Infortrend EonStor DS S16F-R2842 6000 Mailbox 1GB Mailbox Resiliency Exchange 2010 Storage Solution

Technical White Paper

Tested with: ESRP – Storage Version 3.0

Tested Date: 4/10/2012

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Overview

This document provides information on Infortrend's storage solution for Microsoft Exchange Server, based the *Microsoft Exchange Solution Reviewed Program (ESRP) – Storage* program*. For any questions or comments regarding the contents of this document, see Contact for Additional Information.

*The *ESRP – Storage* program was developed by Microsoft Corporation to provide a common storage testing framework for vendors to provide information on its storage solutions for Microsoft Exchange Server software. For more details on the *Microsoft ESRP – Storage* program, please click http://technet.microsoft.com/en-us/exchange/ff182054

Disclaimer

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(The information contained in this document represents the current view of Infortrend on the issues discussed as of the date of publication. Due to changing market conditions, it should not be interpreted to be a commitment on the part of Infortrend, and Infortrend cannot guarantee the accuracy of any information presented after the date of publication)

Features

- Target users: 6000-user environment in entry-level to mid-sized corporations
- Hybrid structure: 8G FC/1G iSCSI
- Scalability: Up to 112 HDDs
- Reliability: High availability architecture with redundant controller, PSU and fan.
- Easy deployment and management: SANWatch management software suite
- Data protection: Snapshot, remote replication
- Product link: EonStor DS S16F-2842

Solution Description

Total HDD deployed: 16

– 7 spindles in a RAID5 disk group

– 3 Exchange databases per disk group

– 2 spare drives(1 for each disk group)

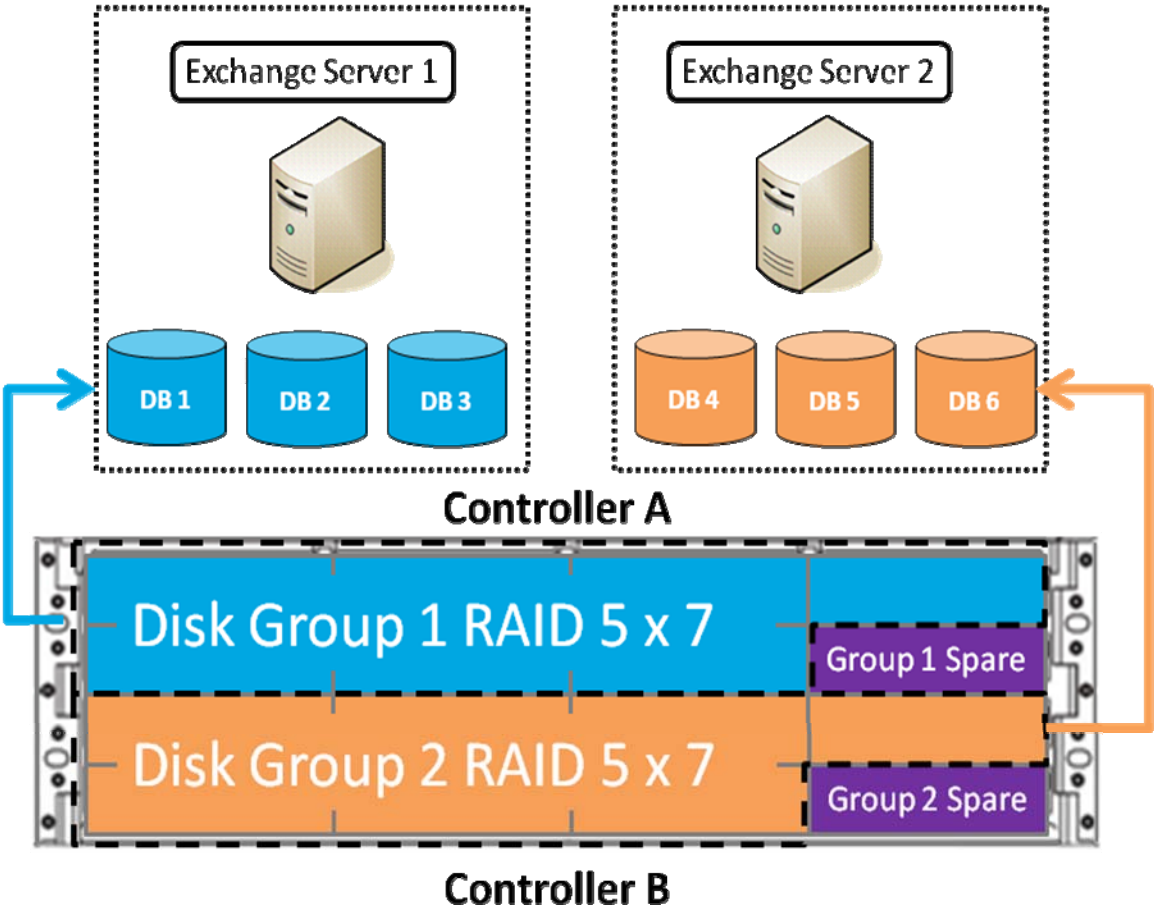

Figure 1. Solution configuration

Two RAID5 – disk groups were created with 14 HDDs (7 disk per group) in this solution. Each RAID group were hosted by one of the redundant controllers of the EonStor DS. In addition to the disk groups, 2 HDDs were deployed as the spare drive of each disk group. Both disk groups were divided to 3LUNs for a total of 6 databases hosted by 2 active Exchange servers. Figure 1 shows the complete architecture of this solution.

A total 6 databases were tested with 2 exchange servers in this solution. Each server hosts 3 databases and each database has 1 active at the local site and 1 passive at the remote site. The servers were configured in the same DAG for exchange 2010 built in database recovery high availability mailbox resiliency when encountered failure.

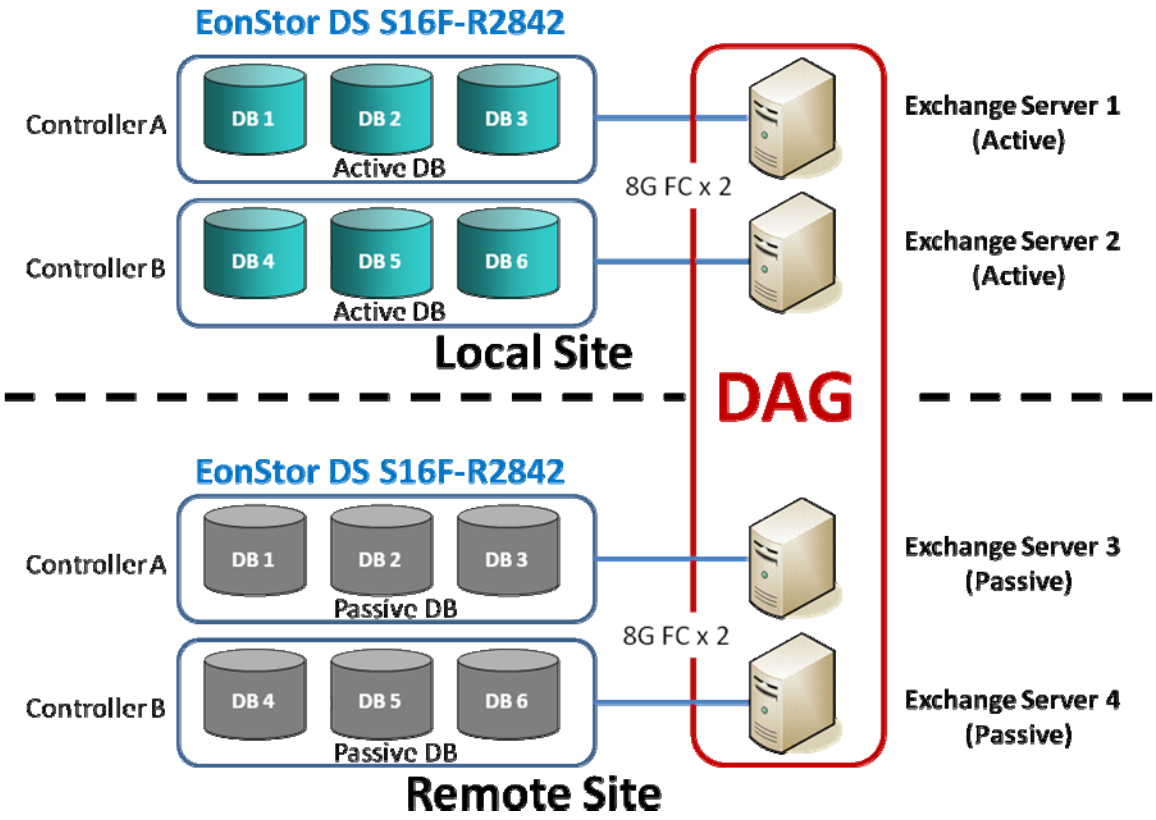

Figure 2. Database architecture

The proposed solution topology is connected with “No single point of failure” method. 2 servers and fiber switches were deployed in this solution with multipath IO configured. Figure 3 shows the complete diagram.

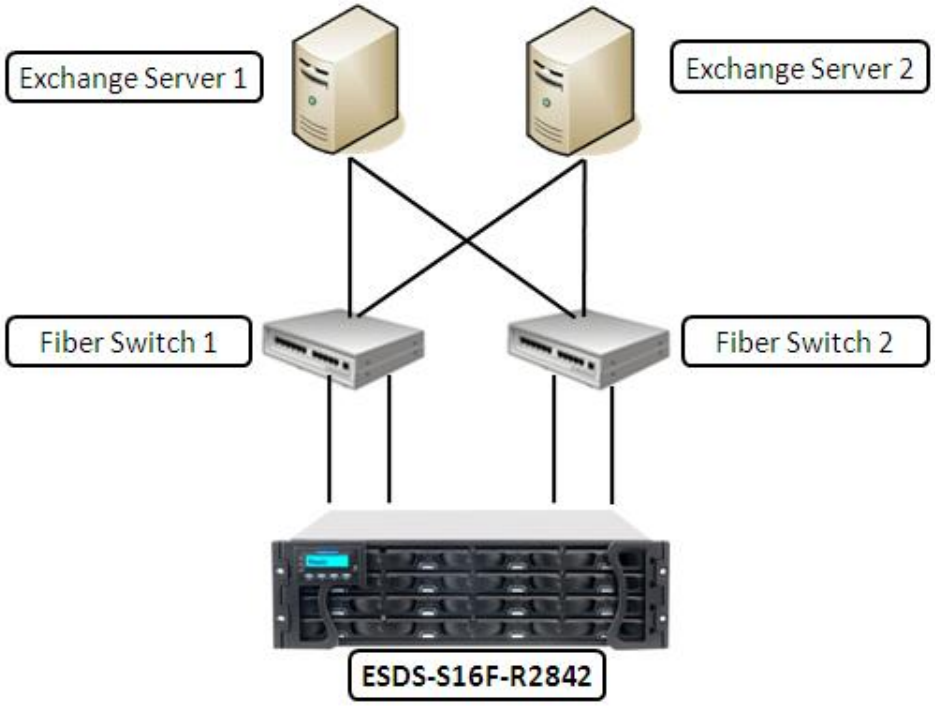

Figure 3. Solution connection topology

The ESRP-Storage program focuses on storage solution testing to address performance and reliability issues with storage design. However, storage is not the only factor to take into consideration when designing a scale up Exchange solution. Other factors which affect the server scalability are: server processor utilization, server physical and virtual memory limitations, resource requirements for ither applications, directory and network service latencies, network infrastructure limitations, replication and recovery requirements, and client usage profiles. All these factors are beyond the scope for ESRP-Storage. Therefore, the number of mailboxes hosted per server as part of the tested configuration may not necessarily be viable for some customer deployment.

