



Infotrend EonStor DS S12F-R2851 1,000-Mailbox Resiliency Storage Solution for Exchange 2010

Technical White Paper

Tested with: ESRP – Storage Version 3.0

Tested Date: 2013/01/31

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Overview

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

*The ESRP was a program developed by Microsoft Corporation and provide a common storage testing framework for vendors to publish information on its storage solutions for Microsoft Exchange Server software. For more details on this program, please visit the web page:

<http://technet.microsoft.com/en-us/exchange/ff182054>

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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

The ESDS S12F-R2851 is a Fibre Channel (FC) host storage system that combines the high performance of 8Gb/s FC host connectivity with 6Gb/s SAS drive support. Accommodating 12 drives and scalable to use up to 228 drives, the dual-controller ESDS S12F-R2851 is an affordable & flexible storage solution featuring enterprise-class protection to provide your organization with a decisive competitive edge in pushing your IT efficiency to previously unattainable levels.

Significant Feature List

- **Host Ports:** Eight 8Gb/s Fibre Channel host ports
- **Expansion Scalability:** Up to 228 HDDs.
- **Availability and Reliability:** Redundant, hot-swappable hardware modules included controller, power supply unit and cooling fan, with high-availability hardware design, preventing the "single-point-of-failure".
- **Capacity efficiency:** With thin provisioning to ensure the most efficient allocation of pooled capacity
- **Easy deployment and management:** Via the powerful SANWatch management software suite.
- **Green Design:** High-efficiency power supplies and intelligent multi-level drive spin-down technology.
- **Data protection:** Equipped Snapshot, Volume copy/Volume mirror for protecting data.

For more detail information of this product, please check the product link:

http://www.infortrend.com/global/products/models/ESDS_S12F-R2851

Solution Description

Total HDD deployed: 8

- 7 spindles in a RAID5 disk group
- 2 Exchange databases per disk group
- 1 spare drives for disk group

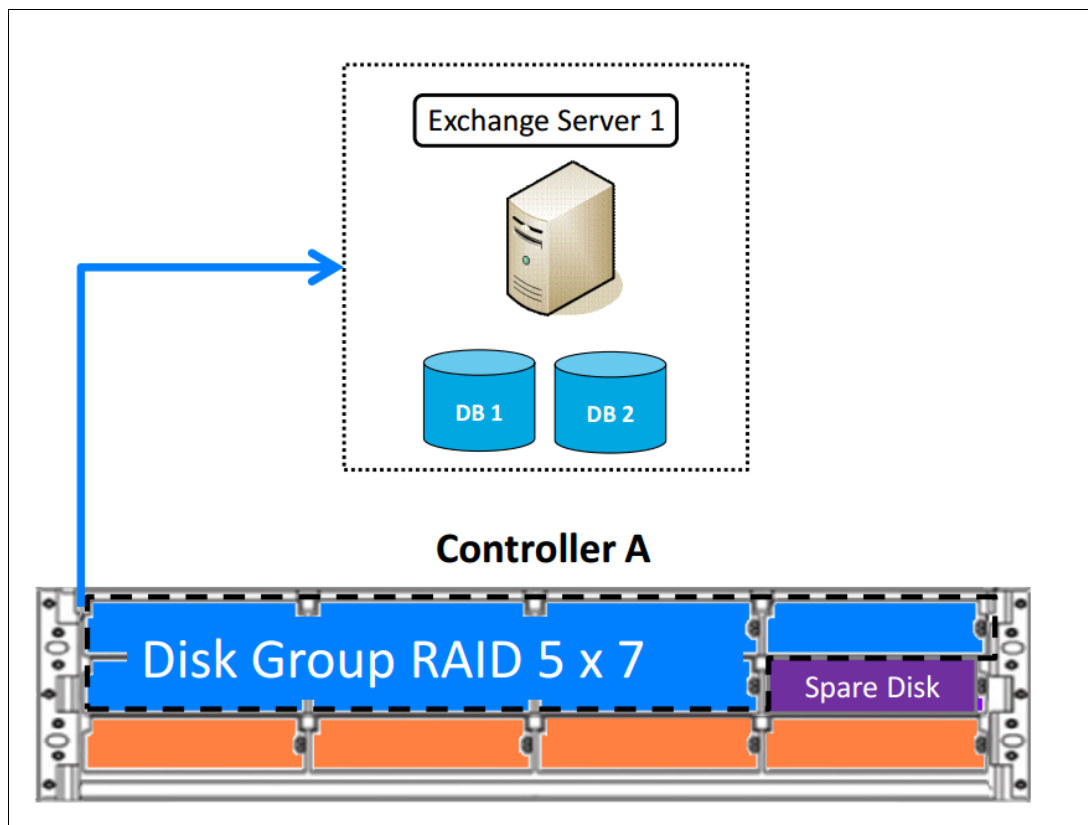


Figure 1: Solution configuration

One RAID5 disk groups were created with 7 HDDs (7 disks per group) in this solution. The RAID group was hosted by one of the redundant controllers of the EonStor DS. The disk group was divided to 2 LUNs for a total of 2 databases hosted by one active Exchange servers. Figure 1 shows the complete architecture of this solution.

Total 2 databases were tested with 1 exchange servers in this solution. The active Exchange server hosts 2 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.

