Dell™ PowerVault™MD1200

7200 Mailbox Resiliency

Exchange 2010 Storage Solution

Tested with: ESRP – Storage Version 3.0
Tested Date: March 10, 2010

Content

Overview

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

*The *ESRP – Storage* program was developed by Microsoft Corporation to provide a common storage testing framework for vendors to provide information on its storage solutions for Microsoft Exchange Server software. For more details on the *Microsoft ESRP – Storage* program, please click http://www.microsoft.com/technet/prodtechnol/exchange/2007/esrp.mspx

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Features

This white paper describes a tested and validated storage solution for a 7200 mailbox Exchange 2010 environment with Data Availability Group. A DAG is the new high availability mechanism in Microsoft Exchange 2010. This model of mailbox resiliency supports multiple copies of Exchange database (up to 16) in a DAG. There is only one active copy of a given Exchange 2010 database at any given time. Secondary copies are periodically synched with the primary copy. Mail clients access the primary (active) copy, and database changes to the primary copy are copied to the secondary (passive) copies in the form of transaction logs. The copied log records are played on the secondary copy to keep the secondary database copies consistent with the primary copy. The secondary hosts are configured to be identical to the primary. The primary and secondary copy storages do not share storage array controllers or disks.

Dell™ PowerVault™ MD1200 is a SAS based storage enclosure. The major features of the storage system include:

- Capacity for 12 3.5-inch, hot-plug, 6.0-Gbps, serial-attached SCSI (SAS) hard drives , 600 GB capacity, and rated at 15K RPM
- Support for up to 8 daisy-chained storage enclosures per channel in unified mode for a total of (96) hard drives
- Host-based RAID support via a PERC H800 adapter
- In-band enclosure management provided through SCSI enclosure services (SES)
- RAID and system management using Dell™ OpenManage™ Server Administrator Storage Management Service

The PowerVault™ MD1200 enclosure supports up to (12) drives. The solution presented in this paper utilizes (2) MD1200 enclosures and (24) disks. Each disk houses the Exchange Information Stores and Transaction Logs.

Solution Description

The Dell™ PowerVault™ MD1200 is a modular disk storage expansion enclosure for PowerEdge™ servers capable of housing up to (12) 3.5-inch disk drives in a single 2U rack able chassis. The expansion enclosure can support both 10K RPM and 15K RPM drives up to capacities of 600GB when they become available.

Dell™ PowerVault™ MD1200 Product Page

Figure 1:Dell™ PowerVault™ MD1200 enclosure with (12) 3.5-inch drives

PERC H800 is the host-based RAID controller used to connect to the PowerVault™ MD1200 storage enclosures. The controller supports up to 6 Gbps Serial Attached SCSI (SAS) as the storage interconnect technology and PCI Express 2.0 (PCI-E) as the host-based interconnect technology.

The PERC H800 controller offers:

- 8 port LSI 2108 Chipset
- 512MB of customized DDR2 400MHz, Error-Correcting Code (ECC) cache memory with optional upgrade to 512MB
- 6 Gbps maximum speed for each SAS lane
- Two external x4 (“by four”) mini-SAS wide ports, each aggregating 4 SAS lanes for a total bandwidth per port of 12.0 Gbps
- x8 PCI E host interface for a total bandwidth of 32.0 Gbps
- Up to 72 hours of intelligent, transportable, battery-backed, cache memory

The presented solution is a Data Availability Group solution for up to 7200 mailboxes. It includes a single primary PowerEdge™ R610 server directly attached to 2 Dell™ PowerVault™ MD1200 storage enclosures. The secondary server is configured to be identical to the primary. The primary and secondary storage do not share storage array controllers or disks.

The tested user profile was .5 IOPS per user with a 1024 MB mailbox size. This IO profile is high for Exchange 2010 (100 read /400 sent emails per database), which may not be unrealistic for certain "super" Exchange users. Sometimes additional applications, such as certain mobile messaging applications, can raise the IOPS profile of a user as high as three or four times that of normal. Using 15K RPM drives gives more than enough performance achieving over 20% more than the target of 3600 IOPS. Single disk RAID 0 virtual drives were configured in this manner to exhibit each disk's maximum IOPS.

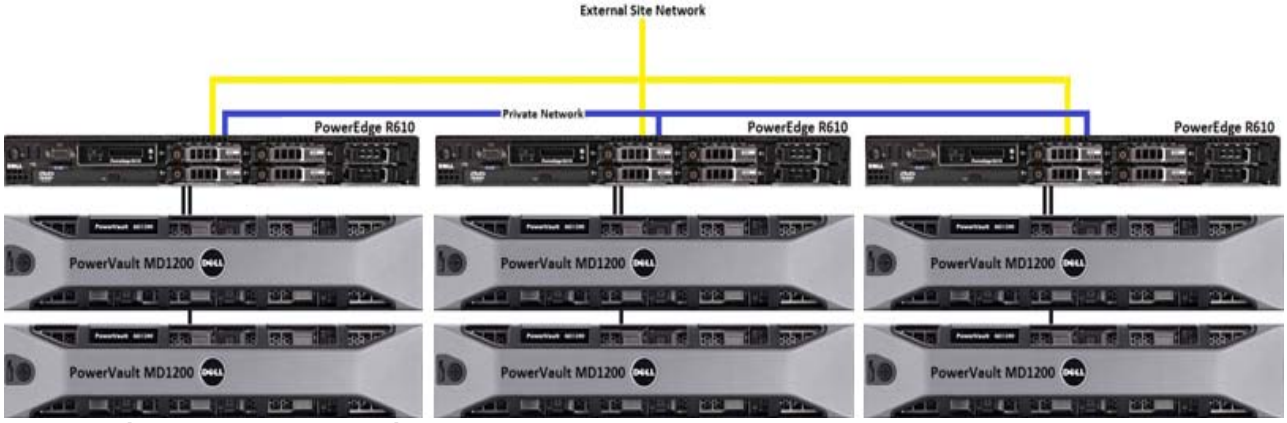

Figure 2: Test Setup Diagram

Microsoft Exchange Server System:

Server	Dell™ PowerEdge™ R610
CPU	2 Intel®Xeon®CPU;5570@2.93GHz
Memory	64 GB DDR2 ECC
NIC	Broadcom NeXtreme II
RAID Controller	PERC 6/i (FW Version 4.5.0.64)
Internal Disks	2 Seagate 146GB 15K RPM SAS(ST9146852SS)

Storage System:

Storage System	Dell™ PowerVault™™ MD1200
Disks	24 Seagate 600GB 15K RPM SAS (ST3600057SS) Drives
RAID Controller	PERC H800 4.22.0.64

Storage Configuration:

The storage configuration per enclosure was as follows:

- A single RAID 0 volume was created from each physical disk from 0 through 11 on each of the PowerVault™ MD1200(s). These volumes were used for Exchange Information stores and transaction logs.

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
- 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.

Targeted Customer Profile

This solution is intended for small to mid size organizations hosting up to 7200 Exchange 2010 mailboxes. The configuration used for testing was as follows:

- Number of mailboxes : 7200
- Number of hosts attached to the storage system: 1
- User IO profile: .5 I/O Operation per second
- 1024 MB Mailbox quota per mailbox
- Backup strategy: Streaming backup to disk
- Data Availability Group (DAG) for Mailbox Resiliency

The table below summarizes the testing environment.

Simulated Exchange Configuration

Number of Exchange mailboxes simulated	7200
Number of Database Availability Groups (DAGs)	1
Number of servers/DAG	3
Number of active mailboxes/server	7200
Number of databases/host	24
Number of copies/database	3
Number of mailboxes/database	300
Simulated profile: I/O's per second per mailbox (IOPS, include 20% headroom)	.5
Database LUN size	13392GB
Log LUN size	N/A
Total database size for performance testing	8928 GB
% storage capacity used by Exchange database**	66%

**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.

Primary Storage Hardware

Storage Connectivity (Fiber Channel, SAS, SATA, iSCSI)	SAS
Storage model and OS/firmware revision	PowerVault™ MD1200 + PERC H800 Firmware 4.22.0.64
Storage cache	512MB – PERC H800 RAID controller cache
Number of storage controllers	2
Number of storage ports	2
Maximum bandwidth of storage connectivity to host	6GBit
Switch type/model/firmware revision	N/A
HBA model and firmware	PERC H800 (RAID controller)
Number of HBA's/host	1
Host server type	Dell™ PowerEdge™ R610e 2 Intel®Xeon®CPU; 5570@2.93GHz 64GB memory
Total number of disks tested in solution	24
Maximum number of spindles can be hosted in the storage	12 per cabinet – up to 96 in daisy chain configuration

Storage Software

HBA driver	Dell™ PERC H800
HBA QueueTarget Setting	N/A
HBA QueueDepth Setting	N/A
Multi-Pathing	N/A
Host OS	Windows Server 2008 R2 Enterprise X64 Edition
ESE.dll file version	14.0.639.19
Replication solution name/version	N/A

Primary Storage Disk Configuration (Mailbox Store Disks)

Disk type, speed and firmware revision	Seagate 600GB RPM SAS (ST3600057SS) Drives
Raw capacity per disk (GB)	600GB
Number of physical disks in test	24
Total raw storage capacity (GB)	14400GB
Disk slice size (GB)	N/A
Number of slices per LUN or number of disks per LUN	1
Raid level	RAID 0
Total formatted capacity	13400GB
Storage capacity utilization	Formatted capacity/total raw capacity 13400/14400 = 91% utilized
Database capacity utilization	Database size/total raw capacity 7824/14400 = 54% utilized

Replication Configuration

Replication mechanism	Exchange 2010 Data Availability Group Mailbox Resiliency
Number of links	2
Simulated link distance	LAN
Link type	IP
Link bandwidth	Gigabit Ethernet (1 Gbps)

The figure below shows the DAG configuration with 24 active database copies and 48 passive copies.

