

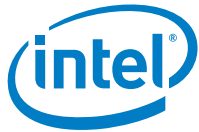
# **Intel® 1800 Mailbox Exchange Server 2007 Storage Solution**

## **Intel® Server Chassis SC5400 and Server Board S5000PSL**

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

Tested Date: March 6, 2009

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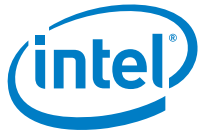
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## Hardware Components

Quantity	Item	Manufacturer	Model
One	Intel® Server Board	Intel	S5000PSL. Additional information is available at: <a href="http://www.intel.com/products/server/motherboards/s5000psl/s5000psl-overview.htm">http://www.intel.com/products/server/motherboards/s5000psl/s5000psl-overview.htm</a> .
One	Intel® Server Chassis	Intel	SC5400. Additional information is available at: <a href="http://www.intel.com/products/server/chassis/sc5400/sc5400-overview.htm">http://www.intel.com/products/server/chassis/sc5400/sc5400-overview.htm</a> .
One (Select one)	Intel® RAID Controller	Intel	SRCSASJV. Additional information is available at: <a href="http://www.intel.com/products/server/raid-controllers/srcsasjv/srcsasjv-overview.htm">http://www.intel.com/products/server/raid-controllers/srcsasjv/srcsasjv-overview.htm</a> .
	Intel® RAID Controller	Intel	SRCSASRB. Additional information is available at: <a href="http://www.intel.com/products/server/raid-controllers/srcsarb/srcsarb-overview.htm">http://www.intel.com/products/server/raid-controllers/srcsarb/srcsarb-overview.htm</a> .
Two	Intel® Xeon® Processors	Intel	Please refer to the Supported Processor List at: <a href="http://www.intel.com/support/motherboards/server/sb/CS-022346.htm">http://www.intel.com/support/motherboards/server/sb/CS-022346.htm</a> . Processors must support Intel® EM64T.
4 GB minimum	Memory	Any supported	Please refer to the Tested Memory List at: <a href="http://www.intel.com/support/motherboards/server/s5000psl/sb/CS-022924.htm">http://www.intel.com/support/motherboards/server/s5000psl/sb/CS-022924.htm</a> .
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: <a href="http://www.intel.com/support/motherboards/server/sb/CS-025416.htm">http://www.intel.com/support/motherboards/server/sb/CS-025416.htm</a> .

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.mspx>.

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## Features

This document describes an Exchange storage solution for 1800 users on the Intel® Server Chassis SC5400 storage system. The tested user profile was 0.50 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 10 146GB SAS-interface enterprise-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® SRCSASRB
Internal Boot Disk	Qty. 1 - Seagate 320GB
Disk Array Disks	Qty. 10 - Seagate Cheetah 15K.5, ST3146855SS, 146GB, 15K RPM

## Targeted Customer Profile

This solution is intended for small and medium-sized organization hosting up to 1800 mailboxes. The configuration used for testing is:

- Number of mailboxes: 1800
- Number of hosts: 1
- User I/O profile: 0.50 I/O per second (IOPS)
- 4 Storage Groups, 4 Databases
- Mailbox size: 250 MB



## Tested Deployment

The following tables summarize the testing environment:

Description	Data
Number of Exchange mailboxes simulated	1800
Number of hosts	1
Number of storage groups / host	4
Number of mailbox stores / storage group	1
Number of mailboxes / mailbox store	450
Number of mailbox store LUNs / storage group	1
Simulated profile: I/O's per second per mailbox	0.50 IOPS
Database LUN size	544 GB
Log LUN size	136 GB
Backup LUN size / storage group	N/A
Total database size for performance testing	439.6 GB
% storage capacity used by Exchange database	81%

### 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® SRCASARB
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	10
Maximum number of spindles can be hosted in the storage	10



Primary Storage Software

Component	Description
HBA driver	Intel® SRCASARB
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

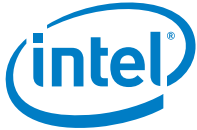
Primary Storage Disk Configuration (Mailbox Store Disks)

Component	Description
Disk type, speed and firmware revision	Seagate SAS, 15K RPM, 0002 (ST3146855SS)
Raw capacity per disk (GB)	136.7
Number of physical disks in test	8
Total raw storage capacity (GB)	1093.6
Number of slices per LUN or number of disks per LUN	2
RAID level	RAID 10
Total formatted capacity	544

Primary Storage Disk Configuration (Transactional Log Disks)

