



NetApp E-Series E2700 20,000-Mailbox Microsoft Exchange Server 2013 Mailbox Resiliency Storage Solution Tested with: ESRP – Storage Version 4.0

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Abstract

This document describes the NetApp® E-Series 2700 storage solution for Microsoft Exchange Server, which was tested through the Microsoft Exchange Solution Reviewed Program – Storage (ESRP). This program was developed by Microsoft Corporation to create a common storage testing framework so that vendors can provide information on their storage solutions for Microsoft Exchange Server software.

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1 Features

Many organizations have come to rely on Microsoft Exchange Server to facilitate critical business e-mail communication processes, group scheduling, and calendaring on a 24/7 basis when system failures might result in unacceptable operational and financial losses. Because of the increasing importance of Microsoft Exchange Server, data protection, disaster recovery, and high availability (HA) are of increasing concern. NetApp offers a comprehensive suite of hardware and software solutions that enable an organization to keep pace with the increasing data availability demands of an ever-expanding Microsoft Exchange Server environment, as well as scale to accommodate future needs while reducing cost and complexity.

The NetApp E-Series E2700 storage system brings together the following advantages:

- Modular host interface flexibility (SAS, FC, and iSCSI)
- Excellent storage density
- High reliability
- Intuitive management

Together, these features create a midrange storage system that is perfectly suited for data-intensive solutions, high bandwidth-intensive streaming applications, transaction-intensive workloads, and high-performance file systems requirements without sacrificing simplicity and efficiency. In addition, its fully redundant I/O paths, advanced protection features, and extensive diagnostic capabilities deliver the highest levels of availability, integrity, and security.

The E-Series E2700, available with up to 768TB of raw capacity, provides capacity and bullet-proof reliability to meet the requirements of the most demanding organizations.

The NetApp E-Series 2700 storage solution for Microsoft Exchange Server is based on the Microsoft Exchange Solution Reviewed Program – Storage (ESRP), a program developed by Microsoft Corporation to create a common storage testing framework for vendors to provide information about their storage solutions for Microsoft Exchange Server software. For more information about the ESRP program, see the Microsoft webpage [Exchange Solution Reviewed Program – Storage](#).

1.1 E2700 Hardware Overview

The E2700 storage controller includes the following new standard features:

- 12G SAS server-led storage controller and host interface card (HIC) options: 16Gb FC, 12Gb SAS, or 10Gb iSCSI
- 2GB, 4GB, or 8GB of system memory per controller
- Dual stack cabling for expansion
- Improved handling of misbehaving drives, including power cycling/power off of nonresponsive drives to improve system availability and performance
- Out-of-order I/O performance improvements

- Support for 120 SSDs
- Dynamic disk pools:
 - Increase in disk pools to 20
 - SSD support for disk pools
 - Disk pool capacity reduction

E2700 Technical Specifications

The E2712 and E2724 are 2U dense chassis with 12 3.5" and 24 2.5" disk drives, respectively. The E2760 is a 4U-dense chassis with 60 3.5" disk drives in 5 horizontal disk drawers of 12 drives per drawer. All three have dual RAID controllers and can support up to a maximum of 192 disk drives in a single array with multiple types of disk expansion trays. They have dual Ethernet ports for management-related activities, built-in SAS ports for host connection, SAS expansion ports to attach additional expansion trays, dual power canisters, and two fan canisters with two fans in each canister and space for optional HICs.

Table 1 lists the technical specifications of NetApp E2700 series controllers. For additional information, see the Technical Specification on the [NetApp Support](#) site.

Table 1) E2700 technical specifications.

Spec ID	E2760	E2724	E2712
Maximum raw capacity	360TB with expansion to 1.2PB (with 6TB HDD)	43.2TB with expansion to 1.1PB (with 6TB HDD)	72TB with expansion to 1.2PB (with 6TB HDD)
Maximum disk drives	180 by using only 60 drive shelves 192 with expansion shelves 120 SSDs	192 with expansion shelves 120 SSDs	192 with expansion shelves
Form factor	4U/60 drives	2U/24 drives	2U/12 drives
Drive types supported	3.5" 7.2K SAS 4TB/3TB/2TB 2.5" 10K SAS 1.2TB/900GB/600GB	2.5" 10K SAS 1.2TB/900GB/600GB	3.5" 7.2K SAS 4TB/3TB/2TB
	2.5" SSD 800GB	2.5" SSD 800GB	
Memory	4/8GB (standalone-simplex), 8/16GB (HA-duplex)		
Onboard I/O	Dual-port 12GB SAS (standalone-simplex), quad-port 12GB SAS (HA-duplex)		
Optional I/O	Dual-port 10GB iSCSI (standalone-simplex), quad-port 10GB iSCSI (HA-duplex)		
	Dual/quad-port 16GB FC (standalone-simplex), quad/octal-port 16GB FC (HA-duplex)		
	Dual/quad-port 12 GB SAS (standalone-simplex), quad/octal-port 12GB SAS (HA-duplex)		
Drive offerings supporting expansion disk trays	DE6600 (4U/60 drives): supports same drive types as E2760		
	DE5600 (2U/24 drives): supports same drive types as E2724		
	DE1600 (2U/12 drives): supports same drive types as E2712		

1.2 SANtricity

The NetApp SANtricity® 11.10 software (with controller firmware 8.20) is the GUI management interface for E-Series storage systems. SANtricity is based on the Java framework and can be installed on

Windows or Linux operating systems (OSs). The management application must be installed on a management node that does not participate in production data delivery. The software is available in 32-bit and 64-bit versions, and if the package is installed on the incorrect OS version, the installation tool detects the mistake.

SANtricity client software can be installed on Windows or Linux OSs for out-of-band management of the storage array. In this configuration, the host agent functionality for in-band management does not function, and the number of client connections is limited to eight. To manage the storage arrays by using in-band connections, the management client must be run on a server OS and must have Fibre Channel (FC) connectivity to all arrays. Limiting the number of client connections to eight for out-of-band management does not apply to in-band management.

To simplify the process of provisioning storage, NetApp recommends using the SANtricity automatic configuration feature. The configuration wizard analyzes the available disk capacity on the array and selects disks that maximize array performance and fault tolerance while meeting capacity requirements, hot spares, and any other criteria specified in the wizard.

The NetApp E-Series storage system has been architected for highest reliability and availability with features such as the following:

- Dual-active controller with automated I/O path failover
- Support for RAID levels 0, 1, 3, 5, 6, 10, or Dynamic Disk Pools (DDP)
- Redundant hot-swappable controllers, disk drives, power supplies, and fans
- Automatic drive failover detection and rebuild using global hot spares
- Mirrored data cache with battery backup and destage to memory
- Nondisruptive controller firmware upgrades
- Proactive drive health monitoring
- Background media scan with autoparity check and correction

All components—including controllers, disk drives, power supplies, and fans—are fully redundant and can be swapped without the need to power off the system or even halting operation. The E-Series power supplies offer an 80-plus efficiency rating. E-Series storage systems feature several functions designed to protect data in every circumstance. Multiple RAID levels are available for use with varying levels of redundancy. The system also includes automatic failover from one path to another in the case of a lost connection. Within the shelf, each drive has a connection to each controller so that even internal connection issues can be quickly overcome. Volumes on the system are available for host I/O from the moment they are created, and they can even have significant properties altered without stopping I/O.

Not only do E-Series storage systems offer the detailed reliability and availability features already described, but using the SANtricity software also makes it possible to maximize availability:

- Support for high-speed, high-efficiency NetApp Snapshot[®] copies
- Robust disaster recovery protection:
 - Synchronous mirroring for no-data-loss protection of content
 - Asynchronous mirroring for long-distance protection and compliance
- Flexible protection to maximize ROI:
 - Allows recovery target to be flash, NL-SAS, or mixed, based on cost/performance needs
 - Delivers speed without breaking budgets

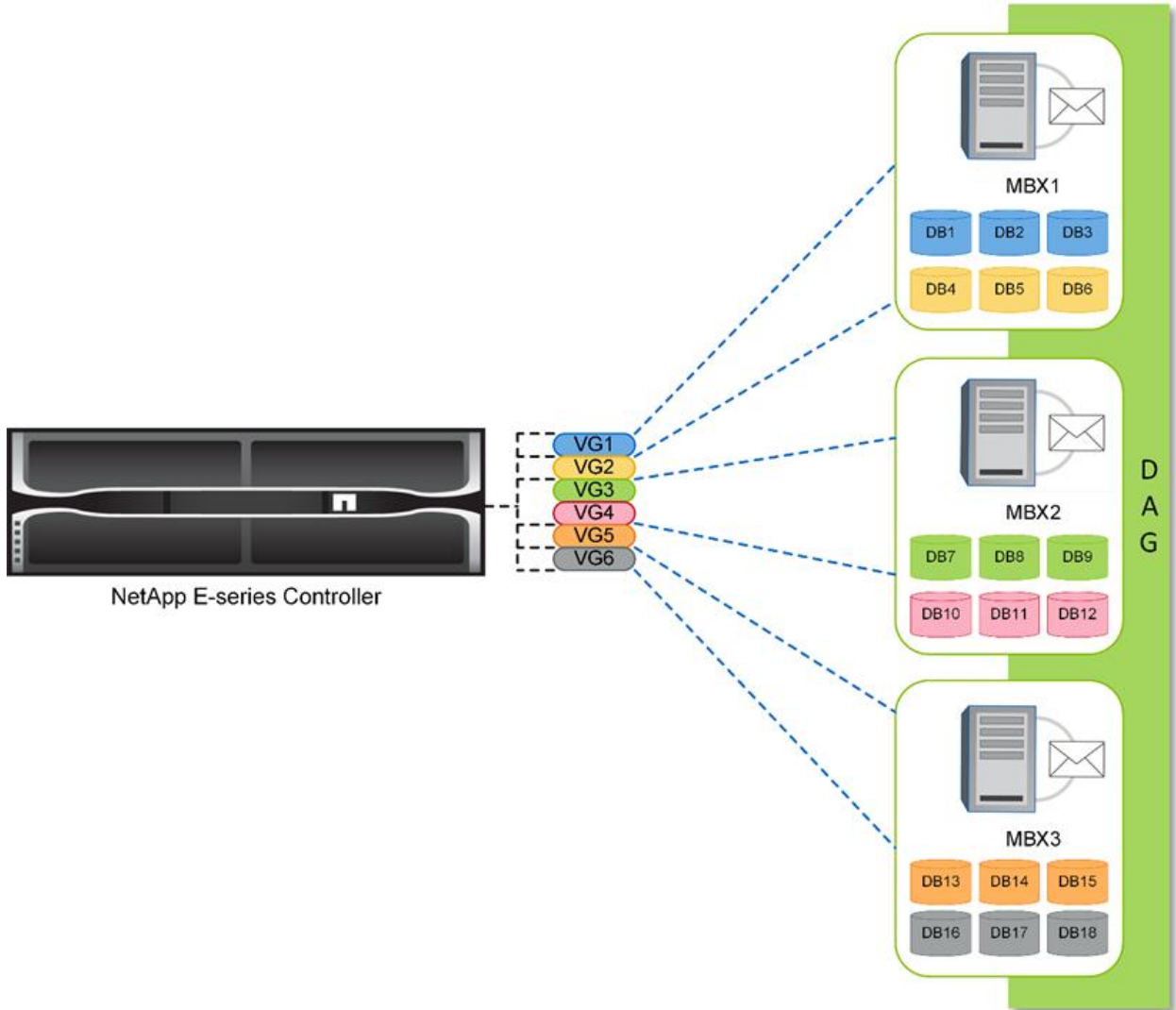
The ESRP testing topology described in this report is composed of one database availability group (DAG) with six mailbox servers (three active and three passive). The detailed DAG architecture is specified in the next section.

2 Solution Description

This document describes the testing of a 20,000-mailbox Exchange Server 2013 mailbox resiliency storage solution in a configuration consisting of two database copies and a single DAG on a NetApp E2700 storage system.

Six RAID 5 volume groups were created with 54 HDDs (9 disks per group) in this solution. The entire volume group was hosted by one of the redundant controllers of the E2700. Two volume groups hosting 6 databases were connected to each mailbox server for a total of 18 databases hosted across 3 active Exchange Server instances. Figure 1 shows the complete architecture of this solution.

Figure 1) Tested configuration.



Each of the 18 databases had one active copy at the primary site and one passive copy at the secondary site. The three servers were configured with the same DAG for Exchange 2013 built-in database recovery HA mailbox resiliency in case of failure.

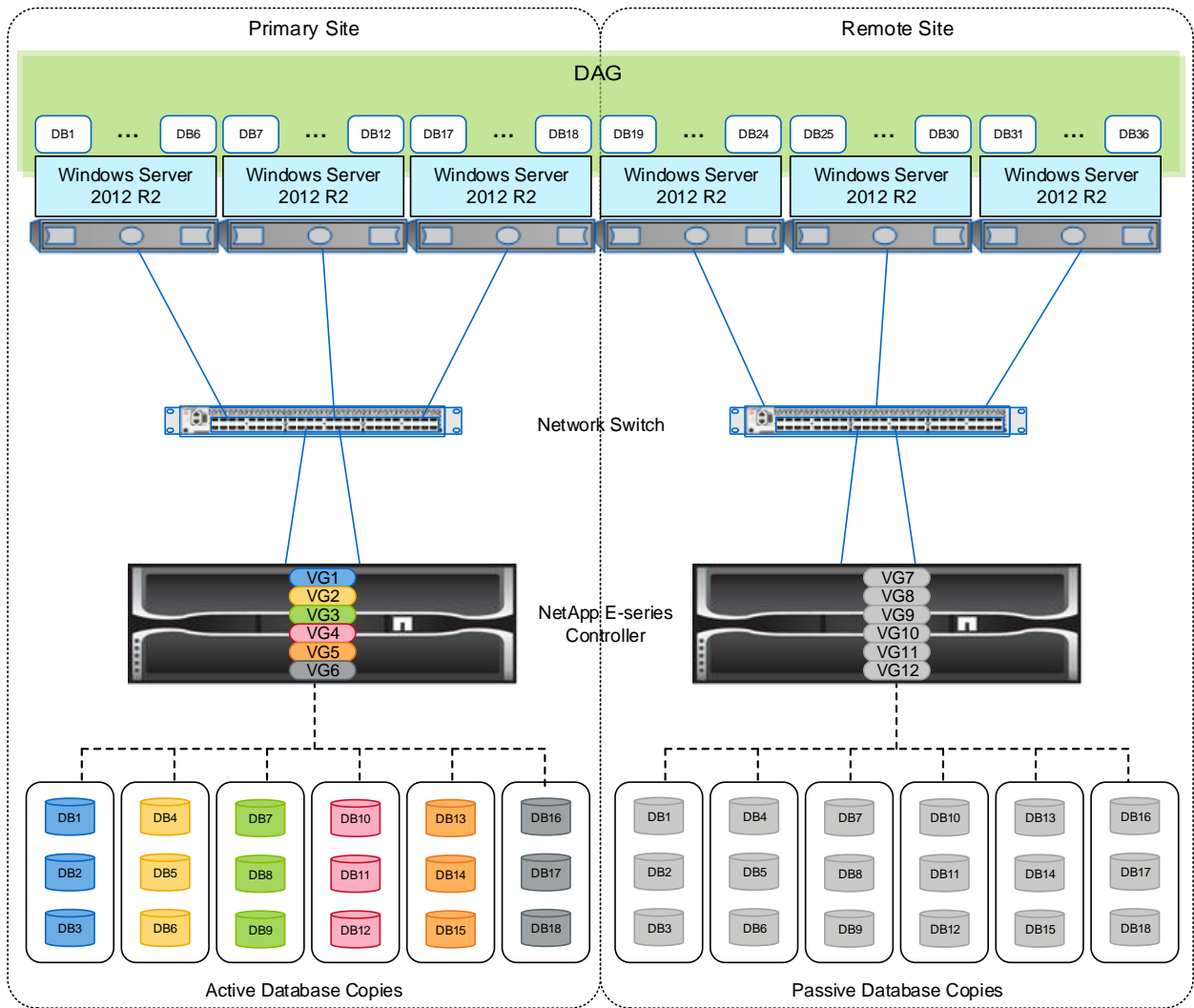
The tested 20,000-mailbox Exchange 2013 mailbox resiliency storage solution included the following components:

- 1 DAG

- 3 active mailbox servers (tested)
- 1,111 mailboxes per database
- 1800MB mailbox size
- 6,666 mailboxes per server (6 databases per server)
- 18 active databases total for 20,000 active mailboxes
- 18 passive databases total, hosted by 3 additional mailbox servers, with the passive databases on separate volume groups and on a separate but identical storage controller node
- Two copies of databases

Figure 2 shows further details of the configuration.

Figure 2) DAG database configuration details and solution configuration in real deployment scenario.



For a mailbox-resiliency configuration, databases and log files can be placed on the same set of disk drives (see [Exchange 2013 Storage Configuration Options](#)). Therefore, in the test configuration, each active server's six databases and logs were placed on the same volume, as shown in Figure 1.

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 consider when designing a scale-up Exchange solution. Other factors that affect server scalability include the following:

- 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 of these factors are beyond the scope of ESRP – Storage. Therefore, the number of mailboxes hosted per server as part of the tested configuration might not be viable for some customer deployments.

For more information about identifying and addressing performance bottlenecks in an Exchange system, see [Troubleshooting Microsoft Exchange Server Performance](#). To order the E2700 solution, see the [Windows Server Catalog](#).

2.1 Targeted Customer Profile

This solution is designed and targeted for Exchange environments that are entry level to medium sized. The target customer is typically looking for a scalable, reliable, high-performance, and highly available Exchange storage solution.

