25:30	6,389.03	199.66	1.35	0:32:25	350.91	350.91	0.74
0:04:35	9,395.45	36.70	7.18	0:11:35	9,048.53	70.69	3.73	0:18:35	7,032.01	109.88	2.39	0:25:35	6,278.09	196.19	1.34	0:32:30	329.88	329.88	0.79
0:04:40	9,360.38	36.56	7.21	0:11:40	8,895.18	69.49	3.76	0:18:40	6,681.95	104.41	2.47	0:25:40	5,879.73	183.74	1.37	0:32:35	352.58	352.58	0.74
0:04:45	9,399.33	36.72	7.14	0:11:45	8,973.14	70.10	3.77	0:18:45	7,278.17	113.72	2.31	0:25:45	6,210.87	194.09	1.35	0:32:40	346.55	346.55	0.75
0:04:50	9,191.03	35.90	7.21	0:11:50	8,860.57	69.22	3.80	0:18:50	7,497.32	117.15	2.23	0:25:50	6,281.44	196.30	1.34	0:32:45	336.17	336.17	0.78
0:04:55	9,395.24	36.70	7.18	0:11:55	8,887.78	69.44	3.77	0:18:55	7,489.61	117.03	2.25	0:25:55	6,628.00	207.12	1.31	0:32:50	285.42	285.42	0.92
0:05:00	9,478.34	37.02	7.09	0:12:00	9,014.35	70.42	3.73	0:19:00	7,335.26	114.61	2.31	0:26:00	6,209.51	194.05	1.30	0:32:55	303.51	303.51	0.89
0:05:05	9,484.63	37.05	7.09	0:12:05	8,907.39	69.59	3.78	0:19:05	7,347.01	114.80	2.28	0:26:05	6,572.79	205.40	1.30	0:33:00	381.73	381.73	0.69
0:05:10	9,497.27	37.10	7.12	0:12:10	8,748.01	68.34	3.76	0:19:10	7,655.55	119.62	2.19	0:26:10	6,395.74	199.87	1.31	0:33:05	318.30	318.30	0.79
0:05:15	9,406.15	36.74	7.17	0:12:15	8,934.44	69.80	3.78	0:19:15	7,251.90	113.31	2.28	0:26:15	6,259.95	195.62	1.34	0:33:10	324.64	324.64	0.81
0:05:20	9,257.25	36.16	7.15	0:12:20	8,939.53	69.84	3.78	0:19:20	7,191.55	112.37	2.31	0:26:20	6,469.29	202.17	1.29	0:33:15	363.02	363.02	0.73
0:05:25	9,460.72	36.96	7.15	0:12:25	8,637.49	67.48	3.77	0:19:25	7,325.67	114.46	2.31	0:26:25	6,339.74	198.12	1.31	0:33:20	327.16	327.16	0.80
0:05:30	9,435.24	36.86	7.11	0:12:30	8,908.91	69.60	3.77	0:19:30	7,628.81	119.20	2.21	0:26:30	6,289.57	196.55	1.32	0:33:25	353.53	353.53	0.74
0:05:35	9,394.98	36.70	7.20	0:12:35	9,146.20	71.45	3.73	0:19:35	7,305.32	114.15	2.28	0:26:35	6,485.86	202.68	1.29	0:33:30	357.46	357.46	0.73
0:05:40	9,371.91	36.61	7.10	0:12:40	8,963.54	70.03	3.77	0:19:40	7,118.00	111.22	2.37	0:26:40	6,679.69	208.74	1.25	0:33:35	371.04	371.04	0.69
0:05:45	9,259.76	36.17	7.20	0:12:45	8,744.81	68.32	3.84	0:19:45	7,155.69	111.81	2.31	0:26:45	6,367.37	198.98	1.32	0:33:40	333.29	333.29	0.81
0:05:50	9,327.14	36.43	7.14	0:12:50	8,884.32	69.41	3.77	0:19:50	7,619.48	119.05	2.26	0:26:50	6,371.57	199.11	1.31	0:33:45	380.48	380.48	0.69
0:05:55	9,149.25	35.74	7.28	0:12:55	8,984.30	70.19	3.75	0:19:55	7,243.56	113.18	2.29	0:26:55	6,433.59	201.05	1.30	0:33:50	342.31	342.31	0.77
0:06:00	9,459.62	36.95	7.15	0:13:00	8,551.56	66.81	3.79	0:20:00	7,323.73	114.43	2.29	0:27:00	6,456.29	201.76	1.30	0:33:55	363.07	363.07	0.69
0:06:05	9,183.69	35.87	7.19	0:13:05	8,959.09	69.99	3.76	0:20:05	7,770.58	121.42	2.14	0:27:05	6,455.45	201.73	1.31	0:34:00	280.86	280.86	0.94
0:06:10	9,412.49	36.77	7.18	0:13:10	9,034.22	70.58	3.74	0:20:10	7,435.50	116.18	2.28	0:27:10	6,418.70	200.58	1.30	0:34:05	360.29	360.29	0.75
0:06:15	9,247.08	36.12	7.20	0:13:15	8,888.94	69.44	3.80	0:20:15	7,312.66	114.26	2.26	0:27:15	6,276.88	196.15	1.31	0:34:10	350.33	350.33	0.72
0:06:20	9,366.61	36.59	7.17	0:13:20	8,829.17	68.98	3.81	0:20:20	7,458.21	116.53	2.25	0:27:20	6,570.85	205.34	1.29	0:34:15	297.11	297.11	0.89
0:06:25	9,365.67	36.58	7.16	0:13:25	8,847.10	69.12	3.78	0:20:25	7,489.40	117.02	2.26	0:27:25	6,307.81	197.12	1.33	0:34:20	372.56	372.56	0.71
0:06:30	9,559.24	37.34	7.15	0:13:30	8,604.25	67.22	3.82	0:20:30	7,416.68	115.89	2.18	0:27:30	6,364.59	198.89	1.33	0:34:25	352.64	352.64	0.74
0:06:35	9,290.91	36.29	7.22	0:13:35	9,118.57	71.24	3.76	0:20:35	7,721.35	120.65	2.19	0:27:35	6,488.33	202.76	1.30	0:34:30	315.94	315.94	0.83
0:06:40	9,425.13	36.82	7.16	0:13:40	8,906.45	69.58	3.80	0:20:40	7,136.56	111.51	2.35	0:27:40	6,219.58	194.36	1.30	0:34:35	283.12	283.12	0.93
0:06:45	9,298.14	75.59	7.22	0:13:45	8,777.79	68.58	3.72	0:20:45	7,260.03	113.44	2.32	0:27:45	6,588.15	506.78	1.31	0:34:40	282.07	282.07	0.94
0:06:50	220.73	0.00	4.78	0:13:50	321.97	0.00	3.07	0:20:50	279.13	0.00	1.66	0:27:50	106.90	0.00	0.95	0:34:45	359.45	359.45	0.70
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	0:34:50	6.08	0.00	0.69
																0:34:55	0.00	0.00	0.00

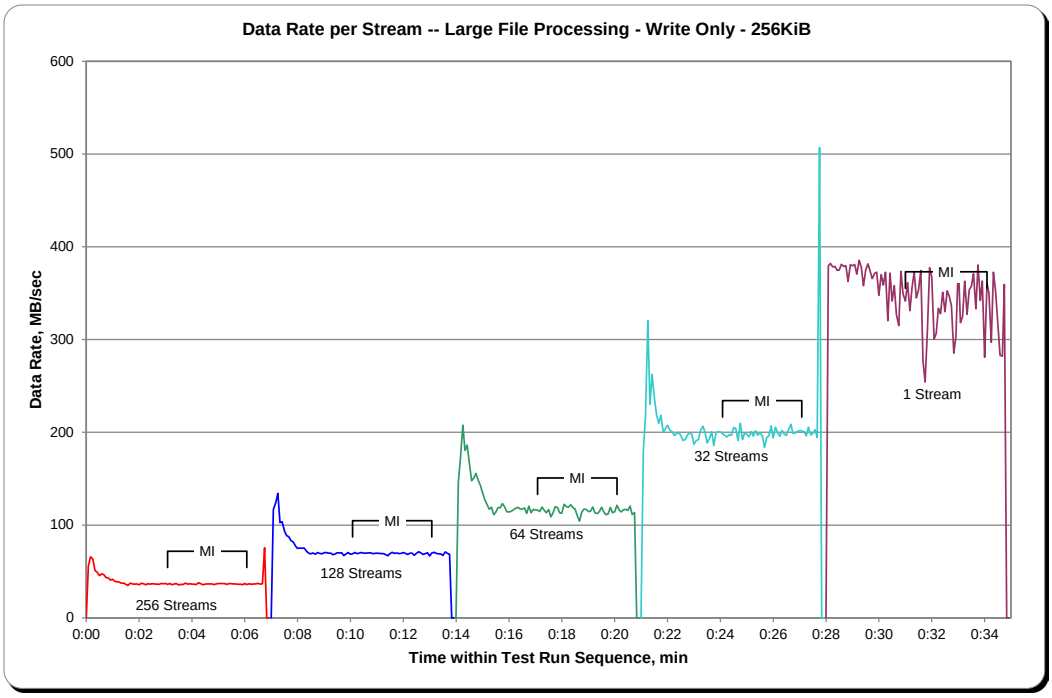
SPC-2 "Large File Processing/ WRITE ONLY /256 KiB Transfer Size" Average Data Rate Graph – Complete Test Run



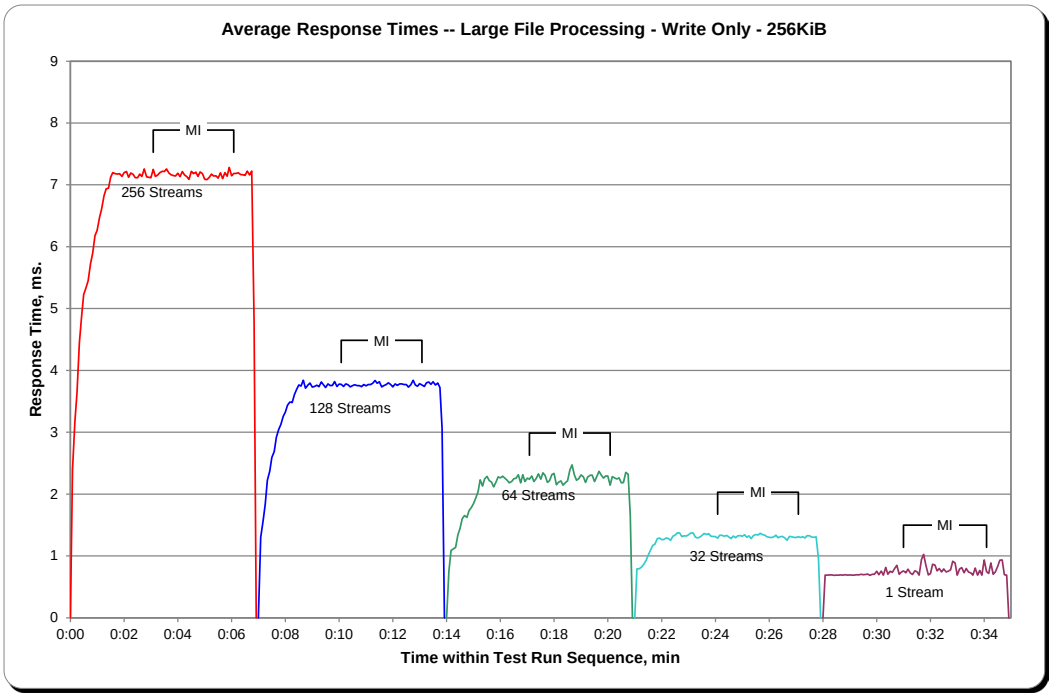
SPC-2 "Large File Processing/ WRITE ONLY /256 KiB Transfer Size" Average Data Rate Graph – Measurement Interval (MI) Only



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.

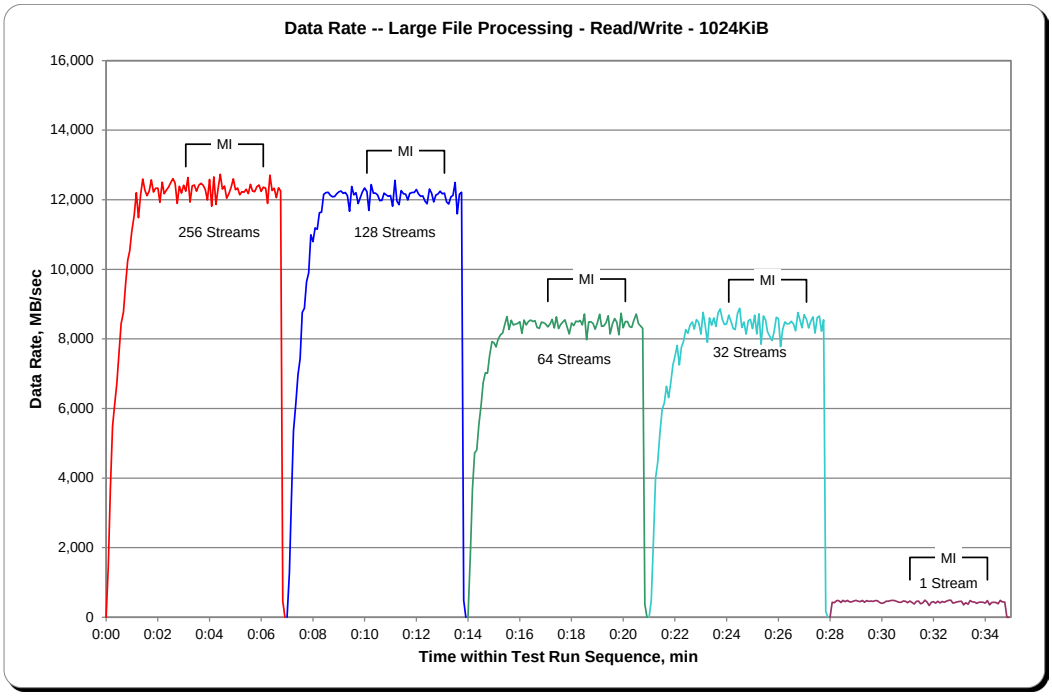
SPC-2 "Large File Processing/READ-WRITE/1024 KiB Transfer Size" Test Run Data – Ramp-Up Period

TR11	256 Streams			TR12	128 Streams			TR13	64 Streams			TR14	32 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	0:28:00	0.00	0.00	0.00
0:00:05	1,455.84	51.99	10.18	0:07:05	1,283.46	106.95	4.27	0:14:05	1,786.77	178.68	3.12	0:21:05	482.14	160.71	2.51	0:28:05	430.55	430.55	2.39
0:00:10	3,732.51	73.19	10.91	0:07:10	3,320.00	138.33	5.74	0:14:10	3,696.86	217.46	3.55	0:21:10	2,159.23	269.90	2.85	0:28:10	416.28	416.28	2.54
0:00:15	5,490.55	77.33	11.72	0:07:15	5,354.87	148.75	6.08	0:14:15	4,719.01	248.37	4.09	0:21:15	3,997.80	333.15	2.99	0:28:15	476.26	476.26	2.21
0:00:20	6,124.10	61.24	14.08	0:07:20	6,144.24	125.39	7.24	0:14:20	4,808.35	192.33	4.62	0:21:20	4,448.48	278.03	3.27	0:28:20	477.73	477.73	2.19
0:00:25	6,723.68	60.57	16.16	0:07:25	6,968.63	120.15	8.36	0:14:25	5,543.61	205.32	5.04	0:21:25	5,336.62	280.87	3.35	0:28:25	420.90	420.90	2.50
0:00:30	7,581.20	60.17	16.13	0:07:30	7,432.52	112.61	8.35	0:14:30	6,080.90	178.85	5.41	0:21:30	5,973.32	298.67	3.40	0:28:30	481.93	481.93	2.19
0:00:35	8,434.33	60.25	16.60	0:07:35	8,762.32	121.70	8.70	0:14:35	6,744.86	177.50	5.57	0:21:35	6,158.29	307.91	3.32	0:28:35	450.68	450.68	2.34
0:00:40	8,774.69	57.73	17.27	0:07:40	8,880.60	111.01	8.88	0:14:40	7,026.51	175.66	5.96	0:21:40	6,635.18	288.49	3.44	0:28:40	485.70	485.70	2.14
0:00:45	9,582.10	58.79	17.34	0:07:45	9,640.40	109.55	9.19	0:14:45	7,012.88	171.05	6.01	0:21:45	6,313.48	274.50	3.85	0:28:45	439.98	439.98	2.38
0:00:50	10,264.93	57.35	17.80	0:07:50	9,897.93	105.30	9.37	0:14:50	7,522.69	163.54	6.07	0:21:50	6,734.79	259.03	3.67	0:28:50	442.50	442.50	2.34
0:00:55	10,527.07	54.54	17.88	0:07:55	10,992.64	106.72	9.57	0:14:55	7,924.09	165.09	6.35	0:21:55	7,246.71	268.40	3.83	0:28:55	466.62	466.62	2.26
0:01:00	11,102.53	53.38	18.84	0:08:00	10,795.93	102.82	10.04	0:15:00	7,885.92	157.72	6.48	0:22:00	7,509.27	278.12	3.68	0:29:00	487.17	487.17	2.16
0:01:05	11,552.79	51.35	19.61	0:08:05	11,190.61	100.82	10.12	0:15:05	7,769.74	149.42	6.76	0:22:05	7,813.99	279.07	3.69	0:29:05	458.23	458.23	2.21
0:01:10	12,203.96	52.15	20.44	0:08:10	11,154.33	96.99	10.36	0:15:10	7,993.92	148.04	6.97	0:22:10	7,253.42	259.05	3.99	0:29:10	450.26	450.26	2.35
0:01:15	11,484.00	47.65	20.94	0:08:15	11,621.79	98.49	10.41	0:15:15	8,117.03	142.40	7.23	0:22:15	7,758.83	258.63	3.83	0:29:15	487.38	487.38	2.16
0:01:20	12,142.72	49.36	21.13	0:08:20	11,643.60	94.66	10.67	0:15:20	8,167.15	133.89	7.48	0:22:20	7,939.40	264.65	3.97	0:29:20	429.50	429.50	2.43
0:01:25	12,594.66	50.18	21.30	0:08:25	12,151.53	94.93	10.92	0:15:25	8,416.92	135.76	7.68	0:22:25	8,267.39	266.69	3.93	0:29:25	480.67	480.67	2.23
0:01:30	12,273.16	47.94	21.71	0:08:30	12,203.75	95.34	11.06	0:15:30	8,639.22	134.99	7.89	0:22:30	8,161.07	255.03	4.11	0:29:30	454.03	454.03	2.30
0:01:35	12,116.09	47.33	21.86	0:08:35	12,213.39	95.42	11.00	0:15:35	8,270.75	129.23	8.08	0:22:35	8,394.06	262.31	4.03	0:29:35	469.34	469.34	2.25
0:01:40	12,245.69	47.83	21.77	0:08:40	12,126.15	94.74	11.09	0:15:40	8,536.88	133.39	7.90	0:22:40	8,484.66	265.15	3.98	0:29:40	454.03	454.03	2.23
0:01:45	12,569.28	49.10	21.89	0:08:45	12,083.58	94.40	11.11	0:15:45	8,397.84	131.22	7.87	0:22:45	8,286.69	258.96	3.90	0:29:45	478.15	478.15	2.21
0:01:50	12,220.73	47.74	21.85	0:08:50	12,088.19	94.44	11.03	0:15:50	8,424.89	131.64	7.97	0:22:50	8,553.44	267.30	3.93	0:29:50	474.17	474.17	2.21
0:01:55	12,329.58	48.16	21.90	0:08:55	12,173.34	95.10	11.04	0:15:55	8,445.65	131.96	8.00	0:22:55	8,482.14	265.07	3.98	0:29:55	420.69	420.69	2.51
0:02:00	12,330.00	48.16	21.82	0:09:00	12,224.72	95.51	11.02	0:16:00	8,490.95	132.67	7.95	0:23:00	8,138.21	254.32	4.13	0:30:00	401.81	401.81	2.59
0:02:05	11,923.78	46.58	21.69	0:09:05	12,253.87	95.73	11.03	0:16:05	8,162.95	127.55	7.94	0:23:05	8,762.95	273.84	3.82	0:30:05	417.75	417.75	2.55
0:02:10	12,502.17	48.84	21.78	0:09:10	12,181.52	95.17	11.04	0:16:10	8,544.43	133.51	7.86	0:23:10	8,385.88	262.06	4.02	0:30:10	458.86	458.86	2.21
0:02:15	12,173.34	47.55	21.75	0:09:15	12,209.41	95.39	11.05	0:16:15	8,398.46	131.23	7.97	0:23:15	7,901.23	246.91	4.20	0:30:15	459.70	459.70	2.29
0:02:20	12,283.65	47.98	21.79	0:09:20	12,115.04	94.65	11.08	0:16:20	8,498.08	132.78	7.96	0:23:20	8,601.05	268.78	3.92	0:30:20	478.78	478.78	2.19
0:02:25	12,367.32	48.31	21.79	0:09:25	11,667.92	91.16	11.06	0:16:25	8,542.54	133.48	7.90	0:23:25	8,391.54	262.24	4.02	0:30:25	487.38	487.38	2.20
0:02:30	12,497.56	48.82	21.61	0:09:30	12,377.60	96.70	11.04	0:16:30	8,495.77	132.75	7.94	0:23:30	8,600.42	268.76	3.89	0:30:30	479.83	479.83	2.20
0:02:35	12,610.17	49.26	21.75	0:09:35	12,138.94	94.84	11.06	0:16:35	8,525.76	133.22	7.90	0:23:35	8,355.68	261.12	4.03	0:30:35	456.55	456.55	2.27
0:02:40	12,479.52	48.75	21.67	0:09:40	12,202.07	95.33	11.05	0:16:40	8,325.48	130.09	7.94	0:23:40	8,745.54	273.30	3.81	0:30:40	429.50	429.50	2.45
0:02:45	11,895.05	46.47	21.71	0:09:45	11,887.29	92.87	11.06	0:16:45	8,303.46	129.74	8.08	0:23:45	8,859.21	276.85	3.80	0:30:45	427.19	427.19	2.39
0:02:50	12,384.94	48.38	21.84	0:09:50	12,060.09	94.22	11.07	0:16:50	8,481.72	132.53	7.95	0:23:50	8,563.09	267.60	3.89	0:30:50	465.78	465.78	2.25
0:02:55	12,187.18	47.61	21.85	0:09:55	12,228.70	95.54	11.09	0:16:55	8,470.61	132.35	7.97	0:23:55	8,415.87	263.00	3.97	0:30:55	462.84	462.84	2.28
0:03:00	12,416.40	48.50	21.69	0:10:00	12,337.55	96.39	11.08	0:17:00	8,422.58	131.60	8.02	0:24:00	8,430.34	263.45	3.93	0:31:00	418.17	418.17	2.50

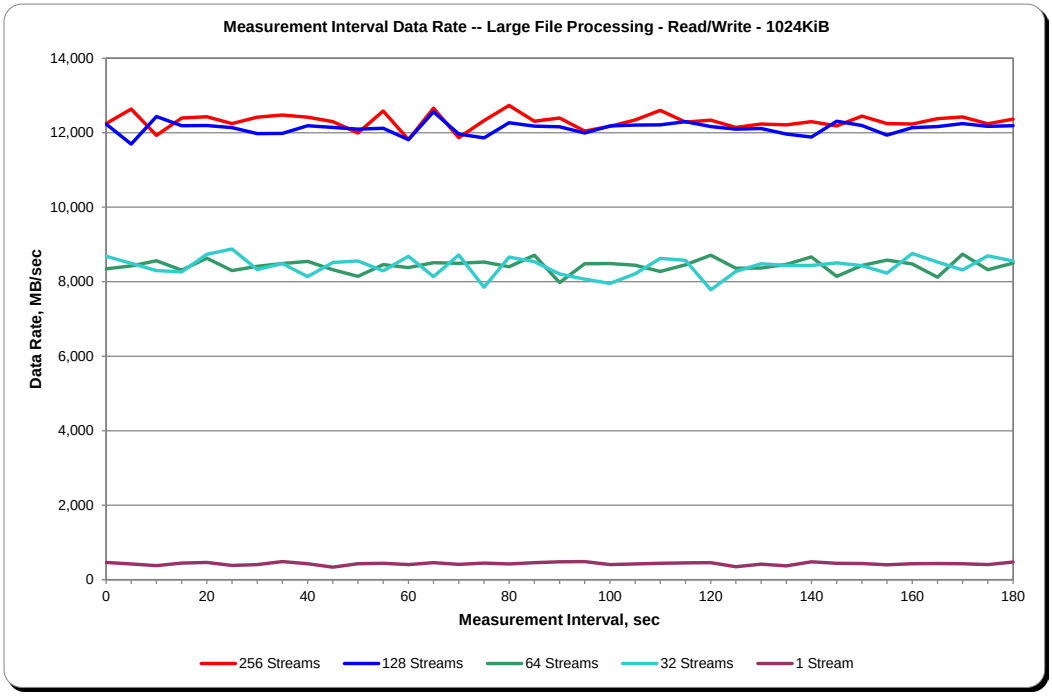
SPC-2 "Large File Processing/READ-WRITE/1024 KiB Transfer Size" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods

TR11	256 Streams			TR12	128 Streams			TR13	64 Streams			TR14	32 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	12,246.95	47.84	21.88	0:10:05	12,233.95	95.58	11.09	0:17:05	8,347.50	130.43	7.92	0:24:05	8,685.35	271.42	3.97	0:31:05	465.36	465.36	2.26
0:03:10	12,635.55	49.36	21.88	0:10:10	11,691.41	91.34	11.04	0:17:10	8,427.82	131.68	7.96	0:24:10	8,492.42	265.39	3.97	0:31:10	425.51	425.51	2.48
0:03:15	11,930.49	46.60	21.95	0:10:15	12,433.39	97.14	11.03	0:17:15	8,561.62	133.78	7.83	0:24:15	8,297.59	259.30	4.04	0:31:15	380.63	380.63	2.77
0:03:20	12,395.43	48.42	21.71	0:10:20	12,186.76	95.21	11.10	0:17:20	8,311.85	129.87	8.09	0:24:20	8,265.51	258.30	3.94	0:31:20	451.10	451.10	2.34
0:03:25	12,425.42	48.54	21.76	0:10:25	12,191.79	95.25	11.07	0:17:25	8,631.46	134.87	7.92	0:24:25	8,736.94	273.03	3.87	0:31:25	463.47	463.47	2.18
0:03:30	12,241.92	47.82	21.88	0:10:30	12,133.07	94.79	11.08	0:17:30	8,298.85	129.67	7.99	0:24:30	8,879.76	277.49	3.81	0:31:30	388.18	388.18	2.72
0:03:35	12,414.09	48.49	21.81	0:10:35	11,977.46	93.57	11.13	0:17:35	8,414.40	131.48	7.89	0:24:35	8,325.69	260.18	3.97	0:31:35	410.83	410.83	2.57
0:03:40	12,473.65	48.73	21.64	0:10:40	11,979.56	93.59	11.07	0:17:40	8,486.54	132.60	8.02	0:24:40	8,488.22	265.26	3.97	0:31:40	488.22	488.22	2.16
0:03:45	12,416.40	48.50	21.75	0:10:45	12,186.55	95.21	11.04	0:17:45	8,546.31	133.54	7.89	0:24:45	8,139.47	254.36	4.10	0:31:45	433.48	433.48	2.37
0:03:50	12,293.50	48.02	21.69	0:10:50	12,140.41	94.85	11.08	0:17:50	8,321.29	130.02	8.11	0:24:50	8,518.63	266.21	4.04	0:31:50	338.69	338.69	3.08
0:03:55	11,991.72	46.84	21.76	0:10:55	12,095.53	94.50	11.09	0:17:55	8,142.19	127.22	7.96	0:24:55	8,557.22	267.41	3.93	0:31:55	430.76	430.76	2.43
0:04:00	12,581.23	49.15	21.97	0:11:00	12,120.70	94.69	11.08	0:18:00	8,457.39	132.15	7.99	0:25:00	8,293.82	259.18	3.95	0:32:00	445.02	445.02	2.36
0:04:05	11,815.77	46.16	21.97	0:11:05	11,812.00	92.28	11.06	0:18:05	8,381.69	130.96	7.92	0:25:05	8,680.53	271.27	3.94	0:32:05	406.85	406.85	2.58
0:04:10	12,656.10	49.44	21.90	0:11:10	12,557.33	98.10	11.07	0:18:10	8,512.55	133.01	7.90	0:25:10	8,141.14	254.41	4.03	0:32:10	460.32	460.32	2.30
0:04:15	11,864.22	46.34	21.86	0:11:15	11,962.15	93.45	11.08	0:18:15	8,491.79	132.68	7.96	0:25:15	8,718.07	272.44	3.92	0:32:15	411.67	411.67	2.55
0:04:20	12,322.03	48.13	21.77	0:11:20	11,860.86	92.66	11.03	0:18:20	8,529.33	133.27	7.88	0:25:20	7,850.27	245.32	4.20	0:32:20	451.10	451.10	2.29
0:04:25	12,730.34	49.73	21.68	0:11:25	12,264.98	95.82	11.03	0:18:25	8,401.61	131.28	7.94	0:25:25	8,660.40	270.64	3.95	0:32:25	428.45	428.45	2.44
0:04:30	12,306.09	48.07	21.81	0:11:30	12,173.55	95.11	11.06	0:18:30	8,713.67	136.15	7.95	0:25:30	8,541.28	266.92	3.92	0:32:30	461.58	461.58	2.27
0:04:35	12,392.70	48.41	21.77	0:11:35	12,159.71	95.00	11.08	0:18:35	7,976.52	124.63	8.09	0:25:35	8,205.11	256.41	3.96	0:32:35	482.14	482.14	2.17
0:04:40	12,044.78	47.05	22.02	0:11:40	11,990.89	93.68	11.07	0:18:40	8,485.29	132.58	7.91	0:25:40	8,071.10	252.22	4.19	0:32:40	488.85	488.85	2.14
0:04:45	12,170.19	47.54	21.88	0:11:45	12,181.31	95.17	11.06	0:18:45	8,490.74	132.67	7.94	0:25:45	7,953.03	248.53	4.24	0:32:45	405.80	405.80	2.58
0:04:50	12,342.37	48.21	21.78	0:11:50	12,206.89	95.37	11.06	0:18:50	8,442.50	131.91	7.98	0:25:50	8,214.33	256.70	4.01	0:32:50	424.04	424.04	2.48
0:04:55	12,602.42	49.23	21.72	0:11:55	12,209.83	95.39	11.06	0:18:55	8,277.67	129.34	8.06	0:25:55	8,623.91	269.50	3.99	0:32:55	441.87	441.87	2.39
0:05:00	12,287.21	48.00	21.85	0:12:00	12,296.65	96.07	10.98	0:19:00	8,455.09	132.11	7.88	0:26:00	8,575.67	267.99	3.94	0:33:00	452.98	452.98	2.33
0:05:05	12,336.29	48.19	21.76	0:12:05	12,166.00	95.05	11.09	0:19:05	8,710.10	136.10	7.86	0:26:05	7,780.43	243.14	4.16	0:33:05	459.28	459.28	2.22
0:05:10	12,141.04	47.43	21.88	0:12:10	12,095.11	94.49	11.10	0:19:10	8,362.18	130.66	7.93	0:26:10	8,277.25	258.66	4.08	0:33:10	353.37	353.37	3.08
0:05:15	12,230.38	47.77	21.90	0:12:15	12,110.84	94.62	11.14	0:19:15	8,369.31	130.77	8.09	0:26:15	8,483.82	265.12	3.99	0:33:15	418.59	418.59	2.50
0:05:20	12,211.72	47.70	21.81	0:12:20	11,964.04	93.47	11.06	0:19:20	8,465.99	132.28	7.90	0:26:20	8,434.12	263.57	3.90	0:33:20	376.86	376.86	2.78
0:05:25	12,297.91	48.04	21.90	0:12:25	11,882.46	92.83	11.10	0:19:25	8,663.75	135.37	7.90	0:26:25	8,434.33	263.57	3.99	0:33:25	481.09	481.09	2.18
0:05:30	12,178.58	47.57	21.90	0:12:30	12,304.83	96.13	11.09	0:19:30	8,144.71	127.26	8.08	0:26:30	8,505.84	265.81	3.99	0:33:30	444.60	444.60	2.33
0:05:35	12,442.40	48.60	21.76	0:12:35	12,191.16	95.24	11.03	0:19:35	8,435.16	131.80	8.01	0:26:35	8,429.50	263.42	4.03	0:33:35	434.53	434.53	2.43
0:05:40	12,246.95	47.84	21.91	0:12:40	11,935.31	93.24	11.10	0:19:40	8,582.80	134.11	7.86	0:26:40	8,232.79	257.27	3.96	0:33:40	400.14	400.14	2.55
0:05:45	12,233.32	47.79	21.90	0:12:45	12,136.01	94.81	11.03	0:19:45	8,479.41	132.49	7.96	0:26:45	8,757.71	273.68	3.95	0:33:45	430.96	430.96	2.43
0:05:50	12,375.71	48.34	21.81	0:12:50	12,163.90	95.03	11.10	0:19:50	8,119.54	126.87	7.98	0:26:50	8,528.91	266.53	3.94	0:33:50	435.16	435.16	2.41
0:05:55	12,421.64	48.52	21.78	0:12:55	12,242.33	95.64	11.05	0:19:55	8,737.99	136.53	7.95	0:26:55	8,319.19	259.97	3.89	0:33:55	431.80	431.80	2.43
0:06:00	12,241.08	47.82	21.74	0:13:00	12,169.98	95.08	11.05	0:20:00	8,321.92	130.03	8.02	0:27:00	8,696.89	271.78	3.87	0:34:00	405.80	405.80	2.58
0:06:05	12,362.92	48.29	21.75	0:13:05	12,189.49	95.23	11.08	0:20:05	8,501.64	132.84	7.90	0:27:05	8,557.85	267.43	3.98	0:34:05	476.89	476.89	2.20
0:06:10	12,332.30	48.17	21.89	0:13:10	11,935.52	93.25	11.09	0:20:10	8,497.24	132.77	7.94	0:27:10	8,317.10	259.91	3.98	0:34:10	354.63	354.63	3.01
0:06:15	11,897.56	46.47	21.81	0:13:15	11,877.01	92.79	11.13	0:20:15	8,353.80	130.53	7.88	0:27:15	8,505.21	265.79	3.97	0:34:15	422.37	422.37	2.50
0:06:20	12,706.43	49.63	21.79	0:13:20	12,080.43	94.38	11.12	0:20:20	8,335.97	130.25	7.97	0:27:20	8,636.28	269.88	3.90	0:34:20	432.43	432.43	2.44
0:06:25	12,264.77	47.91	21.80	0:13:25	12,128.04	94.75	11.08	0:20:25	8,540.23	133.44	7.89	0:27:25	8,166.31	255.20	4.02	0:34:25	424.67	424.67	2.35
0:06:30	12,333.77	48.18	21.93	0:13:30	12,498.61	97.65	11.05	0:20:30	8,715.34	136.18	7.74	0:27:30	8,611.12	269.10	4.03	0:34:30	389.02	389.02	2.73
0:06:35	12,062.61	47.12	21.86	0:13:35	11,595.57	90.59	11.11	0:20:35	8,443.97	131.94	7.99	0:27:35	8,659.14	270.60	3.87	0:34:35	483.18	483.18	2.18
0:06:40	12,342.16	48.21	21.80	0:13:40	12,158.87	94.99	11.08	0:20:40	8,370.36	130.79	8.03	0:27:40	8,220.00	256.87	3.93	0:34:40	443.13	443.13	2.38
0:06:45	12,252.61	48.82	21.85	0:13:45	12,214.65	95.43	11.07	0:20:45	8,301.16	129.71	7.98	0:27:45	8,547.99	316.59	4.03	0:34:45	433.69	0.00	2.41
0:06:50	458.02	0.00	17.25	0:13:50	482.34	0.00	9.54	0:20:50	371.83	0.00	5.71	0:27:50	165.05	0.00	3.77	0:34:50	0.21	0.00	1.92
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

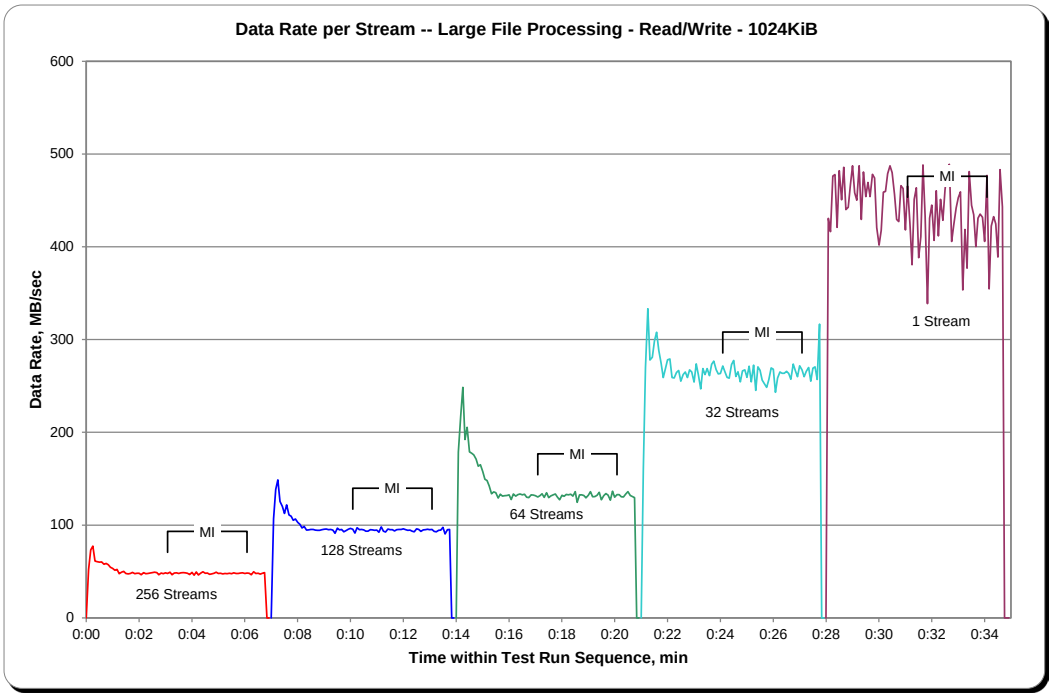
SPC-2 "Large File Processing/ READ-WRITE/1024 KiB Transfer Size" Average Data Rate Graph – Complete Test Run



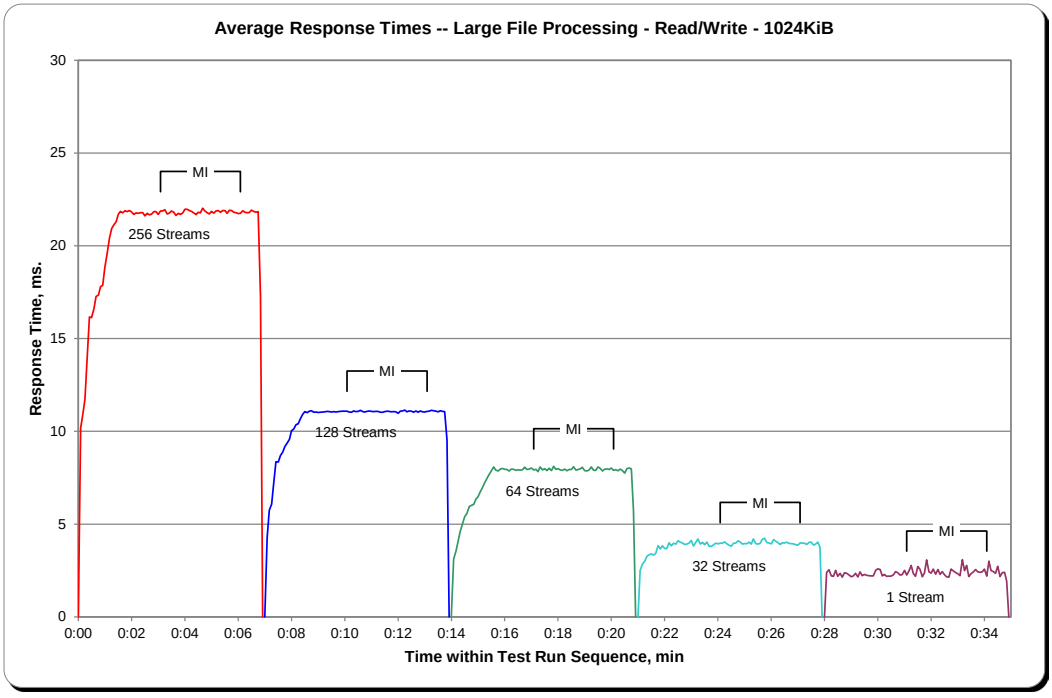
SPC-2 "Large File Processing/ READ-WRITE/1024 KiB Transfer Size" Average Data Rate Graph – Measurement Interval (MI) Only



