Dell PowerEdge R730xd
2,500 Mailbox Resiliency Microsoft Exchange 2013 Storage Solution

Tested with ESRP – Storage Version 4.0
Tested Date: June 2015

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1 Overview

This document provides information about Dell's storage solution for Microsoft Exchange Server. This solution is based on the *Microsoft Exchange Solution Reviewed Program (ESRP) – Storage program v4.0*. For any questions or comments regarding the contents of this document, see Additional Information.

The ESRP – Storage program was developed by Microsoft Corporation to provide a common storage testing framework for vendors to provide storage solutions for Microsoft Exchange Server. For more information about the Microsoft ESRP — Storage program, see http://technet.microsoft.com/en-us/exchange/ff182054.aspx.

This technical white paper discusses Dell's solution for 2,500 Exchange mailboxes with 5GB mailbox size supporting up to 150 messages per day in a two-copy DAG. The solution uses the Dell PowerEdge R730xd server for the Exchange mailbox server role and uses the internal storage of PowerEdge R730xd server for storing the Exchange mailbox databases and transaction logs.

1.1 Disclaimer

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The information in this document represents the current view of Dell on the issues discussed as of the date of publication. Due to changing market conditions, it should not be interpreted to be a commitment on the part of Dell and cannot guarantee the accuracy of any information presented after the date of publication.

2 Features

This technical white paper describes a tested and validated storage solution for a 2,500 mailbox Exchange 2013 environment using Database Availability Group (DAG). A DAG is a high-availability (HA) mechanism in Microsoft Exchange 2013 that supports multiple copies (up to 16) of Exchange database. There can be only one active copy of a given Exchange 2013 database at any given time. Mail clients access the active copy, and changes to the active copy are synchronized to the passive copies (including the copies located at remote sites if any) in the form of transaction logs. All hosts within a DAG are configured to be identical in terms of storage resources for Exchange 2013 databases and logs. The active and passive copies do not share any storage resources and reside on their own dedicated storage resources.

This mailbox resiliency solution includes a single DAG and two copies of each database in a single site environment. Each server holds both database copies—active and passive. The tested environment simulates up to 2,500 users with 5 GB Mailbox size and 150 messages a day or 0.121 IO operations per second (IOPS) per user including a 20% IO headroom.

In this solution, the PowerEdge R730xd server with 3.5-inch drives is configured for the Mailbox Server role. The 3.5-inch chassis of PowerEdge R730xd server has a distinct configuration mode where four 3.5-inch drives could be placed in the internal hard-drive tray of the chassis with twelve 3.5-inch drives in the front of the chassis. Thus, PowerEdge R730xd server provides extra storage compared to PowerEdge R720xd server. Each PowerEdge R730xd server hosts one active copy of an Exchange 2013 database and transaction logs and one passive copy of databases. Following are the major features of the server/storage system:

- Capable of hosting up to sixteen 3.5-inch Large Form Factor (LFF) SAS/Nearline (NL) SAS/SATA drives of up to 6 TB[1] including the four drives in the internal hard-drive tray of the chassis, plus two additional 2.5-inch disk drives in the back of the system (The 3.5-inch LFF configuration of the PowerEdge R730xd is used as part of this solution.); or up to twenty-six 2.5-inch Small Form Factor (SFF) SAS/NL SAS/SATA drives of up to 1.2 TB[1] capacity (including the two 2.5-inch back-accessible disk drives) Or up to eighteen 1.8-inch hard drives of up to 960GB in addition to eight 3.5-inch Large Form Factor drives
- Host-based RAID options with Dell PowerEdge RAID Controller H730P Mini

[1] This information is accurate as of the date written.

3 Solution Components

The solution employs Dell PowerEdge R730xd server/storage combination building blocks, which are capable of meeting the high performance requirements of messaging deployments. The solution is for up to 2,500 mailboxes of size 5GB each. The following subsections describe the hardware components that are part of this Exchange solution:

Figure 1 Dell PowerEdge R730xd 3.5-inch Server

3.1 Dell PowerEdge R730xd

Dell PowerEdge R730xd is a 2-socket, 2U, rack server with highly expandable memory, dense storage capacity and impressive I/O capabilities, PowerEdge R730xd server can readily handle data-intensive applications that require large storage capacity and I/O performance, such as email. It delivers the performance and availability required for mission-critical email and is a great hardware building block for midsize or large business.

The internal RAID controller enables a range of RAID levels for improved storage reliability, while the optional storage controller caching feature caches the most frequently accessed data, boosting database performance. Following are the major features of the server or storage system:

- Intel Xeon processor E5-2600 product family
- Dual processor sockets
- With 24 slots, up to 768GB of Memory for RDIMMS and 1536GB for LRDIMMs
- Up to 96TB Maximum Raw Internal Storage
- Choice of chassis configuration with sixteen 3.5-inch LFF disk drives, twenty-four 2.5-inch SFF disk drives or eighteen 1.8-inch disk drives along with eight 3.5-inch LFF disk drives
- Front loading drive bays plus two 2.5-inch SFF back-accessible drives
- Integrated RAID support through PERC S130, H330, PERC H730, PERC H730P & External JBOD RAID support through PERC H830
- Six PCIe 3.0 expansion slots
- Choice of NIC technologies

- Dell OpenManage Essentials and Dell Management Console, Dell OpenManage Power Center and Dell OpenManage Connections

The PowerEdge R730xd chassis configured with the 3.5-inch large form factor drives is used as part of this solution. For more information, see Dell PowerEdge R730xd Server product page.

3.2 PowerEdge RAID Controller H730P Mini

PowerEdge RAID Controller (PERC) H730P Mini is used in the PowerEdge R730xd server that hosts the Exchange Server. PERC H730P Mini is the internal host-based RAID Controller cards from the PERC Series 8 family. These PERC cards, built on the LSI SAS-3 3108 dual-core PowerPC RAID-on-Chip (ROC), offer unmatched I/O performance for databases, applications, and streaming digital media environments.

Table 1 shows the technical specifications of PERC H730P Mini. For more information, see Dell PowerEdge RAID Controller product page.

Table 1 Dell PowerEdge RAID Controller H730P Mini Technical Specifications

Feature	Specification
Solution	Eight port internal SATA+SAS solution supporting up to 32 hard disk drives (HDDs) and solid-state drives (SSDs)
Physical dimension	167.6mm (6.6in) x 64.4mm (2.5-inch) (MD2 low profile)
Connectors	Two internal mini-SAS HD SFF8643
Device support	Up to 32 SAS or SATA devices
Host bus type	8-lane, PCI Express 3.0 compliant
Data transfer rate	Up to 12 Gb/s per port
SAS controller	LSISAS3108 dual-core PowerPC ROC
Cache size	2 GB
RAID management	Dell OpenManage Storage Services & Additional management through UEFI (HII) & CEM
Optional SSD optimization	Dell FastPath software: delivers high passive performance on SSD arrays

For more information about recommended hardware specifications, see Section 4.3.

