Infortrend EonStor DS S12E-R2140 1,000-Mailbox Resiliency Storage Solution for Exchange 2010

Technical White Paper

Tested with: ESRP – Storage Version 3.0

Tested Date: 2012/05/16

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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

EonStor DS S12E-R2140 featured 1GbE iSCSI host connectivity and 6Gb/s SAS drive support, the product provides a budget-friendly choice to help SMB users easily deploy high-availability IP SANs. Accommodating 12 SAS or SATA drives, the dual-controller S12E-R2140 delivers optimal performance. The enterprise-class data protection and outstanding price-performance of the EonStor DS S12E-R2140 can generate significant business advantages.

Significant Feature List

- **Host Ports**: Eight 1GbE iSCSI ports.
- **Expansion Scalability**: Up to 84 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, sync and async remote replication for protecting data.

For more detail information of this product, please check the product link:
http://www.infortrend.com/global/products/models/ESDS S12E-R2140

Solution Description

Total HDD deployed: 8

- 7 spindles in a RAID 5 disk group
- 2 Exchange databases per disk group
- 1 spare drive

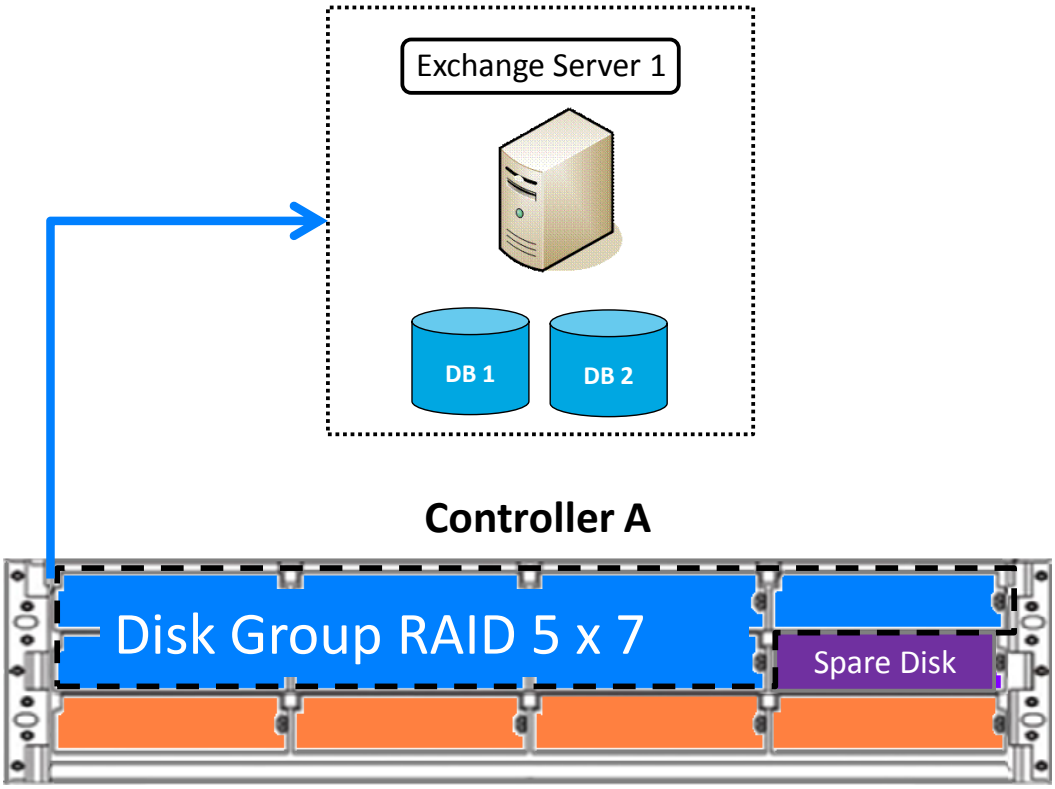

Figure 1: Solution configuration

One RAID5 disk group was created with 7 HDDs in this solution. The RAID group was hosted by one controller of the EonStor DS. In addition to the disk group, one HDD was deployed as the spare drive. The disk group was created one LUN for a total of 2 databases hosted by one active Exchange server. Figure 1 shows the complete architecture of this solution.

A total 2 databases were tested with one exchange server in this solution. The 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.

