



**SPC BENCHMARK 1™  
EXECUTIVE SUMMARY**

**INFORTREND TECHNOLOGIES, INC.  
INFORTREND ESVA F60**

**SPC-1 V1.12**

**Submitted for Review: February 8, 2010  
Submission Identifier: A00088**

## **EXECUTIVE SUMMARY**

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

<b>Test Sponsor and Contact Information</b>	
<b>Test Sponsor Primary Contact</b>	Infotrend Technologies, Inc. – <a href="http://www.infotrend.com">http://www.infotrend.com</a> Galvin Chang – <a href="mailto:galvin.chang@infotrend.com">galvin.chang@infotrend.com</a> 8F, No. 102 Sec 3, Jhonshan Rd. Jhonhe City, Taiei County 235, Taiwan Phone: +866 02 2226 0126 x8512 FAX: +866 2 2226-0020
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<b>Auditor</b>	Storage Performance Council – <a href="http://www.storageperformance.org">http://www.storageperformance.org</a> Walter E. Baker – <a href="mailto:AuditService@StoragePerformance.org">AuditService@StoragePerformance.org</a> 643 Bair Island Road, Suite 103 Redwood City, CA 94063 Phone: (650) 556-9384 FAX: (650) 556-9385

### **Revision Information and Key Dates**

<b>Revision Information and Key Dates</b>	
<b>SPC-1 Specification revision number</b>	V1.12
<b>SPC-1 Workload Generator revision number</b>	V2.1.0
<b>Date Results were first used publicly</b>	February 8, 2010
<b>Date the FDR was submitted to the SPC</b>	February 8, 2010
<b>Date the priced storage configuration is available for shipment to customers</b>	currently available
<b>Date the TSC completed audit certification</b>	TBD

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

The Infotrend ESVA Fiber Series is designed to support a powerful, reliable and flexible Fiber Channel (FC) SAN. It offers wide configuration choices to meet diverse application requirements of performance, capacity, space and costs. Based on Enterprise Scalable Virtualized Architecture, the ESVA FC SAN can help mid-range enterprises optimize returns on investment, simplify storage infrastructure and maximize application productivity.

### Summary of Results

SPC-1 Results	
Tested Storage Configuration (TSC) Name: Infortrend ESVA F60	
Metric	Reported Result
SPC-1 IOPS™	180,488.53
SPC-1 Price-Performance	\$5.12/SPC-1 IOPS™
Total ASU Capacity	49,177.376 GB
Data Protection Level	Protected ( <i>Mirroring</i> )
Total TSC Price (including three-year maintenance)	\$924,231.65

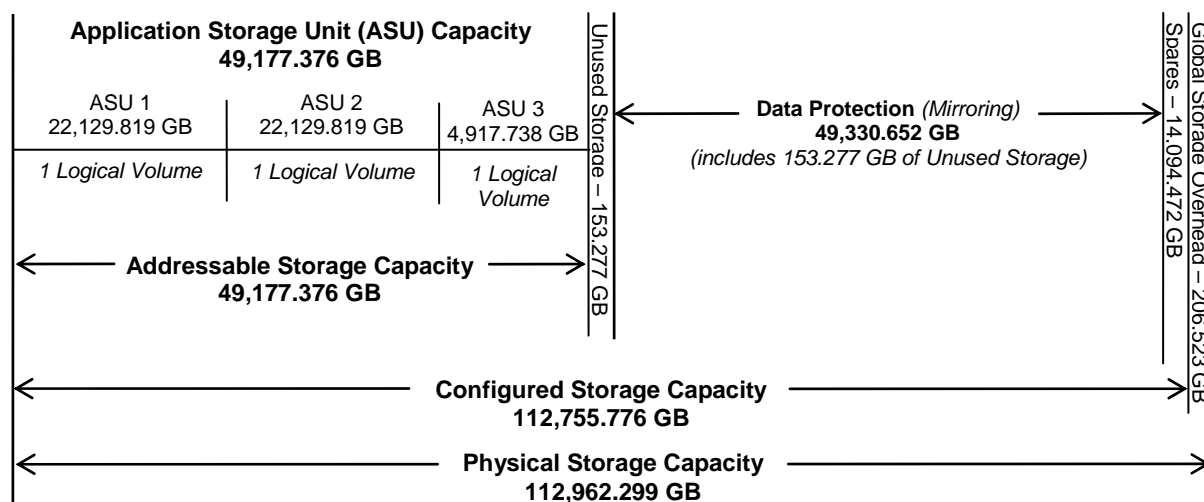
**SPC-1 IOPS™** represents the maximum I/O Request Throughput at the 100% load point.