4 Solution Description

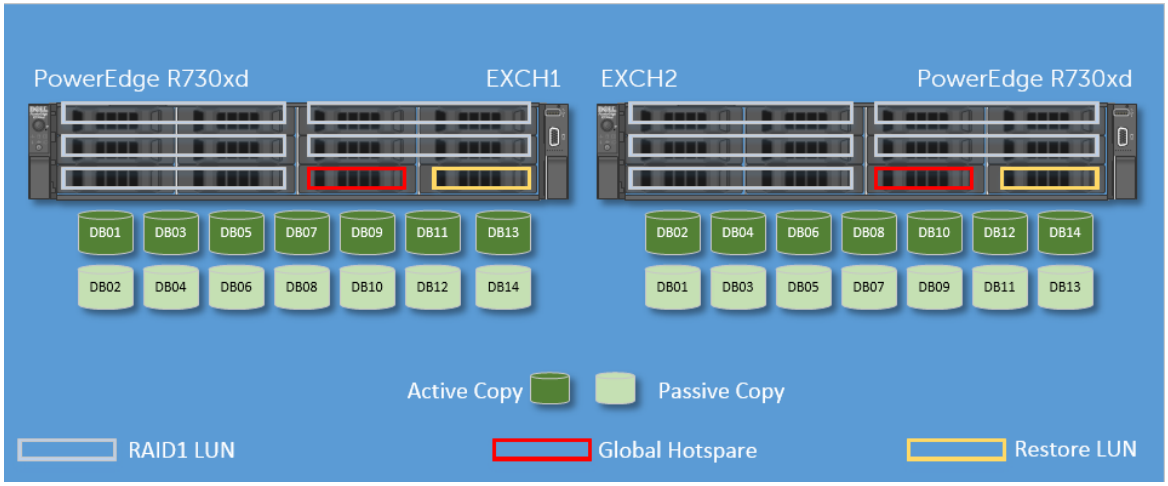
In this solution, the PowerEdge R730xd server with 3.5-inch LFF drives is used as the Mailbox Server. The PowerEdge R730xd server provides SAS-based internal storage with RAID. The solution uses sixteen 3.5-inch LFF 7.2KRPM NL-SAS disks and back-accessible 2.5-inch disks drives in the following layout:

- Two back-accessible disk drives (in RAID 1 container) for the operating system plus application files and Exchange Transport database
- Fourteen disk drives (in seven RAID 1 containers) for the Exchange database and its transaction logs
- One disk drive marked for Restore LUN
- One disk drive configured as a global hot spare

The solution has a 2-copy DAG Layout with Exchange Servers hosted in a single site environment. Each server node has seven RAID 1 LUNs hosting one active and one passive database per LUN. Each database has 179 users with 5 GB mailbox. Thus, a single server can accommodate 1,250 users during normal operating conditions. Two such servers provide Exchange Mailbox Services for 2,500 users. The mailbox user profile that was tested had 150 messages per day or 0.121 IOPS per user, which included a 20% IO overhead.

Figure 2 represents the distribution of database copies across the DAG members. It shows a 2-copy DAG highly available solution with Exchange Servers hosted in a single site environment. Each server hosts one active and one passive copy of the Exchange database. If a server fails, the databases are activated on the second server to provide mailbox service continuity.

Figure 2 Database Availability Group architectural diagram



4.1 Failure and Recovery Scenarios

Figure 2 shows the logical diagram of the solution in the data center. The solution employs two servers that are hosted in the same data center. A single server failure activates the passive copies of the impacted databases and the users connect to their databases on the second server. This is shown in Figure 3. The

condition considered and simulated here is a worst-case failure scenario wherein one server is unavailable and all the databases are activated on the second server. Thus, each host is designed in a way that any one server is capable of holding the entire load. Each server is capable of handling the load for 2,500 users. Therefore, with one server, all 2,500 users can be managed without compromising on the performance.

Figure 3 With one server unavailable in the data center

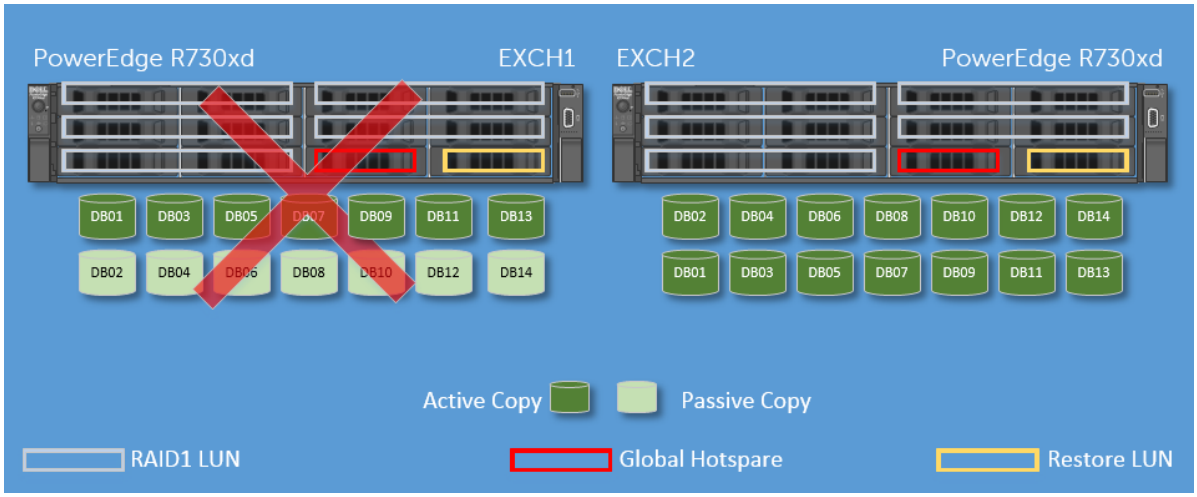


Figure 4 represents the database distribution across servers. The Microsoft Exchange 2013 Server Role Requirements Calculator can be used to derive the database distribution including the active and passive copies across servers. The database distribution follows a particular pattern to ensure that, if a server fails, the passive copies are activated on the remaining host such that the load on each of the host machine is evenly distributed.

Figure 4 Database/Transaction Log Layout across servers in DAG

Database Name	Active Server	EXCH1	EXCH2
DB01	EXCH1	1	2
DB02	EXCH2	2	1
DB03	EXCH1	1	2
DB04	EXCH2	2	1
DB05	EXCH1	1	2
DB06	EXCH2	2	1
DB07	EXCH1	1	2
DB08	EXCH2	2	1
DB09	EXCH1	1	2
DB10	EXCH2	2	1
DB11	EXCH1	1	2
DB12	EXCH2	2	1
DB13	EXCH1	1	2
DB14	EXCH2	2	1

1
Active Copy

2
Passive Copy

4.2 Storage Sizing

The Storage sizing process includes the type of RAID, type of disk drives and number of disk drives both from capacity and IOPS perspectives. Selecting the right storage is crucial to achieve a balance between cost and performance. The storage design also depends on the actual size of mailbox on the disk drive, content indexing space, and log space required.

Microsoft Exchange 2013 Server Role Requirements Calculator can be used to derive the required IOPS for a particular user profile. Figure 5 shows the Mailbox Calculator output for 2,500 users with 150 messages per day profile. The recommended IOPS per server is 302. Microsoft Exchange Jetstress tools verify if the storage subsystem meets the targeted IOPS requirement. For more information, see Section 5.

Figure 5 Recommended IOPS from the Microsoft Exchange 2013 Server Role Requirements Calculator

Host IO and Throughput Requirements	/ Database	/ Server	/ DAG	/ Environment
Total Database Required IOPS	22	302	603	603
Total Log Required IOPS	5	66	133	133
Database Read I/O Percentage	60%	--	--	--
Background Database Maintenance Throughput Requirements	1.0 MB/s	14 MB/s	28 MB/s	28 MB/s

4.3 Recommended Hardware Configuration

Based on the solution requirements described in the earlier sections, Table 2 and Table 3 provide more information about the server and storage configuration. The firmware and driver versions are also provided for the tested solution.