The tested solution is designed for the following specifications:

- 20,000 mailboxes
- 6 Exchange Server instances (3 tested)
- 0.084 IOPS (0.07 IOPS tested with additional 20% headroom)
- 1800MB per mailbox
- Maintaining ample controller headroom available for storage infrastructure activities such as data replication and disk reconstructs
- 24/7 background database maintenance (BDM)
- Mailbox Resiliency (2-copy)

2.2 Tested Deployment

The following tables summarize the testing environment.

Simulated Exchange Configuration

Table 2 lists the components of a simulated Exchange configuration.

Table 2) Components of a simulated Exchange configuration.

Item	Quantity
Number of Exchange mailboxes simulated	20,000
Number of DAGs	1
Number of servers per DAG	6 (3 tested)
Number of active mailboxes per server	6,666
Number of databases per host	6
Number of copies per database	2

Item	Quantity
Number of mailboxes per database	1,111
Simulated profile: IOPS per mailbox (IOPS include 20% headroom)	0.084 IOPS per mailbox (0.07 IOPS plus 20% headroom added)
Database/Log LUN size	2.25TB
Total database size for performance testing	36TB
% storage capacity used by Exchange database**	89%

**Storage performance characteristics change based on the percentage of utilization of the individual disks. Tests that use a small percentage of the storage (~25%) might exhibit reduced throughput if the storage capacity utilization is significantly increased beyond what is tested in this report.

Storage Hardware

Table 3 lists all components of the storage hardware.

Table 3) Storage hardware components.

Item	Quantity
Storage connectivity (FC, SAS, SATA, iSCSI)	FC SAN
Storage model and OS/firmware revision	E2700 duplex/08.20.08.00
Storage cache	2GB per controller
Number of storage controllers	2 (1 tested)
Number of storage ports	8 (4 16Gb/sec FC ports per controller)
Maximum bandwidth of storage connectivity to host	64 Gb/sec (4 x 16Gb/sec per port) per controller
Switch type/model/firmware revision	Brocade 6505 FC switch, v7.2.0a
HBA model and firmware	QLogic QLE2672, 9.1.11.28
Number of HBAs per host	2 per host
Host server type (physical server)	Dell, Inc. PowerEdge R720, Intel Xeon CPU E5-2620 @2.00GHz, 80GB RAM
Total number of disks tested in solution	54
Maximum number of spindles that can be hosted in the storage	192

Storage Software

Table 4 lists all components of the storage software.

Table 4) Storage software components.

Item	Quantity
HBA driver	STOR miniport v9.1.11.28
HBA QueueTarget setting	N/A

Item	Quantity
HBA QueueDepth setting	N/A
Multipathing	NetApp E-Series Device Specific Module for Multipath
Exchange virtual machine guest OS	Windows Server 2012 R2 Datacenter (6.3.9600 Build 9600)
ESE.dll file version	15.00.1076.009
Replication solution name or version	N/A

Storage Disk Configuration (Mailbox Store and Log Disks)

Table 5 lists specific quantities for the storage disk configuration.

Table 5) Storage disk configuration.

Item	Quantity
Disk type, speed, and firmware revision	NL-SAS 2TB 7,200 RPM – FW MS00
Raw capacity per disk (GB)	1,863.016GB
Number of physical disks in test	54
Total raw storage capacity (GB)	98.2TB
Disk slice size (GB)	N/A
RAID level	RAID 5
Total formatted capacity	40.5TB
Storage capacity utilization	41%
Database capacity utilization	37%

3 Best Practices

Exchange Server is a disk-sensitive application. Based on the results of the ESRP testing runs described in this report, NetApp recommends the following best practices for improving storage performance:

- Format the database and log volumes with a 64kb allocation unit size, as recommended by Microsoft.
- The typical recommendation is to isolate Exchange database and log disk I/O on separate physical disk arrays because this isolation allows independent log and database disk tuning or RAID levels. However, given the high-performance characteristics of the E2700 storage system and of RAID 5, the database and log LUNs can be included in the same volume group to simplify installation.
- For most Exchange Server 2013 environments, Microsoft recommends using hardware-level RAID 5 for databases and RAID 10 for logs. Using RAID 5 for databases provides better space utilization when mailboxes larger than 1GB are used, provided there are adequate disks for the I/O requirements.
- Enable read/write caching on all LUNS.
- The recommended disk stripe size for Exchange 2013 is 256KB or larger.

- Enable read caching and dynamic cache read prefetch under Cache properties.
- Set the `Start demand cache flushing` parameter at 80%.

For Exchange 2013 best practices for storage design, see [Exchange 2013 storage configuration options](#).

3.1 Core Storage Sizing

Performance, stability, disaster recovery procedures, and general Exchange maintenance all benefit from proper Exchange sizing. NetApp has studied the I/O patterns of Exchange systems running on NetApp storage. When a customer approaches NetApp for an Exchange storage solution, NetApp leverages this knowledge and expertise to properly size the storage specifically to the customer's environment. Several factors are taken into consideration in this process, including but not limited to the following:

- Number of mailboxes
- Mailbox size
- IOPS per mailbox
- Storage platform type
- Physical drive type

3.2 Layout

Another key consideration for Exchange Server 2013 is the layout of the databases. NetApp storage solutions can take full advantage of the performance benefits of volume groups, and following proper layout guidelines is essential for a high-performing, low-latency Exchange solution. To enable your Exchange deployment on NetApp storage to perform optimally in your environment, consult your NetApp Exchange specialist about proper layout.

4 Test Results Summary

This section provides a high-level summary of the test data from ESRP and the detailed reports generated by the ESRP testing framework.

4.1 Reliability

The purpose of a number of tests in the framework was to check reliability test runs for 24 hours to verify that the storage could handle high I/O loads for a long period of time. Both log and database files were analyzed for integrity after the stress test to confirm that there was no database or log corruption.

No errors were reported in any of the event logs collected for the reliability tests.

No errors were reported during the database and log checksum process. For the detailed reports, see section 5.2, "Database Checksum for 24-Hour Stress Test."

4.2 Storage Performance Results

The primary storage performance testing was designed to exercise the storage with the maximum sustainable Exchange type of I/O for two hours. This test shows how long it takes for the storage to respond to an I/O under load. The data presented in this section is the sum of all of the logical disk I/Os and the average of all of the logical disks' I/O latency in the two-hour test duration. Each server is listed separately as well as the aggregate numbers across all servers.

Individual Server Metrics

Table 6 through Table 8 list both the sum of I/O operations across storage groups and the average latency across all databases on a per-server basis.

Table 6) Mailbox server 1.

Type of Operation	Amount
Database I/O	
Database disk transfers per second	615.18
Database disk reads per second	433.095
Database disk writes per second	182.085
Average database disk read latency (ms)	14.74
Average database disk write latency (ms)	1.21
Transaction Log I/O	
Log disk writes per second	42.418
Average log disk write latency (ms)	0.434

Table 7) Mailbox server 2.

Type of Operation	Amount
Database I/O	
Database disk transfers per second	615.47
Database disk reads per second	433.02
Database disk writes per second	182.45
Average database disk read latency (ms)	14.86
Average database disk write latency (ms)	1.19
Transaction Log I/O	
Log disk writes per second	42.273
Average log disk write latency (ms)	0.437

Table 8) Mailbox server 3.

Type of Operation	Amount
Database I/O	
Database disk transfers per second	594.727
Database disk reads per second	418.175
Database disk writes per second	176.552
Average database disk read latency (ms)	14.88
Average database disk write latency (ms)	1.15
Transaction Log I/O	
Log disk writes per second	41.106

Type of Operation	Amount
Average log disk write latency (ms)	0.428

Metrics for Aggregate Performance Across All Servers

Table 9 lists both the sum of I/O operations and the average latency across all servers in the solution.

Table 9) Aggregate performance metrics.

Type of Operation	Amount
Database I/O	
Database disk transfers per second	1,825.377
Database disk reads per second	1,284.29
Database disk writes per second	541.087
Average database disk read latency (ms)	14.82
Average database disk write latency (ms)	1.18
Transaction Log I/O	
Log disk writes per second	125.797
Average log disk write latency (ms)	0.433

4.3 Database Backup and Recovery Performance

This section introduces two reports. The first measures the sequential read rate of the database files, and the second measures the recovery/replay performance (playing transaction logs into the database).

Database Read-Only Performance

The database read-only performance test measures the maximum rate at which databases can be backed up by Volume Shadow Copy Service (VSS). Table 10 shows the average rate for a single database file.

Table 10) Database read-only performance test.

Test	Result
Reads per second per database (MB)	200.15
Reads-per-second total per server (MB)	1,200.9

Transaction Log Recovery and Replay Performance

The transaction log recovery and replay performance test measures the maximum rate at which log files can be played against databases. Table 11 lists the average rate for 500 log files played in a single storage group. Each log file is 1MB in size.

Table 11) Transaction log recovery/replay performance test.

Test	Result
Average time to play one log file (sec)	4.25

5 Detailed Test Reports

This section provides detailed test results for all three mailbox servers. The following tests were run:

- 24-hour stress tests
- Database checksum for the 24-hour stress tests
- Two-hour performance tests
- Database checksum for the two-hour performance tests
- Backup tests
- Soft recovery tests

5.1 24-Hour Stress Test Results

This section provides the results of 24-hour stress tests for all three mailbox servers.

24-Hour Stress Test #1

Table 12) Test summary: 24-hour stress test #1.

Test Information	Result
Overall test result	Pass
Machine name	ICTM0901R720-9
Test description	
Test start time	3/28/2015 7:55:38 p.m.
Test end time	3/29/2015 8:17:55 p.m.
Collection start time	3/28/2015 7:59:23 p.m.
Collection end time	3/29/2015 7:59:17 p.m.
Jetstress version	15.00.0995.000
Extensible Storage Engine (ESE) version	15.00.1076.009
Operating system	Windows Server 2012 R2 Datacenter (6.2.9200.0)
Performance log	C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_55_51.blg

Table 13) Database sizing and throughput: 24-hour stress test #1.

Database Information	Result
Achieved transactional I/O per second	603.108
Target transactional I/O per second	560.028
Initial database size (bytes)	14,047,546,179,584
Final database size (bytes)	14,064,298,229,760
Database files (count)	6

Table 14) Jetstress system parameters: 24-hour stress test #1.

Parameter	Result
Thread count	15
Minimum database cache	192.0MB
Maximum database cache	1536.0MB
Insert operations	40%
Delete operations	20%
Replace operations	5%
Read operations	35%
Lazy commits	70%
Run background database maintenance	True
Number of copies per database	2

Table 15) Database configuration: 24-hour stress test #1.

Instance	Path
Instance4764.1	Log path: C:\Mount\DB1 Database: C:\Mount\DB1\Jetstress001001.edb
Instance4764.2	Log path: C:\Mount\DB2 Database: C:\Mount\DB2\Jetstress002001.edb
Instance4764.3	Log path: C:\Mount\DB3 Database: C:\Mount\DB3\Jetstress003001.edb
Instance4764.4	Log path: C:\Mount\DB4 Database: C:\Mount\DB4\Jetstress004001.edb
Instance4764.5	Log path: C:\Mount\DB5 Database: C:\Mount\DB5\Jetstress005001.edb
Instance4764.6	Log path: C:\Mount\DB6 Database: C:\Mount\DB6\Jetstress006001.edb

Table 16) Transactional I/O performance: 24-hour stress test #1.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance4764.1	14.222	1.172	70.631	29.875	33,024.008	34,238.633	0.000	0.429	0.000	6.937	0.000	20,413.844
Instance4764.2	15.595	1.229	70.664	29.841	33,015.609	34,228.872	0.000	0.436	0.000	6.919	0.000	20,386.686
Instance4764.3	14.575	1.248	70.686	29.940	33,022.723	34,233.214	0.000	0.427	0.000	6.954	0.000	20,353.993
Instance4764.4	14.350	1.212	70.681	29.835	33,023.189	34,227.771	0.000	0.432	0.000	6.915	0.000	20,380.148
Instance4764.5	14.374	1.126	70.591	29.779	33,025.309	34,231.926	0.000	0.430	0.000	6.926	0.000	20,394.522
Instance4764.6	14.288	1.076	70.681	29.904	33,022.405	34,221.682	0.000	0.429	0.000	6.949	0.000	20,349.307

Table 17) Background database maintenance I/O performance: 24-hour stress test #1.

Microsoft Exchange Database Instances	Database Maintenance I/O Reads per Second	Database Maintenance I/O Reads Average Bytes
Instance4764.1	9.148	261,953.261
Instance4764.2	9.148	261,964.261
Instance4764.3	9.148	261,975.050
Instance4764.4	9.149	261,947.552
Instance4764.5	9.148	261,968.247
Instance4764.6	9.082	261,957.537

Table 18) Log replication I/O performance: 24-hour stress test #1.

Microsoft Exchange Database Instances	I/O Log Reads per Second	I/O Log Reads Average Bytes
Instance4764.1	0.604	217,846.451
Instance4764.2	0.602	216,866.226
Instance4764.3	0.603	216,992.320
Instance4764.4	0.601	216,210.928
Instance4764.5	0.602	215,647.954
Instance4764.6	0.603	217,374.000

Table 19) Total I/O performance: 24-hour stress test #1.

Microsoft Exchange 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 per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance4764.1	14.222	1.172	79.780	29.875	59,275.473	34,238.633	8.543	0.429	0.604	6.937	217,846.451	20,413.844
Instance4764.2	15.595	1.229	79.812	29.841	59,257.592	34,228.872	9.044	0.436	0.602	6.919	216,866.226	20,386.686
Instance4764.3	14.575	1.248	79.834	29.940	59,257.096	34,233.214	8.866	0.427	0.603	6.954	216,992.320	20,353.993
Instance4764.4	14.350	1.212	79.829	29.835	59,258.193	34,227.771	8.479	0.432	0.601	6.915	216,210.928	20,380.148
Instance4764.5	14.374	1.126	79.739	29.779	59,290.248	34,231.926	8.655	0.430	0.602	6.926	215,647.954	20,394.522
Instance4764.6	14.288	1.076	79.763	29.904	59,090.394	34,221.682	8.571	0.429	0.603	6.949	217,374.000	20,349.307

Table 20) Host system performance: 24-hour stress test #1.

Counter	Average	Minimum	Maximum
% processor time	0.486	0.129	2.997
Available megabytes	77,790.198	77,755.000	77,834.000
Free system page table entries	16,429,276.066	16,426,650.000	16,429,560.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	245,390,909.640	244,555,776.000	246,300,672.000
Pool paged bytes	118,291,720.373	116,940,800.000	123,723,776.000
Database page fault stalls per second	0.000	0.000	0.000

Figure 3) Test log: 24-hour stress test #1.

```

3/28/2015 7:55:38 PM -- Preparing for testing ...
3/28/2015 7:55:44 PM -- Attaching databases ...
3/28/2015 7:55:44 PM -- Preparations for testing are complete.
3/28/2015 7:55:45 PM -- Starting transaction dispatch ..
3/28/2015 7:55:45 PM -- Database cache settings: (minimum: 192.0 MB, maximum: 1.5 GB)
3/28/2015 7:55:45 PM -- Database flush thresholds: (start: 15.3 MB, stop: 30.7 MB)
3/28/2015 7:55:51 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 200 msec/read).
3/28/2015 7:55:51 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 200 msec/write).
3/28/2015 7:55:52 PM -- Operation mix: Sessions 15, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.
3/28/2015 7:55:52 PM -- Performance logging started (interval: 15000 ms).
3/28/2015 7:55:52 PM -- Attaining prerequisites:
3/28/2015 7:59:23 PM -- \MSEExchange Database (JetstressWin)\Database Cache Size, Last: 1452708000.0 (lower bound: 1449551000.0, upper bound: none)
3/29/2015 7:59:24 PM -- Performance logging has ended.
3/29/2015 8:17:43 PM -- JetInterop batch transaction stats: 198055, 198055, 198055, 198054, 198054 and 198054.
3/29/2015 8:17:43 PM -- Dispatching transactions ends.
3/29/2015 8:17:43 PM -- Shutting down databases ...
3/29/2015 8:17:55 PM -- Instance4764.1 (complete), Instance4764.2 (complete), Instance4764.3 (complete), Instance4764.4 (complete), Instance4764.5 (complete) and Instance4764.6 (complete)
3/29/2015 8:17:55 PM -- C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_55_51.blg has 5762 samples.
3/29/2015 8:17:55 PM -- Creating test report ...

```

```

3/29/2015 8:19:40 PM -- Instance4764.1 has 14.2 for I/O Database Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.1 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.1 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.2 has 15.6 for I/O Database Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.2 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.2 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.3 has 14.6 for I/O Database Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.3 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.3 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.4 has 14.4 for I/O Database Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.4 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.4 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.5 has 14.4 for I/O Database Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.5 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.5 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.6 has 14.3 for I/O Database Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.6 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.6 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:19:40 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.
3/29/2015 8:19:40 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
3/29/2015 8:19:40 PM -- C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_55_51.xml has
5747 samples queried.

```

24-Hour Stress Test #2

Table 21) Test summary: 24-hour stress test #2.

Test Information	Result
Overall test result	Pass
Machine name	ICTM0902R720-11
Test description	
Test start time	3/28/2015 7:55:50 p.m.
Test end time	3/29/2015 8:18:25 p.m.
Collection start time	3/28/2015 7:59:33 p.m.
Collection end time	3/29/2015 7:59:31 p.m.
Jetstress version	15.00.0995.000
ESE version	15.00.1076.009
Operating system	Windows Server 2012 R2 Datacenter (6.2.9200.0)
Performance log	C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_56_3.blg

Table 22) Database sizing and throughput: 24-hour stress test #2.