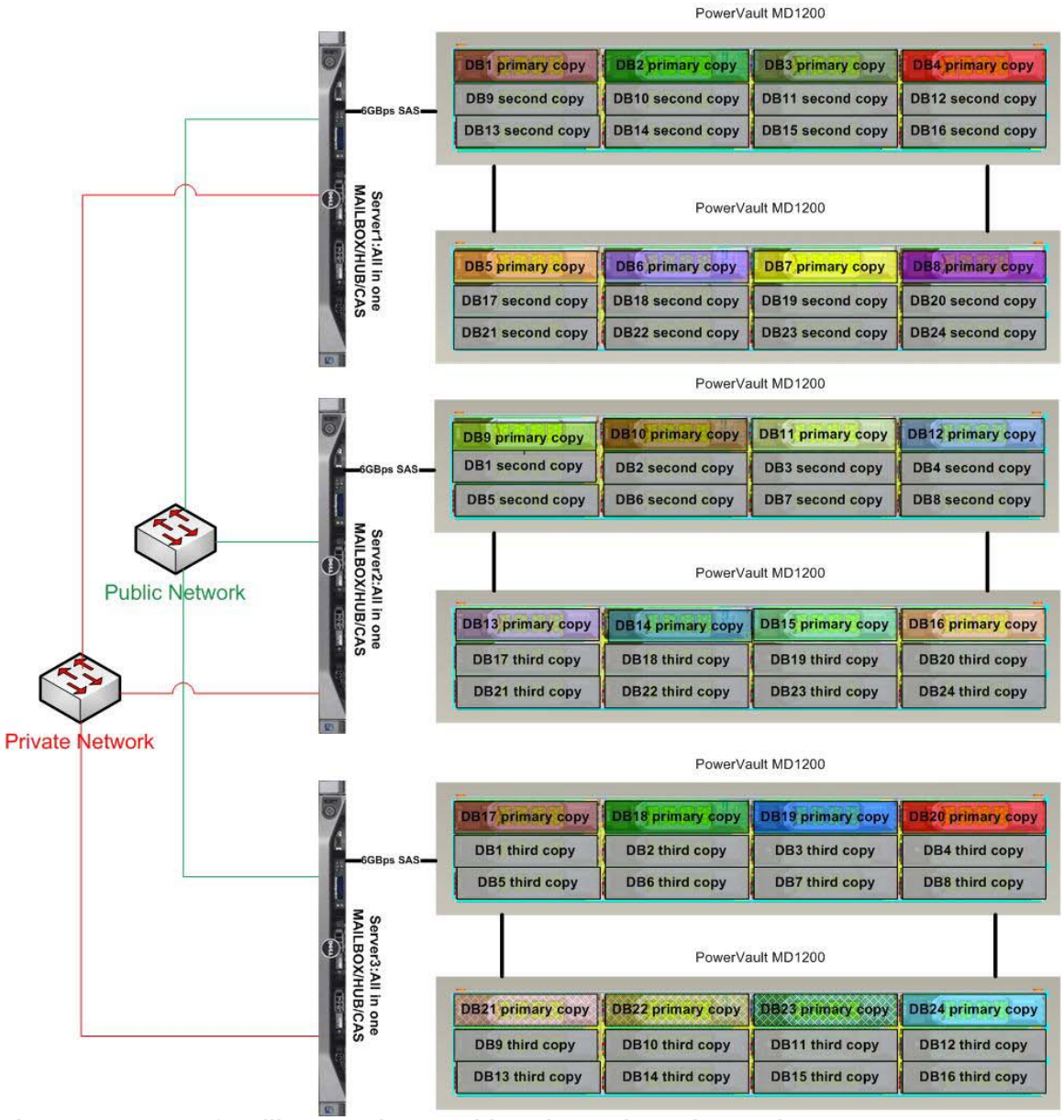

Figure 3: Layout of Mailbox Databases with active and passive copies

Best Practices

Exchange Server 2007 and 2010 overcome the memory limitations of previous Exchange versions by providing support as a 64-bit application capable of running on supported x64 platforms. On Windows Server 2008 R2 x64 Edition about 2TB of addressable memory is available for the kernel mode and the user mode applications. Both the application and kernel can have sufficient memory for operations, allowing the Extensible Storage

Engine (ESE) in Exchange Server 2010 to utilize more memory to buffer data pages. The result is a reduction in the number of I/Os, specifically the read operations, required to the disk sub-system. The total number of database disk I/O operations for a given user load is dependent on the available system memory. For a given load, the total database disk I/O operations required per second (IOPS) decreases over a period with increase in system memory. This decrease in database IOPS is primarily caused by a decrease in database reads.

Even with the decrease in database IOPS using larger server memory, Exchange server remains a disk I/O intensive application. The disk subsystem should be capable to support both the capacity and I/O throughput demands of the application. Based on testing using the ESRP framework, we would recommend the following best practices to help improve the I/O subsystem performance:

For Exchange Server 2010 Mailbox Storage Design, please visit
http://technet.microsoft.com/en-us/library/dd346703.aspx

Core Storage/Replication

1. Exchange 2010 is an IO intensive application. Sharing Exchange 2010 storage resources with other applications may negatively impact the performance of Exchange 2010 deployment and therefore is not recommended.
2. In our testing, the database and log folders shared the same physical disk. Other testing indicated that separating the database folders from log folders on to different set of disks does not provide a noticeable performance advantage. In an Exchange Server 2010 resiliency solution, separating the database and log folders is no longer a required best practice.
3. For Exchange 2010 Database, it is recommended that the size of elements within a RAID stripe be set 512K for best performance.
4. Windows NTFS allocation unit size for Exchange 2010 database partitions should be set to 64K for best performance. For log partitions, if separated from database, the default allocation unit size should be used.
5. Exchange Server 2010 storage latencies are most often related the number of disks available for given a workload. Windows Performance Monitor may be used to monitor Exchange Server 2010 database counters. Average database read latencies (Avg. Disk sec/Read) should not exceed 20ms.

Backup strategy

To protect e-mail data from potential disasters having a well designed and implemented backup solution is critical. Depending on the requirements of an environment different backup strategies may be implemented such as:

- Backup to disk
- Backup to tape
- LAN/SAN based backup etc.

In this solution, DAG is used to maintain a passive database copy on a separate storage system. This passive copy of the database may be used to perform to tape or disk.

The tests performed for backup include: backup-to-disk (read only) and log replay. The backup-to-disk test measures the read I/O performance by running a checksum on all the databases and log files. This test can help determine what kind of database read throughput can be achieved during backups. The backup speed and throughput achieved will depend upon the backup device used. The log replay test was used to measure the maximum rate at which the log files can be played against the databases. This is used to determine the restore times and also database write throughput can be achieved during a log recovery.

Contact for Additional Information

For additional information please visit Dell™ and Exchange Server 2010

Test Result Summary

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

Reliability

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

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

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

Storage Performance Results

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

Individual Server Metrics:

Database I/O	
Database Disks Transfers/sec	5006.96
Average Database Disks Reads/sec	112.24
Average Database Disks Writes/sec	96.37
Average Database Disk Read Latency (ms)	15.74
Average Database Disk Write Latency (ms)	8.38
Transaction Log I/O	
Log Disks Writes/sec	1783.89
Average Log Disk Write Latency (ms)	2.58

Database Backup/Recovery Performance

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

Database Read-only Performance

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

MB read/sec per database	86 (Average)
MB read/sec total per server	2064

Transaction Log Recovery/Replay Performance

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

Average time to play one Log file (sec)	3.99

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: Stress Testing

Microsoft Exchange Server Jetstress Tool

Stress Test Result Report

Test Summary

Overall Test Result	**Pass**
Machine Name	R610E
Test Description	10threads dbmaint adapReadWriteBack 5ios

	daisy-chain 64K NTFS BLK Size gold 24hr
Test Start Time	1/19/2010 4:54:10 PM
Test End Time	1/20/2010 4:58:06 PM
Collection Start Time	1/19/2010 4:57:54 PM
Collection End Time	1/20/2010 4:57:44 PM
Jetstress Version	14.01.0043.000
Ese Version	14.00.0639.019
Operating System	Windows Server 2008 R2 Enterprise (6.1.7600.0)
Performance Log	C:\Jetstress\Results\10thrds_dbmt_adRdWrtBk_5ios_daisy_64kblksize_24hr_gold\Stress_2010_1_19_16_55_0.blg C:\Jetstress\Results\10thrds_dbmt_adRdWrtBk_5ios_daisy_64kblksize_24hr_gold\DBChecksum_2010_1_20_16_58_6.blg

Database Sizing and Throughput

Achieved Transactional I/O per Second	5026.416
Target Transactional I/O per Second	3600
Initial Database Size (bytes)	7761225580544
Final Database Size (bytes)	7983112650752
Database Files (Count)	24

Jetstress System Parameters

Thread Count	10 (per database)
Minimum Database Cache	768.0 MB
Maximum Database Cache	6144.0 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	3

Database Configuration

Instance812.1	Log Path: C:\Amnt\Disk0 Database: C:\Amnt\Disk0\Jetstress001001.edb
Instance812.2	Log Path: C:\Amnt\Disk1 Database: C:\Amnt\Disk1\Jetstress002001.edb
Instance812.3	Log Path: C:\Amnt\Disk2

Database: C:\Amnt\Disk2\Jetstress003001.edb

Instance812.4 Log Path: C:\Amnt\Disk3
Database: C:\Amnt\Disk3\Jetstress004001.edb

Instance812.5 Log Path: C:\Amnt\Disk4
Database: C:\Amnt\Disk4\Jetstress005001.edb

Instance812.6 Log Path: C:\Amnt\Disk5
Database: C:\Amnt\Disk5\Jetstress006001.edb

Instance812.7 Log Path: C:\Amnt\Disk6
Database: C:\Amnt\Disk6\Jetstress007001.edb

Instance812.8 Log Path: C:\Amnt\Disk7
Database: C:\Amnt\Disk7\Jetstress008001.edb

Instance812.9 Log Path: C:\Amnt\Disk8
Database: C:\Amnt\Disk8\Jetstress009001.edb

Instance812.10 Log Path: C:\Amnt\Disk9
Database: C:\Amnt\Disk9\Jetstress010001.edb

Instance812.11 Log Path: C:\Amnt\Disk10
Database: C:\Amnt\Disk10\Jetstress011001.edb

Instance812.12 Log Path: C:\Amnt\Disk11
Database: C:\Amnt\Disk11\Jetstress012001.edb

Instance812.13 Log Path: C:\Amnt\Disk12
Database: C:\Amnt\Disk12\Jetstress013001.edb

Instance812.14 Log Path: C:\Amnt\Disk13
Database: C:\Amnt\Disk13\Jetstress014001.edb

Instance812.15 Log Path: C:\Amnt\Disk14
Database: C:\Amnt\Disk14\Jetstress015001.edb

Instance812.16 Log Path: C:\Amnt\Disk15
Database: C:\Amnt\Disk15\Jetstress016001.edb

Instance812.17 Log Path: C:\Amnt\Disk16
Database: C:\Amnt\Disk16\Jetstress017001.edb

Instance812.18 Log Path: C:\Amnt\Disk17
Database: C:\Amnt\Disk17\Jetstress018001.edb

Instance812.19 Log Path: C:\Amnt\Disk18

Database: C:\Amnt\Disk18\Jetstress019001.edb

Instance812.20 Log Path: C:\Amnt\Disk19
Database: C:\Amnt\Disk19\Jetstress020001.edb

Instance812.21 Log Path: C:\Amnt\Disk20
Database: C:\Amnt\Disk20\Jetstress021001.edb

Instance812.22 Log Path: C:\Amnt\Disk21
Database: C:\Amnt\Disk21\Jetstress022001.edb

Instance812.23 Log Path: C:\Amnt\Disk22
Database: C:\Amnt\Disk22\Jetstress023001.edb

Instance812.24 Log Path: C:\Amnt\Disk23
Database: C:\Amnt\Disk23\Jetstress024001.edb