For more information on identifying and addressing performance bottleneck in an Exchange system, please refer to Microsoft’s Troubleshooting Microsoft Exchange Server Performance, available at http://technet.microsoft.com/en-us/library/dd335215.aspx

Targeted Customer Profile

This solution targets a 6000 user Exchange environment, suitable for small and medium size companies. The hybrid structure of EonStor DS (Fibre/iSCSI) provides excellent price point and performance through remote replication, backup and disaster recovery features. This EonStor DS solution was also designed for easy deployment and maintenance without IT professionals involved.

This solution has been tested with the following characteristics:

- 6000 Mailboxes
- 1GB capacity for each Mailbox
- 0.18 User Profile (including 20% headroom)
- Tested with 2 servers
- 24 x 7 background database maintenance enabled
- Mailbox resiliency
- 10% of capacity reserved for EonStor DS Snapshot technology for data protection

Tested Deployment

The following tables summarize the testing environment:

Simulated Exchange Configuration:

Number of Exchange mailboxes simulated	6000
Number of Database Availability Groups (DAGs)	1
Number of servers/DAG	4 (2 active & 2 passive)
Number of active mailboxes/server	3000
Number of databases/host	3
Number of copies/database	2
Number of mailboxes/database	1000
Simulated profile: I/O's per second per mailbox (IOPS, include 20% headroom)	0.18
Database/Log LUN size	1TB
Total database size for performance testing	6TB
% storage capacity used by Exchange database**	83.33%

**Storage performance characteristics change based on the percentage utilization

of the individual disks. Tests that use a small percentage of the storage (~25%) may exhibit reduced throughput if the storage capacity utilization is significantly increased beyond what is tested in this paper.

Storage Hardware

Storage Connectivity (Fiber Channel, SAS, SATA, iSCSI)	Fibre Channel
Storage model and OS/firmware revision	ESDS-S16F-R2842 Firmware version: 3.86C.11
Storage cache	1GB per controller
Number of storage controllers	2
Number of storage ports	2
Maximum bandwidth of storage connectivity to host	16 Gbps bandwidth (2 x 8G Fibre Channel)
Switch type/model/firmwar e revision	Fibre Switch Qlogic SANBox 5800 Firmware: 7.4.0.10.0
HBA model and firmware	Qlogic QLE2562-SP Firmware version: 4.6.02
Number of HBA's/host	1 x Dual Port Fibre HBA per host
Host server type	Intel Xeon E5405 2.00Ghz x 2 8GB RAM
Total number of disks tested in solution	16 (14 + 2 spares)
Maximum number of spindles can be hosted in the storage	112

Storage Software

HBA driver	Driver version: 9.1.8.6
HBA QueueTarget	N/A

Setting	
HBA QueueDepth Setting	N/A
Multi-Pathing	EonPath-v1.23.2.48
Host OS	Windows Server 2008 R2 64bit
ESE.dll file version	14.0.639.19
Replication solution name/version	N/A

Storage Disk Configuration (Mailbox Store Disks)

Disk type, speed and firmware revision	15k rpm SAS drive
Raw capacity per disk (GB)	600GB
Number of physical disks in test	14 + 2 spare
Total raw storage capacity (GB)	8400GB
Disk slice size (GB)	N/A
Number of slices per LUN or number of disks per LUN	7 disks per 3 LUN
Raid level	RAID5
Total formatted capacity	7200GB
Storage capacity utilization	85.7%
Database capacity utilization	11.9%

Storage Disk Configuration (Transactional Log Disks)

Disk type, speed and firmware revision	15k rpm SAS drive
Raw capacity per disk (GB)	600GB
Number of Spindles in test	14

total raw storage capacity (GB)	8400GB
Disk slice size (GB)	N/A
Number of slices per LUN or number of disks per LUN	7 disks per 3 LUNs
Raid level	RAID5
Total formatted capacity	7200GB

Best Practices

Exchange server is a disk-intensive application. Based on the testing run using the ESRP framework, we would recommend the following to improve the storage performance.

EonStor DS

●Capacity and performance

- Mailbox capacity
- Performance requirements
- Future growth

This solution includes the best practice of initial deployment of EonStor DS for Microsoft Exchange 2010, under consideration of both mailbox capacity and performance requirements. The type and amount of hard disk drives is the key factor in this solution when considering future growth in data size and usage. Please refer to the Microsoft Exchange 2010 best practices on storage design from Microsoft, visit
http://technet.microsoft.com/en-us/library/dd346703.aspx.

●Layout

- Number of database
- Database size

Since larger database size and more number of databases may cause higher performance impact, it is recommended to follow this white paper for the best practice when configuring the number of database and database size when using EonStor DS for Exchange 2010 deployment. It has been tested that with the same total available capacity, deploying more databases will cause a higher impact than deploying larger databases.

- Windows server 2008 R2 no longer require to use diskpar for partitioning and aligning sector boundary. For windows server 2003, use diskpart to align the sectors to 64k.
- It is not recommended to share Exchange 2010 disks with other IO intensive applications it may cause performance impact.
- Database and Log I/O is no longer needed to be isolated in Exchange 2010 solution.
- It is best practice to format the database and log LUN as 64k allocation size.
- It is best practice to minimize the number of database and increase the database size.
- It is best practice to minimize the number of disk groups and multiple disk

groups hosted by a single server may carry lower performance than single disk groups.

- It is recommended to use identical drives for better performance optimization and capacity utilization.
- It is best practice to optimize performance by balancing the load of both controllers with even disk groups.

Backup strategy

This solution has reserved capacity for Infortrend's snapshot technology for Exchange server data protection. For database backup, deployment of capacity expansion will be required in addition to this solution.

Contact for Additional Information

Click here to find out more details about the EonStor DS S16F-2842 solution.

Test Result Summary

This section provides a high level summary of the test data from ESRP and the link to the detailed html reports which are generated by ESRP testing framework. Please click on the underlined headings below to view the html report for each test.

Reliability

A number of tests in the framework are to check Reliability tests runs for 24 hours. The goal is to verify the storage can handle high IO load for a long period of time. Both log and database files will be analyzed for integrity after the stress test to ensure no database/log corruption.

The following list provides an overview: (click on the underlined word will show the html report after the reliability tests run)

- No errors reported in the saved event log file.
- No errors reported in during the database and log checksum process.

Storage Performance Results

The Primary Storage performance testing is designed to exercise the storage with maximum sustainable Exchange type of IO for 2 hours. The test is to show how long it takes for the storage to respond to an IO under load. The data below is the

sum of all of the logical disk I/O's and average of all the logical disks I/O latency in the 2 hours test duration. Each server is listed separately and the aggregate numbers across all servers is listed as well.

Individual Server Metrics:

The sum of I/O's across Storage Groups and the average latency across all Storage Groups on a per server basis.

Server 1

Database I/O	
Database Disks Transfers/sec	633.616
Database Disks Reads/sec	388.551
Database Disks Writes/sec	245.065
Average Database Disk Read Latency (ms)	17.37
Average Database Disk Write Latency (ms)	2.99
Transaction Log I/O	
Log Disks Writes/sec	197.987
Average Log Disk Write Latency (ms)	0.74

Server 2

Database I/O	
Database Disks Transfers/sec	647.703
Database Disks Reads/sec	396.956
Database Disks Writes/sec	250.746
Average Database Disk Read Latency (ms)	16.96
Average Database Disk Write Latency (ms)	2.55
Transaction Log I/O	
Log Disks Writes/sec	204.823
Average Log Disk Write Latency (ms)	0.63

Aggregate Performance across all servers Metrics:

The sum of I/O's across servers in solution and the average latency across all all servers in solution.

Database I/O	
Database Disks Transfers/sec	1281.319

Database Disks Reads/sec	785.507
Database Disks Writes/sec	495.811
Average Database Disk Read Latency (ms)	17.17
Average Database Disk Write Latency (ms)	2.77
Transaction Log I/O	
Log Disks Writes/sec	402.81
Average Log Disk Write Latency (ms)	0.69

Database Backup/Recovery Performance

There are two tests reports in this section. The first one is to measure the sequential read rate of the database files, and the second is to measure the recovery/replay performance (playing transaction logs in to the database).

Database Read-only Performance

The test is to measure the maximum rate at which databases could be backed up via VSS. The following table shows the average rate for a single database file.

MB read/sec per database_	149.83
MB read/sec total per server	449.49

Transaction Log Recovery/Replay Performance

The test is to measure the maximum rate at which the log files can be played against the databases. The following table shows the average rate for 500 log files played in a single storage group. Each log file is 1 MB in size.

Average time to play one Log file (sec)	0.94

Conclusion

The information discussed in this report describes the best practices and test report for EonStor DS S16F-2842 supporting 6,000 users. The test was conducted under the environment listed in the Tested Deployment section. The test result shows that the S16F-2842 system is capable of handing the specified number of users without using up its performance resources.

This document is developed by storage solution providers, and reviewed by Microsoft Exchange Product team. The test results/data presented in this document is based on the tests introduced in the ESRP test framework. Customer should not quote the data directly for his/her pre-deployment verification. It is still necessary to go through the exercises to validate the storage design for a specific customer environment.

ESRP program is not designed to be a benchmarking program; tests are not designed to getting the maximum throughput for a giving solution. Rather, it is focused on producing recommendations from vendors for Exchange application. So the data presented in this document should not be used for direct comparisons among the solutions.

Appendix A: Performance Test

This appendix contains Jetstress test results for one of the servers used in testing this storage solution. These test results are representative of the results obtained for all of the servers tested.

Microsoft Exchange **Jetstress 2010**

2 hr Performance Test Result Report (Server 1)

Test Summary

Overall Test Result	**Pass**
Machine Name	WIN-9GG4SNONIAU
Test Description	
Test Start Time	4/24/2012 8:04:23 PM
Test End Time	4/24/2012 10:10:17 PM
Collection Start Time	4/24/2012 8:06:08 PM
Collection End Time	4/24/2012 10:06:05 PM
Jetstress Version	14.01.0225.017
ESE Version	14.00.0639.019
Operating System	Windows Server 2008 R2 Enterprise (6.1.7600.0)

Database Sizing and Throughput

Achieved Transactional I/O per Second	633.616
Target Transactional I/O per Second	540
Initial Database Size (bytes)	2584920915968
Final Database Size (bytes)	2586900627456
Database Files (Count)	3

Jetstress System Parameters

Thread Count	6 (per database)
Minimum Database Cache	96.0 MB
Maximum Database Cache	768.0 MB
Insert Operations	40%
Delete Operations	20%
Replace Operations	5%
Read Operations	35%
Lazy Commits	70%
Run Background Database Maintenance	True

Number of Copies per Database	2

Database Configuration

Instance3716.1	Log path: F:\DB1 Database: F:\DB1\Jetstress001001.edb
Instance3716.2	Log path: G:\DB2 Database: G:\DB2\Jetstress002001.edb
Instance3716.3	Log path: H:\DB3 Database: H:\DB3\Jetstress003001.edb

Transactional I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance3716.1	17.790	3.670	129.621	81.891	33266.937	35452.464	0.000	0.734	0.000	66.334	0.000	4820.923
Instance3716.2	15.704	3.057	129.908	81.891	33340.435	35434.667	0.000	0.735	0.000	66.047	0.000	4786.787
Instance3716.3	18.624	2.233	129.022	81.283	33220.128	35451.616	0.000	0.740	0.000	65.606	0.000	4805.696

Background Database Maintenance I/O Performance

MSExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes
Instance3716.1	23.209	261716.952
Instance3716.2	24.475	261692.343
Instance3716.3	24.216	261689.576

Log Replication I/O Performance

MSExchange Database ==> Instances	I/O Log Reads/sec	I/O Log Reads Average Bytes
Instance3716.1	1.301	232561.778
Instance3716.2	1.288	232561.778
Instance3716.3	1.284	232561.778

Total I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average	I/O Database Writes Average	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average	I/O Database Writes Average	I/O Log Reads Average Latency	I/O Log Writes Average Latency	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes

	Latency (msec)	Latency (msec)			Bytes	Bytes	(msec)	(msec)				
Instance3716.1	17.790	3.670	152.830	81.891	67959.765	35452.464	1.008	0.734	1.301	66.334	232561.778	4820.923
Instance3716.2	15.704	3.057	154.383	81.891	69542.242	35434.667	1.079	0.735	1.288	66.047	232561.778	4786.787
Instance3716.3	18.624	2.233	153.238	81.283	69324.918	35451.616	1.266	0.740	1.284	65.606	232561.778	4805.696

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	1.078	0.755	1.510
Available MBytes	6237.379	6225.000	6254.000
Free System Page Table Entries	33555144.927	33555097.000	33555610.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	27617826.133	27602944.000	27660288.000
Pool Paged Bytes	110691072.000	110043136.000	112164864.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

4/24/2012 8:04:23 PM -- Jetstress testing begins ...