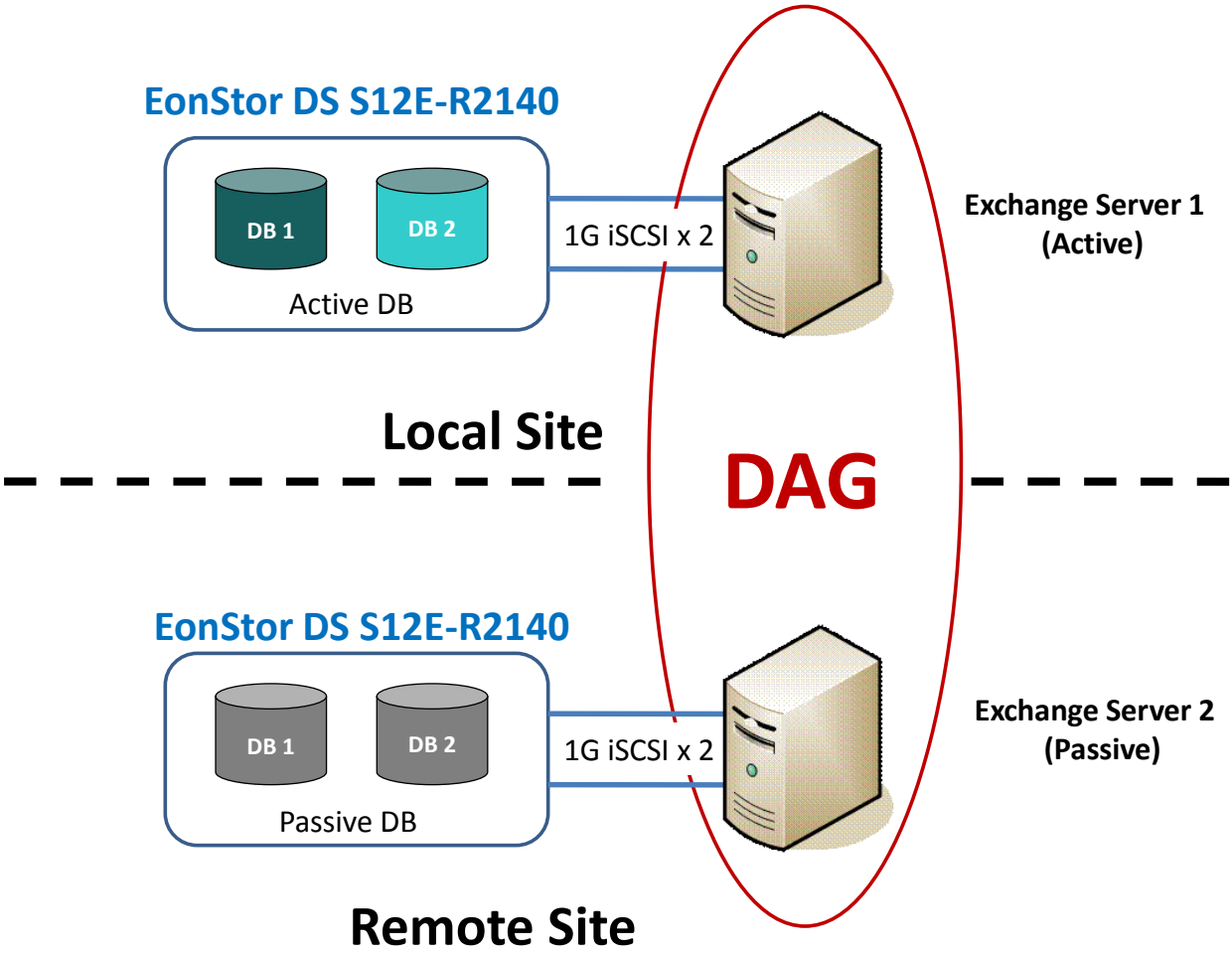

Figure 2: Database architecture

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

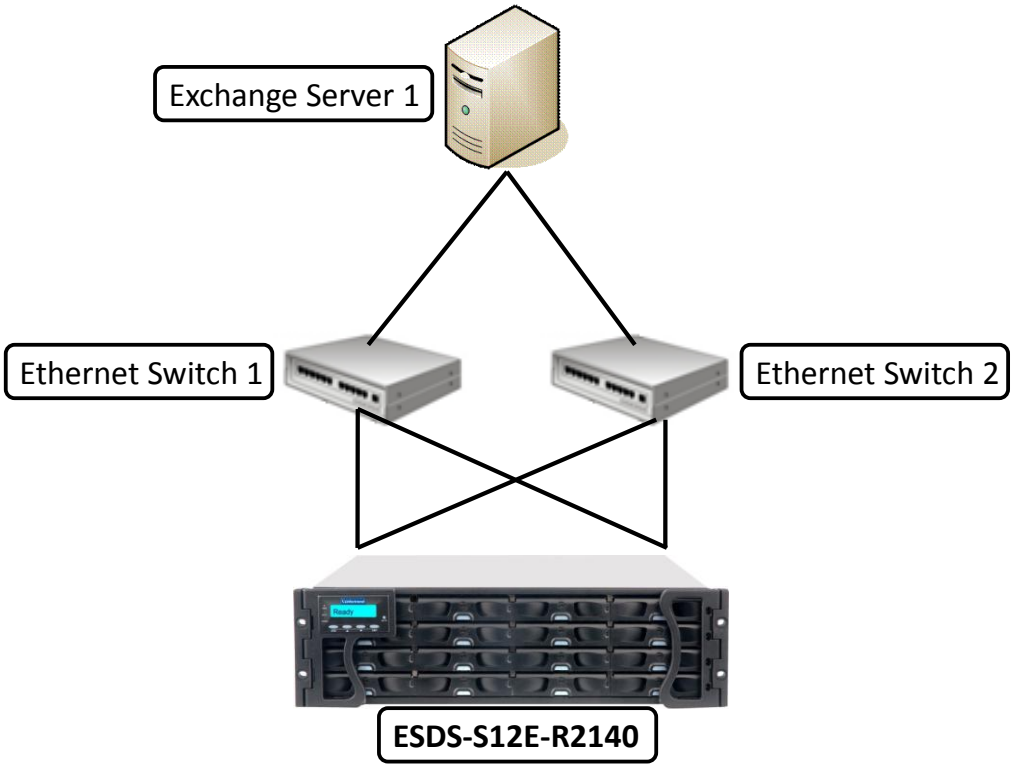

Figure 3: Solution connection topology

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 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 (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:

- 1,000 Mailboxes
- 1GB capacity for each Mailbox
- 0.3 User Profile (including 20% headroom)
- Tested with 1 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	1,000
Number of Database Availability Groups (DAGs)	1
Number of servers/DAG	2 servers (active & passive)
Number of active mailboxes/server	1,000
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)	0.3
Database/Log LUN size	500GB
Total database size for performance testing	1000GB
% storage capacity used by Exchange database**	28%

**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)	iSCSI
Storage model and OS/firmware revision	ESDS S12E-R2140 FW 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	2 Gbps bandwidth (2 x 1GbE)
Switch type/model/firmware revision	Ethernet switch 3Com Baseline Switch 2948-SFP Plus FW version: 1.00.09
HBA model and firmware	Intel PRO/1000 EB Network Connection with I/O Acceleration
Number of HBAs/host	Onboard dual port ethernet per host
Host server type	Intel Xeon E5405 2.00Ghz x 2 8GB RAM
Total number of disks tested in solution	8 (7 + spare disk)
Maximum number of spindles can be hosted in the storage	84

Storage Software

HBA driver	Driver version: 9.11.5.7
HBA QueueTarget Setting	N/A
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
HBA driver	EonPath-v1.23.2.48

Storage Disk Configuration (Mailbox Store Disks)

Disk type, speed and firmware revision	15000RPM SAS drive
Raw capacity per disk (GB)	600GB
Number of physical disks in test	7 + one spare disk
Total raw storage capacity (GB)	4200 GB
Disk slice size (GB)	N/A
Number of slices per LUN or number of disks per LUN	7 disks per 2 LUNs
RAID level	RAID 5
Total formatted capacity	3600GB
Storage capacity utilization	85.7%
Database capacity utilization	11.9%

Storage Disk Configuration (Transactional Log Disks)

Disk type, speed and firmware revision	15000RPM SAS drive
Raw capacity per disk (GB)	600GB
Number of Spindles in test	7
Total raw storage capacity (GB)	4200GB
Disk slice size (GB)	N/A
Number of slices per LUN or number of disks per LUN	7 disks per 2 LUNs
RAID level	RAID 5
Total formatted capacity	3600GB

Best Practices

Exchange server is a disk-intensive application. Based on the testing run using the ESRP framework, Infortrend 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 S16E-R2142, please visit the product solution webpage: http://www.infortrend.com/global/products/models/ESDS S16E-R2142