Transactional I/O Performance

MSExchange Database ==> Instances	I/O DB Reads Avg Latency (msec)	I/O DB Writes Avg Latency (msec)	I/O DB Reads/sec	I/O DB Writes/sec	I/O DB Reads Avg Bytes	I/O DB Writes Avg Bytes	I/O Log Reads Avg Latency (msec)	I/O Log Writes Avg Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Read Avg Bytes	I/O Log Write Avg Bytes
Instance812.1	16.515	15.174	111.939	97.185	33498.956	35442.018	0.000	2.080	0.000	74.067	0.000	5104.761
Instance812.2	16.450	14.698	112.280	97.508	33498.469	35434.352	0.000	2.554	0.000	71.596	0.000	5267.816
Instance812.3	16.302	14.223	112.058	97.285	33480.714	35431.621	0.000	2.510	0.000	71.658	0.000	5247.352
Instance812.4	17.094	13.715	112.231	97.484	33464.331	35431.747	0.000	2.665	0.000	70.970	0.000	5321.187
Instance812.5	16.548	13.153	112.041	97.279	33497.561	35435.522	0.000	2.615	0.000	71.131	0.000	5291.565
Instance812.6	16.929	12.544	111.954	97.135	33480.796	35433.062	0.000	2.772	0.000	70.092	0.000	5347.708
Instance812.7	16.501	11.915	111.888	97.151	33496.793	35437.109	0.000	2.616	0.000	70.970	0.000	5309.116
Instance812.8	16.394	11.236	112.316	97.546	33498.178	35437.750	0.000	2.643	0.000	70.980	0.000	5319.599
Instance812.9	16.240	10.426	112.059	97.309	33489.898	35437.955	0.000	2.532	0.000	71.319	0.000	5288.359
Instance812.10	16.836	9.565	111.896	97.149	33486.881	35436.603	0.000	2.886	0.000	69.331	0.000	5420.267
Instance812.11	15.997	8.706	112.113	97.379	33515.335	35434.146	0.000	2.589	0.000	70.968	0.000	5316.392
Instance812.12	16.256	7.937	112.105	97.404	33518.729	35430.028	0.000	2.725	0.000	70.231	0.000	5377.846
Instance812.13	16.238	7.293	112.226	97.483	33514.932	35427.081	0.000	2.832	0.000	69.572	0.000	5401.890
Instance812.14	16.386	6.837	112.129	97.336	33489.967	35432.709	0.000	2.791	0.000	69.776	0.000	5396.543
Instance812.15	16.271	6.537	112.238	97.499	33490.916	35421.946	0.000	2.951	0.000	68.990	0.000	5454.343
Instance812.16	16.199	6.321	112.175	97.447	33512.303	35430.200	0.000	2.881	0.000	69.340	0.000	5423.983
Instance812.17	16.162	6.164	112.028	97.239	33512.678	35429.512	0.000	2.953	0.000	68.877	0.000	5447.343
Instance812.18	16.575	6.016	112.232	97.496	33491.839	35434.614	0.000	3.088	0.000	68.494	0.000	5508.429
Instance812.19	16.254	5.867	112.232	97.488	33503.190	35424.957	0.000	2.907	0.000	69.211	0.000	5441.210
Instance812.20	16.149	5.700	111.801	97.035	33490.422	35422.665	0.000	2.906	0.000	69.050	0.000	5438.733
Instance812.21	16.075	5.492	112.082	97.316	33487.025	35436.889	0.000	2.911	0.000	69.231	0.000	5443.211
Instance812.22	16.377	5.190	112.138	97.371	33495.696	35436.761	0.000	3.020	0.000	68.669	0.000	5484.196
Instance812.23	16.177	4.871	112.042	97.306	33527.431	35430.906	0.000	2.946	0.000	68.864	0.000	5457.388
Instance812.24	16.080	4.587	112.079	97.305	33498.317	35435.900	0.000	2.882	0.000	69.356	0.000	5429.264

Background Database Maintenance I/O Performance

MSExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes
Instance812.1	30.229	260755.076

Instance812.2	30.365	260745.160
Instance812.3	30.427	260756.588
Instance812.4	30.137	260787.985
Instance812.5	30.450	260782.721
Instance812.6	30.400	260778.487
Instance812.7	30.603	260770.982
Instance812.8	30.709	260774.831
Instance812.9	30.702	260762.983
Instance812.10	30.722	260759.661
Instance812.11	31.001	260776.230
Instance812.12	30.957	260768.520
Instance812.13	31.026	260785.351
Instance812.14	30.976	260792.138
Instance812.15	31.173	260767.683
Instance812.16	31.212	260777.564
Instance812.17	31.146	260780.836
Instance812.18	31.069	260784.557
Instance812.19	31.141	260784.463
Instance812.20	31.104	260810.276
Instance812.21	31.140	260758.122
Instance812.22	31.119	260806.287
Instance812.23	31.090	260768.822
Instance812.24	31.085	260788.802

Log Replication I/O Performance

MSExchange Database ==> Instances	I/O Log Reads/sec	I/O Log Reads Average Bytes
Instance812.1	3.093	232540.136
Instance812.2	3.091	232539.880
Instance812.3	3.082	232544.894
Instance812.4	3.097	232537.134
Instance812.5	3.086	232545.325
Instance812.6	3.075	232539.134
Instance812.7	3.090	232538.436
Instance812.8	3.097	232545.669
Instance812.9	3.092	232543.505
Instance812.10	3.085	232536.501
Instance812.11	3.094	232545.756
Instance812.12	3.098	232547.965
Instance812.13	3.084	232538.669
Instance812.14	3.090	232539.519
Instance812.15	3.089	232542.732
Instance812.16	3.088	232544.103

Instance812.17	3.080	232546.507
Instance812.18	3.098	232541.415
Instance812.19	3.091	232545.421
Instance812.20	3.083	232543.588
Instance812.21	3.094	232540.361
Instance812.22	3.093	232539.801
Instance812.23	3.086	232544.059
Instance812.24	3.092	232545.514

Total I/O Performance

MSExchange Database ==> Instances	I/O DB Reads Avg Latency (msec)	I/O DB Writes Avg Latency (msec)	I/O DB Reads/ sec	I/O DB Writes/ sec	I/O DB Reads Avg Bytes	I/O DB Writes Avg Bytes	I/O Log Reads Avg Latency (msec)	I/O Log Writes Avg Latency (msec)	I/O Log Reads/ sec	I/O Log Writes/ sec	I/O Log Reads Avg Bytes	I/O Log Writes Avg Bytes
Instance812.1	16.515	15.174	142.168	97.185	81820.783	35442.018	8.080	2.080	3.093	74.067	232540.136	5104.761
Instance812.2	16.450	14.698	142.645	97.508	81872.198	35434.352	8.920	2.554	3.091	71.596	232539.880	5267.816
Instance812.3	16.302	14.223	142.485	97.285	82014.285	35431.621	8.714	2.510	3.082	71.658	232544.894	5247.352
Instance812.4	17.094	13.715	142.368	97.484	81584.766	35431.747	8.999	2.665	3.097	70.970	232537.134	5321.187
Instance812.5	16.548	13.153	142.491	97.279	82067.441	35435.522	8.813	2.615	3.086	71.131	232545.325	5291.565
Instance812.6	16.929	12.544	142.354	97.135	82020.903	35433.062	8.988	2.772	3.075	70.092	232539.134	5347.708
Instance812.7	16.501	11.915	142.492	97.151	82308.739	35437.109	8.763	2.616	3.090	70.970	232538.436	5309.116
Instance812.8	16.394	11.236	143.025	97.546	82297.253	35437.750	8.709	2.643	3.097	70.980	232545.669	5319.599
Instance812.9	16.240	10.426	142.761	97.309	82367.407	35437.955	8.552	2.532	3.092	71.319	232543.505	5288.359
Instance812.10	16.836	9.565	142.619	97.149	82444.677	35436.603	9.039	2.886	3.085	69.331	232536.501	5420.267
Instance812.11	15.997	8.706	143.115	97.379	82744.416	35434.146	8.629	2.589	3.094	70.968	232545.756	5316.392
Instance812.12	16.256	7.937	143.061	97.404	82693.090	35430.028	8.574	2.725	3.098	70.231	232547.965	5377.846
Instance812.13	16.238	7.293	143.252	97.483	82738.449	35427.081	8.653	2.832	3.084	69.572	232538.669	5401.890
Instance812.14	16.386	6.837	143.105	97.336	82691.350	35432.709	8.827	2.791	3.090	69.776	232539.519	5396.543
Instance812.15	16.271	6.537	143.411	97.499	82894.173	35421.946	8.792	2.951	3.089	68.990	232542.732	5454.343
Instance812.16	16.199	6.321	143.387	97.447	82982.836	35430.200	8.715	2.881	3.088	69.340	232544.103	5423.983
Instance812.17	16.162	6.164	143.174	97.239	82952.823	35429.512	8.685	2.953	3.080	68.877	232546.507	5447.343
Instance812.18	16.575	6.016	143.300	97.496	82770.555	35434.614	8.850	3.088	3.098	68.494	232541.415	5508.429
Instance812.19	16.254	5.867	143.373	97.488	82868.621	35424.957	8.617	2.907	3.091	69.211	232545.421	5441.210
Instance812.20	16.149	5.700	142.905	97.035	82967.287	35422.665	8.638	2.906	3.083	69.050	232543.588	5438.733
Instance812.21	16.075	5.492	143.222	97.316	82900.896	35436.889	8.559	2.911	3.094	69.231	232540.361	5443.211
Instance812.22	16.377	5.190	143.257	97.371	82873.649	35436.761	8.766	3.020	3.093	68.669	232539.801	5484.196
Instance812.23	16.177	4.871	143.132	97.306	82887.392	35430.906	8.562	2.946	3.086	68.864	232544.059	5457.388
Instance812.24	16.080	4.587	143.163	97.305	82849.288	35435.900	8.635	2.882	3.092	69.356	232545.514	5429.264

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	4.039	3.287	4.920
Available MBytes	8148.426	8070.000	8776.000
Free System Page Table Entries	33555593.947	33555577.000	33555596.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	87297352.143	85684224.000	87670784.000
Pool Paged Bytes	130872277.757	130093056.000	164302848.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log 1/19/2010 4:54:10 PM -- Jetstress testing begins ...
1/19/2010 4:54:10 PM -- Prepare testing begins ...
1/19/2010 4:54:35 PM -- Attaching databases ...
1/19/2010 4:54:35 PM -- Prepare testing ends.
1/19/2010 4:54:35 PM -- Dispatching transactions begins ...
1/19/2010 4:54:35 PM -- Database cache settings: (minimum: 768.0 MB, maximum: 6.0 GB)
1/19/2010 4:54:35 PM -- Database flush thresholds: (start: 61.4 MB, stop: 122.9 MB)
1/19/2010 4:55:00 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 200 msec/read).
1/19/2010 4:55:00 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 200 msec/write).
1/19/2010 4:55:16 PM -- Operation mix: Sessions 10, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.
1/19/2010 4:55:16 PM -- Performance logging begins (interval: 15000 ms).
1/19/2010 4:55:16 PM -- Attaining prerequisites:
1/19/2010 4:57:54 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 5811896000.0 (lower bound: 5798205000.0, upper bound: none)
1/20/2010 4:57:55 PM -- Performance logging ends.
1/20/2010 4:57:55 PM -- JetInterop batch transaction stats: 646248, 645542, 644436, 646091, 644745, 643660, 644801, 646334, 646065, 644845, 646083, 645433, 644685, 645168, 645764, 645314, 644714, 645851, 646297, 645237, 645484, 645856, 644508 and 645966.
1/20/2010 4:57:55 PM -- Dispatching transactions ends.
1/20/2010 4:57:55 PM -- Shutting down databases ...
1/20/2010 4:58:06 PM -- Instance812.1 (complete), Instance812.2 (complete), Instance812.3 (complete), Instance812.4 (complete), Instance812.5 (complete), Instance812.6 (complete), Instance812.7 (complete), Instance812.8 (complete), Instance812.9 (complete), Instance812.10 (complete), Instance812.11 (complete), Instance812.12 (complete), Instance812.13 (complete), Instance812.14 (complete), Instance812.15 (complete), Instance812.16 (complete), Instance812.17 (complete), Instance812.18 (complete), Instance812.19 (complete), Instance812.20 (complete), Instance812.21 (complete), Instance812.22 (complete), Instance812.23 (complete) and Instance812.24 (complete)
1/20/2010 4:58:07 PM -- Performance logging begins (interval: 30000 ms).
1/20/2010 4:58:07 PM -- Verifying database checksums ...
1/20/2010 6:02:01 PM -- C:\Amnt\Disk0 (100% processed), C:\Amnt\Disk1 (100% processed), C:\Amnt\Disk2 (100% processed), C:\Amnt\Disk3 (100% processed), C:\Amnt\Disk4 (100% processed), C:\Amnt\Disk5 (100% processed), C:\Amnt\Disk6 (100% processed), C:\Amnt\Disk7 (100% processed), C:\Amnt\Disk8 (100% processed), C:\Amnt\Disk9 (100% processed), C:\Amnt\Disk10 (100% processed), C:\Amnt\Disk11 (100% processed), C:\Amnt\Disk12 (100% processed), C:\Amnt\Disk13 (100% processed), C:\Amnt\Disk14 (100% processed), C:\Amnt\Disk15 (100% processed), C:\Amnt\Disk16 (100% processed), C:\Amnt\Disk17 (100% processed), C:\Amnt\Disk18 (100% processed), C:\Amnt\Disk19 (100% processed), C:\Amnt\Disk20 (100% processed), C:\Amnt\Disk21 (100% processed), C:\Amnt\Disk22 (100% processed) and C:\Amnt\Disk23 (100% processed)
1/20/2010 6:02:01 PM -- Performance logging ends.
1/20/2010 6:02:01 PM -- C:\Jetstress\Results\10thrds_dbmt_adRdWrtBk_5ios_daisy_64kblksize_24hr_gold\DBChecksum_2010_1_20_16_58_6.blg has 127 samples.
1/20/2010 6:02:08 PM -- C:\Jetstress\Results\10thrds_dbmt_adRdWrtBk_5ios_daisy_64kblksize_24hr_gold\DBChecksum_2010_1_20_16_58_6.html is saved.
1/20/2010 6:02:08 PM -- Verifying log checksums ...
1/20/2010 6:02:08 PM -- C:\Amnt\Disk0 (22 log(s) processed), C:\Amnt\Disk1 (21 log(s) processed), C:\Amnt\Disk2 (21 log(s) processed), C:\Amnt\Disk3 (21 log(s) processed), C:\Amnt\Disk4 (21 log(s) processed), C:\Amnt\Disk5 (22 log(s) processed), C:\Amnt\Disk6 (20 log(s) processed), C:\Amnt\Disk7 (21 log(s) processed), C:\Amnt\Disk8 (19 log(s) processed), C:\Amnt\Disk9 (21 log(s) processed), C:\Amnt\Disk10 (21 log(s) processed),