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



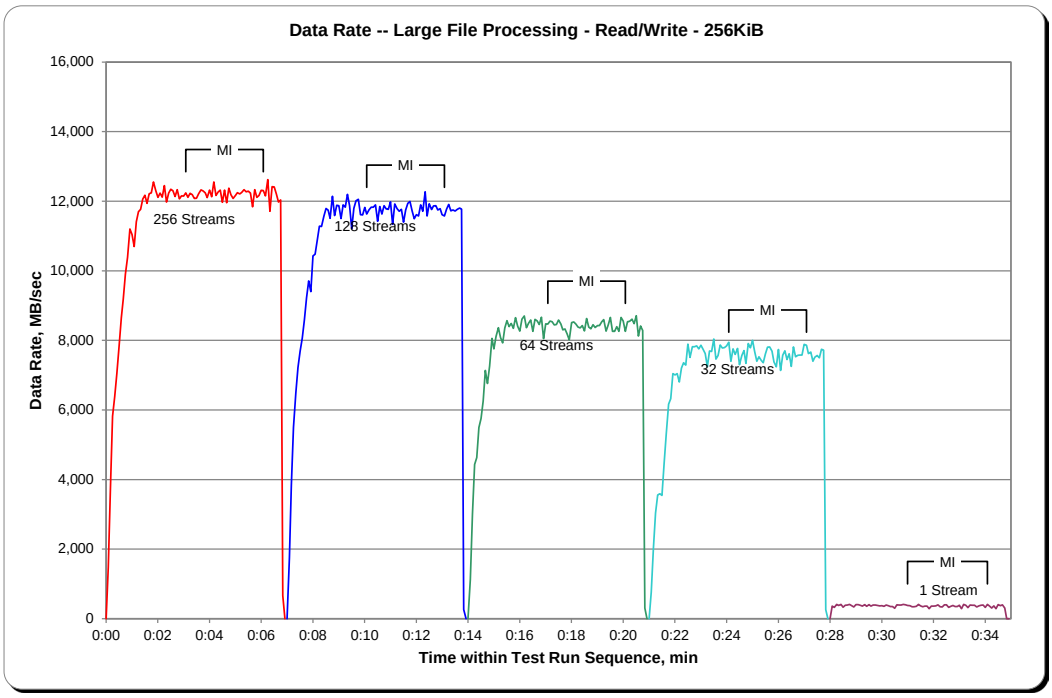
SPC-2 "Large File Processing/READ-WRITE/256 KiB Transfer Size" Test Run Data – Ramp-Up Period

TR16	256 Streams			TR17	128 Streams			TR18	64 Streams			TR19	32 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	1,476.97	54.70	2.63	0:07:05	1,752.90	103.11	1.40	0:14:05	1,130.00	161.43	0.78	0:21:05	769.60	128.27	0.79	0:28:05	363.12	363.12	0.71
0:00:10	3,726.17	66.54	3.03	0:07:10	3,830.08	132.07	1.55	0:14:10	3,019.69	215.69	0.88	0:21:10	2,018.77	252.35	0.89	0:28:10	322.59	322.59	0.81
0:00:15	5,822.43	73.70	3.18	0:07:15	5,502.30	137.56	1.67	0:14:15	4,431.81	246.21	0.97	0:21:15	3,036.62	303.66	0.79	0:28:15	412.40	412.40	0.65
0:00:20	6,381.37	63.18	3.75	0:07:20	6,491.73	127.29	1.84	0:14:20	4,630.51	210.48	1.10	0:21:20	3,554.83	296.24	0.87	0:28:20	381.84	381.84	0.67
0:00:25	7,041.66	57.72	4.15	0:07:25	7,224.16	122.44	2.03	0:14:25	5,494.07	203.48	1.21	0:21:25	3,590.38	299.20	0.88	0:28:25	410.99	410.99	0.64
0:00:30	7,794.38	57.74	4.31	0:07:30	7,687.63	116.48	2.14	0:14:30	5,751.12	198.31	1.29	0:21:30	3,545.03	236.34	0.94	0:28:30	331.77	331.77	0.81
0:00:35	8,652.01	59.67	4.30	0:07:35	8,059.83	113.52	2.20	0:14:35	6,254.81	169.05	1.33	0:21:35	4,458.70	247.71	0.95	0:28:35	389.18	389.18	0.66
0:00:40	9,185.32	55.33	4.43	0:07:40	8,592.35	110.16	2.25	0:14:40	7,136.92	187.81	1.43	0:21:40	5,308.68	252.79	0.96	0:28:40	393.32	393.32	0.67
0:00:45	9,903.96	55.95	4.45	0:07:45	9,223.06	111.12	2.30	0:14:45	6,763.42	169.09	1.45	0:21:45	6,163.22	256.80	0.96	0:28:45	408.68	408.68	0.64
0:00:50	10,383.73	56.13	4.57	0:07:50	9,708.29	112.89	2.33	0:14:50	7,258.66	168.81	1.50	0:21:50	6,327.11	253.08	0.96	0:28:50	374.87	374.87	0.69
0:00:55	11,200.78	57.74	4.60	0:07:55	9,402.37	102.20	2.41	0:14:55	8,058.62	171.46	1.52	0:21:55	7,044.91	260.92	0.98	0:28:55	337.96	337.96	0.78
0:01:00	11,041.35	54.39	4.75	0:08:00	10,426.62	103.23	2.49	0:15:00	7,754.11	155.08	1.60	0:22:00	7,003.54	259.39	1.00	0:29:00	406.64	406.64	0.65
0:01:05	10,697.26	49.99	4.89	0:08:05	10,473.91	98.81	2.55	0:15:05	8,111.89	153.05	1.66	0:22:05	7,041.35	260.79	1.00	0:29:05	406.22	406.22	0.65
0:01:10	11,408.14	50.48	5.06	0:08:10	10,874.57	97.09	2.64	0:15:10	8,364.18	154.89	1.71	0:22:10	6,805.63	234.68	1.07	0:29:10	387.66	387.66	0.68
0:01:15	11,697.23	49.99	5.15	0:08:15	11,278.54	98.07	2.67	0:15:15	8,078.70	141.73	1.80	0:22:15	7,200.26	240.01	1.06	0:29:15	360.50	360.50	0.73
0:01:20	11,764.18	49.02	5.31	0:08:20	11,271.93	94.72	2.69	0:15:20	7,926.61	129.94	1.90	0:22:20	7,355.08	245.17	1.07	0:29:20	407.42	407.42	0.64
0:01:25	12,059.25	48.82	5.32	0:08:25	11,569.46	93.30	2.78	0:15:25	8,360.45	134.85	1.92	0:22:25	7,289.07	235.13	1.07	0:29:25	354.94	354.94	0.73
0:01:30	12,173.29	47.74	5.39	0:08:30	11,791.60	92.12	2.82	0:15:30	8,564.40	133.82	1.91	0:22:30	7,893.73	246.68	1.06	0:29:30	404.91	404.91	0.65
0:01:35	11,938.04	46.63	5.51	0:08:35	11,742.22	91.74	2.87	0:15:35	8,396.84	131.20	2.01	0:22:35	7,510.22	234.69	1.09	0:29:35	364.28	364.28	0.69
0:01:40	12,211.82	47.70	5.49	0:08:40	11,505.76	89.89	2.83	0:15:40	8,488.22	132.63	1.98	0:22:40	7,816.09	244.25	1.09	0:29:40	390.59	390.59	0.67
0:01:45	12,241.13	47.82	5.48	0:08:45	12,137.69	94.83	2.84	0:15:45	8,344.31	130.38	2.00	0:22:45	7,816.71	244.27	1.07	0:29:45	395.31	395.31	0.66
0:01:50	12,554.44	49.04	5.48	0:08:50	11,584.88	90.51	2.85	0:15:50	8,654.11	135.22	1.93	0:22:50	7,840.26	245.01	1.07	0:29:50	377.49	377.49	0.70
0:01:55	12,302.84	48.06	5.48	0:08:55	11,880.00	92.81	2.84	0:15:55	8,409.58	131.40	1.97	0:22:55	7,756.05	242.38	1.08	0:29:55	369.41	369.41	0.71
0:02:00	12,109.79	47.30	5.52	0:09:00	11,869.15	92.73	2.85	0:16:00	8,268.07	129.19	2.03	0:23:00	7,857.08	245.53	1.07	0:30:00	375.39	375.39	0.70
0:02:05	12,233.68	47.79	5.50	0:09:05	11,501.99	89.86	2.83	0:16:05	8,611.22	134.55	1.95	0:23:05	7,745.10	242.03	1.08	0:30:05	358.56	358.56	0.73
0:02:10	12,116.72	47.33	5.47	0:09:10	11,895.99	92.94	2.83	0:16:10	8,700.93	135.95	1.99	0:23:10	7,620.32	238.13	1.10	0:30:10	394.21	394.21	0.65
0:02:15	12,448.43	48.63	5.46	0:09:15	11,824.32	92.38	2.83	0:16:15	8,360.98	130.64	1.98	0:23:15	7,245.14	226.41	1.11	0:30:15	372.45	372.45	0.71
0:02:20	11,977.57	46.79	5.52	0:09:20	12,193.00	95.26	2.84	0:16:20	8,495.14	132.74	1.98	0:23:20	7,694.50	240.45	1.09	0:30:20	347.18	347.18	0.74
0:02:25	12,231.95	47.78	5.50	0:09:25	11,871.35	92.74	2.83	0:16:25	8,586.58	134.17	1.96	0:23:25	7,679.93	240.00	1.10	0:30:25	352.27	352.27	0.72
0:02:30	12,340.43	48.20	5.46	0:09:30	11,212.95	87.60	2.87	0:16:30	8,261.94	129.09	1.98	0:23:30	8,037.34	251.17	1.05	0:30:30	301.68	301.68	0.89
0:02:35	12,298.96	48.04	5.48	0:09:35	11,795.06	92.15	2.85	0:16:35	8,603.25	134.43	1.94	0:23:35	7,458.68	233.08	1.13	0:30:35	396.05	396.05	0.66
0:02:40	12,132.39	47.39	5.51	0:09:40	12,010.97	93.84	2.83	0:16:40	8,562.57	133.79	1.97	0:23:40	7,567.05	236.47	1.11	0:30:40	392.85	392.85	0.69
0:02:45	12,327.74	48.16	5.44	0:09:45	12,052.33	94.16	2.84	0:16:45	8,454.35	132.10	2.00	0:23:45	7,868.51	245.89	1.07	0:30:45	393.90	393.90	0.64
0:02:50	12,064.65	47.13	5.49	0:09:50	11,612.25	90.72	2.87	0:16:50	8,666.95	135.42	1.95	0:23:50	7,783.00	243.22	1.08	0:30:50	412.09	412.09	0.63
0:02:55	12,154.04	47.48	5.49	0:09:55	11,608.31	90.69	2.84	0:16:55	8,050.23	125.78	2.03	0:23:55	7,794.90	243.59	1.08	0:30:55	398.30	398.30	0.67
0:03:00	12,147.91	47.45	5.50	0:10:00	11,822.69	92.36	2.84	0:17:00	8,471.86	132.37	1.99	0:24:00	7,842.72	245.08	1.06				

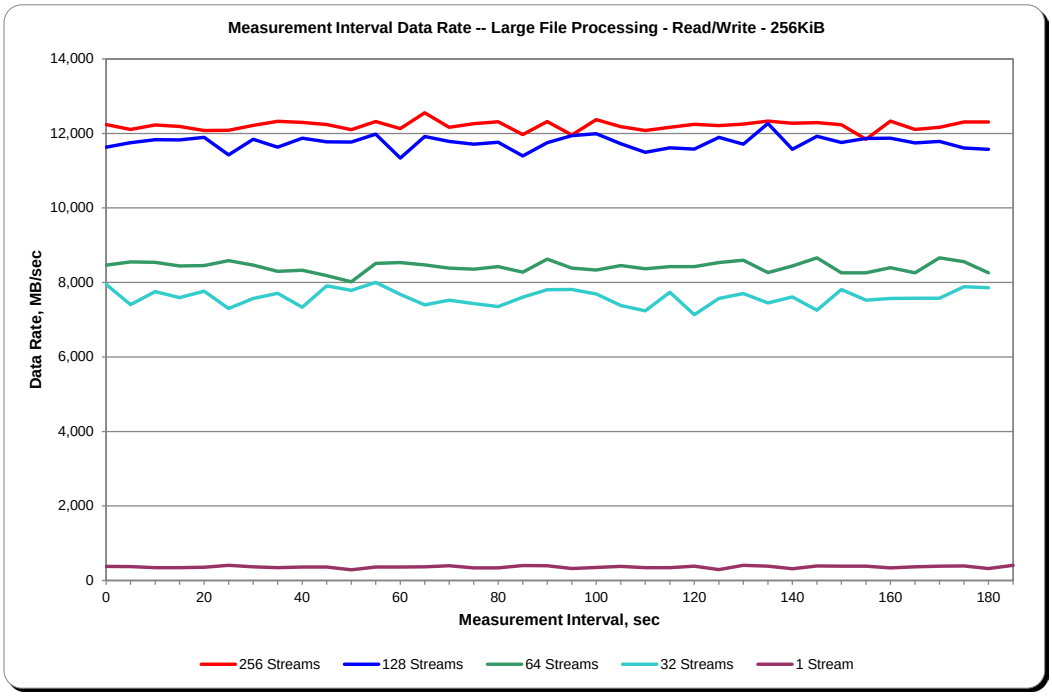
SPC-2 "Large File Processing/READ-WRITE/256 KiB Transfer Size" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods

TR16	256 Streams			TR17	128 Streams			TR18	64 Streams			TR19	32 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	12,236.83	47.80	5.51	0:10:05	11,631.49	90.87	2.86	0:17:05	8,466.05	132.28	1.97	0:24:05	7,947.16	248.35	1.06	0:31:00	381.52	381.52	0.68
0:03:10	12,108.54	47.30	5.52	0:10:10	11,750.76	91.80	2.87	0:17:10	8,552.76	133.64	1.97	0:24:10	7,402.16	231.32	1.09	0:31:05	374.71	374.71	0.71
0:03:15	12,228.18	47.77	5.50	0:10:15	11,829.20	92.42	2.85	0:17:15	8,538.45	133.41	1.97	0:24:15	7,756.95	242.40	1.09	0:31:10	344.72	344.72	0.73
0:03:20	12,189.22	47.61	5.51	0:10:20	11,825.63	92.39	2.85	0:17:20	8,441.77	131.90	1.99	0:24:20	7,594.94	237.34	1.11	0:31:15	343.62	343.62	0.76
0:03:25	12,076.61	47.17	5.53	0:10:25	11,894.42	92.93	2.83	0:17:25	8,454.25	132.10	1.99	0:24:25	7,768.58	242.77	1.08	0:31:20	355.83	355.83	0.74
0:03:30	12,085.68	47.21	5.52	0:10:30	11,423.34	89.24	2.84	0:17:30	8,584.69	134.14	1.97	0:24:30	7,302.07	228.19	1.15	0:31:25	408.21	408.21	0.64
0:03:35	12,215.18	47.72	5.49	0:10:35	11,845.34	92.54	2.86	0:17:35	8,467.15	132.30	1.98	0:24:35	7,568.04	236.50	1.12	0:31:30	370.04	370.04	0.71
0:03:40	12,322.97	48.14	5.49	0:10:40	11,631.43	90.87	2.87	0:17:40	8,300.53	129.70	2.01	0:24:40	7,707.77	240.87	1.09	0:31:35	345.82	345.82	0.75
0:03:45	12,294.50	48.03	5.50	0:10:45	11,871.03	92.74	2.87	0:17:45	8,328.42	130.13	2.00	0:24:45	7,337.41	229.29	1.10	0:31:40	364.17	364.17	0.71
0:03:50	12,236.67	47.80	5.48	0:10:50	11,776.40	92.00	2.85	0:17:50	8,184.45	127.88	2.02	0:24:50	7,912.08	247.25	1.06	0:31:45	364.17	364.17	0.73
0:03:55	12,103.50	47.28	5.47	0:10:55	11,767.33	91.93	2.85	0:17:55	8,016.42	125.26	2.12	0:24:55	7,788.77	243.40	1.07	0:31:50	286.73	286.73	0.91
0:04:00	12,320.93	48.13	5.45	0:11:00	11,978.98	93.59	2.82	0:18:00	8,511.29	132.99	1.98	0:25:00	8,003.47	250.11	1.07	0:31:55	361.44	361.44	0.73
0:04:05	12,130.40	47.38	5.51	0:11:05	11,338.57	88.58	2.89	0:18:05	8,532.11	133.31	1.98	0:25:05	7,677.20	239.91	1.09	0:32:00	362.28	362.28	0.73
0:04:10	12,554.50	49.04	5.50	0:11:10	11,919.32	93.12	2.85	0:18:10	8,470.82	132.36	1.95	0:25:10	7,398.80	231.21	1.14	0:32:05	369.20	369.20	0.71
0:04:15	12,164.58	47.52	5.47	0:11:15	11,783.16	92.06	2.88	0:18:15	8,384.31	131.00	1.98	0:25:15	7,526.52	235.20	1.12	0:32:10	397.57	397.57	0.65
0:04:20	12,261.52	47.90	5.49	0:11:20	11,713.59	91.51	2.86	0:18:20	8,357.31	130.58	1.99	0:25:20	7,433.15	232.29	1.09	0:32:15	341.00	341.00	0.75
0:04:25	12,315.58	48.11	5.47	0:11:25	11,762.77	91.90	2.85	0:18:25	8,427.88	131.69	2.00	0:25:25	7,354.14	229.82	1.15	0:32:20	337.22	337.22	0.78
0:04:30	11,966.51	46.74	5.49	0:11:30	11,396.61	89.04	2.84	0:18:30	8,274.52	129.29	2.03	0:25:30	7,607.16	237.72	1.10	0:32:25	401.66	401.66	0.64
0:04:35	12,320.87	48.13	5.44	0:11:35	11,750.08	91.80	2.88	0:18:35	8,628.36	134.82	1.95	0:25:35	7,804.18	243.88	1.08	0:32:30	397.36	397.36	0.66
0:04:40	11,957.28	46.71	5.53	0:11:40	11,939.09	93.27	2.82	0:18:40	8,384.52	131.01	1.99	0:25:40	7,812.42	244.14	1.08	0:32:35	325.16	325.16	0.80
0:04:45	12,371.36	48.33	5.49	0:11:45	11,991.62	93.68	2.86	0:18:45	8,334.55	130.23	2.01	0:25:45	7,689.68	240.30	1.10	0:32:40	353.11	353.11	0.75
0:04:50	12,183.25	47.59	5.49	0:11:50	11,722.77	91.58	2.85	0:18:50	8,451.16	132.05	1.99	0:25:50	7,383.91	230.75	1.12	0:32:45	378.38	378.38	0.70
0:04:55	12,077.34	47.18	5.51	0:11:55	11,495.91	89.81	2.85	0:18:55	8,368.53	130.76	2.01	0:25:55	7,238.95	226.22	1.15	0:32:50	347.08	347.08	0.75
0:05:00	12,163.27	47.51	5.54	0:12:00	11,613.92	90.73	2.87	0:19:00	8,427.04	131.67	2.02	0:26:00	7,734.66	241.71	1.10	0:32:55	346.76	346.76	0.75
0:05:05	12,245.95	47.84	5.46	0:12:05	11,576.54	90.44	2.87	0:19:05	8,427.56	131.68	1.97	0:26:05	7,136.92	223.03	1.15	0:33:00	388.08	388.08	0.66
0:05:10	12,207.57	47.69	5.48	0:12:10	11,895.31	92.93	2.83	0:19:10	8,535.25	133.36	1.96	0:26:10	7,568.57	236.52	1.11	0:33:05	291.35	291.35	0.90
0:05:15	12,251.30	47.86	5.52	0:12:15	11,712.28	91.50	2.85	0:19:15	8,595.39	134.30	1.95	0:26:15	7,702.16	240.69	1.11	0:33:10	408.58	408.58	0.64
0:05:20	12,328.53	48.16	5.48	0:12:20	12,267.55	95.84	2.82	0:19:20	8,264.30	129.13	2.01	0:26:20	7,449.56	232.80	1.13	0:33:15	385.88	385.88	0.68
0:05:25	12,270.44	47.93	5.49	0:12:25	11,572.61	90.41	2.84	0:19:25	8,444.23	131.94	1.99	0:26:25	7,613.24	237.91	1.10	0:33:20	317.14	317.14	0.82
0:05:30	12,287.69	48.00	5.50	0:12:30	11,922.68	93.15	2.83	0:19:30	8,659.04	135.30	1.94	0:26:30	7,254.05	226.69	1.11	0:33:25	392.85	392.85	0.67
0:05:35	12,232.01	47.78	5.51	0:12:35	11,757.53	91.86	2.85	0:19:35	8,256.38	129.01	2.00	0:26:35	7,809.64	244.05	1.11	0:33:30	385.04	385.04	0.66
0:05:40	11,842.46	46.26	5.46	0:12:40	11,866.11	92.70	2.83	0:19:40	8,259.69	129.06	2.04	0:26:40	7,527.83	235.24	1.10	0:33:35	383.83	383.83	0.68
0:05:45	12,331.20	48.17	5.48	0:12:45	11,869.72	92.73	2.86	0:19:45	8,394.69	131.17	1.97	0:26:45	7,572.92	236.65	1.11	0:33:40	337.48	337.48	0.78
0:05:50	12,106.86	47.29	5.54	0:12:50	11,746.36	91.77	2.85	0:19:50	8,257.27	129.02	2.03	0:26:50	7,575.07	236.72	1.11	0:33:45	368.05	368.05	0.71
0:05:55	12,163.43	47.51	5.48	0:12:55	11,787.25	92.09	2.84	0:19:55	8,660.40	135.32	1.99	0:26:55	7,577.32	236.79	1.09	0:33:50	387.19	387.19	0.69
0:06:00	12,309.71	48.08	5.48	0:13:00	11,609.62	90.70	2.87	0:20:00	8,554.55	133.66	1.96	0:27:00	7,883.56	246.36	1.06	0:33:55	391.12	391.12	0.67
0:06:05	12,306.19	48.07	5.48	0:13:05	11,574.92	90.43	2.84	0:20:05	8,259.27	129.05	1.97	0:27:05	7,858.71	245.58	1.08	0:34:00	323.28	323.28	0.78
0:06:10	12,149.90	47.46	5.50	0:13:10	11,769.74	91.95	2.86	0:20:10	8,536.56	133.38	1.98	0:27:10	7,620.74	238.15	1.09	0:34:05	409.42	409.42	0.64
0:06:15	12,622.39	49.31	5.48	0:13:15	11,906.42	93.02	2.83	0:20:15	8,545.16	133.52	1.99	0:27:15	7,663.15	239.47	1.11	0:34:10	363.12	363.12	0.73
0:06:20	11,712.38	45.75	5.50	0:13:20	11,723.71	91.59	2.87	0:20:20	8,611.43	134.55	1.95	0:27:20	7,397.91	231.18	1.10	0:34:15	303.77	303.77	0.86
0:06:25	12,417.55	48.51	5.53	0:13:25	11,749.03	91.79	2.85	0:20:25	8,481.46	132.52	1.99	0:27:25	7,517.45	234.92	1.12	0:34:20	366.22	366.22	0.72
0:06:30	12,411.31	48.48	5.47	0:13:30	11,717.78	91.55	2.87	0:20:30	8,705.28	136.02	1.93	0:27:30	7,565.79	236.43	1.09	0:34:25	290.40	290.40	0.89
0:06:35	12,207.57	47.69	5.50	0:13:35	11,767.38	91.93	2.85	0:20:35	8,121.12	126.89	2.06	0:27:35	7,497.42	234.29	1.12	0:34:30	403.86	403.86	0.65
0:06:40	11,973.22	46.77	5.48	0:13:40	11,804.40	92.22	2.85	0:20:40	8,411.00	131.42	1.99	0:27:40	7,740.75	241.90	1.09	0:34:35	371.56	371.56	0.71
0:06:45	12,036.24	47.02	5.48	0:13:45	11,771.31	183.93	2.85	0:20:45	8,286.53	129.48	1.99	0:27:45	7,715.84	241.12	1.08	0:34:40	400.50	400.50	0.66
0:06:50	665.22	0.00	4.49	0:13:50	264.82	0.00	1.99	0:20:50	309.59	0.00	1.52	0:27:50	257.32	0.00	0.96	0:34:45	305.56	0.00	0.84
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	0:34:50	0.00	0.00	0.00
																0:34:55	0.00	0.00	0.00

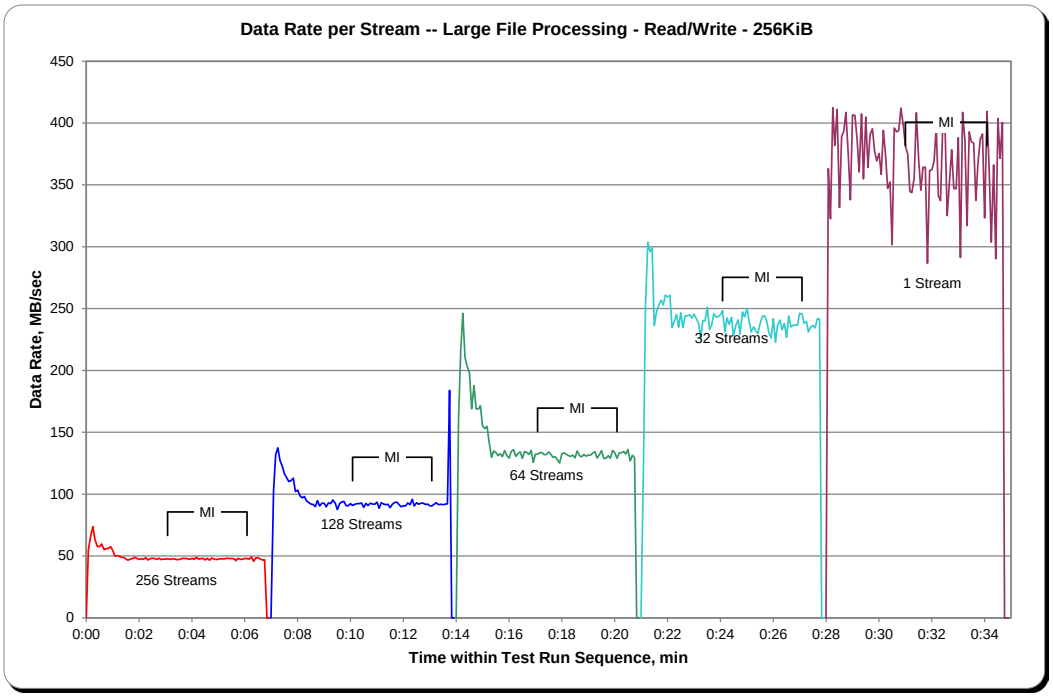
SPC-2 "Large File Processing/READ-WRITE/256 KiB Transfer Size" Average Data Rate Graph – Complete Test Run



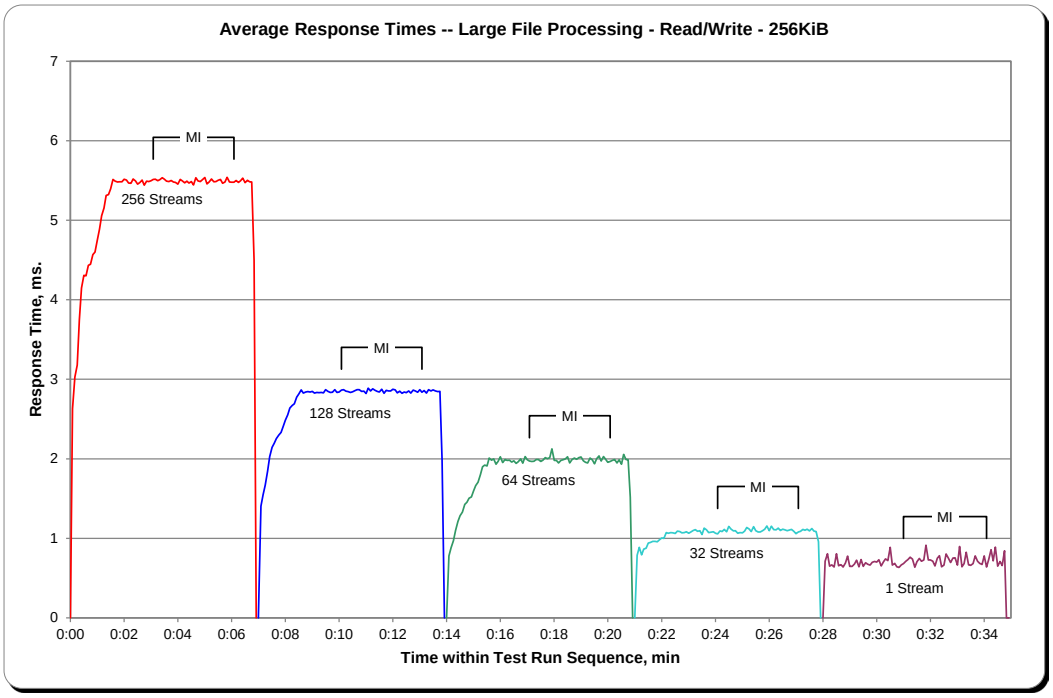
SPC-2 "Large File Processing/READ-WRITE/256 KiB Transfer Size" Average Data Rate Graph – Measurement Interval (MI) Only



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.

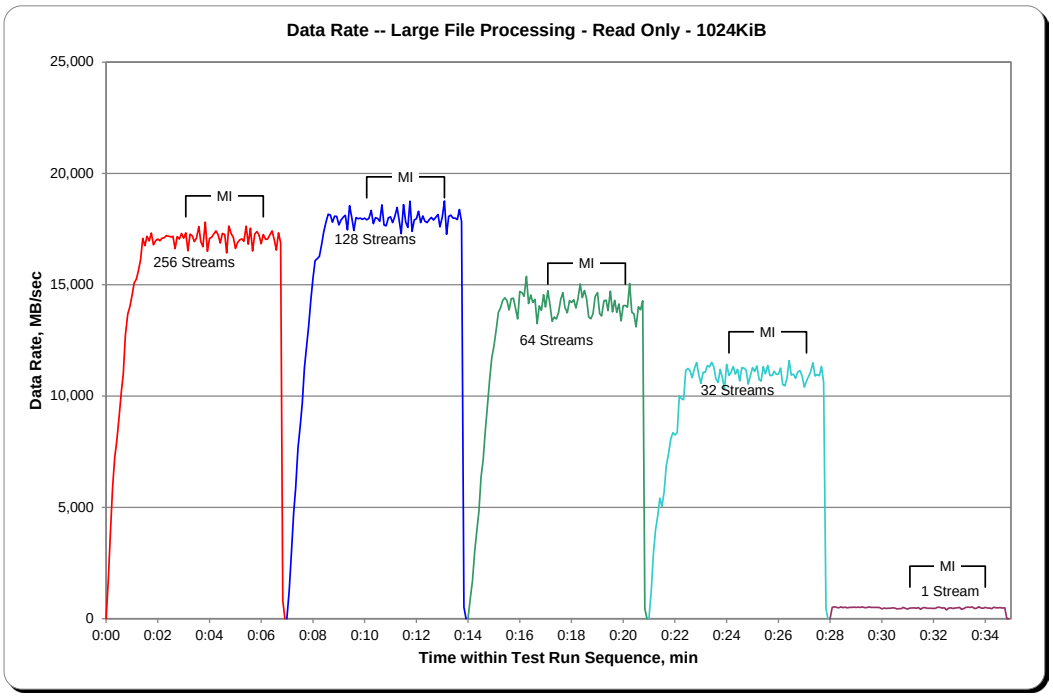
SPC-2 "Large File Processing/READ ONLY/1024 KiB Transfer Size" Test Run Data – Ramp Up Period

TR21	256 Streams			TR22	128 Streams			TR23	64 Streams			TR24	32 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	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	1,704.77	68.19	8.61	0:07:05	1,256.82	139.65	4.56	0:14:05	933.65	233.41	3.28	0:21:05	1,258.08	314.52	2.64	0:28:05	508.56	508.56	2.03
0:00:10	3,859.39	64.32	11.23	0:07:10	2,898.89	170.52	5.12	0:14:10	1,699.11	212.39	3.08	0:21:10	2,920.70	324.52	2.55	0:28:10	536.87	536.87	1.99
0:00:15	5,875.80	76.31	11.94	0:07:15	4,769.97	170.36	5.39	0:14:15	2,979.63	229.20	3.98	0:21:15	3,988.15	398.82	2.52	0:28:15	511.71	511.71	2.06
0:00:20	7,220.28	74.44	12.70	0:07:20	5,842.04	139.10	5.92	0:14:20	3,926.29	245.39	3.83	0:21:20	4,612.90	354.84	2.71	0:28:20	493.04	493.04	2.06
0:00:25	8,012.17	70.28	13.76	0:07:25	7,662.99	144.58	6.50	0:14:25	4,815.90	209.39	4.24	0:21:25	5,412.33	416.33	2.52	0:28:25	528.27	528.27	2.05
0:00:30	9,103.53	67.94	14.50	0:07:30	8,603.15	138.76	7.16	0:14:30	6,365.70	235.77	4.23	0:21:30	5,045.75	360.41	2.92	0:28:30	503.11	503.11	2.01
0:00:35	10,187.34	68.83	14.41	0:07:35	9,664.31	132.39	7.18	0:14:35	7,143.95	223.25	4.32	0:21:35	5,688.11	316.01	2.82	0:28:35	512.96	512.96	2.05
0:00:40	10,985.93	66.58	14.28	0:07:40	11,251.22	144.25	6.99	0:14:40	8,456.56	228.56	4.35	0:21:40	6,861.88	361.15	2.79	0:28:40	484.44	484.44	2.18
0:00:45	12,739.15	71.17	14.44	0:07:45	12,216.33	145.43	6.96	0:14:45	9,561.34	222.36	4.31	0:21:45	7,426.02	353.62	2.80	0:28:45	509.82	509.82	2.04
0:00:50	13,686.01	72.80	14.18	0:07:50	13,158.37	144.60	6.95	0:14:50	10,724.63	218.87	4.47	0:21:50	8,072.99	351.00	2.90	0:28:50	506.25	506.25	2.09
0:00:55	14,014.01	70.78	14.48	0:07:55	14,303.21	144.48	6.89	0:14:55	11,708.61	229.58	4.42	0:21:55	8,356.94	363.35	2.87	0:28:55	518.00	518.00	2.03
0:01:00	14,514.39	70.12	14.55	0:08:00	15,284.46	148.39	6.93	0:15:00	12,232.69	226.53	4.48	0:22:00	8,255.86	358.95	2.94	0:29:00	504.37	504.37	2.09
0:01:05	15,078.94	68.85	14.88	0:08:05	16,083.06	148.92	6.92	0:15:05	12,994.37	227.97	4.52	0:22:05	8,359.88	334.40	2.98	0:29:05	515.69	515.69	1.99
0:01:10	15,248.39	67.17	15.17	0:08:10	16,165.48	144.33	7.01	0:15:10	13,762.56	225.62	4.48	0:22:10	10,005.93	357.35	2.84	0:29:10	509.82	509.82	2.05
0:01:15	15,643.71	67.72	15.15	0:08:15	16,270.54	143.99	7.22	0:15:15	13,964.10	228.92	4.59	0:22:15	9,886.81	340.92	3.03	0:29:15	527.85	527.85	1.98
0:01:20	16,142.83	66.43	15.38	0:08:20	16,778.05	143.40	7.16	0:15:20	14,289.15	230.47	4.64	0:22:20	9,837.32	317.33	3.16	0:29:20	501.22	501.22	2.09
0:01:25	17,081.30	68.05	15.57	0:08:25	17,356.87	144.64	7.19	0:15:25	14,407.01	232.37	4.45	0:22:25	11,152.86	348.53	3.01	0:29:25	502.69	502.69	2.08
0:01:30	16,753.94	65.45	15.66	0:08:30	17,815.94	139.19	7.39	0:15:30	14,289.78	223.28	4.63	0:22:30	11,238.85	351.21	2.96	0:29:30	529.95	529.95	2.01
0:01:35	17,172.32	67.08	15.76	0:08:35	18,167.21	141.93	7.43	0:15:35	13,860.08	216.56	4.86	0:22:35	11,137.76	348.06	3.03	0:29:35	512.12	512.12	2.04
0:01:40	16,962.60	66.26	15.70	0:08:40	18,132.82	141.66	7.44	0:15:40	14,373.46	224.59	4.69	0:22:40	10,821.93	338.19	3.10	0:29:40	508.77	508.77	2.06
0:01:45	17,316.81	67.64	15.76	0:08:45	17,812.16	139.16	7.42	0:15:45	14,393.59	224.90	4.69	0:22:45	11,243.25	351.35	3.00	0:29:45	510.45	510.45	2.07
0:01:50	16,789.17	65.58	15.76	0:08:50	18,076.82	141.23	7.45	0:15:50	13,945.22	217.89	4.84	0:22:50	11,505.40	359.54	2.94	0:29:50	508.56	508.56	2.06
0:01:55	16,969.32	66.29	15.71	0:08:55	18,064.45	141.13	7.47	0:15:55	13,457.84	210.28	4.80	0:22:55	10,943.57	341.99	3.08	0:29:55	499.75	499.75	2.10
0:02:00	17,050.68	66.60	15.77	0:09:00	17,687.38	138.18	7.47	0:16:00	14,695.16	229.61	4.57	0:23:00	10,561.47	330.05	3.10	0:30:00	444.81	444.81	2.27
0:02:05	16,977.49	66.32	15.68	0:09:05	17,907.79	139.90	7.46	0:16:05	14,636.44	228.69	4.74	0:23:05	11,066.46	345.83	2.99	0:30:05	481.51	481.51	2.19
0:02:10	17,089.27	66.75	15.73	0:09:10	18,030.89	140.87	7.45	0:16:10	14,476.22	226.19	4.58	0:23:10	11,062.06	345.69	3.05	0:30:10	460.32	460.32	2.30
0:02:15	17,111.08	66.84	15.70	0:09:15	18,120.02	141.56	7.45	0:16:15	15,374.43	240.23	4.37	0:23:15	11,366.56	355.21	2.97	0:30:15	467.04	467.04	2.26
0:02:20	17,199.58	67.19	15.71	0:09:20	17,460.26	136.41	7.51	0:16:20	14,151.37	221.12	4.75	0:23:20	11,302.18	353.19	2.94	0:30:20	466.41	466.41	2.26
0:02:25	17,175.88	67.09	15.69	0:09:25	18,546.37	144.89	7.46	0:16:25	14,539.76	227.18	4.60	0:23:25	11,516.72	359.90	2.97	0:30:25	485.07	485.07	2.17
0:02:30	17,148.62	66.99	15.74	0:09:30	18,032.36	140.88	7.41	0:16:30	14,197.72	221.84	4.75	0:23:30	11,313.09	353.53	2.98	0:30:30	482.97	482.97	2.11
0:02:35	17,177.77	67.10	15.71	0:09:35	17,430.90	136.18	7.50	0:16:35	14,343.47	224.12	4.71	0:23:35	10,778.52	336.83	3.11	0:30:35	440.40	440.40	2.37
0:02:40	16,617.62	64.91	15.70	0:09:40	18,011.60	140.72	7.48	0:16:40	13,250.23	207.03	4.88	0:23:40	10,611.80	331.62	3.08	0:30:40	454.03	454.03	2.33
0:02:45	17,167.29	67.06	15.71	0:09:45	17,961.27	140.32	7.45	0:16:45	14,046.93	219.48	4.94	0:23:45	11,193.76	349.80	3.01	0:30:45	450.26	450.26	2.35
0:02:50	17,045.65	66.58	15.85	0:09:50	17,986.85	140.52	7.47	0:16:50	13,841.83	216.28	4.68	0:23:50	10,818.37	338.07	3.12	0:30:50	508.35	508.35	2.08
0:02:55	17,302.55	67.59	15.49	0:09:55	17,928.34	140.07	7.46	0:16:55	14,546.89	227.30	4.75	0:23:55	10,328.05	322.75	3.18	0:30:55	463.68	463.68	2.26
0:03:00	17,086.97	66.75	15.57	0:10:00	17,986.64	140.52	7.44	0:17:00	13,998.70	218.73	4.75	0:24:00	11,422.56	356.95	3.01	0:31:00	428.66	428.66	2.37

