

Intel® 800 Mailbox Exchange Server 2007 Storage Solution

Intel® Server Chassis SC5400 and Server Board S5000PSL

Tested with: ESRP – Storage Version 2.1, Windows Server 2003 R2

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Hardware Components

Quantity	Item	Manufacturer	Model
One	Intel® Server Board	Intel	S5000PSL. Additional information is available at: http://www.intel.com/products/server/motherboards/s5000psl/s5000psl-overview.htm .
One	Intel® Server Chassis	Intel	SC5400. Additional information is available at: http://www.intel.com/products/server/chassis/sc5400/sc5400-overview.htm .
One (Select one)	Intel® RAID Controller	Intel	SRCSASJV. Additional information is available at: http://www.intel.com/products/server/raid-controllers/srcsasjv/srcsasjv-overview.htm .
	Intel® RAID Controller	Intel	SRCSASRB. Additional information is available at: http://www.intel.com/products/server/raid-controllers/srcsasrb/srcsasrb-overview.htm .
Two	Intel® Xeon® Processors	Intel	Please refer to the Supported Processor List at http://www.intel.com/support/motherboards/server/sb/CS-022346.htm . Processors must support Intel® EM64T.
4 GB minimum	Memory	Any supported	Please refer to the Tested Memory List at http://www.intel.com/support/motherboards/server/s5000psl/sb/CS-022924.htm .
One (60 GB minimum)	SAS or SATA 3.5-inch hard drives	Any supported	Please refer to the Server Hard Drive Validation Test Report at http://www.intel.com/support/motherboards/server/sb/CS-025416.htm .

Table 1 - Intel® Server Board S5000PSL Hardware Configuration

Software Components

Item	Version	Manufacturer	Comment
1	Windows Server 2003 R2	Microsoft	Any 64-bit edition
1	Exchange Server 2007	Microsoft	Available in 64-bit only

Table 2 - Installation Software BOM



Introduction

This document provides information on Intel's storage solution for Microsoft Exchange Server 2007, based on the Microsoft Exchange Solution Reviewed Program (ESRP) – Storage program*.

*The ESRP – Storage program was developed by Microsoft Corporation to provide a common storage testing framework for vendors to provide information on its storage solutions for Microsoft Exchange Server 2007 software. For more details on the Microsoft ESRP – Storage program, please view:

<http://www.microsoft.com/technet/prodtechnol/exchange/2007/esrp.mspix>.

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Features

This document describes an Exchange storage solution for 800 users on the Intel® Server Chassis SC5400 storage system. The tested user profile was 0.30 IOPS per user with a mailbox limit of 250 MB.

Solution Description

The tested solution consists of one Intel® server chassis and server board with an Intel® SRCSASRB RAID controller and 6 500GB SATA-interface desktop-class disk drives installed into the 4-drive and 6-drive cages in the Intel® SC5400 system chassis. This configuration includes 5TB of raw capacity. The Intel® SRCSASRB controller supports SAS and SATA interfaces to disk drives, and can support a mixture of SAS and SATA interface disk drives.

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 other 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 bottlenecks in an Exchange system, please refer to Microsoft's Troubleshooting Microsoft Exchange Server Performance, available at <http://go.microsoft.com/fwlink/?LinkId=23454>.

Test Server Configuration

Component	Description
Server Chassis	Intel® SC5400
Server Board	Intel® S500PSL
CPU	2 Intel® Xeon® E5320, quad-core, 1.86 GHz (8 total cores)
Memory	4 GB DDR2 ECC
NIC	Dual Intel® Gigabit Ethernet (Intel® 82563EB)
RAID Controller	Intel® SRCASRB
Internal Boot Disk	Qty. 1 - Seagate 320GB
Disk Array Disks	Qty. 6 - Seagate Barracuda 7200.11, ST3500320AS, 500GB, 7200 RPM

Targeted Customer Profile

This solution is intended for small and medium-sized organization hosting up to 800 mailboxes. The configuration used for testing is:

- Number of mailboxes: 800
- Number of hosts: 1
- User I/O profile: 0.30 I/O per second (IOPS)
- 3 Storage Groups, 3 Databases
- Mailbox size: 250 MB



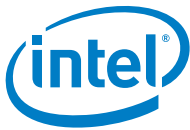
Tested Deployment

The following tables summarize the testing environment:

Description	Data
Number of Exchange mailboxes simulated	800
Number of hosts	1
Number of storage groups / host	3
Number of mailbox stores / storage group	1
Number of mailboxes / mailbox store	267
Number of mailbox store LUNs / storage group	1
Simulated profile: I/O's per second per mailbox	0.30 IOPS
Database LUN size	930 GB
Log LUN size	465 GB
Backup LUN size / storage group	N/A
Total database size for performance testing	195.3 GB
% storage capacity used by Exchange database	20%

Primary Storage Hardware

Component	Description
Storage Connectivity (Fibre Channel, SAS, SATA, iSCSI)	SAS/SATA
Storage model and OS firmware	
Storage cache	256 MB
Number of storage controllers	1
Number of storage ports	2
Maximum bandwidth of storage	6 Gb/sec (2 x 3 Gb SAS ports)
Adapter model and firmware	Intel® SRCSASRB
Number of adapters / host	1
Host server type	Intel® S5000PSL, 2 Intel® Xeon® E5320 quad-core (1.86 GHz), 8 total cores
Total number of disks tested in solution	6
Maximum number of spindles can be hosted in the storage	10



Primary Storage Software

Component	Description
HBA driver	Intel® SRCSASRB
HBA Queue Target Setting	N/A
HBA Queue Depth Setting	N/A
Multi-Pathing	N/A
Host OS	MS Windows Server 2003 R2 Enterprise x64 Edition w/ Service Pack 1
ESE.dll file version	08.00.0685.024
Replication solution name / version	N/A

Primary Storage Disk Configuration (Mailbox Store Disks)

Component	Description
Disk type, speed and firmware revision	Seagate SATA, 7200 RPM, SD15 (ST3500329AS)
Raw capacity per disk (GB)	465.8
Number of physical disks in test	4
Total raw storage capacity (GB)	1863.2
Number of slices per LUN or number of disks per LUN	2
RAID level	RAID 10
Total formatted capacity	930

Primary Storage Disk Configuration (Transactional Log Disks)

Component	Description
Disk type, speed and firmware revision	Seagate SATA, 7200 RPM, SD15 (ST3500329AS)
Raw capacity per disk (GB)	465.8
Number of physical disks in test	2
Total raw storage capacity (GB)	931.6
Number of slices per LUN or number of disks per LUN	2
RAID level	RAID 1
Total formatted capacity	464.7



Best Practices

Exchange Server is a disk-intensive application. Based on the testing runs using the ESRP framework, we recommend the following Microsoft best practices for storage system design for Exchange Server 2007, available at: <http://technet.microsoft.com/en-us/library/bb124518.aspx>.

Contact for Additional Information

Consult the *Certified Intel RAID Configurations for Microsoft Exchange Servers* document available at: <http://www.intelraid.com/tech.php>.

Test Result Summary

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

Reliability

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

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

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

Primary Storage Performance Results

The Primary Storage performance testing is designed to exercise the storage with maximum sustainable Exchange type of I/O for 2 hours. The test is to show how long it takes for the storage to respond to an I/O under load. The data below is the sum of all of the logical disk I/O's and average of all the logical disks I/O latency in the 2 hours test duration. Each server is listed separately and the aggregate numbers across all servers is listed as well.