DataBase Information	Result
Achieved transactional I/O per second	610.314
Target transactional I/O per second	560.028
Initial database size (bytes)	14,024,158,740,480
Final database size (bytes)	14,041,070,174,208
Database files (count)	6

Table 23) Jetstress system parameters: 24-hour stress test #2.

Parameter	Result
Thread count	15
Minimum database cache	192.0MB
Maximum database cache	1536.0MB
Insert operations	40%
Delete operations	20%
Replace operations	5%
Read operations	35%
Lazy commits	70%
Run background database maintenance	True
Number of copies per database	2

Table 24) Database configuration: 24-hour stress test #2.

Instance	Path
Instance1980.1	Log path: C:\Mount\DB1 Database: C:\Mount\DB1\Jetstress001001.edb
Instance1980.2	Log path: C:\Mount\DB2 Database: C:\Mount\DB2\Jetstress002001.edb
Instance1980.3	Log path: C:\Mount\DB3 Database: C:\Mount\DB3\Jetstress003001.edb
Instance1980.4	Log path: C:\Mount\DB4 Database: C:\Mount\DB4\Jetstress004001.edb
Instance1980.5	Log path: C:\Mount\DB5 Database: C:\Mount\DB5\Jetstress005001.edb
Instance1980.6	Log path: C:\Mount\DB6 Database: C:\Mount\DB6\Jetstress006001.edb

Table 25) Transactional I/O performance: 24-hour stress test #2.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance1980.1	14.340	1.219	71.438	30.189	33,016.763	34,347.351	0.000	0.431	0.000	7.038	0.000	20,436.879
Instance1980.2	14.464	1.268	71.491	30.236	33,024.812	34,342.506	0.000	0.429	0.000	7.045	0.000	20,395.946
Instance1980.3	15.049	1.292	71.590	30.256	33,015.562	34,329.001	0.000	0.427	0.000	7.048	0.000	20,323.329
Instance1980.4	14.327	1.251	71.541	30.200	33,017.577	34,336.051	0.000	0.429	0.000	7.040	0.000	20,367.570
Instance1980.5	14.437	1.143	71.537	30.184	33,016.025	34,335.160	0.000	0.428	0.000	7.033	0.000	20,334.852
Instance1980.6	14.731	1.034	71.494	30.158	33,014.248	34,329.597	0.000	0.428	0.000	7.025	0.000	20,349.793

Table 26) Background database maintenance I/O performance: 24-hour stress test #2.

Microsoft Exchange Database Instances	Database Maintenance I/O Reads per Second	Database Maintenance I/O Reads Average Bytes
Instance1980.1	9.148	261,955.634
Instance1980.2	9.148	261,940.665
Instance1980.3	8.906	261,946.686
Instance1980.4	9.148	261,949.622
Instance1980.5	9.147	261,978.855
Instance1980.6	9.008	261,942.351

Table 27) Log replication I/O performance: 24-hour stress test #2.

Microsoft Exchange Database Instances	I/O Log Reads per Second	I/O Log Reads Average Bytes
Instance1980.1	0.613	219,875.131
Instance1980.2	0.613	219,135.524
Instance1980.3	0.611	218,750.806
Instance1980.4	0.611	219,006.434
Instance1980.5	0.610	218,676.348
Instance1980.6	0.610	218,655.594

Table 28) Total I/O performance: 24-hour stress test #2.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance1980.1	14.340	1.219	80.586	30.189	59,004.665	34,347.351	8.554	0.431	0.613	7.038	219,875.131	20,436.879
Instance1980.2	14.464	1.268	80.640	30.236	58,994.407	34,342.506	8.625	0.429	0.613	7.045	219,135.524	20,395.946
Instance1980.3	15.049	1.292	80.497	30.256	58,345.354	34,329.001	8.665	0.427	0.611	7.048	218,750.806	20,323.329
Instance1980.4	14.327	1.251	80.689	30.200	58,972.205	34,336.051	8.499	0.429	0.611	7.040	219,006.434	20,367.570
Instance1980.5	14.437	1.143	80.684	30.184	58,973.004	34,335.160	8.518	0.428	0.610	7.033	218,676.348	20,334.852
Instance1980.6	14.731	1.034	80.502	30.158	58,631.990	34,329.597	8.815	0.428	0.610	7.025	218,655.594	20,349.793

Table 29) Host system performance: 24-hour stress test #2.

Counter	Average	Minimum	Maximum
% processor time	0.479	0.181	4.853
Available megabytes	77,992.358	77,949.000	78,112.000
Free system page table entries	16429615.703	16,427,479.000	16,429,892.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	230374165.062	230,076,416.000	230,752,256.000
Pool paged bytes	115688083.749	114,716,672.000	121,888,768.000
Database page fault stalls per second	0.000	0.000	0.000

Figure 4) Test log: 24-hour stress test #2.

```

3/28/2015 7:55:50 PM -- Preparing for testing ...
3/28/2015 7:55:57 PM -- Attaching databases ...
3/28/2015 7:55:57 PM -- Preparations for testing are complete.
3/28/2015 7:55:57 PM -- Starting transaction dispatch ..
3/28/2015 7:55:57 PM -- Database cache settings: (minimum: 192.0 MB, maximum: 1.5 GB)
3/28/2015 7:55:57 PM -- Database flush thresholds: (start: 15.3 MB, stop: 30.7 MB)
3/28/2015 7:56:03 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 200 msec/read).
3/28/2015 7:56:03 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 200 msec/write).
3/28/2015 7:56:04 PM -- Operation mix: Sessions 15, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.
3/28/2015 7:56:04 PM -- Performance logging started (interval: 15000 ms).
3/28/2015 7:56:04 PM -- Attaining prerequisites:
3/28/2015 7:59:33 PM -- \MSEExchange Database (JetstressWin)\Database Cache Size, Last: 1462239000.0 (lower bound: 1449551000.0, upper bound: none)
3/29/2015 7:59:34 PM -- Performance logging has ended.
3/29/2015 8:18:17 PM -- JetInterop batch transaction stats: 201046, 201045, 201045, 201045, 201045 and 201045.
3/29/2015 8:18:17 PM -- Dispatching transactions ends.
3/29/2015 8:18:17 PM -- Shutting down databases ...
3/29/2015 8:18:25 PM -- Instance1980.1 (complete), Instance1980.2 (complete), Instance1980.3 (complete), Instance1980.4 (complete), Instance1980.5 (complete) and Instance1980.6 (complete)
3/29/2015 8:18:25 PM -- C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_56_3.blg has 5762 samples.
3/29/2015 8:18:25 PM -- Creating test report ...
    
```

```

3/29/2015 8:18:58 PM -- Instance1980.1 has 14.3 for I/O Database Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.1 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.1 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.2 has 14.5 for I/O Database Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.2 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.2 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.3 has 15.0 for I/O Database Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.3 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.3 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.4 has 14.3 for I/O Database Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.4 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.4 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.5 has 14.4 for I/O Database Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.5 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.5 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.6 has 14.7 for I/O Database Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.6 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.6 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:58 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.
3/29/2015 8:18:58 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
3/29/2015 8:18:58 PM -- C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_56_3.xml has 5748
samples queried.

```

24-Hour Stress Test #3

Table 30) Test summary: 24-hour stress test #3.

Test information	Result
Overall test result	Pass
Machine name	ICTM0903R720-13
Test description	
Test start time	3/28/2015 7:55:53 p.m.
Test end time	3/29/2015 8:17:26 p.m.
Collection start time	3/28/2015 7:59:33 p.m.
Collection end time	3/29/2015 7:59:31 p.m.
Jetstress version	15.00.0995.000
ESE version	15.00.1076.009
Operating system	Windows Server 2012 R2 Datacenter (6.2.9200.0)
Performance log	C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_56_6.blg

Table 31) Database sizing and throughput: 24-hour stress test #3.

Database Information	Result
Achieved transactional I/O per second	609.561
Target transactional I/O per second	560.028
Initial database size (bytes)	14,024,225,849,344
Final database size (bytes)	14,041,095,340,032
Database files (count)	6

Table 32) Jetstress system parameters: 24-hour stress test #3.

Parameter	Result
Thread count	15
Minimum database cache	192.0MB
Maximum database cache	1536.0MB
Insert operations	40%
Delete operations	20%
Replace operations	5%
Read operations	35%
Lazy commits	70%
Run background database maintenance	True
Number of copies per database	2

Table 33) Database configuration: 24-hour stress test #3.

Instance	Path
Instance4292.1	Log path: C:\Mount\DB1 Database: C:\Mount\DB1\Jetstress001001.edb
Instance4292.2	Log path: C:\Mount\DB2 Database: C:\Mount\DB2\Jetstress002001.edb
Instance4292.3	Log path: C:\Mount\DB3 Database: C:\Mount\DB3\Jetstress003001.edb
Instance4292.4	Log path: C:\Mount\DB4 Database: C:\Mount\DB4\Jetstress004001.edb
Instance4292.5	Log path: C:\Mount\DB5 Database: C:\Mount\DB5\Jetstress005001.edb
Instance4292.6	Log path: C:\Mount\DB6 Database: C:\Mount\DB6\Jetstress006001.edb

Table 34) Transactional I/O performance: 24-hour stress test #3.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance4292.1	14.415	1.178	71.473	30.140	33,023.816	34,333.926	0.000	0.429	0.000	7.018	0.000	20,359.018
Instance4292.2	14.698	1.230	71.406	30.161	33,022.159	34,345.469	0.000	0.417	0.000	7.036	0.000	20,395.219
Instance4292.3	14.276	1.259	71.381	30.062	33,032.182	34,338.720	0.000	0.428	0.000	7.007	0.000	20,435.630
Instance4292.4	14.456	1.220	71.549	30.171	33,028.177	34,328.342	0.000	0.428	0.000	7.024	0.000	20,306.006
Instance4292.5	14.592	1.120	71.543	30.214	33,028.039	34,334.071	0.000	0.430	0.000	7.035	0.000	20,324.053
Instance4292.6	14.442	1.049	71.422	30.038	33,017.571	34,336.467	0.000	0.424	0.000	6.985	0.000	20,429.894

Table 35) Background database maintenance I/O performance: 24-hour stress test #3.

Microsoft Exchange Database Instances	Database Maintenance I/O Reads per Second	Database Maintenance I/O Reads Average Bytes
Instance4292.1	9.148	261,942.692
Instance4292.2	9.011	261,966.435
Instance4292.3	9.139	261,955.914
Instance4292.4	9.142	261,958.366
Instance4292.5	9.049	261,960.796
Instance4292.6	9.054	261,959.089

Table 36) Log replication I/O performance: 24-hour stress test #3.

Microsoft Exchange Database Instances	I/O Log Reads per Second	I/O Log Reads Average Bytes
Instance4292.1	0.610	218,027.298
Instance4292.2	0.612	218,842.522
Instance4292.3	0.611	218,303.233
Instance4292.4	0.608	218,252.476
Instance4292.5	0.610	218,779.262
Instance4292.6	0.609	217,759.356

Table 37) Total I/O performance: 24-hour stress test #3.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance4292.1	14.415	1.178	80.621	30.140	59,000.179	34,333.926	8.793	0.429	0.610	7.018	218,027.298	20,359.018
Instance4292.2	14.698	1.230	80.417	30.161	58,674.903	34,345.469	8.570	0.417	0.612	7.036	218,842.522	20,395.219
Instance4292.3	14.276	1.259	80.520	30.062	59,014.542	34,338.720	8.743	0.428	0.611	7.007	218,303.233	20,435.630
Instance4292.4	14.456	1.220	80.691	30.171	58,964.397	34,328.342	8.780	0.428	0.608	7.024	218,252.476	20,306.006
Instance4292.5	14.592	1.120	80.592	30.214	58,732.315	34,334.071	8.596	0.430	0.610	7.035	218,779.262	20,324.053
Instance4292.6	14.442	1.049	80.476	30.038	58,774.155	34,336.467	8.441	0.424	0.609	6.985	217,759.356	20,429.894

Table 38) Host system performance: 24-hour stress test #3.

Counter	Average	Minimum	Maximum
% processor time	0.500	0.190	4.929
Available megabytes	191,080.783	191,029.000	191,211.000
Free system page table entries	16,343,053.583	16,342,354.000	16,343,527.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	239,282,442.108	235,298,816.000	243,265,536.000
Pool paged bytes	123,131,801.760	120,778,752.000	129,347,584.000
Database page fault stalls per second	0.000	0.000	0.000

Figure 5) Test log: 24-hour stress test #3.

```

3/28/2015 7:55:53 PM -- Preparing for testing ...
3/28/2015 7:55:59 PM -- Attaching databases ...
3/28/2015 7:55:59 PM -- Preparations for testing are complete.
3/28/2015 7:55:59 PM -- Starting transaction dispatch ..
3/28/2015 7:55:59 PM -- Database cache settings: (minimum: 192.0 MB, maximum: 1.5 GB)
3/28/2015 7:55:59 PM -- Database flush thresholds: (start: 15.3 MB, stop: 30.7 MB)
3/28/2015 7:56:06 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 200 msec/read).
3/28/2015 7:56:06 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 200 msec/write).
3/28/2015 7:56:07 PM -- Operation mix: Sessions 15, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.
3/28/2015 7:56:07 PM -- Performance logging started (interval: 15000 ms).
3/28/2015 7:56:07 PM -- Attaining prerequisites:
3/28/2015 7:59:33 PM -- \MSExchange Database (JetstressWin)\Database Cache Size, Last: 1455874000.0 (lower bound: 1449551000.0, upper bound: none)
3/29/2015 7:59:34 PM -- Performance logging has ended.
3/29/2015 8:17:14 PM -- JetInterop batch transaction stats: 200780, 200780, 200780, 200780, 200780 and 200779.
3/29/2015 8:17:14 PM -- Dispatching transactions ends.
3/29/2015 8:17:14 PM -- Shutting down databases ...
3/29/2015 8:17:26 PM -- Instance4292.1 (complete), Instance4292.2 (complete), Instance4292.3 (complete), Instance4292.4 (complete), Instance4292.5 (complete) and Instance4292.6 (complete)
3/29/2015 8:17:26 PM -- C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_56_6.blg has 5762 samples.
3/29/2015 8:17:26 PM -- Creating test report ...

```

```

3/29/2015 8:18:57 PM -- Instance4292.1 has 14.4 for I/O Database Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.1 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.1 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.2 has 14.7 for I/O Database Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.2 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.2 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.3 has 14.3 for I/O Database Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.3 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.3 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.4 has 14.5 for I/O Database Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.4 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.4 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.5 has 14.6 for I/O Database Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.5 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.5 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.6 has 14.4 for I/O Database Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.6 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.6 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:57 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.
3/29/2015 8:18:57 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
3/29/2015 8:18:57 PM -- C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_56_6.xml has 5748
samples queried.

```

5.2 Database Checksum for 24-Hour Stress Test Results

This section provides the database checksum results for the 24-hour stress tests for all three mailbox servers.

Database Checksum for 24-Hour Stress Test #1

Table 39) Checksum statistics (all): database checksum for 24-hour stress test #1.

Database	Pages Seen	Bad Pages	Correctable Pages	Pages with Wrong Page Number	File Length per Seconds Taken
C:\Mount\DB1\Jetstress001001.edb	71,416,576	0	0	0	2,231768MB per 18,013 seconds
C:\Mount\DB2\Jetstress002001.edb	71,416,320	0	0	0	2231760MB per 18,030 seconds
C:\Mount\DB3\Jetstress003001.edb	71,416,832	0	0	0	2231776MB per 18,028 seconds
C:\Mount\DB4\Jetstress004001.edb	71,416,320	0	0	0	2231760MB per 18,022 seconds
C:\Mount\DB5\Jetstress005001.edb	71,416,320	0	0	0	2231760MB per 18,019 seconds
C:\Mount\DB6\Jetstress006001.edb	71,417,088	0	0	0	2231784MB per 18,030 seconds
(Sum)	428,499,456	0	0	0	13390608MB per 18,030 seconds

Table 40) Disk subsystem performance (of checksum): database checksum for 24-hour stress test #1.

Logical Disk	Average Disk Seconds per Read	Average Disk Seconds per Write	Disk Reads per Second	Disk Writes per Second	Average Disk Bytes per Read
C:\Mount\DB1	0.023	0.000	1,981.300	0.000	65,536.000
C:\Mount\DB2	0.023	0.000	1,978.752	0.000	65,536.000
C:\Mount\DB3	0.024	0.000	1,978.983	0.000	65,536.000
C:\Mount\DB4	0.023	0.000	1,980.025	0.000	65,536.000
C:\Mount\DB5	0.023	0.000	1,980.373	0.000	65,536.000
C:\Mount\DB6	0.023	0.000	1,978.823	0.000	65,536.000

Table 41) Memory system performance (of checksum): database checksum for 24-hour stress test #1.