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

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

### Storage Capacities and Relationships

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



SPC-1 Storage Capacity Utilization	
Application Utilization	43.53%
Protected Application Utilization	87.07%
Unused Storage Ratio	0.27%

**Application Utilization:** Total ASU Capacity (49,177.376 GB) divided by Physical Storage Capacity (112,963.299 GB)

**Protected Application Utilization:** (Total ASU Capacity (49,177.376 GB) plus total Data Protection Capacity (GB) minus unused Data Protection Capacity (GB) divided by Physical Storage Capacity (112,963.299 GB)

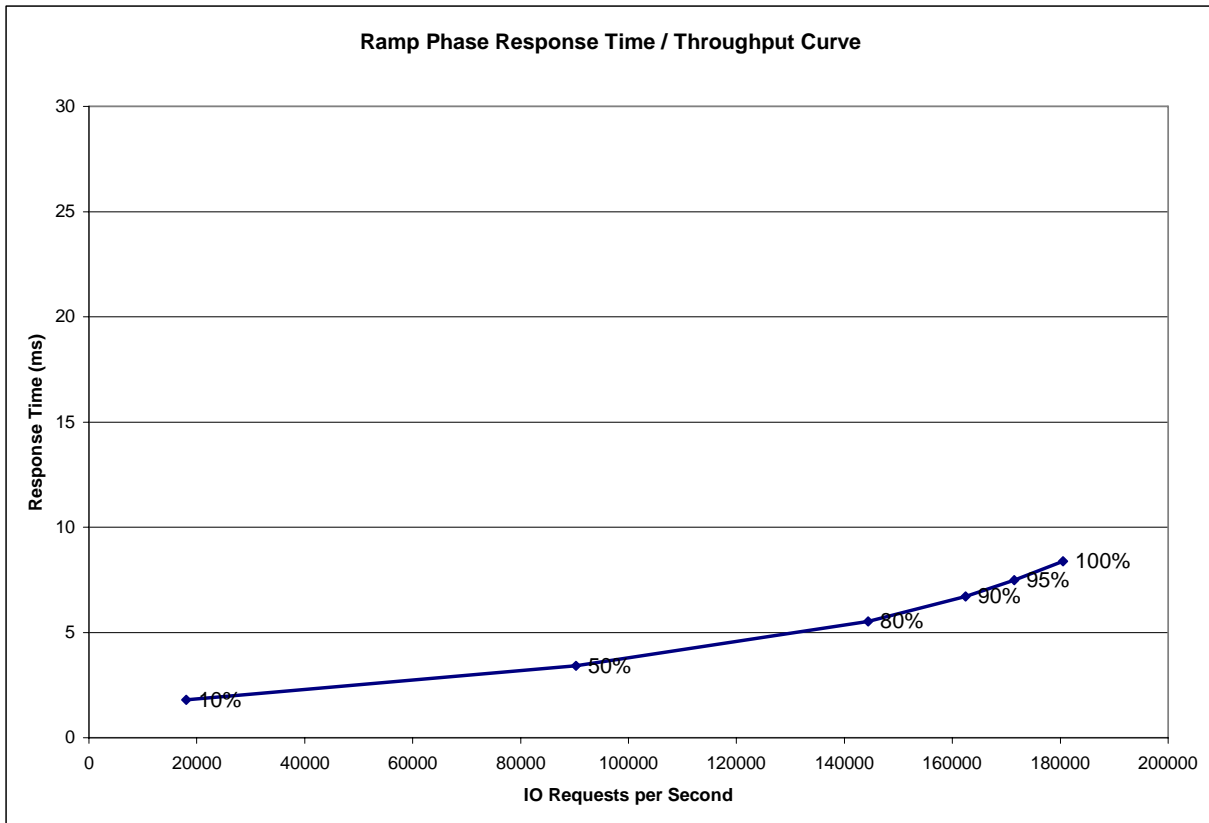
**Unused Storage Ratio:** Total Unused Capacity (GB) divided by Physical Storage Capacity (112,963.299 GB) and may not exceed 45%.

Detailed information for the various storage capacities and utilizations is available on pages 20-21 in the Full Disclosure Report.

### Response Time – Throughput Curve

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

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



### Response Time – Throughput Data

	10% Load	50% Load	80% Load	90% Load	95% Load	100% Load
<b>I/O Request Throughput</b>	18,049.45	90,251.51	144,385.34	162,457.18	171,475.69	180,488.53
<b>Average Response Time (ms):</b>						
All ASUs	1.79	3.41	5.51	6.71	7.48	8.38
ASU-1	2.42	4.57	7.17	8.59	9.45	10.41
ASU-2	1.86	3.34	5.43	6.72	7.61	8.75
ASU-3	0.44	0.99	2.03	2.72	3.24	3.92
Reads	3.90	7.17	10.91	12.88	14.04	15.27
Writes	0.42	0.97	2.00	2.69	3.21	3.89