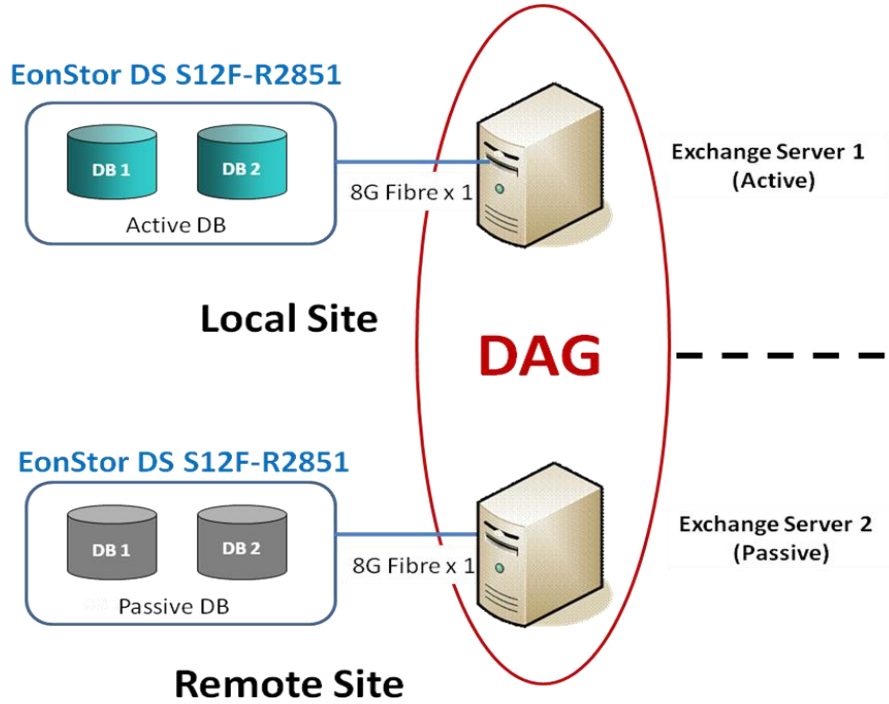


Figure 2: Database architecture

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

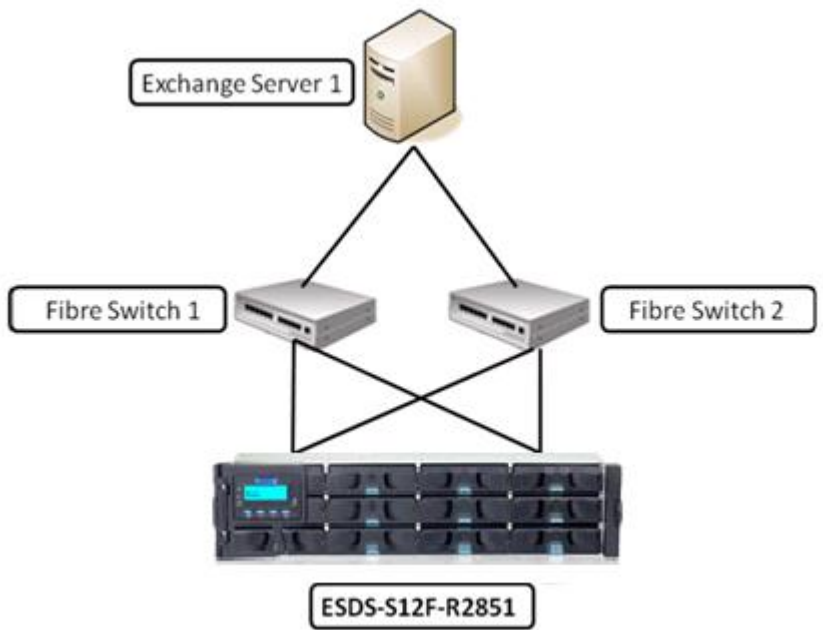


Figure 3: Solution connection topology

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 their 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 1,000 user Exchange environment, suitable for small and medium size companies. The EonStor DS (Fibre Channel) provides excellent price point and performance through 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:

- 1,000 Mailboxes
- 3GB capacity for each Mailbox
- 0.24 User Profile (including 20% headroom)
- Tested with 1 server
- 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	1000
Number of Database Availability Groups (DAGs)	1
Number of servers/DAG	2 (1 active & 1 passive)
Number of active mailboxes/server	1000
Number of databases/host	2
Number of copies/database	2
Number of mailboxes/database	500
Simulated profile: I/O's per second per mailbox (IOPS, include 20% headroom)	0.24
Database/Log LUN size	2TB
Total database size for performance testing	3TB
% storage capacity used by Exchange database**	75%

**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-S12F-R2851 Firmware version: 3.91F.01
Storage cache	8GB per controller
Number of storage controllers	2
Number of storage ports	4
Maximum bandwidth of storage connectivity to host	8 Gbps bandwidth (1 x 8G Fibre Channel)
Switch type/model/firmware 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 HBAs/host	1 x Dual Port Fibre HBA per host
Host server type	Intel(R) Xeon(R) L5410 2.33Ghz x 8GB RAM
Total number of disks tested in solution	8 (7 + 1 spares)
Maximum number of spindles can be hosted in the storage	228

Storage Software

HBA driver	Driver version: 9.19.27
HBA QueueTarget Setting	N/A
HBA QueueDepth Setting	N/A
Multi-Pathing	EonPath-v1.23.2.50
Host OS	Windows Server 2008 R2 64bit
ESE.dll file version	14.01.0218.012
Replication solution name/version	N/A

Storage Disk Configuration (Mailbox Store Disks)

Disk type, speed and firmware revision	7.2k RPM NL SAS drive
Raw capacity per disk (GB)	3000GB

Number of physical disks in test	7 + 1 spare
Total raw storage capacity (GB)	24000GB
Disk slice size (GB)	N/A
Number of slices per LUN or number of disks per LUN	7 disks per 2 LUN
RAID level	RAID5
Total formatted capacity	4000GB
Storage capacity utilization	16,7%
Database capacity utilization	12.5%