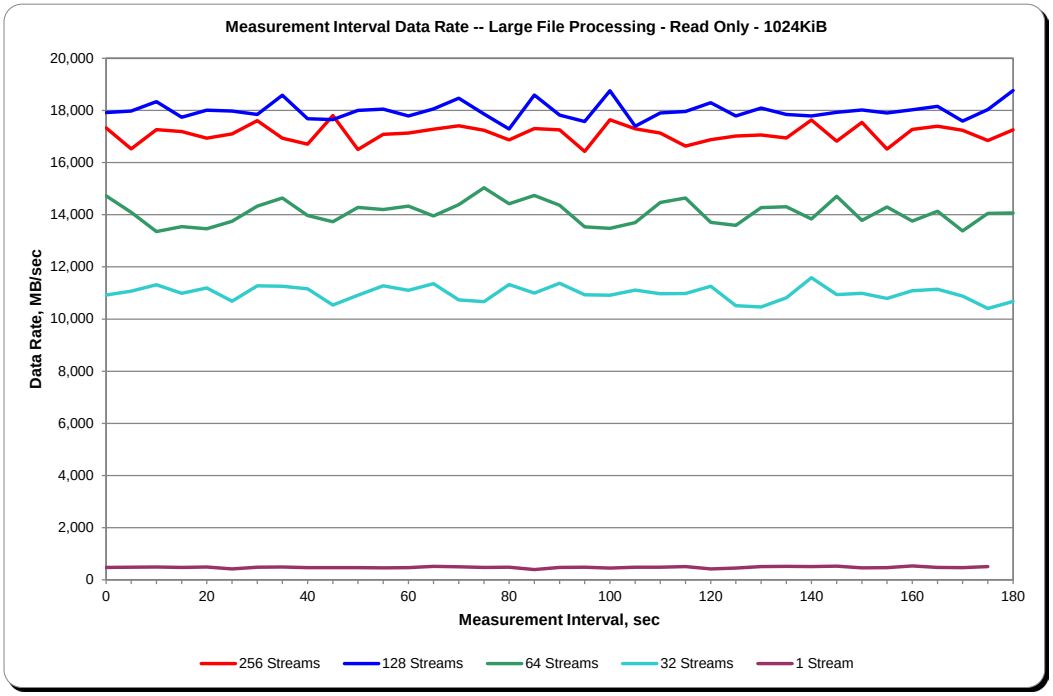
SPC-2 "Large File Processing/READ ONLY/1024 KiB Transfer Size" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods

TR21	256 Streams			TR22	128 Streams			TR23	64 Streams			TR24	32 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
0:03:05	17,325.62	67.68	15.82	0:10:05	17,917.44	139.98	7.53	0:17:05	14,726.62	230.10	4.58	0:24:05	10,925.74	341.43	3.07	0:31:05	475.84	475.84	2.16
0:03:10	16,522.41	64.54	15.80	0:10:10	17,974.90	140.43	7.48	0:17:10	14,095.59	220.24	4.78	0:24:10	11,068.35	345.89	3.01	0:31:10	482.34	482.34	2.27
0:03:15	17,266.69	67.45	15.63	0:10:15	18,336.03	143.25	7.45	0:17:15	13,359.07	208.74	4.98	0:24:15	11,317.49	353.67	2.94	0:31:15	491.78	491.78	2.14
0:03:20	17,191.19	67.15	15.67	0:10:20	17,736.45	138.57	7.46	0:17:20	13,546.97	211.67	4.98	0:24:20	10,988.66	343.40	3.07	0:31:20	473.33	473.33	2.14
0:03:25	16,933.24	66.15	15.72	0:10:25	18,006.15	140.67	7.46	0:17:25	13,464.97	210.39	4.91	0:24:25	11,193.97	349.81	3.01	0:31:25	494.93	494.93	2.13
0:03:30	17,097.87	66.79	15.67	0:10:30	17,974.48	140.43	7.47	0:17:30	13,747.25	214.80	4.89	0:24:30	10,681.21	333.79	3.11	0:31:30	419.85	419.85	2.45
0:03:35	17,606.64	68.78	15.77	0:10:35	17,847.18	139.43	7.44	0:17:35	14,332.15	223.94	4.67	0:24:35	11,275.97	352.37	3.00	0:31:35	486.96	486.96	2.22
0:03:40	16,934.92	66.15	15.62	0:10:40	18,585.38	145.20	7.48	0:17:40	14,643.78	228.81	4.55	0:24:40	11,257.09	351.78	2.94	0:31:40	496.61	496.61	2.13
0:03:45	16,703.82	65.25	15.80	0:10:45	17,677.10	138.10	7.50	0:17:45	13,968.71	218.26	4.81	0:24:45	11,158.32	348.70	3.00	0:31:45	468.92	468.92	2.24
0:03:50	17,807.55	69.56	15.58	0:10:50	17,647.95	137.87	7.48	0:17:50	13,735.51	214.62	4.91	0:24:50	10,538.82	329.34	3.19	0:31:50	467.87	467.87	2.16
0:03:55	16,503.96	64.47	15.65	0:10:55	17,997.55	140.61	7.47	0:17:55	14,283.70	223.18	4.73	0:24:55	10,914.21	341.07	3.09	0:31:55	467.66	467.66	2.24
0:04:00	17,081.51	66.72	15.76	0:11:00	18,048.30	141.00	7.41	0:18:00	14,201.07	221.89	4.70	0:25:00	11,273.87	352.31	2.95	0:32:00	460.32	460.32	2.28
0:04:05	17,135.20	66.93	15.73	0:11:05	17,788.88	138.98	7.50	0:18:05	14,329.84	223.90	4.73	0:25:05	11,105.47	347.05	3.04	0:32:05	472.07	472.07	2.22
0:04:10	17,276.34	67.49	15.55	0:11:10	18,053.75	141.04	7.46	0:18:10	13,950.88	217.98	4.80	0:25:10	11,354.40	354.83	2.98	0:32:10	515.27	515.27	2.05
0:04:15	17,412.86	68.02	15.60	0:11:15	18,469.62	144.29	7.49	0:18:15	14,384.37	224.76	4.61	0:25:15	10,737.21	335.54	3.14	0:32:15	504.16	504.16	2.09
0:04:20	17,240.27	67.34	15.80	0:11:20	17,862.07	139.55	7.50	0:18:20	15,038.26	234.97	4.47	0:25:20	10,666.12	333.32	3.04	0:32:20	475.84	475.84	2.21
0:04:25	16,865.72	65.88	15.76	0:11:25	17,285.57	135.04	7.49	0:18:25	14,416.87	225.26	4.66	0:25:25	11,323.99	353.87	2.98	0:32:25	486.75	486.75	2.15
0:04:30	17,300.87	67.58	15.57	0:11:30	18,592.30	145.25	7.47	0:18:30	14,742.56	230.35	4.54	0:25:30	10,996.63	343.64	3.05	0:32:30	396.57	396.57	2.66
0:04:35	17,255.79	67.41	15.66	0:11:35	17,818.87	139.21	7.41	0:18:35	14,360.88	224.39	4.70	0:25:35	11,374.11	355.44	2.98	0:32:35	473.33	473.33	2.14
0:04:40	16,425.73	64.16	15.76	0:11:40	17,572.25	137.28	7.46	0:18:40	13,535.44	211.49	4.97	0:25:40	10,933.08	341.66	3.05	0:32:40	487.80	487.80	2.20
0:04:45	17,639.15	68.90	15.63	0:11:45	18,750.01	146.48	7.43	0:18:45	13,475.04	210.55	4.96	0:25:45	10,914.42	341.08	3.09	0:32:45	456.13	456.13	2.27
0:04:50	17,292.07	67.55	15.64	0:11:50	17,394.62	135.90	7.44	0:18:50	13,697.34	214.02	4.82	0:25:50	11,113.02	347.28	3.02	0:32:50	481.93	481.93	2.19
0:04:55	17,128.49	66.91	15.68	0:11:55	17,902.34	139.86	7.49	0:18:55	14,466.57	226.04	4.68	0:25:55	10,972.30	342.88	3.08	0:32:55	484.44	484.44	2.18
0:05:00	16,628.95	64.96	15.80	0:12:00	17,961.27	140.32	7.47	0:19:00	14,643.36	228.80	4.64	0:26:00	10,977.75	343.05	3.06	0:33:00	509.82	509.82	2.07
0:05:05	16,877.25	65.93	15.76	0:12:05	18,297.65	142.95	7.48	0:19:05	13,705.10	214.14	4.81	0:26:05	11,256.04	351.75	2.99	0:33:05	423.41	423.41	2.39
0:05:10	17,016.71	66.47	15.77	0:12:10	17,789.30	138.98	7.48	0:19:10	13,596.68	212.45	4.83	0:26:10	10,512.81	328.53	3.10	0:33:10	450.68	450.68	2.32
0:05:15	17,061.59	66.65	15.73	0:12:15	18,090.45	141.33	7.44	0:19:15	14,273.64	223.03	4.72	0:26:15	10,461.43	326.92	3.20	0:33:15	510.03	510.03	2.07
0:05:20	16,942.05	66.18	15.76	0:12:20	17,845.09	139.41	7.49	0:19:20	14,308.87	223.58	4.78	0:26:20	10,812.29	337.88	3.10	0:33:20	521.56	521.56	2.02
0:05:25	17,627.40	68.86	15.67	0:12:25	17,787.62	138.97	7.49	0:19:25	13,838.90	216.23	4.75	0:26:25	11,585.93	362.06	2.91	0:33:25	508.98	508.98	2.07
0:05:30	16,823.98	65.72	15.74	0:12:30	17,923.10	140.02	7.49	0:19:30	14,707.75	229.81	4.63	0:26:30	10,939.16	341.85	3.11	0:33:30	524.29	524.29	2.00
0:05:35	17,538.48	68.51	15.61	0:12:35	18,019.15	140.77	7.46	0:19:35	13,780.39	215.32	4.88	0:26:35	10,987.40	343.36	3.04	0:33:35	458.86	458.86	2.31
0:05:40	16,515.07	64.51	15.67	0:12:40	17,904.02	139.88	7.44	0:19:40	14,295.24	223.36	4.69	0:26:40	10,792.99	337.28	3.11	0:33:40	467.46	467.46	2.17
0:05:45	17,275.08	67.48	15.59	0:12:45	18,022.92	140.80	7.46	0:19:45	13,758.37	214.97	4.90	0:26:45	11,086.38	346.45	3.03	0:33:45	534.56	534.56	1.98
0:05:50	17,390.84	67.93	15.62	0:12:50	18,156.72	141.85	7.48	0:19:50	14,133.13	220.83	4.75	0:26:50	11,142.59	348.21	3.00	0:33:50	478.99	478.99	2.23
0:05:55	17,234.60	67.32	15.66	0:12:55	17,593.64	137.45	7.52	0:19:55	13,377.73	209.03	5.03	0:26:55	10,883.17	340.10	3.11	0:33:55	468.92	468.92	2.15
0:06:00	16,842.44	65.79	15.69	0:13:00	18,033.83	140.89	7.41	0:20:00	14,055.32	219.61	4.75	0:27:00	10,404.18	325.13	3.18	0:34:00	510.87	510.87	2.09
0:06:05	17,252.22	67.39	15.74	0:13:05	18,760.28	146.56	7.43	0:20:05	14,068.12	219.81	4.62	0:27:05	10,678.28	333.70	3.18	0:34:05	481.09	481.09	2.18
0:06:10	17,031.81	66.53	15.71	0:13:10	17,260.61	134.85	7.46	0:20:10	13,986.54	218.54	4.82	0:27:10	10,881.91	340.06	3.07	0:34:10	482.34	482.34	2.19
0:06:15	17,054.25	66.62	15.62	0:13:15	18,062.77	141.12	7.45	0:20:15	15,052.73	235.20	4.47	0:27:15	11,109.66	347.18	3.02	0:34:15	445.85	445.85	2.31
0:06:20	17,240.06	67.34	15.69	0:13:20	18,121.28	141.57	7.43	0:20:20	13,771.37	215.18	4.87	0:27:20	11,491.97	359.12	2.92	0:34:20	515.90	515.90	2.02
0:06:25	17,412.23	68.02	15.63	0:13:25	17,992.10	140.56	7.43	0:20:25	13,679.09	213.74	4.92	0:27:25	10,895.54	340.49	3.06	0:34:25	491.57	491.57	2.15
0:06:30	17,029.29	66.52	15.77	0:13:30	17,988.95	140.54	7.47	0:20:30	13,102.38	204.72	5.05	0:27:30	10,970.83	342.84	3.02	0:34:30	488.22	488.22	2.15
0:06:35	16,548.42	64.64	15.70	0:13:35	17,919.74	140.00	7.50	0:20:35	14,006.88	218.86	4.79	0:27:35	10,905.82	340.81	3.06	0:34:35	502.27	502.27	2.10
0:06:40	17,327.51	67.69	15.75	0:13:40	18,377.97	143.58	7.48	0:20:40	13,871.19	216.74	4.85	0:27:40	11,324.83	353.90	3.02	0:34:40	483.18	483.18	2.18
0:06:45	16,885.43	65.96	15.67	0:13:45	17,824.95	143.75	7.44	0:20:45	14,275.31	230.25	4.76	0:27:45	10,620.61	331.89	3.08	0:34:45	489.06	0.00	2.12
0:06:50	813.07	0.00	14.66	0:13:50	521.14	0.00	6.26	0:20:50	437.89	0.00	3.89	0:27:50	452.98	0.00	3.13	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

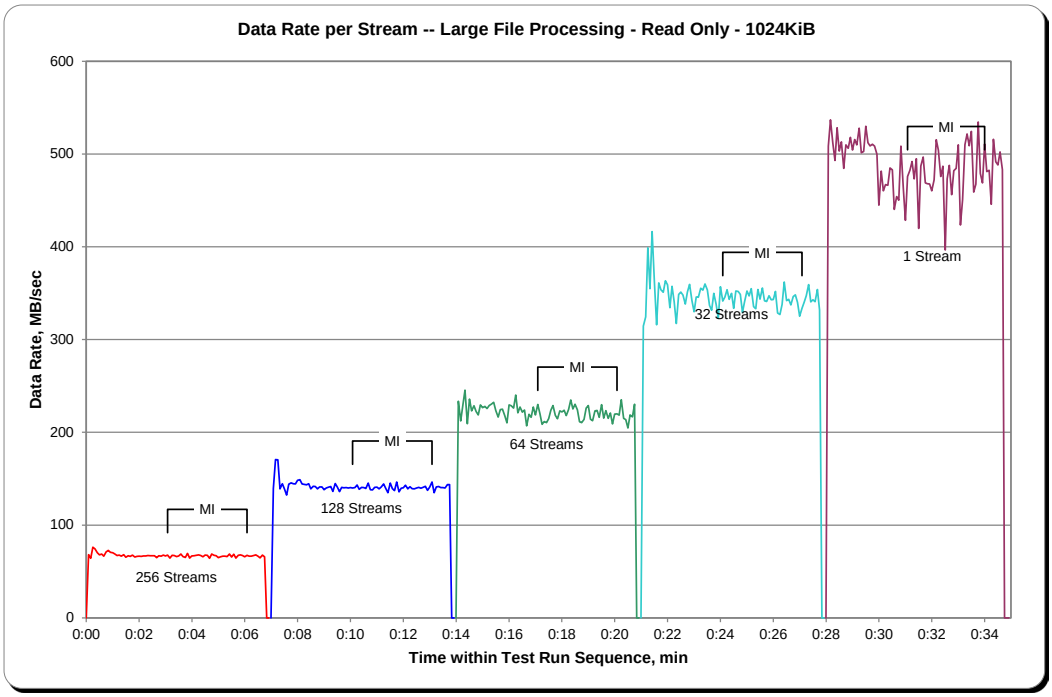
SPC-2 "Large File Processing/READ ONLY/1024 KiB Transfer Size" Average Data Rate Graph – Complete Test Run



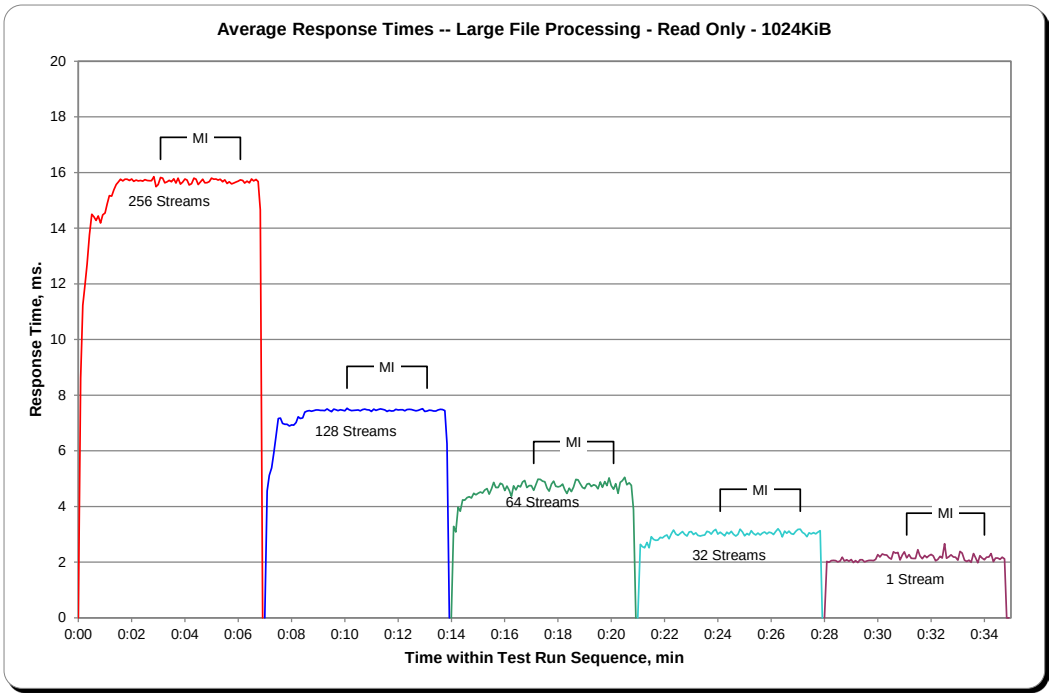
SPC-2 "Large File Processing/READ ONLY/1024 KiB Transfer Size" Average Data Rate Graph – Measurement Interval (MI) Only



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



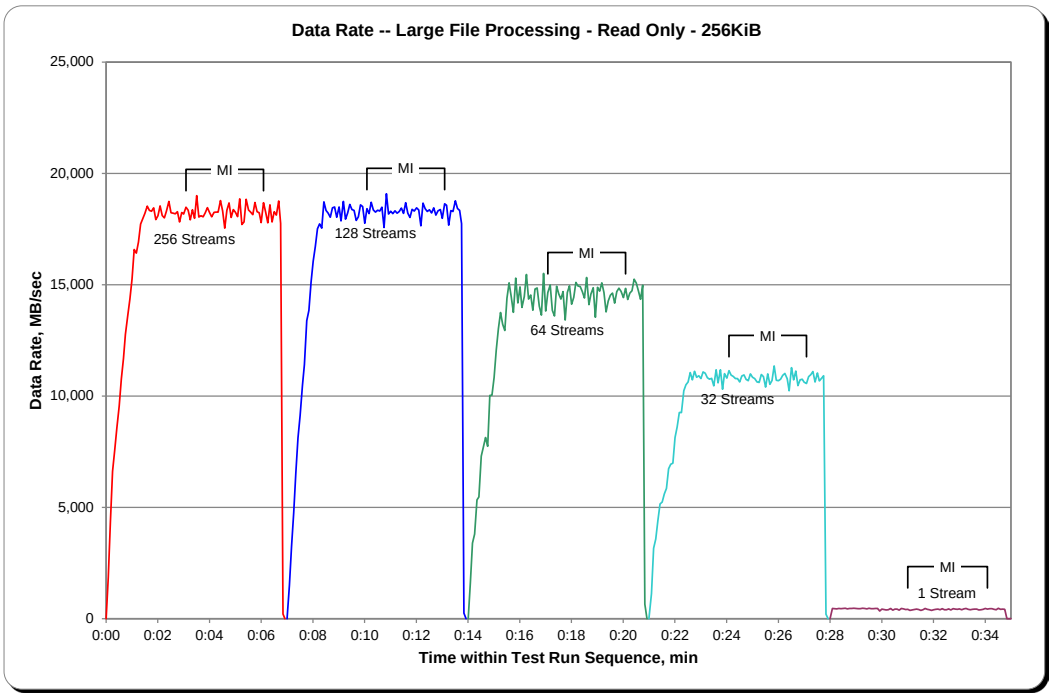
SPC-2 "Large File Processing/READ ONLY/256 KiB Transfer Size" Test Run Data – Ramp-Up Period

TR26	256 Streams			TR27	128 Streams			TR28	64 Streams			TR29	32 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	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	1,863.27	60.11	2.31	0:07:05	1,493.59	135.78	1.05	0:14:05	1,592.52	159.25	1.04	0:21:05	1,121.03	186.84	0.63	0:28:05	457.18	457.18	0.57
0:00:10	4,364.96	75.26	2.67	0:07:10	3,253.36	154.92	1.28	0:14:10	3,397.12	261.32	0.93	0:21:10	3,162.56	351.40	0.66	0:28:10	454.82	454.82	0.57
0:00:15	6,617.93	77.86	2.97	0:07:15	4,747.43	163.70	1.40	0:14:15	3,800.56	223.56	1.05	0:21:15	3,579.16	325.38	0.69	0:28:15	445.28	445.28	0.59
0:00:20	7,556.09	70.62	3.24	0:07:20	6,552.60	152.39	1.46	0:14:20	5,332.69	253.94	0.94	0:21:20	4,418.07	315.58	0.71	0:28:20	459.91	459.91	0.57
0:00:25	8,557.27	71.31	3.50	0:07:25	8,112.94	139.88	1.61	0:14:25	5,473.36	228.06	1.05	0:21:25	5,156.37	368.31	0.71	0:28:25	452.67	452.67	0.58
0:00:30	9,542.78	69.15	3.57	0:07:30	9,123.97	140.37	1.79	0:14:30	7,301.81	251.79	0.96	0:21:30	5,235.12	349.01	0.73	0:28:30	461.85	461.85	0.56
0:00:35	10,766.36	71.78	3.46	0:07:36	10,487.86	147.72	1.73	0:14:35	7,710.18	240.94	1.08	0:21:35	5,605.90	350.37	0.70	0:28:35	469.03	469.03	0.56
0:00:40	11,686.38	73.50	3.42	0:07:40	11,404.47	137.40	1.73	0:14:40	8,139.20	232.55	1.10	0:21:40	5,855.77	325.32	0.75	0:28:40	438.93	438.93	0.58
0:00:45	12,769.77	73.81	3.45	0:07:45	13,387.06	153.87	1.71	0:14:45	7,741.32	198.50	1.21	0:21:45	6,731.39	354.28	0.73	0:28:45	463.10	463.10	0.57
0:00:50	13,613.45	75.21	3.43	0:07:51	13,841.10	147.25	1.69	0:14:50	10,022.92	238.64	1.03	0:21:50	6,937.22	365.12	0.72	0:28:50	461.11	461.11	0.57
0:00:55	14,355.53	74.00	3.42	0:07:55	15,099.60	151.00	1.70	0:14:55	10,033.09	233.33	1.12	0:21:55	6,989.55	349.48	0.71	0:28:55	465.31	465.31	0.56
0:01:00	15,256.89	74.42	3.41	0:08:01	16,050.08	148.61	1.71	0:15:00	10,827.81	225.58	1.07	0:22:00	8,132.81	353.60	0.74	0:29:00	458.75	458.75	0.57
0:01:05	16,581.71	75.37	3.43	0:08:05	16,715.04	145.35	1.72	0:15:05	12,059.25	231.91	1.10	0:22:05	8,618.40	319.20	0.73	0:29:05	454.45	454.45	0.58
0:01:10	16,420.02	72.33	3.52	0:08:10	17,512.27	145.94	1.77	0:15:10	13,019.59	245.65	1.06	0:22:10	9,256.20	342.82	0.76	0:29:10	446.75	446.75	0.56
0:01:15	16,920.08	72.31	3.54	0:08:16	17,732.84	146.55	1.78	0:15:15	13,753.23	241.28	1.06	0:22:15	9,257.93	330.64	0.76	0:29:15	467.82	467.82	0.56
0:01:20	17,725.08	73.24	3.56	0:08:20	17,537.22	140.30	1.78	0:15:20	13,221.60	220.36	1.16	0:22:20	10,234.73	341.16	0.76	0:29:20	462.32	462.32	0.57
0:01:25	17,964.41	71.29	3.63	0:08:26	18,715.35	148.53	1.80	0:15:25	12,939.17	212.12	1.21	0:22:25	10,507.73	338.96	0.75	0:29:25	444.91	444.91	0.59
0:01:30	18,203.17	71.11	3.66	0:08:31	18,338.13	143.27	1.81	0:15:30	14,396.79	224.95	1.14	0:22:30	10,628.52	332.14	0.77	0:29:30	467.09	467.09	0.56
0:01:35	18,526.40	72.37	3.65	0:08:35	18,215.76	142.31	1.82	0:15:35	15,079.62	235.62	1.14	0:22:35	11,057.39	345.54	0.76	0:29:35	453.61	453.61	0.56
0:01:40	18,331.31	71.61	3.67	0:08:40	18,027.22	140.84	1.84	0:15:40	14,463.90	226.00	1.13	0:22:40	10,728.77	335.27	0.76	0:29:40	451.20	451.20	0.58
0:01:45	18,294.09	71.46	3.66	0:08:45	18,452.63	144.16	1.83	0:15:45	13,757.26	214.96	1.22	0:22:45	11,106.15	347.07	0.76	0:29:45	455.61	455.61	0.58
0:01:51	18,449.22	72.07	3.67	0:08:50	18,487.29	144.43	1.83	0:15:50	15,290.49	238.91	1.11	0:22:50	10,841.70	338.80	0.77	0:29:50	457.81	457.81	0.58
0:01:55	17,925.83	70.02	3.68	0:08:55	18,027.80	140.84	1.84	0:15:55	14,179.47	221.55	1.18	0:22:55	10,906.40	340.82	0.78	0:29:55	344.93	344.93	0.76
0:02:00	18,095.91	70.69	3.67	0:09:01	18,492.42	144.47	1.83	0:16:00	14,899.06	232.80	1.13	0:23:00	10,780.51	336.89	0.77	0:30:00	433.64	433.64	0.61
0:02:05	18,533.90	72.40	3.68	0:09:05	17,865.59	139.57	1.83	0:16:05	13,978.51	218.41	1.18	0:23:05	11,084.71	346.40	0.76	0:30:05	412.51	412.51	0.64
0:02:10	18,110.06	70.74	3.68	0:09:11	18,742.51	146.43	1.83	0:16:10	14,465.47	226.02	1.16	0:23:10	11,020.95	344.40	0.76	0:30:10	394.74	394.74	0.64
0:02:15	17,995.77	70.30	3.67	0:09:15	17,944.18	140.19	1.84	0:16:15	15,462.04	241.59	1.08	0:23:15	10,826.70	338.33	0.77	0:30:15	399.04	399.04	0.66
0:02:20	18,317.73	71.55	3.67	0:09:20	18,218.22	142.33	1.83	0:16:20	14,352.59	224.26	1.17	0:23:20	10,757.13	336.16	0.78	0:30:20	463.10	463.10	0.58
0:02:25	18,743.24	73.22	3.67	0:09:25	18,601.69	145.33	1.83	0:16:25	14,537.67	227.15	1.16	0:23:25	10,798.08	337.44	0.78	0:30:25	387.71	387.71	0.67
0:02:30	18,226.45	71.20	3.67	0:09:31	18,373.46	143.54	1.83	0:16:30	13,856.51	216.51	1.21	0:23:30	10,455.88	326.75	0.78	0:30:30	428.66	428.66	0.61
0:02:36	18,206.90	71.12	3.68	0:09:35	18,331.99	143.22	1.83	0:16:35	14,809.67	231.40	1.13	0:23:35	11,180.34	349.39	0.77	0:30:35	428.92	428.92	0.61
0:02:41	18,187.08	71.04	3.67	0:09:40	17,880.48	139.69	1.83	0:16:40	14,855.49	232.12	1.13	0:23:40	10,595.13	331.10	0.77	0:30:40	383.57	383.57	0.66
0:02:46	18,279.09	71.40	3.66	0:09:45	18,045.15	140.98	1.84	0:16:45	14,037.13	219.33	1.19	0:23:45	11,179.76	349.37	0.77	0:30:45	457.70	457.70	0.58
0:02:50	17,817.56	69.60	3.69	0:09:50	18,587.06	145.21	1.83	0:16:50	13,638.15	213.10	1.18	0:23:50	10,307.19	322.10	0.78	0:30:50	439.72	439.72	0.60
0:02:55	18,237.20	71.24	3.68	0:09:55	18,508.78	144.60	1.83	0:16:55	15,505.50	242.27	1.12	0:23:55	11,008.68	344.02	0.76	0:30:55	409.05	409.05	0.63
0:03:00	18,176.80	71.00	3.68	0:10:00	17,759.31	138.74	1.85	0:17:00	13,812.84	215.83	1.19	0:24:00	10,799.91	337.50	0.78				

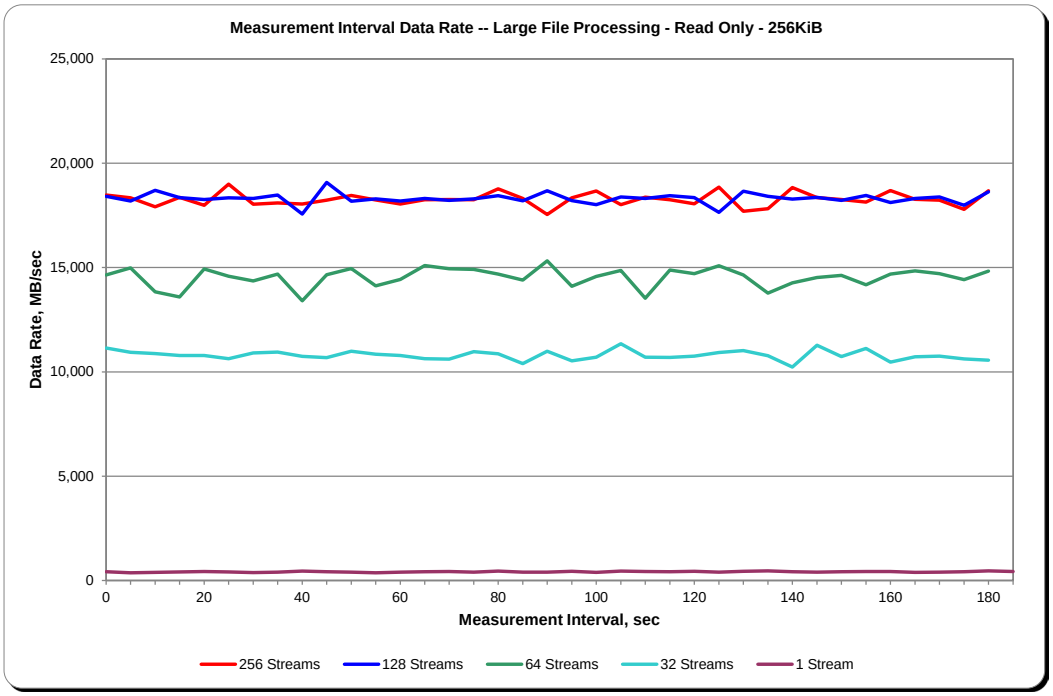
SPC-2 "Large File Processing/READ ONLY/256 KiB Transfer Size" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods

TR26	256 Streams			TR27	128 Streams			TR28	64 Streams			TR29	32 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
0:03:05	18,479.21	72.18	3.69	0:10:05	18,414.72	143.87	1.83	0:17:05	14,647.24	228.86	1.13	0:24:05	11,141.28	348.16	0.77	0:31:00	424.46	424.46	0.62
0:03:10	18,343.11	71.65	3.68	0:10:10	18,192.95	142.13	1.84	0:17:10	14,988.24	234.19	1.16	0:24:10	10,938.06	341.81	0.76	0:31:05	375.91	375.91	0.70
0:03:15	17,917.02	69.99	3.67	0:10:15	18,699.57	146.09	1.83	0:17:15	13,841.20	216.27	1.20	0:24:15	10,879.55	339.99	0.77	0:31:10	392.90	392.90	0.67
0:03:20	18,364.29	71.74	3.69	0:10:20	18,354.22	143.39	1.82	0:17:20	13,593.90	212.40	1.21	0:24:20	10,782.24	336.95	0.77	0:31:15	408.63	408.63	0.62
0:03:25	17,982.50	70.24	3.66	0:10:25	18,258.17	142.64	1.83	0:17:25	14,929.31	233.27	1.12	0:24:25	10,784.97	337.03	0.78	0:31:20	432.90	432.90	0.62
0:03:30	18,998.47	74.21	3.66	0:10:30	18,345.26	143.32	1.83	0:17:30	14,585.74	227.90	1.16	0:24:30	10,629.89	332.18	0.79	0:31:25	407.90	407.90	0.64
0:03:35	18,034.98	70.45	3.69	0:10:35	18,307.30	143.03	1.82	0:17:35	14,358.26	224.35	1.16	0:24:35	10,904.30	340.76	0.77	0:31:30	378.12	378.12	0.66
0:03:40	18,099.16	70.70	3.68	0:10:40	18,478.90	144.37	1.83	0:17:40	14,689.34	229.52	1.14	0:24:40	10,945.14	342.04	0.77	0:31:35	400.45	400.45	0.68
0:03:45	18,047.57	70.50	3.67	0:10:45	17,569.31	137.26	1.83	0:17:45	13,411.29	209.55	1.23	0:24:45	10,749.21	335.91	0.75	0:31:41	456.50	456.50	0.58
0:03:50	18,228.55	71.21	3.68	0:10:50	19,081.78	149.08	1.83	0:17:50	14,653.27	228.96	1.14	0:24:50	10,684.47	333.89	0.78	0:31:45	422.89	422.89	0.60
0:03:55	18,456.72	72.10	3.65	0:10:55	18,177.33	142.01	1.83	0:17:55	14,948.39	233.57	1.14	0:24:55	10,995.11	343.60	0.77	0:31:50	402.60	402.60	0.65
0:04:00	18,243.28	71.26	3.68	0:11:00	18,295.13	142.93	1.83	0:18:00	14,124.90	220.70	1.17	0:25:00	10,843.64	338.86	0.77	0:31:55	372.87	372.87	0.70
0:04:05	18,049.82	70.51	3.67	0:11:05	18,192.27	142.13	1.83	0:18:05	14,431.71	225.50	1.15	0:25:05	10,783.40	336.98	0.77	0:32:00	398.72	398.72	0.66
0:04:10	18,247.37	71.28	3.66	0:11:10	18,314.90	143.09	1.83	0:18:10	15,097.87	235.90	1.11	0:25:10	10,627.06	332.10	0.79	0:32:05	421.89	421.89	0.63
0:04:15	18,256.49	71.31	3.67	0:11:15	18,215.44	142.31	1.83	0:18:15	14,943.20	233.49	1.12	0:25:15	10,612.17	331.63	0.79	0:32:10	427.40	427.40	0.61
0:04:20	18,254.82	71.31	3.67	0:11:20	18,287.38	142.87	1.83	0:18:20	14,915.68	233.06	1.12	0:25:20	10,966.58	342.71	0.76	0:32:15	405.06	405.06	0.62
0:04:25	18,777.32	73.35	3.68	0:11:25	18,445.87	144.11	1.83	0:18:25	14,686.98	229.48	1.14	0:25:25	10,867.60	339.61	0.78	0:32:20	448.48	448.48	0.59
0:04:30	18,312.59	71.53	3.68	0:11:30	18,199.35	142.18	1.83	0:18:30	14,401.88	225.03	1.15	0:25:30	10,397.99	324.94	0.78	0:32:25	404.28	404.28	0.65
0:04:35	17,542.20	68.52	3.67	0:11:35	18,678.39	145.92	1.83	0:18:35	15,318.80	239.36	1.14	0:25:35	10,990.96	343.47	0.79	0:32:30	400.24	400.24	0.65
0:04:40	18,347.35	71.67	3.68	0:11:40	18,207.37	142.25	1.84	0:18:40	14,104.34	220.38	1.19	0:25:40	10,529.64	329.05	0.79	0:32:35	440.30	440.30	0.59
0:04:45	18,673.04	72.94	3.67	0:11:45	18,018.00	140.77	1.83	0:18:45	14,579.24	227.80	1.15	0:25:45	10,698.78	334.34	0.76	0:32:40	393.43	393.43	0.66
0:04:50	18,017.89	70.38	3.66	0:11:50	18,385.84	143.64	1.82	0:18:51	14,865.77	232.28	1.17	0:25:50	11,351.88	354.75	0.74	0:32:45	452.78	452.78	0.60
0:04:55	18,372.26	71.77	3.67	0:11:55	18,311.91	143.06	1.84	0:18:55	13,534.28	211.47	1.13	0:25:55	10,706.85	334.59	0.78	0:32:50	433.17	433.17	0.60
0:05:00	18,253.03	71.30	3.67	0:12:01	18,449.48	144.14	1.84	0:19:00	14,883.28	232.55	1.13	0:26:00	10,691.91	334.12	0.78	0:32:55	420.27	420.27	0.62
0:05:05	18,058.10	70.54	3.66	0:12:05	18,353.17	143.38	1.84	0:19:05	14,706.86	229.79	1.12	0:26:05	10,755.35	336.10	0.78	0:33:00	438.72	438.72	0.60
0:05:10	18,857.91	73.66	3.68	0:12:10	17,642.03	137.83	1.83	0:19:10	15,084.08	235.69	1.11	0:26:10	10,928.00	341.50	0.75	0:33:05	405.85	405.85	0.62
0:05:15	17,701.96	69.15	3.67	0:12:15	18,660.67	145.79	1.82	0:19:15	14,650.07	228.91	1.18	0:26:15	11,017.23	344.29	0.76	0:33:10	438.62	438.62	0.60
0:05:20	17,821.44	69.62	3.68	0:12:20	18,413.10	143.85	1.83	0:19:20	13,778.97	215.30	1.17	0:26:20	10,779.41	336.86	0.79	0:33:15	459.85	459.85	0.58
0:05:25	18,836.09	73.58	3.67	0:12:25	18,285.28	142.85	1.83	0:19:25	14,272.06	223.00	1.18	0:26:25	10,235.99	319.87	0.80	0:33:20	421.68	421.68	0.61
0:05:30	18,352.75	71.69	3.65	0:12:30	18,367.75	143.50	1.82	0:19:30	14,527.92	227.00	1.16	0:26:30	11,277.91	352.43	0.76	0:33:25	405.80	405.80	0.64
0:05:35	18,264.36	71.35	3.69	0:12:35	18,224.72	142.38	1.83	0:19:35	14,623.28	228.49	1.14	0:26:35	10,730.92	335.34	0.76	0:33:30	421.32	421.32	0.61
0:05:40	18,139.63	70.86	3.68	0:12:40	18,452.89	144.16	1.83	0:19:40	14,172.13	221.44	1.18	0:26:40	11,121.72	347.55	0.77	0:33:35	429.13	429.13	0.63
0:05:45	18,689.03	73.00	3.66	0:12:45	18,120.23	141.56	1.83	0:19:45	14,688.24	229.50	1.13	0:26:45	10,463.37	326.98	0.78	0:33:40	429.86	429.86	0.59
0:05:50	18,274.01	71.38	3.68	0:12:50	18,314.85	143.08	1.82	0:19:50	14,843.43	231.93	1.12	0:26:50	10,723.52	335.11	0.78	0:33:45	389.39	389.39	0.69
0:05:55	18,232.06	71.22	3.65	0:12:56	18,378.50	143.58	1.84	0:19:55	14,702.45	229.73	1.17	0:26:55	10,753.20	336.04	0.80	0:33:50	402.71	402.71	0.65
0:06:00	17,790.98	69.50	3.69	0:13:00	17,981.92	140.48	1.83	0:20:00	14,423.42	225.37	1.15	0:27:00	10,620.71	331.90	0.79	0:33:55	417.33	417.33	0.60
0:06:05	18,679.96	72.97	3.67	0:13:06	18,629.79	145.55	1.84	0:20:05	14,830.69	231.73	1.12	0:27:05	10,560.52	330.02	0.77	0:34:00	462.63	462.63	0.57
0:06:10	18,256.81	71.32	3.67	0:13:10	18,569.55	145.07	1.82	0:20:10	14,331.88	223.94	1.16	0:27:10	10,874.26	339.82	0.77	0:34:05	433.22	433.22	0.61
0:06:15	17,783.01	69.46	3.66	0:13:15	17,678.41	138.11	1.83	0:20:15	14,625.38	228.52	1.15	0:27:15	10,960.92	342.53	0.77	0:34:10	449.05	449.05	0.59
0:06:20	18,590.31	72.62	3.71	0:13:20	18,322.29	143.14	1.83	0:20:20	14,726.62	230.10	1.14	0:27:20	11,105.00	347.03	0.75	0:34:15	452.15	452.15	0.57
0:06:25	17,813.42	69.58	3.68	0:13:25	18,287.79	142.87	1.83	0:20:25	15,241.63	238.15	1.10	0:27:25	10,627.89	332.12	0.80	0:34:20	416.97	416.97	0.63
0:06:30	18,282.60	71.42	3.68	0:13:30	18,765.95	146.61	1.83	0:20:30	15,072.49	235.51	1.12	0:27:30	11,029.92	344.68	0.76	0:34:25	406.59	406.59	0.64
0:06:35	18,123.22	70.79	3.67	0:13:35	18,418.97	143.90	1.83	0:20:35	14,716.87	229.95	1.14	0:27:35	10,679.01	333.72	0.77	0:34:30	465.25	465.25	0.56
0:06:40	18,756.46	73.27	3.67	0:13:40	18,336.55	143.25	1.83	0:20:40	14,346.83	224.17	1.15	0:27:40	10,804.06	337.63	0.78	0:34:35	422.84	422.84	0.62
0:06:45	17,753.70	153.05	3.67	0:13:45	17,739.34	143.06	1.82	0:20:45	14,980.06	234.06	1.10	0:27:45	10,910.75	363.69	0.77	0:34:40	435.84	435.84	0.58
0:06:50	211.13	0.00	2.83	0:13:50	252.23	0.00	1.36	0:20:50	654.21	0.00	1.01	0:27:50	201.48	0.00	0.77	0:34:45	417.65	0.00	0.64
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	0:34:50	0.00	0.00	0.00
																0:34:55	0.00	0.00	0.00
																0:35:00	0.00	0.00	0.00