Individual Server Metrics:

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

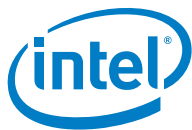


I/O Component	Metric
Database I/O	
Average Database Disk Transfers/sec	155.443
Average Database Disk Reads/sec	161.024
Average Database Disk Writes/sec	149.861
Average Database Disk Read Latency (ms)	0.018
Average Database Disk Write Latency (ms)	0.047
Transaction Log I/O	
Average Log Disk Writes/sec	97.019
Average Log Disk Write Latency (ms)	0.001

Conclusion

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

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



Appendix A - Test Results

Microsoft Exchange Server Jetstress 24 Hour Reliability

Microsoft Exchange Server **Jetstress**

Stress Test Result Report

Test Summary

Overall Test Result **Pass**

Machine Name DMRTK-SRVR-12

Test Description Intel SRCASRB 6-SATA drives, mailboxes=0800, size=250, IOPS=0.3, threads=3, DB=RAID10(2+2), Log=RAID1(1+1), SG=3, Partition=1

Test Start Time 3/21/2009 9:31:43 PM

Test End Time 3/22/2009 9:48:25 PM

Jetstress Version 08.02.0060.000

Ese Version 08.00.0685.024

Operating System Microsoft Windows Server 2003 R2 Service Pack 2 (5.2.3790.131072)

Performance Log C:\Data\Jetstress\Stress_2009_3_21_21_31_50.blg
C:\Data\Jetstress\DBChecksum_2009_3_22_21_48_25.blg

Database Sizing and Throughput

Achieved I/O per Second 310.885

Target I/O per Second 240

Initial database size 213061779456

Final database size 244550909952

Database files (count) 3

Jetstress System Parameters

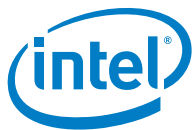
Thread count 3 (per-storage group)

Log buffers 9000

Minimum database cache 96.0 MB

Maximum database cache 768.0 MB

Insert operations 25%



Delete operations 10%
Replace operations 50%
Read operations 15%
Lazy commits 80%

Disk Subsystem Performance

LogicalDisk	Avg. Disk sec/Read	Avg. Disk sec/Write	Disk Reads/sec	Disk Writes/sec	Avg. Disk Bytes/Write
Database (M:)	0.018	0.047	161.024	149.861	(n/a)
Log (L:)	0.000	0.001	0.000	97.019	10399.712

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	0.419	0.130	2.578
Available MBytes	2575.271	2557.000	2655.000
Free System Page Table Entries	4170416.000	4170416.000	4170416.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	34428840.533	34422784.000	34492416.000
Pool Paged Bytes	47000113.778	46415872.000	48500736.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

3/21/2009 9:31:42 PM -- Jetstress testing begins ...
 3/21/2009 9:31:43 PM -- Prepare testing begins ...
 3/21/2009 9:31:46 PM -- Attaching databases ...
 3/21/2009 9:31:46 PM -- Prepare testing ends.
 3/21/2009 9:31:46 PM -- Dispatching transactions begins ...
 3/21/2009 9:31:46 PM -- Database cache settings: (minimum: 96.0 MB, maximum: 768.0 MB)
 3/21/2009 9:31:46 PM -- Database flush thresholds: (start: 7.7 MB, stop: 15.4 MB)
 3/21/2009 9:31:50 PM -- Database read latency thresholds: (average: 0.02 seconds/read, maximum: 0.1 seconds/read).
 3/21/2009 9:31:50 PM -- Log write latency thresholds: (average: 0.01 seconds/write, maximum: 0.1 seconds/write).
 3/21/2009 9:31:51 PM -- Operation mix: Sessions 3, Inserts 25%, Deletes 10%, Replaces 50%, Reads 15%, Lazy Commits 80%.
 3/21/2009 9:31:51 PM -- Performance logging begins (interval: 15000 ms).
 3/21/2009 9:31:51 PM -- Attaining prerequisites:
 3/21/2009 9:47:25 PM -- \Database(JetstressWin)\Database Cache Size, Last: 725966800.0