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	348.073
Database Disks Reads/sec	200.726
Database Disks Writes/sec	147.347
Average Database Disk Read Latency (ms)	16.774
Average Database Disk Write Latency (ms)	5.489

Transaction Log I/O	
Log Disks Writes/sec	123.976
Average Log Disk Write Latency (ms)	0.879

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	55.86
MB read/sec total per server	111.72

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)	1.26

Conclusion

The information discussed in this report describes the best practices and test report for EonStor DS S12E-R2140 supporting 1,000 users. The test was conducted under the environment listed in the Tested Deployment section. The test result shows that the S12E-R2140 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: 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-BJOQTS92TBD
Test Description	
Test Start Time	5/14/2012 1:04:19 PM
Test End Time	5/14/2012 3:06:24 PM
Collection Start Time	5/14/2012 1:06:18 PM
Collection End Time	5/14/2012 3:06:14 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	339.059
Target Transactional I/O per Second	300
Initial Database Size (bytes)	861537435648
Final Database Size (bytes)	875043094528
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

Instance1364.1	Log path: F:\DB1 Database: F:\DB1\Jetstress001001.edb
Instance1364.2	Log path: G:\DB2 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
Instance1364.1	17.024	6.694	97.453	72.157	33402.389	35440.315	0.000	0.912	0.000	58.719	0.000	4772.168
Instance1364.2	17.340	4.575	97.360	72.089	33385.821	35449.434	0.000	0.919	0.000	58.702	0.000	4767.267

Background Database Maintenance I/O Performance

MSExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes
Instance1364.1	24.390	261090.348
Instance1364.2	24.559	261119.930

Log Replication I/O Performance

MSExchange Database ==> Instances	I/O Log Reads/sec	I/O Log Reads Average Bytes
Instance1364.1	1.140	232558.293
Instance1364.2	1.139	232555.838

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
Instance1364.1	17.024	6.694	121.843	72.157	78979.965	35440.315	4.329	0.912	1.140	58.719	232558.293	4772.168

Instance1364.2	17.340	4.575	121.920	72.089	79260.090	35449.434	3.669	0.919	1.139	58.702	232555.838	4767.267

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	3.391	0.508	7.370
Available MBytes	13962.810	13942.000	14001.000
Free System Page Table Entries	33555607.034	33555584.000	33555610.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	101153078.044	100237312.000	103084032.000
Pool Paged Bytes	82448014.222	81768448.000	86192128.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

5/14/2012 7:09:19 PM -- Jetstress testing begins ...