4/24/2012 8:04:23 PM -- Preparing for testing ...

4/24/2012 8:04:26 PM -- Attaching databases ...

4/24/2012 8:04:26 PM -- Preparations for testing are complete.

4/24/2012 8:04:26 PM -- Starting transaction dispatch ..

4/24/2012 8:04:26 PM -- Database cache settings: (minimum: 96.0 MB, maximum: 768.0 MB)

4/24/2012 8:04:26 PM -- Database flush thresholds: (start: 7.7 MB, stop: 15.3 MB)

4/24/2012 8:04:29 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

4/24/2012 8:04:29 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

4/24/2012 8:04:34 PM -- Operation mix: Sessions 6, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

4/24/2012 8:04:34 PM -- Performance logging started (interval: 15000 ms).

4/24/2012 8:04:34 PM -- Attaining prerequisites:

4/24/2012 8:06:08 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 724910100.0 (lower bound: 724775700.0, upper bound: none)

4/24/2012 10:06:09 PM -- Performance logging has ended.

4/24/2012 10:10:10 PM -- JetInterop batch transaction stats: 47505, 47315 and 47101.

4/24/2012 10:10:10 PM -- Dispatching transactions ends.

4/24/2012 10:10:10 PM -- Shutting down databases ...

4/24/2012 10:10:17 PM -- Instance3716.1 (complete), Instance3716.2 (complete) and Instance3716.3 (complete)

4/24/2012 10:10:17 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000, 1GB, 0.18, 6DB, 6Thread\server 1\performance\Performance_2012_4_24_20_4_29.blg has 486 samples.

4/24/2012 10:10:17 PM -- Creating test report ...

4/24/2012 10:10:20 PM -- Instance3716.1 has 17.8 for I/O Database Reads Average Latency.

4/24/2012 10:10:20 PM -- Instance3716.1 has 0.7 for I/O Log Writes Average Latency.

4/24/2012 10:10:20 PM -- Instance3716.1 has 0.7 for I/O Log Reads Average Latency.

4/24/2012 10:10:20 PM -- Instance3716.2 has 15.7 for I/O Database Reads Average Latency.

4/24/2012 10:10:20 PM -- Instance3716.2 has 0.7 for I/O Log Writes Average Latency.

4/24/2012 10:10:20 PM -- Instance3716.2 has 0.7 for I/O Log Reads Average Latency.

4/24/2012 10:10:20 PM -- Instance3716.3 has 18.6 for I/O Database Reads Average Latency.

4/24/2012 10:10:20 PM -- Instance3716.3 has 0.7 for I/O Log Writes Average Latency.

4/24/2012 10:10:20 PM -- Instance3716.3 has 0.7 for I/O Log Reads Average Latency.

4/24/2012 10:10:20 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.

4/24/2012 10:10:20 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

4/24/2012 10:10:20 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000, 1GB, 0.18, 6DB, 6Thread\server 1\performance\Performance_2012_4_24_20_4_29.xml has 479 samples queried.

Performance Test Database Checksum (Server 1)

Checksum Statistics - All

Database	Seen pages	Bad pages	Correctable pages	Wrong page-number pages	File length / seconds taken
F:\DB1\Jetstress001001.edb	26315570	0	0	0	822361 MB/5582 sec
G:\DB2\Jetstress002001.edb	26315058	0	0	0	822345 MB/5402 sec
H:\DB3\Jetstress003001.edb	26315314	0	0	0	822353 MB/5520 sec
(Sum)	78945942	0	0	0	2467060 MB/5582 sec

Disk Subsystem Performance (of checksum)

LogicalDisk	Avg. Disk sec/Read	Avg. Disk sec/Write	Disk Reads/sec	Disk Writes/sec	Avg. Disk Bytes/Read
F:	0.031	0.000	2356.452	0.000	65536.000
G:	0.032	0.000	2436.396	0.000	65536.000
H:	0.031	0.000	2383.875	0.000	65536.000

Memory System Performance (of checksum)

Counter	Average	Minimum	Maximum
% Processor Time	8.583	7.546	10.521
Available MBytes	7024.624	7015.000	7036.000
Free System Page Table Entries	33555384.188	33555097.000	33555610.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	27785370.151	27680768.000	28037120.000
Pool Paged Bytes	111660461.419	111620096.000	111857664.000

Test Log

4/24/2012 8:04:23 PM -- Jetstress testing begins ...

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4/24/2012 8:04:26 PM -- Attaching databases ...

4/24/2012 8:04:26 PM -- Preparations for testing are complete.

4/24/2012 8:04:26 PM -- Starting transaction dispatch ..

4/24/2012 8:04:26 PM -- Database cache settings: (minimum: 96.0 MB, maximum: 768.0 MB)

4/24/2012 8:04:26 PM -- Database flush thresholds: (start: 7.7 MB, stop: 15.3 MB)

4/24/2012 8:04:29 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

4/24/2012 8:04:29 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

4/24/2012 8:04:34 PM -- Operation mix: Sessions 6, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

4/24/2012 8:04:34 PM -- Performance logging started (interval: 15000 ms).

4/24/2012 8:04:34 PM -- Attaining prerequisites:

4/24/2012 8:06:08 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 724910100.0 (lower bound: 724775700.0, upper bound: none)

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4/24/2012 10:10:10 PM -- Shutting down databases ...

4/24/2012 10:10:17 PM -- Instance3716.1 (complete), Instance3716.2 (complete) and Instance3716.3 (complete)

4/24/2012 10:10:17 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000, 1GB, 0.18, 6DB, 6Thread\server 1\performance\Performance_2012_4_24_20_4_29.blg has 486 samples.

4/24/2012 10:10:17 PM -- Creating test report ...

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4/24/2012 10:10:20 PM -- Instance3716.1 has 0.7 for I/O Log Writes Average Latency.

4/24/2012 10:10:20 PM -- Instance3716.1 has 0.7 for I/O Log Reads Average Latency.

4/24/2012 10:10:20 PM -- Instance3716.2 has 15.7 for I/O Database Reads Average Latency.

4/24/2012 10:10:20 PM -- Instance3716.2 has 0.7 for I/O Log Writes Average Latency.

4/24/2012 10:10:20 PM -- Instance3716.2 has 0.7 for I/O Log Reads Average Latency.

4/24/2012 10:10:20 PM -- Instance3716.3 has 18.6 for I/O Database Reads Average Latency.

4/24/2012 10:10:20 PM -- Instance3716.3 has 0.7 for I/O Log Writes Average Latency.

4/24/2012 10:10:20 PM -- Instance3716.3 has 0.7 for I/O Log Reads Average Latency.

4/24/2012 10:10:20 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.

4/24/2012 10:10:20 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

4/24/2012 10:10:20 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000, 1GB, 0.18, 6DB, 6Thread\server 1\performance\Performance_2012_4_24_20_4_29.xml has 479 samples queried.

4/24/2012 10:10:20 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000, 1GB, 0.18, 6DB, 6Thread\server 1\performance\Performance_2012_4_24_20_4_29.html was saved.

4/24/2012 10:10:21 PM -- Performance logging started (interval: 30000 ms).

4/24/2012 10:10:21 PM -- Verifying database checksums ...

4/24/2012 11:43:23 PM -- F: (100% processed), G: (100% processed) and H: (100% processed)

4/24/2012 11:43:23 PM -- Performance logging has ended.

4/24/2012 11:43:23 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000, 1GB, 0.18, 6DB, 6Thread\server 1\performance\DBChecksum_2012_4_24_22_10_20.blg has 186 samples.

2 hr Performance Test Result Report (Server 2)

Test Summary

Overall Test Result	**Pass**
Machine Name	WIN-9GG4SNONIAU
Test Description	
Test Start Time	4/24/2012 8:04:56 PM
Test End Time	4/24/2012 10:10:51 PM
Collection Start Time	4/24/2012 8:06:40 PM
Collection End Time	4/24/2012 10:06:26 PM
Jetstress Version	14.01.0225.017
ESE Version	14.00.0639.019
Operating System	Windows Server 2008 R2 Enterprise (6.1.7600.0)

Database Sizing and Throughput

Achieved Transactional I/O per Second	647.703
Target Transactional I/O per Second	540
Initial Database Size (bytes)	2585533284352
Final Database Size (bytes)	2587563327488
Database Files (Count)	3

Jetstress System Parameters

Thread Count	6 (per database)
Minimum Database Cache	96.0 MB
Maximum Database Cache	768.0 MB
Insert Operations	40%
Delete Operations	20%
Replace Operations	5%
Read Operations	35%
Lazy Commits	70%
Run Background Database Maintenance	True

Number of Copies per Database	2

Database Configuration

Instance3716.1	Log path: J:\DB4 Database: J:\DB4\Jetstress001001.edb
Instance3716.2	Log path: H:\DB5 Database: H:\DB5\Jetstress002001.edb
Instance3716.3	Log path: G:\DB6 Database: G:\DB6\Jetstress003001.edb

Transactional I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance3068.1	17.386	3.138	132.968	83.731	33227.361	35392.581	0.000	0.638	0.000	68.076	0.000	4754.426
Instance3068.2	15.136	2.605	132.684	84.023	33342.103	35436.707	0.000	0.628	0.000	68.559	0.000	4802.080
Instance3068.3	18.361	1.904	131.304	82.992	33156.766	35454.138	0.000	0.631	0.000	68.188	0.000	4773.716

Background Database Maintenance I/O Performance

MSExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes
Instance3068.1	23.447	261724.075
Instance3068.2	24.984	261692.799
Instance3068.3	24.642	261698.989

Log Replication I/O Performance

MSExchange Database ==> Instances	I/O Log Reads/sec	I/O Log Reads Average Bytes
Instance3068.1	1.317	232561.778
Instance3068.2	1.340	232561.778
Instance3068.3	1.324	232555.005

Total I/O Performance

MSExchange Database ==>	I/O Database	I/O Database	I/O Database	I/O Database	I/O Database	I/O Database	I/O Log Reads	I/O Log Writes	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads	I/O Log Writes

Instances	Reads Average Latency (msec)	Writes Average Latency (msec)	Reads/sec	Writes/sec	Reads Average Bytes	Writes Average Bytes	Average Latency (msec)	Average Latency (msec)			Average Bytes	Average Bytes
Instance3068.1	17.386	3.138	156.415	83.731	67479.768	35392.581	0.874	0.638	1.317	68.076	232561.778	4754.426
Instance3068.2	15.136	2.605	157.668	84.023	69526.851	35436.707	0.998	0.628	1.340	68.559	232561.778	4802.080
Instance3068.3	18.361	1.904	155.946	82.992	69270.113	35454.138	0.920	0.631	1.324	68.188	232555.005	4773.716

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	1.240	0.000	3.456
Available MBytes	6250.290	6241.000	6257.000
Free System Page Table Entries	33555340.086	33555287.000	33555802.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	28951759.365	28938240.000	29028352.000
Pool Paged Bytes	82565278.196	82321408.000	84418560.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

.