(lower bound: 724775700.0, upper bound: none)
3/22/2009 9:47:27 PM -- Performance logging ends.
3/22/2009 9:47:27 PM -- JetInterop batch transaction stats: 255898, 255665, and 255299.
3/22/2009 9:47:27 PM -- Dispatching transactions ends.
3/22/2009 9:47:27 PM -- Shutting down databases ...
3/22/2009 9:48:25 PM -- Instance2444.1 (complete), Instance2444.2 (complete), and Instance2444.3 (complete)
3/22/2009 9:48:26 PM -- Performance logging begins (interval: 15000 ms).
3/22/2009 9:48:26 PM -- Verifying database checksums ...
3/22/2009 10:13:58 PM -- M: (100% processed)
3/22/2009 10:13:59 PM -- Performance logging ends.
3/22/2009 10:13:59 PM -- C:\Data\Jetstress\DBChecksum_2009_3_22_21_48_25.blg has 102 samples.
3/22/2009 10:14:02 PM -- C:\Data\Jetstress\DBChecksum_2009_3_22_21_48_25.html is saved.
3/22/2009 10:14:02 PM -- Verifying log checksums ...
3/22/2009 10:14:06 PM -- L:\01 (22 logs passed), L:\02 (21 logs passed), and L:\03 (21 logs passed)
3/22/2009 10:14:06 PM -- C:\Data\Jetstress\Stress_2009_3_21_21_31_50.blg has 5822 samples.
3/22/2009 10:14:06 PM -- Creating test report ...
3/22/2009 10:15:07 PM -- Volume M: has 0.0180 for Avg. Disk sec/Read.
3/22/2009 10:15:07 PM -- Volume L: has 0.0009 for Avg. Disk sec/Write.
3/22/2009 10:15:07 PM -- Volume L: has 0.0000 for Avg. Disk sec/Read.
3/22/2009 10:15:07 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.
3/22/2009 10:15:07 PM -- Test has 0 Database Page Fault Stalls/sec samples higher than 0.
3/22/2009 10:15:07 PM -- C:\Data\Jetstress\Stress_2009_3_21_21_31_50.xml has 5759 samples queried.

Microsoft Exchange Server Jetstress

Test Result Report

Checksum Statistics - All

Database	Seen pages	Bad pages	Correctable pages	Wrong page no pages	File length / seconds taken
M:\01\Jetstress1.edb	9948754	0	0	0	77724 MBytes / 506 seconds
M:\02\Jetstress1.edb	9943890	0	0	0	77686 MBytes / 511 seconds
M:\03\Jetstress1.edb	9959762	0	0	0	77810 MBytes / 513 seconds
(Sum)	29852406	0	0	0	233221 MBytes / 1532 seconds

Disk Subsystem Performance (of checksum)

LogicalDisk	Avg. Disk sec/Read	Avg. Disk sec/Write	Disk Reads/sec	Disk Writes/sec
M:	0.099	0.000	2435.366	0.000

Memory System Performance (of checksum)

Counter	Average	Minimum	Maximum
% Processor Time	2.544	1.874	3.150
Available MBytes	3362.765	3355.000	3366.000
Free System Page Table Entries	4170416.000	4170416.000	4170416.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	34717053.490	34684928.000	34750464.000
Pool Paged Bytes	48488287.373	47669248.000	49471488.000

Test Log

3/21/2009 9:31:42 PM -- Jetstress testing begins ...
 3/21/2009 9:31:43 PM -- Prepare testing begins ...
 3/21/2009 9:31:46 PM -- Attaching databases ...
 3/21/2009 9:31:46 PM -- Prepare testing ends.
 3/21/2009 9:31:46 PM -- Dispatching transactions begins ...
 3/21/2009 9:31:46 PM -- Database cache settings: (minimum: 96.0 MB, maximum: 768.0 MB)
 3/21/2009 9:31:46 PM -- Database flush thresholds: (start: 7.7 MB, stop: 15.4 MB)
 3/21/2009 9:31:50 PM -- Database read latency thresholds: (average: 0.02 seconds/read, maximum: 0.1 seconds/read).
 3/21/2009 9:31:50 PM -- Log write latency thresholds: (average: 0.01 seconds/write, maximum: 0.1 seconds/write).
 3/21/2009 9:31:51 PM -- Operation mix: Sessions 3, Inserts 25%, Deletes 10%, Replaces 50%, Reads 15%, Lazy Commits 80%.
 3/21/2009 9:31:51 PM -- Performance logging begins (interval: 15000 ms).
 3/21/2009 9:31:51 PM -- Attaining prerequisites:
 3/21/2009 9:47:25 PM -- \Database(JetstressWin)\Database Cache Size, Last: 725966800.0 (lower bound: 724775700.0, upper bound: none)
 3/22/2009 9:47:27 PM -- Performance logging ends.