Storage Disk Configuration (Transactional Log Disks)

Disk type, speed and firmware revision	7.2k RPM NL SAS drive
Raw capacity per disk (GB)	3000GB
Number of Spindles in test	7 + 1 spare
Total raw storage capacity (GB)	24000GB
Disk slice size (GB)	N/A
Number of slices per LUN or number of disks per LUN	7 disks per 2 LUNs
RAID level	RAID5
Total formatted capacity	4000GB

Best Practices

Exchange server is a disk-intensive application. Based on the testing run using the ESRP framework, Infotrend recommends 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, and 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 diskpart 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 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

To find out more detail information about the EonStor DS S12F-R2851, please visit the product solution webpage: <http://www.infortrend.com/global/products/models/ESDS S12F-R2851>

For more information about Infortrend storage solution, we recommend you consult with Infortrend directly to assist with the related information about products and services. Or visit Infortrend website: <http://www.infortrend.com>

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 check the [Appendix](#) for all detailed information about test results.

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. Please check the [Appendix A: Stress Test](#) for detailed results.

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. Please check the [Appendix B: Performance Test](#) for detailed results.

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	379.485

Database Disks Reads/sec	239.043
Database Disks Writes/sec	140.443
Average Database Disk Read Latency (ms)	12.411
Average Database Disk Write Latency (ms)	1.039
Transaction Log I/O	
Log Disks Writes/sec	124.921
Average Log Disk Write Latency (ms)	0.278

Aggregate Performance across all servers Metrics:

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

Database I/O	
Database Disks Transfers/sec	379.485
Database Disks Reads/sec	239.043
Database Disks Writes/sec	140.443
Average Database Disk Read Latency (ms)	12.411
Average Database Disk Write Latency (ms)	1.039
Transaction Log I/O	
Log Disks Writes/sec	124.921
Average Log Disk Write Latency (ms)	0.278

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. Please check the [Appendix C: Database Backup Test](#) for detailed results.

MB read/sec per database	367.665
MB read/sec total per server	735.33

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. Please check the [Appendix D: Soft Recovery](#) for detailed results.

Average time to play one Log file (sec)	1.735
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Conclusion

The information discussed in this report describes the best practices and test report for EonStor DS S12F-R2851 supporting 1,000 users. The test was conducted under the environment listed in the [Tested Deployment](#) section. The test result shows that the S12F-R2851 system is capable of handling 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: Test Report

This appendix contains Microsoft Exchange Jetstress 2010 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.

Appendix A: Stress Test

Microsoft Exchange **Jetstress 2010**

24hr Stress Test Result Report (Server 1)

Test Summary

Overall Test Result	Pass
Machine Name	WIN-6I8V9TSAFBE
Test Description	
Test Start Time	1/21/2013 3:47:55 PM
Test End Time	1/22/2013 3:58:33 PM
Collection Start Time	1/21/2013 3:49:24 PM
Collection End Time	1/22/2013 3:49:17 PM
Jetstress Version	14.01.0225.017
ESE Version	14.01.0218.012
Operating System	Windows Server 2008 R2 Enterprise (6.1.7600.0)

Database Sizing and Throughput

Achieved Transactional I/O per Second	364.925
Target Transactional I/O per Second	240
Initial Database Size (bytes)	3148544606208
Final Database Size (bytes)	3161194627072
Database Files (Count)	2

Jetstress System Parameters

Thread Count	4 (per database)
Minimum Database Cache	64.0 MB
Maximum Database Cache	512.0 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

Instance3452.1	Log path: F:\log1 Database: F:\db1\Jetstress001001.edb
Instance3452.2	Log path: G:\log2 Database: G:\db2\Jetstress002001.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
Instance3452.1	12.849	1.204	114.500	68.273	33786.633	35296.136	0.000	0.340	0.000	58.337	0.000	4546.793
Instance3452.2	12.723	0.916	114.089	68.062	33845.505	35303.372	0.000	0.339	0.000	58.209	0.000	4553.620

Background Database Maintenance I/O Performance

MSExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes
Instance3452.1	31.350	261883.622
Instance3452.2	31.356	261887.626

Log Replication I/O Performance

MSExchange Database ==> Instances	I/O Log Reads/sec	I/O Log Reads Average Bytes
Instance3452.1	1.074	232360.607
Instance3452.2	1.073	232439.278

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
Instance3452.1	12.849	1.204	145.850	68.273	82815.39	35296.136	0.643	0.340	1.074	58.337	232360.607	4546.793
Instance3452.2	12.723	0.916	145.445	68.062	83008.47	35303.372	0.623	0.339	1.073	58.209	232439.278	4553.620

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	0.550	0.000	3.092
Available MBytes	22240.546	22197.000	22340.000
Free System Page Table Entries	33555536.983	33555505.000	33555539.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	34195582.288	34000896.000	38219776.000
Pool Paged Bytes	113661426.571	112807936.000	115281920.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

1/21/2013 3:47:55 PM -- Jetstress testing begins ...

1/21/2013 3:47:55 PM -- Preparing for testing ...

1/21/2013 3:47:57 PM -- Attaching databases ...

1/21/2013 3:47:57 PM -- Preparations for testing are complete.

1/21/2013 3:47:57 PM -- Starting transaction dispatch ..

1/21/2013 3:47:58 PM -- Database cache settings: (minimum: 64.0 MB, maximum: 512.0 MB)

1/21/2013 3:47:58 PM -- Database flush thresholds: (start: 5.1 MB, stop: 10.2 MB)

1/21/2013 3:48:00 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

1/21/2013 3:48:00 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

1/21/2013 3:48:04 PM -- Operation mix: Sessions 4, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

1/21/2013 3:48:04 PM -- Performance logging started (interval: 15000 ms).