Test Log

4/24/2012 8:04:56 PM -- Jetstress testing begins ...

4/24/2012 8:04:56 PM -- Preparing for testing ...

4/24/2012 8:04:59 PM -- Attaching databases ...

4/24/2012 8:04:59 PM -- Preparations for testing are complete.

4/24/2012 8:04:59 PM -- Starting transaction dispatch ..

4/24/2012 8:04:59 PM -- Database cache settings: (minimum: 96.0 MB, maximum: 768.0 MB)

4/24/2012 8:04:59 PM -- Database flush thresholds: (start: 7.7 MB, stop: 15.3 MB)

4/24/2012 8:05:02 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

4/24/2012 8:05:02 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

4/24/2012 8:05:07 PM -- Operation mix: Sessions 6, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

4/24/2012 8:05:07 PM -- Performance logging started (interval: 15000 ms).

4/24/2012 8:05:07 PM -- Attaining prerequisites:

4/24/2012 8:06:40 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 729554900.0 (lower bound: 724775700.0, upper bound: none)

4/24/2012 10:06:40 PM -- Performance logging has ended.

4/24/2012 10:10:43 PM -- JetInterop batch transaction stats: 48163, 48489 and 48209.

4/24/2012 10:10:43 PM -- Dispatching transactions ends.

4/24/2012 10:10:43 PM -- Shutting down databases ...

4/24/2012 10:10:51 PM -- Instance3068.1 (complete), Instance3068.2 (complete) and Instance3068.3 (complete)

4/24/2012 10:10:51 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000 1GB 0.18 6DB 6thread\server2\Performance\Performance_2012_4_24_20_5_2.blg has 485 samples.

4/24/2012 10:10:51 PM -- Creating test report ...

4/24/2012 10:10:54 PM -- Instance3068.1 has 17.4 for I/O Database Reads Average Latency.

4/24/2012 10:10:54 PM -- Instance3068.1 has 0.6 for I/O Log Writes Average Latency.

4/24/2012 10:10:54 PM -- Instance3068.1 has 0.6 for I/O Log Reads Average Latency.

4/24/2012 10:10:54 PM -- Instance3068.2 has 15.1 for I/O Database Reads Average Latency.

4/24/2012 10:10:54 PM -- Instance3068.2 has 0.6 for I/O Log Writes Average Latency.

4/24/2012 10:10:54 PM -- Instance3068.2 has 0.6 for I/O Log Reads Average Latency.

4/24/2012 10:10:54 PM -- Instance3068.3 has 18.4 for I/O Database Reads Average Latency.

4/24/2012 10:10:54 PM -- Instance3068.3 has 0.6 for I/O Log Writes Average Latency.

4/24/2012 10:10:54 PM -- Instance3068.3 has 0.6 for I/O Log Reads Average Latency.

4/24/2012 10:10:54 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.

4/24/2012 10:10:54 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

4/24/2012 10:10:54 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000 1GB 0.18 6DB 6thread\server2\Performance\Performance_2012_4_24_20_5_2.xml has 478 samples queried.

Performance Test Database Checksum (Server 2)

Checksum Statistics - All

Database	Seen pages	Bad pages	Correctable pages	Wrong page-number pages	File length / seconds taken
J:\DB4\Jetstress001001.edb	26321970	0	0	0	822561 MB/5682 sec
H:\DB5\Jetstress002001.edb	26321970	0	0	0	822561 MB/5416 sec
G:\DB6\Jetstress003001.edb	26322226	0	0	0	822569 MB/5619 sec
(Sum)	78966166	0	0	0	2467692 MB/5682 sec

Disk Subsystem Performance (of checksum)

Logical Disk	Avg. Disk sec/Read	Avg. Disk sec/Write	Disk Reads/sec	Disk Writes/sec	Avg. Disk Bytes/Read
J:	0.031	0.000	2306.049	0.000	65536.000
H:	0.032	0.000	2430.023	0.000	65536.000
G:	0.031	0.000	2341.772	0.000	65536.000

Memory System Performance (of checksum)

Counter	Average	Minimum	Maximum
% Processor Time	8.993	7.776	11.532
Available MBytes	7055.873	7028.000	7071.000
Free System Page Table Entries	33555334.238	33555287.000	33555802.000
Transition Pages Repurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	28946973.799	28934144.000	29016064.000

Pool Paged Bytes	84416501.164	84385792.000	84582400.000

Test Log

4/24/2012 8:04:56 PM -- Jetstress testing begins ...

4/24/2012 8:04:56 PM -- Preparing for testing ...

4/24/2012 8:04:59 PM -- Attaching databases ...

4/24/2012 8:04:59 PM -- Preparations for testing are complete.

4/24/2012 8:04:59 PM -- Starting transaction dispatch ..

4/24/2012 8:04:59 PM -- Database cache settings: (minimum: 96.0 MB, maximum: 768.0 MB)

4/24/2012 8:04:59 PM -- Database flush thresholds: (start: 7.7 MB, stop: 15.3 MB)

4/24/2012 8:05:02 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

4/24/2012 8:05:02 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

4/24/2012 8:05:07 PM -- Operation mix: Sessions 6, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

4/24/2012 8:05:07 PM -- Performance logging started (interval: 15000 ms).

4/24/2012 8:05:07 PM -- Attaining prerequisites:

4/24/2012 8:06:40 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 729554900.0 (lower bound: 724775700.0, upper bound: none)

4/24/2012 10:06:40 PM -- Performance logging has ended.

4/24/2012 10:10:43 PM -- JetInterop batch transaction stats: 48163, 48489 and 48209.

4/24/2012 10:10:43 PM -- Dispatching transactions ends.

4/24/2012 10:10:43 PM -- Shutting down databases ...

4/24/2012 10:10:51 PM -- Instance3068.1 (complete), Instance3068.2 (complete) and Instance3068.3 (complete)

4/24/2012 10:10:51 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\60001GB 0.18 6DB 6thread\server2\Performance\Performance_2012_4_24_20_5_2.blg has 485 samples.

4/24/2012 10:10:51 PM -- Creating test report ...

4/24/2012 10:10:54 PM -- Instance3068.1 has 17.4 for I/O Database Reads Average Latency.

4/24/2012 10:10:54 PM -- Instance3068.1 has 0.6 for I/O Log Writes Average Latency.

4/24/2012 10:10:54 PM -- Instance3068.1 has 0.6 for I/O Log Reads Average Latency.

4/24/2012 10:10:54 PM -- Instance3068.2 has 15.1 for I/O Database Reads Average Latency.

4/24/2012 10:10:54 PM -- Instance3068.2 has 0.6 for I/O Log Writes Average Latency.

4/24/2012 10:10:54 PM -- Instance3068.2 has 0.6 for I/O Log Reads Average Latency.

4/24/2012 10:10:54 PM -- Instance3068.3 has 18.4 for I/O Database Reads Average Latency.

4/24/2012 10:10:54 PM -- Instance3068.3 has 0.6 for I/O Log Writes Average Latency.

4/24/2012 10:10:54 PM -- Instance3068.3 has 0.6 for I/O Log Reads Average Latency.

4/24/2012 10:10:54 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.

4/24/2012 10:10:54 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

4/24/2012 10:10:54 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000 1GB_0.18_6DB_6thread\server2\Performance\Performance_2012_4_24_20_5_2.xml has 478 samples queried.

4/24/2012 10:10:54 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000 1GB 0.18 6DB 6thread\server2\Performance\Performance_2012_4_24_20_5_2.html was saved.

4/24/2012 10:10:55 PM -- Performance logging started (interval: 30000 ms).

4/24/2012 10:10:55 PM -- Verifying database checksums ...

4/24/2012 11:45:37 PM -- J: (100% processed), H: (100% processed) and G: (100% processed)

4/24/2012 11:45:37 PM -- Performance logging has ended.

4/24/2012 11:45:37 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000 1GB 0.18 6DB 6thread\server2\Performance\DBChecksum_2012_4_24_22_10_54.blg has 189 samples.

Appendix B: Stress Test

This appendix contains Jetstress test results for one of the servers used in testing this storage solution. These test results are representative of the results obtained for all of the servers tested.

Microsoft Exchange Jetstress 2010

24hr Stress Test Result Report (Server 1)

Test Summary

Overall Test Result	**Pass**
Machine Name	WIN-9GG4SNONIAU
Test Description	
Test Start Time	4/25/2012 6:36:07 PM
Test End Time	5/1/2012 6:34:10 PM
Collection Start Time	4/25/2012 6:37:52 PM
Collection End Time	4/26/2012 6:37:39 PM
Jetstress Version	14.01.0225.017
ESE Version	14.00.0639.019
Operating System	Windows Server 2008 R2 Enterprise (6.1.7600.0)

Database Sizing and Throughput

Achieved Transactional I/O per Second	629.385
Target Transactional I/O per Second	540
Initial Database Size (bytes)	2586900627456
Final Database Size (bytes)	2721673576448
Database Files (Count)	3

Jetstress System Parameters

Thread Count	6 (per database)
Minimum Database Cache	96.0 MB
Maximum Database Cache	768.0 MB
Insert Operations	40%
Delete Operations	20%
Replace Operations	5%
Read Operations	35%
Lazy Commits	70%
Run Background Database Maintenance	True

Number of Copies per Database	2

Database Configuration

Instance3716.1	Log path: F:\DB1 Database: F:\DB1\Jetstress001001.edb
Instance3716.2	Log path: G:\DB2 Database: G:\DB2\Jetstress002001.edb
Instance3716.3	Log path: H:\DB3 Database: H:\DB3\Jetstress003001.edb

Transactional I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance3716.1	17.822	3.431	128.388	81.630	33225.298	35129.072	0.000	0.727	0.000	65.036	0.000	4800.006
Instance3716.2	15.746	2.836	128.571	81.783	33345.787	35131.263	0.000	0.723	0.000	65.149	0.000	4804.024
Instance3716.3	18.537	2.051	127.777	81.236	33219.780	35142.758	0.000	0.730	0.000	64.915	0.000	4812.949

Background Database Maintenance I/O Performance

MSExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes
Instance3716.1	24.107	261652.931
Instance3716.2	24.852	261658.023
Instance3716.3	24.247	261657.407

Log Replication I/O Performance

MSExchange Database ==> Instances	I/O Log Reads/sec	I/O Log Reads Average Bytes
Instance3716.1	1.271	232557.498
Instance3716.2	1.274	232561.375
Instance3716.3	1.273	232559.019

Total I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average	I/O Database Writes Average	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average	I/O Database Writes Average	I/O Log Reads Average Latency	I/O Log Writes Average Latency	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes

	Latency (msec)	Latency (msec)			Bytes	Bytes	(msec)	(msec)				
Instance3716.1	17.822	3.431	152.495	81.630	69335.791	35129.072	1.074	0.727	1.271	65.036	232557.498	4800.006
Instance3716.2	15.746	2.836	153.422	81.783	70328.160	35131.263	1.464	0.723	1.274	65.149	232561.375	4804.024
Instance3716.3	18.537	2.051	152.024	81.236	69654.075	35142.758	1.298	0.730	1.273	64.915	232559.019	4812.949

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	1.082	0.625	1.771
Available MBytes	6209.875	6188.000	6249.000
Free System Page Table Entries	33555252.305	33555090.000	33555612.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	27624665.816	27553792.000	27668480.000
Pool Paged Bytes	111555604.092	110501888.000	112148480.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

4/25/2012 6:36:06 PM -- Jetstress testing begins ...