5/14/2012 7:09:19 PM -- Preparing for testing ...

5/14/2012 7:09:21 PM -- Attaching databases ...

5/14/2012 7:09:21 PM -- Preparations for testing are complete.

5/14/2012 7:09:21 PM -- Starting transaction dispatch ..

5/14/2012 7:09:21 PM -- Database cache settings: (minimum: 64.0 MB, maximum: 512.0 MB)

5/14/2012 7:09:21 PM -- Database flush thresholds: (start: 5.1 MB, stop: 10.2 MB)

5/14/2012 7:09:24 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

5/14/2012 7:09:24 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

5/14/2012 7:09:28 PM -- Operation mix: Sessions 4, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

5/14/2012 7:09:28 PM -- Performance logging started (interval: 15000 ms).

5/14/2012 7:09:28 PM -- Attaining prerequisites:

5/14/2012 7:11:20 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 483209200.0 (lower bound: 483183800.0, upper bound: none)

5/15/2012 7:11:21 PM -- Performance logging has ended.

5/15/2012 7:11:21 PM -- JetInterop batch transaction stats: 476945 and 477476.

5/15/2012 7:11:21 PM -- Dispatching transactions ends.

5/15/2012 7:11:21 PM -- Shutting down databases ...

5/15/2012 7:11:26 PM -- Instance1364.1 (complete) and Instance1364.2 (complete)

5/15/2012 7:11:26 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\stress test\Performance_2012_5_14_19_9_24.blg has 5767 samples.

5/15/2012 7:11:26 PM -- Creating test report ...

5/15/2012 7:11:50 PM -- Instance1364.1 has 17.0 for I/O Database Reads Average Latency.

5/15/2012 7:11:50 PM -- Instance1364.1 has 0.9 for I/O Log Writes Average Latency.

5/15/2012 7:11:50 PM -- Instance1364.1 has 0.9 for I/O Log Reads Average Latency.

5/15/2012 7:11:50 PM -- Instance1364.2 has 17.3 for I/O Database Reads Average Latency.

5/15/2012 7:11:50 PM -- Instance1364.2 has 0.9 for I/O Log Writes Average Latency.

5/15/2012 7:11:50 PM -- Instance1364.2 has 0.9 for I/O Log Reads Average Latency.

5/15/2012 7:11:50 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.

5/15/2012 7:11:50 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

5/15/2012 7:11:50 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\stress test\Performance_2012_5_14_19_9_24.xml has 5759 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	13352226	0	0	0	417257 MB/7308 sec
G:\DB2\Jetstress002001.edb	13351970	0	0	0	417249 MB/7421 sec
(Sum)	26704196	0	0	0	834506 MB/7421 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:	0.058	0.000	913.871	0.000	65536.000
G:	0.059	0.000	898.111	0.000	65536.000

Memory System Performance (of checksum)

Counter	Average	Minimum	Maximum
% Processor Time	6.828	6.335	7.539
Available MBytes	14473.874	14463.000	14483.000
Free System Page Table Entries	33555594.555	33555592.000	33555610.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	102887788.826	102785024.000	102965248.000
Pool Paged Bytes	85250528.907	84738048.000	85733376.000

Test Log

5/14/2012 7:09:19 PM -- Jetstress testing begins ...

5/14/2012 7:09:19 PM -- Preparing for testing ...

5/14/2012 7:09:21 PM -- Attaching databases ...

5/14/2012 7:09:21 PM -- Preparations for testing are complete.

5/14/2012 7:09:21 PM -- Starting transaction dispatch ..

5/14/2012 7:09:21 PM -- Database cache settings: (minimum: 64.0 MB, maximum: 512.0 MB)

5/14/2012 7:09:21 PM -- Database flush thresholds: (start: 5.1 MB, stop: 10.2 MB)

5/14/2012 7:09:24 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

5/14/2012 7:09:24 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

5/14/2012 7:09:28 PM -- Operation mix: Sessions 4, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

5/14/2012 7:09:28 PM -- Performance logging started (interval: 15000 ms).

5/14/2012 7:09:28 PM -- Attaining prerequisites:

5/14/2012 7:11:20 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 483209200.0 (lower bound: 483183800.0, upper bound: none)

5/15/2012 7:11:21 PM -- Performance logging has ended.

5/15/2012 7:11:21 PM -- JetInterop batch transaction stats: 476945 and 477476.