Counter	Average	Minimum	Maximum
% processor time	4.900	4.304	7.233
Available megabytes	79,601.397	79,551.000	79,621.000
Free system page table entries	16,428,663.163	16,426,307.000	16,429,615.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	232,124,900.693	231,899,136.000	232,898,560.000
Pool paged bytes	120,185,268.907	119,709,696.000	125,198,336.000

Figure 6) Test log: database checksum for 24-hour stress test #1.

```

3/28/2015 7:55:50 PM -- Preparing for testing ...
3/28/2015 7:55:57 PM -- Attaching databases ...
3/28/2015 7:55:57 PM -- Preparations for testing are complete.
3/28/2015 7:55:57 PM -- Starting transaction dispatch ..
3/28/2015 7:55:57 PM -- Database cache settings: (minimum: 192.0 MB, maximum: 1.5 GB)
3/28/2015 7:55:57 PM -- Database flush thresholds: (start: 15.3 MB, stop: 30.7 MB)
3/28/2015 7:56:03 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 200
msec/read).
3/28/2015 7:56:03 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 200
msec/write).
3/28/2015 7:56:04 PM -- Operation mix: Sessions 15, Inserts 40%, Deletes 20%, Replaces 5%, Reads
35%, Lazy Commits 70%.
3/28/2015 7:56:04 PM -- Performance logging started (interval: 15000 ms).
3/28/2015 7:56:04 PM -- Attaining prerequisites:
3/28/2015 7:59:33 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last:
1462239000.0 (lower bound: 1449551000.0, upper bound: none)
3/29/2015 7:59:34 PM -- Performance logging has ended.
3/29/2015 8:18:17 PM -- JetInterop batch transaction stats: 201046, 201045, 201045, 201045,
201045 and 201045.
3/29/2015 8:18:17 PM -- Dispatching transactions ends.
3/29/2015 8:18:17 PM -- Shutting down databases ...
3/29/2015 8:18:25 PM -- Instance1980.1 (complete), Instance1980.2 (complete), Instance1980.3
(complete), Instance1980.4 (complete), Instance1980.5 (complete) and Instance1980.6 (complete)
3/29/2015 8:18:25 PM -- C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_56_3.blg has 5762
samples.
3/29/2015 8:18:25 PM -- Creating test report ...
3/29/2015 8:18:58 PM -- Instance1980.1 has 14.3 for I/O Database Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.1 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.1 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.2 has 14.5 for I/O Database Reads Average Latency.

```

```

3/29/2015 8:18:58 PM -- Instance1980.2 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.2 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.3 has 15.0 for I/O Database Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.3 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.3 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.4 has 14.3 for I/O Database Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.4 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.4 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.5 has 14.4 for I/O Database Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.5 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.5 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.6 has 14.7 for I/O Database Reads Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.6 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:58 PM -- Instance1980.6 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:58 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.
3/29/2015 8:18:58 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
3/29/2015 8:18:58 PM -- C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_56_3.xml has 5748
samples queried.
3/29/2015 8:18:58 PM -- C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_56_3.html was
saved.
3/29/2015 8:18:59 PM -- Performance logging started (interval: 30000 ms).
3/29/2015 8:18:59 PM -- Verifying database checksums ...
3/30/2015 1:19:29 AM -- C:\Mount\DB1 (100% processed), C:\Mount\DB2 (100% processed),
C:\Mount\DB3 (100% processed), C:\Mount\DB4 (100% processed), C:\Mount\DB5 (100% processed) and
C:\Mount\DB6 (100% processed)
3/30/2015 1:19:30 AM -- Performance logging has ended.
3/30/2015 1:19:30 AM -- C:\Program Files\Exchange Jetstress\DBChecksum_2015_3_29_20_18_58.blg has
600 samples.

```

Database Checksum for 24-Hour Stress Test #2

Table 42) Checksum statistics (all): database checksum for 24-hour stress test #2.

Database	Pages Seen	Bad Pages	Correctable Pages	Pages with Wrong Page Numbers	File Length per Seconds Taken
C:\Mount\DB1\Jetstress001001.edb	71,534,336	0	0	0	2235448MB per 18,019 seconds
C:\Mount\DB2\Jetstress002001.edb	71,534,848	0	0	0	2235464MB per 18,040 seconds
C:\Mount\DB3\Jetstress003001.edb	71,534,336	0	0	0	2235448MB per 18,039 seconds
C:\Mount\DB4\Jetstress004001.edb	71,534,592	0	0	0	2235456MB per 18,033 seconds
C:\Mount\DB5\Jetstress005001.edb	71,535,104	0	0	0	2235472MB per 18,035 seconds
C:\Mount\DB6\Jetstress006001.edb	71,535,104	0	0	0	2235472MB per 18,036 seconds
(Sum)	429,208,320	0	0	0	13412760MB per 18,040 seconds`

Table 43) Disk subsystem performance (of checksum): database checksum for 24-hour stress test #2.

Logical Disk	Average Disk Seconds per Read	Average Disk Seconds per Write	Disk Reads per Second	Disk Writes per Second	Average Disk Bytes per Read
C:\Mount\DB1	0.023	0.000	1,984.099	0.000	65,536.000
C:\Mount\DB2	0.023	0.000	1,982.644	0.000	65,536.000
C:\Mount\DB3	0.023	0.000	1,982.695	0.000	65,536.000
C:\Mount\DB4	0.023	0.000	1,981.175	0.000	65,536.000
C:\Mount\DB5	0.023	0.000	1,980.718	0.000	65,536.000
C:\Mount\DB6	0.023	0.000	1,980.615	0.000	65,536.000

Table 44) Memory system performance (of checksum): database checksum for 24-hour stress test #2.

Counter	Average	Minimum	Maximum
% processor time	5.031	4.523	9.200
Available megabytes	79,396.359	79,354.000	79,412.000
Free system page table entries	16,428,489.930	16,425,669.000	16,429,515.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	246,441,585.304	246,124,544.000	246,861,824.000
Pool paged bytes	122,560,300.725	122,118,144.000	127,795,200.000

Figure 7) Test log: database checksum for 24-hour stress test #2.

```

3/28/2015 7:55:38 PM -- Preparing for testing ...
3/28/2015 7:55:44 PM -- Attaching databases ...
3/28/2015 7:55:44 PM -- Preparations for testing are complete.
3/28/2015 7:55:45 PM -- Starting transaction dispatch ..
3/28/2015 7:55:45 PM -- Database cache settings: (minimum: 192.0 MB, maximum: 1.5 GB)
3/28/2015 7:55:45 PM -- Database flush thresholds: (start: 15.3 MB, stop: 30.7 MB)
3/28/2015 7:55:51 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 200
msec/read).
3/28/2015 7:55:51 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 200
msec/write).
3/28/2015 7:55:52 PM -- Operation mix: Sessions 15, Inserts 40%, Deletes 20%, Replaces 5%, Reads
35%, Lazy Commits 70%.
3/28/2015 7:55:52 PM -- Performance logging started (interval: 15000 ms).
3/28/2015 7:55:52 PM -- Attaining prerequisites:
3/28/2015 7:59:23 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last:
1452708000.0 (lower bound: 1449551000.0, upper bound: none)
3/29/2015 7:59:24 PM -- Performance logging has ended.
3/29/2015 8:17:43 PM -- JetInterop batch transaction stats: 198055, 198055, 198055, 198054,
198054 and 198054.
3/29/2015 8:17:43 PM -- Dispatching transactions ends.
3/29/2015 8:17:43 PM -- Shutting down databases ...
3/29/2015 8:17:55 PM -- Instance4764.1 (complete), Instance4764.2 (complete), Instance4764.3
(complete), Instance4764.4 (complete), Instance4764.5 (complete) and Instance4764.6 (complete)
3/29/2015 8:17:55 PM -- C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_55_51.blg has
5762 samples.
3/29/2015 8:17:55 PM -- Creating test report ...
3/29/2015 8:19:40 PM -- Instance4764.1 has 14.2 for I/O Database Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.1 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.1 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.2 has 15.6 for I/O Database Reads Average Latency.

```

```

3/29/2015 8:19:40 PM -- Instance4764.2 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.2 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.3 has 14.6 for I/O Database Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.3 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.3 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.4 has 14.4 for I/O Database Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.4 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.4 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.5 has 14.4 for I/O Database Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.5 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.5 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.6 has 14.3 for I/O Database Reads Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.6 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:19:40 PM -- Instance4764.6 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:19:40 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.
3/29/2015 8:19:40 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
3/29/2015 8:19:40 PM -- C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_55_51.xml has
5747 samples queried.
3/29/2015 8:19:40 PM -- C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_55_51.html was
saved.
3/29/2015 8:19:40 PM -- Performance logging started (interval: 30000 ms).
3/29/2015 8:19:40 PM -- Verifying database checksums ...
3/30/2015 1:20:21 AM -- C:\Mount\DB1 (100% processed), C:\Mount\DB2 (100% processed),
C:\Mount\DB3 (100% processed), C:\Mount\DB4 (100% processed), C:\Mount\DB5 (100% processed) and
C:\Mount\DB6 (100% processed)
3/30/2015 1:20:21 AM -- Performance logging has ended.
3/30/2015 1:20:21 AM -- C:\Program Files\Exchange Jetstress\DBChecksum_2015_3_29_20_19_40.blg has
601 samples.

```

Database Checksum for 24-Hour Stress Test #3

Table 45) Checksum statistics (all): database checksum for 24-hour stress test #3.

Database	Pages Seen	Bad Pages	Correctable Pages	Pages with Wrong Page Numbers	File Length per Seconds Taken
C:\Mount\DB1\Jetstress001001.edb	71416064	0	0	0	2231752MB per 18,014 seconds
C:\Mount\DB2\Jetstress002001.edb	71416832	0	0	0	2231776MB per 18,030 seconds
C:\Mount\DB3\Jetstress003001.edb	71417344	0	0	0	2231792MB per 18,026 seconds
C:\Mount\DB4\Jetstress004001.edb	71416320	0	0	0	2231760MB per 18,026 seconds
C:\Mount\DB5\Jetstress005001.edb	71416576	0	0	0	2231768MB per 18,025 seconds
C:\Mount\DB6\Jetstress006001.edb	71417088	0	0	0	2231784MB per 18,030 seconds
(Sum)	428500224	0	0	0	13390632MB per 18,030 seconds

Table 46) Disk subsystem performance (of checksum): database checksum for 24-hour stress test #3.

Logical Disk	Average Disk Seconds per Read	Average Disk Seconds per Write	Disk Reads per Second	Disk Writes per Second	Average Disk Bytes per Read
C:\Mount\DB1	0.023	0.000	1,981.020	0.000	65,536.000
C:\Mount\DB2	0.023	0.000	1,978.738	0.000	65,536.000
C:\Mount\DB3	0.024	0.000	1,979.432	0.000	65,536.000
C:\Mount\DB4	0.023	0.000	1,979.398	0.000	65,536.000
C:\Mount\DB5	0.023	0.000	1,979.594	0.000	65,536.000
C:\Mount\DB6	0.023	0.000	1,978.667	0.000	65,536.000

Table 47) Memory system performance (of checksum): database checksum for 24-hour stress test #3.

Counter	Average	Minimum	Maximum
% processor time	4.661	4.164	7.002
Available megabytes	192,674.522	192,624.000	192,696.000
Free system page table entries	16,341,421.280	16,339,475.000	16,343,215.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	245,596,965.547	244,793,344.000	246,902,784.000
Pool paged bytes	129,754,535.253	128,913,408.000	135,274,496.000

Figure 8) Test log: database checksum for 24-hour stress test #3.

```

3/28/2015 7:55:53 PM -- Preparing for testing ...
3/28/2015 7:55:59 PM -- Attaching databases ...
3/28/2015 7:55:59 PM -- Preparations for testing are complete.
3/28/2015 7:55:59 PM -- Starting transaction dispatch ..
3/28/2015 7:55:59 PM -- Database cache settings: (minimum: 192.0 MB, maximum: 1.5 GB)
3/28/2015 7:55:59 PM -- Database flush thresholds: (start: 15.3 MB, stop: 30.7 MB)
3/28/2015 7:56:06 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 200 msec/read).
3/28/2015 7:56:06 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 200 msec/write).
3/28/2015 7:56:07 PM -- Operation mix: Sessions 15, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.
3/28/2015 7:56:07 PM -- Performance logging started (interval: 15000 ms).
3/28/2015 7:56:07 PM -- Attaining prerequisites:
3/28/2015 7:59:33 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 1455874000.0 (lower bound: 1449551000.0, upper bound: none)
3/29/2015 7:59:34 PM -- Performance logging has ended.
3/29/2015 8:17:14 PM -- JetInterop batch transaction stats: 200780, 200780, 200780, 200780, 200780 and 200779.
3/29/2015 8:17:14 PM -- Dispatching transactions ends.
3/29/2015 8:17:14 PM -- Shutting down databases ...
3/29/2015 8:17:26 PM -- Instance4292.1 (complete), Instance4292.2 (complete), Instance4292.3 (complete), Instance4292.4 (complete), Instance4292.5 (complete) and Instance4292.6 (complete)
3/29/2015 8:17:26 PM -- C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_56_6.blg has 5762 samples.
3/29/2015 8:17:26 PM -- Creating test report ...
3/29/2015 8:18:57 PM -- Instance4292.1 has 14.4 for I/O Database Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.1 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.1 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.2 has 14.7 for I/O Database Reads Average Latency.
    
```

```

3/29/2015 8:18:57 PM -- Instance4292.2 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.2 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.3 has 14.3 for I/O Database Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.3 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.3 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.4 has 14.5 for I/O Database Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.4 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.4 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.5 has 14.6 for I/O Database Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.5 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.5 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.6 has 14.4 for I/O Database Reads Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.6 has 0.4 for I/O Log Writes Average Latency.
3/29/2015 8:18:57 PM -- Instance4292.6 has 0.4 for I/O Log Reads Average Latency.
3/29/2015 8:18:57 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.
3/29/2015 8:18:57 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
3/29/2015 8:18:57 PM -- C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_56_6.xml has 5748
samples queried.
3/29/2015 8:18:57 PM -- C:\Program Files\Exchange Jetstress\Stress_2015_3_28_19_56_6.html was
saved.
3/29/2015 8:18:58 PM -- Performance logging started (interval: 30000 ms).
3/29/2015 8:18:58 PM -- Verifying database checksums ...
3/30/2015 1:19:29 AM -- C:\Mount\DB1 (100% processed), C:\Mount\DB2 (100% processed),
C:\Mount\DB3 (100% processed), C:\Mount\DB4 (100% processed), C:\Mount\DB5 (100% processed) and
C:\Mount\DB6 (100% processed)
3/30/2015 1:19:29 AM -- Performance logging has ended.
3/30/2015 1:19:29 AM -- C:\Program Files\Exchange Jetstress\DBChecksum_2015_3_29_20_18_57.blg has
600 samples.

```

5.3 Two-Hour Performance Test Results

This section provides the results of two-hour stress tests for all three mailbox servers.

Two-Hour Performance Test #1

Table 48) Test summary: two-hour performance test #1.

Test Information	Result
Overall test result	Pass
Machine name	ICTM0901R720-9
Test description	
Test start time	3/30/2015 8:23:11 a.m.
Test end time	3/30/2015 10:27:19 a.m.
Collection start time	3/30/2015 8:26:50 a.m.
Collection end time	3/30/2015 10:26:39 a.m.
Jetstress version	15.00.0995.000
ESE version	15.00.1076.009
Operating system	Windows Server 2012 R2 Datacenter (6.2.9200.0)

Table 49) Database sizing and throughput: two-hour performance test #1.

Database Information	Result
Achieved transactional I/O per second	615.47
Target transactional I/O per second	560.028
Initial database size (bytes)	14,065,732,681,728
Final database size (bytes)	14,067,158,745,088
Database files (count)	6

Table 50) Jetstress system parameter: two-hour performance test #1.

Parameter	Result
Thread count	15
Minimum database cache	192.0MB
Maximum database cache	15360MB
Insert operations	40%
Delete operations	20%
Replace operations	5%
Read operations	35%
Lazy commits	70%
Run background database maintenance	True
Number of copies per database	2

Table 51) Database configuration: two-hour performance test #1.

Instance	Path
Instance4172.1	Log path: C:\Mount\DB1 Database: C:\Mount\DB1\Jetstress001001.edb
Instance4172.2	Log path: C:\Mount\DB2 Database: C:\Mount\DB2\Jetstress002001.edb
Instance4172.3	Log path: C:\Mount\DB3 Database: C:\Mount\DB3\Jetstress003001.edb
Instance4172.4	Log path: C:\Mount\DB4 Database: C:\Mount\DB4\Jetstress004001.edb
Instance4172.5	Log path: C:\Mount\DB5 Database: C:\Mount\DB5\Jetstress005001.edb
Instance4172.6	Log path: C:\Mount\DB6 Database: C:\Mount\DB6\Jetstress006001.edb

Table 52) Transactional I/O performance: two-hour performance test #1.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance4172.1	14.573	1.191	72.229	30.683	32,907.905	34,193.702	0.000	0.439	0.000	7.100	0.000	20,359.419
Instance4172.2	16.184	1.239	72.009	30.208	32,919.304	34,201.445	0.000	0.448	0.000	7.070	0.000	20,319.911
Instance4172.3	14.848	1.266	71.985	30.294	32,930.525	34,188.549	0.000	0.436	0.000	7.054	0.000	20,406.027
Instance4172.4	14.571	1.242	71.999	30.448	32,923.877	34,218.699	0.000	0.436	0.000	7.019	0.000	20,629.494
Instance4172.5	14.668	1.158	72.345	30.356	32,914.270	34,175.501	0.000	0.440	0.000	6.976	0.000	20,253.806
Instance4172.6	14.329	1.098	72.453	30.462	32,934.782	34,166.962	0.000	0.423	0.000	7.054	0.000	20,110.353

Table 53) Background database maintenance I/O performance: two-hour performance test #1.

Microsoft Exchange Database Instances	Database Maintenance I/O Reads per Second	Database Maintenance I/O Reads Average Bytes
Instance4172.1	9.149	262,035.401
Instance4172.2	9.152	261,914.211
Instance4172.3	9.152	261,924.009
Instance4172.4	9.150	262,005.903
Instance4172.5	9.152	261,939.494
Instance4172.6	9.152	261,931.159

Table 54) Log replication I/O performance: two-hour performance test #1.