C:\Amnt\Disk11 (21 log(s) processed), C:\Amnt\Disk12 (21 log(s) processed),
C:\Amnt\Disk13 (21 log(s) processed), C:\Amnt\Disk14 (22 log(s) processed),
C:\Amnt\Disk15 (21 log(s) processed), C:\Amnt\Disk16 (19 log(s) processed),
C:\Amnt\Disk17 (19 log(s) processed), C:\Amnt\Disk18 (21 log(s) processed),
C:\Amnt\Disk19 (19 log(s) processed), C:\Amnt\Disk20 (20 log(s) processed),
C:\Amnt\Disk21 (20 log(s) processed), C:\Amnt\Disk22 (20 log(s) processed) and
C:\Amnt\Disk23 (20 log(s) processed)
1/20/2010 6:02:09 PM --
C:\Jetstress\Results\10thrds_dbmt_adRdWrtBk_5ios_daisy_64kblksize_24hr_gold\Stress_2010_1_19_16_55_0.blg has 5755 samples.
1/20/2010 6:02:09 PM -- Creating test report ...
1/20/2010 6:03:59 PM -- Instance812.1 has 16.5 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.1 has 2.1 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.1 has 2.1 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.2 has 16.5 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.2 has 2.6 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.2 has 2.6 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.3 has 16.3 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.3 has 2.5 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.3 has 2.5 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.4 has 17.1 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.4 has 2.7 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.4 has 2.7 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.5 has 16.5 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.5 has 2.6 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.5 has 2.6 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.6 has 16.9 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.6 has 2.8 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.6 has 2.8 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.7 has 16.5 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.7 has 2.6 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.7 has 2.6 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.8 has 16.4 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.8 has 2.6 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.8 has 2.6 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.9 has 16.2 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.9 has 2.5 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.9 has 2.5 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.10 has 16.8 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.10 has 2.9 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.10 has 2.9 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.11 has 16.0 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.11 has 2.6 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.11 has 2.6 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.12 has 16.3 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.12 has 2.7 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.12 has 2.7 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.13 has 16.2 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.13 has 2.8 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.13 has 2.8 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.14 has 16.4 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.14 has 2.8 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.14 has 2.8 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.15 has 16.3 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.15 has 3.0 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.15 has 3.0 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.16 has 16.2 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.16 has 2.9 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.16 has 2.9 for I/O Log Reads Average Latency.

1/20/2010 6:03:59 PM -- Instance812.17 has 16.2 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.17 has 3.0 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.17 has 3.0 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.18 has 16.6 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.18 has 3.1 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.18 has 3.1 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.19 has 16.3 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.19 has 2.9 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.19 has 2.9 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.20 has 16.1 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.20 has 2.9 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.20 has 2.9 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.21 has 16.1 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.21 has 2.9 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.21 has 2.9 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.22 has 16.4 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.22 has 3.0 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.22 has 3.0 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.23 has 16.2 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.23 has 2.9 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.23 has 2.9 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.24 has 16.1 for I/O Database Reads Average Latency.
1/20/2010 6:03:59 PM -- Instance812.24 has 2.9 for I/O Log Writes Average Latency.
1/20/2010 6:03:59 PM -- Instance812.24 has 2.9 for I/O Log Reads Average Latency.
1/20/2010 6:03:59 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.
1/20/2010 6:03:59 PM -- Test has 0 Database Page Fault Stalls/sec samples higher than 0.
1/20/2010 6:03:59 PM -- C:\Jetstress\Results\10thrds_dbmt_adRdWrtBk_5ios_daisy_64kblksize_24hr_gold\Stress_2010_1_19_16_55_0.xml has 5744 samples queried.

Appendix B: Performance Testing

Microsoft Exchange Server Jetstress Tool

Performance Test Result Report

Test Summary

Overall Test Result	**Pass**
Machine Name	R610E
Test Description	10threads dbmaint

	adapReadWriteBack 5ios daisy-chain 64K NTFS BLK Size gold 2hr
Test Start Time	1/19/2010 12:49:37 PM
Test End Time	1/19/2010 2:53:52 PM
Collection Start Time	1/19/2010 12:53:40 PM
Collection End Time	1/19/2010 2:53:32 PM
Jetstress Version	14.01.0043.000
Ese Version	14.00.0639.019
Operating System	Windows Server 2008 R2 Enterprise (6.1.7600.0)
Performance Log	C:\Jetstress\Results\10thrds_dbmt_adRdWrtBk_5ios_daisy_64kblksize_2hr_gold\Performance_2010_1_19_12_50_26.blg C:\Jetstress\Results\10thrds_dbmt_adRdWrtBk_5ios_daisy_64kblksize_2hr_gold\DBChecksum_2010_1_19_14_53_52.blg

Database Sizing and Throughput

Achieved Transactional I/O per Second	5006.884
Target Transactional I/O per Second	3600
Initial Database Size (bytes)	7741780787200
Final Database Size (bytes)	7761225580544
Database Files (Count)	24

Jetstress System Parameters

Thread Count	10 (per database)
Minimum Database Cache	768.0 MB
Maximum Database Cache	6144.0 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	3

Database Configuration

Instance3124.1	Log Path: C:\Amnt\Disk0 Database: C:\Amnt\Disk0\Jetstress001001.edb
Instance3124.2	Log Path: C:\Amnt\Disk1

Database: C:\Amnt\Disk1\Jetstress002001.edb

Instance3124.3 Log Path: C:\Amnt\Disk2
Database: C:\Amnt\Disk2\Jetstress003001.edb

Instance3124.4 Log Path: C:\Amnt\Disk3
Database: C:\Amnt\Disk3\Jetstress004001.edb

Instance3124.5 Log Path: C:\Amnt\Disk4
Database: C:\Amnt\Disk4\Jetstress005001.edb

Instance3124.6 Log Path: C:\Amnt\Disk5
Database: C:\Amnt\Disk5\Jetstress006001.edb

Instance3124.7 Log Path: C:\Amnt\Disk6
Database: C:\Amnt\Disk6\Jetstress007001.edb

Instance3124.8 Log Path: C:\Amnt\Disk7
Database: C:\Amnt\Disk7\Jetstress008001.edb

Instance3124.9 Log Path: C:\Amnt\Disk8
Database: C:\Amnt\Disk8\Jetstress009001.edb

Instance3124.10 Log Path: C:\Amnt\Disk9
Database: C:\Amnt\Disk9\Jetstress010001.edb

Instance3124.11 Log Path: C:\Amnt\Disk10
Database: C:\Amnt\Disk10\Jetstress011001.edb

Instance3124.12 Log Path: C:\Amnt\Disk11
Database: C:\Amnt\Disk11\Jetstress012001.edb

Instance3124.13 Log Path: C:\Amnt\Disk12
Database: C:\Amnt\Disk12\Jetstress013001.edb

Instance3124.14 Log Path: C:\Amnt\Disk13
Database: C:\Amnt\Disk13\Jetstress014001.edb

Instance3124.15 Log Path: C:\Amnt\Disk14
Database: C:\Amnt\Disk14\Jetstress015001.edb

Instance3124.16 Log Path: C:\Amnt\Disk15
Database: C:\Amnt\Disk15\Jetstress016001.edb

Instance3124.17 Log Path: C:\Amnt\Disk16
Database: C:\Amnt\Disk16\Jetstress017001.edb

Instance3124.18 Log Path: C:\Amnt\Disk17

Database: C:\Amnt\Disk17\Jetstress018001.edb

Instance3124.19 Log Path: C:\Amnt\Disk18
Database: C:\Amnt\Disk18\Jetstress019001.edb

Instance3124.20 Log Path: C:\Amnt\Disk19
Database: C:\Amnt\Disk19\Jetstress020001.edb

Instance3124.21 Log Path: C:\Amnt\Disk20
Database: C:\Amnt\Disk20\Jetstress021001.edb

Instance3124.22 Log Path: C:\Amnt\Disk21
Database: C:\Amnt\Disk21\Jetstress022001.edb

Instance3124.23 Log Path: C:\Amnt\Disk22
Database: C:\Amnt\Disk22\Jetstress023001.edb