5/15/2012 7:11:21 PM -- Dispatching transactions ends.

5/15/2012 7:11:21 PM -- Shutting down databases ...

5/15/2012 7:11:26 PM -- Instance1364.1 (complete) and Instance1364.2 (complete)

5/15/2012 7:11:26 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\stress test\Performance_2012_5_14_19_9_24.blg has 5767 samples.

5/15/2012 7:11:26 PM -- Creating test report ...

5/15/2012 7:11:50 PM -- Instance1364.1 has 17.0 for I/O Database Reads Average Latency.

5/15/2012 7:11:50 PM -- Instance1364.1 has 0.9 for I/O Log Writes Average Latency.

5/15/2012 7:11:50 PM -- Instance1364.1 has 0.9 for I/O Log Reads Average Latency.

5/15/2012 7:11:50 PM -- Instance1364.2 has 17.3 for I/O Database Reads Average Latency.

5/15/2012 7:11:50 PM -- Instance1364.2 has 0.9 for I/O Log Writes Average Latency.

5/15/2012 7:11:50 PM -- Instance1364.2 has 0.9 for I/O Log Reads Average Latency.

5/15/2012 7:11:50 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.

5/15/2012 7:11:50 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

5/15/2012 7:11:50 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\stress test\Performance_2012_5_14_19_9_24.xml has 5759 samples queried.

5/15/2012 7:11:50 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\stress test\Performance_2012_5_14_19_9_24.html was saved.

5/15/2012 7:11:51 PM -- Performance logging started (interval: 30000 ms).

5/15/2012 7:11:51 PM -- Verifying database checksums ...

5/15/2012 9:15:33 PM -- F: (100% processed) and G: (100% processed)

5/15/2012 9:15:33 PM -- Performance logging has ended.

5/15/2012 9:15:33 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\stress test\DBChecksum_2012_5_15_19_11_50.blg has 247 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-BJOQTS92TBD
Test Description	
Test Start Time	5/14/2012 1:04:19 PM
Test End Time	5/14/2012 3:06:24 PM
Collection Start Time	5/14/2012 1:06:18 PM
Collection End Time	5/14/2012 3:06:14 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	348.073
Target Transactional I/O per Second	300
Initial Database Size (bytes)	860346253312
Final Database Size (bytes)	861537435648
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

Instance1364.1	Log path: F:\DB1 Database: F:\DB1\Jetstress001001.edb

Instance1364.2	Log path: G:\DB2 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
Instance1364.1	16.620	6.635	99.915	73.336	33400.403	36340.717	0.000	0.878	0.000	61.674	0.000	4793.768
Instance1364.2	16.928	4.343	100.811	74.011	33224.747	36310.639	0.000	0.880	0.000	62.302	0.000	4765.697

Background Database Maintenance I/O Performance

MSExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes
Instance1364.1	24.258	261215.154
Instance1364.2	25.288	261194.994

Log Replication I/O Performance

MSExchange Database ==> Instances	I/O Log Reads/sec	I/O Log Reads Average Bytes
Instance1364.1	1.202	232561.778
Instance1364.2	1.209	232566.479

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
Instance1364.1	16.620	6.635	124.174	73.336	77905.394	36340.717	3.704	0.878	1.202	61.674	232561.778	4793.768
Instance1364.2	16.928	4.343	126.099	74.011	78941.766	36310.639	3.682	0.880	1.209	62.302	232566.479	4765.697

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	3.489	0.677	8.828
Available MBytes	13935.033	13916.000	13963.000
Free System Page Table Entries	33555607.444	33555593.000	33555610.000
Transition Pages RePurposed/sec	0.000	0.000	0.000

Pool Nonpaged Bytes	99873237.333	99557376.000	100114432.000
Pool Paged Bytes	81593224.533	81416192.000	81698816.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

5/14/2012 1:04:19 PM -- Jetstress testing begins ...

5/14/2012 1:04:19 PM -- Preparing for testing ...

5/14/2012 1:04:21 PM -- Attaching databases ...

5/14/2012 1:04:21 PM -- Preparations for testing are complete.

5/14/2012 1:04:21 PM -- Starting transaction dispatch ..

5/14/2012 1:04:22 PM -- Database cache settings: (minimum: 64.0 MB, maximum: 512.0 MB)

5/14/2012 1:04:22 PM -- Database flush thresholds: (start: 5.1 MB, stop: 10.2 MB)

5/14/2012 1:04:24 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

5/14/2012 1:04:24 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

5/14/2012 1:04:28 PM -- Operation mix: Sessions 4, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

5/14/2012 1:04:28 PM -- Performance logging started (interval: 15000 ms).

5/14/2012 1:04:28 PM -- Attaining prerequisites:

5/14/2012 1:06:18 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 483905500.0 (lower bound: 483183800.0, upper bound: none)

5/14/2012 3:06:19 PM -- Performance logging has ended.

5/14/2012 3:06:19 PM -- JetInterop batch transaction stats: 42623 and 42887.

5/14/2012 3:06:19 PM -- Dispatching transactions ends.