Component	Description
Disk type, speed and firmware revision	Seagate SAS, 15K RPM, 0002 (ST3146855SS)
Raw capacity per disk (GB)	136.7
Number of physical disks in test	2
Total raw storage capacity (GB)	273.4
Number of slices per LUN or number of disks per LUN	2
RAID level	RAID 1
Total formatted capacity	136.0





## 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.



<b>I/O Component</b>	<b>Metric</b>
<b>Database I/O</b>	
Average Database Disk Transfers/sec	122.227
Average Database Disk Reads/sec	127.296
Average Database Disk Writes/sec	117.158
Average Database Disk Read Latency (ms)	0.016
Average Database Disk Write Latency (ms)	0.019
<b>Transaction Log I/O</b>	
Average Log Disk Writes/sec	188.959
Average Log Disk Write Latency (ms)	0.005

## 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® SRCSASRB mailboxes=1800, size=250, IOPS=0.5, threads=12, DB=RAID10(4+4), Log=RAID1(1+1), SG=4, logs in folders on one volume

**Test Start Time** 3/5/2009 7:41:26 PM

**Test End Time** 3/6/2009 9:24:10 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\\_5\\_19\\_41\\_37.blg](C:\Data\Jetstress\Stress_2009_3_5_19_41_37.blg)  
[C:\Data\Jetstress\DBChecksum\\_2009\\_3\\_6\\_21\\_24\\_10.blg](C:\Data\Jetstress\DBChecksum_2009_3_6_21_24_10.blg)

#### Database Sizing and Throughput

**Achieved I/O per Second** 977.816

**Target I/O per Second** 900

**Initial database size** 490189946880

**Final database size** 583711784960

**Database files (count)** 4

#### Jetstress System Parameters

**Thread count** 12 (per-storage group)

**Log buffers** 9000

**Minimum database cache** 128.0 MB

**Maximum database cache** 1024.0 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:)	0.016	0.019	126.901	122.467	(n/a)
Database (N:)	0.017	0.019	127.072	115.989	(n/a)
Database (O:)	0.015	0.019	127.478	116.160	(n/a)
Database (P:)	0.017	0.020	127.732	114.017	(n/a)
Log (L:)	0.000	0.005	0.000	188.959	14921.564

#### Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	1.481	0.000	4.663
Available MBytes	2326.035	2299.000	2416.000
Free System Page Table Entries	4170136.000	4170136.000	4170136.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	34717558.044	34672640.000	34803712.000
Pool Paged Bytes	45423451.733	44703744.000	46645248.000
Database Page Fault Stalls/sec	0.001	0.000	4.867

#### Test Log

3/5/2009 7:41:26 PM -- Jetstress testing begins ...  
 3/5/2009 7:41:26 PM -- Prepare testing begins ...  
 3/5/2009 7:41:32 PM -- Attaching databases ...  
 3/5/2009 7:41:32 PM -- Prepare testing ends.  
 3/5/2009 7:41:32 PM -- Dispatching transactions begins ...  
 3/5/2009 7:41:32 PM -- Database cache settings: (minimum: 128.0 MB, maximum: 1.0 GB)  
 3/5/2009 7:41:32 PM -- Database flush thresholds: (start: 10.2 MB, stop: 20.5 MB)  
 3/5/2009 7:41:37 PM -- Database read latency thresholds: (average: 0.02 seconds/read, maximum: 0.1 seconds/read).  
 3/5/2009 7:41:37 PM -- Log write latency thresholds: (average: 0.01 seconds/write, maximum: 0.1 seconds/write).  
 3/5/2009 7:41:39 PM -- Operation mix: Sessions 12, Inserts 25%, Deletes 10%, Replaces 50%, Reads 15%, Lazy Commits 80%.  
 3/5/2009 7:41:39 PM -- Performance logging begins (interval: 15000 ms).  
 3/5/2009 7:41:39 PM -- Attaining prerequisites:  
 3/5/2009 7:47:42 PM -- \Database (JetstressWin)\Database Cache Size, Last: 967401500.0 (lower bound: 966367600.0, upper bound: none)  
 3/6/2009 7:47:44 PM -- Performance logging ends.