4/25/2012 6:36:07 PM -- Preparing for testing ...

4/25/2012 6:36:10 PM -- Attaching databases ...

4/25/2012 6:36:10 PM -- Preparations for testing are complete.

4/25/2012 6:36:10 PM -- Starting transaction dispatch ..

4/25/2012 6:36:10 PM -- Database cache settings: (minimum: 96.0 MB, maximum: 768.0 MB)

4/25/2012 6:36:10 PM -- Database flush thresholds: (start: 7.7 MB, stop: 15.3 MB)

4/25/2012 6:36:13 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

4/25/2012 6:36:13 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

4/25/2012 6:36:18 PM -- Operation mix: Sessions 6, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

4/25/2012 6:36:18 PM -- Performance logging started (interval: 15000 ms).

4/25/2012 6:36:18 PM -- Attaining prerequisites:

4/25/2012 6:37:52 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 726126600.0 (lower bound: 724775700.0, upper bound: none)

4/26/2012 6:37:52 PM -- Performance logging has ended.

5/1/2012 6:34:04 PM -- JetInterop batch transaction stats: 3152210, 3150831 and 3151022.

5/1/2012 6:34:04 PM -- Dispatching transactions ends.

5/1/2012 6:34:04 PM -- Shutting down databases ...

5/1/2012 6:34:10 PM -- Instance3716.1 (complete), Instance3716.2 (complete) and Instance3716.3 (complete)

5/1/2012 6:34:10 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000, 1GB, 0.18, 6DB, 6Thread\server 1\stress test\Performance_2012_4_25_18_36_13.blg has 5765 samples.

5/1/2012 6:34:10 PM -- Creating test report ...

5/1/2012 6:34:36 PM -- Instance3716.1 has 17.8 for I/O Database Reads Average Latency.

5/1/2012 6:34:36 PM -- Instance3716.1 has 0.7 for I/O Log Writes Average Latency.

5/1/2012 6:34:36 PM -- Instance3716.1 has 0.7 for I/O Log Reads Average Latency.

5/1/2012 6:34:36 PM -- Instance3716.2 has 15.7 for I/O Database Reads Average Latency.

5/1/2012 6:34:36 PM -- Instance3716.2 has 0.7 for I/O Log Writes Average Latency.

5/1/2012 6:34:36 PM -- Instance3716.2 has 0.7 for I/O Log Reads Average Latency.

5/1/2012 6:34:36 PM -- Instance3716.3 has 18.5 for I/O Database Reads Average Latency.

5/1/2012 6:34:36 PM -- Instance3716.3 has 0.7 for I/O Log Writes Average Latency.

5/1/2012 6:34:36 PM -- Instance3716.3 has 0.7 for I/O Log Reads Average Latency.

5/1/2012 6:34:36 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.

5/1/2012 6:34:36 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

5/1/2012 6:34:36 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000, 1GB, 0.18, 6DB, 6Thread\server 1\stress test\Performance_2012_4_25_18_36_13.xml has 5758 samples queried.

Stress Test Database Checksum (Server 1)

Checksum Statistics - All

Database	Seen pages	Bad pages	Correctable pages	Wrong page-number pages	File length / seconds taken
F:\DB1\Jetstress001001.edb	27686978	0	0	0	865218 MB/5906 sec
G:\DB2\Jetstress002001.edb	27684418	0	0	0	865138 MB/5775 sec
H:\DB3\Jetstress003001.edb	27687490	0	0	0	865234 MB/5844 sec
(Sum)	83058886	0	0	0	2595590 MB/5907 sec

Disk Subsystem Performance (of checksum)

LogicalDisk	Avg. Disk sec/Read	Avg. Disk sec/Write	Disk Reads/sec	Disk Writes/sec	Avg. Disk Bytes/Read
F:	0.031	0.000	2314.622	0.000	65536.000
G:	0.033	0.000	2396.518	0.000	65536.000
H:	0.031	0.000	2363.988	0.000	65536.000

Memory System Performance (of checksum)

Counter	Average	Minimum	Maximum
% Processor Time	8.504	7.624	11.168
Available MBytes	6906.495	6862.000	6929.000
Free System Page Table Entries	33555322.622	33555097.000	33555611.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	29277727.347	29155328.000	29409280.000

Pool Paged Bytes	113657291.755	113508352.000	113901568.000

Test Log

4/25/2012 6:36:06 PM -- Jetstress testing begins ...

4/25/2012 6:36:07 PM -- Preparing for testing ...

4/25/2012 6:36:10 PM -- Attaching databases ...

4/25/2012 6:36:10 PM -- Preparations for testing are complete.

4/25/2012 6:36:10 PM -- Starting transaction dispatch ..

4/25/2012 6:36:10 PM -- Database cache settings: (minimum: 96.0 MB, maximum: 768.0 MB)

4/25/2012 6:36:10 PM -- Database flush thresholds: (start: 7.7 MB, stop: 15.3 MB)

4/25/2012 6:36:13 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

4/25/2012 6:36:13 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

4/25/2012 6:36:18 PM -- Operation mix: Sessions 6, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

4/25/2012 6:36:18 PM -- Performance logging started (interval: 15000 ms).

4/25/2012 6:36:18 PM -- Attaining prerequisites:

4/25/2012 6:37:52 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 726126600.0 (lower bound: 724775700.0, upper bound: none)

4/26/2012 6:37:52 PM -- Performance logging has ended.

5/1/2012 6:34:04 PM -- JetInterop batch transaction stats: 3152210, 3150831 and 3151022.

5/1/2012 6:34:04 PM -- Dispatching transactions ends.

5/1/2012 6:34:04 PM -- Shutting down databases ...

5/1/2012 6:34:10 PM -- Instance3716.1 (complete), Instance3716.2 (complete) and Instance3716.3 (complete)

5/1/2012 6:34:10 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000, 1GB, 0.18, 6DB, 6Thread\server 1\stress test\Performance_2012_4_25_18_36_13.blg has 5765 samples.

5/1/2012 6:34:10 PM -- Creating test report ...

5/1/2012 6:34:36 PM -- Instance3716.1 has 17.8 for I/O Database Reads Average Latency.

5/1/2012 6:34:36 PM -- Instance3716.1 has 0.7 for I/O Log Writes Average Latency.

5/1/2012 6:34:36 PM -- Instance3716.1 has 0.7 for I/O Log Reads Average Latency.

5/1/2012 6:34:36 PM -- Instance3716.2 has 15.7 for I/O Database Reads Average Latency.

5/1/2012 6:34:36 PM -- Instance3716.2 has 0.7 for I/O Log Writes Average Latency.

5/1/2012 6:34:36 PM -- Instance3716.2 has 0.7 for I/O Log Reads Average Latency.

5/1/2012 6:34:36 PM -- Instance3716.3 has 18.5 for I/O Database Reads Average Latency.

5/1/2012 6:34:36 PM -- Instance3716.3 has 0.7 for I/O Log Writes Average Latency.

5/1/2012 6:34:36 PM -- Instance3716.3 has 0.7 for I/O Log Reads Average Latency.

5/1/2012 6:34:36 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.

5/1/2012 6:34:36 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

5/1/2012 6:34:36 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000, 1GB, 0.18, 6DB, 6Thread\server 1\stress test\Performance_2012_4_25_18_36_13.xml has 5758 samples queried.

5/1/2012 6:34:36 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000,

1GB, 0.18, 6DB, 6Thread\server 1\stress test\Performance_2012_4_25_18_36_13.html was saved.

5/1/2012 6:34:37 PM -- Performance logging started (interval: 30000 ms).

5/1/2012 6:34:37 PM -- Verifying database checksums ...

5/1/2012 8:13:04 PM -- F: (100% processed), G: (100% processed) and H: (100% processed)

5/1/2012 8:13:04 PM -- Performance logging has ended.

5/1/2012 8:13:04 PM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000, 1GB, 0.18, 6DB, 6Thread\server 1\stress test\DBChecksum_2012_5_1_18_34_36.blg has 196 samples.

24hr Stress Test Result Report (Server 2)

Test Summary

Overall Test Result	**Pass**
Machine Name	WIN-9GG4SNONIAU
Test Description	
Test Start Time	4/25/2012 6:36:25 PM
Test End Time	4/30/2012 1:30:08 AM
Collection Start Time	4/25/2012 6:38:11 PM
Collection End Time	4/26/2012 6:38:07 PM
Jetstress Version	14.01.0225.017
ESE Version	14.00.0639.019
Operating System	Windows Server 2008 R2 Enterprise (6.1.7600.0)

Database Sizing and Throughput

Achieved Transactional I/O per Second	645.03
Target Transactional I/O per Second	540
Initial Database Size (bytes)	2587563327488
Final Database Size (bytes)	2686533697536
Database Files (Count)	3

Jetstress System Parameters

Thread Count	6 (per database)
Minimum Database Cache	96.0 MB
Maximum Database Cache	768.0 MB
Insert Operations	40%
Delete Operations	20%
Replace Operations	5%
Read Operations	35%
Lazy Commits	70%

Run Background Database Maintenance	True
Number of Copies per Database	2

Database Configuration

Instance3068.1	Log path: J:\DB4 Database: J:\DB4\Jetstress001001.edb
Instance3068.2	Log path: H:\DB5 Database: H:\DB5\Jetstress002001.edb
Instance3068.3	Log path: G:\DB6 Database: G:\DB6\Jetstress003001.edb

Transactional I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance3068.1	17.499	2.966	131.281	83.448	33202.589	35122.016	0.000	0.626	0.000	67.513	0.000	4743.144
Instance3068.2	15.214	2.440	131.480	83.574	33335.305	35126.517	0.000	0.625	0.000	67.407	0.000	4757.652
Instance3068.3	18.322	1.774	131.612	83.635	33188.336	35128.370	0.000	0.626	0.000	67.575	0.000	4751.280

Background Database Maintenance I/O Performance

MSExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes
Instance3068.1	24.187	261679.223
Instance3068.2	25.152	261666.322
Instance3068.3	24.353	261672.838

Log Replication I/O Performance

MSExchange Database ==> Instances	I/O Log Reads/sec	I/O Log Reads Average Bytes
Instance3068.1	1.303	232557.907
Instance3068.2	1.304	232556.713
Instance3068.3	1.306	232562.306

Total I/O Performance

MSExchange	I/O	I/O	I/O	I/O	I/O	I/O	I/O Log	I/O Log	I/O Log	I/O Log	I/O Log	I/O Log

Database ==> Instances	Database Reads Average Latency (msec)	Database Writes Average Latency (msec)	Database Reads/sec	Database Writes/sec	Database Reads Average Bytes	Database Writes Average Bytes	Reads Average Latency (msec)	Writes Average Latency (msec)	Reads/sec	Writes/sec	Reads Average Bytes	Writes Average Bytes
Instance3068.1	17.499	2.966	155.468	83.448	68747.409	35122.016	0.991	0.626	1.303	67.513	232557.907	4743.144
Instance3068.2	15.214	2.440	156.632	83.574	70000.816	35126.517	1.067	0.625	1.304	67.407	232556.713	4757.652
Instance3068.3	18.322	1.774	155.965	83.635	68864.837	35128.370	0.920	0.626	1.306	67.575	232562.306	4751.280

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	1.166	0.000	5.912
Available MBytes	6243.715	6140.000	6261.000
Free System Page Table Entries	33555541.208	33555272.000	33555802.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	29007188.266	28884992.000	29278208.000
Pool Paged Bytes	85757771.284	83365888.000	119771136.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

4/25/2012 6:36:25 PM -- Jetstress testing begins ...