3/22/2009 9:47:27 PM -- JetInterop batch transaction stats: 255898, 255665, and 255299.
3/22/2009 9:47:27 PM -- Dispatching transactions ends.
3/22/2009 9:47:27 PM -- Shutting down databases ...
3/22/2009 9:48:25 PM -- Instance2444.1 (complete), Instance2444.2 (complete), and
Instance2444.3 (complete)
3/22/2009 9:48:26 PM -- Performance logging begins (interval: 15000 ms).
3/22/2009 9:48:26 PM -- Verifying database checksums ...
3/22/2009 10:13:58 PM -- M: (100% processed)
3/22/2009 10:13:59 PM -- Performance logging ends.
3/22/2009 10:13:59 PM -- [C:\Data\Jetstress\DBChecksum_2009_3_22_21_48_25.blg](#) has 102
samples.



Microsoft Exchange Server Jetstress 2 Hour Performance

Microsoft Exchange Server Jetstress

Performance Test Result Report

Test Summary

Overall Test Result **Pass**

Machine Name DMRTK-SRVR-I2

Test Description Intel SRCASRB 6-SATA drives, mailboxes=0800, size=250, IOPS=0.3, threads=3, DB=RAID10(2+2), Log=RAID1(1+1), SG=3, Partition=1

Test Start Time 3/21/2009 4:28:29 PM

Test End Time 3/21/2009 8:27:44 PM

Jetstress Version 08.02.0060.000

Ese Version 08.00.0685.024

Operating System Microsoft Windows Server 2003 R2 Service Pack 2 (5.2.3790.131072)

Performance Log C:\Data\Jetstress\Performance_2009_3_21_18_10_44.blg
C:\Data\Jetstress\DBChecksum_2009_3_21_20_27_44.blg

Database Sizing and Throughput

Achieved I/O per Second 318.885

Target I/O per Second 240

Initial database size 209727307776

Final database size 213061779456

Database files (count) 3

Jetstress System Parameters

Thread count 3 (per-storage group)

Log buffers 9000

Minimum database cache 96.0 MB

Maximum database cache 768.0 MB

Insert operations 25%

Delete operations 10%

Replace operations 50%



Read operations 15%
Lazy commits 80%

Disk Subsystem Performance

LogicalDisk	Avg. Disk sec/Read	Avg. Disk sec/Write	Disk Reads/sec	Disk Writes/sec	Avg. Disk Bytes/Write
Database (M:)	0.018	0.048	159.550	159.335	(n/a)
Log (L:)	0.000	0.001	0.000	108.685	10458.449

Host System Performance

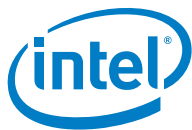
Counter	Average	Minimum	Maximum
% Processor Time	0.443	0.182	0.898
Available MBytes	2501.544	2469.000	2540.000
Free System Page Table Entries	4170416.000	4170416.000	4170416.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	34375475.200	34365440.000	34406400.000
Pool Paged Bytes	46085179.733	45965312.000	46764032.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