3/6/2009 7:47:44 PM -- JetInterop batch transaction stats: 569497, 569587, 570316, and 570129.  
3/6/2009 7:48:47 PM -- Dispatching transactions ends.  
3/6/2009 7:48:47 PM -- Shutting down databases ...  
3/6/2009 9:24:10 PM -- Instance2840.1 (complete), Instance2840.2 (complete), Instance2840.3 (complete), and Instance2840.4 (complete)  
3/6/2009 9:24:11 PM -- Performance logging begins (interval: 30000 ms).  
3/6/2009 9:24:11 PM -- Verifying database checksums ...  
3/6/2009 10:10:32 PM -- M: (100% processed), N: (100% processed), O: (100% processed), and P: (100% processed)  
3/6/2009 10:10:33 PM -- Performance logging ends.  
3/6/2009 10:10:33 PM -- [C:\Data\Jetstress\DBChecksum\\_2009\\_3\\_6\\_21\\_24\\_10.blg](C:\Data\Jetstress\DBChecksum_2009_3_6_21_24_10.blg) has 92 samples.  
3/6/2009 10:10:37 PM -- [C:\Data\Jetstress\DBChecksum\\_2009\\_3\\_6\\_21\\_24\\_10.html](C:\Data\Jetstress\DBChecksum_2009_3_6_21_24_10.html) is saved.  
3/6/2009 10:10:37 PM -- Verifying log checksums ...  
3/6/2009 10:10:41 PM -- L:\01 (8 logs passed), L:\02 (22 logs passed), L:\03 (22 logs passed), and L:\04 (21 logs passed)  
3/6/2009 10:10:41 PM -- [C:\Data\Jetstress\Stress\\_2009\\_3\\_5\\_19\\_41\\_37.blg](C:\Data\Jetstress\Stress_2009_3_5_19_41_37.blg) has 5784 samples.  
3/6/2009 10:10:41 PM -- Creating test report ...  
3/6/2009 10:11:47 PM -- Volume M: has 0.0158 for Avg. Disk sec/Read.  
3/6/2009 10:11:47 PM -- Volume N: has 0.0165 for Avg. Disk sec/Read.  
3/6/2009 10:11:47 PM -- Volume O: has 0.0151 for Avg. Disk sec/Read.  
3/6/2009 10:11:47 PM -- Volume P: has 0.0173 for Avg. Disk sec/Read.  
3/6/2009 10:11:47 PM -- Volume L: has 0.0045 for Avg. Disk sec/Write.  
3/6/2009 10:11:47 PM -- Volume L: has 0.0000 for Avg. Disk sec/Read.  
3/6/2009 10:11:47 PM -- Test has 4.86722147380135 Maximum Database Page Fault Stalls/sec.  
3/6/2009 10:11:47 PM -- Test has 0 Database Page Fault Stalls/sec samples higher than 0.  
3/6/2009 10:11:47 PM -- [C:\Data\Jetstress\Stress\\_2009\\_3\\_5\\_19\\_41\\_37.xml](C:\Data\Jetstress\Stress_2009_3_5_19_41_37.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:\Jetstress1.edb	17813464	0	0	0	139167 MBytes / 2371 seconds
N:\Jetstress1.edb	17813472	0	0	0	139167 MBytes / 2780 seconds
O:\Jetstress1.edb	17813472	0	0	0	139167 MBytes / 2668 seconds
P:\Jetstress1.edb	17813472	0	0	0	139167 MBytes / 2744 seconds
(Sum)	71253880	0	0	0	556670 MBytes / 2780 seconds

#### Disk Subsystem Performance (of checksum)

LogicalDisk	Avg. Disk sec/Read	Avg. Disk sec/Write	Disk Reads/sec	Disk Writes/sec
M:	0.065	0.000	941.332	0.000
N:	0.089	0.000	766.710	0.000
O:	0.078	0.000	833.158	0.000
P:	0.083	0.000	802.019	0.000

#### Memory System Performance (of checksum)

Counter	Average	Minimum	Maximum
% Processor Time	3.784	3.262	7.077
Available MBytes	3366.511	3358.000	3382.000
Free System Page Table Entries	4170136.000	4170136.000	4170136.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	34783454.609	34775040.000	34795520.000
Pool Paged Bytes	47010370.783	46862336.000	47939584.000

#### Test Log

3/5/2009 7:41:26 PM -- Jetstress testing begins ...  
 3/5/2009 7:41:26 PM -- Prepare testing begins ...  
 3/5/2009 7:41:32 PM -- Attaching databases ...  
 3/5/2009 7:41:32 PM -- Prepare testing ends.  
 3/5/2009 7:41:32 PM -- Dispatching transactions begins ...  
 3/5/2009 7:41:32 PM -- Database cache settings: (minimum: 128.0 MB, maximum: 1.0 GB)