Instance3124.24 Log Path: C:\Amnt\Disk23
Database: C:\Amnt\Disk23\Jetstress024001.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
Instance3124.1	15.827	14.041	112.522	96.494	33625.107	36969.132	0.000	2.024	0.000	78.144	0.000	5119.057
Instance3124.2	15.906	13.587	112.257	96.558	33620.775	36996.703	0.000	2.428	0.000	76.027	0.000	5284.551
Instance3124.3	15.790	13.083	112.842	97.040	33572.886	36974.459	0.000	2.359	0.000	76.415	0.000	5251.461
Instance3124.4	15.959	12.625	112.226	96.380	33552.264	36992.023	0.000	2.436	0.000	75.878	0.000	5310.832
Instance3124.5	15.931	11.998	112.475	96.461	33605.875	36967.259	0.000	2.454	0.000	75.371	0.000	5267.936
Instance3124.6	16.001	11.497	111.647	95.717	33677.524	36981.049	0.000	2.573	0.000	74.239	0.000	5355.989
Instance3124.7	16.021	10.869	113.166	97.274	33565.267	36946.948	0.000	2.466	0.000	75.401	0.000	5306.898
Instance3124.8	15.895	10.230	112.701	96.790	33603.260	36976.274	0.000	2.522	0.000	75.095	0.000	5306.727
Instance3124.9	15.594	9.548	112.477	96.610	33581.723	36991.104	0.000	2.385	0.000	75.477	0.000	5270.723
Instance3124.10	15.910	8.837	110.920	95.008	33625.666	36956.303	0.000	2.745	0.000	72.504	0.000	5431.102
Instance3124.11	15.587	8.108	112.360	96.522	33641.381	36991.886	0.000	2.472	0.000	75.017	0.000	5339.132
Instance3124.12	15.412	7.473	111.584	95.696	33616.890	36979.627	0.000	2.572	0.000	73.680	0.000	5401.633
Instance3124.13	15.661	6.976	112.368	96.559	33598.316	36964.287	0.000	2.643	0.000	74.203	0.000	5391.497
Instance3124.14	15.546	6.594	112.403	96.516	33485.907	36912.688	0.000	2.584	0.000	73.958	0.000	5362.615
Instance3124.15	15.597	6.354	111.340	95.525	33604.332	36991.570	0.000	2.760	0.000	72.836	0.000	5460.540
Instance3124.16	15.625	6.178	111.787	95.836	33584.519	36998.880	0.000	2.755	0.000	73.001	0.000	5450.127
Instance3124.17	15.532	6.076	111.622	95.572	33619.833	36946.343	0.000	2.786	0.000	72.346	0.000	5475.142
Instance3124.18	15.729	5.927	112.302	96.498	33595.488	36994.195	0.000	2.787	0.000	73.249	0.000	5452.656
Instance3124.19	15.862	5.784	112.752	96.906	33543.299	36982.636	0.000	2.724	0.000	73.755	0.000	5451.992
Instance3124.20	15.818	5.624	113.392	97.689	33512.808	36998.190	0.000	2.689	0.000	74.413	0.000	5421.174
Instance3124.21	15.657	5.421	112.229	96.429	33643.403	36946.038	0.000	2.678	0.000	73.418	0.000	5419.018
Instance3124.22	15.943	5.124	113.016	97.169	33605.219	36972.696	0.000	2.789	0.000	73.521	0.000	5414.605
Instance3124.23	15.638	4.773	112.225	96.292	33566.037	36950.211	0.000	2.748	0.000	72.889	0.000	5456.451
Instance3124.24	15.513	4.486	111.262	95.468	33556.142	36993.213	0.000	2.686	0.000	73.062	0.000	5449.481

Background Database Maintenance I/O Performance

MSExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes
Instance3124.1	30.546	260959.915
Instance3124.2	30.555	260968.042
Instance3124.3	30.623	260909.350
Instance3124.4	30.647	261007.087
Instance3124.5	30.708	260904.415
Instance3124.6	30.747	260970.682
Instance3124.7	30.750	260858.886
Instance3124.8	30.883	260811.418
Instance3124.9	30.973	260942.604
Instance3124.10	31.030	260902.685
Instance3124.11	31.087	260892.796
Instance3124.12	31.186	260937.513
Instance3124.13	31.236	260901.504
Instance3124.14	31.274	260877.424
Instance3124.15	31.266	260956.687
Instance3124.16	31.260	260908.957
Instance3124.17	31.249	261008.114
Instance3124.18	31.266	260887.531
Instance3124.19	31.179	260902.158
Instance3124.20	31.188	260947.239
Instance3124.21	31.204	260934.410
Instance3124.22	31.173	260891.101
Instance3124.23	31.158	260915.869
Instance3124.24	31.128	260955.243

Log Replication I/O Performance

MSExchange Database ==> Instances	I/O Log Reads/sec	I/O Log Reads Average Bytes
Instance3124.1	3.270	232546.391
Instance3124.2	3.295	232536.129
Instance3124.3	3.288	232550.975
Instance3124.4	3.305	232541.624
Instance3124.5	3.253	232528.109
Instance3124.6	3.263	232549.041
Instance3124.7	3.280	232549.959
Instance3124.8	3.273	232528.969
Instance3124.9	3.263	232526.585
Instance3124.10	3.238	232551.903
Instance3124.11	3.285	232542.819
Instance3124.12	3.265	232536.835
Instance3124.13	3.285	232549.911

Instance3124.14	3.253	232552.668
Instance3124.15	3.267	232564.027
Instance3124.16	3.270	232551.035
Instance3124.17	3.255	232541.267
Instance3124.18	3.283	232539.220
Instance3124.19	3.305	232545.242
Instance3124.20	3.313	232550.185
Instance3124.21	3.265	232541.113
Instance3124.22	3.268	232543.576
Instance3124.23	3.265	232545.194
Instance3124.24	3.270	232548.558

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 Avg Latency (msec)	I/O Log Writes Avg Latency (msec)	I/O Log Reads / sec	I/O Log Writes/ sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance3124.1	15.827	14.041	143.068	96.494	82163.225	36969.132	7.726	2.024	3.270	78.144	232546.391	5119.057
Instance3124.2	15.906	13.587	142.812	96.558	82262.270	36996.703	8.490	2.428	3.295	76.027	232536.129	5284.551
Instance3124.3	15.790	13.083	143.465	97.040	82097.865	36974.459	8.387	2.359	3.288	76.415	232550.975	5251.461
Instance3124.4	15.959	12.625	142.873	96.380	82343.045	36992.023	8.805	2.436	3.305	75.878	232541.624	5310.832
Instance3124.5	15.931	11.998	143.182	96.461	82353.401	36967.259	8.536	2.454	3.253	75.371	232528.109	5267.936
Instance3124.6	16.001	11.497	142.394	95.717	82756.709	36981.049	8.360	2.573	3.263	74.239	232549.041	5355.989
Instance3124.7	16.021	10.869	143.916	97.274	82130.222	36946.948	8.763	2.466	3.280	75.401	232549.959	5306.898
Instance3124.8	15.895	10.230	143.584	96.790	82472.521	36976.274	8.531	2.522	3.273	75.095	232528.969	5306.727
Instance3124.9	15.594	9.548	143.450	96.610	82672.356	36991.104	8.265	2.385	3.263	75.477	232526.585	5270.723
Instance3124.10	15.910	8.837	141.951	95.008	83308.279	36956.303	8.788	2.745	3.238	72.504	232551.903	5431.102
Instance3124.11	15.587	8.108	143.447	96.522	82890.351	36991.886	8.543	2.472	3.285	75.017	232542.819	5339.132
Instance3124.12	15.412	7.473	142.770	95.696	83271.751	36979.627	8.079	2.572	3.265	73.680	232536.835	5401.633
Instance3124.13	15.661	6.976	143.604	96.559	83039.657	36964.287	8.269	2.643	3.285	74.203	232549.911	5391.497
Instance3124.14	15.546	6.594	143.677	96.516	82982.080	36912.688	8.591	2.584	3.253	73.958	232552.668	5362.615
Instance3124.15	15.597	6.354	142.606	95.525	83450.893	36991.570	8.408	2.760	3.267	72.836	232564.027	5460.540
Instance3124.16	15.625	6.178	143.047	95.836	83261.583	36998.880	8.584	2.755	3.270	73.001	232551.035	5450.127
Instance3124.17	15.532	6.076	142.872	95.572	83354.853	36946.343	8.312	2.786	3.255	72.346	232541.267	5475.142
Instance3124.18	15.729	5.927	143.567	96.498	83094.319	36994.195	8.285	2.787	3.283	73.249	232539.220	5452.656
Instance3124.19	15.862	5.784	143.931	96.906	82794.372	36982.636	8.720	2.724	3.305	73.755	232545.242	5451.992
Instance3124.20	15.818	5.624	144.580	97.689	82574.050	36998.190	8.355	2.689	3.313	74.413	232550.185	5421.174
Instance3124.21	15.657	5.421	143.433	96.429	83090.468	36946.038	8.426	2.678	3.265	73.418	232541.113	5419.018
Instance3124.22	15.943	5.124	144.189	97.169	82742.834	36972.696	8.495	2.789	3.268	73.521	232543.576	5414.605
Instance3124.23	15.638	4.773	143.383	96.292	82970.200	36950.211	8.218	2.748	3.265	72.889	232545.194	5456.451
Instance3124.24	15.513	4.486	142.390	95.468	83268.027	36993.213	8.167	2.686	3.270	73.062	232548.558	5449.481

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	2.904	1.899	3.527
Available MBytes	8422.200	8359.000	9018.000
Free System Page Table Entries	33555593.958	33555592.000	33555594.000
Transition Pages RePurposed/sec	0.000	0.000	0.000

Pool Nonpaged Bytes	86831223.716	85250048.000	87199744.000
Pool Paged Bytes	128801755.658	128720896.000	128892928.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log 1/19/2010 12:49:36 PM -- Jetstress testing begins ...
1/19/2010 12:49:37 PM -- Prepare testing begins ...
1/19/2010 12:50:01 PM -- Attaching databases ...
1/19/2010 12:50:01 PM -- Prepare testing ends.
1/19/2010 12:50:01 PM -- Dispatching transactions begins ...
1/19/2010 12:50:01 PM -- Database cache settings: (minimum: 768.0 MB, maximum: 6.0 GB)
1/19/2010 12:50:01 PM -- Database flush thresholds: (start: 61.4 MB, stop: 122.9 MB)
1/19/2010 12:50:26 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).
1/19/2010 12:50:26 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).
1/19/2010 12:50:43 PM -- Operation mix: Sessions 10, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.
1/19/2010 12:50:43 PM -- Performance logging begins (interval: 15000 ms).
1/19/2010 12:50:43 PM -- Attaining prerequisites:
1/19/2010 12:53:40 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 5817692000.0 (lower bound: 5798205000.0, upper bound: none)
1/19/2010 2:53:41 PM -- Performance logging ends.
1/19/2010 2:53:41 PM -- JetInterop batch transaction stats: 57420, 57391, 57782, 57415, 57132, 57306, 57595, 57777, 57457, 56847, 57609, 57128, 57594, 57303, 57179, 57124, 57209, 57188, 57699, 57955, 57421, 57597, 57482 and 57293.
1/19/2010 2:53:41 PM -- Dispatching transactions ends.
1/19/2010 2:53:41 PM -- Shutting down databases ...
1/19/2010 2:53:52 PM -- Instance3124.1 (complete), Instance3124.2 (complete), Instance3124.3 (complete), Instance3124.4 (complete), Instance3124.5 (complete), Instance3124.6 (complete), Instance3124.7 (complete), Instance3124.8 (complete), Instance3124.9 (complete), Instance3124.10 (complete), Instance3124.11 (complete), Instance3124.12 (complete), Instance3124.13 (complete), Instance3124.14 (complete), Instance3124.15 (complete), Instance3124.16 (complete), Instance3124.17 (complete), Instance3124.18 (complete), Instance3124.19 (complete), Instance3124.20 (complete), Instance3124.21 (complete), Instance3124.22 (complete), Instance3124.23 (complete) and Instance3124.24 (complete)
1/19/2010 2:53:53 PM -- Performance logging begins (interval: 30000 ms).
1/19/2010 2:53:53 PM -- Verifying database checksums ...
1/19/2010 3:56:06 PM -- C:\Amnt\Disk0 (100% processed), C:\Amnt\Disk1 (100% processed), C:\Amnt\Disk2 (100% processed), C:\Amnt\Disk3 (100% processed), C:\Amnt\Disk4 (100% processed), C:\Amnt\Disk5 (100% processed), C:\Amnt\Disk6 (100% processed), C:\Amnt\Disk7 (100% processed), C:\Amnt\Disk8 (100% processed), C:\Amnt\Disk9 (100% processed), C:\Amnt\Disk10 (100% processed), C:\Amnt\Disk11 (100% processed), C:\Amnt\Disk12 (100% processed), C:\Amnt\Disk13 (100% processed), C:\Amnt\Disk14 (100% processed), C:\Amnt\Disk15 (100% processed), C:\Amnt\Disk16 (100% processed), C:\Amnt\Disk17 (100% processed), C:\Amnt\Disk18 (100% processed), C:\Amnt\Disk19 (100% processed), C:\Amnt\Disk20 (100% processed), C:\Amnt\Disk21 (100% processed), C:\Amnt\Disk22 (100% processed) and C:\Amnt\Disk23 (100% processed)
1/19/2010 3:56:06 PM -- Performance logging ends.
1/19/2010 3:56:06 PM -- C:\Jetstress\Results\10thrds_dbmt_adRdWrtBk_5ios_daisy_64kblksize_2hr_gold\DBChecksum_2010_1_19_14_53_52.blg has 124 samples.
1/19/2010 3:56:13 PM -- C:\Jetstress\Results\10thrds_dbmt_adRdWrtBk_5ios_daisy_64kblksize_2hr_gold\DBChecksum_2010_1_19_14_53_52.html is saved.
1/19/2010 3:56:13 PM -- Verifying log checksums ...
1/19/2010 3:56:14 PM -- C:\Amnt\Disk0 (22 log(s) processed), C:\Amnt\Disk1 (21 log(s)