1/21/2013 3:48:04 PM -- Attaining prerequisites:

1/21/2013 3:49:24 PM -- \MSEExchange Database(JetstressWin)\Database Cache Size, Last: 484159500.0 (lower bound: 483183800.0, upper bound: none)

1/22/2013 3:49:24 PM -- Performance logging has ended.

1/22/2013 3:58:32 PM -- JetInterop batch transaction stats: 450558 and 450369.

1/22/2013 3:58:32 PM -- Dispatching transactions ends.

1/22/2013 3:58:32 PM -- Shutting down databases ...

1/22/2013 3:58:33 PM -- Instance3452.1 (complete) and Instance3452.2 (complete)

1/22/2013 3:58:33 PM -- C:\Program Files\Exchange Jetstress\Performance_2013_1_21_15_48_0.blg has 5762 samples.

1/22/2013 3:58:33 PM -- Creating test report ...

1/22/2013 3:58:50 PM -- Instance3452.1 has 12.8 for I/O Database Reads Average Latency.

1/22/2013 3:58:50 PM -- Instance3452.1 has 0.3 for I/O Log Writes Average Latency.

1/22/2013 3:58:50 PM -- Instance3452.1 has 0.3 for I/O Log Reads Average Latency.

1/22/2013 3:58:50 PM -- Instance3452.2 has 12.7 for I/O Database Reads Average Latency.

1/22/2013 3:58:50 PM -- Instance3452.2 has 0.3 for I/O Log Writes Average Latency.

1/22/2013 3:58:50 PM -- Instance3452.2 has 0.3 for I/O Log Reads Average Latency.

1/22/2013 3:58:50 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.

1/22/2013 3:58:51 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

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	48235874	0	0	0	1507371 MB/3357 sec
G:\db2\Jetstress002001.edb	48236130	0	0	0	1507379 MB/3563 sec
(Sum)	96472004	0	0	0	3014750 MB/3563 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:	0.020	0.000	7216.764	0.000	65536.000
G:	0.022	0.000	6745.556	0.000	65536.000

Memory System Performance (of checksum)

Counter	Average	Minimum	Maximum
% Processor Time	4.037	2.728	4.801
Available MBytes	22726.441	22716.000	22736.000
Free System Page Table Entries	33555537.017	33555537.000	33555539.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	35671508.610	35475456.000	35794944.000
Pool Paged Bytes	117158790.508	115331072.000	117522432.000

Test Log

1/21/2013 3:47:55 PM -- Jetstress testing begins ...

1/21/2013 3:47:55 PM -- Preparing for testing ...

1/21/2013 3:47:57 PM -- Attaching databases ...

1/21/2013 3:47:57 PM -- Preparations for testing are complete.

1/21/2013 3:47:57 PM -- Starting transaction dispatch ..

1/21/2013 3:47:58 PM -- Database cache settings: (minimum: 64.0 MB, maximum: 512.0 MB)

1/21/2013 3:47:58 PM -- Database flush thresholds: (start: 5.1 MB, stop: 10.2 MB)

1/21/2013 3:48:00 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

1/21/2013 3:48:00 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

1/21/2013 3:48:04 PM -- Operation mix: Sessions 4, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

1/21/2013 3:48:04 PM -- Performance logging started (interval: 15000 ms).

1/21/2013 3:48:04 PM -- Attaining prerequisites:

1/21/2013 3:49:24 PM -- MExchange Database(JetstressWin)\Database Cache Size, Last: 484159500.0 (lower bound: 483183800.0, upper bound: none)

Infotrend EonStor DS S12F-R2851 1,000-Mailbox Resiliency Storage Solution for Exchange 2010

1/22/2013 3:49:24 PM -- Performance logging has ended.

1/22/2013 3:58:32 PM -- JetInterop batch transaction stats: 450558 and 450369.

1/22/2013 3:58:32 PM -- Dispatching transactions ends.

1/22/2013 3:58:32 PM -- Shutting down databases ...

1/22/2013 3:58:33 PM -- Instance3452.1 (complete) and Instance3452.2 (complete)

1/22/2013 3:58:33 PM -- C:\Program Files\Exchange Jetstress\Performance_2013_1_21_15_48_0.blg has 5762 samples.

1/22/2013 3:58:33 PM -- Creating test report ...

1/22/2013 3:58:50 PM -- Instance3452.1 has 12.8 for I/O Database Reads Average Latency.

1/22/2013 3:58:50 PM -- Instance3452.1 has 0.3 for I/O Log Writes Average Latency.

1/22/2013 3:58:50 PM -- Instance3452.1 has 0.3 for I/O Log Reads Average Latency.

1/22/2013 3:58:50 PM -- Instance3452.2 has 12.7 for I/O Database Reads Average Latency.

1/22/2013 3:58:50 PM -- Instance3452.2 has 0.3 for I/O Log Writes Average Latency.

1/22/2013 3:58:50 PM -- Instance3452.2 has 0.3 for I/O Log Reads Average Latency.

1/22/2013 3:58:50 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.

1/22/2013 3:58:51 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

1/22/2013 3:58:51 PM -- C:\Program Files\Exchange Jetstress\Performance_2013_1_21_15_48_0.xml has 5756 samples queried.

1/22/2013 3:58:51 PM -- C:\Program Files\Exchange Jetstress\Performance_2013_1_21_15_48_0.html was saved.

1/22/2013 3:58:52 PM -- Performance logging started (interval: 30000 ms).

1/22/2013 3:58:52 PM -- Verifying database checksums ...

1/22/2013 4:58:16 PM -- F: (100% processed) and G: (100% processed)

1/22/2013 4:58:16 PM -- Performance logging has ended.