5/14/2012 3:06:19 PM -- Shutting down databases ...

5/14/2012 3:06:24 PM -- Instance1364.1 (complete) and Instance1364.2 (complete)

5/14/2012 3:06:24 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\performance\Performance_2012_5_14_13_4_24.blg has 487 samples.

5/14/2012 3:06:24 PM -- Creating test report ...

5/14/2012 3:06:27 PM -- Instance1364.1 has 16.6 for I/O Database Reads Average Latency.

5/14/2012 3:06:27 PM -- Instance1364.1 has 0.9 for I/O Log Writes Average Latency.

5/14/2012 3:06:27 PM -- Instance1364.1 has 0.9 for I/O Log Reads Average Latency.

5/14/2012 3:06:27 PM -- Instance1364.2 has 16.9 for I/O Database Reads Average Latency.

5/14/2012 3:06:27 PM -- Instance1364.2 has 0.9 for I/O Log Writes Average Latency.

5/14/2012 3:06:27 PM -- Instance1364.2 has 0.9 for I/O Log Reads Average Latency.

5/14/2012 3:06:27 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.

5/14/2012 3:06:27 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

5/14/2012 3:06:27 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\performance\Performance_2012_5_14_13_4_24.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	13146146	0	0	0	410817 MB/7273 sec
G:\DB2\Jetstress002001.edb	13145890	0	0	0	410809 MB/7314 sec
(Sum)	26292036	0	0	0	821626 MB/7315 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:	0.058	0.000	904.443	0.000	65536.000
G:	0.059	0.000	896.055	0.000	65536.000

Memory System Performance (of checksum)

Counter	Average	Minimum	Maximum
% Processor Time	6.796	6.335	9.076
Available MBytes	14447.444	14432.000	14454.000
Free System Page Table Entries	33555594.782	33555593.000	33555610.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	100688327.111	100597760.000	100843520.000
Pool Paged Bytes	81870595.160	81829888.000	81981440.000

Test Log

5/14/2012 1:04:19 PM -- Jetstress testing begins ...

5/14/2012 1:04:19 PM -- Preparing for testing ...

5/14/2012 1:04:21 PM -- Attaching databases ...

5/14/2012 1:04:21 PM -- Preparations for testing are complete.

5/14/2012 1:04:21 PM -- Starting transaction dispatch ..

5/14/2012 1:04:22 PM -- Database cache settings: (minimum: 64.0 MB, maximum: 512.0 MB)

5/14/2012 1:04:22 PM -- Database flush thresholds: (start: 5.1 MB, stop: 10.2 MB)

5/14/2012 1:04:24 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

5/14/2012 1:04:24 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

5/14/2012 1:04:28 PM -- Operation mix: Sessions 4, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

5/14/2012 1:04:28 PM -- Performance logging started (interval: 15000 ms).

5/14/2012 1:04:28 PM -- Attaining prerequisites:

5/14/2012 1:06:18 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 483905500.0 (lower bound: 483183800.0, upper bound: none)

5/14/2012 3:06:19 PM -- Performance logging has ended.

5/14/2012 3:06:19 PM -- JetInterop batch transaction stats: 42623 and 42887.

5/14/2012 3:06:19 PM -- Dispatching transactions ends.

5/14/2012 3:06:19 PM -- Shutting down databases ...

5/14/2012 3:06:24 PM -- Instance1364.1 (complete) and Instance1364.2 (complete)

5/14/2012 3:06:24 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\performance\Performance_2012_5_14_13_4_24.blg has 487 samples.

5/14/2012 3:06:24 PM -- Creating test report ...

5/14/2012 3:06:27 PM -- Instance1364.1 has 16.6 for I/O Database Reads Average Latency.

5/14/2012 3:06:27 PM -- Instance1364.1 has 0.9 for I/O Log Writes Average Latency.

5/14/2012 3:06:27 PM -- Instance1364.1 has 0.9 for I/O Log Reads Average Latency.

5/14/2012 3:06:27 PM -- Instance1364.2 has 16.9 for I/O Database Reads Average Latency.

5/14/2012 3:06:27 PM -- Instance1364.2 has 0.9 for I/O Log Writes Average Latency.

5/14/2012 3:06:27 PM -- Instance1364.2 has 0.9 for I/O Log Reads Average Latency.

5/14/2012 3:06:27 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.

5/14/2012 3:06:27 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

5/14/2012 3:06:27 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\performance\Performance_2012_5_14_13_4_24.xml has 479 samples queried.

5/14/2012 3:06:27 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\performance\Performance_2012_5_14_13_4_24.html was saved.

5/14/2012 3:06:28 PM -- Performance logging started (interval: 30000 ms).

5/14/2012 3:06:28 PM -- Verifying database checksums ...

5/14/2012 5:08:23 PM -- F: (100% processed) and G: (100% processed)

5/14/2012 5:08:23 PM -- Performance logging has ended.