4/25/2012 6:36:25 PM -- Preparing for testing ...

4/25/2012 6:36:28 PM -- Attaching databases ...

4/25/2012 6:36:28 PM -- Preparations for testing are complete.

4/25/2012 6:36:28 PM -- Starting transaction dispatch ..

4/25/2012 6:36:28 PM -- Database cache settings: (minimum: 96.0 MB, maximum: 768.0 MB)

4/25/2012 6:36:28 PM -- Database flush thresholds: (start: 7.7 MB, stop: 15.3 MB)

4/25/2012 6:36:31 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

4/25/2012 6:36:31 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

4/25/2012 6:36:36 PM -- Operation mix: Sessions 6, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

4/25/2012 6:36:36 PM -- Performance logging started (interval: 15000 ms).

4/25/2012 6:36:36 PM -- Attaining prerequisites:

4/25/2012 6:38:11 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 728191000.0 (lower bound: 724775700.0, upper bound: none)

4/26/2012 6:38:12 PM -- Performance logging has ended.

4/30/2012 1:30:01 AM -- JetInterop batch transaction stats: 2317683, 2317551 and 2316627.

4/30/2012 1:30:01 AM -- Dispatching transactions ends.

4/30/2012 1:30:01 AM -- Shutting down databases ...

4/30/2012 1:30:08 AM -- Instance3068.1 (complete), Instance3068.2 (complete) and Instance3068.3

(complete)

4/30/2012 1:30:08 AM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000 1GB 0.18 6DB 6thread\server2\stress test\Performance_2012_4_25_18_36_31.blg has 5763 samples.

4/30/2012 1:30:08 AM -- Creating test report ...

4/30/2012 1:30:40 AM -- Instance3068.1 has 17.5 for I/O Database Reads Average Latency.

4/30/2012 1:30:40 AM -- Instance3068.1 has 0.6 for I/O Log Writes Average Latency.

4/30/2012 1:30:40 AM -- Instance3068.1 has 0.6 for I/O Log Reads Average Latency.

4/30/2012 1:30:40 AM -- Instance3068.2 has 15.2 for I/O Database Reads Average Latency.

4/30/2012 1:30:40 AM -- Instance3068.2 has 0.6 for I/O Log Writes Average Latency.

4/30/2012 1:30:40 AM -- Instance3068.2 has 0.6 for I/O Log Reads Average Latency.

4/30/2012 1:30:40 AM -- Instance3068.3 has 18.3 for I/O Database Reads Average Latency.

4/30/2012 1:30:40 AM -- Instance3068.3 has 0.6 for I/O Log Writes Average Latency.

4/30/2012 1:30:40 AM -- Instance3068.3 has 0.6 for I/O Log Reads Average Latency.

4/30/2012 1:30:40 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.

4/30/2012 1:30:40 AM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

4/30/2012 1:30:40 AM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000 1GB 0.18 6DB 6thread\server2\stress test\Performance_2012_4_25_18_36_31.xml has 5756 samples queried.

Stress Test Database Checksum (Server 2)

Checksum Statistics - All

Database	Seen pages	Bad pages	Correctable pages	Wrong page-number pages	File length / seconds taken
J:\DB4\Jetstress001001.edb	27327810	0	0	0	853994 MB/5913 sec
H:\DB5\Jetstress002001.edb	27328834	0	0	0	854026 MB/5654 sec
G:\DB6\Jetstress003001.edb	27329858	0	0	0	854058 MB/5845 sec
(Sum)	81986502	0	0	0	2562078 MB/5913 sec

Disk Subsystem Performance (of checksum)

Logical Disk	Avg. Disk sec/Read	Avg. Disk sec/Write	Disk Reads/sec	Disk Writes/sec	Avg. Disk Bytes/Read
J:	0.031	0.000	2309.621	0.000	65536.000
H:	0.032	0.000	2416.488	0.000	65536.000
G:	0.031	0.000	2332.933	0.000	65536.000

Memory System Performance (of checksum)

Counter	Average	Minimum	Maximum
% Processor Time	8.959	7.549	12.617
Available MBytes	6999.553	6952.000	7014.000
Free System Page Table Entries	33555374.102	33555287.000	33555802.000

Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	29341456.893	29204480.000	29749248.000
Pool Paged Bytes	87772726.579	87678976.000	88096768.000

Test Log

4/25/2012 6:36:25 PM -- Jetstress testing begins ...

4/25/2012 6:36:25 PM -- Preparing for testing ...

4/25/2012 6:36:28 PM -- Attaching databases ...

4/25/2012 6:36:28 PM -- Preparations for testing are complete.

4/25/2012 6:36:28 PM -- Starting transaction dispatch ..

4/25/2012 6:36:28 PM -- Database cache settings: (minimum: 96.0 MB, maximum: 768.0 MB)

4/25/2012 6:36:28 PM -- Database flush thresholds: (start: 7.7 MB, stop: 15.3 MB)

4/25/2012 6:36:31 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

4/25/2012 6:36:31 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

4/25/2012 6:36:36 PM -- Operation mix: Sessions 6, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

4/25/2012 6:36:36 PM -- Performance logging started (interval: 15000 ms).

4/25/2012 6:36:36 PM -- Attaining prerequisites:

4/25/2012 6:38:11 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 728191000.0 (lower bound: 724775700.0, upper bound: none)

4/26/2012 6:38:12 PM -- Performance logging has ended.

4/30/2012 1:30:01 AM -- JetInterop batch transaction stats: 2317683, 2317551 and 2316627.

4/30/2012 1:30:01 AM -- Dispatching transactions ends.

4/30/2012 1:30:01 AM -- Shutting down databases ...

4/30/2012 1:30:08 AM -- Instance3068.1 (complete), Instance3068.2 (complete) and Instance3068.3 (complete)

4/30/2012 1:30:08 AM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000 1GB 0.18 6DB 6thread\server2\stress test\Performance_2012_4_25_18_36_31.blg has 5763 samples.

4/30/2012 1:30:08 AM -- Creating test report ...

4/30/2012 1:30:40 AM -- Instance3068.1 has 17.5 for I/O Database Reads Average Latency.

4/30/2012 1:30:40 AM -- Instance3068.1 has 0.6 for I/O Log Writes Average Latency.

4/30/2012 1:30:40 AM -- Instance3068.1 has 0.6 for I/O Log Reads Average Latency.

4/30/2012 1:30:40 AM -- Instance3068.2 has 15.2 for I/O Database Reads Average Latency.

4/30/2012 1:30:40 AM -- Instance3068.2 has 0.6 for I/O Log Writes Average Latency.

4/30/2012 1:30:40 AM -- Instance3068.2 has 0.6 for I/O Log Reads Average Latency.

4/30/2012 1:30:40 AM -- Instance3068.3 has 18.3 for I/O Database Reads Average Latency.

4/30/2012 1:30:40 AM -- Instance3068.3 has 0.6 for I/O Log Writes Average Latency.

4/30/2012 1:30:40 AM -- Instance3068.3 has 0.6 for I/O Log Reads Average Latency.

4/30/2012 1:30:40 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.

4/30/2012 1:30:40 AM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

4/30/2012 1:30:40 AM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000 1GB 0.18 6DB 6thread\server2\stress test\Performance_2012_4_25_18_36_31.xml has 5756 samples queried.

4/30/2012 1:30:40 AM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000 1GB 0.18 6DB 6thread\server2\stress test\Performance_2012_4_25_18_36_31.html was saved.

4/30/2012 1:30:41 AM -- Performance logging started (interval: 30000 ms).

4/30/2012 1:30:41 AM -- Verifying database checksums ...

4/30/2012 3:09:15 AM -- J: (100% processed), H: (100% processed) and G: (100% processed)

4/30/2012 3:09:15 AM -- Performance logging has ended.

4/30/2012 3:09:15 AM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000 1GB 0.18 6DB 6thread\server2\stress test\DBChecksum_2012_4_30_1_30_40.blg has 197 samples.

Appendix C: Database Backup

This appendix contains Jetstress test results for one of the servers used in testing this storage solution. These test results are representative of the results obtained for all of the servers tested.

Database backup Test Result Report (Server 1)

Database Backup Statistics - All

Database Instance	Database Size (MBytes)	Elapsed Backup Time	MBytes Transferred/sec
Instance1884.1	865210.09	01:34:50	152.04
Instance1884.2	865130.09	01:33:25	154.35
Instance1884.3	865226.09	01:32:02	156.67

Jetstress System Parameters

Thread Count	6 (per database)
Minimum Database Cache	96.0 MB
Maximum Database Cache	768.0 MB
Insert Operations	40%
Delete Operations	20%
Replace Operations	5%
Read Operations	35%
Lazy Commits	70%

Database Configuration

Instance1884.1	Log path: F:\DB1 Database: F:\DB1\Jetstress001001.edb
Instance1884.2	Log path: G:\DB2 Database: G:\DB2\Jetstress002001.edb
Instance1884.3	Log path: H:\DB3 Database: H:\DB3\Jetstress003001.edb

Transactional I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance1884.1	2.837	0.000	605.665	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance1884.2	2.667	0.000	616.863	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Instance1884.3	2.635	0.000	626.822	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	4.179	2.585	5.052
Available MBytes	6916.185	6906.000	6921.000
Free System Page Table Entries	33555132.407	33555086.000	33555612.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	29109751.873	29097984.000	29134848.000
Pool Paged Bytes	113446326.857	113164288.000	114020352.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

5/1/2012 11:47:38 PM -- Jetstress testing begins ...

5/1/2012 11:47:38 PM -- Preparing for testing ...

5/1/2012 11:47:41 PM -- Attaching databases ...

5/1/2012 11:47:41 PM -- Preparations for testing are complete.

5/1/2012 11:47:48 PM -- Performance logging started (interval: 30000 ms).

5/1/2012 11:47:48 PM -- Backing up databases ...

5/2/2012 1:22:39 AM -- Performance logging has ended.

5/2/2012 1:22:39 AM -- Instance1884.1 (100% processed), Instance1884.2 (100% processed) and Instance1884.3 (100% processed)

5/2/2012 1:22:39 AM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000, 1GB, 0.18, 6DB, 6Thread\server 1\DB backup\DatabaseBackup_2012_5_1_23_47_41.blg has 189 samples.

5/2/2012 1:22:39 AM -- Creating test report ...

Database backup Test Result Report (Server 2)

Database Backup Statistics - All

Database Instance	Database Size (MBytes)	Elapsed Backup Time	MBytes Transferred/sec
Instance2420.1	853986.09	01:39:52	142.52
Instance2420.2	854018.09	01:36:46	147.09
Instance2420.3	854050.09	01:37:16	146.32

Jetstress System Parameters

Thread Count	6 (per database)
Minimum Database Cache	96.0 MB
Maximum Database Cache	768.0 MB
Insert Operations	40%

Delete Operations	20%
Replace Operations	5%
Read Operations	35%
Lazy Commits	70%

Database Configuration

Instance2420.1	Log path: J:\DB4 Database: J:\DB4\Jetstress001001.edb
Instance2420.2	Log path: H:\DB5 Database: H:\DB5\Jetstress002001.edb
Instance2420.3	Log path: G:\DB6 Database: G:\DB6\Jetstress003001.edb

Transactional I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance2420.1	2.754	0.000	566.918	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance2420.2	2.475	0.000	588.440	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance2420.3	2.457	0.000	584.819	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	4.879	2.267	7.257
Available MBytes	7275.754	7260.000	7292.000
Free System Page Table Entries	33555350.543	33555274.000	33555802.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	24369697.447	23638016.000	24911872.000
Pool Paged Bytes	75392313.889	73416704.000	76873728.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

5/1/2012 11:48:36 PM -- Jetstress testing begins ...