Table 2 Exchange Server Configuration

Microsoft Exchange Server System	**Dell PowerEdge R730xd Server with 3.5" HDD Chassis**
CPU	2 x Intel Xeon E5-2660 v3 processor with 10-cores
Memory	96 GB DDR4
NIC	Qlogic Network adapters NetXtreme II
RAID Controller	Dell PowerEdge RAID Controller H730P Mini Firmware version: 25.2.2-0004 Storport Driver Version 6.3.9600.16384 Driver version 6.602.07.00
Internal Disks	2 x 1.2 TB SAS 2.5-inch 10K RPM disk drives (Operating System and Application)

Table 3 Storage Subsystem configuration

Storage System	**Dell PowerEdge R730xd Internal 3.5-inch drives**
Disks	16 x 4 TB 7.2K RPM NL-SAS 3.5-inch disk: • 14 x 4 TB 7.2K RPM NL-SAS 3.5-inch drive in 7 x RAID 1 (for DB and Log) • 1 x 4 TB 7.2K RPM NL-SAS 3.5-inch drive (for Restore LUN) • 1 x 4 TB 7.2K RPM NL-SAS 3.5-inch drive (for Global Hot spare)
RAID Controller	Dell PowerEdge RAID Controller H730P Mini (Firmware version: 25.2.2.0004)

5 Targeted Customer Profile

This solution is intended for small to midsize organizations hosting up to 2,500 Exchange 2013 mailboxes. The configuration used for testing was as follows:

- Number of mailboxes: 2,500
- Number of sites: 1
- Number of servers: 2
- User IO profile: 150 messages sent and received or 0.121 IOPS per mailbox (This includes 20% IO overhead factor.)
- 5 GB Mailbox quota per mailbox
- 24x7 Background Database Maintenance enabled
- Data Availability Group (DAG) for Mailbox Resiliency (2 copies simulated-1 Active, 1 Passive)

5.1 Tested User Profile

The tested user profile had 0.121 IOPS per user with a 5 GB mailbox size. This equates to 150 messages (sent or received) per mailbox per day and accounts for an additional 20% I/O overhead. Additional applications such as certain mobile messaging applications can increase the IOPS profile of a user by three or four times.

5.2 Tested Deployment

The tested deployment simulated a failure scenario where one server was completely unavailable and the passive copies on the surviving DAG member on the second server were activated to provide mailbox service continuity. Therefore, the IOPS simulated 2,500 mailboxes on the same Exchange 2013 Server. The target IOPS for the given profile was 302. The achieved IOPS was 980—much higher than the target—and the solution still maintained read and write latencies well within the recommended thresholds. The following tables summarize the testing environment:

Table 4 Simulated Exchange Configuration

Feature	Specification
Number of Exchange mailboxes simulated	2,500 (at 5 GB mailbox size each)
Number of Database Availability Groups (DAGs)	1
Number of Sites	1

Feature	Specification
Number of servers/DAG	2
Number of active mailboxes/server	1,250 (during normal operations) and 2,500 (during single server failure)
Number of databases/server	14 (7 active, 7 passive)
Number of copies/database	2
Number of mailboxes/database	179
Simulated profile: IOPS/mailbox	0.121 (150 messages/day) This includes 20% IO overhead factor
Database/Log LUN size	3725 GB
Number of LUNs per server	7
Number of DBs per LUN	2 (one active, one passive)
Background database maintenance (BDM)	Tested with BDM enabled
Total database size for performance testing	893 GB per DB 24.42 TB total
% storage capacity used by Exchange database	24.42 TB / 50.92 TB 47.96%

Table 5 Storage and Server Hardware

Feature	Specification
Storage connectivity (Fiber Channel, SAS, SATA, iSCSI)	SAS
Storage model and OS/firmware revision	Dell PowerEdge R730xd with PERC H730P Mini Firmware 6.3.9600.16384
Storage cache	2 GB- PERC H730P Mini
Number of storage controllers	1
Number of storage ports	2 (Two internal mini-SAS HD SFF8643)
Maximum bandwidth of storage connectivity to host	12 Gb/s per port
Switch type/model/firmware revision	NA
HBA model and firmware	H730P Mini Firmware 25.2.2-0004
Number of HBAs/host	1
Host server type	Dell PowerEdge R730xd 2 x Intel Xeon processor 96 GB RAM
Total number of disks tested in solution	28 (14 per server)
Maximum number of spindles can be hosted in the storage	16 x 3.5" and 2 x 2.5" per Dell PowerEdge R730xd server

Table 6 Storage and Server Software

Feature	Specification
HBA driver	PERC H730P SAS-RAID 6.602.07.00
HBA QueueTarget Setting	N/A
HBA QueueDepth Setting	N/A
Multi-Pathing	N/A

Host OS	Windows Server 2012 R2 Datacenter X64 Edition
ESE.dll file version	15.0.1044.24
Replication solution name/version	N/A

Table 7 Storage Disk Configuration (Mailbox Store Disks)

Feature	**Specification**
Disk type, speed and firmware revision	Dell 7.2K 3.5" RPM 4 TB NL-SAS Model – ST4000NM0063
Raw capacity per disk (TB)	4 TB
Number of physical disks in test	28 (14 per server)
Total raw storage capacity (TB)	112 TB (56 TB per server)
RAID level	RAID 1 pairs
Number of disks per LUN	2
Total formatted capacity	3725 GB per LUN 50.92 TB total
Storage capacity utilization	50.92/112=45.46% Formatted capacity/Total raw capacity
Database capacity utilization	24.42 TB/50.92 TB=47.96% Database size/Total formatted capacity

5.3 Best Practices

Exchange Server 2007, 2010 and 2013 overcame the memory limitations of earlier Exchange versions by providing support as a 64-bit application. On Windows Server 2012 x64 Edition, about 4 TB of addressable memory is available for kernel mode and user mode applications. Both the application and kernel have sufficient memory for operations, allowing the Extensible Storage Engine (ESE) in Exchange Server 2013 to utilize more memory to buffer data pages. This reduces the number of I/O operations, specifically the read operations required on the disk subsystem. The total number of database disk I/O operations for a given user load depends on the available system memory. For a given load, the total database disk I/O operations required per second (IOPS) decreases over a period with the increase in system memory. This decrease in database IOPS is primarily caused by a decrease in database reads.

The Exchange Storage subsystem must be sized accurately to ensure that there are no I/O bottlenecks from an IOPS and disk latency perspective. The disk subsystem should be capable of supporting both the capacity and I/O throughput demands of the application. The following best practices are recommended to improve the I/O subsystem performance:

- For Exchange 2013 database, it is recommended that the size of elements within a RAID stripe be set to 512K for best performance
- Windows NTFS allocation unit size for Exchange 2013 database partitions should be set to 64K for best performance. If log partitions are separated from the database, the default allocation unit size should be used. While formatting the windows partitions, GUID partition table (GPT) should be used.
- Average database read latencies (Avg. Disk sec/Read) should not exceed 20 ms. Exchange Server 2013 storage latencies are most often related to the number of disk drives available for a given workload. Windows Performance Monitor may be used to monitor Exchange Server 2013 database counters.
- Sharing Exchange 2013 storage resources with other applications may negatively affect the performance of Exchange 2013 deployment. Therefore, sharing the spindles hosting the Exchange Database and log with any other application or operating system is not recommended.

  For Exchange 2013 best practices on storage design, see:
  http://technet.microsoft.com/en-us/library/ee832792(v=exchg.150).aspx

5.4 Backup Strategy

Protecting email data from potential disasters requires a well designed and implemented backup solution. Depending on environmental requirements, different backup strategies may be implemented, such as backup to tape or LAN/SAN-based backup. In this solution, DAG is used to maintain a passive database copy on a separate storage system. This passive copy of the database may be used to back up to tape or disk drive.

The log replay test was used to measure the maximum rate at which the log files can be replayed on the passive copies. This is used to determine the restore times and also the database write throughput that can be achieved during a log recovery.

6 Test Result Summary

This section provides a high-level summary of the test data from Microsoft Exchange Jetstress as part of the ESRP requirements and the link to the detailed HTML reports, which are generated by the ESRP testing framework.

6.1 Reliability

Reliability tests run for 24 hours and the goal is to verify if the storage can handle a high I/O load for a long period. After the stress test, both log and database files are analyzed for integrity to make sure that there is no database/log corruption.

The following list provides an overview of any errors reported during testing:

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

6.2 Storage Performance Test Result Report

The storage performance test is designed to exercise the storage with maximum sustainable Exchange I/O for four hours. The test shows how long it takes the storage to respond to an I/O under load. The data here is the sum of all of the logical disks I/O's and average of all the logical disks I/O latencies in the four hour test duration. The achieved IOPS was around 1001.

As part of the ESRP framework, the Stress Test was also performed. The duration of the test was 24 hours with a target IOPS of 0.121 per user or 302 IOPS per server. The achieved IOPS was around 971 per server, well above the target IOPS. The Stress Test Result Report

6.2.1 Individual Server Metrics

Table 8 shows the sum of I/O across Mailbox databases and the average latency across all databases on a per server basis.