5/14/2012 5:08:23 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\performance\DBChecksum_2012_5_14_15_6_27.blg has 243 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
Instance1364.1	417249.09	02:03:45	56.19
Instance1364.2	417241.09	02:05:13	55.53

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

Instance1364.1	Log path: F:\DB1 Database: F:\DB1\Jetstress001001.edb
Instance1364.2	Log path: G:\DB2 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
Instance1364.1	7.635	0.000	224.861	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance1364.2	7.756	0.000	221.793	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	5.708	4.746	8.366
Available MBytes	14450.368	14376.000	14487.000
Free System Page Table Entries	33555593.612	33555591.000	33555610.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	103012270.080	102727680.000	103604224.000
Pool Paged Bytes	90476118.016	85127168.000	113164288.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

5/16/2012 9:36:20 AM -- Jetstress testing begins ...

5/16/2012 9:36:20 AM -- Preparing for testing ...

5/16/2012 9:36:22 AM -- Attaching databases ...

5/16/2012 9:36:22 AM -- Preparations for testing are complete.

5/16/2012 9:36:27 AM -- Performance logging started (interval: 30000 ms).

5/16/2012 9:36:27 AM -- Backing up databases ...

5/16/2012 11:41:41 AM -- Performance logging has ended.

5/16/2012 11:41:41 AM -- Instance1364.1 (100% processed) and Instance1364.2 (100% processed)

5/16/2012 11:41:41 AM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\DB backup\DatabaseBackup_2012_5_16_9_36_22.blg has 250 samples.

5/16/2012 11:41:41 AM -- 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
Instance1364.1	503	637.765625
Instance1364.2	500	627.015625

Database Configuration

Instance1364.1	Log path: F:\DB1 Database: F:\DB1\Jetstress001001.edb
Instance1364.2	Log path: G:\DB2 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
Instance1364.1	92.291	38.741	841.150	4.731	37485.320	32044.416	13.565	0.000	7.096	0.000	225780.054	0.000
Instance1364.2	95.601	39.280	844.662	4.787	38629.357	31717.744	12.313	0.000	7.180	0.000	223215.229	0.000

Background Database Maintenance I/O Performance

MSExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes
Instance1364.1	12.980	261380.587
Instance1364.2	12.832	261217.141

Total I/O Performance

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

	(msec)	(msec)										
Instance1364.1	92.291	38.741	854.130	4.731	40887.809	32044.416	13.565	0.000	7.096	0.000	225780.054	0.000
Instance1364.2	95.601	39.280	857.495	4.787	41960.391	31717.744	12.313	0.000	7.180	0.000	223215.229	0.000

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	6.501	0.195	18.457
Available MBytes	13878.450	13853.000	14359.000
Free System Page Table Entries	33555601.730	33555581.000	33555610.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	107217333.937	104353792.000	107687936.000
Pool Paged Bytes	116754109.987	116699136.000	116912128.000
Database Page Fault Stalls/sec	0.011	0.000	1.000

Test Log

5/16/2012 12:00:04 PM -- Jetstress testing begins ...

5/16/2012 12:00:04 PM -- Preparing for testing ...

5/16/2012 12:00:06 PM -- Attaching databases ...

5/16/2012 12:00:06 PM -- Preparations for testing are complete.

5/16/2012 12:00:06 PM -- Starting transaction dispatch ..

5/16/2012 12:00:06 PM -- Database cache settings: (minimum: 64.0 MB, maximum: 512.0 MB)

5/16/2012 12:00:06 PM -- Database flush thresholds: (start: 5.1 MB, stop: 10.2 MB)

5/16/2012 12:00:08 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

5/16/2012 12:00:08 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

5/16/2012 12:00:11 PM -- Operation mix: Sessions 4, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

5/16/2012 12:00:11 PM -- Performance logging started (interval: 15000 ms).

5/16/2012 12:00:11 PM -- Generating log files ...

5/16/2012 1:01:52 PM -- F:\DB1 (100.8% generated) and G:\DB2 (100.2% generated)

5/16/2012 1:01:52 PM -- Performance logging has ended.

5/16/2012 1:01:52 PM -- JetInterop batch transaction stats: 21820 and 21761.

5/16/2012 1:01:52 PM -- Dispatching transactions ends.

5/16/2012 1:01:52 PM -- Shutting down databases ...

5/16/2012 1:01:58 PM -- Instance1364.1 (complete) and Instance1364.2 (complete)

5/16/2012 1:01:58 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\Soft Recovery\Performance_2012_5_16_12_0_8.blg has 246 samples.

5/16/2012 1:01:58 PM -- Creating test report ...

5/16/2012 1:01:59 PM -- Instance1364.1 has 16.8 for I/O Database Reads Average Latency.

5/16/2012 1:01:59 PM -- Instance1364.1 has 0.8 for I/O Log Writes Average Latency.

5/16/2012 1:01:59 PM -- Instance1364.1 has 0.8 for I/O Log Reads Average Latency.

5/16/2012 1:01:59 PM -- Instance1364.2 has 17.2 for I/O Database Reads Average Latency.

5/16/2012 1:01:59 PM -- Instance1364.2 has 0.8 for I/O Log Writes Average Latency.