Microsoft Exchange Database Instances	I/O Log Reads per Second	I/O Log Reads Average Bytes
Instance4172.1	0.615	222,803.118
Instance4172.2	0.613	221,181.802
Instance4172.3	0.614	216,973.108
Instance4172.4	0.618	225,242.527
Instance4172.5	0.603	222,299.225
Instance4172.6	0.605	219,353.566

Table 55) Total I/O performance: two-hour performance test #1.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance4172.1	14.573	1.191	81.378	30.683	58,666.867	34,193.702	9.173	0.439	0.615	7.100	222,803.118	20,359.419
Instance4172.2	16.184	1.239	81.161	30.208	58,742.098	34,201.445	9.613	0.448	0.613	7.070	221,181.802	20,319.911
Instance4172.3	14.848	1.266	81.137	30.294	58,760.730	34,188.549	8.763	0.436	0.614	7.054	216,973.108	20,406.027
Instance4172.4	14.571	1.242	81.149	30.448	58,753.295	34,218.699	9.092	0.436	0.618	7.019	225,242.527	20,629.494
Instance4172.5	14.668	1.158	81.497	30.356	58,633.619	34,175.501	9.105	0.440	0.603	6.976	222,299.225	20,253.806
Instance4172.6	14.329	1.098	81.605	30.462	58,616.748	34,166.962	8.407	0.423	0.605	7.054	219,353.566	20,110.353

Table 56) Host system performance: two-hour performance test #1.

Counter	Average	Minimum	Maximum
% processor time	0.499	0.234	3.928
Available megabytes	77,650.463	77,613.000	77,742.000
Free system page table entries	16,428,933.570	16,428,428.000	16,429,169.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	251,110,744.184	251,023,360.000	251,727,872.000
Pool paged bytes	132,966,746.322	132,730,880.000	137,768,960.000
Database page fault stalls per second	0.000	0.000	0.000

Figure 9) Test log: two-hour performance test #1.

```

3/30/2015 8:23:11 AM -- Preparing for testing ...
3/30/2015 8:23:17 AM -- Attaching databases ...
3/30/2015 8:23:17 AM -- Preparations for testing are complete.
3/30/2015 8:23:17 AM -- Starting transaction dispatch ..
3/30/2015 8:23:18 AM -- Database cache settings: (minimum: 192.0 MB, maximum: 1.5 GB)
3/30/2015 8:23:18 AM -- Database flush thresholds: (start: 15.3 MB, stop: 30.7 MB)
3/30/2015 8:23:24 AM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).
3/30/2015 8:23:24 AM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).
3/30/2015 8:23:25 AM -- Operation mix: Sessions 15, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.
3/30/2015 8:23:25 AM -- Performance logging started (interval: 15000 ms).
3/30/2015 8:23:25 AM -- Attaining prerequisites:
3/30/2015 8:26:50 AM -- \MSEExchange Database(JetstressWin)\Database Cache Size, Last: 1455075000.0 (lower bound: 1449551000.0, upper bound: none)
3/30/2015 10:26:51 AM -- Performance logging has ended.
3/30/2015 10:27:00 AM -- JetInterop batch transaction stats: 17093, 17093, 17093, 17093, 17093 and 17093.
3/30/2015 10:27:00 AM -- Dispatching transactions ends.
3/30/2015 10:27:00 AM -- Shutting down databases ...
3/30/2015 10:27:19 AM -- Instance4172.1 (complete), Instance4172.2 (complete), Instance4172.3 (complete), Instance4172.4 (complete), Instance4172.5 (complete) and Instance4172.6 (complete)
3/30/2015 10:27:19 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_8_23_24.blg has 492 samples.
3/30/2015 10:27:19 AM -- Creating test report ...

```

```

3/30/2015 10:27:29 AM -- Instance4172.1 has 14.6 for I/O Database Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.1 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.1 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.2 has 16.2 for I/O Database Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.2 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.2 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.3 has 14.8 for I/O Database Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.3 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.3 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.4 has 14.6 for I/O Database Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.4 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.4 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.5 has 14.7 for I/O Database Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.5 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.5 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.6 has 14.3 for I/O Database Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.6 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.6 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:29 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.
3/30/2015 10:27:29 AM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
3/30/2015 10:27:29 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_8_23_24.xml
has 478 samples queried.

```

Two-Hour Performance Test #2

Table 57) Test summary: two-hour performance test #2.

Test Information	Result
Overall test result	Pass
Machine name	ICTM0902R720-11
Test description	
Test start time	3/30/2015 8:23:17 a.m.
Test end time	3/30/2015 10:27:20 a.m.
Collection start time	3/30/2015 8:27:00 a.m.
Collection end time	3/30/2015 10:27:00 a.m.
Jetstress version	15.00.0995.000
ESE version	15.00.1076.009
Operating system	Windows Server 2012 R2 Datacenter (6.2.9200.0)

Table 58) Database sizing and throughput: two-hour performance test #2.

Database Information	Result
Achieved transactional I/O per second	615.18
Target transactional I/O per second	560.028
Initial database size (bytes)	14,042,529,792,000
Final database size (bytes)	14,043,981,021,184
Database files (count)	6

Table 59) Jetstress system parameters: two-hour performance test #2.

Parameter	Result
Thread count	15
Minimum database cache	192.0MB
Maximum database cache	1536.0MB
Insert operations	40%
Delete operations	20%
Replace operations	5%
Read operations	35%
Lazy commits	70%
Run background database maintenance	True
Number of copies per database	2

Table 60) Database configuration: two-hour performance test #2.

Instance	Path
Instance4212.1	Log path: C:\Mount\DB1 Database: C:\Mount\DB1\Jetstress001001.edb
Instance4212.2	Log path: C:\Mount\DB2 Database: C:\Mount\DB2\Jetstress002001.edb
Instance4212.3	Log path: C:\Mount\DB3 Database: C:\Mount\DB3\Jetstress003001.edb
Instance4212.4	Log path: C:\Mount\DB4 Database: C:\Mount\DB4\Jetstress004001.edb
Instance4212.5	Log path: C:\Mount\DB5 Database: C:\Mount\DB5\Jetstress005001.edb
Instance4212.6	Log path: C:\Mount\DB6 Database: C:\Mount\DB6\Jetstress006001.edb

Table 61) Transactional I/O performance: two-hour performance test #2.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance4212.1	14.427	1.247	72.063	30.162	32,969.970	34,292.012	0.000	0.455	0.000	7.058	0.000	20,376.446
Instance4212.2	14.577	1.285	72.191	30.273	32,968.179	34,268.006	0.000	0.438	0.000	7.016	0.000	20,405.245
Instance4212.3	14.560	1.309	72.013	30.201	32,967.558	34,281.669	0.000	0.433	0.000	7.043	0.000	20,416.802
Instance4212.4	14.395	1.270	72.281	30.318	32,985.465	34,288.221	0.000	0.423	0.000	7.034	0.000	20,515.338
Instance4212.5	14.580	1.142	72.264	30.602	32,964.362	34,278.828	0.000	0.422	0.000	7.148	0.000	20,248.435
Instance4212.6	15.940	1.018	72.283	30.529	32,964.587	34,278.793	0.000	0.436	0.000	7.119	0.000	20,355.079

Table 62) Background database maintenance I/O performance: two-hour performance test #2.

Microsoft Exchange Database Instances	Database Maintenance I/O Reads per Second	Database Maintenance I/O Reads Average Bytes
Instance4212.1	9.149	261,975.235
Instance4212.2	9.151	261,911.859
Instance4212.3	9.149	261,990.210
Instance4212.4	9.147	262,049.369
Instance4212.5	9.152	261,901.508
Instance4212.6	8.545	261,999.157

Table 63) Log replication I/O performance: two-hour performance test #2.

Microsoft Exchange Database Instances	I/O Log Reads per Second	I/O Log Reads Average Bytes
Instance4212.1	0.614	215,661.022
Instance4212.2	0.611	219,451.265
Instance4212.3	0.614	220,530.351
Instance4212.4	0.614	222,888.082
Instance4212.5	0.618	217,994.719
Instance4212.6	0.619	219,858.267

Table 64) Total I/O performance: two-hour performance test #2.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance4212.1	14.427	1.247	81.212	30.162	58,768.859	34,292.012	8.371	0.455	0.614	7.058	215,661.022	20,376.446
Instance4212.2	14.577	1.285	81.342	30.273	58,724.836	34,268.006	8.971	0.438	0.611	7.016	219,451.265	20,405.245
Instance4212.3	14.560	1.309	81.163	30.201	58,784.878	34,281.669	8.657	0.433	0.614	7.043	220,530.351	20,416.802
Instance4212.4	14.395	1.270	81.429	30.318	58,717.654	34,288.221	8.041	0.423	0.614	7.034	222,888.082	20,515.338
Instance4212.5	14.580	1.142	81.416	30.602	58,700.051	34,278.828	8.436	0.422	0.618	7.148	217,994.719	20,248.435
Instance4212.6	15.940	1.018	80.828	30.529	57,177.881	34,278.793	7.734	0.436	0.619	7.119	219,858.267	20,355.079

Table 65) Host system performance: two-hour performance test #2.

Counter	Average	Minimum	Maximum
% processor time	0.489	0.162	3.147
Available megabytes	77,880.275	77,846.000	77,995.000
Free system page table entries	16,429,330.525	16,428,740.000	16,429,543.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	236,998,664.533	236,736,512.000	237,268,992.000
Pool paged bytes	129,752,524.800	129,425,408.000	134,340,608.000
Database page fault stalls per second	0.000	0.000	0.000

Figure 10) Test log: two-hour performance test #2.

```

3/30/2015 8:23:17 AM -- Preparing for testing ...
3/30/2015 8:23:24 AM -- Attaching databases ...
3/30/2015 8:23:24 AM -- Preparations for testing are complete.
3/30/2015 8:23:24 AM -- Starting transaction dispatch ..
3/30/2015 8:23:24 AM -- Database cache settings: (minimum: 192.0 MB, maximum: 1.5 GB)
3/30/2015 8:23:24 AM -- Database flush thresholds: (start: 15.3 MB, stop: 30.7 MB)
3/30/2015 8:23:30 AM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).
3/30/2015 8:23:30 AM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).
3/30/2015 8:23:31 AM -- Operation mix: Sessions 15, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.
3/30/2015 8:23:31 AM -- Performance logging started (interval: 15000 ms).
3/30/2015 8:23:31 AM -- Attaining prerequisites:
3/30/2015 8:27:00 AM -- \MSEExchange Database(JetstressWin)\Database Cache Size, Last: 1463312000.0 (lower bound: 1449551000.0, upper bound: none)
3/30/2015 10:27:01 AM -- Performance logging has ended.
3/30/2015 10:27:06 AM -- JetInterop batch transaction stats: 17165, 17164, 17164, 17164, 17164 and 17164.
3/30/2015 10:27:06 AM -- Dispatching transactions ends.
3/30/2015 10:27:06 AM -- Shutting down databases ...
3/30/2015 10:27:20 AM -- Instance4212.1 (complete), Instance4212.2 (complete), Instance4212.3 (complete), Instance4212.4 (complete), Instance4212.5 (complete) and Instance4212.6 (complete)
3/30/2015 10:27:20 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_8_23_30.blg has 493 samples.
3/30/2015 10:27:20 AM -- Creating test report ...

```

```

3/30/2015 10:27:23 AM -- Instance4212.1 has 14.4 for I/O Database Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.1 has 0.5 for I/O Log Writes Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.1 has 0.5 for I/O Log Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.2 has 14.6 for I/O Database Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.2 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.2 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.3 has 14.6 for I/O Database Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.3 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.3 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.4 has 14.4 for I/O Database Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.4 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.4 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.5 has 14.6 for I/O Database Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.5 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.5 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.6 has 15.9 for I/O Database Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.6 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.6 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:23 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.
3/30/2015 10:27:23 AM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
3/30/2015 10:27:23 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_8_23_30.xml
has 479 samples queried.

```

Two-Hour Performance Test #3

Table 66) Test summary: two-hour performance test #3.

Test Information	Result
Overall test result	Pass
Machine name	ICTM0903R720-13
Test description	
Test start time	3/30/2015 8:23:20 a.m
Test end time	3/30/2015 10:27:24 a.m
Collection start time	3/30/2015 8:27:01 a.m
Collection end time	3/30/2015 10:26:48 a.m
Jetstress version	15.00.0995.000
ESE version	15.00.1076.009
Operating system	Windows Server 2012 R2 Datacenter (6.2.9200.0)

Table 67) Database sizing and throughput: two-hour performance test #3.

Database Information	Result
Achieved transactional I/O per second	594.727
Target transactional I/O per second	560.028
Initial database size (bytes)	14,042,529,792,000
Final database size (bytes)	14,043,922,300,928
Database files (count)	6

Table 68) Jetstress system parameters: two-hour performance test #3.

Parameter	Result
Thread count	15
Minimum database cache	192.0MB
Maximum database cache	1536.0MB
Insert operations	40%
Delete operations	20%
Replace operations	5%
Read operations	35%
Lazy commits	70%
Run background database maintenance	True
Number of copies per database	2

Table 69) Database configuration: two-hour performance test #3.

Instance	Path
Instance4868.1	Log path: C:\Mount\DB1 Database: C:\Mount\DB1\Jetstress001001.edb
Instance4868.2	Log path: C:\Mount\DB2 Database: C:\Mount\DB2\Jetstress002001.edb
Instance4868.3	Log path: C:\Mount\DB3 Database: C:\Mount\DB3\Jetstress003001.edb
Instance4868.4	Log path: C:\Mount\DB4 Database: C:\Mount\DB4\Jetstress004001.edb
Instance4868.5	Log path: C:\Mount\DB5 Database: C:\Mount\DB5\Jetstress005001.edb
Instance4868.6	Log path: C:\Mount\DB6 Database: C:\Mount\DB6\Jetstress006001.edb

Table 70) Transactional I/O performance: two-hour performance test #3.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance4868.1	14.213	1.163	70.090	29.750	33,072.315	34,274.187	0.000	0.436	0.000	6.852	0.000	20,317.891
Instance4868.2	14.131	1.222	69.634	29.289	33,088.199	34,283.227	0.000	0.414	0.000	6.771	0.000	20,511.453
Instance4868.3	15.500	1.230	69.639	29.522	33,126.028	34,305.419	0.000	0.418	0.000	6.967	0.000	20,321.611
Instance4868.4	15.450	1.200	69.330	29.216	33,083.105	34,312.170	0.000	0.433	0.000	6.840	0.000	20,531.644
Instance4868.5	15.157	1.116	69.853	29.411	33,088.667	34,276.237	0.000	0.442	0.000	6.829	0.000	20,345.999
Instance4868.6	14.857	1.019	69.629	29.364	33,074.660	34,268.247	0.000	0.427	0.000	6.847	0.000	20,435.253

Table 71) Background database maintenance I/O performance: two-hour performance test #3.

Microsoft Exchange Database Instances	Database Maintenance I/O Reads per Second	Database Maintenance I/O Reads Average Bytes
Instance4868.1	9.151	261,952.356
Instance4868.2	9.143	261,984.696
Instance4868.3	8.586	262,010.180
Instance4868.4	8.599	261,894.937
Instance4868.5	8.745	261,943.325
Instance4868.6	8.765	261,976.284

Table 72) Log replication I/O performance: two-hour performance test #3.

Microsoft Exchange Database	I/O Log Reads per Second	I/O Log Reads Average Bytes
Instance4868.1	0.595	216,076.221
Instance4868.2	0.591	214,358.421
Instance4868.3	0.601	215,907.813
Instance4868.4	0.599	213,168.855
Instance4868.5	0.593	216,844.190
Instance4868.6	0.596	214,376.495

Table 73) Total I/O performance: two-hour performance test #3.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance4868.1	14.213	1.163	79.241	29.750	59,504.722	34,274.187	8.324	0.436	0.595	6.852	216,076.221	20,317.891
Instance4868.2	14.131	1.222	78.777	29.289	59,653.311	34,283.227	8.311	0.414	0.591	6.771	214,358.421	20,511.453
Instance4868.3	15.500	1.230	78.226	29.522	58,249.531	34,305.419	8.901	0.418	0.601	6.967	215,907.813	20,321.611
Instance4868.4	15.450	1.200	77.928	29.216	58,330.490	34,312.170	7.950	0.433	0.599	6.840	213,168.855	20,531.644
Instance4868.5	15.157	1.116	78.598	29.411	58,551.653	34,276.237	8.128	0.442	0.593	6.829	216,844.190	20,345.999
Instance4868.6	14.857	1.019	78.394	29.364	58,667.122	34,268.247	7.887	0.427	0.596	6.847	214,376.495	20,435.253

Table 74) Host system performance: two-hour performance test #3.

Counter	Average	Minimum	Maximum
% processor time	0.532	0.253	4.870
Available megabytes	190,933.854	190,892.000	191,019.000
Free system page table entries	16,342,704.106	16,342,324.000	16,343,172.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	253,722,666.756	253,325,312.000	254,443,520.000
Pool paged bytes	141,221,853.795	140,804,096.000	146,112,512.000
Database page fault stalls per second	0.000	0.000	0.000

Figure 11) Test log: two-hour performance test #3.

```

3/30/2015 8:23:20 AM -- Preparing for testing ...
3/30/2015 8:23:26 AM -- Attaching databases ...
3/30/2015 8:23:26 AM -- Preparations for testing are complete.
3/30/2015 8:23:26 AM -- Starting transaction dispatch ..
3/30/2015 8:23:26 AM -- Database cache settings: (minimum: 192.0 MB, maximum: 1.5 GB)
3/30/2015 8:23:26 AM -- Database flush thresholds: (start: 15.3 MB, stop: 30.7 MB)
3/30/2015 8:23:33 AM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).
3/30/2015 8:23:33 AM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).
3/30/2015 8:23:34 AM -- Operation mix: Sessions 15, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.
3/30/2015 8:23:34 AM -- Performance logging started (interval: 15000 ms).
3/30/2015 8:23:34 AM -- Attaining prerequisites:
3/30/2015 8:27:01 AM -- \MSEExchange Database(JetstressWin)\Database Cache Size, Last: 1460617000.0 (lower bound: 1449551000.0, upper bound: none)
3/30/2015 10:27:02 AM -- Performance logging has ended.
3/30/2015 10:27:08 AM -- JetInterop batch transaction stats: 16582, 16582, 16582, 16581, 16581 and 16581.
3/30/2015 10:27:08 AM -- Dispatching transactions ends.
3/30/2015 10:27:08 AM -- Shutting down databases ...
3/30/2015 10:27:24 AM -- Instance4868.1 (complete), Instance4868.2 (complete), Instance4868.3 (complete), Instance4868.4 (complete), Instance4868.5 (complete) and Instance4868.6 (complete)
3/30/2015 10:27:24 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_8_23_33.blg has 492 samples.
3/30/2015 10:27:24 AM -- Creating test report ...