5/1/2012 11:48:36 PM -- Preparing for testing ...

5/1/2012 11:48:40 PM -- Attaching databases ...

5/1/2012 11:48:40 PM -- Preparations for testing are complete.

5/1/2012 11:48:46 PM -- Performance logging started (interval: 30000 ms).

5/1/2012 11:48:46 PM -- Backing up databases ...

5/2/2012 1:28:39 AM -- Performance logging has ended.

5/2/2012 1:28:39 AM -- Instance2420.1 (100% processed), Instance2420.2 (100% processed) and Instance2420.3 (100% processed)

5/2/2012 1:28:39 AM -- C:\Users\Administrator\Desktop\formal_result\15k_SAS_600GB\1R\2_server\6000 1GB 0.18 6DB 6thread\server2\DB backup\DatabaseBackup_2012_5_1_23_48_40.blg has 199 samples.

5/2/2012 1:28:39 AM -- Creating test report ...

Appendix D: Soft Recovery

This appendix contains Jetstress test results for one of the servers used in testing this storage solution. These test results are representative of the results obtained for all of the servers tested.

Soft Recovery Test Result Report (Server 1)

Soft-Recovery Statistics - All

Database Instance	Log files replayed	Elapsed seconds
Instance1884.1	509	470.53125
Instance1884.2	501	461.78125
Instance1884.3	500	481.78125

Database Configuration

Instance1884.1	Log path: F:\DB1 Database: F:\DB1\Jetstress001001.edb
Instance1884.2	Log path: G:\DB2 Database: G:\DB2\Jetstress002001.edb
Instance1884.3	Log path: H:\DB3 Database: H:\DB3\Jetstress003001.edb

Transactional I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance1884.1	56.890	19.325	1313.938	6.510	35560.746	32627.966	19.919	0.001	9.765	0.006	231349.136	2.188
Instance1884.2	55.076	17.861	1417.342	6.534	35489.065	32624.908	14.919	0.000	9.802	0.000	231238.596	0.000
Instance1884.3	57.177	18.978	1283.575	6.207	35872.453	32493.791	19.751	0.000	9.316	0.000	230198.600	0.000

Background Database Maintenance I/O Performance

MSExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes
Instance1884.1	15.326	261639.907
Instance1884.2	17.960	261630.412
Instance1884.3	18.244	261893.865

Total I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance1884.1	56.890	19.325	1329.265	6.510	38167.407	32627.966	19.919	0.001	9.765	0.006	231349.136	2.188
Instance1884.2	55.076	17.861	1435.302	6.534	38318.860	32624.908	14.919	0.000	9.802	0.000	231238.596	0.000
Instance1884.3	57.177	18.978	1301.819	6.207	39040.026	32493.791	19.751	0.000	9.316	0.000	230198.600	0.000

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	3.976	0.872	8.887
Available MBytes	6101.004	6063.000	6811.000
Free System Page Table Entries	33555100.125	33555086.000	33555102.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	32085213.867	29085696.000	32976896.000
Pool Paged Bytes	113220727.467	113143808.000	113512448.000
Database Page Fault Stalls/sec	0.019	0.000	1.000

Test Log

5/2/2012 1:33:14 AM -- Jetstress testing begins ...

5/2/2012 1:33:14 AM -- Preparing for testing ...

5/2/2012 1:33:17 AM -- Attaching databases ...

5/2/2012 1:33:17 AM -- Preparations for testing are complete.

5/2/2012 1:33:17 AM -- Starting transaction dispatch ..

5/2/2012 1:33:18 AM -- Database cache settings: (minimum: 96.0 MB, maximum: 768.0 MB)

5/2/2012 1:33:18 AM -- Database flush thresholds: (start: 7.7 MB, stop: 15.3 MB)

5/2/2012 1:33:21 AM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

5/2/2012 1:33:21 AM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

5/2/2012 1:33:24 AM -- Operation mix: Sessions 6, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

5/2/2012 1:33:24 AM -- Performance logging started (interval: 15000 ms).

5/2/2012 1:33:24 AM -- Generating log files ...

5/2/2012 2:27:56 AM -- F:\DB1 (102.0% generated), G:\DB2 (100.4% generated) and H:\DB3 (100.2% generated)

5/2/2012 2:27:56 AM -- Performance logging has ended.

5/2/2012 2:27:56 AM -- JetInterop batch transaction stats: 22264, 22120 and 22052.

5/2/2012 2:27:56 AM -- Dispatching transactions ends.

5/2/2012 2:27:56 AM -- Shutting down databases ...

5/2/2012 2:28:03 AM -- Instance1884.1 (complete), Instance1884.2 (complete) and Instance1884.3 (complete)

5/2/2012 2:28:03 AM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000, 1GB, 0.18, 6DB, 6Thread\server 1\soft recovery\Performance_2012_5_2_1_33_21.blg has 218 samples.

5/2/2012 2:28:03 AM -- Creating test report ...

5/2/2012 2:28:04 AM -- Instance1884.1 has 17.2 for I/O Database Reads Average Latency.

5/2/2012 2:28:04 AM -- Instance1884.1 has 0.7 for I/O Log Writes Average Latency.

5/2/2012 2:28:04 AM -- Instance1884.1 has 0.7 for I/O Log Reads Average Latency.

5/2/2012 2:28:04 AM -- Instance1884.2 has 15.6 for I/O Database Reads Average Latency.

5/2/2012 2:28:04 AM -- Instance1884.2 has 0.7 for I/O Log Writes Average Latency.

5/2/2012 2:28:04 AM -- Instance1884.2 has 0.7 for I/O Log Reads Average Latency.

5/2/2012 2:28:04 AM -- Instance1884.3 has 17.7 for I/O Database Reads Average Latency.

5/2/2012 2:28:04 AM -- Instance1884.3 has 0.7 for I/O Log Writes Average Latency.

5/2/2012 2:28:04 AM -- Instance1884.3 has 0.7 for I/O Log Reads Average Latency.

5/2/2012 2:28:04 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.

5/2/2012 2:28:04 AM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

5/2/2012 2:28:04 AM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000, 1GB, 0.18, 6DB, 6Thread\server 1\soft recovery\Performance_2012_5_2_1_33_21.xml has 217 samples queried.

5/2/2012 2:28:04 AM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000, 1GB, 0.18, 6DB, 6Thread\server 1\soft recovery\Performance_2012_5_2_1_33_21.html was saved.

5/2/2012 2:34:57 AM -- Performance logging started (interval: 2000 ms).

5/2/2012 2:34:57 AM -- Recovering databases ...

5/2/2012 2:42:59 AM -- Performance logging has ended.

5/2/2012 2:42:59 AM -- Instance1884.1 (470.53125), Instance1884.2 (461.78125) and Instance1884.3 (481.78125)

5/2/2012 2:42:59 AM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000, 1GB, 0.18, 6DB, 6Thread\server 1\soft recovery\SoftRecovery_2012_5_2_2_34_53.blg has 240 samples.

5/2/2012 2:42:59 AM -- Creating test report...

Soft Recovery Performance Test Result Report (Server 1)

Test Summary

Overall Test Result	**Pass**
Machine Name	WIN-9GG4SNONIAU
Test Description	
Test Start Time	5/2/2012 1:33:14 AM
Test End Time	5/2/2012 2:28:03 AM
Collection Start Time	5/2/2012 1:33:39 AM
Collection End Time	5/2/2012 2:27:55 AM
Jetstress Version	14.01.0225.017

ESE Version	14.00.0639.019
Operating System	Windows Server 2008 R2 Enterprise (6.1.7600.0)

Database Sizing and Throughput

Achieved Transactional I/O per Second	695.413
Target Transactional I/O per Second	540
Initial Database Size (bytes)	2721673576448
Final Database Size (bytes)	2722629877760
Database Files (Count)	3

Jetstress System Parameters

Thread Count	6 (per database)
Minimum Database Cache	96.0 MB
Maximum Database Cache	768.0 MB
Insert Operations	40%
Delete Operations	20%
Replace Operations	5%
Read Operations	35%
Lazy Commits	70%

Database Configuration

Instance1884.1	Log path: F:\DB1 Database: F:\DB1\Jetstress001001.edb
Instance1884.2	Log path: G:\DB2 Database: G:\DB2\Jetstress002001.edb
Instance1884.3	Log path: H:\DB3 Database: H:\DB3\Jetstress003001.edb

Transactional I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance1884.1	17.207	4.811	142.137	89.326	32768.000	34904.482	0.000	0.742	0.000	70.455	0.000	4845.657
Instance1884.2	15.615	3.854	143.001	89.739	32768.000	34895.447	0.000	0.740	0.000	70.476	0.000	4786.073
Instance1884.3	17.691	2.690	141.967	89.243	32768.453	34899.328	0.000	0.743	0.000	69.813	0.000	4808.189

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	1.241	0.898	1.758
Available MBytes	6100.894	6085.000	6612.000
Free System Page Table Entries	33555323.124	33555099.000	33555614.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	29089190.752	29085696.000	29118464.000
Pool Paged Bytes	113202486.018	113106944.000	113373184.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

5/2/2012 1:33:14 AM -- Jetstress testing begins ...

5/2/2012 1:33:14 AM -- Preparing for testing ...

5/2/2012 1:33:17 AM -- Attaching databases ...

5/2/2012 1:33:17 AM -- Preparations for testing are complete.

5/2/2012 1:33:17 AM -- Starting transaction dispatch ..

5/2/2012 1:33:18 AM -- Database cache settings: (minimum: 96.0 MB, maximum: 768.0 MB)

5/2/2012 1:33:18 AM -- Database flush thresholds: (start: 7.7 MB, stop: 15.3 MB)

5/2/2012 1:33:21 AM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

5/2/2012 1:33:21 AM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

5/2/2012 1:33:24 AM -- Operation mix: Sessions 6, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

5/2/2012 1:33:24 AM -- Performance logging started (interval: 15000 ms).

5/2/2012 1:33:24 AM -- Generating log files ...

5/2/2012 2:27:56 AM -- F:\DB1 (102.0% generated), G:\DB2 (100.4% generated) and H:\DB3 (100.2% generated)

5/2/2012 2:27:56 AM -- Performance logging has ended.

5/2/2012 2:27:56 AM -- JetInterop batch transaction stats: 22264, 22120 and 22052.

5/2/2012 2:27:56 AM -- Dispatching transactions ends.

5/2/2012 2:27:56 AM -- Shutting down databases ...

5/2/2012 2:28:03 AM -- Instance1884.1 (complete), Instance1884.2 (complete) and Instance1884.3 (complete)

5/2/2012 2:28:03 AM -- C:\Users\Administrator\Desktop\formal_result\15k_SAS_600GB\1R\2_server\6000, 1GB, 0.18, 6DB, 6Thread\server 1\soft recovery\Performance_2012_5_2_1_33_21.blg has 218 samples.

5/2/2012 2:28:03 AM -- Creating test report ...

5/2/2012 2:28:04 AM -- Instance1884.1 has 17.2 for I/O Database Reads Average Latency.

5/2/2012 2:28:04 AM -- Instance1884.1 has 0.7 for I/O Log Writes Average Latency.

5/2/2012 2:28:04 AM -- Instance1884.1 has 0.7 for I/O Log Reads Average Latency.

5/2/2012 2:28:04 AM -- Instance1884.2 has 15.6 for I/O Database Reads Average Latency.

5/2/2012 2:28:04 AM -- Instance1884.2 has 0.7 for I/O Log Writes Average Latency.

5/2/2012 2:28:04 AM -- Instance1884.2 has 0.7 for I/O Log Reads Average Latency.

5/2/2012 2:28:04 AM -- Instance1884.3 has 17.7 for I/O Database Reads Average Latency.