processed), C:\Amnt\Disk2 (21 log(s) processed), C:\Amnt\Disk3 (21 log(s) processed), C:\Amnt\Disk4 (21 log(s) processed), C:\Amnt\Disk5 (20 log(s) processed), C:\Amnt\Disk6 (20 log(s) processed), C:\Amnt\Disk7 (20 log(s) processed), C:\Amnt\Disk8 (22 log(s) processed), C:\Amnt\Disk9 (21 log(s) processed), C:\Amnt\Disk10 (20 log(s) processed), C:\Amnt\Disk11 (20 log(s) processed), C:\Amnt\Disk12 (21 log(s) processed), C:\Amnt\Disk13 (20 log(s) processed), C:\Amnt\Disk14 (20 log(s) processed), C:\Amnt\Disk15 (21 log(s) processed), C:\Amnt\Disk16 (20 log(s) processed), C:\Amnt\Disk17 (21 log(s) processed), C:\Amnt\Disk18 (21 log(s) processed), C:\Amnt\Disk19 (21 log(s) processed), C:\Amnt\Disk20 (21 log(s) processed), C:\Amnt\Disk21 (20 log(s) processed), C:\Amnt\Disk22 (21 log(s) processed) and C:\Amnt\Disk23 (19 log(s) processed)
1/19/2010 3:56:14 PM -- C:\Jetstress\Results\10thrds_dbmt_adRdWrtBk_5ios_daisy_64kblksize_2hr_gold\Performance_2010_1_19_12_50_26.blg has 490 samples.
1/19/2010 3:56:14 PM -- Creating test report ...
1/19/2010 3:56:23 PM -- Instance3124.1 has 15.8 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.1 has 2.0 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.1 has 2.0 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.2 has 15.9 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.2 has 2.4 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.2 has 2.4 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.3 has 15.8 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.3 has 2.4 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.3 has 2.4 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.4 has 16.0 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.4 has 2.4 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.4 has 2.4 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.5 has 15.9 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.5 has 2.5 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.5 has 2.5 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.6 has 16.0 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.6 has 2.6 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.6 has 2.6 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.7 has 16.0 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.7 has 2.5 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.7 has 2.5 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.8 has 15.9 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.8 has 2.5 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.8 has 2.5 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.9 has 15.6 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.9 has 2.4 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.9 has 2.4 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.10 has 15.9 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.10 has 2.7 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.10 has 2.7 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.11 has 15.6 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.11 has 2.5 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.11 has 2.5 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.12 has 15.4 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.12 has 2.6 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.12 has 2.6 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.13 has 15.7 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.13 has 2.6 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.13 has 2.6 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.14 has 15.5 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.14 has 2.6 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.14 has 2.6 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.15 has 15.6 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.15 has 2.8 for I/O Log Writes Average Latency.

1/19/2010 3:56:23 PM -- Instance3124.15 has 2.8 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.16 has 15.6 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.16 has 2.8 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.16 has 2.8 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.17 has 15.5 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.17 has 2.8 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.17 has 2.8 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.18 has 15.7 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.18 has 2.8 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.18 has 2.8 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.19 has 15.9 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.19 has 2.7 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.19 has 2.7 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.20 has 15.8 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.20 has 2.7 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.20 has 2.7 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.21 has 15.7 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.21 has 2.7 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.21 has 2.7 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.22 has 15.9 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.22 has 2.8 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.22 has 2.8 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.23 has 15.6 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.23 has 2.7 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.23 has 2.7 for I/O Log Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.24 has 15.5 for I/O Database Reads Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.24 has 2.7 for I/O Log Writes Average Latency.
1/19/2010 3:56:23 PM -- Instance3124.24 has 2.7 for I/O Log Reads Average Latency.
1/19/2010 3:56:24 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.
1/19/2010 3:56:24 PM -- Test has 0 Database Page Fault Stalls/sec samples higher than 0.
1/19/2010 3:56:24 PM -- C:\Jetstress\Results\10thrds_dbmt_adRdWrtBk_5ios_daisy_64kblksize_2hr_gold\Performance_2010_1_19_12_50_26.xml has 478 samples queried.

Appendix C Streaming Backup Testing

Microsoft Exchange Server Jetstress Tool

Database backup Test Result Report

Database Backup Statistics - All

Database Instance	Database Size (MBytes)	Elapsed Backup Time	MBytes Transferred/sec
Instance4172.1	334825.09	01:05:41	84.94
Instance4172.2	334817.09	00:56:49	98.20
Instance4172.3	334825.09	01:06:59	83.30
Instance4172.4	334873.09	01:06:56	83.38
Instance4172.5	334865.09	01:06:50	83.51
Instance4172.6	334801.09	01:06:44	83.61
Instance4172.7	334833.09	01:06:50	83.48
Instance4172.8	334873.09	01:06:54	83.42
Instance4172.9	334857.09	01:06:52	83.45
Instance4172.10	334833.09	01:06:53	83.42
Instance4172.11	334833.09	00:51:00	109.40
Instance4172.12	334865.09	01:06:53	83.43
Instance4172.13	334889.09	01:07:06	83.17
Instance4172.14	334833.09	01:07:14	82.99
Instance4172.15	334785.09	01:07:11	83.05
Instance4172.16	334801.09	01:07:01	83.25
Instance4172.17	334833.09	00:51:48	107.72
Instance4172.18	334849.09	01:07:00	83.28
Instance4172.19	334849.09	01:06:58	83.33
Instance4172.20	334841.09	01:06:58	83.32
Instance4172.21	334897.09	01:06:58	83.34
Instance4172.22	334881.09	01:05:55	84.66
Instance4172.23	334873.09	01:06:57	83.35
Instance4172.24	334809.09	01:06:57	83.34

Jetstress System Parameters

Thread Count	10 (per database)
Minimum Database Cache	768.0 MB
Maximum Database Cache	6144.0 MB
Insert Operations	40%
Delete Operations	20%
Replace Operations	5%
Read Operations	35%
Lazy Commits	70%

Database Configuration

Instance4172.1 Log Path: C:\Amnt\Disk0
Database: C:\Amnt\Disk0\Jetstress001001.edb

Instance4172.2 Log Path: C:\Amnt\Disk1

Database: C:\Amnt\Disk1\Jetstress002001.edb

Instance4172.3 Log Path: C:\Amnt\Disk2
Database: C:\Amnt\Disk2\Jetstress003001.edb

Instance4172.4 Log Path: C:\Amnt\Disk3
Database: C:\Amnt\Disk3\Jetstress004001.edb

Instance4172.5 Log Path: C:\Amnt\Disk4
Database: C:\Amnt\Disk4\Jetstress005001.edb

Instance4172.6 Log Path: C:\Amnt\Disk5
Database: C:\Amnt\Disk5\Jetstress006001.edb

Instance4172.7 Log Path: C:\Amnt\Disk6
Database: C:\Amnt\Disk6\Jetstress007001.edb

Instance4172.8 Log Path: C:\Amnt\Disk7
Database: C:\Amnt\Disk7\Jetstress008001.edb

Instance4172.9 Log Path: C:\Amnt\Disk8
Database: C:\Amnt\Disk8\Jetstress009001.edb

Instance4172.10 Log Path: C:\Amnt\Disk9
Database: C:\Amnt\Disk9\Jetstress010001.edb

Instance4172.11 Log Path: C:\Amnt\Disk10
Database: C:\Amnt\Disk10\Jetstress011001.edb

Instance4172.12 Log Path: C:\Amnt\Disk11
Database: C:\Amnt\Disk11\Jetstress012001.edb

Instance4172.13 Log Path: C:\Amnt\Disk12
Database: C:\Amnt\Disk12\Jetstress013001.edb

Instance4172.14 Log Path: C:\Amnt\Disk13
Database: C:\Amnt\Disk13\Jetstress014001.edb

Instance4172.15 Log Path: C:\Amnt\Disk14
Database: C:\Amnt\Disk14\Jetstress015001.edb

Instance4172.16 Log Path: C:\Amnt\Disk15
Database: C:\Amnt\Disk15\Jetstress016001.edb

Instance4172.17 Log Path: C:\Amnt\Disk16
Database: C:\Amnt\Disk16\Jetstress017001.edb

Instance4172.18 Log Path: C:\Amnt\Disk17

Database: C:\Amnt\Disk17\Jetstress018001.edb

Instance4172.19 Log Path: C:\Amnt\Disk18
Database: C:\Amnt\Disk18\Jetstress019001.edb

Instance4172.20 Log Path: C:\Amnt\Disk19
Database: C:\Amnt\Disk19\Jetstress020001.edb

Instance4172.21 Log Path: C:\Amnt\Disk20
Database: C:\Amnt\Disk20\Jetstress021001.edb

Instance4172.22 Log Path: C:\Amnt\Disk21
Database: C:\Amnt\Disk21\Jetstress022001.edb

Instance4172.23 Log Path: C:\Amnt\Disk22
Database: C:\Amnt\Disk22\Jetstress023001.edb