```

```

3/30/2015 10:27:33 AM -- Instance4868.1 has 14.2 for I/O Database Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.1 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.1 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.2 has 14.1 for I/O Database Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.2 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.2 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.3 has 15.5 for I/O Database Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.3 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.3 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.4 has 15.5 for I/O Database Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.4 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.4 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.5 has 15.2 for I/O Database Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.5 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.5 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.6 has 14.9 for I/O Database Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.6 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.6 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:33 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.
3/30/2015 10:27:33 AM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
3/30/2015 10:27:33 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_8_23_33.xml
has 478 samples queried.

```

5.4 Database Checksum for Two-Hour Performance Test Results

This section provides the database checksum results for the two-hour performance tests for all three mailbox servers.

Database Checksum for Two-Hour Performance Test #1

Table 75) Checksum statistics (all): database checksum for two-hour performance test #1.

Database	Pages Seen	Bad Pages	Correctable Pages	Pages with Wrong Page Numbers	File Length per Seconds Taken
C:\Mount\DB1\Jetstress001001.edb	71,431,424	0	0	0	2232232MB per 18,024 seconds
C:\Mount\DB2\Jetstress002001.edb	71,431,168	0	0	0	2232224MB per 18,058 seconds
C:\Mount\DB3\Jetstress003001.edb	71,431,680	0	0	0	2232240MB per 18,048 seconds
C:\Mount\DB4\Jetstress004001.edb	71,430,912	0	0	0	2232216MB per 180,45 seconds
C:\Mount\DB5\Jetstress005001.edb	71,431,168	0	0	0	2232224MB per 18,045 seconds
C:\Mount\DB6\Jetstress006001.edb	71,431,936	0	0	0	2232248MB per 18,050 seconds
(Sum)	428,588,288	0	0	0	13393384MB per 18,058 seconds

Table 76) Disk subsystem performance (of checksum): database checksum for two-hour performance test #1.

Logical Disk	Average Disk Seconds per Read	Average Disk Seconds per Write	Disk Reads per Second	Disk Writes per Second	Average Disk Bytes per Read
C:\Mount\DB1	0.023	0.000	1,980.736	0.000	65,535.973
C:\Mount\DB2	0.023	0.000	1,976.559	0.000	65,535.973
C:\Mount\DB3	0.024	0.000	1,978.001	0.000	65,535.973
C:\Mount\DB4	0.024	0.000	1,978.296	0.000	65,535.973
C:\Mount\DB5	0.023	0.000	1,978.377	0.000	65,535.972
C:\Mount\DB6	0.023	0.000	1,977.710	0.000	65,535.972

Table 77) Memory system performance (of checksum): database checksum for two-hour performance test #1.

Counter	Average	Minimum	Maximum
% processor time	4.211	3.627	5.748
Available megabytes	79,513.710	79,457.000	79,538.000
Free system page table entries	16,428,496.491	16,426,606.000	16,429,365.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	238,058,743.055	237,641,728.000	238,792,704.000
Pool paged bytes	129,893,251.621	129,642,496.000	130,236,416.000

Figure 12) Test log: database checksum for two-hour performance test #1.

```

3/30/2015 8:23:17 AM -- Preparing for testing ...
3/30/2015 8:23:24 AM -- Attaching databases ...
3/30/2015 8:23:24 AM -- Preparations for testing are complete.
3/30/2015 8:23:24 AM -- Starting transaction dispatch ..
3/30/2015 8:23:24 AM -- Database cache settings: (minimum: 192.0 MB, maximum: 1.5 GB)
3/30/2015 8:23:24 AM -- Database flush thresholds: (start: 15.3 MB, stop: 30.7 MB)
3/30/2015 8:23:30 AM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).
3/30/2015 8:23:30 AM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).
3/30/2015 8:23:31 AM -- Operation mix: Sessions 15, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.
3/30/2015 8:23:31 AM -- Performance logging started (interval: 15000 ms).
3/30/2015 8:23:31 AM -- Attaining prerequisites:
3/30/2015 8:27:00 AM -- \MSEExchange Database(JetstressWin)\Database Cache Size, Last: 1463312000.0 (lower bound: 1449551000.0, upper bound: none)
3/30/2015 10:27:01 AM -- Performance logging has ended.
3/30/2015 10:27:06 AM -- JetInterop batch transaction stats: 17165, 17164, 17164, 17164, 17164 and 17164.
3/30/2015 10:27:06 AM -- Dispatching transactions ends.
3/30/2015 10:27:06 AM -- Shutting down databases ...
3/30/2015 10:27:20 AM -- Instance4212.1 (complete), Instance4212.2 (complete), Instance4212.3 (complete), Instance4212.4 (complete), Instance4212.5 (complete) and Instance4212.6 (complete)
3/30/2015 10:27:20 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_8_23_30.blg has 493 samples.
3/30/2015 10:27:20 AM -- Creating test report ...
3/30/2015 10:27:23 AM -- Instance4212.1 has 14.4 for I/O Database Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.1 has 0.5 for I/O Log Writes Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.1 has 0.5 for I/O Log Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.2 has 14.6 for I/O Database Reads Average Latency.
    
```

```

3/30/2015 10:27:23 AM -- Instance4212.2 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.2 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.3 has 14.6 for I/O Database Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.3 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.3 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.4 has 14.4 for I/O Database Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.4 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.4 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.5 has 14.6 for I/O Database Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.5 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.5 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.6 has 15.9 for I/O Database Reads Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.6 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:23 AM -- Instance4212.6 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:23 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.
3/30/2015 10:27:23 AM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
3/30/2015 10:27:23 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_8_23_30.xml
has 479 samples queried.
3/30/2015 10:27:24 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_8_23_30.html
was saved.
3/30/2015 10:27:24 AM -- Performance logging started (interval: 30000 ms).
3/30/2015 10:27:24 AM -- Verifying database checksums ...
3/30/2015 3:28:23 PM -- C:\Mount\DB1 (100% processed), C:\Mount\DB2 (100% processed),
C:\Mount\DB3 (100% processed), C:\Mount\DB4 (100% processed), C:\Mount\DB5 (100% processed) and
C:\Mount\DB6 (100% processed)
3/30/2015 3:28:23 PM -- Performance logging has ended.
3/30/2015 3:28:23 PM -- C:\Program Files\Exchange Jetstress\DBChecksum_2015_3_30_10_27_24.blg has
601 samples.

```

Database Checksum for Two-Hour Performance Test #2

Table 78) Checksum statistics (all): database checksum for two-hour performance test #2.

Database	Pages Seen	Bad Pages	Correctable Pages	Pages with Wrong Page Numbers	File Length per Seconds Taken
C:\Mount\DB1\Jetstress001001.edb	71,548,928	0	0	0	2235904MB per 18,058 seconds
C:\Mount\DB2\Jetstress002001.edb	71,549,440	0	0	0	2235920MB per 18,082 seconds
C:\Mount\DB3\Jetstress003001.edb	71,548,928	0	0	0	2235904MB per 18,072 seconds
C:\Mount\DB4\Jetstress004001.edb	71,549,184	0	0	0	2235912MB per 18,068 seconds
C:\Mount\DB5\Jetstress005001.edb	71,549,440	0	0	0	2235920MB per 18,072 seconds
C:\Mount\DB6\Jetstress006001.edb	71,549,696	0	0	0	2235928MB per 18,075 seconds
(Sum)	429,295,616	0	0	0	13415488MB per 18,082 seconds

Table 79) Disk subsystem performance (of checksum): database checksum for two-hour performance test #2.

Logical Disk	Average Disk Seconds per Read	Average Disk Seconds per Write	Disk Reads per Second	Disk Writes per Second	Average Disk Bytes per Read
C:\Mount\DB1	0.023	0.000	1,980.187	0.000	65,535.973
C:\Mount\DB2	0.023	0.000	1,977.351	0.000	65,535.973
C:\Mount\DB3	0.024	0.000	1,979.316	0.000	65,535.972
C:\Mount\DB4	0.024	0.000	1,978.119	0.000	65,535.972
C:\Mount\DB5	0.023	0.000	1,979.343	0.000	65,535.972
C:\Mount\DB6	0.023	0.000	1,978.680	0.000	65,535.972

Table 80) Memory system performance (of checksum): database checksum for two-hour performance test #2

Counter	Average	Minimum	Maximum
% processor time	5.057	4.524	7.321
Available megabytes	79,277.902	79,208.000	79,319.000
Free system page table entries	16,427,980.757	16,425,167.000	16,428,947.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	252,601,347.402	252,321,792.000	253,120,512.000
Pool paged bytes	13,416,051.535	133,029,888.000	135,069,696.000

Figure 13) Test log: database checksum for two-hour performance test #2.

```

3/30/2015 8:23:11 AM -- Preparing for testing ...
3/30/2015 8:23:17 AM -- Attaching databases ...
3/30/2015 8:23:17 AM -- Preparations for testing are complete.
3/30/2015 8:23:17 AM -- Starting transaction dispatch ..
3/30/2015 8:23:18 AM -- Database cache settings: (minimum: 192.0 MB, maximum: 1.5 GB)
3/30/2015 8:23:18 AM -- Database flush thresholds: (start: 15.3 MB, stop: 30.7 MB)
3/30/2015 8:23:24 AM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).
3/30/2015 8:23:24 AM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).
3/30/2015 8:23:25 AM -- Operation mix: Sessions 15, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.
3/30/2015 8:23:25 AM -- Performance logging started (interval: 15000 ms).
3/30/2015 8:23:25 AM -- Attaining prerequisites:
3/30/2015 8:26:50 AM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 1455075000.0 (lower bound: 1449551000.0, upper bound: none)
3/30/2015 10:26:51 AM -- Performance logging has ended.
3/30/2015 10:27:00 AM -- JetInterop batch transaction stats: 17093, 17093, 17093, 17093, 17093 and 17093.
3/30/2015 10:27:00 AM -- Dispatching transactions ends.
3/30/2015 10:27:00 AM -- Shutting down databases ...
3/30/2015 10:27:19 AM -- Instance4172.1 (complete), Instance4172.2 (complete), Instance4172.3 (complete), Instance4172.4 (complete), Instance4172.5 (complete) and Instance4172.6 (complete)
3/30/2015 10:27:19 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_8_23_24.blg has 492 samples.
3/30/2015 10:27:19 AM -- Creating test report ...
3/30/2015 10:27:29 AM -- Instance4172.1 has 14.6 for I/O Database Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.1 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.1 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.2 has 16.2 for I/O Database Reads Average Latency.
    
```

```

3/30/2015 10:27:29 AM -- Instance4172.2 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.2 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.3 has 14.8 for I/O Database Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.3 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.3 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.4 has 14.6 for I/O Database Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.4 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.4 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.5 has 14.7 for I/O Database Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.5 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.5 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.6 has 14.3 for I/O Database Reads Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.6 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:29 AM -- Instance4172.6 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:29 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.
3/30/2015 10:27:29 AM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
3/30/2015 10:27:29 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_8_23_24.xml
has 478 samples queried.
3/30/2015 10:27:29 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_8_23_24.html
was saved.
3/30/2015 10:27:30 AM -- Performance logging started (interval: 30000 ms).
3/30/2015 10:27:30 AM -- Verifying database checksums ...
3/30/2015 3:28:52 PM -- C:\Mount\DB1 (100% processed), C:\Mount\DB2 (100% processed),
C:\Mount\DB3 (100% processed), C:\Mount\DB4 (100% processed), C:\Mount\DB5 (100% processed) and
C:\Mount\DB6 (100% processed)
3/30/2015 3:28:53 PM -- Performance logging has ended.
3/30/2015 3:28:53 PM -- C:\Program Files\Exchange Jetstress\DBChecksum_2015_3_30_10_27_29.blg has
602 samples.

```

Database Checksum for Two-Hour Performance Test #3

Table 81) Checksum statistics (all): database checksum for two-hour performance test #3.

Database	Pages Seen	Bad Pages	Correctable Pages	Pages with Wrong Page Numbers	File Length per Seconds Taken
C:\Mount\DB1\Jetstress001001.edb	71,430,400	0	0	0	2232200MB per 18,047 seconds
C:\Mount\DB2\Jetstress002001.edb	71,431,168	0	0	0	2232224MB per 8,057 seconds
C:\Mount\DB3\Jetstress003001.edb	71,431,680	0	0	0	2232240MB per 18,058 seconds
C:\Mount\DB4\Jetstress004001.edb	71,430,656	0	0	0	2232208MB per 1,8052 seconds
C:\Mount\DB5\Jetstress005001.edb	71,430,912	0	0	0	2232216MB per 1,8051 seconds
C:\Mount\DB6\Jetstress006001.edb	71,431,680	0	0	0	2232240MB per 1,8055 seconds
(Sum)	428,586,496	0	0	0	13393328MB per 1,8058 seconds

Table 82) Disk subsystem performance (of checksum): database checksum for two-hour performance test #3.

Logical Disk	Average Disk Seconds per Read	Average Disk Seconds per Write	Disk Reads per Second	Disk Writes per Second	Average Disk Bytes per Read
C:\Mount\DB1	0.023	0.000	1,978.881	0.000	65,536.000
C:\Mount\DB2	0.023	0.000	1,976.968	0.000	65,536.000
C:\Mount\DB3	0.024	0.000	1,976.695	0.000	65,536.000
C:\Mount\DB4	0.023	0.000	1,977.964	0.000	65,536.000
C:\Mount\DB5	0.023	0.000	1,978.136	0.000	65,536.000
C:\Mount\DB6	0.023	0.000	1,977.378	0.000	65,536.000

Table 83) Memory system performance (of checksum): database checksum for two-hour performance test #3.

Counter	Average	Minimum	Maximum
% processor time	4.679	4.181	5.637
Available megabytes	192,550.825	192,503.000	192,582.000
Free system page table entries	16,341,804.288	16,339,029.000	16,342,956.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	256,725,312.319	255,504,384.000	258,355,200.000
Pool paged bytes	142,195,638.735	141,459,456.000	148,054,016.000

Figure 14) Test log: database checksum for two-hour performance test #3.

```

3/30/2015 8:23:20 AM -- Preparing for testing ...
3/30/2015 8:23:26 AM -- Attaching databases ...
3/30/2015 8:23:26 AM -- Preparations for testing are complete.
3/30/2015 8:23:26 AM -- Starting transaction dispatch ..
3/30/2015 8:23:26 AM -- Database cache settings: (minimum: 192.0 MB, maximum: 1.5 GB)
3/30/2015 8:23:26 AM -- Database flush thresholds: (start: 15.3 MB, stop: 30.7 MB)
3/30/2015 8:23:33 AM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).
3/30/2015 8:23:33 AM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).
3/30/2015 8:23:34 AM -- Operation mix: Sessions 15, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.
3/30/2015 8:23:34 AM -- Performance logging started (interval: 15000 ms).
3/30/2015 8:23:34 AM -- Attaining prerequisites:
3/30/2015 8:27:01 AM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 1460617000.0 (lower bound: 1449551000.0, upper bound: none)
3/30/2015 10:27:02 AM -- Performance logging has ended.
3/30/2015 10:27:08 AM -- JetInterop batch transaction stats: 16582, 16582, 16582, 16581, 16581 and 16581.
3/30/2015 10:27:08 AM -- Dispatching transactions ends.
3/30/2015 10:27:08 AM -- Shutting down databases ...
3/30/2015 10:27:24 AM -- Instance4868.1 (complete), Instance4868.2 (complete), Instance4868.3 (complete), Instance4868.4 (complete), Instance4868.5 (complete) and Instance4868.6 (complete)
3/30/2015 10:27:24 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_8_23_33.blg has 492 samples.
3/30/2015 10:27:24 AM -- Creating test report ...
3/30/2015 10:27:33 AM -- Instance4868.1 has 14.2 for I/O Database Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.1 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.1 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.2 has 14.1 for I/O Database Reads Average Latency.
    
```

```

3/30/2015 10:27:33 AM -- Instance4868.2 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.2 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.3 has 15.5 for I/O Database Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.3 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.3 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.4 has 15.5 for I/O Database Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.4 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.4 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.5 has 15.2 for I/O Database Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.5 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.5 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.6 has 14.9 for I/O Database Reads Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.6 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 10:27:33 AM -- Instance4868.6 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 10:27:33 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.
3/30/2015 10:27:33 AM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
3/30/2015 10:27:33 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_8_23_33.xml
has 478 samples queried.
3/30/2015 10:27:33 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_8_23_33.html
was saved.
3/30/2015 10:27:33 AM -- Performance logging started (interval: 30000 ms).
3/30/2015 10:27:33 AM -- Verifying database checksums ...
3/30/2015 3:28:32 PM -- C:\Mount\DB1 (100% processed), C:\Mount\DB2 (100% processed),
C:\Mount\DB3 (100% processed), C:\Mount\DB4 (100% processed), C:\Mount\DB5 (100% processed) and
C:\Mount\DB6 (100% processed)
3/30/2015 3:28:33 PM -- Performance logging has ended.
3/30/2015 3:28:33 PM -- C:\Program Files\Exchange Jetstress\DBChecksum_2015_3_30_10_27_33.blg has
601 samples.