3/5/2009 7:41:32 PM -- Database flush thresholds: (start: 10.2 MB, stop: 20.5 MB)  
3/5/2009 7:41:37 PM -- Database read latency thresholds: (average: 0.02 seconds/read, maximum: 0.1 seconds/read).  
3/5/2009 7:41:37 PM -- Log write latency thresholds: (average: 0.01 seconds/write, maximum: 0.1 seconds/write).  
3/5/2009 7:41:39 PM -- Operation mix: Sessions 12, Inserts 25%, Deletes 10%, Replaces 50%, Reads 15%, Lazy Commits 80%.  
3/5/2009 7:41:39 PM -- Performance logging begins (interval: 15000 ms).  
3/5/2009 7:41:39 PM -- Attaining prerequisites:  
3/5/2009 7:47:42 PM -- \Database(JetstressWin)\Database Cache Size, Last: 967401500.0 (lower bound: 966367600.0, upper bound: none)  
3/6/2009 7:47:44 PM -- Performance logging ends.  
3/6/2009 7:47:44 PM -- JetInterop batch transaction stats: 569497, 569587, 570316, and 570129.  
3/6/2009 7:48:47 PM -- Dispatching transactions ends.  
3/6/2009 7:48:47 PM -- Shutting down databases ...  
3/6/2009 9:24:10 PM -- Instance2840.1 (complete), Instance2840.2 (complete), Instance2840.3 (complete), and Instance2840.4 (complete)  
3/6/2009 9:24:11 PM -- Performance logging begins (interval: 30000 ms).  
3/6/2009 9:24:11 PM -- Verifying database checksums ...  
3/6/2009 10:10:32 PM -- M: (100% processed), N: (100% processed), O: (100% processed), and P: (100% processed)  
3/6/2009 10:10:33 PM -- Performance logging ends.  
3/6/2009 10:10:33 PM -- [C:\Data\Jetstress\DBChecksum\\_2009\\_3\\_6\\_21\\_24\\_10.blg](#) has 92 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-12

**Test Description** Intel® SRCSASRB mailboxes=1800, size=250, IOPS=0.5, threads=12, DB=RAID10(4+4), Log=RAID1(1+1), SG=4, logs in folders on one volume

**Test Start Time** 3/5/2009 8:47:51 AM

**Test End Time** 3/5/2009 10:54:35 AM

**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\\_5\\_8\\_48\\_3.blg](C:\Data\Jetstress\Performance_2009_3_5_8_48_3.blg)  
[C:\Data\Jetstress\DBChecksum\\_2009\\_3\\_5\\_10\\_54\\_35.blg](C:\Data\Jetstress\DBChecksum_2009_3_5_10_54_35.blg)

#### Database Sizing and Throughput

**Achieved I/O per Second** 1043.031

**Target I/O per Second** 900

**Initial database size** 480715014144

**Final database size** 490189946880

**Database files (count)** 4

#### Jetstress System Parameters

**Thread count** 12 (per-storage group)

**Log buffers** 9000

**Minimum database cache** 128.0 MB

**Maximum database cache** 1024.0 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:)	0.016	0.020	137.238	123.295	(n/a)
Database (N:)	0.017	0.019	136.878	121.694	(n/a)
Database (O:)	0.015	0.020	137.248	123.954	(n/a)
Database (P:)	0.017	0.020	138.488	124.237	(n/a)
Log (L:)	0.000	0.005	0.000	212.419	16057.226

### Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	1.463	0.807	3.189
Available MBytes	2337.569	2321.000	2426.000
Free System Page Table Entries	4170197.104	4170136.000	4170206.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	34485990.400	34471936.000	34570240.000
Pool Paged Bytes	44406920.533	44056576.000	46239744.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

### Test Log

3/5/2009 8:47:51 AM -- Jetstress testing begins ...  
 3/5/2009 8:47:51 AM -- Prepare testing begins ...  
 3/5/2009 8:47:58 AM -- Attaching databases ...  
 3/5/2009 8:47:58 AM -- Prepare testing ends.  
 3/5/2009 8:47:58 AM -- Dispatching transactions begins ...  
 3/5/2009 8:47:58 AM -- Database cache settings: (minimum: 128.0 MB, maximum: 1.0 GB)  
 3/5/2009 8:47:58 AM -- Database flush thresholds: (start: 10.2 MB, stop: 20.5 MB)  
 3/5/2009 8:48:03 AM -- Database read latency thresholds: (average: 0.02 seconds/read, maximum: 0.05 seconds/read).  
 3/5/2009 8:48:03 AM -- Log write latency thresholds: (average: 0.01 seconds/write, maximum: 0.05 seconds/write).  
 3/5/2009 8:48:05 AM -- Operation mix: Sessions 12, Inserts 25%, Deletes 10%, Replaces 50%, Reads 15%, Lazy Commits 80%.  
 3/5/2009 8:48:05 AM -- Performance logging begins (interval: 15000 ms).  
 3/5/2009 8:48:05 AM -- Attaining prerequisites:  
 3/5/2009 8:54:13 AM -- \Database(JetstressWin)\Database Cache Size, Last: 968089600.0 (lower bound: 966367600.0, upper bound: none)  
 3/5/2009 10:54:15 AM -- Performance logging ends.  
 3/5/2009 10:54:15 AM -- JetInterop batch transaction stats: 57614, 56979, 57398, and 57460.  
 3/5/2009 10:54:16 AM -- Dispatching transactions ends.  
 3/5/2009 10:54:16 AM -- Shutting down databases ...  
 3/5/2009 10:54:35 AM -- Instance2304.1 (complete), Instance2304.2 (complete), Instance2304.3 (complete), and Instance2304.4 (complete)