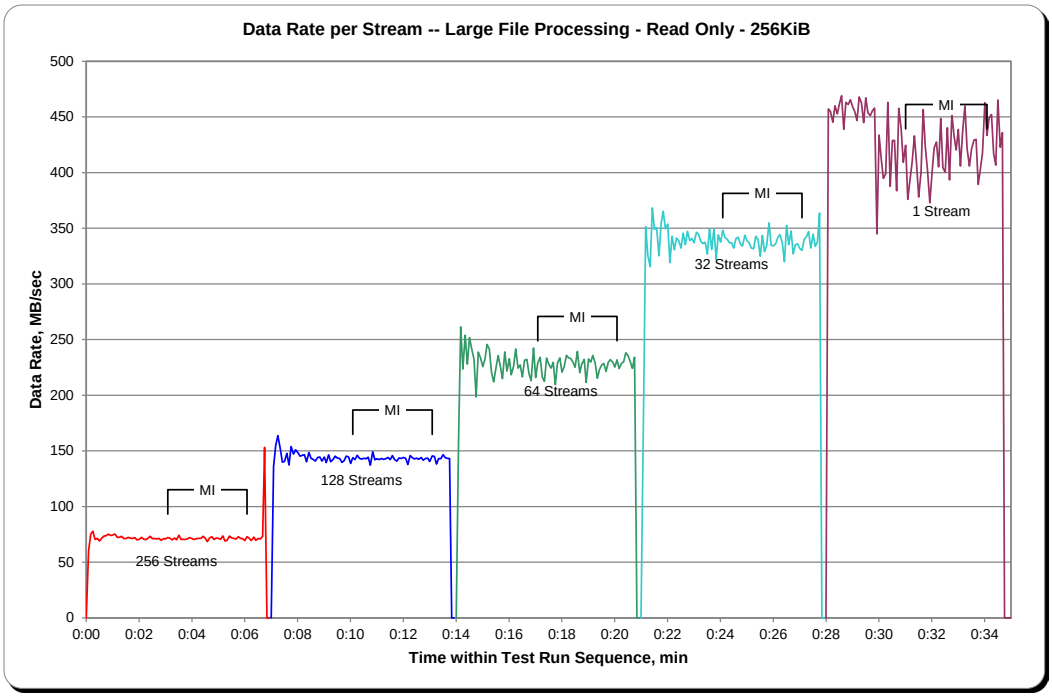
SPC-2 "Large File Processing/READ ONLY/256 KiB Transfer Size" Average Data Rate Graph – Complete Test Run



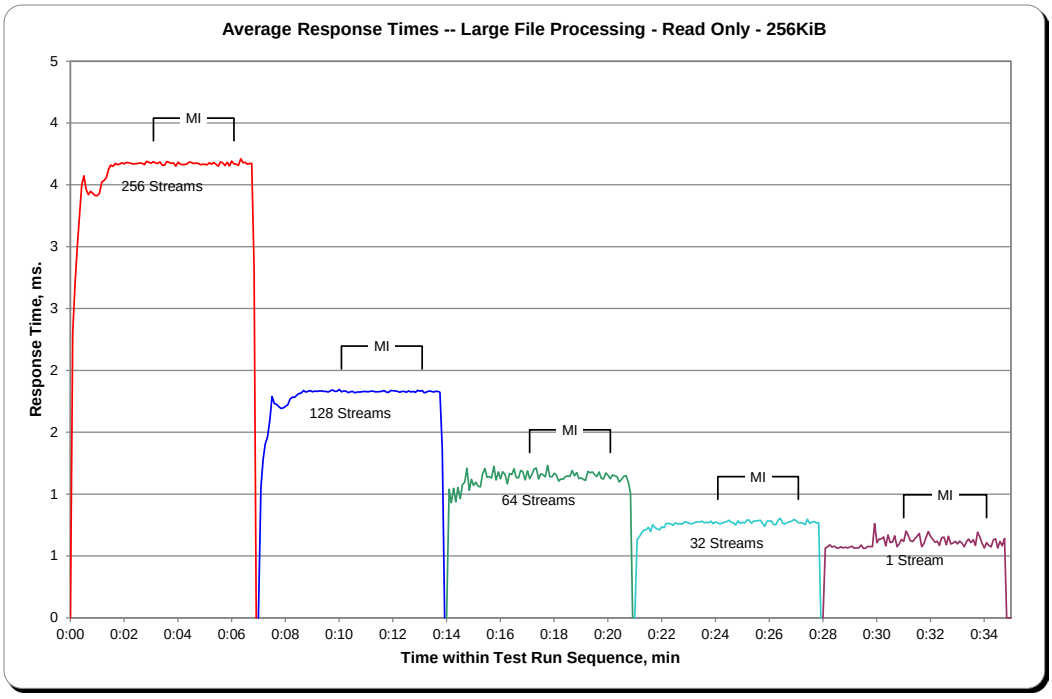
SPC-2 "Large File Processing/READ ONLY/256 KiB Transfer Size" Average Data Rate Graph – Measurement Interval (MI) Only



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 117.

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.

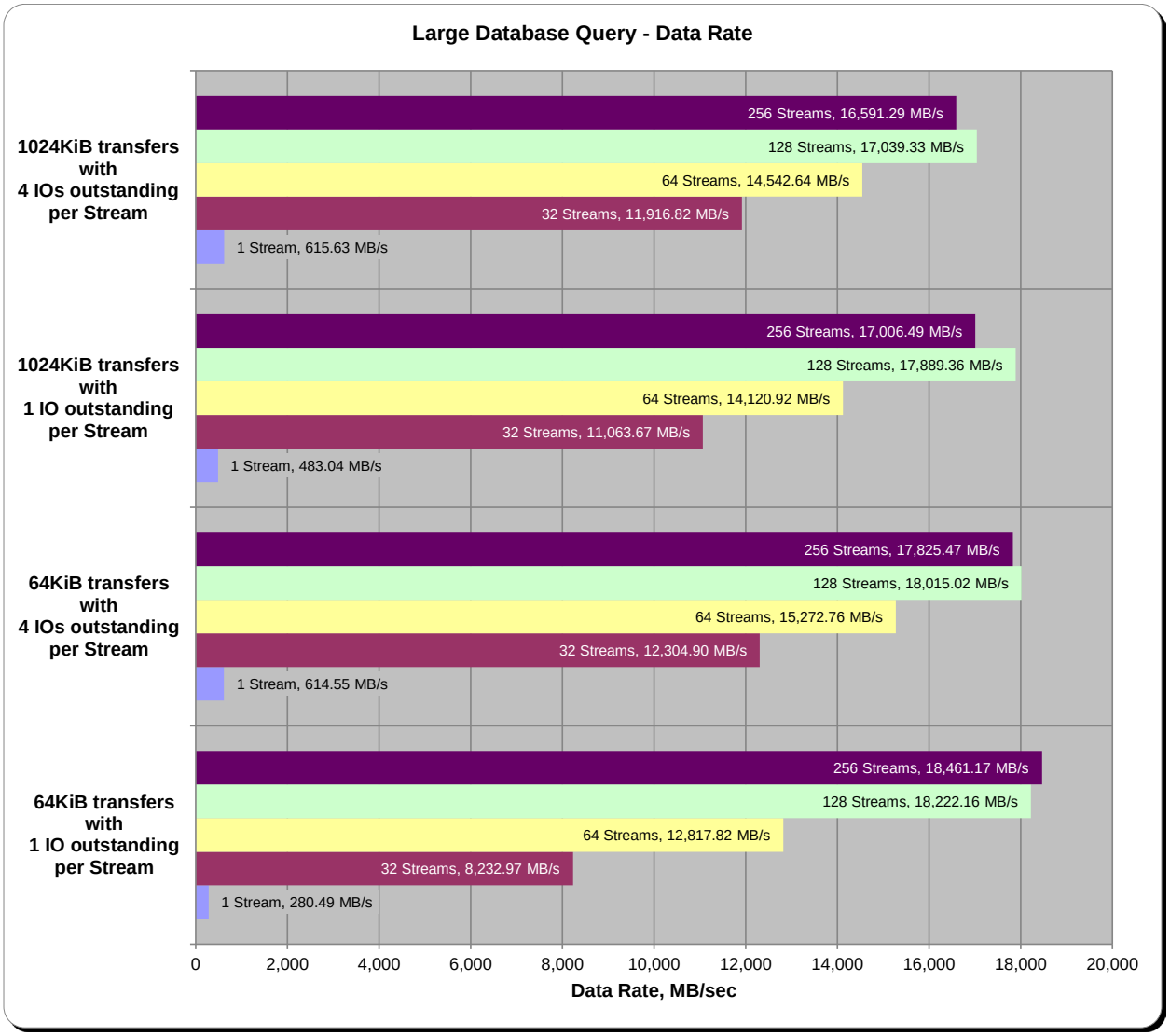
SPC-2 Large Database Query Test Results File

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	32 Streams	64 Streams	128 Streams	256 Streams
1024KiB w/ 4 IOs/Stream	615.63	11,916.82	14,542.64	17,039.33	16,591.29
1024KiB w/ 1 IO/Stream	483.04	11,063.67	14,120.92	17,889.36	17,006.49
64KiB w/ 4 IOs/Stream	614.55	12,304.90	15,272.76	18,015.02	17,825.47
64KiB w/ 1 IO/Stream	280.49	8,232.97	12,817.82	18,222.16	18,461.17

SPC-2 Large Database Query Average Data Rates Graph

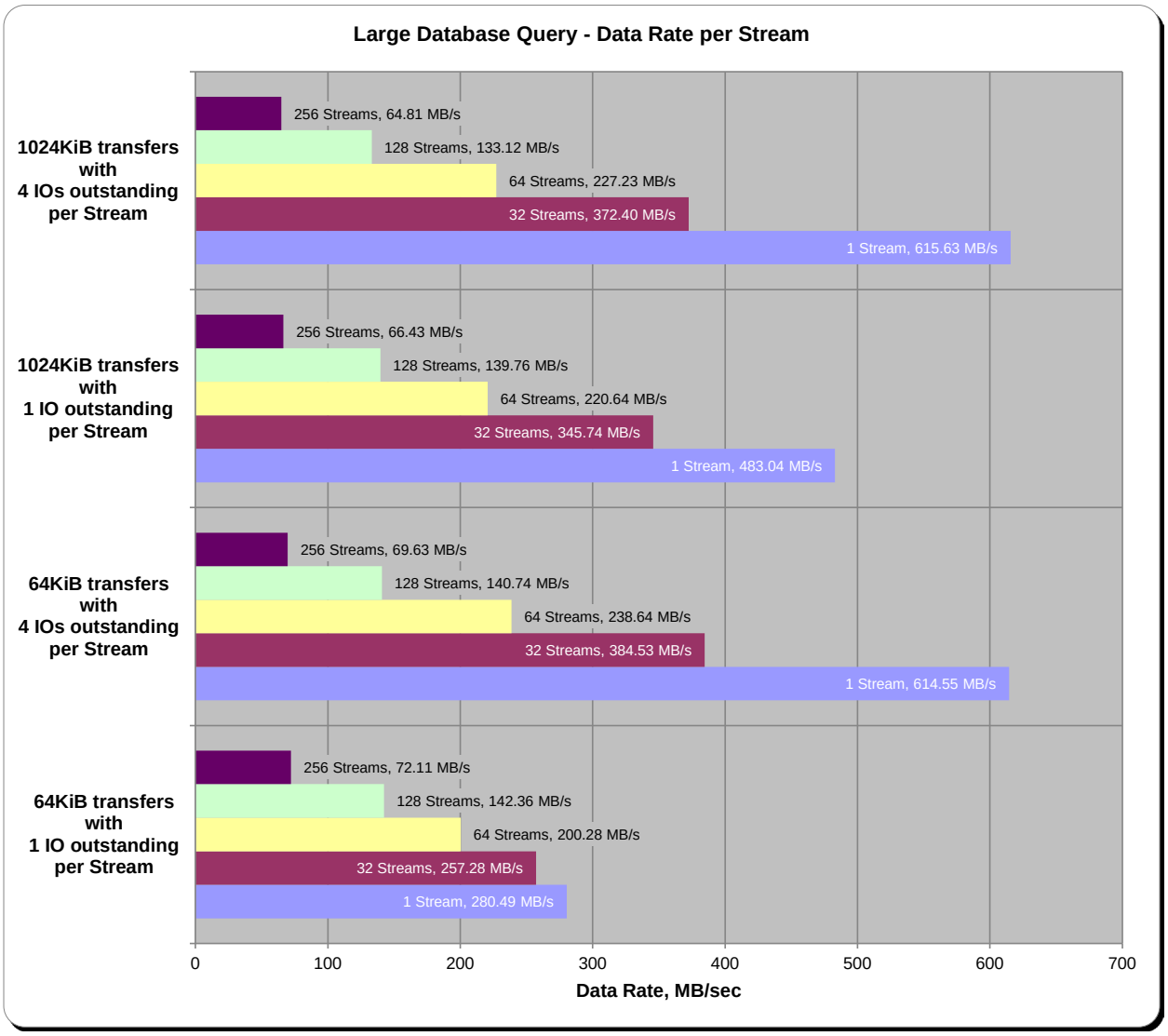


SPC-2 Large Database Query Average Data Rate per Stream

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	32 Streams	64 Streams	128 Streams	256 Streams
1024KiB w/ 4 IOs/Stream	615.63	372.40	227.23	133.12	64.81
1024KiB w/ 1 IO/Stream	483.04	345.74	220.64	139.76	66.43
64KiB w/ 4 IOs/Stream	614.55	384.53	238.64	140.74	69.63
64KiB w/ 1 IO/Stream	280.49	257.28	200.28	142.36	72.11

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

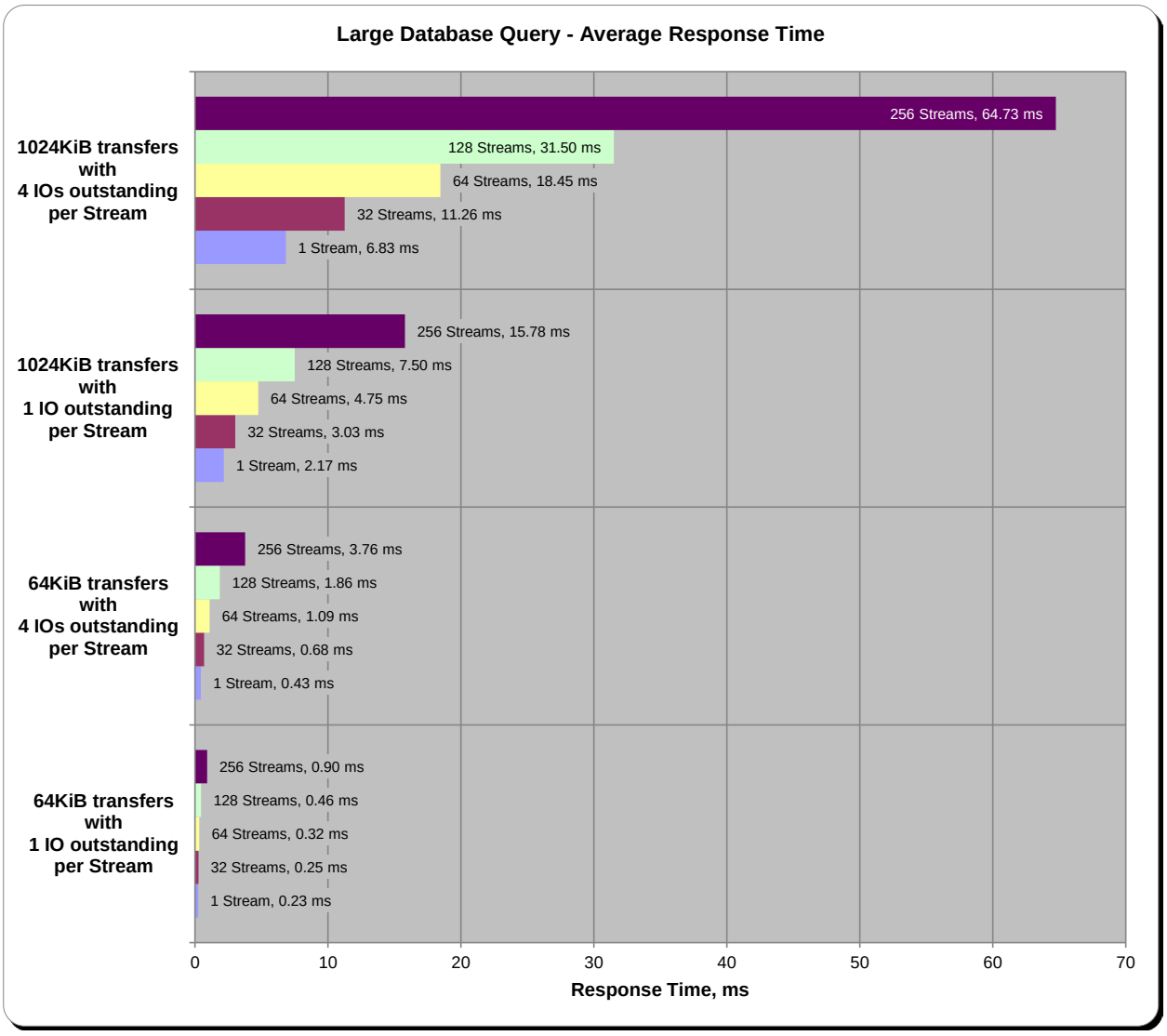


SPC-2 Large Database Query Average Response Time

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	32 Streams	64 Streams	128 Streams	256 Streams
1024KiB w/ 4 IOs/Stream	6.83	11.26	18.45	31.50	64.73
1024KiB w/ 1 IO/Stream	2.17	3.03	4.75	7.50	15.78
64KiB w/ 4 IOs/Stream	0.43	0.68	1.09	1.86	3.76
64KiB w/ 1 IO/Stream	0.23	0.25	0.32	0.46	0.90

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 Database Query/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 Database Query/1024 KIB TRANSFER SIZE/4 Outstanding I/Os" table and graphs will be the SPC-2 "Large Database Query/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.

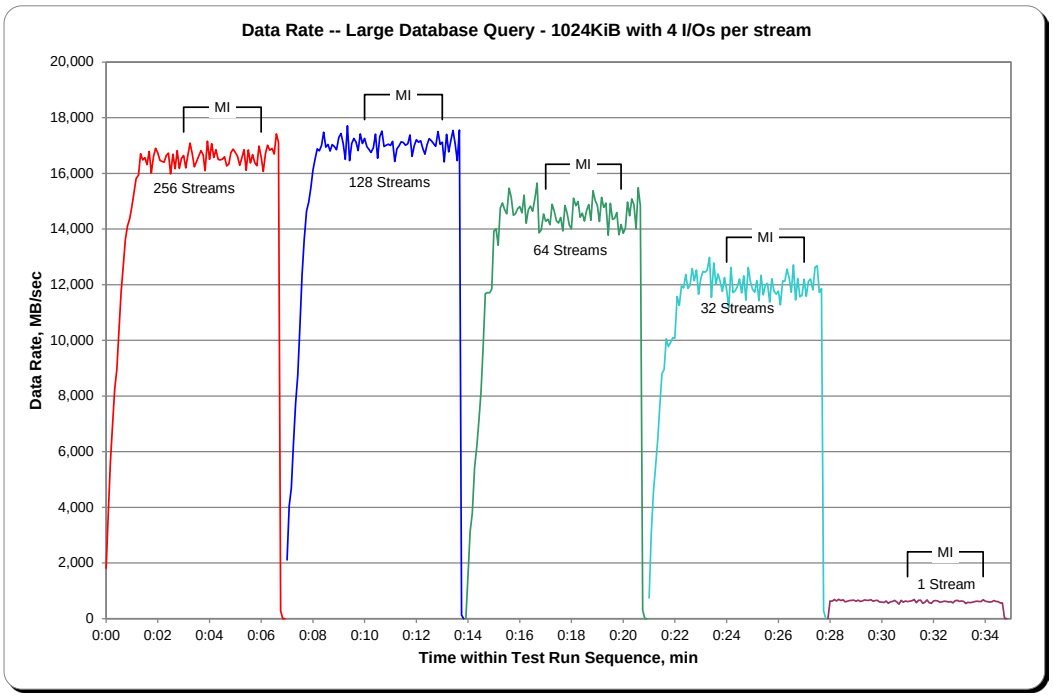
SPC-2 "Large Database Query/1024 KiB Transfer Size/4 Outstanding I/Os" Test Run Data – Ramp-Up Period

TR11	256 Streams			TR12	128 Streams			TR13	64 Streams			TR14	32 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	1,812.99	62.52	33.53	0:07:00	2,109.53	150.68	17.87	0:13:55	0.00	0.00	0.00	0:21:00	744.70	186.17	7.55	0:27:55	0.00	0.00	0.00
0:00:05	3,785.36	72.80	41.72	0:07:05	4,054.84	162.19	21.15	0:14:00	1,540.99	220.14	14.63	0:21:05	3,047.79	304.78	10.09	0:28:00	637.53	637.53	6.59
0:00:10	5,631.90	75.09	45.87	0:07:10	4,694.89	142.27	22.62	0:14:05	3,126.22	223.30	13.71	0:21:10	4,537.82	349.06	10.08	0:28:05	631.24	631.24	6.40
0:00:15	6,965.69	69.66	51.84	0:07:15	6,306.77	157.67	23.63	0:14:10	3,783.47	199.13	17.66	0:21:15	5,459.73	389.98	10.49	0:28:10	692.27	692.27	6.10
0:00:20	8,254.60	70.55	55.24	0:07:20	7,741.43	140.75	25.61	0:14:15	5,451.13	237.01	16.74	0:21:20	6,408.69	356.04	10.26	0:28:15	635.44	635.44	6.73
0:00:25	8,947.29	66.28	58.78	0:07:25	8,744.08	143.35	27.28	0:14:20	6,162.27	246.49	16.40	0:21:25	7,647.47	364.17	10.57	0:28:20	696.46	696.46	6.02
0:00:30	10,361.19	68.62	57.91	0:07:30	10,487.44	136.20	27.92	0:14:25	7,116.06	229.55	16.13	0:21:30	8,812.02	400.55	10.15	0:28:25	649.91	649.91	6.41
0:00:35	11,739.86	71.58	57.18	0:07:35	12,340.06	143.49	27.53	0:14:30	8,169.46	226.93	17.71	0:21:35	8,952.32	373.01	10.68	0:28:30	683.25	683.25	6.22
0:00:40	12,670.15	71.99	55.91	0:07:40	13,611.57	146.36	27.69	0:14:35	9,794.75	233.21	16.65	0:21:40	10,056.89	402.28	10.14	0:28:35	607.13	607.13	6.67
0:00:45	13,637.78	73.72	55.99	0:07:45	14,646.72	147.95	28.09	0:14:40	11,685.54	243.45	16.72	0:21:45	9,777.13	391.09	10.62	0:28:40	626.21	626.21	6.70
0:00:50	14,118.45	70.95	57.07	0:07:50	14,961.29	145.26	28.34	0:14:45	11,711.34	239.01	17.48	0:21:50	9,926.87	381.80	10.90	0:28:45	655.15	655.15	6.42
0:00:55	14,370.73	70.10	58.29	0:07:55	15,475.93	139.42	29.04	0:14:50	11,704.41	234.09	17.67	0:21:55	10,091.50	388.13	11.01	0:28:50	659.13	659.13	6.36
0:01:00	14,799.18	67.27	60.20	0:08:00	16,117.66	140.15	29.60	0:14:55	11,845.34	219.36	18.41	0:22:00	10,081.01	360.04	10.72	0:28:55	665.43	665.43	6.30
0:01:05	15,299.77	68.00	61.17	0:08:05	16,516.33	135.38	30.37	0:15:00	13,921.52	240.03	16.74	0:22:05	11,577.33	399.22	10.61	0:29:00	626.84	626.84	6.85
0:01:10	15,809.38	66.15	61.19	0:08:10	16,882.07	136.15	30.44	0:15:05	14,009.39	233.49	17.57	0:22:10	11,256.25	375.21	10.79	0:29:05	666.27	666.27	6.32
0:01:15	15,935.42	65.31	63.52	0:08:15	16,808.25	133.40	30.90	0:15:10	13,421.35	220.02	18.32	0:22:15	11,951.67	385.54	10.69	0:29:10	620.97	620.97	6.50
0:01:20	16,702.98	66.81	62.41	0:08:20	16,999.09	134.91	30.70	0:15:15	14,755.56	241.89	17.44	0:22:20	11,883.09	371.35	10.63	0:29:15	634.39	634.39	6.59
0:01:25	16,480.68	64.38	64.34	0:08:25	17,474.94	136.52	31.21	0:15:20	14,937.17	233.39	17.77	0:22:25	12,363.76	386.37	10.88	0:29:20	671.51	671.51	6.25
0:01:30	16,568.13	64.72	64.88	0:08:30	16,939.75	132.34	31.43	0:15:25	14,697.26	229.64	18.25	0:22:30	11,865.06	370.78	11.59	0:29:25	659.76	659.76	6.39
0:01:35	16,310.18	63.71	64.66	0:08:35	17,037.89	133.11	31.50	0:15:30	14,545.43	227.27	18.48	0:22:35	11,976.42	374.26	11.05	0:29:30	657.25	657.25	6.43
0:01:40	16,784.98	65.57	65.97	0:08:40	16,799.45	131.25	31.46	0:15:35	15,469.22	241.71	17.35	0:22:40	12,581.65	393.18	10.70	0:29:35	681.36	681.36	6.05
0:01:45	16,013.01	62.55	64.66	0:08:45	17,036.84	133.10	31.69	0:15:40	15,139.97	236.56	17.78	0:22:45	12,141.04	379.41	10.91	0:29:40	632.29	632.29	6.67
0:01:50	16,594.97	64.82	64.95	0:08:50	16,961.35	132.51	31.59	0:15:45	14,489.85	226.40	18.87	0:22:50	12,525.87	391.43	10.82	0:29:45	650.12	650.12	6.47
0:01:55	16,902.42	66.03	63.78	0:08:55	16,850.83	131.65	31.52	0:15:50	14,550.04	227.34	18.02	0:22:55	11,657.86	364.31	11.48	0:29:50	659.55	659.55	6.34
0:02:00	16,737.79	65.38	64.12	0:09:00	17,296.89	135.13	31.26	0:15:55	14,730.40	230.16	18.23	0:23:00	12,204.17	381.38	11.09	0:29:55	598.32	598.32	7.06
0:02:05	16,471.24	64.34	65.28	0:09:05	17,430.69	136.18	31.47	0:16:00	14,804.43	231.32	18.05	0:23:05	12,469.67	389.68	10.85	0:30:00	597.90	597.90	7.06
0:02:10	16,424.47	64.16	64.62	0:09:10	17,076.06	133.41	31.59	0:16:05	14,581.92	227.84	18.20	0:23:10	12,454.15	389.19	10.80	0:30:05	583.85	583.85	7.23
0:02:15	16,400.36	64.06	65.48	0:09:15	16,505.63	128.95	31.38	0:16:10	15,213.16	237.71	18.25	0:23:15	12,518.53	391.20	10.60	0:30:10	633.34	633.34	6.67
0:02:20	16,638.17	64.99	64.86	0:09:20	17,705.83	138.33	31.35	0:16:15	14,209.88	222.03	18.61	0:23:20	12,979.06	405.60	10.39	0:30:15	553.02	553.02	7.28
0:02:25	16,725.00	65.33	64.54	0:09:25	16,456.56	128.57	31.51	0:16:20	14,696.00	229.63	18.23	0:23:25	11,543.77	360.74	11.44	0:30:20	602.72	602.72	6.96
0:02:30	15,978.62	62.42	66.64	0:09:30	17,069.56	133.36	31.45	0:16:25	14,825.82	231.65	17.93	0:23:30	12,782.14	399.44	10.58	0:30:25	618.66	618.66	6.78
0:02:35	16,685.15	65.18	65.60	0:09:35	17,256.42	134.82	31.28	0:16:30	14,638.96	228.73	18.22	0:23:35	12,021.92	375.69	11.17	0:30:30	656.20	656.20	6.36
0:02:40	16,168.83	63.16	65.63	0:09:40	17,125.34	133.79	31.69	0:16:35	15,070.13	235.47	17.92	0:23:40	12,380.33	386.89	10.84	0:30:35	597.27	597.27	7.11
0:02:45	16,821.05	65.71	64.83	0:09:45	16,818.32	131.39	31.51	0:16:40	15,649.58	244.52	17.56	0:23:45	12,113.57	378.55	11.07	0:30:40	520.09	520.09	8.01
0:02:50	16,184.56	63.22	65.61	0:09:50	17,419.78	136.09	31.67	0:16:45	13,859.87	216.56	19.09	0:23:50	11,759.36	367.48	11.43	0:30:45	656.20	656.20	6.39
0:02:55	16,545.48	64.63	65.18	0:09:55	17,068.72	133.35	31.20	0:16:50	13,962.84	218.17	18.85	0:23:55	12,257.43	383.04	11.01	0:30:50	588.04	588.04	7.14
								0:16:55	14,535.78	227.12	19.00					0:30:55	635.23	635.23	6.65

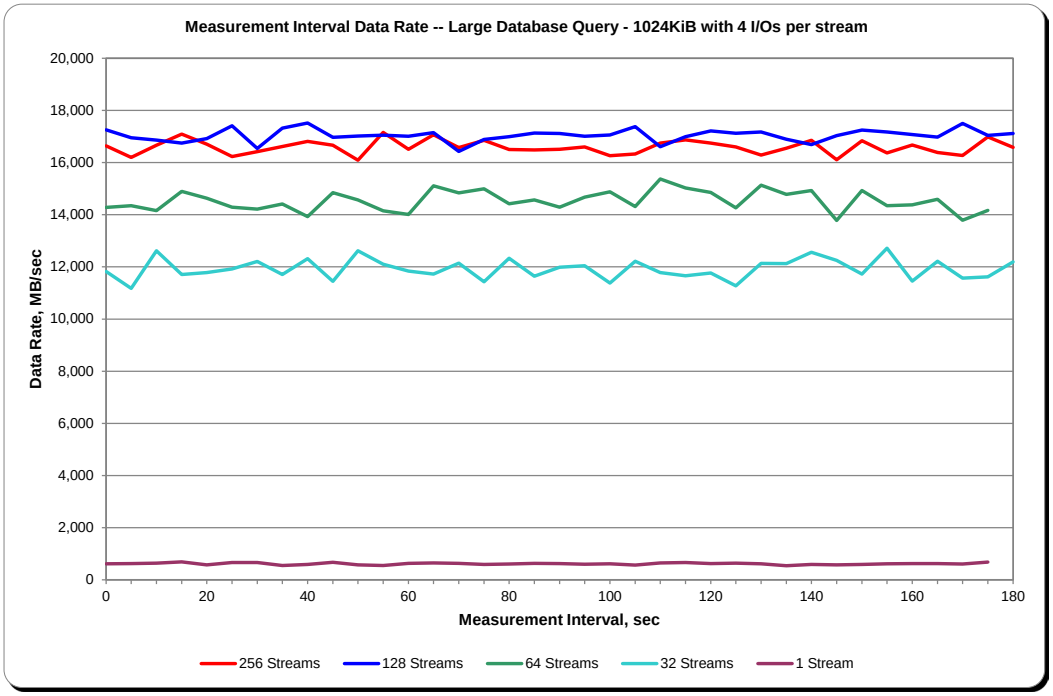
SPC-2 "Large Database Query/1024 KiB Transfer Size/4 Outstanding I/Os" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods

TR11	256 Streams			TR12	128 Streams			TR13	64 Streams			TR14	32 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	16,642.58	65.01	65.11	0:10:00	17,256.21	134.81	31.26	0:17:00	14,277.20	223.08	18.92	0:24:00	11,820.81	369.40	11.47	0:31:00	613.42	613.42	6.83
0:03:05	16,199.66	63.28	64.97	0:10:05	16,952.96	132.44	31.74	0:17:05	14,350.39	224.22	18.51	0:24:05	11,176.14	349.25	11.52	0:31:05	626.84	626.84	6.70
0:03:10	16,661.87	65.09	63.89	0:10:10	16,857.54	131.70	31.54	0:17:10	14,153.89	221.15	19.03	0:24:10	12,615.84	394.24	10.93	0:31:10	642.36	642.36	6.14
0:03:15	17,088.01	66.75	64.61	0:10:15	16,750.16	130.86	31.45	0:17:15	14,892.51	232.70	18.09	0:24:15	11,710.92	365.97	11.23	0:31:15	690.80	690.80	6.41
0:03:20	16,707.38	65.26	64.76	0:10:20	16,918.98	132.18	31.80	0:17:20	14,635.81	228.68	18.43	0:24:20	11,785.57	368.30	11.45	0:31:20	572.94	572.94	7.36
0:03:25	16,232.59	63.41	64.27	0:10:25	17,411.39	136.03	31.20	0:17:25	14,290.83	223.29	18.61	0:24:25	11,924.62	372.64	11.21	0:31:25	662.49	662.49	6.38
0:03:30	16,419.86	64.14	65.75	0:10:30	16,538.35	129.21	31.67	0:17:30	14,214.71	222.10	18.32	0:24:30	12,204.80	381.40	11.04	0:31:30	665.43	665.43	6.35
0:03:35	16,614.48	64.90	64.97	0:10:35	17,316.81	135.29	31.23	0:17:35	14,411.84	225.18	18.90	0:24:35	11,704.62	365.77	11.43	0:31:35	549.87	549.87	7.22
0:03:40	16,815.80	65.69	64.42	0:10:40	17,516.67	136.85	31.52	0:17:40	13,931.38	217.68	19.23	0:24:40	12,318.67	384.96	10.87	0:31:40	593.91	593.91	7.23
0:03:45	16,665.86	65.10	64.19	0:10:45	16,967.22	132.56	31.49	0:17:45	14,846.79	231.98	18.47	0:24:45	11,442.27	357.57	11.64	0:31:45	674.86	674.86	6.26
0:03:50	16,095.01	62.87	65.37	0:10:50	17,013.15	132.92	31.68	0:17:50	14,568.29	227.63	18.45	0:24:50	12,615.63	394.24	10.70	0:31:50	578.18	578.18	7.24
0:03:55	17,155.12	67.01	64.16	0:10:55	17,047.75	133.19	31.62	0:17:55	14,147.39	221.05	18.27	0:24:55	12,105.39	378.29	11.12	0:31:55	551.13	551.13	7.71
0:04:00	16,507.10	64.48	64.63	0:11:00	17,005.39	132.85	31.31	0:18:00	14,010.86	218.92	19.26	0:25:00	11,838.00	369.94	11.30	0:32:00	636.28	636.28	6.36
0:04:05	17,067.25	66.67	62.87	0:11:05	17,151.77	134.00	31.47	0:18:05	15,108.93	236.08	17.90	0:25:05	11,726.85	366.46	11.50	0:32:05	651.17	651.17	6.44
0:04:10	16,574.84	64.75	65.23	0:11:10	16,428.88	128.35	31.51	0:18:10	14,838.19	231.85	18.23	0:25:10	12,141.88	379.43	11.20	0:32:10	634.81	634.81	6.61
0:04:15	16,849.15	65.82	63.86	0:11:15	16,882.91	131.90	31.73	0:18:15	14,989.81	234.22	18.05	0:25:15	11,432.83	357.28	11.69	0:32:15	594.12	594.12	7.10
0:04:20	16,503.12	64.47	64.79	0:11:20	16,989.66	132.73	31.85	0:18:20	14,420.65	225.32	18.46	0:25:20	12,332.09	385.38	10.97	0:32:20	607.54	607.54	6.86
0:04:25	16,483.61	64.39	65.44	0:11:25	17,131.22	133.84	31.45	0:18:25	14,568.71	227.64	18.54	0:25:25	11,639.19	363.72	11.25	0:32:25	630.40	630.40	6.68
0:04:30	16,511.72	64.50	64.40	0:11:30	17,112.13	133.69	31.55	0:18:30	14,287.90	223.25	18.85	0:25:30	11,989.21	374.66	11.51	0:32:30	622.22	622.22	6.74
0:04:35	16,595.18	64.82	64.49	0:11:35	17,011.89	132.91	31.39	0:18:35	14,671.05	229.24	18.34	0:25:35	12,042.48	376.33	11.17	0:32:35	600.83	600.83	6.97
0:04:40	16,264.25	63.53	66.32	0:11:40	17,060.96	133.29	31.40	0:18:40	14,875.10	232.42	18.17	0:25:40	11,377.47	355.55	11.36	0:32:40	615.09	615.09	6.90
0:04:45	16,332.20	63.80	64.47	0:11:45	17,375.74	135.75	31.55	0:18:45	14,313.06	223.64	18.19	0:25:45	12,215.07	381.72	11.27	0:32:45	567.91	567.91	7.33
0:04:50	16,749.32	65.43	64.36	0:11:50	16,608.19	129.75	31.59	0:18:50	15,372.96	240.20	17.93	0:25:50	11,778.44	368.08	11.36	0:32:50	645.08	645.08	6.55
0:04:55	16,868.44	65.89	64.04	0:11:55	16,991.96	132.75	31.71	0:18:55	15,029.87	234.84	17.90	0:25:55	11,657.86	364.31	11.54	0:32:55	661.44	661.44	6.18
0:05:00	16,745.13	65.41	64.45	0:12:00	17,211.75	134.47	31.57	0:19:00	14,854.55	232.10	17.72	0:26:00	11,768.59	367.77	11.18	0:33:00	623.27	623.27	6.95
0:05:05	16,600.85	64.85	65.49	0:12:05	17,120.94	133.76	31.39	0:19:05	14,268.18	222.94	18.56	0:26:05	11,275.55	352.36	11.81	0:33:05	640.26	640.26	6.32
0:05:10	16,288.58	63.63	65.91	0:12:10	17,169.80	134.14	31.53	0:19:10	15,135.36	236.49	17.87	0:26:10	12,134.12	379.19	11.40	0:33:10	619.29	619.29	6.82
0:05:15	16,553.45	64.66	64.56	0:12:15	16,894.03	131.98	31.47	0:19:15	14,778.00	230.91	18.09	0:26:15	12,124.68	378.90	11.04	0:33:15	546.31	546.31	7.72
0:05:20	16,851.04	65.82	64.20	0:12:20	16,686.20	130.36	31.40	0:19:20	14,927.95	233.25	17.97	0:26:20	12,559.84	392.50	10.72	0:33:20	589.93	589.93	7.14
0:05:25	16,109.27	62.93	64.00	0:12:25	17,034.33	133.08	31.39	0:19:25	13,781.01	215.33	19.63	0:26:25	12,245.90	382.68	10.98	0:33:25	571.68	571.68	7.39
0:05:30	16,840.34	65.78	64.59	0:12:30	17,244.67	134.72	31.42	0:19:30	14,924.38	233.19	18.05	0:26:30	11,727.90	366.50	11.03	0:33:30	593.70	593.70	7.10
0:05:35	16,371.42	63.95	64.89	0:12:35	17,168.75	134.13	31.44	0:19:35	14,347.04	224.17	18.81	0:26:35	12,712.10	397.25	10.91	0:33:35	614.26	614.26	6.76
0:05:40	16,673.83	65.13	64.71	0:12:40	17,071.24	133.37	31.32	0:19:40	14,383.11	224.74	18.66	0:26:40	11,452.34	357.89	11.29	0:33:40	625.79	625.79	6.58
0:05:45	16,390.08	64.02	65.55	0:12:45	16,973.93	132.61	31.29	0:19:45	14,593.87	228.03	18.53	0:26:45	12,220.31	381.88	11.00	0:33:45	621.60	621.60	6.79
0:05:50	16,275.58	63.58	65.72	0:12:50	17,503.88	136.75	31.70	0:19:50	13,790.87	215.48	18.73	0:26:50	11,570.83	361.59	11.58	0:33:50	611.95	611.95	6.89
0:05:55	16,982.32	66.34	64.81	0:12:55	17,038.31	133.11	31.40	0:19:55	14,164.16	221.32	19.49	0:26:55	11,616.75	363.02	11.63	0:33:55	682.20	682.20	6.19
0:06:00	16,585.75	64.79	64.02	0:13:00	17,117.79	133.73	31.55	0:20:00	13,847.91	216.37	19.36	0:27:00	12,194.10	381.07	11.24	0:34:00	630.19	630.19	6.71
0:06:05	16,063.76	62.75	65.40	0:13:05	16,413.57	128.23	31.58	0:20:05	14,026.59	219.17	19.07	0:27:05	11,581.52	361.92	11.31	0:34:05	614.05	614.05	6.58
0:06:10	16,700.46	65.24	64.56	0:13:10	17,400.07	135.94	31.48	0:20:10	14,971.78	233.93	18.07	0:27:10	12,120.70	378.77	11.13	0:34:10	599.58	599.58	7.05
0:06:15	17,010.21	66.45	63.79	0:13:15	16,768.83	131.01	31.34	0:20:15	14,476.01	226.19	18.10	0:27:15	12,204.38	381.39	11.01	0:34:15	603.14	603.14	6.96
0:06:20	16,834.89	65.76	64.14	0:13:20	17,179.03	134.21	31.17	0:20:20	15,081.46	235.65	17.80	0:27:20	11,814.31	369.20	11.44	0:34:20	648.23	648.23	6.47
0:06:25	16,891.72	65.98	63.46	0:13:25	17,536.18	137.00	31.49	0:20:25	14,873.21	232.39	17.95	0:27:25	12,625.48	394.55	10.54	0:34:25	622.85	622.85	6.78
0:06:30	16,696.48	65.22	63.70	0:13:30	17,072.29	133.38	31.58	0:20:30	14,007.93	218.87	19.23	0:27:30	12,682.53	396.33	10.82	0:34:30	609.85	609.85	6.90
0:06:35	17,413.91	68.02	62.83	0:13:35	16,454.04	128.55	31.70	0:20:35	15,481.39	241.90	17.30	0:27:35	11,718.47	366.20	11.19	0:34:35	568.96	568.96	7.32
0:06:40	17,108.15	66.83	62.72	0:13:40	17,553.58	417.94	31.35	0:20:40	14,836.09	231.81	18.19	0:27:40	11,859.81	370.62	11.27	0:34:40	568.96	568.96	7.27
0:06:45	281.65	0.00	73.81	0:13:45	129.60	0.00	28.12	0:20:45	301.99	0.00	17.95	0:27:45	281.44	0.00	10.49	0:34:45	16.78	0.00	5.87
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					0:20:55	0.00	0.00	0.00								