## Priced Storage Configuration Pricing

Description	Quantity	Price	subtotal
<b>Storage System</b>			
<b>ESVA F60-1830 package include</b>	12	\$ 23,920.00	\$ 287,040.00
Control Module			
Cooling Module			
Battery Module			
Power Supply Unit			
16x 147GB magazine with MUX board plus 15k RPM SAS disk drive			
4x 5m cable lc-lc 1.8 mm x 2 mm-62.5/125 DUPLEX LSZH			
4x Finnisar 8 GB SFP			
<b>ESVA J60-130 package</b>	36	\$ 9,880.00	\$ 355,680.00
Controller Module			
Battery Module			
Power Supply Unit			
16x 147GB magazine with MUX board plus 15k RPM SAS disk drive			
6x SAS Cable			
<b>Storage Software &amp; Warranty</b>			
Infotrend MPIO v1.23.2.40	1		
Load Balance driver v1.0.1.1 1045	1		
Infotrend SANWatch 2.0	1		
Premium Service Upgrade - 3 years Standard Service + 4hr Onsite (RAID)	12	\$ 6,571.00	\$ 78,852.00
Premium Service Upgrade - 3 years Standard Service + 4hr Onsite (JBOD)	36	\$ 4,571.00	\$ 164,556.00
<b>Storage Subtotal</b>			<b>\$ 886,128.00</b>
<b>Third-Party Components</b>			
SuperMicro X7DBE Xeon Quad-Core E5405 2.0GHz 16GM DDR memory	1	\$ 2,221.15	\$ 2,221.15
Qlogic SanBox 5800 Fibre Switch	4	\$ 3,548.00	\$ 14,192.00
Qlogic port Expansion license	12	\$ 737.00	\$ 8,844.00
XPAK Connector Cable	2	\$ 227.00	\$ 454.00
Qlogic HBA QLE2562 8GB	3	\$ 890.00	\$ 2,670.00
42U AMS2000 Rackmount	7	\$ 437.50	\$ 3,062.50
5m cable lc-lc 1.8 mm x 2 mm-62.5/125 DUPLEX LSZH	6	\$ 30.00	\$ 180.00
Finnisar 8 GB SFP	54	\$ 120.00	\$ 6,480.00
<b>Host Subtotal</b>			<b>\$ 38,103.65</b>
<b>Total</b>			<b>\$ 924,231.65</b>

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

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

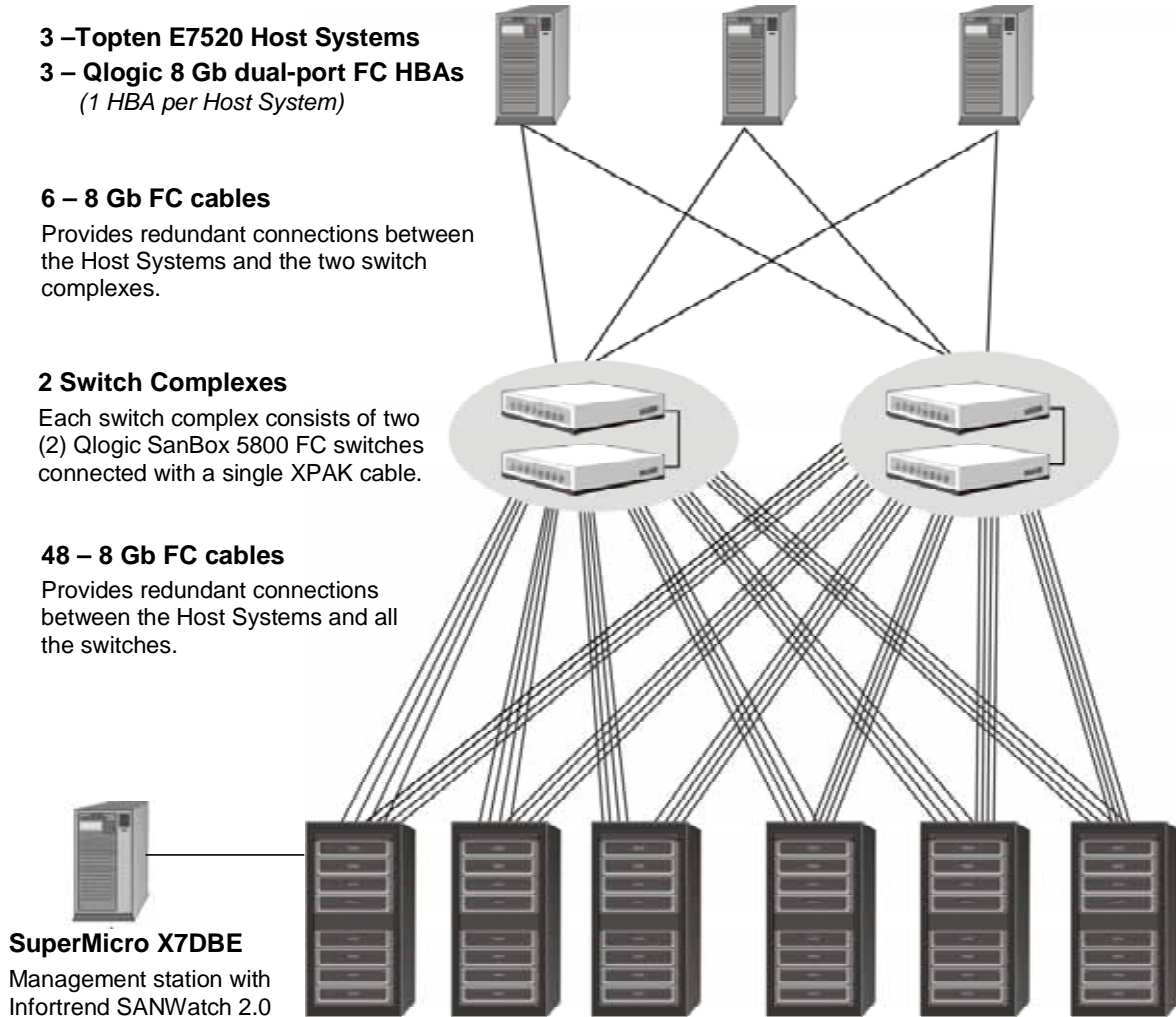
be remedied by the repair or replacement of a Priced Storage Configuration component.