```

5.5 Backup Test Results

This section provides the results of backup tests for all three mailbox servers.

Backup Test #1

Table 84) Database backup statistics (all): backup test #1.

Database Instance	Database Size (MB)	Elapsed Backup Time	Megabytes Transferred/Sec
Instance4996.1	2,231,760.03	03:05:35	200.42
Instance4996.2	2,231,752.03	03:05:47	200.20
Instance4996.3	2,231,768.03	03:05:04	200.98
Instance4996.4	2,231,752.03	03:05:06	200.94
Instance4996.5	2,231,752.03	03:06:20	199.61
Instance4996.6	2,231,776.03	03:07:10	198.73
Average			200.15
Sum			1,200.88

Table 85) Jetstress system parameters: backup test #1.

Parameter	Result
Thread count	15
Minimum database cache	192.0MB
Maximum database cache	1536.0MB
Insert operations	40%
Delete operations	20%
Replace operations	5%
Read operations	35%
Lazy commits	70%

Table 86) Database configuration: backup test #1.

Instance	Path
Instance4996.1	Log path: C:\Mount\DB1 Database: C:\Mount\DB1\Jetstress001001.edb
Instance4996.2	Log path: C:\Mount\DB2 Database: C:\Mount\DB2\Jetstress002001.edb
Instance4996.3	Log path: C:\Mount\DB3 Database: C:\Mount\DB3\Jetstress003001.edb
Instance4996.4	Log path: C:\Mount\DB4 Database: C:\Mount\DB4\Jetstress004001.edb
Instance4996.5	Log path: C:\Mount\DB5 Database: C:\Mount\DB5\Jetstress005001.edb
Instance4996.6	Log path: C:\Mount\DB6 Database: C:\Mount\DB6\Jetstress006001.edb

Table 87) Transactional I/O performance: backup test #1.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance4996.1	2.235	0.000	801.296	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4996.2	2.237	0.000	800.549	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4996.3	2.230	0.000	803.770	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4996.4	2.230	0.000	803.591	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4996.5	2.242	0.000	798.155	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4996.6	2.241	0.000	794.788	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 88) Host system performance: backup test #1.

Counter	Average	Minimum	Maximum
% processor time	2.690	0.472	4.998
Available metabytes	79,600.594	79,564.000	79,617.000
Free system page table entries	16,429,750.866	16,429,123.000	16,429,936.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	233,320,699.893	232,747,008.000	234,725,376.000
Pool paged bytes	123,065,667.080	120,266,752.000	135,151,616.000
Database page fault stalls per second	0.000	0.000	0.000

Figure 15) Test log: backup test #1.

```

3/30/2015 1:36:03 AM -- Preparing for testing ...
3/30/2015 1:36:09 AM -- Attaching databases ...
3/30/2015 1:36:09 AM -- Preparations for testing are complete.
3/30/2015 1:36:16 AM -- Performance logging started (interval: 30000 ms).
3/30/2015 1:36:16 AM -- Backing up databases ...
3/30/2015 4:43:27 AM -- Performance logging has ended.
3/30/2015 4:43:27 AM -- Instance4996.1 (100% processed), Instance4996.2 (100% processed),
Instance4996.3 (100% processed), Instance4996.4 (100% processed), Instance4996.5 (100% processed)
and Instance4996.6 (100% processed)
3/30/2015 4:43:27 AM -- C:\Program Files\Exchange Jetstress\DatabaseBackup_2015_3_30_1_36_9.blg
has 374 samples.
3/30/2015 4:43:27 AM -- Creating test report ...
    
```

Backup Test #2

Table 89) Database backup statistics (all): backup test #2.

Database Instance	Database Size (MB)	Elapsed Backup Time	Megabytes Transferred/Sec
Instance152.1	2,235,440.03	03:10:39	195.42
Instance152.2	2,235,456.03	03:11:11	194.87
Instance152.3	2,235,440.03	03:10:39	195.42
Instance152.4	2,235,448.03	03:10:58	195.08
Instance152.5	2,235,464.03	03:10:46	195.30
Instance152.6	2,235,464.03	03:12:08	193.90
Average			195.00
Sum			1,170.00

Table 90) Jetstress system parameters: backup test #2.

Parameter	Result
Thread count	15
Minimum database cache	192.0MB
Maximum database cache	1536.0MB
Insert operations	40%
Delete operations	20%
Replace operations	5%
Read operations	35%
Lazy commits	70%

Table 91) Database configuration: backup test #2.

Instance	Path
Instance152.1	Log path: C:\Mount\DB1 Database: C:\Mount\DB1\Jetstress001001.edb
Instance152.2	Log path: C:\Mount\DB2 Database: C:\Mount\DB2\Jetstress002001.edb
Instance152.3	Log path: C:\Mount\DB3 Database: C:\Mount\DB3\Jetstress003001.edb
Instance152.4	Log path: C:\Mount\DB4 Database: C:\Mount\DB4\Jetstress004001.edb
Instance152.5	Log path: C:\Mount\DB5 Database: C:\Mount\DB5\Jetstress005001.edb
Instance152.6	Log path: C:\Mount\DB6 Database: C:\Mount\DB6\Jetstress006001.edb

Table 92) Transactional I/O performance: backup test #2.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance152.1	2.274	0.000	781.398	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance152.2	2.280	0.000	779.177	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance152.3	2.266	0.000	781.388	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance152.4	2.268	0.000	779.799	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance152.5	2.265	0.000	780.825	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance152.6	2.288	0.000	775.314	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 93) Host system performance: backup test #2.

Counter	Average	Minimum	Maximum
% processor time	3.280	0.594	5.388
Available megabytes	79,395.357	79,358.000	79,415.000
Free system page table entries	16,429,360.474	16,428,709.000	16,429,597.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	246,873,077.333	246,562,816.000	247,787,520.000
Pool paged bytes	122,984,512.000	122,380,288.000	128,122,880.000
Database page fault stalls per second	0.000	0.000	0.000

Figure 16) Test log: backup test #2.

```

3/30/2015 1:35:56 AM -- Preparing for testing ...
3/30/2015 1:36:03 AM -- Attaching databases ...
3/30/2015 1:36:03 AM -- Preparations for testing are complete.
3/30/2015 1:36:10 AM -- Performance logging started (interval: 30000 ms).
3/30/2015 1:36:10 AM -- Backing up databases ...
3/30/2015 4:48:19 AM -- Performance logging has ended.
3/30/2015 4:48:19 AM -- Instance152.1 (100% processed), Instance152.2 (100% processed),
Instance152.3 (100% processed), Instance152.4 (100% processed), Instance152.5 (100% processed)
and Instance152.6 (100% processed)
3/30/2015 4:48:19 AM -- C:\Program Files\Exchange Jetstress\DatabaseBackup_2015_3_30_1_36_3.blg
has 384 samples.
3/30/2015 4:48:19 AM -- Creating test report ...

```

Backup Test #3

Table 94) Database backup statistics (all): backup test #3.

Database Instance	Database Size (MB)	Elapsed Backup Time	Megabytes Transferred/Sec
Instance844.1	2,231,744.03	03:09:47	195.99
Instance844.2	2,231,768.03	03:09:42	196.07
Instance844.3	2,231,784.03	03:08:59	196.82
Instance844.4	2,231,752.03	03:08:12	197.63
Instance844.5	2,231,760.03	03:08:49	196.99
Instance844.6	2,231,776.03	03:08:12	197.63
Average			196.86
Sum			1,181.14

Table 95) Jetstress system parameters: backup test #3.

Parameter	Result
Thread count	15
Minimum database cache	192.0MB
Maximum database cache	1536.0MB
Insert operations	40%
Delete operations	20%
Replace operations	5%
Read operations	35%
Lazy commits	70%

Table 96) Database configuration: backup test #3.

Instance	Path
Instance844.1	Log path: C:\Mount\DB1 Database: C:\Mount\DB1\Jetstress001001.edb
Instance844.2	Log path: C:\Mount\DB2 Database: C:\Mount\DB2\Jetstress002001.edb
Instance844.3	Log path: C:\Mount\DB3 Database: C:\Mount\DB3\Jetstress003001.edb
Instance844.4	Log path: C:\Mount\DB4 Database: C:\Mount\DB4\Jetstress004001.edb
Instance844.5	Log path: C:\Mount\DB5 Database: C:\Mount\DB5\Jetstress005001.edb
Instance844.6	Log path: C:\Mount\DB6 Database: C:\Mount\DB6\Jetstress006001.edb

Table 97) Transactional I/O performance: backup test #3.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance844.1	2.271	0.000	783.838	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance844.2	2.263	0.000	784.257	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance844.3	2.255	0.000	787.038	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance844.4	2.255	0.000	790.500	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance844.5	2.261	0.000	787.796	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance844.6	2.254	0.000	790.465	0.000	262,144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 98) Host system performance: backup test #3.

Counter	Average	Minimum	Maximum
% processor time	3.073	1.523	5.093
Available megabytes	192,637.984	192,596.000	192,663.000
Free system page table entries	16,343,061.536	16,342,466.000	16,343,471.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	249,381,588.095	247,005,184.000	250,884,096.000
Pool paged bytes	138,421,250.702	130,318,336.000	145,375,232.000
Database page fault stalls per second	0.000	0.000	0.000

Figure 17) Test log: backup test #3.

```

3/30/2015 1:36:07 AM -- Preparing for testing ...
3/30/2015 1:36:13 AM -- Attaching databases ...
3/30/2015 1:36:13 AM -- Preparations for testing are complete.
3/30/2015 1:36:20 AM -- Performance logging started (interval: 30000 ms).
3/30/2015 1:36:20 AM -- Backing up databases ...
3/30/2015 4:46:08 AM -- Performance logging has ended.
3/30/2015 4:46:08 AM -- Instance844.1 (100% processed), Instance844.2 (100% processed),
Instance844.3 (100% processed), Instance844.4 (100% processed), Instance844.5 (100% processed)
and Instance844.6 (100% processed)
3/30/2015 4:46:08 AM -- C:\Program Files\Exchange Jetstress\DatabaseBackup_2015_3_30_1_36_13.blg
has 379 samples.
3/30/2015 4:46:08 AM -- Creating test report ...

```

5.6 Soft Recovery Test Results

This section provides the results of soft recovery tests for all three mailbox servers.

Soft Recovery Test #1

Table 99) Soft recovery statistics (all): soft recovery test #1.

Database Instance	Log Files Replayed	Elapsed Seconds
Instance2936.1	508	2,155.344876
Instance2936.2	507	2,163.0284323
Instance2936.3	512	2,172.1938731
Instance2936.4	501	2,128.1265861
Instance2936.5	509	2,165.0598404
Instance2936.6	507	2,158.67326
Average	507	2,157.071
Sum	3,044	12,942.4268679

Table 100) Database configuration: soft recovery test #1.

Instance	Path
Instance2936.1	Log path: C:\Mount\DB1 Database: C:\Mount\DB1\Jetstress001001.edb
Instance2936.2	Log path: C:\Mount\DB2 Database: C:\Mount\DB2\Jetstress002001.edb
Instance2936.3	Log path: C:\Mount\DB3 Database: C:\Mount\DB3\Jetstress003001.edb
Instance2936.4	Log path: C:\Mount\DB4 Database: C:\Mount\DB4\Jetstress004001.edb
Instance2936.5	Log path: C:\Mount\DB5 Database: C:\Mount\DB5\Jetstress005001.edb
Instance2936.6	Log path: C:\Mount\DB6 Database: C:\Mount\DB6\Jetstress006001.edb

Table 101) Transactional I/O performance: soft recovery test #1.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance2936.1	15.322	0.307	100.615	0.942	38,032.600	30,930.542	0.455	0.000	1.177	0.000	197,563.478	0.000
Instance2936.2	15.627	0.303	101.587	0.936	38,029.308	30,815.345	0.415	0.000	1.170	0.000	197,218.205	0.000
Instance2936.3	15.503	0.310	99.926	0.940	38,023.841	31,065.766	0.414	0.000	1.175	0.000	198,042.740	0.000
Instance2936.4	15.058	0.313	100.508	0.939	38,097.639	31,030.303	0.469	0.000	1.174	0.000	197,799.564	0.000
Instance2936.5	15.520	0.302	100.912	0.938	38,009.368	31,120.447	0.473	0.000	1.173	0.000	197,712.089	0.000
Instance2936.6	15.475	0.308	100.938	0.938	37,983.222	30,872.836	0.418	0.000	1.172	0.000	197,586.149	0.000

Table 102) Total I/O performance: soft recovery test #1.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance2936.1	15.322	0.307	100.615	0.942	38,032.600	30,930.542	0.455	0.000	1.177	0.000	197,563.478	0.000
Instance2936.2	15.627	0.303	101.587	0.936	38,029.308	30,815.345	0.415	0.000	1.170	0.000	197,218.205	0.000
Instance2936.3	15.503	0.310	99.926	0.940	38,023.841	31,065.766	0.414	0.000	1.175	0.000	198,042.740	0.000
Instance2936.4	15.058	0.313	100.508	0.939	38,097.639	31,030.303	0.469	0.000	1.174	0.000	197,799.564	0.000
Instance2936.5	15.520	0.302	100.912	0.938	38,009.368	31,120.447	0.473	0.000	1.173	0.000	197,712.089	0.000
Instance2936.6	15.475	0.308	100.938	0.938	37,983.222	30,872.836	0.418	0.000	1.172	0.000	197,586.149	0.000

Table 103) Host system performance: soft recovery test #1.

Counter	Average	Minimum	Maximum
% processor time	0.140	0.000	2.958
Available megabytes	77,969.967	77,876.000	79,522.000
Free system page table entries	16,429,305.691	16,427,210.000	16,429,758.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	236,574,735.170	236,343,296.000	236,929,024.000
Pool paged bytes	129,322,090.193	129,224,704.000	129,515,520.000
Database page fault stalls per second	0.000	0.000	0.000

Figure 18) Test log: soft recovery test #1.

```

3/30/2015 4:58:22 AM -- Preparing for testing ...
3/30/2015 4:58:28 AM -- Attaching databases ...
3/30/2015 4:58:28 AM -- Preparations for testing are complete.
3/30/2015 4:58:28 AM -- Starting transaction dispatch ..
3/30/2015 4:58:28 AM -- Database cache settings: (minimum: 192.0 MB, maximum: 1.5 GB)
3/30/2015 4:58:28 AM -- Database flush thresholds: (start: 15.3 MB, stop: 30.7 MB)
3/30/2015 4:58:34 AM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100
msec/read).
3/30/2015 4:58:34 AM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100
msec/write).
3/30/2015 4:58:35 AM -- Operation mix: Sessions 15, Inserts 40%, Deletes 20%, Replaces 5%, Reads
35%, Lazy Commits 70%.
3/30/2015 4:58:35 AM -- Performance logging started (interval: 15000 ms).
3/30/2015 4:58:35 AM -- Generating log files ...
3/30/2015 7:01:03 AM -- C:\Mount\DB1 (101.6% generated), C:\Mount\DB2 (101.4% generated),
C:\Mount\DB3 (102.4% generated), C:\Mount\DB4 (100.2% generated), C:\Mount\DB5 (101.8% generated)
and C:\Mount\DB6 (101.4% generated)
3/30/2015 7:01:04 AM -- Performance logging has ended.
3/30/2015 7:01:04 AM -- JetInterop batch transaction stats: 16979, 16979, 16979, 16979, 16979 and
16979.
3/30/2015 7:01:04 AM -- Dispatching transactions ends.
3/30/2015 7:01:04 AM -- Shutting down databases ...
3/30/2015 7:01:15 AM -- Instance2936.1 (complete), Instance2936.2 (complete), Instance2936.3
(complete), Instance2936.4 (complete), Instance2936.5 (complete) and Instance2936.6 (complete)
3/30/2015 7:01:15 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_4_58_34.blg has
489 samples.
3/30/2015 7:01:16 AM -- Creating test report ...
3/30/2015 7:01:18 AM -- Instance2936.1 has 15.7 for I/O Database Reads Average Latency.
3/30/2015 7:01:18 AM -- Instance2936.1 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 7:01:18 AM -- Instance2936.1 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 7:01:18 AM -- Instance2936.2 has 15.9 for I/O Database Reads Average Latency.
3/30/2015 7:01:18 AM -- Instance2936.2 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 7:01:18 AM -- Instance2936.2 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 7:01:18 AM -- Instance2936.3 has 15.8 for I/O Database Reads Average Latency.
3/30/2015 7:01:18 AM -- Instance2936.3 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 7:01:18 AM -- Instance2936.3 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 7:01:18 AM -- Instance2936.4 has 15.7 for I/O Database Reads Average Latency.
3/30/2015 7:01:18 AM -- Instance2936.4 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 7:01:18 AM -- Instance2936.4 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 7:01:18 AM -- Instance2936.5 has 15.8 for I/O Database Reads Average Latency.
3/30/2015 7:01:18 AM -- Instance2936.5 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 7:01:18 AM -- Instance2936.5 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 7:01:18 AM -- Instance2936.6 has 15.8 for I/O Database Reads Average Latency.
3/30/2015 7:01:18 AM -- Instance2936.6 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 7:01:18 AM -- Instance2936.6 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 7:01:18 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.
3/30/2015 7:01:18 AM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
3/30/2015 7:01:18 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_4_58_34.xml has

```

```

488 samples queried.
3/30/2015 7:01:18 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_4_58_34.html
was saved.
3/30/2015 7:01:37 AM -- Performance logging started (interval: 4000 ms).
3/30/2015 7:01:37 AM -- Recovering databases ...
3/30/2015 7:37:50 AM -- Performance logging has ended.
3/30/2015 7:37:50 AM -- Instance2936.1 (2155.344876), Instance2936.2 (2163.0284323),
Instance2936.3 (2172.1938731), Instance2936.4 (2128.1265861), Instance2936.5 (2165.0598404) and
Instance2936.6 (2158.67326)
3/30/2015 7:37:50 AM -- C:\Program Files\Exchange Jetstress\SoftRecovery_2015_3_30_7_1_36.blg has
540 samples.
3/30/2015 7:37:50 AM -- Creating test report ...