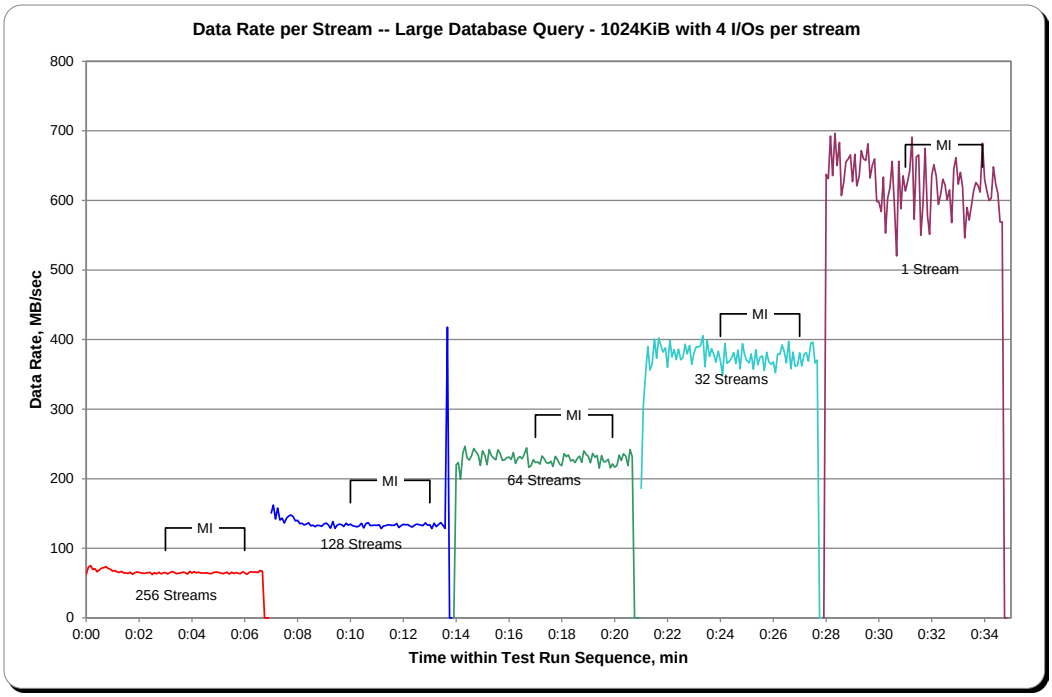
SPC-2 "Large Database Query/1024 KiB Transfer Size/4 Outstanding I/Os" Average Data Rate Graph – Complete Test Run



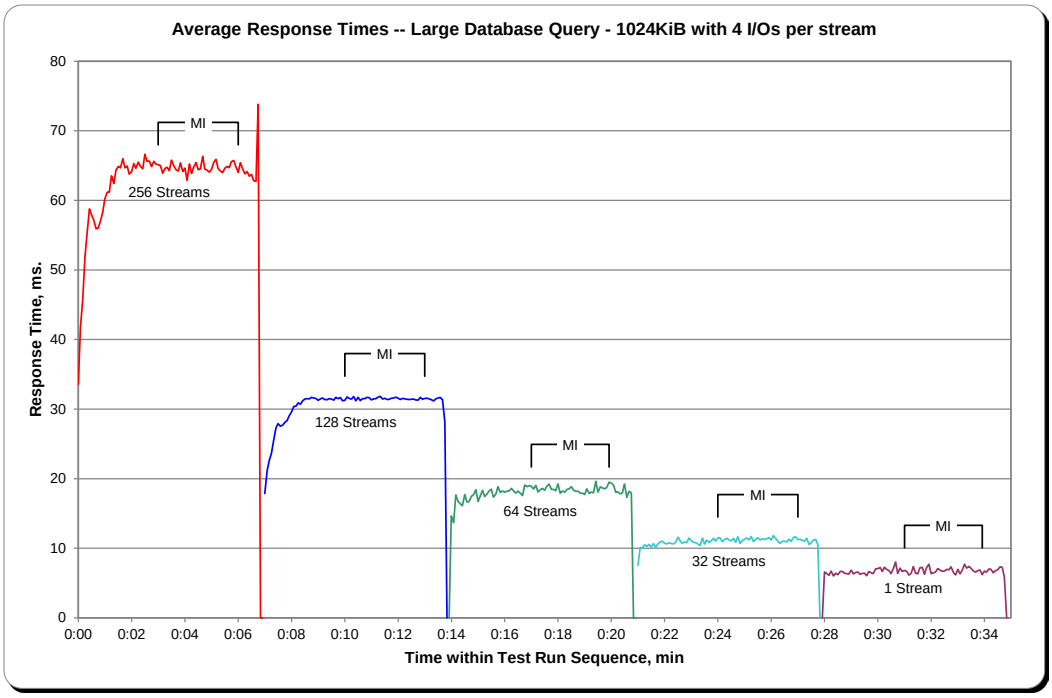
SPC-2 "Large Database Query/1024 KiB Transfer Size/4 Outstanding I/Os" Average Data Rate Graph – Measurement Interval (MI) Only



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



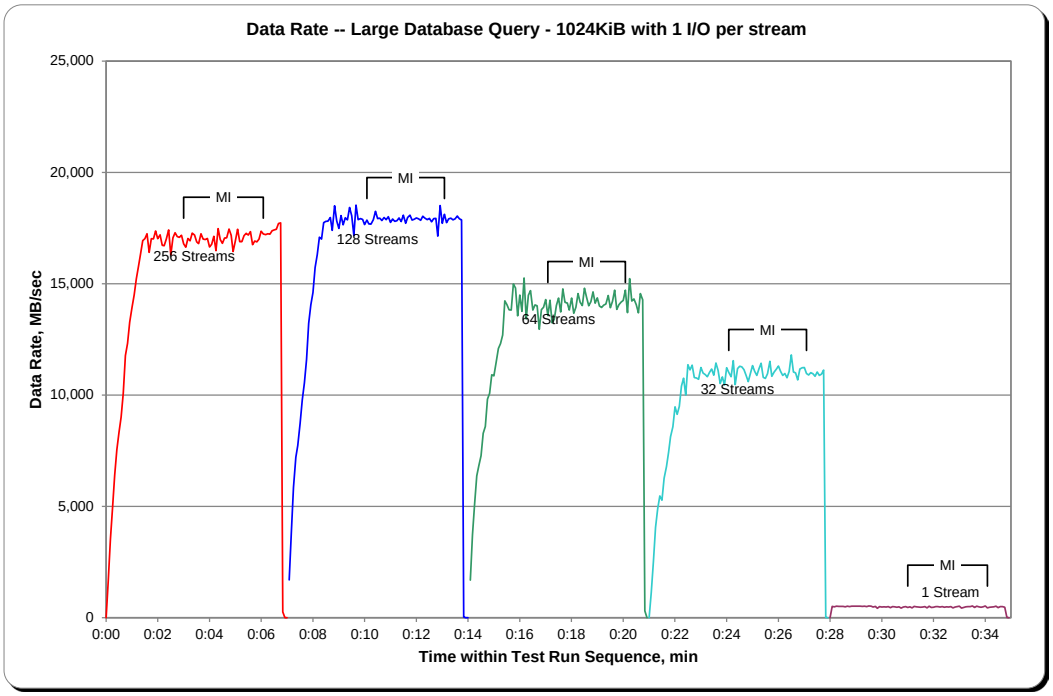
SPC-2 "Large Database Query/1024 KiB Transfer Size/1 Outstanding I/O" Test Run Data – Ramp-Up Period

TR16	256 Streams			TR17	128 Streams			TR18	64 Streams			TR19	32 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	0:07:05	1,695.55	105.97	4.28	0:14:05	1,686.74	168.67	3.88	0:21:00	0.00	0.00	0.00	0:28:00	0.00	0.00	0.00
0:00:05	1,683.38	70.14	9.37	0:07:10	3,830.03	153.20	5.30	0:14:10	3,725.17	232.82	3.80	0:21:05	1,135.61	283.90	2.41	0:28:05	504.78	504.78	2.05
0:00:10	3,516.92	78.15	10.59	0:07:15	5,856.51	150.17	5.76	0:14:15	5,110.76	212.95	4.26	0:21:10	2,513.65	279.29	2.38	0:28:10	484.86	484.86	2.14
0:00:15	4,944.87	76.07	11.49	0:07:20	7,210.01	156.74	6.26	0:14:20	6,367.37	235.83	4.35	0:21:15	4,060.30	338.36	2.57	0:28:15	516.53	516.53	2.04
0:00:20	6,411.83	74.56	12.24	0:07:25	7,730.31	143.15	6.65	0:14:25	6,839.86	235.86	4.32	0:21:20	4,892.45	349.46	2.80	0:28:20	504.99	504.99	2.09
0:00:25	7,542.83	71.16	13.14	0:07:30	8,734.01	140.87	7.13	0:14:30	7,273.97	227.31	4.38	0:21:25	5,464.34	390.31	2.70	0:28:25	507.30	507.30	2.08
0:00:30	8,316.68	69.89	14.41	0:07:35	9,776.71	141.69	7.18	0:14:35	8,278.09	236.52	4.25	0:21:30	5,274.76	351.65	2.91	0:28:30	511.29	511.29	2.06
0:00:35	9,014.19	68.29	14.50	0:07:40	10,546.37	138.77	7.08	0:14:40	8,590.35	220.27	4.44	0:21:35	6,261.47	368.32	2.72	0:28:35	491.15	491.15	2.06
0:00:40	10,080.80	67.21	14.37	0:07:45	11,586.76	141.30	7.04	0:14:45	9,817.40	233.75	4.31	0:21:40	6,785.75	339.29	2.83	0:28:40	517.58	517.58	2.04
0:00:45	11,774.25	72.23	14.16	0:07:50	13,222.54	148.57	6.94	0:14:50	10,072.41	228.92	4.38	0:21:45	7,438.60	338.12	2.92	0:28:45	501.64	501.64	2.10
0:00:50	12,321.61	70.41	14.28	0:07:55	14,049.24	147.89	6.88	0:14:55	10,905.19	227.19	4.52	0:21:50	8,122.69	338.45	2.87	0:28:50	515.69	515.69	2.03
0:00:55	13,268.68	70.20	14.41	0:08:00	14,603.52	144.59	7.00	0:15:00	10,864.30	221.72	4.66	0:21:55	8,577.35	357.39	2.95	0:28:55	519.46	519.46	2.03
0:01:00	13,944.80	70.79	14.56	0:08:05	15,723.19	142.94	7.03	0:15:05	11,437.45	228.75	4.52	0:22:00	9,473.88	364.38	2.81	0:29:00	515.27	515.27	2.02
0:01:05	14,500.55	68.72	14.91	0:08:10	16,305.15	145.58	7.16	0:15:10	12,086.94	219.76	4.70	0:22:05	9,138.13	351.47	3.00	0:29:05	514.64	514.64	2.01
0:01:10	15,222.39	66.47	15.15	0:08:15	17,091.58	144.84	7.16	0:15:15	12,305.67	208.57	4.76	0:22:10	9,484.79	351.29	2.96	0:29:10	518.84	518.84	2.02
0:01:15	15,771.00	66.54	15.40	0:08:20	17,000.98	142.87	7.22	0:15:20	12,697.21	211.62	4.79	0:22:15	10,404.18	335.62	3.00	0:29:15	504.78	504.78	2.08
0:01:20	16,353.80	66.48	15.58	0:08:25	17,738.34	140.78	7.32	0:15:25	14,231.27	229.54	4.55	0:22:20	10,760.28	347.11	3.04	0:29:20	521.35	521.35	2.02
0:01:25	16,937.02	67.21	15.54	0:08:30	17,796.85	139.04	7.49	0:15:30	14,059.94	219.69	4.68	0:22:25	10,000.90	322.61	3.14	0:29:25	498.91	498.91	2.11
0:01:30	17,025.31	66.51	15.74	0:08:35	17,806.29	139.11	7.50	0:15:35	13,827.57	216.06	4.78	0:22:30	11,363.00	355.09	2.94	0:29:30	526.39	526.39	2.00
0:01:35	17,245.30	67.36	15.67	0:08:40	17,969.66	140.39	7.51	0:15:40	13,814.99	215.86	4.86	0:22:35	11,125.81	347.68	3.01	0:29:35	515.27	515.27	2.04
0:01:40	16,411.05	64.11	15.77	0:08:45	17,397.55	135.92	7.46	0:15:45	14,986.88	234.17	4.60	0:22:40	11,339.93	354.37	3.03	0:29:40	483.39	483.39	2.18
0:01:45	17,025.31	66.51	15.82	0:08:50	18,500.66	144.54	7.53	0:15:50	14,804.43	231.32	4.53	0:22:45	10,781.25	336.91	3.10	0:29:45	507.72	507.72	2.07
0:01:50	17,015.03	66.46	15.82	0:08:55	17,819.92	139.22	7.51	0:15:55	13,555.99	211.81	4.82	0:22:50	10,769.09	336.53	3.06	0:29:50	422.37	422.37	2.40
0:01:55	17,370.29	67.85	15.80	0:09:00	17,479.97	136.56	7.45	0:16:00	14,484.61	226.32	4.64	0:22:55	10,704.49	334.52	3.14	0:29:55	500.59	500.59	2.09
0:02:00	17,020.49	66.49	15.79	0:09:05	18,056.90	141.07	7.49	0:16:05	13,756.27	214.94	4.87	0:23:00	11,237.80	351.18	3.02	0:30:00	479.83	479.83	2.19
0:02:05	17,190.56	67.15	15.66	0:09:10	17,641.45	137.82	7.49	0:16:10	15,255.10	238.36	4.54	0:23:05	10,986.14	343.32	3.07	0:30:05	491.57	491.57	2.14
0:02:10	16,728.77	65.35	15.89	0:09:15	17,964.41	140.35	7.48	0:16:15	13,415.69	209.62	4.87	0:23:10	10,918.19	341.19	2.99	0:30:10	482.97	482.97	2.17
0:02:15	16,707.38	65.26	15.81	0:09:20	17,869.83	139.61	7.53	0:16:20	14,474.12	226.16	4.63	0:23:15	10,822.77	338.21	3.10	0:30:15	497.44	497.44	2.12
0:02:20	16,998.26	66.40	15.74	0:09:25	18,425.79	143.95	7.46	0:16:25	14,689.08	229.52	4.59	0:23:20	11,017.81	344.31	3.04	0:30:20	454.45	454.45	2.32
0:02:25	17,413.70	68.02	15.82	0:09:30	18,052.70	141.04	7.47	0:16:30	13,817.72	215.90	4.90	0:23:25	11,165.66	348.93	2.99	0:30:25	497.86	497.86	2.12
0:02:30	16,294.24	63.65	15.90	0:09:35	17,168.75	134.13	7.53	0:16:35	14,042.95	219.42	4.78	0:23:30	10,889.25	340.29	3.10	0:30:30	492.62	492.62	2.13
0:02:35	17,059.49	66.64	15.81	0:09:40	18,531.06	144.77	7.51	0:16:40	14,006.67	218.85	4.80	0:23:35	11,439.13	357.47	2.95	0:30:35	464.94	464.94	2.20
0:02:40	17,294.79	67.56	15.83	0:09:45	17,877.38	139.67	7.48	0:16:45	12,957.04	202.45	5.09	0:23:40	11,113.65	347.30	3.02	0:30:40	491.78	491.78	2.13
0:02:45	17,122.20	66.88	15.75	0:09:50	17,921.84	140.01	7.50	0:16:50	13,835.54	216.18	4.80	0:23:45	10,517.43	328.67	3.17	0:30:45	432.85	432.85	2.40
0:02:50	17,078.58	66.71	15.79	0:09:55	17,885.56	139.73	7.50	0:16:55	13,937.25	217.77	4.97	0:23:50	10,811.03	337.84	3.09	0:30:50	474.59	474.59	2.22
0:02:55	17,174.42	67.09	15.69	0:10:00	17,651.73	137.90	7.53	0:17:00	14,283.28	223.18	4.66	0:23:55	10,452.83	326.65	3.18	0:30:55	503.11	503.11	2.10
												0:24:00	11,228.36	350.89	3.06				

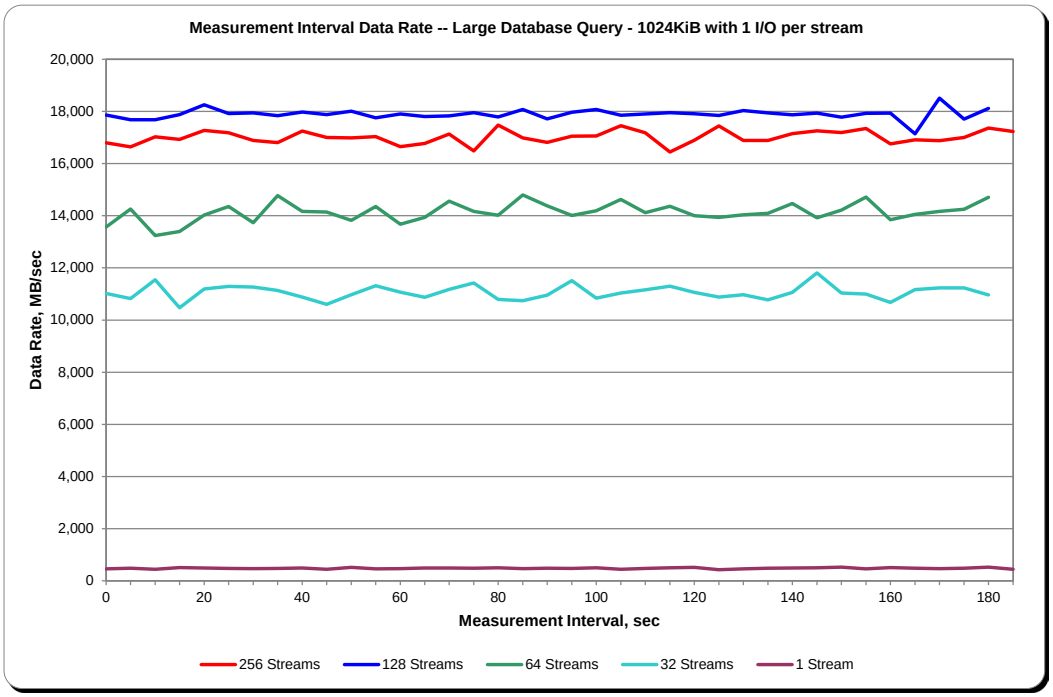
SPC-2 "Large Database Query/1024 KiB Transfer Size/1 Outstanding I/O" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods

TR16	256 Streams			TR17	128 Streams			TR18	64 Streams			TR19	32 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	16,795.04	65.61	15.86	0:10:05	17,860.19	139.53	7.49	0:17:05	13,570.67	212.04	4.82	0:24:05	11,018.44	344.33	3.05	0:31:00	463.89	463.89	2.27
0:03:05	16,640.90	65.00	15.80	0:10:10	17,682.56	138.14	7.50	0:17:10	14,256.86	222.76	4.71	0:24:10	10,823.40	338.23	3.11	0:31:05	486.75	486.75	2.18
0:03:10	17,026.99	66.51	15.82	0:10:15	17,677.73	138.11	7.49	0:17:15	13,237.43	206.83	5.17	0:24:15	11,545.45	360.80	2.92	0:31:10	442.08	442.08	2.28
0:03:15	16,926.53	66.12	15.85	0:10:20	17,878.22	139.67	7.50	0:17:20	13,399.54	209.37	4.92	0:24:20	10,469.40	327.17	3.08	0:31:15	507.51	507.51	2.08
0:03:20	17,274.45	67.48	15.76	0:10:25	18,250.05	142.58	7.45	0:17:25	14,026.17	219.16	4.91	0:24:25	11,189.77	349.68	3.02	0:31:20	492.83	492.83	2.14
0:03:25	17,182.39	67.12	15.71	0:10:30	17,921.84	140.01	7.55	0:17:30	14,356.47	224.32	4.61	0:24:30	11,289.60	352.80	2.99	0:31:25	477.94	477.94	2.19
0:03:30	16,882.28	65.95	15.83	0:10:35	17,943.65	140.18	7.50	0:17:35	13,730.68	214.54	4.80	0:24:35	11,265.90	352.06	2.99	0:31:30	470.81	470.81	2.18
0:03:35	16,802.59	65.64	15.73	0:10:40	17,838.58	139.36	7.49	0:17:40	14,770.03	230.78	4.58	0:24:40	11,136.30	348.01	3.03	0:31:35	476.26	476.26	2.26
0:03:40	17,246.35	67.37	15.73	0:10:45	17,973.85	140.42	7.50	0:17:45	14,163.12	221.30	4.75	0:24:45	10,881.70	340.05	3.10	0:31:40	496.61	496.61	2.12
0:03:45	17,002.66	66.42	15.84	0:10:50	17,878.43	139.68	7.50	0:17:50	14,137.53	220.90	4.75	0:24:50	10,600.68	331.27	3.06	0:31:45	442.50	442.50	2.29
0:03:50	16,985.67	66.35	15.84	0:10:55	18,008.24	140.69	7.50	0:17:55	13,818.97	215.92	4.83	0:24:55	10,968.52	342.77	3.07	0:31:50	521.35	521.35	2.03
0:03:55	17,033.49	66.54	15.77	0:11:00	17,755.54	138.72	7.50	0:18:00	14,355.42	224.30	4.71	0:25:00	11,318.54	353.70	2.98	0:31:55	461.79	461.79	2.27
0:04:00	16,646.14	65.02	16.03	0:11:05	17,904.23	139.88	7.44	0:18:05	13,673.01	213.64	4.92	0:25:05	11,067.51	345.86	3.04	0:32:00	467.25	467.25	2.26
0:04:05	16,774.49	65.53	15.87	0:11:10	17,799.58	139.06	7.48	0:18:10	13,938.72	217.79	4.77	0:25:10	10,876.88	339.90	3.10	0:32:05	494.09	494.09	2.13
0:04:10	17,127.86	66.91	15.76	0:11:15	17,831.66	139.31	7.46	0:18:15	14,555.49	227.43	4.63	0:25:15	11,174.05	349.19	3.01	0:32:10	494.30	494.30	2.10
0:04:15	16,480.68	64.38	15.86	0:11:20	17,949.94	140.23	7.51	0:18:20	14,166.68	221.35	4.77	0:25:20	11,424.86	357.03	2.96	0:32:15	483.18	483.18	2.17
0:04:20	17,475.15	68.26	15.77	0:11:25	17,786.58	138.96	7.49	0:18:25	14,015.48	218.99	4.78	0:25:25	10,791.11	337.22	3.06	0:32:20	502.90	502.90	2.09
0:04:25	16,985.46	66.35	15.75	0:11:30	18,074.93	141.21	7.48	0:18:30	14,796.46	231.19	4.57	0:25:30	10,744.34	335.76	3.12	0:32:25	471.44	471.44	2.24
0:04:30	16,813.71	65.68	15.75	0:11:35	17,716.32	138.41	7.47	0:18:35	14,381.01	224.70	4.64	0:25:35	10,958.25	342.45	3.08	0:32:30	488.64	488.64	2.15
0:04:35	17,050.27	66.60	15.79	0:11:40	17,967.56	140.37	7.51	0:18:40	14,006.46	218.85	4.62	0:25:40	11,511.90	359.75	2.93	0:32:35	477.73	477.73	2.11
0:04:40	17,057.19	66.63	15.73	0:11:45	18,076.40	141.22	7.46	0:18:45	14,193.31	221.77	4.74	0:25:45	10,841.86	338.81	3.00	0:32:40	498.49	498.49	2.11
0:04:45	17,448.51	68.16	15.69	0:11:50	17,854.10	139.49	7.50	0:18:50	14,627.64	228.56	4.62	0:25:50	11,036.26	344.88	3.06	0:32:45	440.19	440.19	2.40
0:04:50	17,178.61	67.10	15.69	0:11:55	17,897.93	139.83	7.52	0:18:55	14,120.54	220.63	4.77	0:25:55	11,157.48	348.67	3.02	0:32:50	477.73	477.73	2.17
0:04:55	16,444.19	64.24	15.88	0:12:00	17,951.41	140.25	7.49	0:19:00	14,361.09	224.39	4.67	0:26:00	11,302.39	353.20	2.99	0:32:55	500.38	500.38	2.11
0:05:00	16,894.87	66.00	15.70	0:12:05	17,911.78	139.94	7.51	0:19:05	14,002.47	218.79	4.82	0:26:05	11,060.38	345.64	2.99	0:33:00	515.90	515.90	2.05
0:05:05	17,442.43	68.13	15.80	0:12:10	17,842.57	139.40	7.51	0:19:10	13,934.53	217.73	4.81	0:26:10	10,878.98	339.97	3.06	0:33:05	429.92	429.92	2.46
0:05:10	16,887.95	65.97	15.81	0:12:15	18,029.22	140.85	7.47	0:19:15	14,035.40	219.30	4.68	0:26:15	10,969.99	342.81	3.07	0:33:10	458.44	458.44	2.30
0:05:15	16,889.41	65.97	15.71	0:12:20	17,946.59	140.21	7.54	0:19:20	14,088.67	220.14	4.79	0:26:20	10,776.43	336.76	3.12	0:33:15	484.23	484.23	2.09
0:05:20	17,151.98	67.00	15.65	0:12:25	17,872.77	139.63	7.52	0:19:25	14,469.93	226.09	4.67	0:26:25	11,061.22	345.66	3.03	0:33:20	493.67	493.67	2.17
0:05:25	17,256.62	67.41	15.75	0:12:30	17,937.57	140.14	7.49	0:19:30	13,922.78	217.54	4.79	0:26:30	11,805.29	368.92	2.91	0:33:25	497.86	497.86	2.10
0:05:30	17,185.53	67.13	15.66	0:12:35	17,776.72	138.88	7.51	0:19:35	14,214.08	222.09	4.71	0:26:35	11,037.94	344.94	3.03	0:33:30	523.87	523.87	2.00
0:05:35	17,341.77	67.74	15.56	0:12:40	17,926.04	140.05	7.53	0:19:40	14,712.78	229.89	4.64	0:26:40	10,997.26	343.66	3.04	0:33:35	461.79	461.79	2.26
0:05:40	16,755.20	65.45	15.87	0:12:45	17,936.31	140.13	7.48	0:19:45	13,843.09	216.30	4.83	0:26:45	10,677.65	333.68	3.03	0:33:40	512.96	512.96	2.06
0:05:45	16,912.27	66.06	15.76	0:12:50	17,140.44	133.91	7.53	0:19:50	14,053.23	219.58	4.76	0:26:50	11,167.75	348.99	3.03	0:33:45	484.44	484.44	2.09
0:05:50	16,877.46	65.93	15.86	0:12:55	18,509.46	144.61	7.53	0:19:55	14,169.20	221.39	4.73	0:26:55	11,229.83	350.93	3.00	0:33:50	465.15	465.15	2.27
0:05:55	17,000.77	66.41	15.72	0:13:00	17,708.14	138.34	7.46	0:20:00	14,248.05	222.63	4.62	0:27:00	11,234.65	351.08	2.99	0:33:55	484.44	484.44	2.17
0:06:00	17,362.11	67.82	15.75	0:13:05	18,116.04	141.53	7.45	0:20:05	14,708.38	229.82	4.71	0:27:05	10,963.07	342.60	3.04	0:34:00	523.24	523.24	2.02
0:06:05	17,232.30	67.31	15.65	0:13:10	17,741.91	138.61	7.49	0:20:10	13,699.02	214.05	4.70	0:27:10	10,901.21	340.66	3.08	0:34:05	442.71	442.71	2.37
0:06:10	17,203.99	67.20	15.54	0:13:15	17,911.57	139.93	7.50	0:20:15	15,227.00	237.92	4.43	0:27:15	11,002.92	343.84	3.02	0:34:10	471.65	471.65	2.24
0:06:15	17,241.74	67.35	15.71	0:13:20	17,944.49	140.19	7.48	0:20:20	14,218.90	222.17	4.73	0:27:20	10,960.14	342.50	3.07	0:34:15	478.36	478.36	2.20
0:06:20	17,223.28	67.28	15.53	0:13:25	17,869.41	139.60	7.52	0:20:25	14,313.90	223.65	4.71	0:27:25	10,838.92	338.72	3.07	0:34:20	484.44	484.44	2.09
0:06:25	17,377.84	67.88	15.44	0:13:30	17,916.18	139.97	7.47	0:20:30	14,059.94	219.69	4.85	0:27:30	11,037.73	344.93	3.05	0:34:25	515.48	515.48	2.04
0:06:30	17,416.64	68.03	15.25	0:13:35	18,039.49	140.93	7.48	0:20:35	13,687.48	213.87	4.77	0:27:35	10,882.33	340.07	3.11	0:34:30	450.89	450.89	2.34
0:06:35	17,439.71	68.12	15.18	0:13:40	17,909.68	139.92	7.52	0:20:40	14,555.91	227.44	4.58	0:27:40	10,939.79	341.87	3.09	0:34:35	494.93	494.93	2.13
0:06:40	17,699.12	69.14	15.12	0:13:45	17,863.12	4,465.78	7.49	0:20:45	14,276.36	223.07	4.74	0:27:45	11,118.47	1,853.08	3.03	0:34:40	498.91	498.91	2.10
0:06:45	17,731.21	69.26	15.26	0:13:50	29.78	0.00	11.69	0:20:50	310.80	0.00	4.65	0:27:50	12.79	0.00	2.66	0:34:45	473.54	473.54	2.20
0:06:50	262.98	0.00	15.77	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	0:34:50	6.71	0.00	1.98
0:06:55	0.00	0.00	0.00	0:14:00	0.00	0.00	0.00									0:34:55	0.00	0.00	0.00
0:07:00	0.00	0.00	0.00																

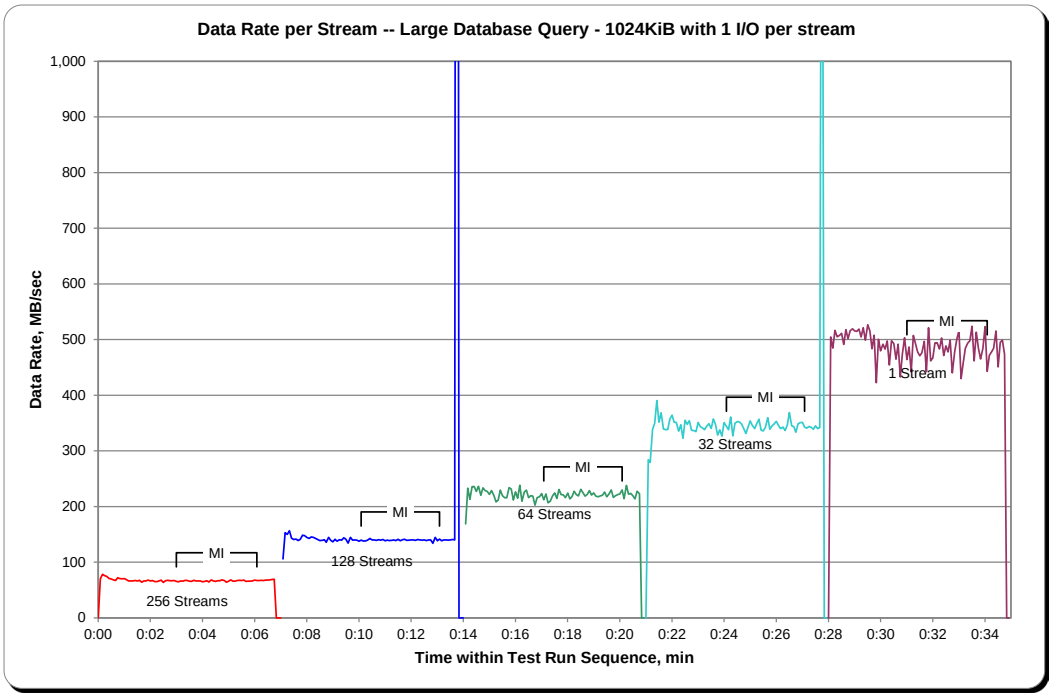
SPC-2 "Large Database Query/1024 KiB Transfer Size/1 Outstanding I/O" Average Data Rate Graph – Complete Test Run



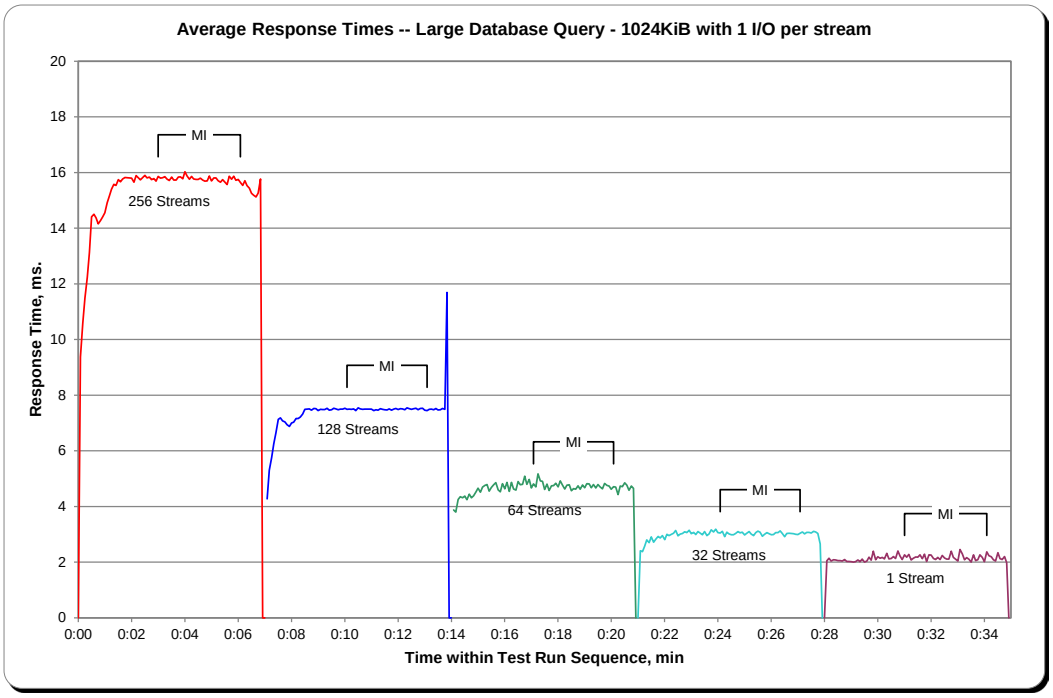
SPC-2 "Large Database Query/1024 KiB Transfer Size/1 Outstanding I/O" Average Data Rate Graph – Measurement Interval (MI) Only



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 Database Query/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 Database Query/64 KIB TRANSFER SIZE/4 Outstanding I/Os" table and graphs will be the SPC-2 "Large Database Query/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.