Instance4172.24 Log Path: C:\Amnt\Disk23
Database: C:\Amnt\Disk23\Jetstress024001.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
Instance4172.1	4.491	0.000	339.164	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.2	4.452	0.000	392.551	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.3	4.622	0.000	332.267	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.4	4.614	0.000	332.897	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.5	4.605	0.000	333.782	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.6	4.598	0.000	334.345	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.7	4.606	0.000	333.637	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.8	4.612	0.000	333.201	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.9	4.608	0.000	333.432	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.10	4.609	0.000	333.266	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.11	4.331	0.000	437.489	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.12	4.608	0.000	333.325	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.13	4.630	0.000	332.663	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.14	4.646	0.000	331.255	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.15	4.639	0.000	331.762	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.16	4.633	0.000	331.966	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.17	4.382	0.000	431.276	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.18	4.631	0.000	332.124	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.19	4.626	0.000	332.533	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.20	4.626	0.000	332.475	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.21	4.625	0.000	332.558	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.22	4.620	0.000	337.844	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Instance4172.23	4.624	0.000	332.734	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4172.24	4.624	0.000	332.699	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	3.052	2.353	3.519
Available Mbytes	14659.769	14641.000	14666.000
Free System Page Table Entries	33555594.000	33555594.000	33555594.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	89953081.313	89927680.000	90058752.000
Pool Paged Bytes	816242198.925	816234496.000	816267264.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log 1/28/2010 2:04:11 PM -- Jetstress testing begins ...
1/28/2010 2:04:11 PM -- Prepare testing begins ...
1/28/2010 2:04:35 PM -- Attaching databases ...
1/28/2010 2:04:35 PM -- Prepare testing ends.
1/28/2010 2:05:09 PM -- Performance logging begins (interval: 30000 ms).
1/28/2010 2:05:09 PM -- Backing up databases ...
1/28/2010 3:12:23 PM -- Performance logging ends.
1/28/2010 3:12:23 PM -- Instance4172.1 (100% processed), Instance4172.2 (100% processed), Instance4172.3 (100% processed), Instance4172.4 (100% processed), Instance4172.5 (100% processed), Instance4172.6 (100% processed), Instance4172.7 (100% processed), Instance4172.8 (100% processed), Instance4172.9 (100% processed), Instance4172.10 (100% processed), Instance4172.11 (100% processed), Instance4172.12 (100% processed), Instance4172.13 (100% processed), Instance4172.14 (100% processed), Instance4172.15 (100% processed), Instance4172.16 (100% processed), Instance4172.17 (100% processed), Instance4172.18 (100% processed), Instance4172.19 (100% processed), Instance4172.20 (100% processed), Instance4172.21 (100% processed), Instance4172.22 (100% processed), Instance4172.23 (100% processed) and Instance4172.24 (100% processed)
1/28/2010 3:12:23 PM -- C:\Jetstress\Results\10threads_dbmaint_adapReadWriteCache_5ios_backup_gold\DatabaseBackup_2010_1_28_14_4_35.blg has 134 samples.
1/28/2010 3:12:23 PM -- Creating test report ...

Appendix D Soft Recovery Testing

Microsoft Exchange Server Jetstress Tool

Soft Recovery Test Result Report

Soft-Recovery Statistics - All

Database Instance	Log files replayed	Elapsed seconds

Instance2036.1	508	2103.3048942
Instance2036.2	506	1877.3540974
Instance2036.3	500	2064.0552253
Instance2036.4	511	2151.3061785
Instance2036.5	503	1961.6878455
Instance2036.6	508	2010.7499317
Instance2036.7	504	2044.4303908
Instance2036.8	500	2067.7680318
Instance2036.9	510	1720.8858225
Instance2036.10	505	1822.9880019
Instance2036.11	511	1885.3101113
Instance2036.12	512	2013.6671368
Instance2036.13	506	2009.1587289
Instance2036.14	505	2043.369589
Instance2036.15	505	2170.931013
Instance2036.16	513	1995.3683047
Instance2036.17	502	2025.0707568
Instance2036.18	507	2098.2660854
Instance2036.19	502	2106.4872998
Instance2036.20	500	1874.1716918
Instance2036.21	500	2162.7097986
Instance2036.22	507	2116.2997171
Instance2036.23	506	2108.874104
Instance2036.24	504	2039.9219829

Database Configuration

Instance2036.1 Log Path: C:\Amnt\Disk0
Database: C:\Amnt\Disk0\Jetstress001001.edb

Instance2036.2 Log Path: C:\Amnt\Disk1
Database: C:\Amnt\Disk1\Jetstress002001.edb

Instance2036.3 Log Path: C:\Amnt\Disk2
Database: C:\Amnt\Disk2\Jetstress003001.edb

Instance2036.4 Log Path: C:\Amnt\Disk3
Database: C:\Amnt\Disk3\Jetstress004001.edb

Instance2036.5 Log Path: C:\Amnt\Disk4
Database: C:\Amnt\Disk4\Jetstress005001.edb

Instance2036.6 Log Path: C:\Amnt\Disk5
Database: C:\Amnt\Disk5\Jetstress006001.edb

Instance2036.7 Log Path: C:\Amnt\Disk6

Database: C:\Amnt\Disk6\Jetstress007001.edb

Instance2036.8 Log Path: C:\Amnt\Disk7
Database: C:\Amnt\Disk7\Jetstress008001.edb

Instance2036.9 Log Path: C:\Amnt\Disk8
Database: C:\Amnt\Disk8\Jetstress009001.edb

Instance2036.10 Log Path: C:\Amnt\Disk9
Database: C:\Amnt\Disk9\Jetstress010001.edb

Instance2036.11 Log Path: C:\Amnt\Disk10
Database: C:\Amnt\Disk10\Jetstress011001.edb

Instance2036.12 Log Path: C:\Amnt\Disk11
Database: C:\Amnt\Disk11\Jetstress012001.edb

Instance2036.13 Log Path: C:\Amnt\Disk12
Database: C:\Amnt\Disk12\Jetstress013001.edb

Instance2036.14 Log Path: C:\Amnt\Disk13
Database: C:\Amnt\Disk13\Jetstress014001.edb

Instance2036.15 Log Path: C:\Amnt\Disk14
Database: C:\Amnt\Disk14\Jetstress015001.edb

Instance2036.16 Log Path: C:\Amnt\Disk15
Database: C:\Amnt\Disk15\Jetstress016001.edb

Instance2036.17 Log Path: C:\Amnt\Disk16
Database: C:\Amnt\Disk16\Jetstress017001.edb

Instance2036.18 Log Path: C:\Amnt\Disk17
Database: C:\Amnt\Disk17\Jetstress018001.edb

Instance2036.19 Log Path: C:\Amnt\Disk18
Database: C:\Amnt\Disk18\Jetstress019001.edb

Instance2036.20 Log Path: C:\Amnt\Disk19
Database: C:\Amnt\Disk19\Jetstress020001.edb

Instance2036.21 Log Path: C:\Amnt\Disk20
Database: C:\Amnt\Disk20\Jetstress021001.edb

Instance2036.22 Log Path: C:\Amnt\Disk21
Database: C:\Amnt\Disk21\Jetstress022001.edb

Instance2036.23 Log Path: C:\Amnt\Disk22

Database: C:\Amnt\Disk22\Jetstress023001.edb

Instance2036.24 Log Path: C:\Amnt\Disk23
Database: C:\Amnt\Disk23\Jetstress024001.edb

Transactional I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O DB Reads/ sec	I/O DB Writes/ sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Avg Latency (msec)	I/O Log Writes Avg Latency (msec)	I/O Log Reads /sec	I/O Log Writes/ sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance2036.1	263.116	20.872	152.954	1.451	36013.018	22956.468	18.820	0.024	2.176	0.001	156925.196	0.983
Instance2036.2	295.818	22.602	164.016	1.616	36338.488	25580.181	21.232	0.191	2.426	0.003	177536.932	2.202
Instance2036.3	275.353	21.316	152.811	1.453	36016.726	23488.000	18.828	0.233	2.179	0.006	159600.603	2.000
Instance2036.4	258.791	19.790	150.057	1.423	35857.550	21640.405	17.584	0.000	2.135	0.000	147890.596	0.000
Instance2036.5	286.159	21.240	157.966	1.535	36106.109	24088.181	19.857	0.144	2.305	0.008	164829.887	3.154
Instance2036.6	288.473	21.464	156.876	1.516	36160.943	24099.912	20.233	0.093	2.276	0.008	167227.037	2.052
Instance2036.7	284.853	20.875	154.642	1.480	36009.093	23784.268	19.695	0.185	2.223	0.006	162822.012	2.020
Instance2036.8	270.554	20.543	153.069	1.453	36112.181	22976.000	19.017	0.054	2.179	0.001	157251.426	1.000
Instance2036.9	297.155	23.152	176.414	1.779	36362.934	26705.536	23.086	0.180	2.671	0.009	185760.487	3.597
Instance2036.10	295.935	22.131	167.164	1.663	36212.410	25663.434	22.177	0.079	2.494	0.007	176948.834	2.265
Instance2036.11	290.294	21.619	165.306	1.628	36192.099	24839.126	20.486	0.113	2.447	0.006	171133.382	2.193
Instance2036.12	278.647	21.005	157.574	1.523	36217.337	24099.912	19.456	0.092	2.285	0.006	164862.453	2.052
Instance2036.13	279.580	21.774	156.458	1.512	36162.434	24148.305	20.686	0.230	2.272	0.006	165464.380	2.056
Instance2036.14	278.492	20.961	153.787	1.483	36056.929	23913.531	20.156	0.112	2.227	0.007	164669.069	3.030
Instance2036.15	254.456	19.713	150.144	1.389	35869.523	21500.193	17.987	0.000	2.083	0.000	144953.593	0.000
Instance2036.16	284.464	22.337	156.465	1.543	36015.501	24824.242	20.212	0.074	2.317	0.007	168035.108	2.069
Instance2036.17	269.785	20.743	155.156	1.489	36004.175	23433.689	18.942	0.103	2.236	0.006	159653.445	2.040
Instance2036.18	270.521	20.803	150.955	1.451	35933.135	23000.615	18.823	0.037	2.178	0.003	155586.028	0.985
Instance2036.19	261.868	20.680	150.945	1.431	36044.229	22786.943	18.106	0.045	2.148	0.003	155535.173	0.981
Instance2036.20	285.381	22.306	163.270	1.601	36252.983	25227.837	20.838	0.229	2.404	0.007	175668.275	3.303
Instance2036.21	259.639	20.271	148.940	1.384	35833.960	21641.552	17.777	0.000	2.078	0.000	146170.939	0.000
Instance2036.22	265.184	20.808	151.480	1.436	36114.084	22762.504	18.354	0.000	2.151	0.000	154955.065	0.000
Instance2036.23	271.233	20.129	152.112	1.438	35978.387	22618.065	18.222	0.013	2.159	0.006	152302.784	0.979
Instance2036.24	269.261	20.724	154.065	1.483	35994.224	23183.684	18.686	0.064	2.227	0.006	157714.848	2.024

Background Database Maintenance I/O Performance

MSExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes
Instance2036.1	0.000	0.000
Instance2036.2	0.000	0.000
Instance2036.3	0.000	0.000
Instance2036.4	0.000	0.000
Instance2036.5	0.000	0.000
Instance2036.6	0.000	0.000
Instance2036.7	0.000	0.000
Instance2036.8	0.000	0.000
Instance2036.9	0.000	0.000
Instance2036.10	0.000	0.000
Instance2036.11	0.000	0.000
Instance2036.12	0.000	0.000

Instance2036.13	0.000	0.000
Instance2036.14	0.000	0.000
Instance2036.15	0.000	0.000
Instance2036.16	0.000	0.000
Instance2036.17	0.000	0.000
Instance2036.18	0.000	0.000
Instance2036.19	0.000	0.000
Instance2036.20	0.000	0.000
Instance2036.21	0.000	0.000
Instance2036.22	0.000	0.000
Instance2036.23	0.000	0.000
Instance2036.24	0.000	0.000