```

Soft Recovery Test #2

Table 104) Soft recovery statistics (all): soft recovery test #2.

Database Instance	Log Files Replayed	Elapsed Seconds
Instance4800.1	504	2,143.6042307
Instance4800.2	501	2,140.6823554
Instance4800.3	501	2,136.7237118
Instance4800.4	504	2,148.3854807
Instance4800.5	501	2,139.8854807
Instance4800.6	503	2,139.3542307
Average	502	2,141.439
Sum	3014	12,848.63549

Table 105) Database configuration: soft recovery test #2.

Instance	Path
Instance4800.1	Log path: C:\Mount\DB1 Database: C:\Mount\DB1\Jetstress001001.edb
Instance4800.2	Log path: C:\Mount\DB2 Database: C:\Mount\DB2\Jetstress002001.edb
Instance4800.3	Log path: C:\Mount\DB3 Database: C:\Mount\DB3\Jetstress003001.edb
Instance4800.4	Log path: C:\Mount\DB4 Database: C:\Mount\DB4\Jetstress004001.edb
Instance4800.5	Log path: C:\Mount\DB5 Database: C:\Mount\DB5\Jetstress005001.edb
Instance4800.6	Log path: C:\Mount\DB6 Database: C:\Mount\DB6\Jetstress006001.edb

Table 106) Transactional I/O performance: soft recovery test #2.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance4800.1	15.504	0.306	101.345	0.939	37,888.938	30,981.774	0.472	0.000	1.174	0.000	197,889.155	0.000
Instance4800.2	16.400	0.310	100.937	0.934	37,804.652	30,731.571	0.485	0.000	1.167	0.000	196,682.052	0.000
Instance4800.3	15.764	0.312	101.239	0.935	37,837.961	30,913.208	0.428	0.000	1.169	0.000	197,053.150	0.000
Instance4800.4	15.562	0.318	101.252	0.936	37,838.565	30,923.647	0.460	0.000	1.170	0.000	197,124.419	0.000
Instance4800.5	15.616	0.317	101.656	0.935	37,687.951	30,916.701	0.426	0.000	1.169	0.000	197,076.996	0.000
Instance4800.6	15.339	0.307	100.208	0.939	37,824.381	31,163.540	0.429	0.000	1.174	0.000	197,866.884	0.000

Table 107) Total I/O performance soft recovery test #2.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance4800.1	15.504	0.306	101.345	0.939	37,888.938	30,981.774	0.472	0.000	1.174	0.000	197,889.155	0.000
Instance4800.2	16.400	0.310	100.937	0.934	37,804.652	30,731.571	0.485	0.000	1.167	0.000	196,682.052	0.000
Instance4800.3	15.764	0.312	101.239	0.935	37,837.961	30,913.208	0.428	0.000	1.169	0.000	197,053.150	0.000
Instance4800.4	15.562	0.318	101.252	0.936	37,838.565	30,923.647	0.460	0.000	1.170	0.000	197,124.419	0.000
Instance4800.5	15.616	0.317	101.656	0.935	37,687.951	30,916.701	0.426	0.000	1.169	0.000	197,076.996	0.000
Instance4800.6	15.339	0.307	100.208	0.939	37,824.381	31,163.540	0.429	0.000	1.174	0.000	197,866.884	0.000

Table 108) Host system performance: soft recovery test #2.

Counter	Average	Minimum	Maximum
% processor time	0.169	0.000	2.833
Available megabytes	77,721.601	77,626.000	79,281.000
Free system page table entries	16,428,716.610	16,425,934.000	16,429,363.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	251,903,923.296	251,793,408.000	252,059,648.000
Pool paged bytes	132,753,814.532	132,648,960.000	132,931,584.000
Database page fault stalls per second	0.000	0.000	0.000

Figure 19) Test log: soft recovery test #2.

```
3/30/2015 4:58:15 AM -- Preparing for testing ...
3/30/2015 4:58:22 AM -- Attaching databases ...
3/30/2015 4:58:22 AM -- Preparations for testing are complete.
3/30/2015 4:58:22 AM -- Starting transaction dispatch ..
3/30/2015 4:58:22 AM -- Database cache settings: (minimum: 192.0 MB, maximum: 1.5 GB)
3/30/2015 4:58:22 AM -- Database flush thresholds: (start: 15.3 MB, stop: 30.7 MB)
3/30/2015 4:58:28 AM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100
msec/read).
3/30/2015 4:58:28 AM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100
msec/write).
3/30/2015 4:58:29 AM -- Operation mix: Sessions 15, Inserts 40%, Deletes 20%, Replaces 5%, Reads
35%, Lazy Commits 70%.
3/30/2015 4:58:29 AM -- Performance logging started (interval: 15000 ms).
3/30/2015 4:58:29 AM -- Generating log files ...
3/30/2015 7:00:32 AM -- C:\Mount\DB1 (100.8% generated), C:\Mount\DB2 (100.2% generated),
C:\Mount\DB3 (100.2% generated), C:\Mount\DB4 (100.8% generated), C:\Mount\DB5 (100.2% generated)
and C:\Mount\DB6 (100.6% generated)
3/30/2015 7:00:32 AM -- Performance logging has ended.
3/30/2015 7:00:32 AM -- JetInterop batch transaction stats: 16883, 16883, 16883, 16883, 16882 and
16882.
3/30/2015 7:00:32 AM -- Dispatching transactions ends.
3/30/2015 7:00:32 AM -- Shutting down databases ...
3/30/2015 7:00:47 AM -- Instance4800.1 (complete), Instance4800.2 (complete), Instance4800.3
(complete), Instance4800.4 (complete), Instance4800.5 (complete) and Instance4800.6 (complete)
3/30/2015 7:00:47 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_4_58_28.blg has
487 samples.
3/30/2015 7:00:47 AM -- Creating test report ...
3/30/2015 7:00:54 AM -- Instance4800.1 has 15.7 for I/O Database Reads Average Latency.
3/30/2015 7:00:54 AM -- Instance4800.1 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 7:00:54 AM -- Instance4800.1 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 7:00:54 AM -- Instance4800.2 has 17.7 for I/O Database Reads Average Latency.
3/30/2015 7:00:54 AM -- Instance4800.2 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 7:00:54 AM -- Instance4800.2 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 7:00:54 AM -- Instance4800.3 has 16.1 for I/O Database Reads Average Latency.
3/30/2015 7:00:54 AM -- Instance4800.3 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 7:00:54 AM -- Instance4800.3 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 7:00:54 AM -- Instance4800.4 has 15.9 for I/O Database Reads Average Latency.
3/30/2015 7:00:54 AM -- Instance4800.4 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 7:00:54 AM -- Instance4800.4 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 7:00:54 AM -- Instance4800.5 has 16.0 for I/O Database Reads Average Latency.
3/30/2015 7:00:54 AM -- Instance4800.5 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 7:00:54 AM -- Instance4800.5 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 7:00:54 AM -- Instance4800.6 has 15.6 for I/O Database Reads Average Latency.
3/30/2015 7:00:54 AM -- Instance4800.6 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 7:00:54 AM -- Instance4800.6 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 7:00:54 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.
3/30/2015 7:00:54 AM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
3/30/2015 7:00:54 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_4_58_28.xml has
486 samples queried.
3/30/2015 7:00:54 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_4_58_28.html
was saved.
3/30/2015 7:01:31 AM -- Performance logging started (interval: 4000 ms).
3/30/2015 7:01:31 AM -- Recovering databases ...
3/30/2015 7:37:20 AM -- Performance logging has ended.
3/30/2015 7:37:20 AM -- Instance4800.1 (2143.6042307), Instance4800.2 (2140.6823554),
Instance4800.3 (2136.7237118), Instance4800.4 (2148.3854807), Instance4800.5 (2139.8854807) and
Instance4800.6 (2139.3542307)
3/30/2015 7:37:20 AM -- C:\Program Files\Exchange Jetstress\SoftRecovery_2015_3_30_7_1_30.blg has
534 samples.
3/30/2015 7:37:20 AM -- Creating test report ...
```

Soft Recovery Test #3

Table 109) Soft recovery statistics (all): soft recovery test #3.

Database Instance	Log Files Replayed	Elapsed Seconds
Instance5044.1	507	2,155.3528591
Instance5044.2	505	2,150.8497823
Instance5044.3	505	2,149.2560363
Instance5044.4	501	2,130.1669437
Instance5044.5	509	2,155.0872351
Instance5044.6	511	2,169.9565071
Average	506	2,151.778
Sum	3,038	12,910.6693636

Table 110) Database configuration: soft recovery test #3

Instance	Path
Instance5044.1	Log path: C:\Mount\DB1 Database: C:\Mount\DB1\Jetstress001001.edb
Instance5044.2	Log path: C:\Mount\DB2 Database: C:\Mount\DB2\Jetstress002001.edb
Instance5044.3	Log path: C:\Mount\DB3 Database: C:\Mount\DB3\Jetstress003001.edb
Instance5044.4	Log path: C:\Mount\DB4 Database: C:\Mount\DB4\Jetstress004001.edb
Instance5044.5	Log path: C:\Mount\DB5 Database: C:\Mount\DB5\Jetstress005001.edb
Instance5044.6	Log path: C:\Mount\DB6 Database: C:\Mount\DB6\Jetstress006001.edb

Table 111) Transactional I/O performance: soft recovery test #3.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance5044.1	15.209	0.312	101.506	0.940	37,887.566	31,053.039	0.471	0.000	1.175	0.000	197,955.469	0.000
Instance5044.2	15.477	0.302	101.464	0.938	37,887.555	30,988.464	0.448	0.000	1.172	0.000	197,540.722	0.000
Instance5044.3	15.357	0.299	101.693	0.938	38,044.093	31,108.083	0.464	0.000	1.172	0.000	197,517.881	0.000
Instance5044.4	15.529	0.313	101.839	0.939	37,895.797	30,909.701	0.420	0.000	1.174	0.000	196,632.777	0.000
Instance5044.5	15.408	0.313	100.149	0.943	37,846.154	31,175.536	0.476	0.000	1.179	0.000	198,347.460	0.000
Instance5044.6	15.461	0.304	100.844	0.940	37,978.365	31,065.766	0.609	0.000	1.179	0.000	198,069.989	0.000

Table 112) Total I/O performance: soft recovery test #3.

Microsoft Exchange Database Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads per Second	I/O Database Writes per Second	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 per Second	I/O Log Writes per Second	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance5044.1	15.209	0.312	101.506	0.940	37,887.566	31,053.039	0.471	0.000	1.175	0.000	197,955.469	0.000
Instance5044.2	15.477	0.302	101.464	0.938	37,887.555	30,988.464	0.448	0.000	1.172	0.000	197,540.722	0.000
Instance5044.3	15.357	0.299	101.693	0.938	38,044.093	31,108.083	0.464	0.000	1.172	0.000	197,517.881	0.000
Instance5044.4	15.529	0.313	101.839	0.939	37,895.797	30,909.701	0.420	0.000	1.174	0.000	196,632.777	0.000
Instance5044.5	15.408	0.313	100.149	0.943	37,846.154	31,175.536	0.476	0.000	1.179	0.000	198,347.460	0.000
Instance5044.6	15.461	0.304	100.844	0.940	37,978.365	31,065.766	0.609	0.000	1.179	0.000	198,069.989	0.000

Table 113) Host system performance: soft recovery test #3.

Counter	Average	Minimum	Maximum
% processor time	0.162	0.000	3.266
Available megabytes	191,011.178	190,917.000	192,546.000
Free system page table entries	16,342,627.107	16,340,583.000	16,343,292.000
Transition pages repurposed per second	0.000	0.000	0.000
Pool nonpaged bytes	253,347,073.896	253,210,624.000	253,693,952.000
Pool paged bytes	140,621,194.430	140,414,976.000	140,779,520.000
Database page fault stalls per second	0.000	0.000	0.000

Figure 20) Test log: soft recovery test #3.

```

3/30/2015 4:58:24 AM -- Preparing for testing ...
3/30/2015 4:58:31 AM -- Attaching databases ...
3/30/2015 4:58:31 AM -- Preparations for testing are complete.
3/30/2015 4:58:31 AM -- Starting transaction dispatch ..
3/30/2015 4:58:31 AM -- Database cache settings: (minimum: 192.0 MB, maximum: 1.5 GB)
3/30/2015 4:58:31 AM -- Database flush thresholds: (start: 15.3 MB, stop: 30.7 MB)
3/30/2015 4:58:37 AM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).
3/30/2015 4:58:37 AM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).
3/30/2015 4:58:38 AM -- Operation mix: Sessions 15, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.
3/30/2015 4:58:38 AM -- Performance logging started (interval: 15000 ms).
3/30/2015 4:58:38 AM -- Generating log files ...
3/30/2015 6:57:36 AM -- C:\Mount\DB1 (101.4% generated), C:\Mount\DB2 (101.0% generated), C:\Mount\DB3 (101.0% generated), C:\Mount\DB4 (100.2% generated), C:\Mount\DB5 (101.8% generated) and C:\Mount\DB6 (102.2% generated)
3/30/2015 6:57:36 AM -- Performance logging has ended.
3/30/2015 6:57:36 AM -- JetInterop batch transaction stats: 17116, 17116, 17116, 17116, 17116 and 17116.
3/30/2015 6:57:36 AM -- Dispatching transactions ends.
3/30/2015 6:57:37 AM -- Shutting down databases ...
3/30/2015 6:57:49 AM -- Instance5044.1 (complete), Instance5044.2 (complete), Instance5044.3 (complete), Instance5044.4 (complete), Instance5044.5 (complete) and Instance5044.6 (complete)
3/30/2015 6:57:49 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_4_58_37.blg has 475 samples.
3/30/2015 6:57:49 AM -- Creating test report ...

```

```

3/30/2015 6:57:55 AM -- Instance5044.1 has 16.3 for I/O Database Reads Average Latency.
3/30/2015 6:57:55 AM -- Instance5044.1 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 6:57:55 AM -- Instance5044.1 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 6:57:55 AM -- Instance5044.2 has 16.2 for I/O Database Reads Average Latency.
3/30/2015 6:57:55 AM -- Instance5044.2 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 6:57:55 AM -- Instance5044.2 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 6:57:55 AM -- Instance5044.3 has 16.1 for I/O Database Reads Average Latency.
3/30/2015 6:57:55 AM -- Instance5044.3 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 6:57:55 AM -- Instance5044.3 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 6:57:55 AM -- Instance5044.4 has 16.2 for I/O Database Reads Average Latency.
3/30/2015 6:57:55 AM -- Instance5044.4 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 6:57:55 AM -- Instance5044.4 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 6:57:55 AM -- Instance5044.5 has 16.0 for I/O Database Reads Average Latency.
3/30/2015 6:57:55 AM -- Instance5044.5 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 6:57:55 AM -- Instance5044.5 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 6:57:55 AM -- Instance5044.6 has 16.0 for I/O Database Reads Average Latency.
3/30/2015 6:57:55 AM -- Instance5044.6 has 0.4 for I/O Log Writes Average Latency.
3/30/2015 6:57:55 AM -- Instance5044.6 has 0.4 for I/O Log Reads Average Latency.
3/30/2015 6:57:55 AM -- Test has 0 Maximum Database Page Fault Stalls/sec.
3/30/2015 6:57:55 AM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
3/30/2015 6:57:55 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_4_58_37.xml has
474 samples queried.
3/30/2015 6:57:55 AM -- C:\Program Files\Exchange Jetstress\Performance_2015_3_30_4_58_37.html
was saved.
3/30/2015 7:01:27 AM -- Performance logging started (interval: 4000 ms).
3/30/2015 7:01:27 AM -- Recovering databases ...
3/30/2015 7:37:37 AM -- Performance logging has ended.
3/30/2015 7:37:37 AM -- Instance5044.1 (2155.3528591), Instance5044.2 (2150.8497823),
Instance5044.3 (2149.2560363), Instance5044.4 (2130.1669437), Instance5044.5 (2155.0872351) and
Instance5044.6 (2169.9565071)
3/30/2015 7:37:37 AM -- C:\Program Files\Exchange Jetstress\SoftRecovery_2015_3_30_7_1_26.blg has
540 samples.
3/30/2015 7:37:37 AM -- Creating test report ...

```

6 Conclusion

This document was developed by the NetApp storage solution team and reviewed by the Microsoft Exchange product team. The test results and data presented in this document are based on the tests introduced in the ESRP framework. Customers should not quote the data directly for their own predeployment verification. It is still necessary to go through the testing exercises to validate the storage design for a specific customer environment.

The ESRP program is not a benchmarking program; tests are not designed to produce the maximum throughput for a given solution. Instead, the program is focused on validating recommendations from storage vendors for Exchange applications. Therefore, the data presented in this document should not be used for direct comparisons among solutions.

7 References

NetApp recommends that you consult with NetApp Professional Services to assist with the design and deployment of a similar situation.

For additional information about the NetApp E2700 storage array, see the following references:

- [NetApp Support Site Documentation library](#)
- [NetApp Support Documentation for E2700 Series](#)
- [NetApp E2700 Series Controller Technical Specification](#)

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