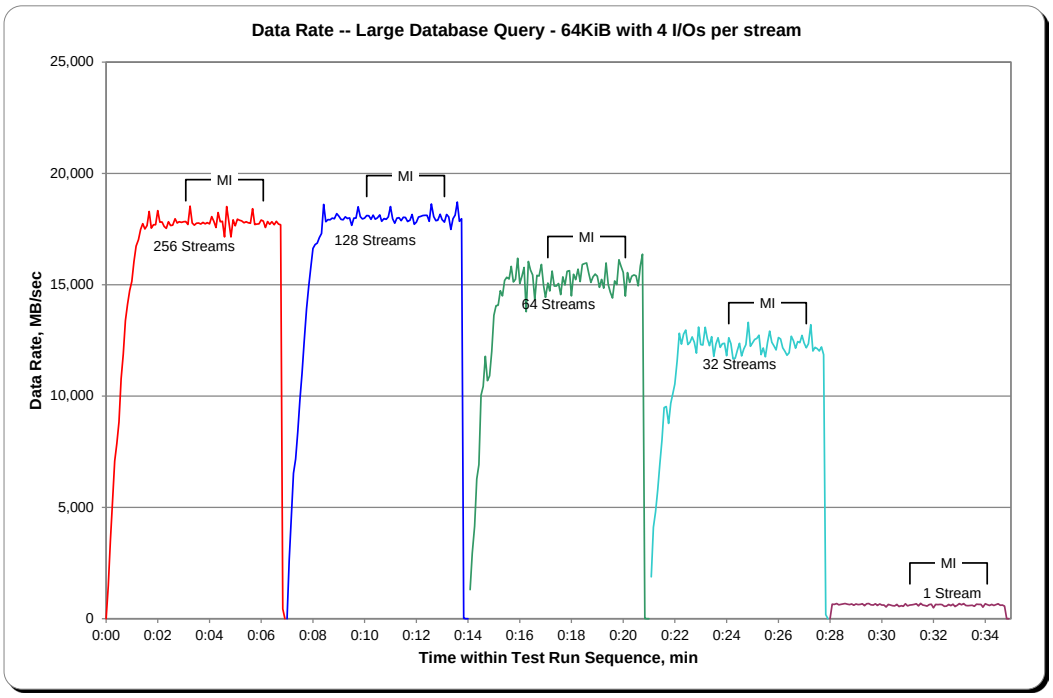
SPC-2 "Large Database Query/64 KiB Transfer Size/4 Outstanding I/Os" Test Run Data – Ramp-Up Period

TR1	256 Streams			TR2	128 Streams			TR3	64 Streams			TR4	32 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	0.00	0.00	0.00	0:07:00	0.00	0.00	0.00	0:14:05	1,304.24	163.03	0.89	0:21:05	1,884.10	269.16	0.61	0:28:00	0.00	0.00	0.00
0:00:05	1,480.67	56.95	2.08	0:07:05	2,626.99	145.94	1.19	0:14:10	2,948.09	245.67	0.89	0:21:10	4,105.71	410.57	0.56	0:28:05	652.68	652.68	0.40
0:00:10	3,518.69	74.87	2.68	0:07:10	4,573.98	157.72	1.31	0:14:15	4,149.49	207.47	0.91	0:21:15	4,795.37	399.61	0.59	0:28:10	643.08	643.08	0.41
0:00:15	5,287.42	74.47	2.83	0:07:15	6,534.19	171.95	1.39	0:14:20	6,276.35	232.46	1.01	0:21:20	5,763.76	360.24	0.65	0:28:15	685.14	685.14	0.38
0:00:20	7,084.72	74.58	3.15	0:07:20	7,167.21	155.81	1.47	0:14:25	6,917.55	192.15	1.12	0:21:25	6,939.56	385.53	0.67	0:28:20	620.96	620.96	0.42
0:00:25	7,867.21	68.41	3.46	0:07:25	8,388.75	144.63	1.65	0:14:30	10,034.31	264.06	0.98	0:21:30	8,022.93	364.68	0.67	0:28:25	645.18	645.18	0.39
0:00:30	8,833.37	64.01	3.68	0:07:30	9,821.82	144.44	1.70	0:14:35	10,430.25	242.56	1.03	0:21:35	9,482.31	412.27	0.62	0:28:30	657.04	657.04	0.40
0:00:35	10,771.18	68.17	3.61	0:07:35	11,027.48	147.03	1.69	0:14:40	11,779.59	267.72	0.96	0:21:40	9,532.21	414.44	0.63	0:28:35	683.98	683.98	0.38
0:00:40	11,875.58	69.86	3.56	0:07:40	12,451.97	150.02	1.68	0:14:45	10,688.43	242.92	1.08	0:21:45	8,767.58	365.32	0.69	0:28:40	653.35	653.35	0.40
0:00:45	13,381.36	72.72	3.45	0:07:45	13,908.90	156.28	1.68	0:14:50	10,905.46	237.08	1.09	0:21:50	9,667.41	371.82	0.66	0:28:45	628.50	628.50	0.42
0:00:50	14,123.78	74.73	3.45	0:07:50	14,907.98	149.08	1.65	0:14:55	12,004.01	226.49	1.06	0:21:55	10,075.92	373.18	0.66	0:28:50	659.08	659.08	0.40
0:00:55	14,736.04	72.95	3.49	0:07:55	15,781.78	144.79	1.71	0:15:00	13,628.30	247.79	1.04	0:22:00	10,538.41	376.37	0.69	0:28:55	605.97	605.97	0.41
0:01:00	15,152.28	72.15	3.55	0:08:00	16,624.49	148.43	1.77	0:15:05	14,054.78	255.54	1.02	0:22:05	11,585.94	399.52	0.64	0:29:00	660.50	660.50	0.40
0:01:05	16,041.30	71.93	3.55	0:08:05	16,804.48	143.63	1.78	0:15:10	14,075.66	238.57	1.04	0:22:10	12,820.14	413.55	0.62	0:29:05	637.26	637.26	0.41
0:01:10	16,735.89	70.91	3.61	0:08:10	16,870.28	142.97	1.78	0:15:15	14,724.69	245.41	1.04	0:22:15	12,333.96	385.44	0.67	0:29:10	643.85	643.85	0.41
0:01:15	17,024.85	70.64	3.66	0:08:15	17,114.52	142.62	1.81	0:15:20	14,493.43	241.56	1.08	0:22:20	12,781.49	399.42	0.65	0:29:15	670.54	670.54	0.39
0:01:20	17,485.19	71.37	3.66	0:08:20	17,301.80	139.53	1.82	0:15:25	15,187.84	241.08	1.07	0:22:25	12,965.63	405.18	0.63	0:29:20	581.38	581.38	0.43
0:01:25	17,738.30	70.95	3.64	0:08:25	18,607.51	145.37	1.81	0:15:30	15,333.79	239.59	1.09	0:22:30	12,313.23	384.79	0.68	0:29:25	672.46	672.46	0.39
0:01:30	17,497.42	68.35	3.76	0:08:30	17,826.30	139.27	1.85	0:15:35	15,252.78	238.32	1.10	0:22:35	12,417.14	388.04	0.67	0:29:30	679.78	679.78	0.38
0:01:35	17,654.99	68.96	3.77	0:08:35	17,921.67	140.01	1.86	0:15:40	15,826.59	247.29	1.06	0:22:40	12,651.12	395.35	0.66	0:29:35	619.62	619.62	0.42
0:01:40	18,283.66	71.42	3.77	0:08:40	17,917.97	139.98	1.86	0:15:45	15,117.93	236.22	1.10	0:22:45	12,418.33	388.07	0.68	0:29:40	612.48	612.48	0.43
0:01:45	17,536.40	68.50	3.77	0:08:45	17,991.09	140.56	1.86	0:15:50	15,248.91	238.26	1.10	0:22:50	11,923.45	372.61	0.70	0:29:45	671.08	671.08	0.39
0:01:50	17,697.23	69.13	3.75	0:08:50	17,961.71	140.33	1.87	0:15:55	16,190.47	252.98	1.07	0:22:55	13,101.81	409.43	0.63	0:29:50	597.29	597.29	0.42
0:01:55	17,691.11	69.11	3.77	0:08:55	18,193.76	142.14	1.84	0:16:00	15,050.04	235.16	1.11	0:23:00	12,308.00	384.62	0.68	0:29:55	663.39	663.39	0.39
0:02:00	18,324.20	71.58	3.76	0:09:00	18,081.65	141.26	1.86	0:16:05	15,379.24	240.30	1.09	0:23:05	12,293.83	384.18	0.68	0:30:00	614.10	614.10	0.43
0:02:05	17,804.60	69.55	3.76	0:09:05	17,934.96	140.12	1.86	0:16:10	15,774.67	246.48	1.06	0:23:10	13,085.65	408.93	0.64	0:30:05	613.31	613.31	0.43
0:02:10	17,818.72	69.60	3.76	0:09:10	17,913.47	139.95	1.86	0:16:15	13,783.89	215.37	1.17	0:23:15	12,569.40	392.79	0.66	0:30:10	527.80	527.80	0.49
0:02:15	17,613.41	68.80	3.77	0:09:15	18,047.75	141.00	1.85	0:16:20	16,040.68	250.64	1.08	0:23:20	12,258.89	383.09	0.67	0:30:15	645.31	645.31	0.41
0:02:20	17,528.19	68.47	3.79	0:09:20	17,967.81	140.37	1.86	0:16:25	15,655.67	244.62	1.06	0:23:25	12,662.51	395.70	0.65	0:30:20	612.12	612.12	0.43
0:02:25	17,826.37	69.63	3.75	0:09:25	18,002.71	140.65	1.85	0:16:30	15,435.03	241.17	1.09	0:23:30	11,783.52	368.23	0.71	0:30:25	580.89	580.89	0.44
0:02:30	17,652.10	68.95	3.77	0:09:30	17,665.44	138.01	1.86	0:16:35	14,322.59	223.79	1.12	0:23:35	12,342.17	385.69	0.68	0:30:30	579.81	579.81	0.46
0:02:35	17,669.75	69.02	3.76	0:09:35	17,989.37	140.54	1.86	0:16:40	15,414.71	240.85	1.09	0:23:40	12,613.40	394.17	0.66	0:30:35	641.00	641.00	0.41
0:02:40	17,957.54	70.15	3.74	0:09:40	17,989.96	140.55	1.85	0:16:45	15,387.08	240.42	1.08	0:23:45	12,184.64	380.77	0.68	0:30:40	546.10	546.10	0.47
0:02:45	17,772.93	69.43	3.75	0:09:45	18,502.86	144.55	1.86	0:16:50	15,907.19	248.55	1.08	0:23:50	12,346.21	385.82	0.69	0:30:45	582.33	582.33	0.45
0:02:50	17,829.42	69.65	3.76	0:09:50	18,060.34	141.10	1.85	0:16:55	14,966.87	233.86	1.12	0:23:55	12,369.83	386.56	0.67	0:30:50	554.27	554.27	0.45
0:02:55	17,799.51	69.53	3.77	0:09:55	17,949.30	140.23	1.85	0:17:00	14,433.88	225.53	1.15	0:24:00	11,806.78	368.96	0.70	0:30:55	673.56	673.56	0.39
0:03:00	17,830.94	69.65	3.76	0:10:00	17,987.89	140.53	1.86									0:31:00	573.83	573.83	0.46

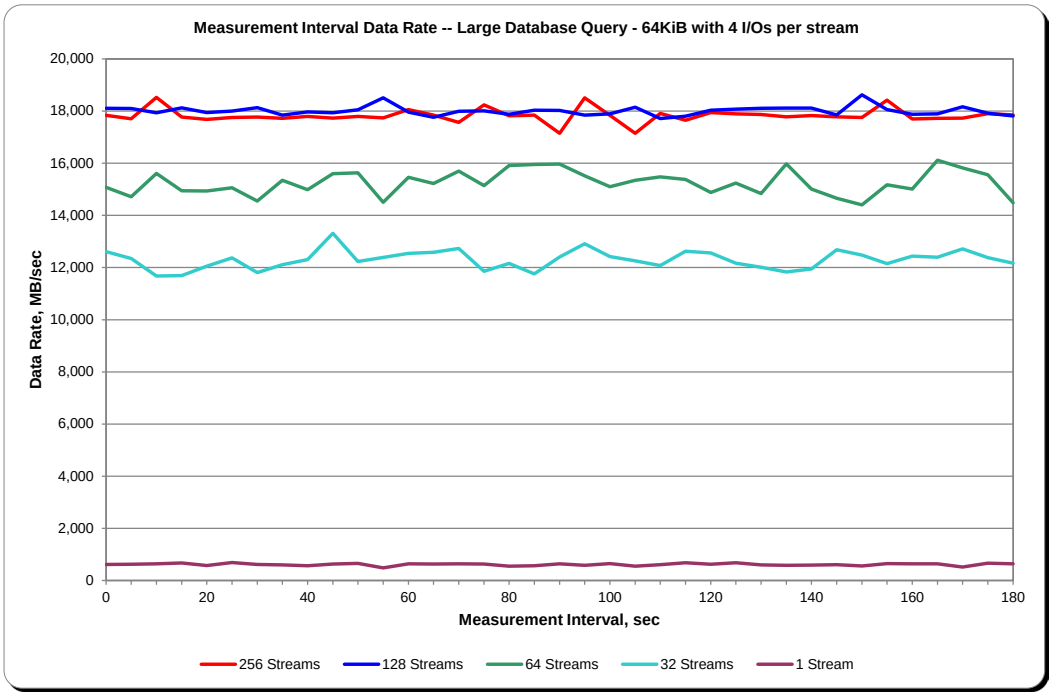
SPC-2 "Large Database Query/64 KiB Transfer Size/4 Outstanding I/Os" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Periods

TR1	256 Streams			TR2	128 Streams			TR3	64 Streams			TR4	32 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
0:03:05	17,835.98	69.67	3.75	0:10:05	18,105.33	141.45	1.85	0:17:05	15,078.27	235.60	1.11	0:24:05	12,613.09	394.16	0.69	0:31:05	613.21	613.21	0.43
0:03:10	17,706.78	69.17	3.77	0:10:10	18,099.81	141.40	1.85	0:17:10	14,718.34	229.97	1.12	0:24:10	12,347.42	385.86	0.66	0:31:10	627.13	627.13	0.42
0:03:15	18,526.28	72.37	3.76	0:10:15	17,933.69	140.11	1.85	0:17:15	15,607.01	243.86	1.07	0:24:15	11,671.78	364.74	0.71	0:31:15	644.55	644.55	0.41
0:03:20	17,774.45	69.43	3.76	0:10:20	18,126.44	141.61	1.85	0:17:20	14,943.78	233.50	1.11	0:24:20	11,693.36	365.42	0.72	0:31:20	672.66	672.66	0.39
0:03:25	17,678.76	69.06	3.76	0:10:25	17,942.39	140.17	1.86	0:17:25	14,937.64	233.40	1.12	0:24:25	12,054.81	376.71	0.70	0:31:25	573.06	573.06	0.45
0:03:30	17,755.85	69.36	3.76	0:10:30	17,996.42	140.60	1.86	0:17:30	15,057.92	235.28	1.11	0:24:30	12,369.69	386.55	0.67	0:31:30	687.96	687.96	0.38
0:03:35	17,772.69	69.42	3.78	0:10:35	18,130.17	141.64	1.86	0:17:35	14,552.14	227.38	1.14	0:24:35	11,803.24	368.85	0.70	0:31:35	617.71	617.71	0.42
0:03:40	17,718.32	69.21	3.77	0:10:40	17,845.65	139.42	1.86	0:17:40	15,349.49	239.84	1.12	0:24:40	12,108.55	378.39	0.68	0:31:40	598.21	598.21	0.42
0:03:45	17,798.63	69.53	3.74	0:10:45	17,968.82	140.38	1.86	0:17:45	14,988.30	234.19	1.07	0:24:45	12,310.26	384.70	0.68	0:31:45	568.49	568.49	0.46
0:03:50	17,731.69	69.26	3.78	0:10:50	17,933.68	140.11	1.86	0:17:50	15,603.78	243.81	1.08	0:24:50	13,311.34	415.98	0.65	0:31:50	630.20	630.20	0.42
0:03:55	17,792.04	69.50	3.78	0:10:55	18,049.50	141.01	1.86	0:17:55	15,631.37	244.24	1.11	0:24:55	12,232.38	382.26	0.68	0:31:55	655.20	655.20	0.39
0:04:00	17,735.45	69.28	3.77	0:11:00	18,505.99	144.58	1.86	0:18:00	14,501.39	226.58	1.11	0:25:00	12,387.37	387.11	0.67	0:32:00	487.54	487.54	0.53
0:04:05	18,057.20	70.54	3.74	0:11:05	17,962.15	140.33	1.85	0:18:05	15,463.33	241.61	1.08	0:25:05	12,541.28	391.92	0.67	0:32:05	638.57	638.57	0.41
0:04:10	17,843.53	69.70	3.76	0:11:10	17,761.21	138.76	1.87	0:18:10	15,226.95	237.92	1.10	0:25:10	12,587.15	393.35	0.66	0:32:10	636.57	636.57	0.41
0:04:15	17,569.95	68.63	3.78	0:11:15	17,993.61	140.58	1.86	0:18:15	15,696.02	245.25	1.09	0:25:15	12,733.34	397.92	0.66	0:32:15	643.09	643.09	0.41
0:04:20	18,236.69	71.24	3.76	0:11:20	18,010.98	140.71	1.86	0:18:20	15,144.15	236.63	1.10	0:25:20	11,856.40	370.51	0.71	0:32:20	633.76	633.76	0.40
0:04:25	17,822.80	69.62	3.76	0:11:25	17,879.19	139.68	1.86	0:18:25	15,909.15	248.58	1.05	0:25:25	12,155.01	379.84	0.68	0:32:25	551.99	551.99	0.47
0:04:30	17,847.46	69.72	3.75	0:11:30	18,031.25	140.87	1.86	0:18:30	15,949.49	249.21	1.04	0:25:30	11,759.16	367.47	0.70	0:32:30	563.32	563.32	0.46
0:04:35	17,145.66	66.98	3.76	0:11:35	18,022.49	140.80	1.87	0:18:35	15,972.52	249.57	1.05	0:25:35	12,402.66	387.58	0.67	0:32:35	639.21	639.21	0.41
0:04:40	18,505.92	72.29	3.75	0:11:40	17,840.37	139.38	1.86	0:18:40	15,516.45	242.44	1.08	0:25:40	12,914.60	403.58	0.64	0:32:40	583.33	583.33	0.45
0:04:45	17,832.45	69.66	3.77	0:11:45	17,896.48	139.82	1.87	0:18:45	15,101.40	235.96	1.11	0:25:45	12,417.72	388.05	0.68	0:32:45	650.02	650.02	0.40
0:04:50	17,146.80	66.98	3.76	0:11:50	18,150.18	141.80	1.85	0:18:50	15,347.38	239.80	1.08	0:25:50	12,254.80	382.96	0.68	0:32:50	548.53	548.53	0.46
0:04:55	17,910.79	69.96	3.74	0:11:55	17,710.03	138.36	1.87	0:18:55	15,476.45	241.82	1.07	0:25:55	12,073.95	377.31	0.69	0:32:55	606.77	606.77	0.43
0:05:00	17,645.87	68.93	3.78	0:12:00	17,804.73	139.10	1.87	0:19:00	15,377.10	240.27	1.12	0:26:00	12,628.43	394.64	0.68	0:33:00	684.70	684.70	0.38
0:05:05	17,946.54	70.10	3.75	0:12:05	18,035.21	140.90	1.85	0:19:05	14,877.35	232.46	1.12	0:26:05	12,556.59	392.39	0.67	0:33:05	624.30	624.30	0.42
0:05:10	17,893.32	69.90	3.75	0:12:10	18,070.33	141.17	1.85	0:19:10	15,238.27	238.10	1.08	0:26:10	12,164.57	380.14	0.66	0:33:10	683.05	683.05	0.38
0:05:15	17,867.54	69.80	3.76	0:12:15	18,108.86	141.48	1.85	0:19:15	14,841.60	231.90	1.12	0:26:15	12,008.49	375.27	0.70	0:33:15	597.32	597.32	0.44
0:05:20	17,780.37	69.45	3.78	0:12:20	18,114.51	141.52	1.85	0:19:20	15,977.82	249.65	1.07	0:26:20	11,827.61	369.61	0.71	0:33:20	585.27	585.27	0.43
0:05:25	17,832.03	69.66	3.76	0:12:25	18,115.08	141.52	1.85	0:19:25	15,009.11	234.52	1.11	0:26:25	11,947.64	373.36	0.70	0:33:25	595.65	595.65	0.44
0:05:30	17,781.13	69.46	3.76	0:12:30	17,848.73	139.44	1.86	0:19:30	14,655.25	228.99	1.14	0:26:30	12,680.11	396.25	0.66	0:33:30	608.60	608.60	0.43
0:05:35	17,757.91	69.37	3.75	0:12:35	18,625.25	145.51	1.86	0:19:35	14,401.23	225.02	1.16	0:26:35	12,478.66	389.96	0.67	0:33:35	560.26	560.26	0.47
0:05:40	18,414.87	71.93	3.78	0:12:40	18,060.80	141.10	1.84	0:19:40	15,170.05	237.03	1.10	0:26:40	12,147.24	379.60	0.68	0:33:40	647.43	647.43	0.40
0:05:45	17,699.06	69.14	3.76	0:12:45	17,877.44	139.67	1.87	0:19:45	15,006.25	234.47	1.10	0:26:45	12,440.18	388.76	0.67	0:33:45	639.32	639.32	0.41
0:05:50	17,722.86	69.23	3.79	0:12:50	17,897.64	139.83	1.86	0:19:50	16,117.25	251.83	1.03	0:26:50	12,397.93	387.44	0.68	0:33:50	638.62	638.62	0.41
0:05:55	17,727.52	69.25	3.76	0:12:55	18,167.48	141.93	1.86	0:19:55	15,818.69	247.17	1.05	0:26:55	12,719.80	397.49	0.65	0:33:55	519.10	519.10	0.48
0:06:00	17,901.82	69.93	3.75	0:13:00	17,918.95	139.99	1.86	0:20:00	15,556.74	243.07	1.10	0:27:00	12,379.69	386.87	0.68	0:34:00	669.14	669.14	0.39
0:06:05	17,854.54	69.74	3.75	0:13:05	17,809.22	139.13	1.88	0:20:05	14,483.90	226.31	1.14	0:27:05	12,170.51	380.33	0.68	0:34:05	637.54	637.54	0.41
0:06:10	17,566.91	68.62	3.79	0:13:10	18,158.25	141.86	1.85	0:20:10	15,542.33	242.85	1.07	0:27:10	12,345.03	385.78	0.67	0:34:10	594.85	594.85	0.44
0:06:15	17,838.57	69.68	3.76	0:13:15	18,048.45	141.00	1.85	0:20:15	15,102.20	235.97	1.11	0:27:15	13,204.61	412.64	0.65	0:34:15	641.63	641.63	0.41
0:06:20	17,712.52	69.19	3.77	0:13:20	17,482.91	136.59	1.85	0:20:20	15,377.33	240.27	1.08	0:27:20	12,018.61	375.58	0.69	0:34:20	595.33	595.33	0.43
0:06:25	17,825.69	69.63	3.76	0:13:25	17,959.97	140.31	1.86	0:20:25	15,442.43	241.29	1.09	0:27:25	12,184.72	380.77	0.69	0:34:25	627.97	627.97	0.43
0:06:30	17,691.30	69.11	3.79	0:13:30	18,121.85	141.58	1.85	0:20:30	15,401.08	240.64	1.08	0:27:30	12,124.71	378.90	0.69	0:34:30	672.34	672.34	0.39
0:06:35	17,849.69	69.73	3.75	0:13:35	18,709.22	146.17	1.86	0:20:35	14,951.38	233.62	1.11	0:27:35	12,021.92	375.69	0.69	0:34:35	600.67	600.67	0.44
0:06:40	17,726.22	69.24	3.76	0:13:40	17,850.44	139.46	1.87	0:20:40	15,839.17	247.49	1.05	0:27:40	12,208.19	381.51	0.68	0:34:40	612.69	612.69	0.41
0:06:45	17,697.92	69.13	3.76	0:13:45	17,960.51	390.45	1.85	0:20:45	16,366.54	16,366.54	1.04	0:27:45	11,857.73	370.55	0.71	0:34:45	566.04	0.00	0.47
0:06:50	442.52	0.00	3.90	0:13:50	22.82	0.00	1.47	0:20:50	5.54	0.00	2.64	0:27:50	186.08	0.00	0.63	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
				0:14:00	0.00	0.00	0.00	0:21:00	0.00	0.00	0.00								

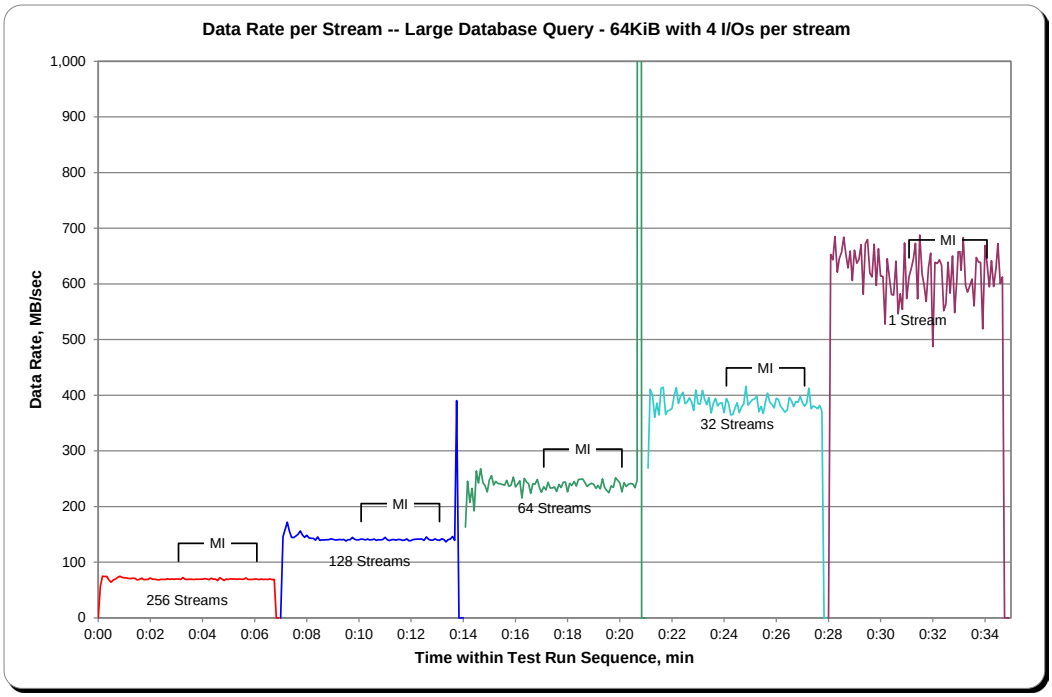
SPC-2 "Large Database Query/64 KiB Transfer Size/4 Outstanding I/Os" Average Data Rate Graph – Complete Test Run



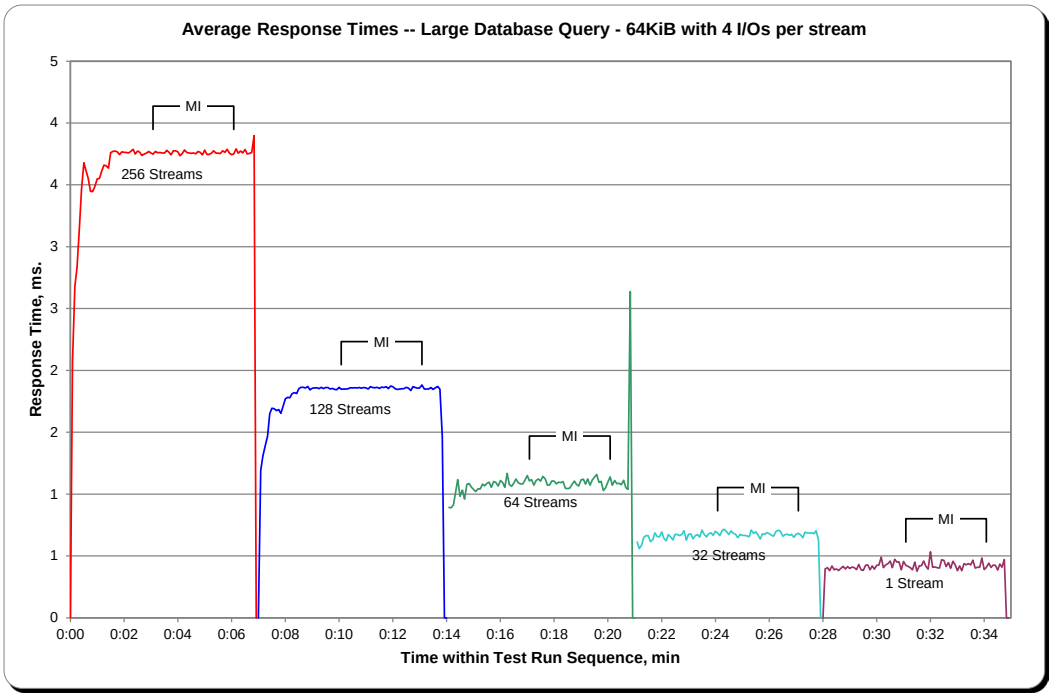
SPC-2 "Large Database Query/64 KiB Transfer Size/4 Outstanding I/Os" Average Data Rate Graph – Measurement Interval (MI) Only



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



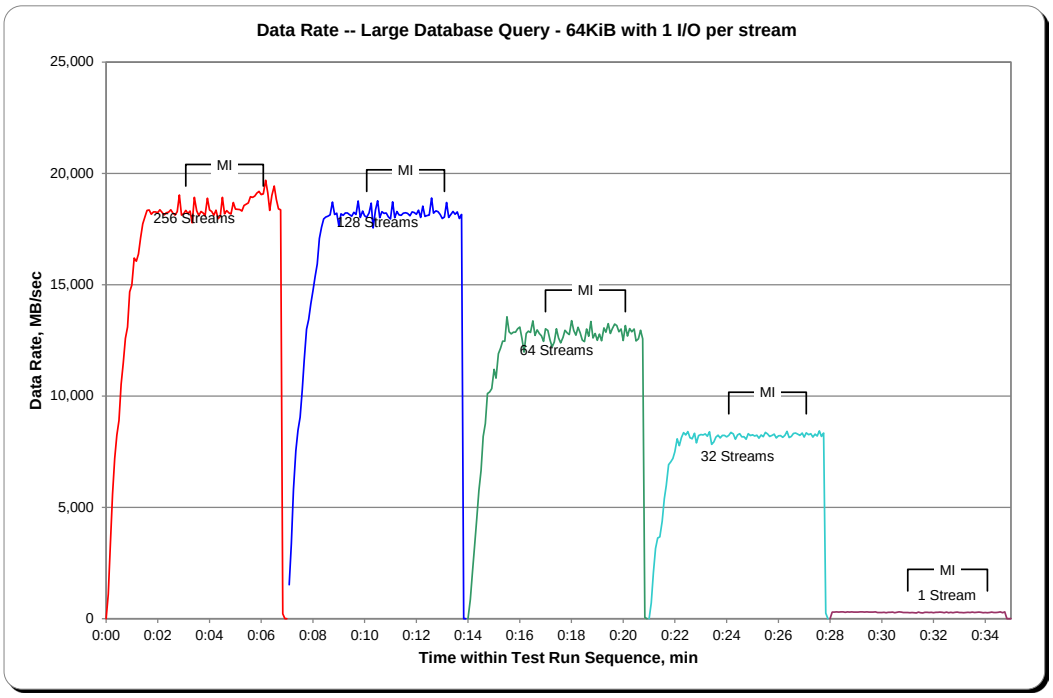
SPC-2 "Large Database Query/64 KiB Transfer Size/1 Outstanding I/O" Test Run Data – Ramp-Up Period

TR6	256 Streams			TR7	128 Streams			TR8	64 Streams			TR9	32 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	0:07:05	1,527.51	127.29	0.32	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	1,103.50	58.08	0.48	0:07:10	3,357.28	139.89	0.35	0:14:05	866.81	123.83	0.27	0:21:05	705.32	235.11	0.24	0:28:05	293.62	293.62	0.22
0:00:10	3,384.51	70.51	0.66	0:07:15	5,815.62	141.84	0.36	0:14:10	2,103.92	175.33	0.28	0:21:10	2,070.79	207.08	0.22	0:28:10	297.49	297.49	0.21
0:00:15	5,604.39	75.73	0.72	0:07:20	7,540.51	153.89	0.39	0:14:15	3,285.35	182.52	0.28	0:21:15	3,155.06	262.92	0.23	0:28:15	308.19	308.19	0.22
0:00:20	7,200.05	75.00	0.77	0:07:25	8,463.92	148.49	0.42	0:14:20	4,486.40	195.06	0.30	0:21:20	3,623.30	278.72	0.23	0:28:20	293.92	293.92	0.22
0:00:25	8,244.10	72.96	0.84	0:07:30	9,046.37	137.07	0.44	0:14:25	5,760.40	213.35	0.29	0:21:25	3,670.70	282.36	0.23	0:28:25	304.41	304.41	0.21
0:00:30	8,906.75	67.99	0.88	0:07:35	10,276.35	135.22	0.44	0:14:30	6,653.06	195.68	0.31	0:21:30	4,371.08	257.12	0.23	0:28:30	304.62	304.62	0.21
0:00:35	10,523.60	70.63	0.87	0:07:40	11,600.08	143.21	0.44	0:14:35	8,183.71	209.84	0.29	0:21:35	5,392.85	256.80	0.24	0:28:35	292.08	292.08	0.22
0:00:40	11,484.48	71.78	0.88	0:07:45	13,002.50	147.76	0.44	0:14:40	8,762.11	194.71	0.30	0:21:40	5,981.31	249.22	0.24	0:28:40	309.21	309.21	0.21
0:00:45	12,589.21	73.62	0.87	0:07:50	13,441.12	146.10	0.44	0:14:45	10,114.93	215.21	0.29	0:21:45	6,918.06	256.22	0.25	0:28:45	298.42	298.42	0.22
0:00:50	13,092.54	70.01	0.88	0:07:55	14,146.75	145.84	0.44	0:14:50	10,184.41	203.69	0.31	0:21:50	7,045.97	260.96	0.25	0:28:50	308.95	308.95	0.21
0:00:55	14,682.48	74.53	0.86	0:08:00	14,729.71	147.30	0.43	0:14:55	10,333.52	206.67	0.31	0:21:55	7,198.39	257.09	0.25	0:28:55	299.01	299.01	0.22
0:01:00	14,990.40	72.77	0.86	0:08:05	15,361.03	146.30	0.44	0:15:00	11,201.73	207.44	0.31	0:22:00	7,488.95	249.63	0.25	0:29:00	301.06	301.06	0.21
0:01:05	16,191.82	75.31	0.88	0:08:10	15,923.09	139.68	0.44	0:15:05	10,805.38	196.46	0.32	0:22:05	8,078.45	260.60	0.25	0:29:05	301.40	301.40	0.22
0:01:10	16,049.38	71.97	0.89	0:08:15	17,079.82	143.53	0.45	0:15:10	11,896.77	201.64	0.32	0:22:10	7,772.83	250.74	0.25	0:29:10	302.61	302.61	0.21
0:01:15	16,378.14	70.90	0.90	0:08:20	17,576.06	142.89	0.45	0:15:15	12,149.90	199.18	0.32	0:22:15	8,134.75	262.41	0.25	0:29:15	309.37	309.37	0.21
0:01:20	17,109.11	70.99	0.90	0:08:25	17,952.06	144.77	0.45	0:15:20	12,464.30	201.04	0.32	0:22:20	8,361.55	261.30	0.25	0:29:20	295.76	295.76	0.22
0:01:25	17,732.04	70.65	0.90	0:08:30	18,036.92	140.91	0.45	0:15:25	12,466.18	194.78	0.33	0:22:25	8,248.90	257.78	0.25	0:29:25	308.37	308.37	0.22
0:01:30	18,036.58	70.46	0.91	0:08:35	18,078.70	141.24	0.46	0:15:30	13,553.67	211.78	0.32	0:22:30	8,406.97	262.72	0.25	0:29:30	294.60	294.60	0.22
0:01:35	18,334.75	71.62	0.91	0:08:40	18,137.74	141.70	0.46	0:15:35	12,882.50	201.29	0.32	0:22:35	8,127.56	253.99	0.26	0:29:35	298.68	298.68	0.21
0:01:40	18,355.00	71.70	0.91	0:08:45	18,710.64	146.18	0.46	0:15:40	12,788.80	199.82	0.33	0:22:40	8,083.37	252.61	0.26	0:29:40	301.46	301.46	0.21
0:01:45	18,162.29	70.95	0.92	0:08:50	18,150.98	141.80	0.46	0:15:45	12,871.08	201.11	0.32	0:22:45	8,329.20	260.29	0.25	0:29:45	303.25	303.25	0.22
0:01:50	18,265.61	71.35	0.92	0:08:55	18,213.03	142.29	0.46	0:15:50	12,866.15	201.03	0.32	0:22:50	7,899.45	246.86	0.25	0:29:50	281.54	281.54	0.23
0:01:55	18,272.64	71.38	0.91	0:09:00	17,648.02	137.88	0.46	0:15:55	13,018.85	203.42	0.32	0:22:55	8,222.21	256.94	0.25	0:29:55	279.75	279.75	0.23
0:02:00	18,234.21	71.23	0.91	0:09:05	18,181.11	142.04	0.46	0:16:00	13,096.65	204.64	0.33	0:23:00	8,274.01	258.56	0.25	0:30:00	280.77	280.77	0.24
0:02:05	18,367.78	71.75	0.91	0:09:10	18,117.23	141.54	0.46	0:16:05	12,587.46	196.68	0.33	0:23:05	8,251.45	257.86	0.25	0:30:05	289.03	289.03	0.22
0:02:10	18,248.20	71.28	0.92	0:09:15	18,217.52	142.32	0.46	0:16:10	11,978.30	187.16	0.33	0:23:10	8,302.60	259.46	0.25	0:30:10	264.81	264.81	0.25
0:02:15	18,137.14	70.85	0.91	0:09:20	18,223.75	142.37	0.46	0:16:15	12,807.88	200.12	0.33	0:23:15	8,193.47	256.05	0.25	0:30:15	289.73	289.73	0.22
0:02:20	18,232.66	71.22	0.92	0:09:25	18,141.58	141.73	0.46	0:16:20	12,914.05	201.78	0.32	0:23:20	8,398.07	262.44	0.25	0:30:20	283.02	283.02	0.23
0:02:25	18,257.57	71.32	0.92	0:09:30	18,080.70	141.26	0.46	0:16:25	12,860.72	200.95	0.33	0:23:25	7,832.98	244.78	0.26	0:30:25	293.19	293.19	0.23
0:02:30	18,363.28	71.73	0.91	0:09:35	18,247.49	142.56	0.46	0:16:30	13,376.15	209.00	0.31	0:23:30	7,934.24	247.94	0.26	0:30:30	264.91	264.91	0.24
0:02:35	18,214.98	71.15	0.91	0:09:40	18,151.48	141.81	0.46	0:16:35	12,726.66	198.85	0.33	0:23:35	8,155.18	254.85	0.26	0:30:35	284.00	284.00	0.23
0:02:40	18,127.04	70.81	0.92	0:09:45	18,757.39	146.54	0.46	0:16:40	12,971.05	202.67	0.32	0:23:40	8,237.65	257.43	0.25	0:30:40	308.33	308.33	0.21
0:02:45	18,281.20	71.41	0.91	0:09:50	18,019.56	140.78	0.46	0:16:45	12,812.78	200.20	0.33	0:23:45	8,120.89	253.78	0.26	0:30:45	297.85	297.85	0.22
0:02:50	19,025.03	74.32	0.91	0:09:55	18,308.51	143.04	0.46	0:16:50	12,699.78	198.43	0.33	0:23:50	8,228.86	257.15	0.25	0:30:50	273.91	273.91	0.23
0:02:55	18,128.81	70.82	0.91	0:10:00	18,097.64	141.39	0.46	0:16:55	12,457.92	194.66	0.33	0:23:55	8,235.47	257.36	0.25	0:30:55	279.66	279.66	0.23
0:03:00	18,180.22	71.02	0.92									0:24:00	8,165.89	255.18	0.25				

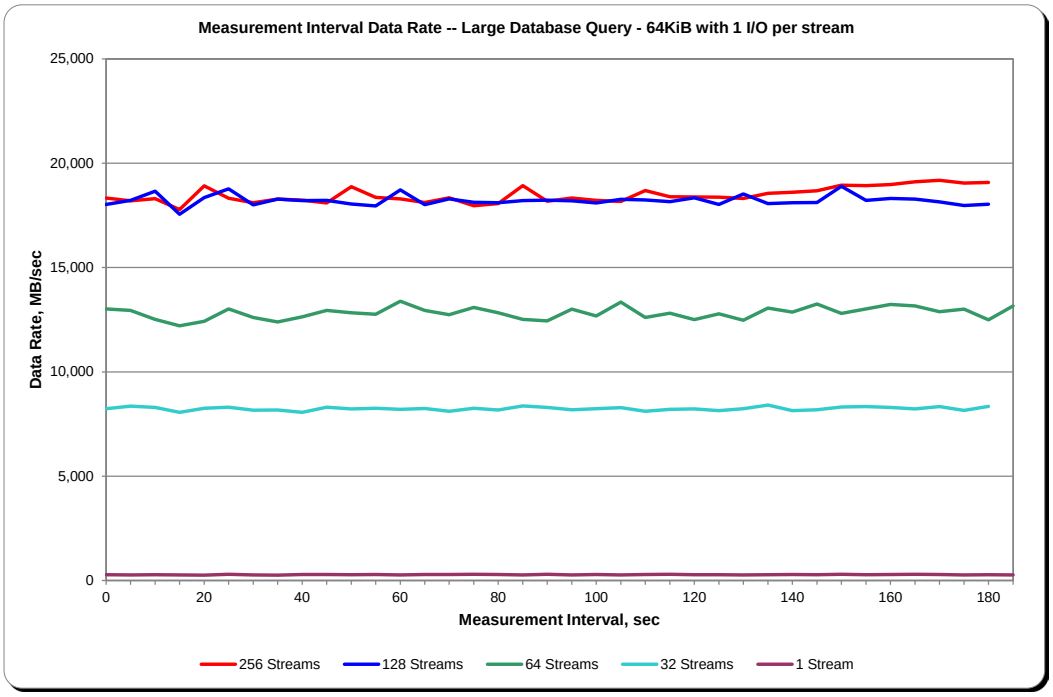
SPC-2 "Large Database Query/64 KiB Transfer Size/1 Outstanding I/O" Test Run Data Measurement Interval, Run-Out, and Ramp-Down Period