3/5/2009 10:54:35 AM -- Performance logging begins (interval: 15000 ms).  
3/5/2009 10:54:35 AM -- Verifying database checksums ...  
3/5/2009 11:33:36 AM -- M: (100% processed), N: (100% processed), O: (100% processed),  
and P: (100% processed)  
3/5/2009 11:33:37 AM -- Performance logging ends.  
3/5/2009 11:33:37 AM -- [C:\Data\Jetstress\DBChecksum\\_2009\\_3\\_5\\_10\\_54\\_35.blg](#) has 156  
samples.  
3/5/2009 11:33:43 AM -- [C:\Data\Jetstress\DBChecksum\\_2009\\_3\\_5\\_10\\_54\\_35.html](#) is saved.  
3/5/2009 11:33:43 AM -- Verifying log checksums ...  
3/5/2009 11:33:48 AM -- L:\01 (22 logs passed), L:\02 (22 logs passed), L:\03 (22 logs  
passed), and L:\04 (22 logs passed)  
3/5/2009 11:33:48 AM -- [C:\Data\Jetstress\Performance\\_2009\\_3\\_5\\_8\\_48\\_3.blg](#) has 504  
samples.  
3/5/2009 11:33:48 AM -- Creating test report ...  
3/5/2009 11:33:54 AM -- Volume M: has 0.0161 for Avg. Disk sec/Read.  
3/5/2009 11:33:54 AM -- Volume N: has 0.0167 for Avg. Disk sec/Read.  
3/5/2009 11:33:54 AM -- Volume O: has 0.0153 for Avg. Disk sec/Read.  
3/5/2009 11:33:54 AM -- Volume P: has 0.0173 for Avg. Disk sec/Read.  
3/5/2009 11:33:54 AM -- Volume L: has 0.0051 for Avg. Disk sec/Write.  
3/5/2009 11:33:54 AM -- Volume L: has 0.0000 for Avg. Disk sec/Read.  
3/5/2009 11:33:54 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.  
3/5/2009 11:33:54 AM -- Test has 0 Database Page Fault Stalls/sec samples higher than 0.  
3/5/2009 11:33:54 AM -- [C:\Data\Jetstress\Performance\\_2009\\_3\\_5\\_8\\_48\\_3.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:\Jetstress1.edb	14956658	0	0	0	116848 MBytes / 1985 seconds
N:\Jetstress1.edb	14957426	0	0	0	116854 MBytes / 2340 seconds
O:\Jetstress1.edb	14956658	0	0	0	116848 MBytes / 2204 seconds
P:\Jetstress1.edb	14966898	0	0	0	116928 MBytes / 2310 seconds
(Sum)	59837640	0	0	0	467481 MBytes / 2340 seconds

#### Disk Subsystem Performance (of checksum)

LogicalDisk	Avg. Disk sec/Read	Avg. Disk sec/Write	Disk Reads/sec	Disk Writes/sec
M:	0.065	0.000	943.576	0.006
N:	0.088	0.000	799.349	0.004
O:	0.077	0.000	848.836	0.005
P:	0.085	0.000	808.067	0.004

#### Memory System Performance (of checksum)

Counter	Average	Minimum	Maximum
% Processor Time	3.835	3.059	8.268
Available MBytes	3402.359	3393.000	3418.000
Free System Page Table Entries	4170136.000	4170136.000	4170136.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	35720612.103	35573760.000	35749888.000
Pool Paged Bytes	45217608.205	45043712.000	46112768.000

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3/5/2009 11:33:37 AM -- [C:\Data\Jetstress\DBChecksum\\_2009\\_3\\_5\\_10\\_54\\_35.blg](C:\Data\Jetstress\DBChecksum_2009_3_5_10_54_35.blg) has 156 samples.