5/2/2012 2:28:04 AM -- Instance1884.3 has 0.7 for I/O Log Writes Average Latency.

5/2/2012 2:28:04 AM -- Instance1884.3 has 0.7 for I/O Log Reads Average Latency.

5/2/2012 2:28:04 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.

5/2/2012 2:28:04 AM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

5/2/2012 2:28:04 AM -- C:\Users\Administrator\Desktop\formal_result\15k_SAS_600GB\1R\2_server\6000, 1GB, 0.18, 6DB, 6Thread\server_1\soft_recovery\Performance_2012_5_2_1_33_21.xml has 217 samples queried.

Soft Recovery Test Result Report (Server 2)

Soft-Recovery Statistics - All

Database Instance	Log files replayed	Elapsed seconds
Instance2420.1	509	486.6584548
Instance2420.2	505	458.282005
Instance2420.3	500	480.5588441

Database Configuration

Instance2420.1	Log path: J:\DB4 Database: J:\DB4\Jetstress001001.edb
Instance2420.2	Log path: H:\DB5 Database: H:\DB5\Jetstress002001.edb
Instance2420.3	Log path: G:\DB6 Database: G:\DB6\Jetstress003001.edb

Transactional I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance2420.1	59.755	20.912	1272.204	6.259	35822.348	32631.467	21.929	0.000	9.389	0.000	230183.765	0.000
Instance2420.2	58.553	20.870	1343.548	6.634	35628.446	32623.009	17.150	0.000	9.950	0.000	231315.655	0.000
Instance2420.3	58.988	21.620	1269.530	6.238	35852.241	32491.477	21.592	0.000	9.357	0.000	230301.838	0.000

Background Database Maintenance I/O Performance

MSExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes

Instance2420.1	15.344	262056.797
Instance2420.2	18.418	261550.548
Instance2420.3	17.896	261879.090

Total I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance2420.1	59.755	20.912	1287.548	6.259	38518.417	32631.467	21.929	0.000	9.389	0.000	230183.765	0.000
Instance2420.2	58.553	20.870	1361.966	6.634	38683.556	32623.009	17.150	0.000	9.950	0.000	231315.655	0.000
Instance2420.3	58.988	21.620	1287.426	6.238	38994.165	32491.477	21.592	0.000	9.357	0.000	230301.838	0.000

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	4.313	0.000	15.116
Available MBytes	6440.610	6416.000	7149.000
Free System Page Table Entries	33555309.228	33555287.000	33555800.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	30127949.544	26734592.000	30830592.000
Pool Paged Bytes	76892967.303	76865536.000	77037568.000
Database Page Fault Stalls/sec	0.017	0.000	2.485

Test Log

5/2/2012 1:33:59 AM -- Jetstress testing begins ...

5/2/2012 1:33:59 AM -- Preparing for testing ...

5/2/2012 1:34:02 AM -- Attaching databases ...

5/2/2012 1:34:02 AM -- Preparations for testing are complete.

5/2/2012 1:34:02 AM -- Starting transaction dispatch ..

5/2/2012 1:34:02 AM -- Database cache settings: (minimum: 96.0 MB, maximum: 768.0 MB)

5/2/2012 1:34:02 AM -- Database flush thresholds: (start: 7.7 MB, stop: 15.3 MB)

5/2/2012 1:34:06 AM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

5/2/2012 1:34:06 AM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

5/2/2012 1:34:09 AM -- Operation mix: Sessions 6, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

5/2/2012 1:34:09 AM -- Performance logging started (interval: 15000 ms).

5/2/2012 1:34:09 AM -- Generating log files ...

5/2/2012 2:27:17 AM -- J:\DB4 (102.0% generated), H:\DB5 (101.2% generated) and G:\DB6 (100.2% generated)

5/2/2012 2:27:17 AM -- Performance logging has ended.

5/2/2012 2:27:17 AM -- JetInterop batch transaction stats: 22210, 22372 and 22091.

5/2/2012 2:27:17 AM -- Dispatching transactions ends.

5/2/2012 2:27:17 AM -- Shutting down databases ...

5/2/2012 2:27:24 AM -- Instance2420.1 (complete), Instance2420.2 (complete) and Instance2420.3 (complete)

5/2/2012 2:27:24 AM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000 1GB 0.18 6DB 6thread\server2\Soft Recovery\Performance_2012_5_2_1_34_6.blg has 212 samples.

5/2/2012 2:27:24 AM -- Creating test report ...

5/2/2012 2:27:25 AM -- Instance2420.1 has 16.7 for I/O Database Reads Average Latency.

5/2/2012 2:27:25 AM -- Instance2420.1 has 0.7 for I/O Log Writes Average Latency.

5/2/2012 2:27:25 AM -- Instance2420.1 has 0.7 for I/O Log Reads Average Latency.

5/2/2012 2:27:25 AM -- Instance2420.2 has 15.2 for I/O Database Reads Average Latency.

5/2/2012 2:27:25 AM -- Instance2420.2 has 0.7 for I/O Log Writes Average Latency.

5/2/2012 2:27:25 AM -- Instance2420.2 has 0.7 for I/O Log Reads Average Latency.

5/2/2012 2:27:25 AM -- Instance2420.3 has 17.3 for I/O Database Reads Average Latency.

5/2/2012 2:27:25 AM -- Instance2420.3 has 0.7 for I/O Log Writes Average Latency.

5/2/2012 2:27:25 AM -- Instance2420.3 has 0.7 for I/O Log Reads Average Latency.

5/2/2012 2:27:25 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.

5/2/2012 2:27:25 AM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

5/2/2012 2:27:25 AM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000 1GB 0.18 6DB 6thread\server2\Soft Recovery\Performance_2012_5_2_1_34_6.xml has 211 samples queried.

5/2/2012 2:27:25 AM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000 1GB 0.18 6DB 6thread\server2\Soft Recovery\Performance_2012_5_2_1_34_6.html was saved.

5/2/2012 2:35:54 AM -- Performance logging started (interval: 2000 ms).

5/2/2012 2:35:54 AM -- Recovering databases ...

5/2/2012 2:44:01 AM -- Performance logging has ended.

5/2/2012 2:44:01 AM -- Instance2420.1 (486.6584548), Instance2420.2 (458.282005) and Instance2420.3 (480.5588441)

5/2/2012 2:44:01 AM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000 1GB 0.18 6DB 6thread\server2\Soft Recovery\SoftRecovery_2012_5_2_2_35_51.blg has 241 samples.

5/2/2012 2:44:01 AM -- Creating test report ...

Soft Recovery Performance Test Result Report (Server 2)

Test Summary

Overall Test Result	**Pass**
Machine Name	WIN-9GG4SNONIAU
Test Description	
Test Start Time	5/2/2012 1:33:59 AM
Test End Time	5/2/2012 2:27:24 AM
Collection Start Time	5/2/2012 1:34:24 AM
Collection End Time	5/2/2012 2:27:11 AM

Jetstress Version	14.01.0225.017
ESE Version	14.00.0639.019
Operating System	Windows Server 2008 R2 Enterprise (6.1.7600.0)

Database Sizing and Throughput

Achieved Transactional I/O per Second	715.15
Target Transactional I/O per Second	540
Initial Database Size (bytes)	2686533697536
Final Database Size (bytes)	2687498387456
Database Files (Count)	3

Jetstress System Parameters

Thread Count	6 (per database)
Minimum Database Cache	96.0 MB
Maximum Database Cache	768.0 MB
Insert Operations	40%
Delete Operations	20%
Replace Operations	5%
Read Operations	35%
Lazy Commits	70%

Database Configuration

Instance2420.1	Log path: J:\DB4 Database: J:\DB4\Jetstress001001.edb
Instance2420.2	Log path: H:\DB5 Database: H:\DB5\Jetstress002001.edb
Instance2420.3	Log path: G:\DB6 Database: G:\DB6\Jetstress003001.edb

Transactional I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance2420.1	16.679	3.942	146.766	92.767	32768.000	34896.010	0.000	0.660	0.000	73.554	0.000	4774.128

Instance2420.2	15.185	3.201	146.829	92.374	32768.379	34890.948	0.000	0.654	0.000	73.277	0.000	4764.416
Instance2420.3	17.347	2.347	144.924	91.489	32768.000	34889.156	0.000	0.663	0.000	72.306	0.000	4774.328

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	1.310	0.000	7.861
Available MBytes	6445.151	6430.000	6988.000
Free System Page Table Entries	33555329.358	33555287.000	33555802.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	25704351.396	24973312.000	25862144.000
Pool Paged Bytes	76855740.377	76722176.000	76996608.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

5/2/2012 1:33:59 AM -- Jetstress testing begins ...

5/2/2012 1:33:59 AM -- Preparing for testing ...

5/2/2012 1:34:02 AM -- Attaching databases ...

5/2/2012 1:34:02 AM -- Preparations for testing are complete.

5/2/2012 1:34:02 AM -- Starting transaction dispatch ..

5/2/2012 1:34:02 AM -- Database cache settings: (minimum: 96.0 MB, maximum: 768.0 MB)

5/2/2012 1:34:02 AM -- Database flush thresholds: (start: 7.7 MB, stop: 15.3 MB)

5/2/2012 1:34:06 AM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

5/2/2012 1:34:06 AM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

5/2/2012 1:34:09 AM -- Operation mix: Sessions 6, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

5/2/2012 1:34:09 AM -- Performance logging started (interval: 15000 ms).

5/2/2012 1:34:09 AM -- Generating log files ...

5/2/2012 2:27:17 AM -- J:\DB4 (102.0% generated), H:\DB5 (101.2% generated) and G:\DB6 (100.2% generated)

5/2/2012 2:27:17 AM -- Performance logging has ended.

5/2/2012 2:27:17 AM -- JetInterop batch transaction stats: 22210, 22372 and 22091.

5/2/2012 2:27:17 AM -- Dispatching transactions ends.

5/2/2012 2:27:17 AM -- Shutting down databases ...

5/2/2012 2:27:24 AM -- Instance2420.1 (complete), Instance2420.2 (complete) and Instance2420.3 (complete)

5/2/2012 2:27:24 AM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000 1GB 0.18 6DB 6thread\server2\Soft Recovery\Performance_2012_5_2_1_34_6.blg has 212 samples.

5/2/2012 2:27:24 AM -- Creating test report ...

5/2/2012 2:27:25 AM -- Instance2420.1 has 16.7 for I/O Database Reads Average Latency.

5/2/2012 2:27:25 AM -- Instance2420.1 has 0.7 for I/O Log Writes Average Latency.

5/2/2012 2:27:25 AM -- Instance2420.1 has 0.7 for I/O Log Reads Average Latency.

5/2/2012 2:27:25 AM -- Instance2420.2 has 15.2 for I/O Database Reads Average Latency.

5/2/2012 2:27:25 AM -- Instance2420.2 has 0.7 for I/O Log Writes Average Latency.

5/2/2012 2:27:25 AM -- Instance2420.2 has 0.7 for I/O Log Reads Average Latency.

5/2/2012 2:27:25 AM -- Instance2420.3 has 17.3 for I/O Database Reads Average Latency.

5/2/2012 2:27:25 AM -- Instance2420.3 has 0.7 for I/O Log Writes Average Latency.

5/2/2012 2:27:25 AM -- Instance2420.3 has 0.7 for I/O Log Reads Average Latency.

5/2/2012 2:27:25 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.

5/2/2012 2:27:25 AM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

5/2/2012 2:27:25 AM -- C:\Users\Administrator\Desktop\formal result\15k SAS 600GB\1R\2 server\6000 1GB 0.18 6DB 6thread\server2\Soft Recovery\Performance_2012_5_2_1_34_6.xml has 211 samples queried.