3/21/2009 4:28:29 PM -- Jetstress testing begins ...
 3/21/2009 4:28:29 PM -- Prepare testing begins ...
 3/21/2009 4:28:29 PM -- Creating M:\01\Jetstress1.edb.
 3/21/2009 4:28:29 PM -- Database cache settings: (minimum: 32.0 MB, maximum: 256.0 MB)
 3/21/2009 4:28:29 PM -- Database flush thresholds: (start: 2.6 MB, stop: 5.1 MB)
 3/21/2009 4:58:49 PM -- 60.0% of 65.1 GB complete (2380362 records inserted).
 3/21/2009 5:21:11 PM -- 100.0% of 65.1 GB complete (3803194 records inserted).
 3/21/2009 5:21:17 PM -- Duplicating 2 databases:
 3/21/2009 6:10:37 PM -- 100.0% of 130.2 GB complete (130.2 GB duplicated).
 3/21/2009 6:10:40 PM -- Attaching databases ...
 3/21/2009 6:10:40 PM -- Prepare testing ends.
 3/21/2009 6:10:40 PM -- Dispatching transactions begins ...
 3/21/2009 6:10:40 PM -- Database cache settings: (minimum: 96.0 MB, maximum: 768.0 MB)
 3/21/2009 6:10:40 PM -- Database flush thresholds: (start: 7.7 MB, stop: 15.4 MB)
 3/21/2009 6:10:44 PM -- Database read latency thresholds: (average: 0.02 seconds/read, maximum: 0.05 seconds/read).
 3/21/2009 6:10:44 PM -- Log write latency thresholds: (average: 0.01 seconds/write, maximum: 0.05 seconds/write).
 3/21/2009 6:10:45 PM -- Operation mix: Sessions 3, Inserts 25%, Deletes 10%, Replaces 50%, Reads 15%, Lazy Commits 80%.
 3/21/2009 6:10:45 PM -- Performance logging begins (interval: 15000 ms).
 3/21/2009 6:10:45 PM -- Attaining prerequisites:
 3/21/2009 6:26:52 PM -- \Database(JetstressWin)\Database Cache Size, Last: 725057500.0 (lower bound: 724775700.0, upper bound: none)
 3/21/2009 8:26:53 PM -- Performance logging ends.
 3/21/2009 8:26:53 PM -- JetInterop batch transaction stats: 27118, 27280, and 27461.



3/21/2009 8:26:53 PM -- Dispatching transactions ends.
3/21/2009 8:26:53 PM -- Shutting down databases ...
3/21/2009 8:27:44 PM -- Instance608.1 (complete), Instance608.2 (complete), and Instance608.3 (complete)
3/21/2009 8:27:44 PM -- Performance logging begins (interval: 15000 ms).
3/21/2009 8:27:44 PM -- Verifying database checksums ...
3/21/2009 8:49:17 PM -- M: (100% processed)
3/21/2009 8:49:18 PM -- Performance logging ends.
3/21/2009 8:49:18 PM -- C:\Data\Jetstress\DBChecksum_2009_3_21_20_27_44.blg has 86 samples.
3/21/2009 8:49:21 PM -- C:\Data\Jetstress\DBChecksum_2009_3_21_20_27_44.html is saved.
3/21/2009 8:49:21 PM -- Verifying log checksums ...
3/21/2009 8:49:25 PM -- L:\01 (22 logs passed), L:\02 (22 logs passed), and L:\03 (22 logs passed)
3/21/2009 8:49:25 PM -- C:\Data\Jetstress\Performance_2009_3_21_18_10_44.blg has 544 samples.
3/21/2009 8:49:25 PM -- Creating test report ...
3/21/2009 8:49:30 PM -- Volume M: has 0.0179 for Avg. Disk sec/Read.
3/21/2009 8:49:30 PM -- Volume L: has 0.0010 for Avg. Disk sec/Write.
3/21/2009 8:49:30 PM -- Volume L: has 0.0000 for Avg. Disk sec/Read.
3/21/2009 8:49:30 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.
3/21/2009 8:49:30 PM -- Test has 0 Database Page Fault Stalls/sec samples higher than 0.
3/21/2009 8:49:31 PM -- C:\Data\Jetstress\Performance_2009_3_21_18_10_44.xml has 479 samples queried.