1/22/2013 4:58:16 PM -- C:\Program Files\Exchange Jetstress\DBChecksum_2013_1_22_15_58_51.blg has 118 samples..

Appendix B: Performance Test

Microsoft Exchange **Jetstress 2010**

2 hr Performance Test Result Report (Server 1)

Test Summary

Overall Test Result	Pass
Machine Name	WIN-6I8V9TSAFBE
Test Description	
Test Start Time	1/21/2013 9:14:16 AM
Test End Time	1/21/2013 11:17:20 AM
Collection Start Time	1/21/2013 9:15:35 AM
Collection End Time	1/21/2013 11:15:29 AM
Jetstress Version	14.01.0225.017
ESE Version	14.01.0218.012
Operating System	Windows Server 2008 R2 Enterprise (6.1.7600.0)

Database Sizing and Throughput

Achieved Transactional I/O per Second	379.485
Target Transactional I/O per Second	240
Initial Database Size (bytes)	3146808164352
Final Database Size (bytes)	3147949015040
Database Files (Count)	2

Jetstress System Parameters

Thread Count	4 (per database)
Minimum Database Cache	64.0 MB
Maximum Database Cache	512.0 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

Instance3844.1	Log path: F:\log1 Database: F:\db1\Jetstress001001.edb
----------------	---

Instance3844.2	Log path: G:\log2 Database: G:\db2\Jetstress002001.edb
-----------------------	---

Transactional I/O Performance

MSExchange Database ==> Instances	I/O Reads Average Latency (msec)	I/O 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
Instance3844.1	12.477	1.173	120.410	70.801	33734.096	36351.624	0.000	0.278	0.000	62.660	0.000	4540.756
Instance3844.2	12.345	0.905	118.633	69.642	33856.294	36393.115	0.000	0.278	0.000	62.261	0.000	4533.994

Background Database Maintenance I/O Performance

MSExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes
Instance3844.1	31.334	261878.662
Instance3844.2	31.328	261840.842

Log Replication I/O Performance

MSExchange Database ==> Instances	I/O Log Reads/sec	I/O Log Reads Average Bytes
Instance3844.1	1.153	232561.778
Instance3844.2	1.143	232076.263

Total I/O Performance

MSExchange Database ==> Instances	I/O Reads Average Latency (msec)	I/O 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
Instance3844.1	12.477	1.173	151.743	70.801	80843.826	36351.624	0.626	0.278	1.153	62.660	232561.778	4540.756
Instance3844.2	12.345	0.905	149.961	69.642	81484.636	36393.115	0.590	0.278	1.143	62.261	232076.263	4533.994

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	0.550	0.000	2.741
Available MBytes	22295.469	22278.000	22318.000
Free System Page Table Entries	33555537.013	33555537.000	33555539.000
Transition Pages RePurposed/sec	0.000	0.000	0.000

Pool Nonpaged Bytes	33770615.467	33681408.000	33878016.000
Pool Paged Bytes	111260782.933	111132672.000	111411200.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

1/21/2013 9:14:16 AM -- Jetstress testing begins ...

1/21/2013 9:14:16 AM -- Preparing for testing ...

1/21/2013 9:14:18 AM -- Attaching databases ...

1/21/2013 9:14:18 AM -- Preparations for testing are complete.

1/21/2013 9:14:18 AM -- Starting transaction dispatch ..

1/21/2013 9:14:18 AM -- Database cache settings: (minimum: 64.0 MB, maximum: 512.0 MB)

1/21/2013 9:14:18 AM -- Database flush thresholds: (start: 5.1 MB, stop: 10.2 MB)

1/21/2013 9:14:21 AM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

1/21/2013 9:14:21 AM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

1/21/2013 9:14:25 AM -- Operation mix: Sessions 4, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

1/21/2013 9:14:25 AM -- Performance logging started (interval: 15000 ms).

1/21/2013 9:14:25 AM -- Attaining prerequisites:

1/21/2013 9:15:35 AM -- \MSEExchange Database(JetstressWin)\Database Cache Size, Last: 485945300.0 (lower bound: 483183800.0, upper bound: none)

1/21/2013 11:15:36 AM -- Performance logging has ended.

1/21/2013 11:17:19 AM -- JetInterop batch transaction stats: 41078 and 40594.

1/21/2013 11:17:19 AM -- Dispatching transactions ends.

1/21/2013 11:17:19 AM -- Shutting down databases ...

1/21/2013 11:17:20 AM -- Instance3844.1 (complete) and Instance3844.2 (complete)

1/21/2013 11:17:20 AM -- C:\Program Files\Exchange Jetstress\Performance_2013_1_21_9_14_21.blg has 484 samples.

1/21/2013 11:17:20 AM -- Creating test report ...

1/21/2013 11:17:22 AM -- Instance3844.1 has 12.5 for I/O Database Reads Average Latency.

1/21/2013 11:17:22 AM -- Instance3844.1 has 0.3 for I/O Log Writes Average Latency.

1/21/2013 11:17:22 AM -- Instance3844.1 has 0.3 for I/O Log Reads Average Latency.

1/21/2013 11:17:22 AM -- Instance3844.2 has 12.3 for I/O Database Reads Average Latency.

1/21/2013 11:17:22 AM -- Instance3844.2 has 0.3 for I/O Log Writes Average Latency.

1/21/2013 11:17:22 AM -- Instance3844.2 has 0.3 for I/O Log Reads Average Latency.

1/21/2013 11:17:22 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.