5/16/2012 1:01:59 PM -- Instance1364.2 has 0.8 for I/O Log Reads Average Latency.

5/16/2012 1:01:59 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.

5/16/2012 1:01:59 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

5/16/2012 1:01:59 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\Soft Recovery\Performance_2012_5_16_12_0_8.xml has 245 samples queried.

5/16/2012 1:01:59 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\Soft Recovery\Performance_2012_5_16_12_0_8.html was saved.

5/16/2012 1:02:03 PM -- Performance logging started (interval: 2000 ms).

5/16/2012 1:02:03 PM -- Recovering databases ...

5/16/2012 1:12:40 PM -- Performance logging has ended.

5/16/2012 1:12:40 PM -- Instance1364.1 (637.765625) and Instance1364.2 (627.015625)

5/16/2012 1:12:41 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\Soft Recovery\SoftRecovery_2012_5_16_13_1_59.blg has 318 samples.

5/16/2012 1:12:41 PM -- Creating test report ...

Soft Recovery Performance Test Result Report (Server 1)

Test Summary

Overall Test Result	Pass
Machine Name	WIN-BJOQTS92TBD
Test Description	
Test Start Time	5/16/2012 12:00:04 PM
Test End Time	5/16/2012 1:01:58 PM
Collection Start Time	5/16/2012 12:00:26 PM
Collection End Time	5/16/2012 1:01:42 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	360.931
Target Transactional I/O per Second	300
Initial Database Size (bytes)	875043094528
Final Database Size (bytes)	875672240128
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%

Database Configuration

Instance1364.1	Log path: F:\DB1 Database: F:\DB1\Jetstress001001.edb
Instance1364.2	Log path: G:\DB2 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
Instance1364.1	16.834	10.305	103.771	77.353	32768.000	35168.225	0.000	0.766	0.000	63.316	0.000	4738.694
Instance1364.2	17.232	5.248	103.006	76.801	32768.000	35159.790	0.000	0.765	0.000	63.572	0.000	4694.093

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	3.505	0.677	6.289
Available MBytes	13871.065	13862.000	14233.000
Free System Page Table Entries	33555607.927	33555600.000	33555610.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	104241035.447	103686144.000	104398848.000
Pool Paged Bytes	116653763.642	116506624.000	116850688.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

5/16/2012 12:00:04 PM -- Jetstress testing begins ...

5/16/2012 12:00:04 PM -- Preparing for testing ...

5/16/2012 12:00:06 PM -- Attaching databases ...

5/16/2012 12:00:06 PM -- Preparations for testing are complete.

5/16/2012 12:00:06 PM -- Starting transaction dispatch ..

5/16/2012 12:00:06 PM -- Database cache settings: (minimum: 64.0 MB, maximum: 512.0 MB)

5/16/2012 12:00:06 PM -- Database flush thresholds: (start: 5.1 MB, stop: 10.2 MB)

5/16/2012 12:00:08 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).

5/16/2012 12:00:08 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).

5/16/2012 12:00:11 PM -- Operation mix: Sessions 4, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.

5/16/2012 12:00:11 PM -- Performance logging started (interval: 15000 ms).

5/16/2012 12:00:11 PM -- Generating log files ...

5/16/2012 1:01:52 PM -- F:\DB1 (100.8% generated) and G:\DB2 (100.2% generated)

5/16/2012 1:01:52 PM -- Performance logging has ended.

5/16/2012 1:01:52 PM -- JetInterop batch transaction stats: 21820 and 21761.

5/16/2012 1:01:52 PM -- Dispatching transactions ends.

5/16/2012 1:01:52 PM -- Shutting down databases ...

5/16/2012 1:01:58 PM -- Instance1364.1 (complete) and Instance1364.2 (complete)

5/16/2012 1:01:58 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\Soft Recovery\Performance_2012_5_16_12_0_8.blg has 246 samples.

5/16/2012 1:01:58 PM -- Creating test report ...

5/16/2012 1:01:59 PM -- Instance1364.1 has 16.8 for I/O Database Reads Average Latency.

5/16/2012 1:01:59 PM -- Instance1364.1 has 0.8 for I/O Log Writes Average Latency.

5/16/2012 1:01:59 PM -- Instance1364.1 has 0.8 for I/O Log Reads Average Latency.

5/16/2012 1:01:59 PM -- Instance1364.2 has 17.2 for I/O Database Reads Average Latency.

5/16/2012 1:01:59 PM -- Instance1364.2 has 0.8 for I/O Log Writes Average Latency.

5/16/2012 1:01:59 PM -- Instance1364.2 has 0.8 for I/O Log Reads Average Latency.

5/16/2012 1:01:59 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.

5/16/2012 1:01:59 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.

5/16/2012 1:01:59 PM -- C:\Users\Administrator\Desktop\formal result\S12E-R2142-6\15k SAS 600GB x 3\1R\2 Server (Active - Passive)\Server 1\Soft Recovery\Performance_2012_5_16_12_0_8.xml has 245 samples queried.