Microsoft Exchange Server Jetstress

Test Result Report

Checksum Statistics - All

Database	Seen pages	Bad pages	Correctable pages	Wrong page no pages	File length / seconds taken
M:\01\Jetstress1.edb	8663874	0	0	0	67686 MBytes / 430 seconds
M:\02\Jetstress1.edb	8668738	0	0	0	67724 MBytes / 428 seconds
M:\03\Jetstress1.edb	8675906	0	0	0	67780 MBytes / 433 seconds
(Sum)	26008518	0	0	0	203191 MBytes / 1292 seconds

Disk Subsystem Performance (of checksum)

LogicalDisk	Avg. Disk sec/Read	Avg. Disk sec/Write	Disk Reads/sec	Disk Writes/sec
M:	0.095	0.000	2516.675	0.002

Memory System Performance (of checksum)

Counter	Average	Minimum	Maximum
% Processor Time	2.596	2.122	3.086
Available MBytes	3292.837	3288.000	3295.000
Free System Page Table Entries	4170416.000	4170416.000	4170416.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	34637061.953	34611200.000	34689024.000
Pool Paged Bytes	46972928.000	46444544.000	47206400.000

Test Log

3/21/2009 4:28:29 PM -- Jetstress testing begins ...
 3/21/2009 4:28:29 PM -- Prepare testing begins ...
 3/21/2009 4:28:29 PM -- Creating M:\01\Jetstress1.edb.
 3/21/2009 4:28:29 PM -- Database cache settings: (minimum: 32.0 MB, maximum: 256.0 MB)
 3/21/2009 4:28:29 PM -- Database flush thresholds: (start: 2.6 MB, stop: 5.1 MB)
 3/21/2009 4:58:49 PM -- 60.0% of 65.1 GB complete (2380362 records inserted).
 3/21/2009 5:21:11 PM -- 100.0% of 65.1 GB complete (3803194 records inserted).
 3/21/2009 5:21:17 PM -- Duplicating 2 databases:
 3/21/2009 6:10:37 PM -- 100.0% of 130.2 GB complete (130.2 GB duplicated).
 3/21/2009 6:10:40 PM -- Attaching databases ...



3/21/2009 6:10:40 PM -- Prepare testing ends.
3/21/2009 6:10:40 PM -- Dispatching transactions begins ...
3/21/2009 6:10:40 PM -- Database cache settings: (minimum: 96.0 MB, maximum: 768.0 MB)
3/21/2009 6:10:40 PM -- Database flush thresholds: (start: 7.7 MB, stop: 15.4 MB)
3/21/2009 6:10:44 PM -- Database read latency thresholds: (average: 0.02 seconds/read,
maximum: 0.05 seconds/read).
3/21/2009 6:10:44 PM -- Log write latency thresholds: (average: 0.01 seconds/write,
maximum: 0.05 seconds/write).
3/21/2009 6:10:45 PM -- Operation mix: Sessions 3, Inserts 25%, Deletes 10%, Replaces 50%,
Reads 15%, Lazy Commits 80%.
3/21/2009 6:10:45 PM -- Performance logging begins (interval: 15000 ms).
3/21/2009 6:10:45 PM -- Attaining prerequisites:
3/21/2009 6:26:52 PM -- \Database (JetstressWin)\Database Cache Size, Last: 725057500.0
(lower bound: 724775700.0, upper bound: none)
3/21/2009 8:26:53 PM -- Performance logging ends.
3/21/2009 8:26:53 PM -- JetInterop batch transaction stats: 27118, 27280, and 27461.
3/21/2009 8:26:53 PM -- Dispatching transactions ends.
3/21/2009 8:26:53 PM -- Shutting down databases ...
3/21/2009 8:27:44 PM -- Instance608.1 (complete), Instance608.2 (complete), and
Instance608.3 (complete)
3/21/2009 8:27:44 PM -- Performance logging begins (interval: 15000 ms).
3/21/2009 8:27:44 PM -- Verifying database checksums ...
3/21/2009 8:49:17 PM -- M: (100% processed)
3/21/2009 8:49:18 PM -- Performance logging ends.
3/21/2009 8:49:18 PM -- [C:\Data\Jetstress\DBChecksum_2009_3_21_20_27_44.blg](#) has 86
samples.