1/21/2013 11:17:22 AM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

1/21/2013 11:17:22 AM -- C:\Program Files\Exchange Jetstress\Performance_2013_1_21_9_14_21.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	48033890	0	0	0	1501059 MB/3394 sec
G:\db2\Jetstress002001.edb	48033890	0	0	0	1501059 MB/3568 sec
(Sum)	96067780	0	0	0	3002118 MB/3568 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:	0.020	0.000	7108.394	0.000	65536.000
G:	0.022	0.000	6696.112	0.000	65536.000

Memory System Performance (of checksum)

Counter	Average	Minimum	Maximum
% Processor Time	4.408	3.267	5.210
Available MBytes	22858.127	22853.000	22877.000
Free System Page Table Entries	33555537.000	33555537.000	33555537.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	34297335.322	34062336.000	34484224.000
Pool Paged Bytes	111307550.373	111300608.000	111403008.000

Test Log

1/21/2013 9:14:16 AM -- Jetstress testing begins ...

1/21/2013 9:14:16 AM -- Preparing for testing ...

1/21/2013 9:14:18 AM -- Attaching databases ...

1/21/2013 9:14:18 AM -- Preparations for testing are complete.

1/21/2013 9:14:18 AM -- Starting transaction dispatch ..

1/21/2013 9:14:18 AM -- Database cache settings: (minimum: 64.0 MB, maximum: 512.0 MB)

1/21/2013 9:14:18 AM -- Database flush thresholds: (start: 5.1 MB, stop: 10.2 MB)

1/21/2013 9:14:21 AM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

1/21/2013 9:14:21 AM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

1/21/2013 9:14:25 AM -- Operation mix: Sessions 4, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

1/21/2013 9:14:25 AM -- Performance logging started (interval: 15000 ms).

1/21/2013 9:14:25 AM -- Attaining prerequisites:

1/21/2013 9:15:35 AM -- IMSEExchange Database(JetstressWin)\Database Cache Size, Last: 485945300.0 (lower bound: 483183800.0, upper bound: none)

1/21/2013 11:15:36 AM -- Performance logging has ended.

1/21/2013 11:17:19 AM -- JetInterop batch transaction stats: 41078 and 40594.

1/21/2013 11:17:19 AM -- Dispatching transactions ends.

1/21/2013 11:17:19 AM -- Shutting down databases ...

1/21/2013 11:17:20 AM -- Instance3844.1 (complete) and Instance3844.2 (complete)

1/21/2013 11:17:20 AM -- C:\Program Files\Exchange Jetstress\Performance_2013_1_21_9_14_21.blg has 484 samples.

1/21/2013 11:17:20 AM -- Creating test report ...

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1/21/2013 11:17:22 AM -- Instance3844.1 has 12.5 for I/O Database Reads Average Latency.
1/21/2013 11:17:22 AM -- Instance3844.1 has 0.3 for I/O Log Writes Average Latency.
1/21/2013 11:17:22 AM -- Instance3844.1 has 0.3 for I/O Log Reads Average Latency.
1/21/2013 11:17:22 AM -- Instance3844.2 has 12.3 for I/O Database Reads Average Latency.
1/21/2013 11:17:22 AM -- Instance3844.2 has 0.3 for I/O Log Writes Average Latency.
1/21/2013 11:17:22 AM -- Instance3844.2 has 0.3 for I/O Log Reads Average Latency.
1/21/2013 11:17:22 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.
1/21/2013 11:17:22 AM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
1/21/2013 11:17:22 AM -- C:\Program Files\Exchange Jetstress\Performance_2013_1_21_9_14_21.xml has 479 samples queried.
1/21/2013 11:17:22 AM -- C:\Program Files\Exchange Jetstress\Performance_2013_1_21_9_14_21.html was saved.
1/21/2013 11:17:23 AM -- Performance logging started (interval: 30000 ms).
1/21/2013 11:17:23 AM -- Verifying database checksums ...
1/21/2013 12:16:52 PM -- F: (100% processed) and G: (100% processed)
1/21/2013 12:16:52 PM -- Performance logging has ended.
1/21/2013 12:16:52 PM -- C:\Program Files\Exchange Jetstress\DBCchecksum_2013_1_21_11_17_22.blg has 118 samples..

Appendix C: Database Backup Test

Microsoft Exchange **Jetstress 2010**

Database Backup Test Result Report (Server 1)

Database Backup Statistics – All

Database Instance	Database Size (MBytes)	Elapsed Backup Time	MBytes Transferred/sec
Instance1968.1	1501051.09	01:08:05	367.41
Instance1968.2	1501051.09	01:07:59	367.92

Jetstress System Parameters

Thread Count	4 (per database)
Minimum Database Cache	64.0 MB
Maximum Database Cache	512.0 MB
Insert Operations	40%
Delete Operations	20%
Replace Operations	5%
Read Operations	35%
Lazy Commits	70%

Database Configuration

Instance1968.1	Log path: F:\log1 Database: F:\db1\Jetstress001001.edb
Instance1968.2	Log path: G:\log2 Database: G:\db2\Jetstress002001.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
Instance1968.1	1.077	0.000	1469.814	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance1968.2	1.073	0.000	1472.077	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	2.096	1.500	2.767
Available MBytes	22879.375	22874.000	22897.000
Free System Page Table Entries	33555537.029	33555537.000	33555539.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	34152839.529	34095104.000	34279424.000
Pool Paged Bytes	111466255.059	111452160.000	111542272.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

1/21/2013 1:17:34 PM -- Jetstress testing begins ...

1/21/2013 1:17:34 PM -- Preparing for testing ...

1/21/2013 1:17:37 PM -- Attaching databases ...

1/21/2013 1:17:37 PM -- Preparations for testing are complete.

1/21/2013 1:17:42 PM -- Performance logging started (interval: 30000 ms).

1/21/2013 1:17:42 PM -- Backing up databases ...