Table 8 Sum of I/O's and average latency

Database I/O	
Target Disk Transfers/sec	302
Database Disks Transfers/sec	1001
Database Disks Reads/sec	678
Database Disks Writes/sec	323
Average Database Disk Read Latency (ms)	14.47

Database I/O	
Average Database Disk Write Latency (ms)	1.70
Transaction Log I/O	
Log Disks Writes/sec	84.54
Average Log Disk Write Latency (ms)	0.12

6.3 Database Backup/Recovery Performance

There are two test reports in this section. The database backup test measures the sequential read rate of the database files, and the soft recovery test measures the recovery/replay performance (playing transaction logs in to the database).

6.3.1 Database Backup Test Result Report

6.3.2

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

Table 9 Database Backup Test Metrics

MB read/sec per database	164.34
MB read/sec total per server	2300.72

6.3.3 Soft Recovery test Result Report

The test is to measure the maximum rate at which the log files can be played on the passive copies. The following table shows the average rate for 507 log files played in a single storage group. Each log file is 1 MB in size.

Table 10 Soft Recovery Test metrics

Average number of log files played	509
Average time to play one Log file (sec)	2.67

7 Conclusion

This ESRP document presents a tested and validated Exchange solution for 2,500 mailboxes with 5GB mailbox size supporting up to 150 messages per day in a two-copy DAG. The solution uses the Dell PowerEdge R730xd server for the Exchange mailbox server role and the internal storage of PowerEdge R730xd for storing the Exchange mailbox databases and transaction logs.

Testing was carried out as part of the ESRP test framework using Microsoft Exchange Server 2013 Jetstress. The test results showed that the proposed solution is more than capable of delivering the IOPS and meeting the capacity requirements to support 2,500 mailboxes.

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

The ESRP program is not designed to be a benchmarking program and the tests are not designed to obtain the maximum throughput for a given solution. Rather, the tests focus on obtaining recommendations from vendors for Exchange application. The data presented in this document should not be used for direct comparisons among solutions.

8 Additional Information

1. **Dell.com/support** is focused on meeting customer requirements with proven services.
2. **DellTechCenter.com** is an IT Community where you can connect with Dell Customers and Dell employees for sharing knowledge, best practices and information about Dell products and installations.
3. Referenced or recommended Dell publications:
    a. Dell Unified Communications and Collaboration website
    b. Dell PowerEdge R730xd
    c. Dell PowerEdge RAID Controller (PERC) H730P User Guide

A Performance Test Result Report

Microsoft Exchange Jetstress 2013

Performance Test Result Report

Test Summary

Overall Test Result	**Pass**
Machine Name	EXCH1
Test Description	Exchange Mailbox Profile Test Host: EXCH1 16*4TB 7.2KRPM NL-SAS 7 RAID1 Volumes for Exchange 1 RAID1 Volume for OS 1 RAID0 Volume for RestoreLUN, 1 HotSpare 2500 users, 150 messages a day and 5GB Mailbox Size
Test Start Time	6/22/2015 7:47:11 AM
Test End Time	6/22/2015 5:58:21 PM
Collection Start Time	6/22/2015 1:57:58 PM
Collection End Time	6/22/2015 5:57:45 PM
Jetstress Version	15.00.0775.000
ESE Version	15.00.1044.024
Operating System	Windows Server 2012 R2 Datacenter (6.2.9200.0)
Performance Log	C:\Jetstress Result\EXCH1\21T-4hrs\Performance_2015_6_22_13_53_27.blg

Database Sizing and Throughput

Achieved Transactional I/O per Second	1001.263
Target Transactional I/O per Second	302.5
Initial Database Size (bytes)	13421923794944
Final Database Size (bytes)	13427535773696
Database Files (Count)	14

Jetstress System Parameters

Thread Count	21
Minimum Database Cache	448.0 MB
Maximum Database Cache	3584.0 MB
Insert Operations	40%
Delete Operations	20%
Replace Operations	5%
Read Operations	35%
Lazy Commits	70%
Run Background Database Maintenance	True
Number of Copies per Database	2

Database Configuration

Instance4516.1	Log path: D:\Log\Log-DB01 Database: D:\Database\DB01\Jetstress001001.edb
Instance4516.2	Log path: D:\Log\Log-DB02 Database: D:\Database\DB02\Jetstress002001.edb
Instance4516.3	Log path: E:\Log\Log-DB03 Database: E:\Database\DB03\Jetstress003001.edb
Instance4516.4	Log path: E:\Log\Log-DB04 Database: E:\Database\DB04\Jetstress004001.edb

Instance4516.5 Log path: F:\Log\Log-DB05
Database: F:\Database\DB05\Jetstress005001.edb

Instance4516.6 Log path: F:\Log\Log-DB06
Database: F:\Database\DB06\Jetstress006001.edb

Instance4516.7 Log path: G:\Log\Log-DB07
Database: G:\Database\DB07\Jetstress007001.edb

Instance4516.8 Log path: G:\Log\Log-DB08
Database: G:\Database\DB08\Jetstress008001.edb

Instance4516.9 Log path: H:\Log\Log-DB09
Database: H:\Database\DB09\Jetstress009001.edb

Instance4516.10 Log path: H:\Log\Log-DB10
Database: H:\Database\DB10\Jetstress010001.edb

Instance4516.11 Log path: I:\Log\Log-DB11
Database: I:\Database\DB11\Jetstress011001.edb

Instance4516.12 Log path: I:\Log\Log-DB12
Database: I:\Database\DB12\Jetstress012001.edb

Instance4516.13 Log path: J:\Log\Log-DB13
Database: J:\Database\DB13\Jetstress013001.edb

Instance4516.14 Log path: J:\Log\Log-DB14
Database: J:\Database\DB14\Jetstress014001.edb

Transactional I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance4516.1	13.726	2.447	48.623	23.169	33031.173	35807.028	0.000	0.123	0.000	6.049	0.000	20420.702
Instance4516.2	14.651	2.456	48.394	23.048	33038.564	35940.549	0.000	0.121	0.000	6.059	0.000	20592.149
Instance4516.3	14.653	2.245	48.351	22.940	33028.175	35864.244	0.000	0.125	0.000	5.991	0.000	20589.191
Instance4516.4	15.502	2.252	48.566	23.185	33023.698	35873.028	0.000	0.126	0.000	6.088	0.000	20397.686
Instance4516.5	14.505	1.974	48.479	23.110	33028.704	35812.880	0.000	0.117	0.000	6.045	0.000	20443.346
Instance4516.6	13.504	1.979	48.366	23.010	33054.415	35838.107	0.000	0.126	0.000	5.986	0.000	20610.848
Instance4516.7	13.293	1.668	48.540	23.257	33038.218	35897.995	0.000	0.118	0.000	6.099	0.000	20529.589
Instance4516.8	14.297	1.675	48.519	23.085	33023.841	35857.508	0.000	0.123	0.000	6.045	0.000	20485.395
Instance4516.9	14.563	1.386	48.294	22.872	33016.888	35898.976	0.000	0.127	0.000	6.030	0.000	20504.020
Instance4516.10	15.461	1.387	48.456	23.049	33044.554	35804.339	0.000	0.128	0.000	5.984	0.000	20587.619
Instance4516.11	14.758	1.145	48.199	22.726	33039.838	35933.207	0.000	0.127	0.000	5.974	0.000	20601.746
Instance4516.12	15.700	1.151	48.364	23.065	33023.639	35860.007	0.000	0.127	0.000	6.069	0.000	20527.775
Instance4516.13	13.507	1.022	48.682	23.302	33032.544	35796.579	0.000	0.114	0.000	6.105	0.000	20306.862
Instance4516.14	14.423	1.027	48.511	23.100	33019.141	35786.810	0.000	0.119	0.000	6.014	0.000	20463.879