TR6	256 Streams			TR7	128 Streams			TR8	64 Streams			TR9	32 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	18,332.48	71.61	0.92	0:10:05	18,028.99	140.85	0.46	0:17:00	13,022.79	203.48	0.32	0:24:05	8,234.62	257.33	0.25	0:31:00	280.70	280.70	0.23
0:03:10	18,199.91	71.09	0.92	0:10:10	18,220.37	142.35	0.46	0:17:05	12,943.95	202.25	0.32	0:24:10	8,363.44	261.36	0.25	0:31:05	265.28	265.28	0.24
0:03:15	18,305.91	71.51	0.91	0:10:15	18,661.41	145.79	0.46	0:17:10	12,517.33	195.58	0.33	0:24:15	8,300.59	259.39	0.26	0:31:10	277.51	277.51	0.24
0:03:20	17,782.06	69.46	0.92	0:10:20	17,553.68	137.14	0.46	0:17:15	12,205.62	190.71	0.34	0:24:20	8,056.75	251.77	0.25	0:31:15	265.00	265.00	0.24
0:03:25	18,918.57	73.90	0.91	0:10:25	18,354.26	143.39	0.46	0:17:20	12,423.36	194.12	0.34	0:24:25	8,252.46	257.89	0.25	0:31:20	260.46	260.46	0.25
0:03:30	18,317.99	71.55	0.91	0:10:30	18,772.57	146.66	0.46	0:17:25	13,021.20	203.46	0.32	0:24:30	8,305.41	259.54	0.25	0:31:25	299.81	299.81	0.22
0:03:35	18,109.33	70.74	0.91	0:10:35	18,007.20	140.68	0.46	0:17:30	12,604.47	196.94	0.33	0:24:35	8,165.14	255.16	0.26	0:31:30	266.76	266.76	0.24
0:03:40	18,284.54	71.42	0.91	0:10:40	18,281.86	142.83	0.46	0:17:35	12,388.83	193.58	0.34	0:24:40	8,173.34	255.42	0.26	0:31:35	259.61	259.61	0.24
0:03:45	18,224.87	71.19	0.91	0:10:45	18,205.47	142.23	0.46	0:17:40	12,634.10	197.41	0.33	0:24:45	8,058.74	251.84	0.25	0:31:40	288.76	288.76	0.23
0:03:50	18,093.29	70.68	0.92	0:10:50	18,222.62	142.36	0.45	0:17:45	12,949.45	202.34	0.32	0:24:50	8,305.24	259.54	0.25	0:31:45	286.62	286.62	0.23
0:03:55	18,879.91	73.75	0.91	0:10:55	18,048.32	141.00	0.46	0:17:50	12,828.71	200.45	0.32	0:24:55	8,225.68	257.05	0.25	0:31:50	276.14	276.14	0.24
0:04:00	18,359.01	71.71	0.91	0:11:00	17,948.74	140.22	0.46	0:17:55	12,758.32	199.35	0.32	0:25:00	8,256.26	258.01	0.25	0:31:55	289.77	289.77	0.23
0:04:05	18,292.67	71.46	0.92	0:11:05	18,721.67	146.26	0.46	0:18:00	13,384.90	209.14	0.31	0:25:05	8,205.17	256.41	0.25	0:32:00	266.49	266.49	0.24
0:04:10	18,114.98	70.76	0.91	0:11:10	18,013.24	140.73	0.46	0:18:05	12,946.13	202.28	0.32	0:25:10	8,242.25	257.57	0.25	0:32:05	284.89	284.89	0.24
0:04:15	18,342.99	71.65	0.92	0:11:15	18,291.74	142.90	0.46	0:18:10	12,736.20	199.00	0.33	0:25:15	8,112.14	253.50	0.25	0:32:10	284.23	284.23	0.23
0:04:20	17,964.06	70.17	0.91	0:11:20	18,132.06	141.66	0.46	0:18:15	13,085.10	204.45	0.32	0:25:20	8,256.13	258.00	0.25	0:32:15	294.42	294.42	0.21
0:04:25	18,067.30	70.58	0.91	0:11:25	18,112.05	141.50	0.46	0:18:20	12,835.16	200.55	0.32	0:25:25	8,175.03	255.47	0.25	0:32:20	285.22	285.22	0.23
0:04:30	18,924.69	73.92	0.91	0:11:30	18,211.24	142.28	0.46	0:18:25	12,511.36	195.49	0.33	0:25:30	8,368.11	261.50	0.25	0:32:25	272.57	272.57	0.23
0:04:35	18,179.96	71.02	0.92	0:11:35	18,228.74	142.41	0.46	0:18:30	12,443.86	194.44	0.33	0:25:35	8,297.92	259.31	0.25	0:32:30	295.50	295.50	0.22
0:04:40	18,329.97	71.60	0.91	0:11:40	18,201.54	142.20	0.46	0:18:35	13,009.98	203.28	0.32	0:25:40	8,181.28	255.67	0.25	0:32:35	272.46	272.46	0.24
0:04:45	18,217.74	71.16	0.91	0:11:45	18,096.06	141.38	0.46	0:18:40	12,680.41	198.13	0.33	0:25:45	8,236.96	257.41	0.25	0:32:40	287.35	287.35	0.23
0:04:50	18,168.88	70.97	0.91	0:11:50	18,269.97	142.73	0.46	0:18:45	13,344.05	208.50	0.32	0:25:50	8,287.85	259.00	0.25	0:32:45	266.32	266.32	0.25
0:04:55	18,691.72	73.01	0.91	0:11:55	18,243.65	142.53	0.46	0:18:50	12,611.42	197.05	0.33	0:25:55	8,116.81	253.65	0.25	0:32:50	283.98	283.98	0.23
0:05:00	18,394.60	71.85	0.91	0:12:00	18,158.94	141.87	0.46	0:18:55	12,810.88	200.17	0.32	0:26:00	8,209.83	256.56	0.25	0:32:55	300.23	300.23	0.22
0:05:05	18,380.26	71.80	0.90	0:12:05	18,341.69	143.29	0.46	0:19:00	12,506.77	195.42	0.33	0:26:05	8,220.72	256.90	0.25	0:33:00	278.27	278.27	0.23
0:05:10	18,373.95	71.77	0.91	0:12:10	18,021.96	140.80	0.46	0:19:05	12,783.56	199.74	0.33	0:26:10	8,143.87	254.50	0.25	0:33:05	282.28	282.28	0.22
0:05:15	18,308.04	71.52	0.91	0:12:15	18,529.41	144.76	0.46	0:19:10	12,479.06	194.99	0.33	0:26:15	8,232.75	257.27	0.25	0:33:10	269.15	269.15	0.25
0:05:20	18,558.73	72.50	0.91	0:12:20	18,063.06	141.12	0.46	0:19:15	13,058.44	204.04	0.32	0:26:20	8,409.98	262.81	0.25	0:33:15	274.72	274.72	0.24
0:05:25	18,611.89	72.70	0.90	0:12:25	18,108.97	141.48	0.46	0:19:20	12,868.31	201.07	0.32	0:26:25	8,140.72	254.40	0.26	0:33:20	289.91	289.91	0.22
0:05:30	18,675.58	72.95	0.89	0:12:30	18,121.47	141.57	0.46	0:19:25	13,252.87	207.08	0.32	0:26:30	8,184.01	255.75	0.25	0:33:25	279.30	279.30	0.23
0:05:35	18,945.78	74.01	0.89	0:12:35	18,893.09	147.60	0.46	0:19:30	12,806.15	200.10	0.33	0:26:35	8,316.94	259.90	0.25	0:33:30	294.77	294.77	0.22
0:05:40	18,924.65	73.92	0.87	0:12:40	18,215.42	142.31	0.46	0:19:35	13,018.68	203.42	0.32	0:26:40	8,340.21	260.63	0.25	0:33:35	281.66	281.66	0.23
0:05:45	18,980.68	74.14	0.87	0:12:45	18,313.48	143.07	0.46	0:19:40	13,233.75	206.78	0.32	0:26:45	8,293.08	259.16	0.25	0:33:40	290.15	290.15	0.22
0:05:50	19,114.51	74.67	0.87	0:12:50	18,282.49	142.83	0.46	0:19:45	13,162.87	205.67	0.32	0:26:50	8,227.66	257.11	0.25	0:33:45	296.90	296.90	0.22
0:05:55	19,186.22	74.95	0.87	0:12:55	18,151.43	141.81	0.46	0:19:50	12,889.37	201.40	0.32	0:26:55	8,333.40	260.42	0.25	0:33:50	289.00	289.00	0.22
0:06:00	19,044.47	74.39	0.88	0:13:00	17,968.87	140.38	0.46	0:19:55	13,009.07	203.27	0.33	0:27:00	8,156.56	254.89	0.25	0:33:55	264.91	264.91	0.24
0:06:05	19,076.76	74.52	0.88	0:13:05	18,039.19	140.93	0.46	0:20:00	12,492.69	195.20	0.32	0:27:05	8,348.53	260.89	0.25	0:34:00	276.95	276.95	0.24
0:06:10	19,689.80	76.91	0.88	0:13:10	18,686.79	145.99	0.46	0:20:05	13,166.12	205.72	0.32	0:27:10	8,259.17	258.10	0.25	0:34:05	264.67	264.67	0.25
0:06:15	19,127.23	74.72	0.87	0:13:15	18,020.63	140.79	0.46	0:20:10	12,693.73	198.34	0.33	0:27:15	8,308.14	259.63	0.25	0:34:10	274.72	274.72	0.24
0:06:20	18,335.67	71.62	0.88	0:13:20	18,150.01	141.80	0.46	0:20:15	13,028.79	203.57	0.32	0:27:20	8,160.10	255.00	0.25	0:34:15	292.85	292.85	0.22
0:06:25	19,008.53	74.25	0.88	0:13:25	18,289.30	142.89	0.46	0:20:20	12,890.17	201.41	0.32	0:27:25	8,293.49	259.17	0.25	0:34:20	279.03	279.03	0.23
0:06:30	19,428.00	75.89	0.89	0:13:30	18,160.37	141.88	0.46	0:20:25	13,006.12	203.22	0.32	0:27:30	8,205.89	256.43	0.25	0:34:25	277.20	277.20	0.23
0:06:35	18,827.22	73.54	0.89	0:13:35	18,271.06	142.74	0.46	0:20:30	12,473.64	194.90	0.33	0:27:35	8,430.26	263.45	0.25	0:34:30	284.28	284.28	0.23
0:06:40	18,404.12	71.89	0.90	0:13:40	17,970.72	140.40	0.46	0:20:35	12,565.88	196.34	0.32	0:27:40	8,182.12	255.69	0.25	0:34:35	304.35	304.35	0.22
0:06:45	18,365.68	71.74	0.91	0:13:45	18,156.88	6,052.29	0.46	0:20:40	12,953.25	202.39	0.32	0:27:45	8,333.36	260.42	0.25	0:34:40	265.06	265.06	0.25
0:06:50	216.57	0.00	0.80	0:13:50	2.73	0.00	0.75	0:20:45	12,573.98	209.57	0.33	0:27:50	252.12	0.00	0.25	0:34:45	301.94	301.94	0.22
0:06:55	0.00	0.00	0.00	0:13:55	0.00	0.00	0.00	0:20:50	57.20	0.00	0.29	0:27:55	0.00	0.00	0.00	0:34:50	1.26	0.00	0.22
0:07:00	0.00	0.00	0.00					0:20:55	0.00	0.00	0.00					0:34:55	0.00	0.00	0.00
																0:35:00	0.00	0.00	0.00

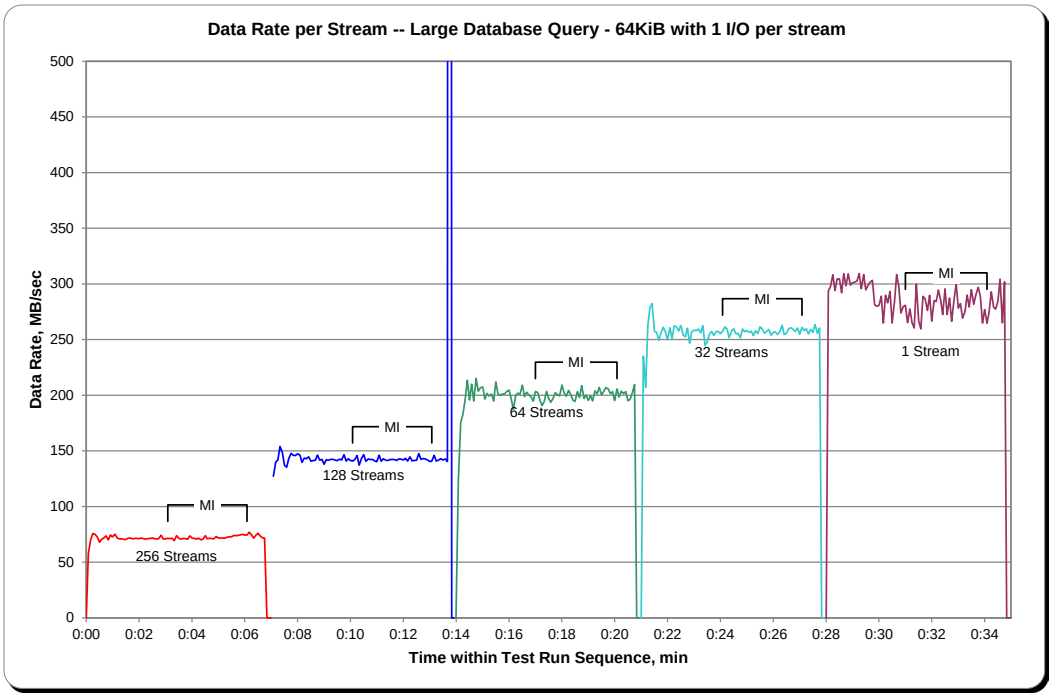
SPC-2 "Large Database Query/64 KiB Transfer Size/1 Outstanding I/O" Average Data Rate Graph – Complete Test Run



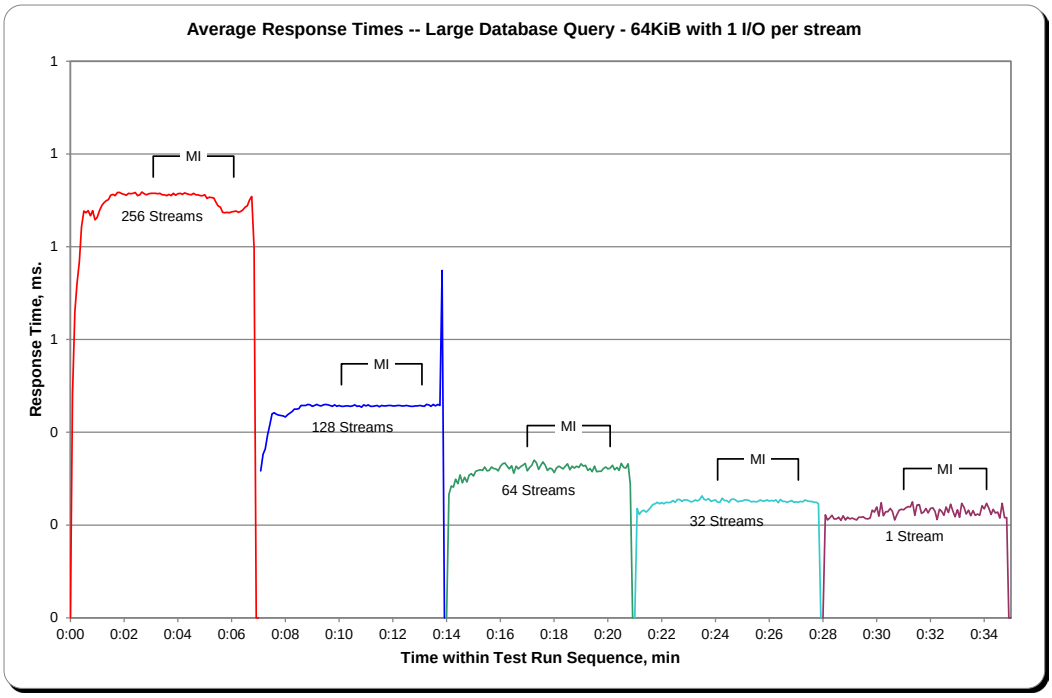
SPC-2 "Large Database Query/64 KiB Transfer Size/1 Outstanding I/O" Average Data Rate Graph – Measurement Interval (MI) Only



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 117.

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.

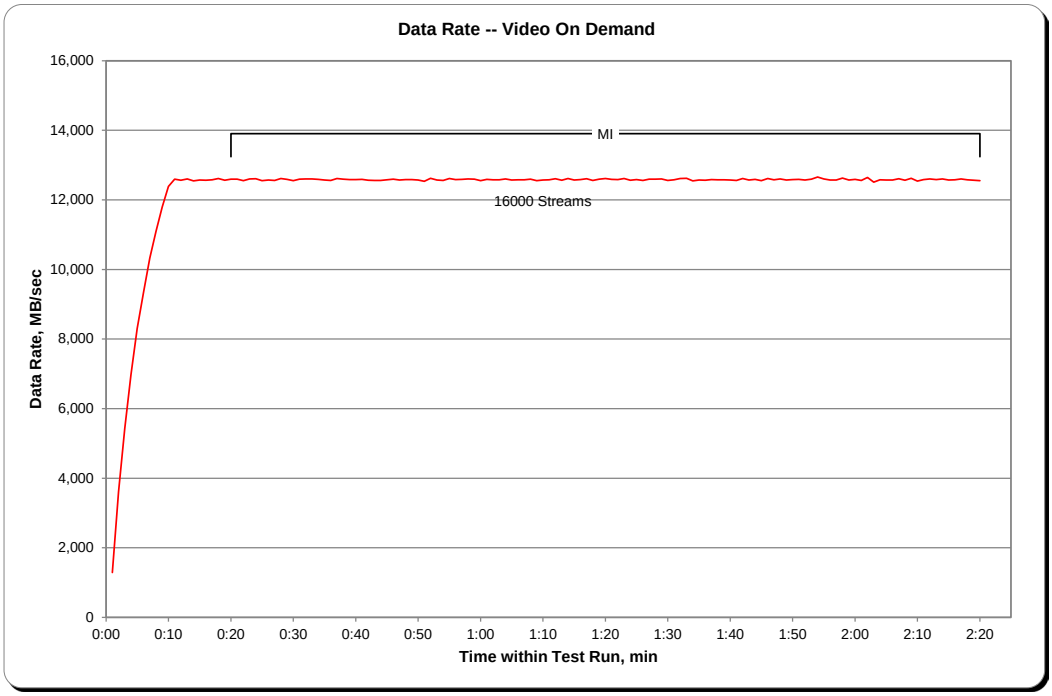
SPC-2-VOD	TR1
Number of Streams	16000
Ramp-up Time, sec	1200
Measurement Interval, sec	7201
Average Data Rate, MB/sec	12,582.86
Per Stream Data Rate, MB/sec	0.79
Average Response Time, ms	14.66
Average Max Response Time, ms	280.48

Video on Demand Delivery Test – TEST RUN DATA BY INTERVAL

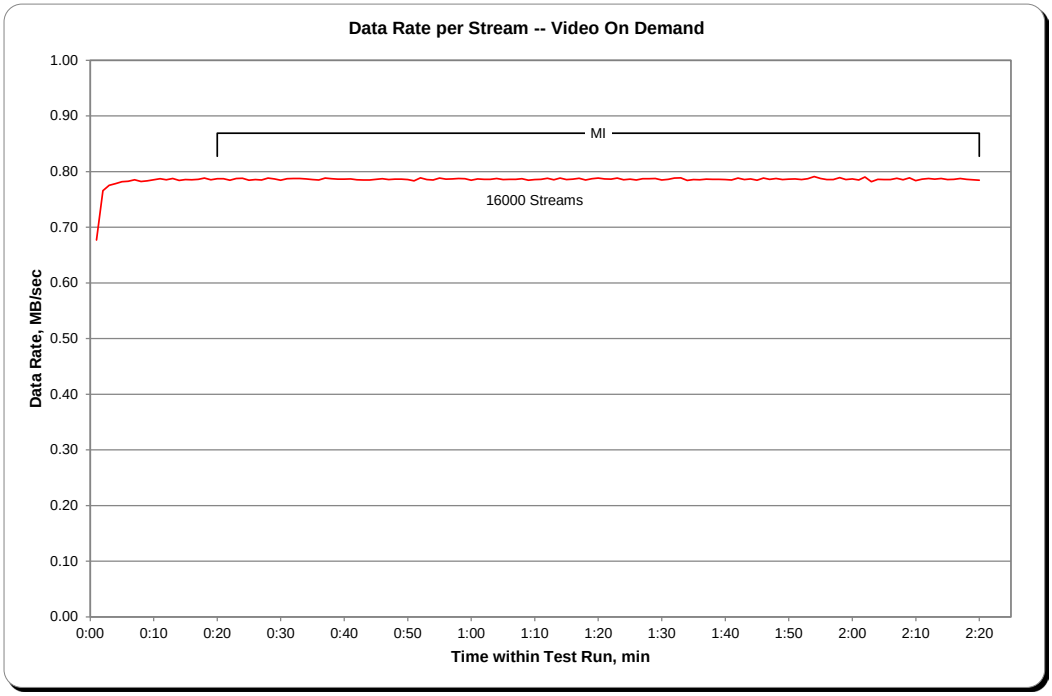
The SPC-2 Video on Demand Delivery Test Run data is contained in the table that appears below. That table is followed by graphs illustrating the average Data Rate and average Data Rate per Stream produced by the same Test Runs. The table and graphs present the data at sixty second intervals.

TR1	16000 Streams				TR1	16000 Streams				TR1	16000 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	1,287.13	0.68	3.93	88.99	0:48:00	12,583.00	0.79	14.53	287.93	1:35:00	12,572.33	0.79	14.70	287.07
0:02:00	3,610.85	0.77	8.83	148.13	0:49:00	12,580.31	0.79	14.63	280.37	1:36:00	12,565.21	0.79	14.62	281.36
0:03:00	5,429.23	0.78	9.69	184.31	0:50:00	12,569.00	0.79	14.65	277.40	1:37:00	12,582.86	0.79	14.73	288.97
0:04:00	6,973.13	0.78	10.36	200.09	0:51:00	12,533.93	0.78	14.68	292.59	1:38:00	12,573.41	0.79	14.73	280.60
0:05:00	8,302.61	0.78	11.23	217.34	0:52:00	12,622.29	0.79	14.74	317.40	1:39:00	12,576.04	0.79	14.86	305.40
0:06:00	9,352.14	0.78	11.82	219.13	0:53:00	12,567.74	0.79	14.71	295.08	1:40:00	12,568.12	0.79	14.54	306.51
0:07:00	10,331.17	0.79	12.50	238.28	0:54:00	12,557.89	0.78	14.50	306.54	1:41:00	12,556.67	0.78	14.70	282.94
0:08:00	11,095.89	0.78	13.11	231.22	0:55:00	12,612.31	0.79	14.70	286.10	1:42:00	12,613.62	0.79	14.62	282.49
0:09:00	11,797.84	0.78	13.67	252.61	0:56:00	12,581.90	0.79	14.76	281.76	1:43:00	12,570.97	0.79	14.56	272.89
0:10:00	12,389.08	0.79	14.37	270.84	0:57:00	12,586.59	0.79	14.69	302.97	1:44:00	12,588.22	0.79	14.55	265.48
0:11:00	12,594.07	0.79	14.57	273.64	0:58:00	12,600.14	0.79	14.62	284.00	1:45:00	12,554.54	0.78	14.64	284.00
0:12:00	12,564.80	0.79	14.62	285.67	0:59:00	12,592.81	0.79	14.67	268.50	1:46:00	12,612.23	0.79	14.66	257.47
0:13:00	12,602.69	0.79	14.59	262.40	1:00:00	12,553.59	0.78	14.64	279.41	1:47:00	12,573.37	0.79	14.54	277.55
0:14:00	12,546.10	0.78	14.60	281.88	1:01:00	12,588.89	0.79	14.65	291.93	1:48:00	12,603.07	0.79	14.63	272.99
0:15:00	12,568.75	0.79	14.47	266.98	1:02:00	12,574.46	0.79	14.72	261.73	1:49:00	12,569.56	0.79	14.69	257.86
0:16:00	12,566.63	0.79	14.57	271.53	1:03:00	12,575.77	0.79	14.66	275.87	1:50:00	12,585.03	0.79	14.65	270.51
0:17:00	12,577.98	0.79	14.62	295.86	1:04:00	12,599.70	0.79	14.70	290.22	1:51:00	12,590.42	0.79	14.58	289.51
0:18:00	12,615.04	0.79	14.57	275.62	1:05:00	12,568.34	0.79	14.61	285.34	1:52:00	12,569.05	0.79	14.71	313.61
0:19:00	12,566.77	0.79	14.61	292.28	1:06:00	12,575.37	0.79	14.56	284.65	1:53:00	12,592.74	0.79	14.55	325.42
0:20:00	12,595.54	0.79	14.49	307.34	1:07:00	12,579.03	0.79	14.71	268.28	1:54:00	12,657.02	0.79	14.63	282.01
0:21:00	12,594.69	0.79	14.56	255.31	1:08:00	12,593.82	0.79	14.59	251.43	1:55:00	12,599.22	0.79	14.60	272.38
0:22:00	12,549.20	0.78	14.58	273.26	1:09:00	12,550.85	0.78	14.66	275.09	1:56:00	12,570.12	0.79	14.67	283.39
0:23:00	12,600.49	0.79	14.57	252.92	1:10:00	12,568.98	0.79	14.63	279.35	1:57:00	12,569.22	0.79	14.61	271.53
0:24:00	12,606.55	0.79	14.69	273.05	1:11:00	12,576.16	0.79	14.54	273.31	1:58:00	12,626.75	0.79	14.60	276.02
0:25:00	12,553.79	0.78	14.60	292.86	1:12:00	12,608.63	0.79	14.73	261.44	1:59:00	12,567.42	0.79	14.65	263.56
0:26:00	12,572.64	0.79	14.68	294.25	1:13:00	12,562.99	0.79	14.67	272.40	2:00:00	12,587.59	0.79	14.66	285.26
0:27:00	12,556.94	0.78	14.65	305.79	1:14:00	12,610.22	0.79	14.74	268.83	2:01:00	12,559.20	0.78	14.73	279.69
0:28:00	12,610.26	0.79	14.65	253.78	1:15:00	12,568.28	0.79	14.56	274.83	2:02:00	12,641.84	0.79	14.67	281.34
0:29:00	12,591.69	0.79	14.66	278.24	1:16:00	12,580.76	0.79	14.66	281.34	2:03:00	12,509.88	0.78	14.69	260.27
0:30:00	12,549.52	0.78	14.69	282.27	1:17:00	12,607.70	0.79	14.62	285.88	2:04:00	12,577.28	0.79	14.59	300.77
0:31:00	12,597.51	0.79	14.71	270.99	1:18:00	12,559.35	0.78	14.64	267.38	2:05:00	12,569.30	0.79	14.65	302.42
0:32:00	12,601.99	0.79	14.64	284.58	1:19:00	12,592.03	0.79	14.77	283.80	2:06:00	12,567.80	0.79	14.77	277.82
0:33:00	12,598.00	0.79	14.72	296.11	1:20:00	12,613.36	0.79	14.61	273.52	2:07:00	12,604.53	0.79	14.66	266.55
0:34:00	12,585.74	0.79	14.63	290.16	1:21:00	12,589.28	0.79	14.74	262.50	2:08:00	12,563.54	0.79	14.68	259.08
0:35:00	12,569.92	0.79	14.69	296.35	1:22:00	12,580.67	0.79	14.58	260.95	2:09:00	12,619.72	0.79	14.58	252.44
0:36:00	12,558.28	0.78	14.64	290.14	1:23:00	12,611.09	0.79	14.64	273.94	2:10:00	12,542.35	0.78	14.64	262.35
0:37:00	12,614.52	0.79	14.59	286.18	1:24:00	12,564.30	0.79	14.57	256.49	2:11:00	12,585.19	0.79	14.72	263.35
0:38:00	12,591.85	0.79	14.65	300.26	1:25:00	12,583.67	0.79	14.60	290.03	2:12:00	12,603.63	0.79	14.71	285.10
0:39:00	12,581.44	0.79	14.64	307.55	1:26:00	12,560.08	0.79	14.63	281.52	2:13:00	12,580.70	0.79	14.76	260.53
0:40:00	12,579.51	0.79	14.66	285.60	1:27:00	12,595.44	0.79	14.64	269.67	2:14:00	12,599.56	0.79	14.71	261.56
0:41:00	12,590.04	0.79	14.57	281.47	1:28:00	12,592.11	0.79	14.71	272.42	2:15:00	12,568.21	0.79	14.69	265.84
0:42:00	12,562.13	0.79	14.50	274.44	1:29:00	12,601.52	0.79	14.73	273.04	2:16:00	12,574.40	0.79	14.77	279.30
0:43:00	12,560.56	0.79	14.60	284.21	1:30:00	12,560.69	0.79	14.70	277.79	2:17:00	12,600.02	0.79	14.67	292.74
0:44:00	12,560.69	0.79	14.58	259.83	1:31:00	12,574.69	0.79	14.74	272.83	2:18:00	12,575.25	0.79	14.81	280.52
0:45:00	12,578.95	0.79	14.60	282.29	1:32:00	12,611.18	0.79	14.69	283.11	2:19:00	12,565.93	0.79	14.74	263.73
0:46:00	12,596.21	0.79	14.63	257.08	1:33:00	12,617.04	0.79	14.61	278.10	2:20:00	12,554.08	0.78	14.70	269.01
0:47:00	12,568.47	0.79	14.74	273.69	1:34:00	12,544.21	0.78	14.76	269.08	0:00:00	0.00	0.00	0.00	0.00

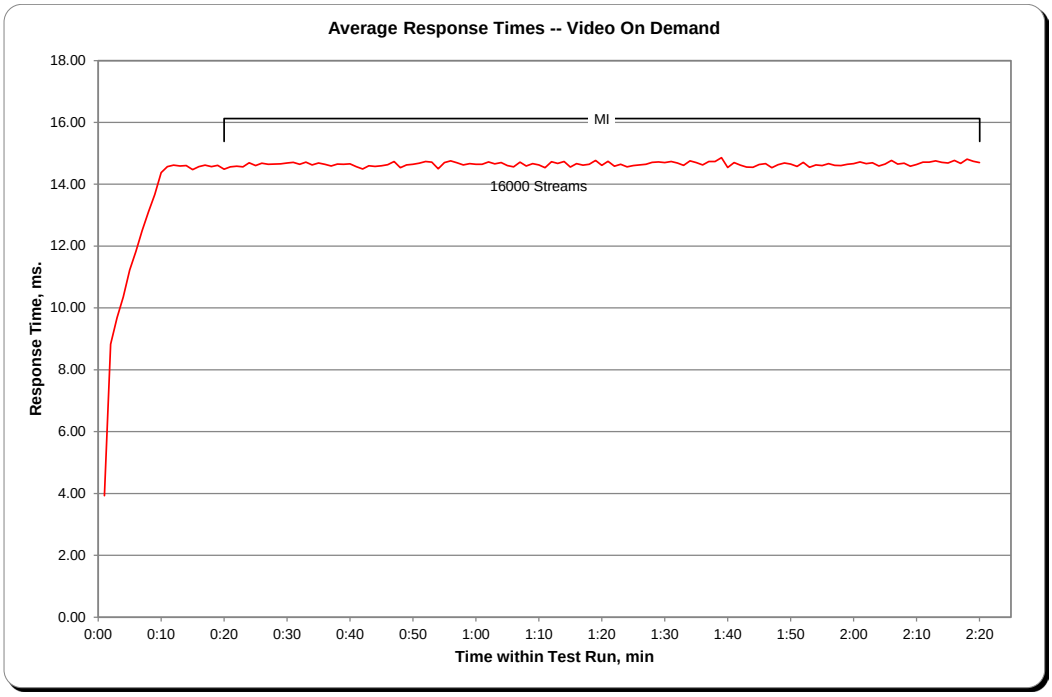
SPC-2 Video on Demand Delivery Average Data Rate Graph



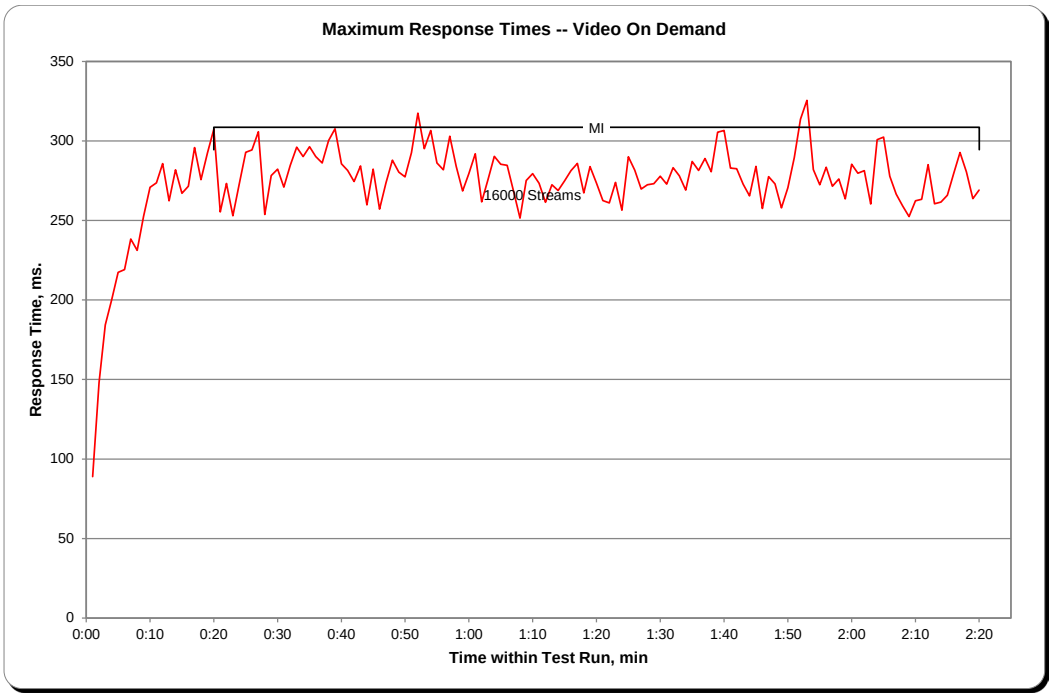
SPC-2 Video on Demand Delivery Average Data Rate per Stream Graph



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 117.

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	4,066,984
Total Number of Logical Blocks Re-referenced	114,960
Total Number of Logical Blocks Verified	3,952,024
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 System Storage SAN Volume Controller v6.4, 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 System Storage SAN Volume Controller v6.4.

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:

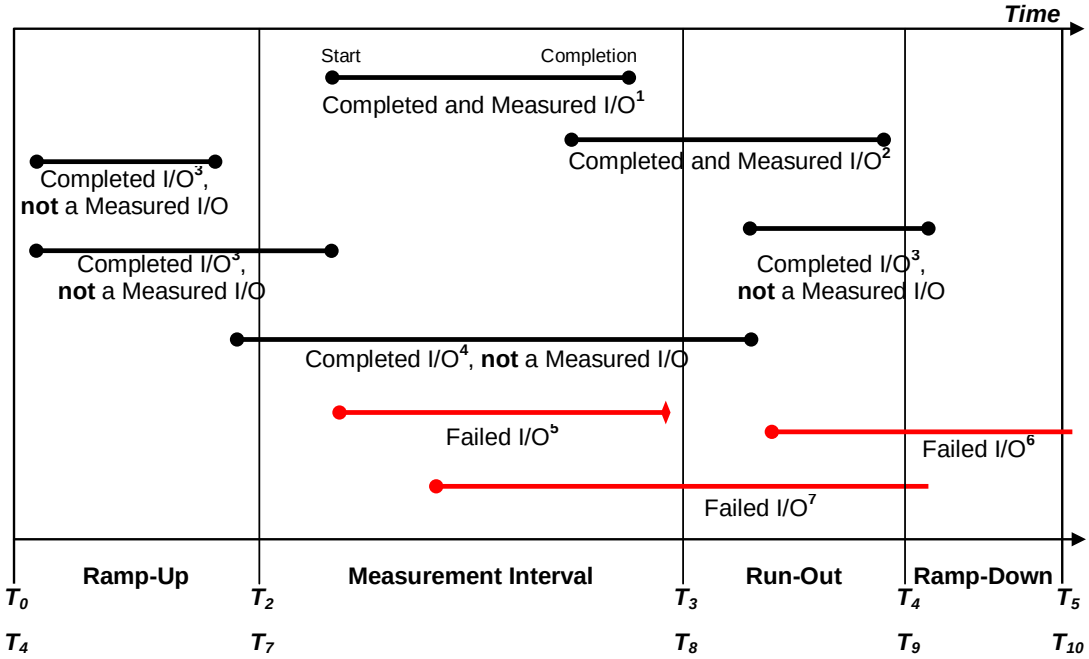
- Test Run 1: Maximum number of Streams, which is selected by the Test Sponsor
- Test Run 2: 50% of the maximum number of Streams used in Test Run 1.
- Test Run 3: 25% of the maximum number of Streams used in Test Run 1.
- Test Run 4: 12.5% of the maximum number of Streams used in Test Run 1.
- Test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

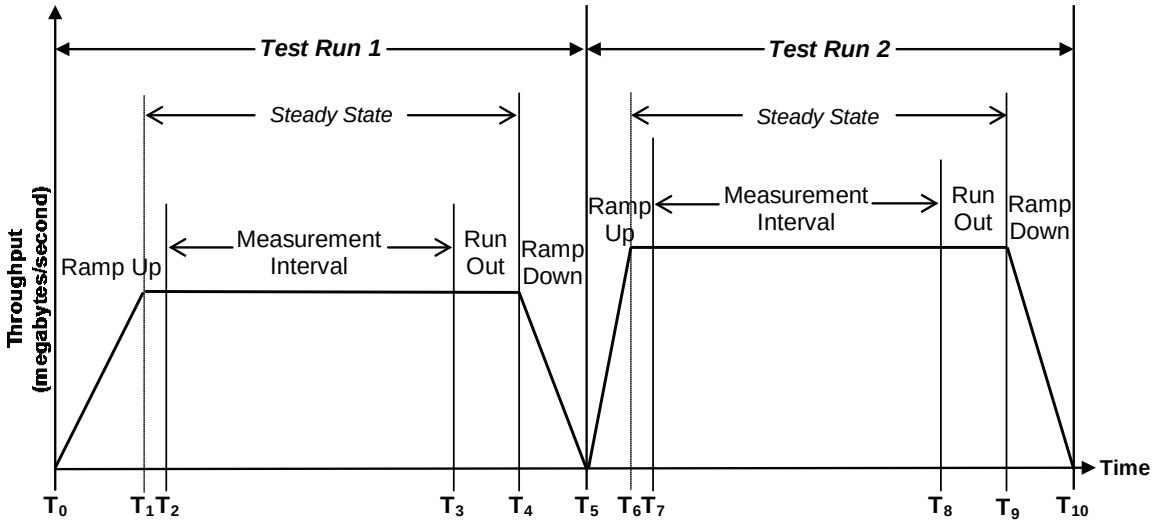
Transfer Size: The Transfer Size parameter specifies the number of bytes in KiB to transfer. *(Clause 3.4.7 of the SPC-2 Benchmark Specification)*

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

Each SPC-2 Logical Volume's **queue_depth** parameter was changed to a value of 80 and **max_transfer** *(maximum transfer size)* parameter changed to a value of 1 MiB. The changes were made via the **chqueue.sh** script as documented in *Appendix C: Tested Storage Configuration (TSC) Creation*.

APPENDIX C: TESTED STORAGE CONFIGURATION (TSC) CREATION

Each script reference, in the following TSC creation sections, is a hyperlink to the actual script. All scripts appear following the last TSC creation section, **AIX Configuration**.