1/21/2013 2:25:48 PM -- Performance logging has ended.

1/21/2013 2:25:48 PM -- Instance1968.1 (100% processed) and Instance1968.2 (100% processed)

1/21/2013 2:25:48 PM -- C:\Program Files\Exchange Jetstress\DatabaseBackup_2013_1_21_13_17_37.blg has 136 samples.

1/21/2013 2:25:48 PM -- Creating test report ...

Appendix D: Soft Recovery

Microsoft Exchange **Jetstress 2010**

Soft Recovery Test Result Report (Server 1)

Soft-Recovery Statistics – All

Database Instance	Log files replayed	Elapsed seconds
Instance2812.1	511	882.8679507
Instance2812.2	501	873.0243334

Database Configuration

Instance2812.1	Log path: F:\log1 Database: F:\db1\Jetstress001001.edb
Instance2812.2	Log path: G:\log2 Database: G:\db2\Jetstress002001.edb

Transactional I/O Performance

MSEExchange	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 ==>	Database	Database	Database	Database	Database	Database	Reads	Writes	Reads/sec	Writes/sec	Reads	Writes
Instances	Reads	Writes	Reads/sec	Writes/sec	Reads	Writes	Average	Average			Average	Average
	Average	Average			Average	Average	Latency	Latency			Bytes	Bytes
	Latency	Latency			Bytes	Bytes	(msec)	(msec)				
	(msec)	(msec)										
Instance2812.1	11.703	6.420	509.992	3.466	42583.439	32318.096	1.862	0.000	5.199	0.000	228857.272	0.000
Instance2812.2	11.688	6.291	504.843	3.437	42707.254	32237.037	1.440	0.000	5.156	0.000	228771.639	0.000

Background Database Maintenance I/O Performance

MSEExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes
Instance2812.1	31.293	261802.034
Instance2812.2	31.369	261946.184

Total I/O Performance

MSEExchange	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 ==>	Database	Database	Database	Database	Database	Database	Reads	Writes	Reads/sec	Writes/sec	Reads	Writes
Instances	Reads	Writes	Reads/sec	Writes/sec	Reads	Writes	Average	Average			Average	Average
	Average	Average			Average	Average	Latency	Latency			Bytes	Bytes
	Latency	Latency			Bytes	Bytes	(msec)	(msec)				
	(msec)	(msec)										

Instance2812.1	11.703	6.420	541.285	3.466	55256.914	32318.096	1.862	0.000	5.199	0.000	228857.272	0.000
Instance2812.2	11.688	6.291	536.211	3.437	55532.811	32237.037	1.440	0.000	5.156	0.000	228771.639	0.000

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	2.095	0.000	15.843
Available MBytes	22296.950	22274.000	22783.000
Free System Page Table Entries	33555536.966	33555533.000	33555539.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	34053582.904	34041856.000	34103296.000
Pool Paged Bytes	114579353.132	114532352.000	114798592.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

1/21/2013 2:30:30 PM -- Jetstress testing begins ...

1/21/2013 2:30:30 PM -- Preparing for testing ...

1/21/2013 2:30:32 PM -- Attaching databases ...

1/21/2013 2:30:32 PM -- Preparations for testing are complete.

1/21/2013 2:30:32 PM -- Starting transaction dispatch ..

1/21/2013 2:30:32 PM -- Database cache settings: (minimum: 64.0 MB, maximum: 512.0 MB)

1/21/2013 2:30:32 PM -- Database flush thresholds: (start: 5.1 MB, stop: 10.2 MB)

1/21/2013 2:30:35 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

1/21/2013 2:30:35 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

1/21/2013 2:30:38 PM -- Operation mix: Sessions 4, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

1/21/2013 2:30:38 PM -- Performance logging started (interval: 15000 ms).

1/21/2013 2:30:38 PM -- Generating log files ...

1/21/2013 3:28:32 PM -- F:\log1 (102.2% generated) and G:\log2 (100.2% generated)

1/21/2013 3:28:32 PM -- Performance logging has ended.

1/21/2013 3:28:32 PM -- JetInterop batch transaction stats: 22135 and 21716.

1/21/2013 3:28:32 PM -- Dispatching transactions ends.

1/21/2013 3:28:32 PM -- Shutting down databases ...

1/21/2013 3:28:33 PM -- Instance2812.1 (complete) and Instance2812.2 (complete)

1/21/2013 3:28:33 PM -- C:\Program Files\Exchange Jetstress\Performance_2013_1_21_14_30_35.blg has 231 samples.

1/21/2013 3:28:33 PM -- Creating test report ...

1/21/2013 3:28:34 PM -- Instance2812.1 has 13.8 for I/O Database Reads Average Latency.

1/21/2013 3:28:34 PM -- Instance2812.1 has 0.3 for I/O Log Writes Average Latency.

1/21/2013 3:28:34 PM -- Instance2812.1 has 0.3 for I/O Log Reads Average Latency.

1/21/2013 3:28:34 PM -- Instance2812.2 has 13.5 for I/O Database Reads Average Latency.

1/21/2013 3:28:34 PM -- Instance2812.2 has 0.3 for I/O Log Writes Average Latency.

1/21/2013 3:28:34 PM -- Instance2812.2 has 0.3 for I/O Log Reads Average Latency.