Background Database Maintenance I/O Performance

MSExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes
Instance4516.1	8.740	261613.387
Instance4516.2	8.479	261696.723
Instance4516.3	8.694	261677.475
Instance4516.4	8.418	261725.073
Instance4516.5	8.655	261635.530
Instance4516.6	8.695	261654.119
Instance4516.7	8.774	261630.750
Instance4516.8	8.524	261613.135
Instance4516.9	8.699	261634.724
Instance4516.10	8.441	261678.921
Instance4516.11	8.688	261708.115
Instance4516.12	8.412	261695.090
Instance4516.13	8.761	261623.200
Instance4516.14	8.498	261708.716

Log Replication I/O Performance

MSExchange Database ==> Instances	I/O Log Reads/sec	I/O Log Reads Average Bytes
Instance4516.1	0.525	200705.171
Instance4516.2	0.531	202364.282
Instance4516.3	0.526	199998.269
Instance4516.4	0.529	201456.336
Instance4516.5	0.527	200241.280
Instance4516.6	0.526	198801.181
Instance4516.7	0.532	202850.851
Instance4516.8	0.527	200948.414
Instance4516.9	0.527	201691.600
Instance4516.10	0.524	198331.311
Instance4516.11	0.524	200159.759
Instance4516.12	0.530	201728.466
Instance4516.13	0.529	203049.823
Instance4516.14	0.524	197325.145

Total I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance4516.1	13.726	2.447	57.364	23.169	67860.143	35807.028	4.659	0.123	0.525	6.049	200705.171	20420.702
Instance4516.2	14.651	2.456	56.873	23.048	67126.898	35940.549	5.118	0.121	0.531	6.059	202364.282	20592.149
Instance4516.3	14.653	2.245	57.045	22.940	67877.036	35864.244	3.438	0.125	0.526	5.991	199998.269	20589.191
Instance4516.4	15.502	2.252	56.984	23.185	66807.347	35873.028	3.213	0.126	0.529	6.088	201456.336	20397.686
Instance4516.5	14.505	1.974	57.134	23.110	67660.178	35812.880	3.577	0.117	0.527	6.045	200241.280	20443.346
Instance4516.6	13.504	1.979	57.061	23.010	67888.483	35838.107	3.501	0.126	0.526	5.986	198801.181	20610.848
Instance4516.7	13.293	1.668	57.313	23.257	68031.271	35897.995	2.932	0.118	0.532	6.099	202850.851	20529.589
Instance4516.8	14.297	1.675	57.043	23.085	67181.144	35857.508	2.797	0.123	0.527	6.045	200948.414	20485.395
Instance4516.9	14.563	1.386	56.993	22.872	67911.428	35898.976	4.318	0.127	0.527	6.030	201691.600	20504.020
Instance4516.10	15.461	1.387	56.896	23.049	66962.950	35804.339	4.194	0.128	0.524	5.984	198331.311	20587.619
Instance4516.11	14.758	1.145	56.886	22.726	67962.161	35933.207	4.497	0.127	0.524	5.974	200159.759	20601.746
Instance4516.12	15.700	1.151	56.776	23.065	66903.835	35860.007	4.514	0.127	0.530	6.069	201728.466	20527.775
Instance4516.13	13.507	1.022	57.443	23.302	67896.675	35796.579	2.680	0.114	0.529	6.105	203049.823	20306.862
Instance4516.14	14.423	1.027	57.009	23.100	67107.409	35786.810	2.758	0.119	0.524	6.014	197325.145	20463.879

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	0.180	0.008	0.291
Available MBytes	89340.803	89324.000	89657.000
Free System Page Table Entries	16555606.313	16555279.000	16555886.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	124745056.735	124399616.000	124878848.000
Pool Paged Bytes	130832738.873	130752512.000	130977792.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

```
6/22/2015 7:47:11 AM -- Preparing for testing ...
6/22/2015 7:47:11 AM -- Creating D:\Database\DB01\Jetstress001001.edb.
6/22/2015 7:47:11 AM -- Database cache settings: (minimum: 32.0 MB, maximum: 256.0 MB)
6/22/2015 7:47:11 AM -- Database flush thresholds: (start: 2.5 MB, stop: 5.1 MB)
6/22/2015 9:23:38 AM -- 100.0% of 892.9 GB complete (305142166 records inserted).
6/22/2015 9:23:38 AM -- 100.0% of 892.9 GB complete (305142169 records inserted).
6/22/2015 9:23:39 AM -- Duplicating 13 databases:
6/22/2015 1:52:57 PM -- 100.0% of 11.3 TB complete (11.3 TB duplicated).
6/22/2015 1:53:12 PM -- Attaching databases ...
6/22/2015 1:53:12 PM -- Preparations for testing are complete.
6/22/2015 1:53:12 PM -- Starting transaction dispatch ..
6/22/2015 1:53:12 PM -- Database cache settings: (minimum: 448.0 MB, maximum: 3.5 GB)
6/22/2015 1:53:12 PM -- Database flush thresholds: (start: 35.8 MB, stop: 71.7 MB)
6/22/2015 1:53:27 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).
6/22/2015 1:53:27 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).
6/22/2015 1:53:29 PM -- Operation mix: Sessions 21, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.
```

6/22/2015 1:53:29 PM -- Performance logging started (interval: 15000 ms).
6/22/2015 1:53:29 PM -- Attaining prerequisites:
6/22/2015 1:57:58 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 3397550000.0 (lower bound: 3382287000.0, upper bound: none)
6/22/2015 5:57:59 PM -- Performance logging has ended.
6/22/2015 5:57:59 PM -- JetInterop batch transaction stats: 28962, 28962, 28962, 28962, 28962, 28962, 28962, 28962, 28962, 28962, 28962, 28962, 28962 and 28961.
6/22/2015 5:57:59 PM -- Dispatching transactions ends.
6/22/2015 5:58:00 PM -- Shutting down databases ...
6/22/2015 5:58:21 PM -- Instance4516.1 (complete), Instance4516.2 (complete), Instance4516.3 (complete), Instance4516.4 (complete), Instance4516.5 (complete), Instance4516.6 (complete), Instance4516.7 (complete), Instance4516.8 (complete), Instance4516.9 (complete), Instance4516.10 (complete), Instance4516.11 (complete), Instance4516.12 (complete), Instance4516.13 (complete) and Instance4516.14 (complete)
6/22/2015 5:58:21 PM -- C:\Jetstress Result\EXCH1\21T-4hrs\Performance_2015_6_22_13_53_27.blg has 975 samples.

6/22/2015 5:58:21 PM -- Creating test report ...
6/22/2015 5:58:32 PM -- Instance4516.1 has 13.7 for I/O Database Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.1 has 0.1 for I/O Log Writes Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.1 has 0.1 for I/O Log Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.2 has 14.7 for I/O Database Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.2 has 0.1 for I/O Log Writes Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.2 has 0.1 for I/O Log Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.3 has 14.7 for I/O Database Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.3 has 0.1 for I/O Log Writes Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.3 has 0.1 for I/O Log Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.4 has 15.5 for I/O Database Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.4 has 0.1 for I/O Log Writes Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.4 has 0.1 for I/O Log Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.5 has 14.5 for I/O Database Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.5 has 0.1 for I/O Log Writes Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.5 has 0.1 for I/O Log Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.6 has 13.5 for I/O Database Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.6 has 0.1 for I/O Log Writes Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.6 has 0.1 for I/O Log Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.7 has 13.3 for I/O Database Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.7 has 0.1 for I/O Log Writes Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.7 has 0.1 for I/O Log Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.8 has 14.3 for I/O Database Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.8 has 0.1 for I/O Log Writes Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.8 has 0.1 for I/O Log Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.9 has 14.6 for I/O Database Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.9 has 0.1 for I/O Log Writes Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.9 has 0.1 for I/O Log Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.10 has 15.5 for I/O Database Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.10 has 0.1 for I/O Log Writes Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.10 has 0.1 for I/O Log Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.11 has 14.8 for I/O Database Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.11 has 0.1 for I/O Log Writes Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.11 has 0.1 for I/O Log Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.12 has 15.7 for I/O Database Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.12 has 0.1 for I/O Log Writes Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.12 has 0.1 for I/O Log Reads Average Latency.