Storwize V7000 Configuration

The scripts, referenced below, are executed in a **Cygwin** command window, on a system running Windows 2003 Server, by invoking the name of the script from the directory where it is located. While a Windows 2003 Server system was used to execute the scripts, an equivalent set of scripts could be executed on the AIX Host System.

The scripts use the **PuTTY** command ***plink***, invoked as ***plink 'name of system'*** to give a command to a specific Storwize V7000 system previously placed into **PuTTY**'s cache of known network locations. This command sequence was used to perform the same configuration processing on each of the Storwize V7000 systems.

Step 1. Define upper paths

Each V7000 system is connected to two switches, with each switch enabling the V7000 to connect to any of the SVC nodes. The WWPN's associated with each SVC node on each switch are defined by the script **v7000step1_mkhost.cyg**.

Step 2. Define RAID ranks

Each V7000 system has 96 disk drives. Of these, one drive is assigned as a spare. RAID-5 ranks are defined using the remaining drives. There is one RAID-5 rank in each V7000 system that contains five drives, while the remaining ranks contain six drives. Each V7000 system has a total of 16 ranks. The actions needed to configure the RAID-5 ranks and spare drive were taken using the script **v7000step2_dochains_raid5_6disk.cyg**.

Step 3. Map volumes for use by SVC

Each RAID-5 rank, created above in Step 2, is presented to the SVC cluster as a volume *(Vdisk)* as defined in the V7000. The logical volume mappings needed so that each volume is made available to each SVC node, via either of two switches, are created by the script **v7000step3_map_byswitch.cyg**.

SAN Volume Controller (SVC) Configuration

The configuration of the SVC, like that of the V7000 systems, uses **Cygwin** and **PuTTY**.

Step 1. Define host paths

The Tested Storage Configuration includes thirty-two 8 Gbps fibre channel host paths which are connected to the SVC via 4 switches. The WWPNs associated with each host connection are defined by running the script **svcstep1_mkhost.cyg**.

Step 2. Define volumes for Host System use

Each V7000 rank is presented as a Host System volume. Thus, there are a total of 8*16 or 128 Host System volumes. These are defined in SVC by the script **svcstep2_mk128vd_8node_seq.cyg**.

Step 3. Define volume mappings

Each volume is mapped to a pair of host WWPNs. The needed mappings are performed by the script **svcstep3_mapfcs_2path.cyg**.

AIX Configuration

Step 1. Discover hdisks

Execute the command ***cfgmgr*** on the Host System, in a standard command shell window, to discover the available 128 Host System volumes, described above. Each discovered hdisk corresponds to a Host System volume, resulting in 128 hdisks, accessible by the Host System.

Step 2. Change queue depth and maximum transfer size for each volume

The settings of each volume were modified to specify a queue depth of 80 and maximum transfer size of 1 MiB. This was done by invoking the **chqueue.sh** script in a standard command shell window on the Host System.

Referenced Scripts

v7000step1_mkhost.cyg

```
#!/usr/bin/bash
# run in cygwin command line
for v in 1 2 3 4 5 6 7 8
do
plink="plink perfv$v"
$plink svctask mkhost -force -name s1path1 -hbawwpn 500507680140d55d
$plink svctask mkhost -force -name s1path2 -hbawwpn 500507680140d58e
$plink svctask mkhost -force -name s1path3 -hbawwpn 500507680140d5cf
$plink svctask mkhost -force -name s1path4 -hbawwpn 500507680140d5ce
$plink svctask mkhost -force -name s1path5 -hbawwpn 500507680140d58b
$plink svctask mkhost -force -name s1path6 -hbawwpn 500507680140d5d0
$plink svctask mkhost -force -name s1path7 -hbawwpn 500507680140d5a2
$plink svctask mkhost -force -name s1path8 -hbawwpn 500507680140d594
$plink svctask mkhost -force -name s2path1 -hbawwpn 500507680130d55d
$plink svctask mkhost -force -name s2path2 -hbawwpn 500507680130d58e
$plink svctask mkhost -force -name s2path3 -hbawwpn 500507680130d5cf
$plink svctask mkhost -force -name s2path4 -hbawwpn 500507680130d5ce
$plink svctask mkhost -force -name s2path5 -hbawwpn 500507680130d58b
$plink svctask mkhost -force -name s2path6 -hbawwpn 500507680130d5d0
$plink svctask mkhost -force -name s2path7 -hbawwpn 500507680130d5a2
$plink svctask mkhost -force -name s2path8 -hbawwpn 500507680130d594
$plink svctask mkhost -force -name s3path1 -hbawwpn 500507680110d55d
$plink svctask mkhost -force -name s3path2 -hbawwpn 500507680110d58e
```

```
$plink svctask mkhost -force -name s3path3 -hbawwpn 500507680110d5cf
$plink svctask mkhost -force -name s3path4 -hbawwpn 500507680110d5ce
$plink svctask mkhost -force -name s3path5 -hbawwpn 500507680110d58b
$plink svctask mkhost -force -name s3path6 -hbawwpn 500507680110d5d0
$plink svctask mkhost -force -name s3path7 -hbawwpn 500507680110d5a2
$plink svctask mkhost -force -name s3path8 -hbawwpn 500507680110d594
$plink svctask mkhost -force -name s4path1 -hbawwpn 500507680120d55d
$plink svctask mkhost -force -name s4path2 -hbawwpn 500507680120d58e
$plink svctask mkhost -force -name s4path3 -hbawwpn 500507680120d5cf
$plink svctask mkhost -force -name s4path4 -hbawwpn 500507680120d5ce
$plink svctask mkhost -force -name s4path5 -hbawwpn 500507680120d58b
$plink svctask mkhost -force -name s4path6 -hbawwpn 500507680120d5d0
$plink svctask mkhost -force -name s4path7 -hbawwpn 500507680120d5a2
$plink svctask mkhost -force -name s4path8 -hbawwpn 500507680120d594
done
```

v7000step2_dochains_raid5_6disk.cyg

```
#!/usr/bin/bash
# run in cygwin command line
# Creates 16 RAID-5 arrays 6 disks each, except for one array (last) which leaves
out a spare disk.

for v in 1 2 3 4 5 6 7 8
do
plink="plink perfv$v"

$plink svctask mkmdiskgrp -name v7000group -ext 256
drives=`$plink svcinfo lsdrive -nohdr | awk '{ print $1 }'`
for d in $drives
do
$plink svctask chdrive -use candidate $d
done
#the first 2 elements show enclosures in chain 1, the last 3 those in chain 2
c_enc=( -1 -1   -2 -2 )
n=0
for cnum in 1 2
do
  chain=`$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 v7000group
  capbytes=`$plink svcinfo lsmdisk -bytes md$arrcount | grep capacity | awk  '{print
$2}'`
  let cap="(capbytes-1610612736)/1073741824"
  let lode="1+(arrcount/8)"
```

```
   $plink svctask mkvdisk -vtype seq -mdisk md$arrcount \
      -size $cap -unit gb -mdiskgrp v7000group -iogrp 0 \
      -name vd$arrcount -node lode$lode
   let e0="e0+(s0+6)/24"
   let s0="(s0+6)%24"
   let arrcount="arrcount+1"
   done
 s0=0
 e0=0
 while [[ $arrcount -le 14 ]]
   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 v7000group
   capbytes=`$plink svcinfo lsmdisk -bytes md$arrcount | grep capacity | awk  '{print
$2}'`
   let cap="(capbytes-1610612736)/1073741824"
   let lode="1+(arrcount/8)"
   $plink svctask mkvdisk -vtype seq -mdisk md$arrcount \
      -size $cap -unit gb -mdiskgrp v7000group -iogrp 0 \
      -name vd$arrcount -node lode$lode
   let e0="e0+(s0+6)/24"
   let s0="(s0+6)%24"
   let arrcount="arrcount+1"
   done
   #one pass for a smaller array, leaving room for 1 spare.
   devlist=`for d in 0 1 2 3 4; 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 v7000group
   capbytes=`$plink svcinfo lsmdisk -bytes md$arrcount | grep capacity | awk  '{print
$2}'`
   let cap="(capbytes-1610612736)/1073741824"
   let lode="1+(arrcount/8)"
   $plink svctask mkvdisk -vtype seq -mdisk md$arrcount \
      -size $cap -unit gb -mdiskgrp v7000group -iogrp 0 \
      -name vd$arrcount -node lode$lode
   let e0="e0+(s0+6)/24"
   let s0="(s0+6)%24"
   let arrcount="arrcount+1"
   #one pass for smaller array done
 sparedr=`$plink svcinfo lsenclosureslot -slot 24 ${c_enc[3]} | grep drive_id | awk
 '{ print $2 }'`
 $plink svctask chdrive -use spare $sparedr

 done
```

v7000step3_map_byswitch.cyg

```
#!/usr/bin/bash
# run in cygwin command line
# maps all V7000 volumes based on the switch to which the owning node connects,
# with alternate path of the partner node connection.

plink perfclus svctask detectmdisk
sleep 5
for S in 1 2 3 4
do
   if [[ $S -le 2 ]]
   then firstv=1
   else firstv=5
   fi
   let lastv="firstv+3"
   if [[ $S%2 -eq 1 ]]
   then vollist="0 1 2 3 4 5 6 7"
   else vollist="8 9 10 11 12 13 14 15"
   fi
   v=$firstv
   while [[ $v -le $lastv ]]
   do
      plink="plink perfv$v"
      for p in 1 2 3 4 5 6 7 8
      do
         for vol in $vollist
         do
            $plink svctask mkvdiskhostmap -force -host s$S\path$p vd$vol
         done
      done
      let v="v+1"
   done
   sleep 5
   plink perfclus svctask detectmdisk
   sleep 5
   mlist=`plink perfclus svcinfo lsmdisk -nohdr | grep unmanaged | awk -v ORS="" '{
print (FNR==1?"":":") $2 }'`
   plink perfclus svctask mkmdiskgrp -name group$S -ext 256 -mdisk $mlist
done

for S in 1 2 3 4
do
   if [[ $S -le 2 ]]
   then firstv=1
   else firstv=5
   fi
   let lastv="firstv+3"
   if [[ $S%2 -eq 0 ]]
   then vollist="0 1 2 3 4 5 6 7"
   else vollist="8 9 10 11 12 13 14 15"
   fi
   v=$firstv
   while [[ $v -le $lastv ]]
   do
      plink="plink perfv$v"
      for p in 1 2 3 4 5 6 7 8
      do
         for vol in $vollist
         do
            $plink svctask mkvdiskhostmap -force -host s$S\path$p vd$vol
```

```
         done
      done
      let v="v+1"
   done
done
sleep 5
plink perfclus svctask detectmdisk
sleep 5
```

svcstep1_mkhost.cyg

```
plink="plink perfclus"
$plink svctask mkhost -force -name fcs7    -hbawwpn   10000000c9d4b081
$plink svctask mkhost -force -name fcs6    -hbawwpn   10000000c9d4b080
$plink svctask mkhost -force -name fcs4    -hbawwpn   10000000c9d4a7bc
$plink svctask mkhost -force -name fcs2    -hbawwpn   10000000c9d4b18c
$plink svctask mkhost -force -name fcs0    -hbawwpn   10000000c9d4a8bc
$plink svctask mkhost -force -name fcs10   -hbawwpn   10000000c9d4a87e
$plink svctask mkhost -force -name fcs8    -hbawwpn   10000000c9cc6c14
$plink svctask mkhost -force -name fcs9    -hbawwpn   10000000c9cc6c15
$plink svctask mkhost -force -name fcs19   -hbawwpn   10000000c9d4a931
$plink svctask mkhost -force -name fcs18   -hbawwpn   10000000c9d4a930
$plink svctask mkhost -force -name fcs16   -hbawwpn   10000000c9d4a8aa
$plink svctask mkhost -force -name fcs14   -hbawwpn   10000000c9d4a7c6
$plink svctask mkhost -force -name fcs12   -hbawwpn   10000000c9d4a912
$plink svctask mkhost -force -name fcs22   -hbawwpn   10000000c9e8b27e
$plink svctask mkhost -force -name fcs20   -hbawwpn   10000000c9d492e2
$plink svctask mkhost -force -name fcs21   -hbawwpn   10000000c9d492e3
$plink svctask mkhost -force -name fcs31   -hbawwpn   10000000c9d4b6f7
$plink svctask mkhost -force -name fcs30   -hbawwpn   10000000c9d4b6f6
$plink svctask mkhost -force -name fcs28   -hbawwpn   10000000c9d42fa8
$plink svctask mkhost -force -name fcs26   -hbawwpn   10000000c9d4a8f4
$plink svctask mkhost -force -name fcs24   -hbawwpn   10000000c9d4a8f8
$plink svctask mkhost -force -name fcs34   -hbawwpn   10000000c9d4a7ce
$plink svctask mkhost -force -name fcs32   -hbawwpn   10000000c9d4b038
$plink svctask mkhost -force -name fcs33   -hbawwpn   10000000c9d4b039
$plink svctask mkhost -force -name fcs43   -hbawwpn   10000000c9d49fed
$plink svctask mkhost -force -name fcs42   -hbawwpn   10000000c9d49fec
$plink svctask mkhost -force -name fcs40   -hbawwpn   10000000c9d4a006
$plink svctask mkhost -force -name fcs38   -hbawwpn   10000000c9d4b040
$plink svctask mkhost -force -name fcs36   -hbawwpn   10000000c9d4a030
$plink svctask mkhost -force -name fcs46   -hbawwpn   10000000c9d4b13e
$plink svctask mkhost -force -name fcs44   -hbawwpn   10000000c9d4a02a
$plink svctask mkhost -force -name fcs45   -hbawwpn   10000000C9d4a02b
```

svcstep2_mk128vd_8node_seq.cyg

```
#!/usr/bin/bash
#execute in cygwin command line
plink="plink perfclus"
i=0
while [[ $i -le 127 ]]
    do
    let lode="1 + ((i%32) / 4)"
    let iogrp="((i%32) / 8)"
    let k="i%128"
    #128 = no. of mdisks
    let j="(k%4)*32 + (k/4)"
    #4 is fixed, 32*4 = no. of mdisks
    let mdgrp="1+(j/32)"
    capbytes=`$plink svcinfo lsmdisk -bytes md$j | grep capacity | awk  '{print
$2}'`
    let cap="(capbytes-1073741824)/1073741824"
    $plink svctask mkvdisk -vtype seq -mdisk md$j \
       -size $cap -unit gb -mdiskgrp group$mdgrp -iogrp io_grp$iogrp \
       -name vd$i -node lode$lode
    let i="i+1"
    done
```

svcstep3_mapfcs_2path.cyg

```
#!/usr/bin/bash
# run in cygwin command line
# Maps each vdisk to two fcs's.

plink="plink perfclus"
#The following is a map of where the host fcs's are in the four switches (left=lower
ports, right=upper)
hostfcs=( \
     7   6  4  2         0 10  8  9       \
     19  18 16 14       12 22 20 21       \
     31  30 28 26       24 34 32 33       \
     43  42 40 38       36 46 44 45       )

lastvd=`$plink svcinfo lsvdisk -nohdr -delim : | cut -f 2 -d : | cut -c 3- | awk
'($1 > b) {b=$1} END{print b}'`
pos1=( 0  8 16 24 4 12 20 28)
pos2=( 12 4 28 20 8 0  24 16)

i=0
while [[ $i -le $lastvd ]]
    do
    let k=i%32
    let j="${pos1[k%8]}+(k/8)"
    let aj="${pos2[k%8]}+(k/8)"
    $plink svctask mkvdiskhostmap -force -host fcs${hostfcs[j]} vd$i
    $plink svctask mkvdiskhostmap -force -host fcs${hostfcs[aj]} vd$i
    let i="i+1"
    done
```

chqueue.sh

```
#changes queue depth and max transfer size
if [[ ($# -lt 2) ]]
then
    echo "usage: chqueue.sh queue_depth 0x100000"
    exit
fi

hfield=`lsdev -Cc disk | grep '2145' | awk '{print $1}'`

for h in $hfield
do
chdev -l $h -a queue_depth=$1
chdev -l $h -a max_transfer=$2
done
```

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

ASU Pre-Fill

```
*
* This will produce a random data pattern of the entire LBA range using LSFR 32bit
*
compratio=1
sd=default,threads=1,size=542g
sd=sd1,lun=/dev/rhdisk196
sd=sd2,lun=/dev/rhdisk197
sd=sd3,lun=/dev/rhdisk198
sd=sd4,lun=/dev/rhdisk199
sd=sd5,lun=/dev/rhdisk200
sd=sd6,lun=/dev/rhdisk201
sd=sd7,lun=/dev/rhdisk202
sd=sd8,lun=/dev/rhdisk203
sd=sd9,lun=/dev/rhdisk204
sd=sd10,lun=/dev/rhdisk205
sd=sd11,lun=/dev/rhdisk206
sd=sd12,lun=/dev/rhdisk207
sd=sd13,lun=/dev/rhdisk208
sd=sd14,lun=/dev/rhdisk209
sd=sd15,lun=/dev/rhdisk210
sd=sd16,lun=/dev/rhdisk211
sd=sd17,lun=/dev/rhdisk212
sd=sd18,lun=/dev/rhdisk213
sd=sd19,lun=/dev/rhdisk214
sd=sd20,lun=/dev/rhdisk215
sd=sd21,lun=/dev/rhdisk216
sd=sd22,lun=/dev/rhdisk217
sd=sd23,lun=/dev/rhdisk218
sd=sd24,lun=/dev/rhdisk219
sd=sd25,lun=/dev/rhdisk220
sd=sd26,lun=/dev/rhdisk221
sd=sd27,lun=/dev/rhdisk222
sd=sd28,lun=/dev/rhdisk223
sd=sd29,lun=/dev/rhdisk224
sd=sd30,lun=/dev/rhdisk225
sd=sd31,lun=/dev/rhdisk226
sd=sd32,lun=/dev/rhdisk227
sd=sd33,lun=/dev/rhdisk228
sd=sd34,lun=/dev/rhdisk229
sd=sd35,lun=/dev/rhdisk230
sd=sd36,lun=/dev/rhdisk231
sd=sd37,lun=/dev/rhdisk232
sd=sd38,lun=/dev/rhdisk233
sd=sd39,lun=/dev/rhdisk234
sd=sd40,lun=/dev/rhdisk235
sd=sd41,lun=/dev/rhdisk236
sd=sd42,lun=/dev/rhdisk237
sd=sd43,lun=/dev/rhdisk238
sd=sd44,lun=/dev/rhdisk239
sd=sd45,lun=/dev/rhdisk240
sd=sd46,lun=/dev/rhdisk241
sd=sd47,lun=/dev/rhdisk242
sd=sd48,lun=/dev/rhdisk243
sd=sd49,lun=/dev/rhdisk244
sd=sd50,lun=/dev/rhdisk245
```

```
  sd=sd51,lun=/dev/rhdisk246
  sd=sd52,lun=/dev/rhdisk247
  sd=sd53,lun=/dev/rhdisk248
  sd=sd54,lun=/dev/rhdisk249
  sd=sd55,lun=/dev/rhdisk250
  sd=sd56,lun=/dev/rhdisk251
  sd=sd57,lun=/dev/rhdisk252
  sd=sd58,lun=/dev/rhdisk253
  sd=sd59,lun=/dev/rhdisk254
  sd=sd60,lun=/dev/rhdisk255
  sd=sd61,lun=/dev/rhdisk256
  sd=sd62,lun=/dev/rhdisk257
  sd=sd63,lun=/dev/rhdisk258
  sd=sd64,lun=/dev/rhdisk259
  sd=sd65,lun=/dev/rhdisk260
  sd=sd66,lun=/dev/rhdisk261
  sd=sd67,lun=/dev/rhdisk262
  sd=sd68,lun=/dev/rhdisk263
  sd=sd69,lun=/dev/rhdisk264
  sd=sd70,lun=/dev/rhdisk265
  sd=sd71,lun=/dev/rhdisk266
  sd=sd72,lun=/dev/rhdisk267
  sd=sd73,lun=/dev/rhdisk268
  sd=sd74,lun=/dev/rhdisk269
  sd=sd75,lun=/dev/rhdisk270
  sd=sd76,lun=/dev/rhdisk271
  sd=sd77,lun=/dev/rhdisk272
  sd=sd78,lun=/dev/rhdisk273
  sd=sd79,lun=/dev/rhdisk274
  sd=sd80,lun=/dev/rhdisk275
  sd=sd81,lun=/dev/rhdisk276
  sd=sd82,lun=/dev/rhdisk277
  sd=sd83,lun=/dev/rhdisk278
  sd=sd84,lun=/dev/rhdisk279
  sd=sd85,lun=/dev/rhdisk280
  sd=sd86,lun=/dev/rhdisk281
  sd=sd87,lun=/dev/rhdisk282
  sd=sd88,lun=/dev/rhdisk283
  sd=sd89,lun=/dev/rhdisk284
  sd=sd90,lun=/dev/rhdisk285
  sd=sd91,lun=/dev/rhdisk286
  sd=sd92,lun=/dev/rhdisk287
  sd=sd93,lun=/dev/rhdisk288
  sd=sd94,lun=/dev/rhdisk289
  sd=sd95,lun=/dev/rhdisk290
  sd=sd96,lun=/dev/rhdisk291
  sd=sd97,lun=/dev/rhdisk292
  sd=sd98,lun=/dev/rhdisk293
  sd=sd99,lun=/dev/rhdisk294
  sd=sd100,lun=/dev/rhdisk295
  sd=sd101,lun=/dev/rhdisk296
  sd=sd102,lun=/dev/rhdisk297
  sd=sd103,lun=/dev/rhdisk298
  sd=sd104,lun=/dev/rhdisk299
  sd=sd105,lun=/dev/rhdisk300
  sd=sd106,lun=/dev/rhdisk301
  sd=sd107,lun=/dev/rhdisk302
  sd=sd108,lun=/dev/rhdisk303
  sd=sd109,lun=/dev/rhdisk304
  sd=sd110,lun=/dev/rhdisk305
  sd=sd111,lun=/dev/rhdisk306
  sd=sd112,lun=/dev/rhdisk307
  sd=sd113,lun=/dev/rhdisk308
```

```
sd=sd114,lun=/dev/rhdisk309
sd=sd115,lun=/dev/rhdisk310
sd=sd116,lun=/dev/rhdisk311
sd=sd117,lun=/dev/rhdisk312
sd=sd118,lun=/dev/rhdisk313
sd=sd119,lun=/dev/rhdisk314
sd=sd120,lun=/dev/rhdisk315
sd=sd121,lun=/dev/rhdisk316
sd=sd122,lun=/dev/rhdisk317
sd=sd123,lun=/dev/rhdisk318
sd=sd124,lun=/dev/rhdisk319
sd=sd125,lun=/dev/rhdisk320
sd=sd126,lun=/dev/rhdisk321
sd=sd127,lun=/dev/rhdisk322
sd=sd128,lun=/dev/rhdisk323

wd=default,rdpct=0,seek=-1,xfersize=256K
wd=wd1,sd=sd1
wd=wd2,sd=sd2
wd=wd3,sd=sd3
wd=wd4,sd=sd4
wd=wd5,sd=sd5
wd=wd6,sd=sd6
wd=wd7,sd=sd7
wd=wd8,sd=sd8
wd=wd9,sd=sd9
wd=wd10,sd=sd10
wd=wd11,sd=sd11
wd=wd12,sd=sd12
wd=wd13,sd=sd13
wd=wd14,sd=sd14
wd=wd15,sd=sd15
wd=wd16,sd=sd16
wd=wd17,sd=sd17
wd=wd18,sd=sd18
wd=wd19,sd=sd19
wd=wd20,sd=sd20
wd=wd21,sd=sd21
wd=wd22,sd=sd22
wd=wd23,sd=sd23
wd=wd24,sd=sd24
wd=wd25,sd=sd25
wd=wd26,sd=sd26
wd=wd27,sd=sd27
wd=wd28,sd=sd28
wd=wd29,sd=sd29
wd=wd30,sd=sd30
wd=wd31,sd=sd31
wd=wd32,sd=sd32
wd=wd33,sd=sd33
wd=wd34,sd=sd34
wd=wd35,sd=sd35
wd=wd36,sd=sd36
wd=wd37,sd=sd37
wd=wd38,sd=sd38
wd=wd39,sd=sd39
wd=wd40,sd=sd40
wd=wd41,sd=sd41
wd=wd42,sd=sd42
wd=wd43,sd=sd43
wd=wd44,sd=sd44
wd=wd45,sd=sd45
wd=wd46,sd=sd46
```

```
  wd=wd47,sd=sd47
  wd=wd48,sd=sd48
  wd=wd49,sd=sd49
  wd=wd50,sd=sd50
  wd=wd51,sd=sd51
  wd=wd52,sd=sd52
  wd=wd53,sd=sd53
  wd=wd54,sd=sd54
  wd=wd55,sd=sd55
  wd=wd56,sd=sd56
  wd=wd57,sd=sd57
  wd=wd58,sd=sd58
  wd=wd59,sd=sd59
  wd=wd60,sd=sd60
  wd=wd61,sd=sd61
  wd=wd62,sd=sd62
  wd=wd63,sd=sd63
  wd=wd64,sd=sd64
  wd=wd65,sd=sd65
  wd=wd66,sd=sd66
  wd=wd67,sd=sd67
  wd=wd68,sd=sd68
  wd=wd69,sd=sd69
  wd=wd70,sd=sd70
  wd=wd71,sd=sd71
  wd=wd72,sd=sd72
  wd=wd73,sd=sd73
  wd=wd74,sd=sd74
  wd=wd75,sd=sd75
  wd=wd76,sd=sd76
  wd=wd77,sd=sd77
  wd=wd78,sd=sd78
  wd=wd79,sd=sd79
  wd=wd80,sd=sd80
  wd=wd81,sd=sd81
  wd=wd82,sd=sd82
  wd=wd83,sd=sd83
  wd=wd84,sd=sd84
  wd=wd85,sd=sd85
  wd=wd86,sd=sd86
  wd=wd87,sd=sd87
  wd=wd88,sd=sd88
  wd=wd89,sd=sd89
  wd=wd90,sd=sd90
  wd=wd91,sd=sd91
  wd=wd92,sd=sd92
  wd=wd93,sd=sd93
  wd=wd94,sd=sd94
  wd=wd95,sd=sd95
  wd=wd96,sd=sd96
  wd=wd97,sd=sd97
  wd=wd98,sd=sd98
  wd=wd99,sd=sd99
  wd=wd100,sd=sd100
  wd=wd101,sd=sd101
  wd=wd102,sd=sd102
  wd=wd103,sd=sd103
  wd=wd104,sd=sd104
  wd=wd105,sd=sd105
  wd=wd106,sd=sd106
  wd=wd107,sd=sd107
  wd=wd108,sd=sd108
  wd=wd109,sd=sd109
```

```
wd=wd110,sd=sd110
wd=wd111,sd=sd111
wd=wd112,sd=sd112
wd=wd113,sd=sd113
wd=wd114,sd=sd114
wd=wd115,sd=sd115
wd=wd116,sd=sd116
wd=wd117,sd=sd117
wd=wd118,sd=sd118
wd=wd119,sd=sd119
wd=wd120,sd=sd120
wd=wd121,sd=sd121
wd=wd122,sd=sd122
wd=wd123,sd=sd123
wd=wd124,sd=sd124
wd=wd125,sd=sd125
wd=wd126,sd=sd126
wd=wd127,sd=sd127
wd=wd128,sd=sd128

*==================================
* Use 10 hours as a maximum elapsed time,
* which should ensure the entire LBA range
* will be written before the time elapses
*==================================
*
rd=FILLIT,wd=wd*,iorate=max,elapsed=999990,interval=10
*
* The above "elapsed=36000" may have to be increased to ensure that the utility will
reach
* the end of the LUN ("seek=-1") prior to the end of the specified elapsed time
```

Common Commands/Parameters

The following command/parameter lines appear each of the command and parameter files for the Large File Processing, Large Database Query, Video on Demand and Persistence Tests. The command lines are only listed below to eliminate redundancy.

```
sd=default,host=localhost,size=542g
sd=sd1,lun=/dev/rhdisk196
sd=sd2,lun=/dev/rhdisk197
sd=sd3,lun=/dev/rhdisk198
sd=sd4,lun=/dev/rhdisk199
sd=sd5,lun=/dev/rhdisk200
sd=sd6,lun=/dev/rhdisk201
sd=sd7,lun=/dev/rhdisk202
sd=sd8,lun=/dev/rhdisk203
sd=sd9,lun=/dev/rhdisk204
sd=sd10,lun=/dev/rhdisk205
sd=sd11,lun=/dev/rhdisk206
sd=sd12,lun=/dev/rhdisk207
sd=sd13,lun=/dev/rhdisk208
sd=sd14,lun=/dev/rhdisk209
sd=sd15,lun=/dev/rhdisk210
sd=sd16,lun=/dev/rhdisk211
sd=sd17,lun=/dev/rhdisk212
sd=sd18,lun=/dev/rhdisk213
sd=sd19,lun=/dev/rhdisk214
sd=sd20,lun=/dev/rhdisk215
sd=sd21,lun=/dev/rhdisk216
sd=sd22,lun=/dev/rhdisk217
sd=sd23,lun=/dev/rhdisk218
sd=sd24,lun=/dev/rhdisk219
sd=sd25,lun=/dev/rhdisk220
sd=sd26,lun=/dev/rhdisk221
sd=sd27,lun=/dev/rhdisk222
sd=sd28,lun=/dev/rhdisk223
sd=sd29,lun=/dev/rhdisk224
sd=sd30,lun=/dev/rhdisk225
sd=sd31,lun=/dev/rhdisk226
sd=sd32,lun=/dev/rhdisk227
sd=sd33,lun=/dev/rhdisk228
sd=sd34,lun=/dev/rhdisk229
sd=sd35,lun=/dev/rhdisk230
sd=sd36,lun=/dev/rhdisk231
sd=sd37,lun=/dev/rhdisk232
sd=sd38,lun=/dev/rhdisk233
sd=sd39,lun=/dev/rhdisk234
sd=sd40,lun=/dev/rhdisk235
sd=sd41,lun=/dev/rhdisk236
sd=sd42,lun=/dev/rhdisk237
sd=sd43,lun=/dev/rhdisk238
sd=sd44,lun=/dev/rhdisk239
sd=sd45,lun=/dev/rhdisk240
sd=sd46,lun=/dev/rhdisk241
sd=sd47,lun=/dev/rhdisk242
sd=sd48,lun=/dev/rhdisk243
sd=sd49,lun=/dev/rhdisk244
sd=sd50,lun=/dev/rhdisk245
sd=sd51,lun=/dev/rhdisk246
sd=sd52,lun=/dev/rhdisk247
sd=sd53,lun=/dev/rhdisk248
```

```
  sd=sd54,lun=/dev/rhdisk249
  sd=sd55,lun=/dev/rhdisk250
  sd=sd56,lun=/dev/rhdisk251
  sd=sd57,lun=/dev/rhdisk252
  sd=sd58,lun=/dev/rhdisk253
  sd=sd59,lun=/dev/rhdisk254
  sd=sd60,lun=/dev/rhdisk255
  sd=sd61,lun=/dev/rhdisk256
  sd=sd62,lun=/dev/rhdisk257
  sd=sd63,lun=/dev/rhdisk258
  sd=sd64,lun=/dev/rhdisk259
  sd=sd65,lun=/dev/rhdisk260
  sd=sd66,lun=/dev/rhdisk261
  sd=sd67,lun=/dev/rhdisk262
  sd=sd68,lun=/dev/rhdisk263
  sd=sd69,lun=/dev/rhdisk264
  sd=sd70,lun=/dev/rhdisk265
  sd=sd71,lun=/dev/rhdisk266
  sd=sd72,lun=/dev/rhdisk267
  sd=sd73,lun=/dev/rhdisk268
  sd=sd74,lun=/dev/rhdisk269
  sd=sd75,lun=/dev/rhdisk270
  sd=sd76,lun=/dev/rhdisk271
  sd=sd77,lun=/dev/rhdisk272
  sd=sd78,lun=/dev/rhdisk273
  sd=sd79,lun=/dev/rhdisk274
  sd=sd80,lun=/dev/rhdisk275
  sd=sd81,lun=/dev/rhdisk276
  sd=sd82,lun=/dev/rhdisk277
  sd=sd83,lun=/dev/rhdisk278
  sd=sd84,lun=/dev/rhdisk279
  sd=sd85,lun=/dev/rhdisk280
  sd=sd86,lun=/dev/rhdisk281
  sd=sd87,lun=/dev/rhdisk282
  sd=sd88,lun=/dev/rhdisk283
  sd=sd89,lun=/dev/rhdisk284
  sd=sd90,lun=/dev/rhdisk285
  sd=sd91,lun=/dev/rhdisk286
  sd=sd92,lun=/dev/rhdisk287
  sd=sd93,lun=/dev/rhdisk288
  sd=sd94,lun=/dev/rhdisk289
  sd=sd95,lun=/dev/rhdisk290
  sd=sd96,lun=/dev/rhdisk291
  sd=sd97,lun=/dev/rhdisk292
  sd=sd98,lun=/dev/rhdisk293
  sd=sd99,lun=/dev/rhdisk294
  sd=sd100,lun=/dev/rhdisk295
  sd=sd101,lun=/dev/rhdisk296
  sd=sd102,lun=/dev/rhdisk297
  sd=sd103,lun=/dev/rhdisk298
  sd=sd104,lun=/dev/rhdisk299
  sd=sd105,lun=/dev/rhdisk300
  sd=sd106,lun=/dev/rhdisk301
  sd=sd107,lun=/dev/rhdisk302
  sd=sd108,lun=/dev/rhdisk303
  sd=sd109,lun=/dev/rhdisk304
  sd=sd110,lun=/dev/rhdisk305
  sd=sd111,lun=/dev/rhdisk306
  sd=sd112,lun=/dev/rhdisk307
  sd=sd113,lun=/dev/rhdisk308
  sd=sd114,lun=/dev/rhdisk309
  sd=sd115,lun=/dev/rhdisk310
  sd=sd116,lun=/dev/rhdisk311
```

```
sd=sd117,lun=/dev/rhdisk312
sd=sd118,lun=/dev/rhdisk313
sd=sd119,lun=/dev/rhdisk314
sd=sd120,lun=/dev/rhdisk315
sd=sd121,lun=/dev/rhdisk316
sd=sd122,lun=/dev/rhdisk317
sd=sd123,lun=/dev/rhdisk318
sd=sd124,lun=/dev/rhdisk319
sd=sd125,lun=/dev/rhdisk320
sd=sd126,lun=/dev/rhdisk321
sd=sd127,lun=/dev/rhdisk322
sd=sd128,lun=/dev/rhdisk323
```

Large File Processing Test *(LFP)*

```
host=localhost,jvms=32,maxstreams=200
```

Common Commands/Parameters

```
maxlatestart=0
reportinginterval=5
segmentlength=512m

rd=default,rampup=180,measurement=180,runout=45,rampdown=15,buffers=1,periods=90
rd=default,rdpct=0,xfersize=1024k,streams=256
rd=TR1_SPC-2-FP,streams=256
rd=TR2_SPC-2-FP,streams=128
rd=TR3_SPC-2-FP,streams=64
rd=TR4_SPC-2-FP,streams=32
rd=TR5_SPC-2-FP,streams=1
rd=default,rdpct=0,xfersize=256k,streams=256
rd=TR6_SPC-2-FP,streams=256
rd=TR7_SPC-2-FP,streams=128
rd=TR8_SPC-2-FP,streams=64
rd=TR9_SPC-2-FP,streams=32
rd=TR10_SPC-2-FP,streams=1
rd=default,rdpct=50,xfersize=1024k,streams=256
rd=TR11_SPC-2-FP,streams=256
rd=TR12_SPC-2-FP,streams=128
rd=TR13_SPC-2-FP,streams=64
rd=TR14_SPC-2-FP,streams=32
rd=TR15_SPC-2-FP,streams=1
rd=default,rdpct=50,xfersize=256k,streams=256
rd=TR16_SPC-2-FP,streams=256
rd=TR17_SPC-2-FP,streams=128
rd=TR18_SPC-2-FP,streams=64
rd=TR19_SPC-2-FP,streams=32
rd=TR20_SPC-2-FP,streams=1
rd=default,rdpct=100,xfersize=1024k,streams=256
rd=TR21_SPC-2-FP,streams=256
rd=TR22_SPC-2-FP,streams=128
rd=TR23_SPC-2-FP,streams=64
rd=TR24_SPC-2-FP,streams=32
rd=TR25_SPC-2-FP,streams=1
rd=default,rdpct=100,xfersize=256k,streams=256
rd=TR26_SPC-2-FP,streams=256
rd=TR27_SPC-2-FP,streams=128
rd=TR28_SPC-2-FP,streams=64
rd=TR29_SPC-2-FP,streams=32
rd=TR30_SPC-2-FP,streams=1
```

Large Database Query Test (LDQ)

```
host=localhost,jvms=32,maxstreams=200
```

Common Commands/Parameters

```
maxlatestart=0
reportinginterval=5
segmentlength=512m

rd=default,rdpct=99,rampup=180,measurement=180,runout=45,rampdown=15,periods=90
rd=default,xfersize=1024k,buffers=4,streams=256
rd=TR11_SPC-2-DQ,streams=256
rd=TR12_SPC-2-DQ,streams=128
rd=TR13_SPC-2-DQ,streams=64
rd=TR14_SPC-2-DQ,streams=32
rd=TR15_SPC-2-DQ,streams=1
rd=default,xfersize=1024k,buffers=1,streams=256
rd=TR16_SPC-2-DQ,streams=256
rd=TR17_SPC-2-DQ,streams=128
rd=TR18_SPC-2-DQ,streams=64
rd=TR19_SPC-2-DQ,streams=32
rd=TR20_SPC-2-DQ,streams=1
rd=default,xfersize=64k,buffers=4,streams=256
rd=TR1_SPC-2-DQ,streams=256
rd=TR2_SPC-2-DQ,streams=128
rd=TR3_SPC-2-DQ,streams=64
rd=TR4_SPC-2-DQ,streams=32
rd=TR5_SPC-2-DQ,streams=1
rd=default,xfersize=64k,buffers=1,streams=256
rd=TR6_SPC-2-DQ,streams=256
rd=TR7_SPC-2-DQ,streams=128
rd=TR8_SPC-2-DQ,streams=64
rd=TR9_SPC-2-DQ,streams=32
rd=TR10_SPC-2-DQ,streams=1
```

Video on Demand Delivery *(VOD)*

```
host=localhost,jvms=50,maxstreams=400
```

Common Commands/Parameters

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

rd=default,measurement=7200,rampup=1200,runout=45,rampdown=15,periods=600
rd=TR1_SPC-2-VOD,streams=16000,buffers=8
```

Persistence Test Run 1 (write phase)

```
* Persistence Test Run 1
host=localhost,jvms=16,maxstreams=200
```

Common Commands/Parameters

```
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=256
```

Persistence Test Run 2 *(read phase)*

```
* Persistence Test Run 2

host=localhost,jvms=16,maxstreams=200
```

Common Commands/Parameters

```
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

ASU Pre-Fill, Large File Processing Test, Large Database Query Test, Video on Demand Delivery Test, and Persistence Test Run 1

The following script was used to execute the required ASU pre-fill, Large File Processing Test, Large Database Query Test, Video on Demand Delivery Test and Persistence Test Run 1.

```
cd ../jun15fill
runfill.sh
cd ../jun15spc2
sleep 300
export PATH=$PATH:/usr/java6/bin
export SPC2HOME=/perform/spc2install
export CLASSPATH=$SPC2HOME
export LIBPATH=$SPC2HOME/aix
export IBM_JAVADUMP_OUTOFMEMORY=false
export IBM_HEAPDUMP_OUTOFMEMORY=false
java -Xoptionsfile=javaopts.cfg vdbench -f vod.cfg -o init -init
java -Xoptionsfile=javaopts.cfg vdbench -f vod.cfg -o vod
java -Xoptionsfile=javaopts.cfg vdbench -f lfp.cfg -o lfp
java -Xoptionsfile=javaopts.cfg vdbench -f ldq.cfg -o ldq
java -Xoptionsfile=javaopts.cfg vdbench -f persistw.cfg -o persistw
getaixdata.sh
getsvcdata.sh
getv7000data.sh
```

Persistence Test Run 2

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

```
export PATH=$PATH:/usr/java6/bin
export SPC2HOME=/perform/spc2install
export CLASSPATH=$SPC2HOME
export LIBPATH=$SPC2HOME/aix
export IBM_JAVADUMP_OUTOFMEMORY=false
export IBM_HEAPDUMP_OUTOFMEMORY=false
java -Xoptionsfile=javaopts.cfg vdbench -f persistr.cfg -o persist
```