Infortrend Corporation (*U.S. office*) only sells its products to third-party resellers, who in turn, sell those products to U.S. customers. The above pricing, which also includes the required three-year maintenance and support, was obtained from one of those third-party resellers. See page 74 (*Appendix F: Third-Party Quotations*) of the corresponding SPC-1 Full Disclosure Report for a copy of the third-party quotation.

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

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

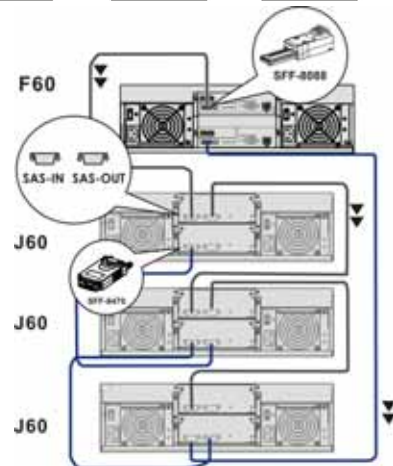
### Benchmark Configuration (BC)/Tested Storage Configuration (TSC)/ Priced Storage Configuration Diagram



**12 – Infortrend ESVA F60 sets**

Each set consists of:

- 1 – Infortrend ESVA F60**  
 dual controller (4 GB cache/controller)  
 with 16 146GB 15K RPM SAS disks drives
- 3 – Infortrend ESVA J60**  
 Expansion units, each with  
 16 146GB 15K RPM SAS disks drives
- 64 – 146GB 15K RPM SAS disks drives**  
 per F60 set





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

Host System:	Tested Storage Configuration (TSC)/ Priced Storage Configuration:
<b>3 – Topten E7520 Host Systems</b>	Infortrend MPIO v1.23.2.40 Load Balance driver v1.0.11 1045
Each Host System with:	<i>(both included with Host Systems)</i>
Dual Intel Xeon 2.0 GHz Quad Core processors with 12 MB L2 cache per CPU	3 – dual port Qlogic 8 Gb PCI-X HBAs ( <i>QLE 2562</i> ) <i>(one HBA per Host System)</i>
16 GB main memory	<b>12 – Infortrend ESVA F60</b> <b>Each F60 includes:</b> 4 GB cache/memory 16 – 146 GB 15K RPM SAS disk drives 4 – 8 Gb Fibre Channel front-end connections 4 – 8 Gb Finisar SFPs 4 – SAS backend connections ( <i>2 used</i> ) 4 – 5m cables lc-lc 1.8mm x2 mm /125 DUPLEX LSZH  <b>36 – Infortrend ESVA J60 (3 J60s per F60)</b> <b>Each J60 includes:</b> 16 – 146 GB 15K RPM SAS disk drives 6 – SAS cables
Windows Server 2003 Enterprise Edition 64-bit with SP2	
PCI-X	
	1 – SuperMicro X7DBE server ( <i>management station</i> ) with Infortrend SANWatch 2.0
	4 – Qlogic SanBox 5800 FC switches with 2 XPAK connector cables
	54 -8 Gb Finisar SFPs
	6 – 5m cables lc-lc 1.8mm x2 mm /125 DUPLEX LSZH
	7 – 42U AMS Rackmounts