6/22/2015 5:58:32 PM -- Instance4516.13 has 13.5 for I/O Database Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.13 has 0.1 for I/O Log Writes Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.13 has 0.1 for I/O Log Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.14 has 14.4 for I/O Database Reads Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.14 has 0.1 for I/O Log Writes Average Latency.
6/22/2015 5:58:32 PM -- Instance4516.14 has 0.1 for I/O Log Reads Average Latency.
6/22/2015 5:58:32 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.
6/22/2015 5:58:32 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
6/22/2015 5:58:32 PM -- C:\Jetstress Result\EXCH1\21T-4hrs\Performance_2015_6_22_13_53_27.xml has 957 samples queried.

B Stress Test Result Report

Microsoft Exchange Jetstress 2013

Stress Test Result Report

Test Summary

Overall Test Result	**Pass**
Machine Name	EXCH1
Test Description	Exchange Mailbox Profile Test Host: EXCH1 16*4TB 7.2KRPM NL-SAS 7 RAID1 Volumes for Exchange 1 RAID1 Volume for OS 1 RAID0 Volume for RestoreLUN, 1 HotSpare 2500 users, 150 messages a day and 5GB Mailbox Size
Test Start Time	6/22/2015 9:22:31 PM
Test End Time	6/23/2015 9:28:05 PM
Collection Start Time	6/22/2015 9:27:40 PM
Collection End Time	6/23/2015 9:27:39 PM
Jetstress Version	15.00.0775.000
ESE Version	15.00.1044.024
Operating System	Windows Server 2012 R2 Datacenter (6.2.9200.0)
Performance Log	C:\Jetstress Result\EXCH1\21T-Stress\Stress_2015_6_22_21_23_0.blg

Database Sizing and Throughput

Achieved Transactional I/O per Second	971.563
Target Transactional I/O per Second	302.5
Initial Database Size (bytes)	13427535773696
Final Database Size (bytes)	13457508270080
Database Files (Count)	14

Jetstress System Parameters

Thread Count	21
Minimum Database Cache	448.0 MB
Maximum Database Cache	3584.0 MB
Insert Operations	40%
Delete Operations	20%
Replace Operations	5%
Read Operations	35%
Lazy Commits	70%
Run Background Database Maintenance	True
Number of Copies per Database	2

Database Configuration

Instance3068.1	Log path: D:\Log\Log-DB01 Database: D:\Database\DB01\Jetstress001001.edb
Instance3068.2	Log path: D:\Log\Log-DB02 Database: D:\Database\DB02\Jetstress002001.edb
Instance3068.3	Log path: E:\Log\Log-DB03 Database: E:\Database\DB03\Jetstress003001.edb
Instance3068.4	Log path: E:\Log\Log-DB04 Database: E:\Database\DB04\Jetstress004001.edb

Instance3068.5 Log path: F:\Log\Log-DB05
Database: F:\Database\DB05\Jetstress005001.edb

Instance3068.6 Log path: F:\Log\Log-DB06
Database: F:\Database\DB06\Jetstress006001.edb

Instance3068.7 Log path: G:\Log\Log-DB07
Database: G:\Database\DB07\Jetstress007001.edb

Instance3068.8 Log path: G:\Log\Log-DB08
Database: G:\Database\DB08\Jetstress008001.edb

Instance3068.9 Log path: H:\Log\Log-DB09
Database: H:\Database\DB09\Jetstress009001.edb

Instance3068.10 Log path: H:\Log\Log-DB10
Database: H:\Database\DB10\Jetstress010001.edb

Instance3068.11 Log path: I:\Log\Log-DB11
Database: I:\Database\DB11\Jetstress011001.edb

Instance3068.12 Log path: I:\Log\Log-DB12
Database: I:\Database\DB12\Jetstress012001.edb

Instance3068.13 Log path: J:\Log\Log-DB13
Database: J:\Database\DB13\Jetstress013001.edb

Instance3068.14 Log path: J:\Log\Log-DB14
Database: J:\Database\DB14\Jetstress014001.edb

Transactional I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance3068.1	13.549	2.520	46.984	22.420	33039.536	35771.996	0.000	0.097	0.000	5.459	0.000	20550.894
Instance3068.2	14.329	2.530	46.965	22.324	33037.864	35769.763	0.000	0.098	0.000	5.421	0.000	20616.439
Instance3068.3	15.306	2.317	47.022	22.424	33032.659	35765.366	0.000	0.105	0.000	5.433	0.000	20528.570
Instance3068.4	16.235	2.324	47.001	22.408	33022.385	35771.119	0.000	0.107	0.000	5.446	0.000	20517.344
Instance3068.5	14.177	2.015	47.017	22.381	33050.854	35782.549	0.000	0.097	0.000	5.435	0.000	20568.611
Instance3068.6	13.143	2.036	47.042	22.362	33050.956	35770.994	0.000	0.096	0.000	5.409	0.000	20544.093
Instance3068.7	14.856	1.709	46.970	22.350	33032.610	35757.621	0.000	0.105	0.000	5.428	0.000	20533.015
Instance3068.8	15.799	1.728	47.010	22.408	33026.626	35772.614	0.000	0.106	0.000	5.424	0.000	20538.842
Instance3068.9	15.215	1.413	47.062	22.448	33038.473	35775.464	0.000	0.105	0.000	5.449	0.000	20486.358
Instance3068.10	16.018	1.427	46.954	22.343	33025.730	35771.312	0.000	0.103	0.000	5.421	0.000	20555.102
Instance3068.11	15.271	1.178	47.074	22.493	33031.406	35735.848	0.000	0.107	0.000	5.445	0.000	20471.568
Instance3068.12	16.311	1.192	47.039	22.397	33034.228	35753.899	0.000	0.108	0.000	5.420	0.000	20486.762
Instance3068.13	13.638	1.045	47.014	22.414	33033.059	35771.952	0.000	0.096	0.000	5.448	0.000	20565.350
Instance3068.14	14.350	1.049	46.933	22.303	33045.871	35786.159	0.000	0.096	0.000	5.433	0.000	20570.224

Background Database Maintenance I/O Performance

MSExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes
Instance3068.1	8.776	261698.833
Instance3068.2	8.516	261703.080
Instance3068.3	8.688	261697.824
Instance3068.4	8.385	261689.791
Instance3068.5	8.695	261665.387
Instance3068.6	8.737	261674.206
Instance3068.7	8.724	261657.893
Instance3068.8	8.419	261669.590
Instance3068.9	8.694	261676.350
Instance3068.10	8.400	261694.887
Instance3068.11	8.694	261701.074
Instance3068.12	8.383	261684.602
Instance3068.13	8.780	261694.199
Instance3068.14	8.514	261682.096

Log Replication I/O Performance

MSExchange Database ==> Instances	I/O Log Reads/sec	I/O Log Reads Average Bytes
Instance3068.1	0.477	184573.967
Instance3068.2	0.475	183687.857
Instance3068.3	0.474	183394.520
Instance3068.4	0.475	183545.496
Instance3068.5	0.475	183739.878
Instance3068.6	0.473	183652.973
Instance3068.7	0.474	183301.984
Instance3068.8	0.474	183272.670
Instance3068.9	0.475	183812.508
Instance3068.10	0.474	183000.890
Instance3068.11	0.474	183433.394
Instance3068.12	0.472	182644.496
Instance3068.13	0.477	184514.549
Instance3068.14	0.475	183707.517