1/21/2013 3:28:34 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.
 1/21/2013 3:28:34 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
 1/21/2013 3:28:34 PM -- C:\Program Files\Exchange Jetstress\Performance_2013_1_21_14_30_35.xml has 230 samples queried.
 1/21/2013 3:28:34 PM -- C:\Program Files\Exchange Jetstress\Performance_2013_1_21_14_30_35.html was saved.
 1/21/2013 3:30:04 PM -- Performance logging started (interval: 2000 ms).
 1/21/2013 3:30:04 PM -- Recovering databases ...
 1/21/2013 3:44:47 PM -- Performance logging has ended.
 1/21/2013 3:44:47 PM -- Instance2812.1 (882.8679507) and Instance2812.2 (873.0243334)
 1/21/2013 3:44:47 PM -- C:\Program Files\Exchange Jetstress\SoftRecovery_2013_1_21_15_30_0.blg has 438 samples.
 1/21/2013 3:44:47 PM -- Creating test report

Soft Recovery Performance Test Result Report (Server 1)

Test Summary

Overall Test Result	Pass
Machine Name	WIN-6I8V9TSAFBE
Test Description	
Test Start Time	1/21/2013 2:30:30 PM
Test End Time	1/21/2013 3:28:33 PM
Collection Start Time	1/21/2013 2:30:53 PM
Collection End Time	1/21/2013 3:28:25 PM
Jetstress Version	14.01.0225.017
ESE Version	14.01.0218.012
Operating System	Windows Server 2008 R2 Enterprise (6.1.7600.0)

Database Sizing and Throughput

Achieved Transactional I/O per Second	433.198
Target Transactional I/O per Second	240
Initial Database Size (bytes)	3147949015040
Final Database Size (bytes)	3148561383424
Database Files (Count)	2

Jetstress System Parameters

Thread Count	4 (per database)
Minimum Database Cache	64.0 MB
Maximum Database Cache	512.0 MB
Insert Operations	40%
Delete Operations	20%
Replace Operations	5%
Read Operations	35%

Lazy Commits	70%
Thread Count	4 (per database)
Minimum Database Cache	64.0 MB

Database Configuration

Instance2812.1	Log path: F:\log1 Database: F:\db1\Jetstress001001.edb
Instance2812.2	Log path: G:\log2 Database: G:\db2\Jetstress002001.edb

Transactional 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 ==>	Database	Database	Database	Database	Database	Database	Reads	Writes	Reads/sec	Writes/sec	Reads	Writes
Instances	Reads	Writes	Reads/sec	Writes/sec	Reads	Writes	Average	Average			Average	Average
	Average	Average			Average	Average	Latency	Latency			Bytes	Bytes
	Latency	Latency			Bytes	Bytes	(msec)	(msec)				
	(msec)	(msec)										
Instance2812.1	13.785	1.195	137.845	81.327	32769.874	35847.057	0.000	0.348	0.000	70.823	0.000	4579.538
Instance2812.2	13.501	0.919	134.727	79.298	32768.346	35841.385	0.000	0.350	0.000	69.235	0.000	4587.179

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	0.623	0.000	1.999
Available MBytes	22326.745	22308.000	22744.000
Free System Page Table Entries	33555537.004	33555536.000	33555539.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	34005098.390	33927168.000	34099200.000
Pool Paged Bytes	111991909.957	111550464.000	114753536.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

1/21/2013 2:30:30 PM -- Jetstress testing begins ...

1/21/2013 2:30:30 PM -- Preparing for testing ...

1/21/2013 2:30:32 PM -- Attaching databases ...

1/21/2013 2:30:32 PM -- Preparations for testing are complete.

1/21/2013 2:30:32 PM -- Starting transaction dispatch ..

1/21/2013 2:30:32 PM -- Database cache settings: (minimum: 64.0 MB, maximum: 512.0 MB)

1/21/2013 2:30:32 PM -- Database flush thresholds: (start: 5.1 MB, stop: 10.2 MB)

1/21/2013 2:30:35 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

Infortrend EonStor DS S12F-R2851 1,000-Mailbox Resiliency Storage Solution for Exchange 2010

1/21/2013 2:30:35 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

1/21/2013 2:30:38 PM -- Operation mix: Sessions 4, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

1/21/2013 2:30:38 PM -- Performance logging started (interval: 15000 ms).

1/21/2013 2:30:38 PM -- Generating log files ...

1/21/2013 3:28:32 PM -- F:\log1 (102.2% generated) and G:\log2 (100.2% generated)

1/21/2013 3:28:32 PM -- Performance logging has ended.

1/21/2013 3:28:32 PM -- JetInterop batch transaction stats: 22135 and 21716.

1/21/2013 3:28:32 PM -- Dispatching transactions ends.

1/21/2013 3:28:32 PM -- Shutting down databases ...

1/21/2013 3:28:33 PM -- Instance2812.1 (complete) and Instance2812.2 (complete)

1/21/2013 3:28:33 PM -- C:\Program Files\Exchange Jetstress\Performance_2013_1_21_14_30_35.blg has 231 samples.

1/21/2013 3:28:33 PM -- Creating test report ...

1/21/2013 3:28:34 PM -- Instance2812.1 has 13.8 for I/O Database Reads Average Latency.

1/21/2013 3:28:34 PM -- Instance2812.1 has 0.3 for I/O Log Writes Average Latency.

1/21/2013 3:28:34 PM -- Instance2812.1 has 0.3 for I/O Log Reads Average Latency.

1/21/2013 3:28:34 PM -- Instance2812.2 has 13.5 for I/O Database Reads Average Latency.

1/21/2013 3:28:34 PM -- Instance2812.2 has 0.3 for I/O Log Writes Average Latency.

1/21/2013 3:28:34 PM -- Instance2812.2 has 0.3 for I/O Log Reads Average Latency.

1/21/2013 3:28:34 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.

1/21/2013 3:28:34 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

1/21/2013 3:28:34 PM -- C:\Program Files\Exchange Jetstress\Performance_2013_1_21_14_30_35.xml has 230 samples queried..