Total I/O Performance

MSExchange Database ==> Instances	I/O DB Reads Avg Latency (msec)	I/O DB Writes Avg Latency (msec)	I/O DB Reads/ sec	I/O DB 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
Instance2036.1	263.116	20.872	152.954	1.451	36013.018	22956.468	18.820	0.024	2.176	0.001	156925.196	0.983
Instance2036.2	295.818	22.602	164.016	1.616	36338.488	25580.181	21.232	0.191	2.426	0.003	177536.932	2.202
Instance2036.3	275.353	21.316	152.811	1.453	36016.726	23488.000	18.828	0.233	2.179	0.006	159600.603	2.000
Instance2036.4	258.791	19.790	150.057	1.423	35857.550	21640.405	17.584	0.000	2.135	0.000	147890.596	0.000
Instance2036.5	286.159	21.240	157.966	1.535	36106.109	24088.181	19.857	0.144	2.305	0.008	164829.887	3.154
Instance2036.6	288.473	21.464	156.876	1.516	36160.943	24099.912	20.233	0.093	2.276	0.008	167227.037	2.052
Instance2036.7	284.853	20.875	154.642	1.480	36009.093	23784.268	19.695	0.185	2.223	0.006	162822.012	2.020
Instance2036.8	270.554	20.543	153.069	1.453	36112.181	22976.000	19.017	0.054	2.179	0.001	157251.426	1.000
Instance2036.9	297.155	23.152	176.414	1.779	36362.934	26705.536	23.086	0.180	2.671	0.009	185760.487	3.597
Instance2036.10	295.935	22.131	167.164	1.663	36212.410	25663.434	22.177	0.079	2.494	0.007	176948.834	2.265
Instance2036.11	290.294	21.619	165.306	1.628	36192.099	24839.126	20.486	0.113	2.447	0.006	171133.382	2.193
Instance2036.12	278.647	21.005	157.574	1.523	36217.337	24099.912	19.456	0.092	2.285	0.006	164862.453	2.052
Instance2036.13	279.580	21.774	156.458	1.512	36162.434	24148.305	20.686	0.230	2.272	0.006	165464.380	2.056
Instance2036.14	278.492	20.961	153.787	1.483	36056.929	23913.531	20.156	0.112	2.227	0.007	164669.069	3.030
Instance2036.15	254.456	19.713	150.144	1.389	35869.523	21500.193	17.987	0.000	2.083	0.000	144953.593	0.000
Instance2036.16	284.464	22.337	156.465	1.543	36015.501	24824.242	20.212	0.074	2.317	0.007	168035.108	2.069
Instance2036.17	269.785	20.743	155.156	1.489	36004.175	23433.689	18.942	0.103	2.236	0.006	159653.445	2.040
Instance2036.18	270.521	20.803	150.955	1.451	35933.135	23000.615	18.823	0.037	2.178	0.003	155586.028	0.985
Instance2036.19	261.868	20.680	150.945	1.431	36044.229	22786.943	18.106	0.045	2.148	0.003	155535.173	0.981
Instance2036.20	285.381	22.306	163.270	1.601	36252.983	25227.837	20.838	0.229	2.404	0.007	175668.275	3.303
Instance2036.21	259.639	20.271	148.940	1.384	35833.960	21641.552	17.777	0.000	2.078	0.000	146170.939	0.000
Instance2036.22	265.184	20.808	151.480	1.436	36114.084	22762.504	18.354	0.000	2.151	0.000	154955.065	0.000
Instance2036.23	271.233	20.129	152.112	1.438	35978.387	22618.065	18.222	0.013	2.159	0.006	152302.784	0.979
Instance2036.24	269.261	20.724	154.065	1.483	35994.224	23183.684	18.686	0.064	2.227	0.006	157714.848	2.024

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	1.381	0.000	2.713
Available Mbytes	8417.776	8248.000	13930.000
Free System Page Table Entries	33555593.855	33555589.000	33555596.000
Transition Pages RePurposed/sec	12.354	0.000	3621.397

Pool Nonpaged Bytes	108230439.421	93900800.000	108863488.000
Pool Paged Bytes	817064973.299	816979968.000	817102848.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log 1/28/2010 4:33:49 PM -- Jetstress testing begins ...
1/28/2010 4:33:49 PM -- Prepare testing begins ...
1/28/2010 4:34:14 PM -- Attaching databases ...
1/28/2010 4:34:14 PM -- Prepare testing ends.
1/28/2010 4:34:14 PM -- Dispatching transactions begins ...
1/28/2010 4:34:14 PM -- Database cache settings: (minimum: 768.0 MB, maximum: 6.0 GB)
1/28/2010 4:34:14 PM -- Database flush thresholds: (start: 61.4 MB, stop: 122.9 MB)
1/28/2010 4:34:39 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).
1/28/2010 4:34:39 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).
1/28/2010 4:34:48 PM -- Operation mix: Sessions 10, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.
1/28/2010 4:34:48 PM -- Performance logging begins (interval: 15000 ms).
1/28/2010 4:34:48 PM -- Generating log files ...
1/28/2010 5:26:09 PM -- C:\Amnt\Disk0 (101.8% generated), C:\Amnt\Disk1 (101.4% generated), C:\Amnt\Disk2 (100.2% generated), C:\Amnt\Disk3 (102.2% generated), C:\Amnt\Disk4 (100.8% generated), C:\Amnt\Disk5 (101.8% generated), C:\Amnt\Disk6 (101.0% generated), C:\Amnt\Disk7 (100.2% generated), C:\Amnt\Disk8 (102.0% generated), C:\Amnt\Disk9 (101.2% generated), C:\Amnt\Disk10 (102.4% generated), C:\Amnt\Disk11 (102.6% generated), C:\Amnt\Disk12 (101.4% generated), C:\Amnt\Disk13 (101.2% generated), C:\Amnt\Disk14 (101.2% generated), C:\Amnt\Disk15 (102.8% generated), C:\Amnt\Disk16 (100.6% generated), C:\Amnt\Disk17 (101.6% generated), C:\Amnt\Disk18 (100.6% generated), C:\Amnt\Disk19 (100.2% generated), C:\Amnt\Disk20 (100.2% generated), C:\Amnt\Disk21 (101.6% generated), C:\Amnt\Disk22 (101.4% generated) and C:\Amnt\Disk23 (101.0% generated)
1/28/2010 5:26:09 PM -- Performance logging ends.
1/28/2010 5:26:09 PM -- JetInterop batch transaction stats: 22303, 22045, 21909, 22285, 21912, 22077, 22195, 21841, 21988, 22154, 22229, 22279, 22144, 22077, 22041, 22143, 21876, 22085, 21913, 21940, 22030, 22126, 22099 and 22009.
1/28/2010 5:26:09 PM -- Dispatching transactions ends.
1/28/2010 5:26:09 PM -- Shutting down databases ...
1/28/2010 5:26:21 PM -- Instance2036.1 (complete), Instance2036.2 (complete), Instance2036.3 (complete), Instance2036.4 (complete), Instance2036.5 (complete), Instance2036.6 (complete), Instance2036.7 (complete), Instance2036.8 (complete), Instance2036.9 (complete), Instance2036.10 (complete), Instance2036.11 (complete), Instance2036.12 (complete), Instance2036.13 (complete), Instance2036.14 (complete), Instance2036.15 (complete), Instance2036.16 (complete), Instance2036.17 (complete), Instance2036.18 (complete), Instance2036.19 (complete), Instance2036.20 (complete), Instance2036.21 (complete), Instance2036.22 (complete), Instance2036.23 (complete) and Instance2036.24 (complete)
1/28/2010 5:26:21 PM -- C:\Jetstress\Results\10thrds_dbmt_adRdWrtBk_5ios_daisy_64kblksize_softrecovery\Performance_2010_1_28_16_34_39.blg has 205 samples.
1/28/2010 5:26:21 PM -- Creating test report ...
1/28/2010 5:26:23 PM -- Instance2036.1 has 17.5 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.1 has 2.3 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.1 has 2.3 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.2 has 17.7 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.2 has 2.5 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.2 has 2.5 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.3 has 17.6 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.3 has 2.4 for I/O Log Writes Average Latency.

1/28/2010 5:26:23 PM -- Instance2036.3 has 2.4 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.4 has 17.9 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.4 has 2.5 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.4 has 2.5 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.5 has 17.9 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.5 has 2.5 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.5 has 2.5 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.6 has 18.0 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.6 has 2.5 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.6 has 2.5 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.7 has 17.7 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.7 has 2.5 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.7 has 2.5 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.8 has 17.6 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.8 has 2.5 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.8 has 2.5 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.9 has 17.5 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.9 has 2.4 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.9 has 2.4 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.10 has 18.0 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.10 has 2.7 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.10 has 2.7 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.11 has 17.4 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.11 has 2.4 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.11 has 2.4 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.12 has 17.6 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.12 has 2.5 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.12 has 2.5 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.13 has 17.5 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.13 has 2.6 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.13 has 2.6 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.14 has 17.2 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.14 has 2.5 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.14 has 2.5 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.15 has 17.7 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.15 has 2.6 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.15 has 2.6 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.16 has 17.3 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.16 has 2.7 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.16 has 2.7 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.17 has 17.0 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.17 has 2.6 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.17 has 2.6 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.18 has 17.0 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.18 has 2.7 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.18 has 2.7 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.19 has 16.6 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.19 has 2.6 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.19 has 2.6 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.20 has 16.4 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.20 has 2.7 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.20 has 2.7 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.21 has 16.6 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.21 has 2.8 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.21 has 2.8 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.22 has 18.7 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.22 has 3.0 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.22 has 3.0 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.23 has 16.6 for I/O Database Reads Average Latency.

1/28/2010 5:26:23 PM -- Instance2036.23 has 2.7 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.23 has 2.7 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.24 has 16.7 for I/O Database Reads Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.24 has 2.7 for I/O Log Writes Average Latency.
1/28/2010 5:26:23 PM -- Instance2036.24 has 2.7 for I/O Log Reads Average Latency.
1/28/2010 5:26:23 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.
1/28/2010 5:26:23 PM -- Test has 0 Database Page Fault Stalls/sec samples higher than 0.
1/28/2010 5:26:23 PM -- C:\Jetstress\Results\10thrds_dbmt_adRdWrtBk_5ios_daisy_64kblksize_softrecovery\Performance_2010_1_28_16_34_39.xml has 204 samples queried.
1/28/2010 5:26:23 PM -- C:\Jetstress\Results\10thrds_dbmt_adRdWrtBk_5ios_daisy_64kblksize_softrecovery\Performance_2010_1_28_16_34_39.html is saved.
1/28/2010 5:26:31 PM -- Performance logging begins (interval: 4000 ms).
1/28/2010 5:26:31 PM -- Recovering databases ...
1/28/2010 6:02:42 PM -- Performance logging ends.
1/28/2010 6:02:42 PM -- Instance2036.1 (2103.3048942), Instance2036.2 (1877.3540974), Instance2036.3 (2064.0552253), Instance2036.4 (2151.3061785), Instance2036.5 (1961.6878455), Instance2036.6 (2010.7499317), Instance2036.7 (2044.4303908), Instance2036.8 (2067.7680318), Instance2036.9 (1720.8858225), Instance2036.10 (1822.9880019), Instance2036.11 (1885.3101113), Instance2036.12 (2013.6671368), Instance2036.13 (2009.1587289), Instance2036.14 (2043.369589), Instance2036.15 (2170.931013), Instance2036.16 (1995.3683047), Instance2036.17 (2025.0707568), Instance2036.18 (2098.2660854), Instance2036.19 (2106.4872998), Instance2036.20 (1874.1716918), Instance2036.21 (2162.7097986), Instance2036.22 (2116.2997171), Instance2036.23 (2108.874104) and Instance2036.24 (2039.9219829)
1/28/2010 6:02:43 PM -- C:\Jetstress\Results\10thrds_dbmt_adRdWrtBk_5ios_daisy_64kblksize_softrecovery\SoftRecovery_2010_1_28_17_26_23.blg has 539 samples.
1/28/2010 6:02:43 PM -- Creating test report ...