Total I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance3068.1	13.549	2.520	55.760	22.420	69028.322	35771.996	4.270	0.097	0.477	5.459	184573.967	20550.894
Instance3068.2	14.329	2.530	55.482	22.324	68137.821	35769.763	4.283	0.098	0.475	5.421	183687.857	20616.439
Instance3068.3	15.306	2.317	55.710	22.424	68692.445	35765.366	3.456	0.105	0.474	5.433	183394.520	20528.570
Instance3068.4	16.235	2.324	55.386	22.408	67641.934	35771.119	3.499	0.107	0.475	5.446	183545.496	20517.344
Instance3068.5	14.177	2.015	55.712	22.381	68731.259	35782.549	3.532	0.097	0.475	5.435	183739.878	20568.611
Instance3068.6	13.143	2.036	55.779	22.362	68860.733	35770.994	3.508	0.096	0.473	5.409	183652.973	20544.093
Instance3068.7	14.856	1.709	55.694	22.350	68845.710	35757.621	3.469	0.105	0.474	5.428	183301.984	20533.015
Instance3068.8	15.799	1.728	55.430	22.408	67755.251	35772.614	3.348	0.106	0.474	5.424	183272.670	20538.842
Instance3068.9	15.215	1.413	55.756	22.448	68690.678	35775.464	3.544	0.105	0.475	5.449	183812.508	20486.358
Instance3068.10	16.018	1.427	55.355	22.343	67727.119	35771.312	3.390	0.103	0.474	5.421	183000.890	20555.102
Instance3068.11	15.271	1.178	55.768	22.493	68679.291	35735.848	3.691	0.107	0.474	5.445	183433.394	20471.568
Instance3068.12	16.311	1.192	55.422	22.397	67620.369	35753.899	3.794	0.108	0.472	5.420	182644.496	20486.762
Instance3068.13	13.638	1.045	55.794	22.414	69016.898	35771.952	3.236	0.096	0.477	5.448	184514.549	20565.350
Instance3068.14	14.350	1.049	55.448	22.303	68154.956	35786.159	3.204	0.096	0.475	5.433	183707.517	20570.224

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	0.175	0.000	1.785
Available MBytes	89320.990	88582.000	89559.000
Free System Page Table Entries	16555462.243	16554422.000	16555846.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	124980380.058	124706816.000	126382080.000
Pool Paged Bytes	136185173.333	132120576.000	155516928.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

```
6/22/2015 9:22:31 PM -- Preparing for testing ...
6/22/2015 9:22:46 PM -- Attaching databases ...
6/22/2015 9:22:46 PM -- Preparations for testing are complete.
6/22/2015 9:22:46 PM -- Starting transaction dispatch ..
6/22/2015 9:22:46 PM -- Database cache settings: (minimum: 448.0 MB, maximum: 3.5 GB)
6/22/2015 9:22:46 PM -- Database flush thresholds: (start: 35.8 MB, stop: 71.7 MB)
6/22/2015 9:23:00 PM -- Database read latency thresholds: (average: 20 msec/read, maximum: 200 msec/read).
6/22/2015 9:23:00 PM -- Log write latency thresholds: (average: 10 msec/write, maximum: 200 msec/write).
6/22/2015 9:23:02 PM -- Operation mix: Sessions 21, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.
6/22/2015 9:23:02 PM -- Performance logging started (interval: 15000 ms).
6/22/2015 9:23:02 PM -- Attaining prerequisites:
6/22/2015 9:27:40 PM -- \MSExchange Database(JetstressWin)\Database Cache Size, Last: 3390411000.0 (lower bound: 3382287000.0, upper bound: none)
6/23/2015 9:27:42 PM -- Performance logging has ended.
6/23/2015 9:27:42 PM -- JetInterop batch transaction stats: 153746, 153746, 153746, 153746, 153746, 153746, 153746, 153746, 153746, 153746, 153746, 153746, 153745 and 153745.
6/23/2015 9:27:42 PM -- Dispatching transactions ends.
6/23/2015 9:27:42 PM -- Shutting down databases ...
6/23/2015 9:28:05 PM -- Instance3068.1 (complete), Instance3068.2 (complete), Instance3068.3 (complete), Instance3068.4 (complete), Instance3068.5 (complete), Instance3068.6 (complete),
Instance3068.7 (complete), Instance3068.8 (complete), Instance3068.9 (complete), Instance3068.10 (complete), Instance3068.11 (complete), Instance3068.12 (complete), Instance3068.13 (complete)
and Instance3068.14 (complete)
6/23/2015 9:28:05 PM -- C:\Jetstress Result\EXCH1\21T-Stress\Stress_2015_6_22_21_23_0.blg has 5766 samples.
```

6/23/2015 9:28:05 PM -- Creating test report ...
6/23/2015 9:29:07 PM -- Instance3068.1 has 13.5 for I/O Database Reads Average Latency.
6/23/2015 9:29:07 PM -- Instance3068.1 has 0.1 for I/O Log Writes Average Latency.
6/23/2015 9:29:07 PM -- Instance3068.1 has 0.1 for I/O Log Reads Average Latency.
6/23/2015 9:29:07 PM -- Instance3068.2 has 14.3 for I/O Database Reads Average Latency.
6/23/2015 9:29:07 PM -- Instance3068.2 has 0.1 for I/O Log Writes Average Latency.
6/23/2015 9:29:07 PM -- Instance3068.2 has 0.1 for I/O Log Reads Average Latency.
6/23/2015 9:29:07 PM -- Instance3068.3 has 15.3 for I/O Database Reads Average Latency.
6/23/2015 9:29:07 PM -- Instance3068.3 has 0.1 for I/O Log Writes Average Latency.
6/23/2015 9:29:07 PM -- Instance3068.3 has 0.1 for I/O Log Reads Average Latency.
6/23/2015 9:29:07 PM -- Instance3068.4 has 16.2 for I/O Database Reads Average Latency.
6/23/2015 9:29:07 PM -- Instance3068.4 has 0.1 for I/O Log Writes Average Latency.
6/23/2015 9:29:07 PM -- Instance3068.4 has 0.1 for I/O Log Reads Average Latency.
6/23/2015 9:29:07 PM -- Instance3068.5 has 14.2 for I/O Database Reads Average Latency.
6/23/2015 9:29:07 PM -- Instance3068.5 has 0.1 for I/O Log Writes Average Latency.
6/23/2015 9:29:07 PM -- Instance3068.5 has 0.1 for I/O Log Reads Average Latency.
6/23/2015 9:29:07 PM -- Instance3068.6 has 13.1 for I/O Database Reads Average Latency.
6/23/2015 9:29:07 PM -- Instance3068.6 has 0.1 for I/O Log Writes Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.6 has 0.1 for I/O Log Reads Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.7 has 14.9 for I/O Database Reads Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.7 has 0.1 for I/O Log Writes Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.7 has 0.1 for I/O Log Reads Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.8 has 15.8 for I/O Database Reads Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.8 has 0.1 for I/O Log Writes Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.8 has 0.1 for I/O Log Reads Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.9 has 15.2 for I/O Database Reads Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.9 has 0.1 for I/O Log Writes Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.9 has 0.1 for I/O Log Reads Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.10 has 16.0 for I/O Database Reads Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.10 has 0.1 for I/O Log Writes Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.10 has 0.1 for I/O Log Reads Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.11 has 15.3 for I/O Database Reads Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.11 has 0.1 for I/O Log Writes Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.11 has 0.1 for I/O Log Reads Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.12 has 16.3 for I/O Database Reads Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.12 has 0.1 for I/O Log Writes Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.12 has 0.1 for I/O Log Reads Average Latency.

6/23/2015 9:29:08 PM -- Instance3068.13 has 13.6 for I/O Database Reads Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.13 has 0.1 for I/O Log Writes Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.13 has 0.1 for I/O Log Reads Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.14 has 14.4 for I/O Database Reads Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.14 has 0.1 for I/O Log Writes Average Latency.
6/23/2015 9:29:08 PM -- Instance3068.14 has 0.1 for I/O Log Reads Average Latency.
6/23/2015 9:29:08 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.
6/23/2015 9:29:08 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
6/23/2015 9:29:08 PM -- C:\Jetstress Result\EXCH1\21T-Stress\Stress_2015_6_22_21_23_0.xml has 5747 samples queried.

C Database Backup Test Result Report

Microsoft Exchange Jetstress 2013

Database backup Test Result Report

Database Backup Statistics - All

Database Instance	Database Size (MBytes)	Elapsed Backup Time	MBytes Transferred/sec
Instance4672.1	916720.03	01:30:24	169.01
Instance4672.2	916712.03	01:37:41	156.40
Instance4672.3	916712.03	01:29:08	171.39
Instance4672.4	916720.03	01:37:18	157.02
Instance4672.5	916704.03	02:02:27	124.76
Instance4672.6	916696.03	01:26:24	176.83
Instance4672.7	916720.03	01:26:41	176.23
Instance4672.8	916704.03	01:35:12	160.48
Instance4672.9	916712.03	01:27:25	174.77
Instance4672.10	916712.03	01:34:57	160.88
Instance4672.11	916712.03	01:28:43	172.21
Instance4672.12	916712.03	01:34:50	161.10
Instance4672.13	916720.03	01:29:38	170.45
Instance4672.14	916712.03	01:37:04	157.40
Avg			163.49
Sum			2288.92

Jetstress System Parameters

Thread Count	21
Minimum Database Cache	448.0 MB
Maximum Database Cache	3584.0 MB
Insert Operations	40%
Delete Operations	20%
Replace Operations	5%
Read Operations	35%
Lazy Commits	70%

Database Configuration

Instance4672.1 Log path: D:\Log\Log-DB01
Database: D:\Database\DB01\Jetstress001001.edb

Instance4672.2 Log path: D:\Log\Log-DB02
Database: D:\Database\DB02\Jetstress002001.edb

Instance4672.3 Log path: E:\Log\Log-DB03
Database: E:\Database\DB03\Jetstress003001.edb

Instance4672.4 Log path: E:\Log\Log-DB04
Database: E:\Database\DB04\Jetstress004001.edb

Instance4672.5 Log path: F:\Log\Log-DB05
Database: F:\Database\DB05\Jetstress005001.edb

Instance4672.6 Log path: F:\Log\Log-DB06
Database: F:\Database\DB06\Jetstress006001.edb

Instance4672.7 Log path: G:\Log\Log-DB07
Database: G:\Database\DB07\Jetstress007001.edb

Instance4672.8 Log path: G:\Log\Log-DB08
Database: G:\Database\DB08\Jetstress008001.edb

Instance4672.9 Log path: H:\Log\Log-DB09
Database: H:\Database\DB09\Jetstress009001.edb

Instance4672.10 Log path: H:\Log\Log-DB10
Database: H:\Database\DB10\Jetstress010001.edb

Instance4672.11 Log path: I:\Log\Log-DB11
Database: I:\Database\DB11\Jetstress011001.edb

Instance4672.12 Log path: I:\Log\Log-DB12
Database: I:\Database\DB12\Jetstress012001.edb

Instance4672.13 Log path: J:\Log\Log-DB13
Database: J:\Database\DB13\Jetstress013001.edb

Instance4672.14 Log path: J:\Log\Log-DB14
Database: J:\Database\DB14\Jetstress014001.edb

Transactional I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance4672.1	2.506	0.000	678.844	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4672.2	2.591	0.000	625.529	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4672.3	2.481	0.000	686.009	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4672.4	2.474	0.000	628.474	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4672.5	2.994	0.000	498.909	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4672.6	2.089	0.000	707.340	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4672.7	2.654	0.000	706.083	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4672.8	2.448	0.000	642.291	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4672.9	2.463	0.000	701.340	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4672.10	2.429	0.000	644.046	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4672.11	2.537	0.000	689.733	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4672.12	2.409	0.000	644.821	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4672.13	2.497	0.000	682.179	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instance4672.14	2.572	0.000	629.635	0.000	262144.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	0.567	0.017	0.840
Available MBytes	93071.619	93061.000	93095.000
Free System Page Table Entries	16555911.316	16555708.000	16556179.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	125206880.525	125194240.000	125325312.000
Pool Paged Bytes	152477998.164	152428544.000	152649728.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

```
6/24/2015 6:59:38 AM -- Preparing for testing ...
6/24/2015 6:59:52 AM -- Attaching databases ...
6/24/2015 6:59:52 AM -- Preparations for testing are complete.
6/24/2015 7:00:08 AM -- Performance logging started (interval: 30000 ms).
6/24/2015 7:00:08 AM -- Backing up databases ...
6/24/2015 9:02:36 AM -- Performance logging has ended.
6/24/2015 9:02:36 AM -- Instance4672.1 (100% processed), Instance4672.2 (100% processed), Instance4672.3 (100% processed), Instance4672.4 (100% processed), Instance4672.5 (100% processed),
Instance4672.6 (100% processed), Instance4672.7 (100% processed), Instance4672.8 (100% processed), Instance4672.9 (100% processed), Instance4672.10 (100% processed), Instance4672.11 (100%
processed), Instance4672.12 (100% processed), Instance4672.13 (100% processed) and Instance4672.14 (100% processed)
6/24/2015 9:02:36 AM -- C:\Jetstress Result\EXCH1\21T-DBBackup\DatabaseBackup_2015_6_24_6_59_52.blg has 244 samples.
6/24/2015 9:02:36 AM -- Creating test report ...
```

D Soft Recovery test Result Report

Microsoft Exchange Jetstress 2013

SoftRecovery Test Result Report

Soft-Recovery Statistics - All

Database Instance	Log files replayed	Elapsed seconds
Instance5748.1	511	1331.5867442
Instance5748.2	516	1320.2046566
Instance5748.3	502	1408.7568992
Instance5748.4	507	1273.7315646
Instance5748.5	509	1416.2065187
Instance5748.6	510	1389.3419888
Instance5748.7	501	1363.5336234
Instance5748.8	507	1260.5948826
Instance5748.9	507	1427.3010682
Instance5748.10	513	1289.2610771
Instance5748.11	512	1360.4553622
Instance5748.12	508	1262.6484209
Instance5748.13	507	1358.640006
Instance5748.14	515	1344.4371941
Avg	508	1343.336
Sum	7125	18806.7000066

Database Configuration

Instance5748.1 Log path: D:\Log\Log-DB01
Database: D:\Database\DB01\Jetstress001001.edb

Instance5748.2 Log path: D:\Log\Log-DB02
Database: D:\Database\DB02\Jetstress002001.edb

Instance5748.3 Log path: E:\Log\Log-DB03
Database: E:\Database\DB03\Jetstress003001.edb

Instance5748.4 Log path: E:\Log\Log-DB04
Database: E:\Database\DB04\Jetstress004001.edb

Instance5748.5 Log path: F:\Log\Log-DB05
Database: F:\Database\DB05\Jetstress005001.edb

Instance5748.6 Log path: F:\Log\Log-DB06
Database: F:\Database\DB06\Jetstress006001.edb

Instance5748.7 Log path: G:\Log\Log-DB07
Database: G:\Database\DB07\Jetstress007001.edb

Instance5748.8 Log path: G:\Log\Log-DB08
Database: G:\Database\DB08\Jetstress008001.edb

Instance5748.9 Log path: H:\Log\Log-DB09
Database: H:\Database\DB09\Jetstress009001.edb

Instance5748.10 Log path: H:\Log\Log-DB10
Database: H:\Database\DB10\Jetstress010001.edb

Instance5748.11 Log path: I:\Log\Log-DB11
Database: I:\Database\DB11\Jetstress011001.edb

Instance5748.12 Log path: I:\Log\Log-DB12
Database: I:\Database\DB12\Jetstress012001.edb

Instance5748.13 Log path: J:\Log\Log-DB13
Database: J:\Database\DB13\Jetstress013001.edb

Instance5748.14 Log path: J:\Log\Log-DB14
Database: J:\Database\DB14\Jetstress014001.edb

Transactional I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance5748.1	27.309	7.101	158.672	1.534	38627.906	32768.000	5.594	0.000	1.918	0.000	209723.337	0.000
Instance5748.2	26.695	6.634	161.077	1.563	38680.571	32768.000	9.899	0.000	1.954	0.000	209728.760	0.000
Instance5748.3	29.577	6.772	148.391	1.422	38628.332	32580.218	8.967	0.000	1.778	0.000	208520.799	0.000
Instance5748.4	26.528	6.563	165.283	1.591	38640.042	32768.000	11.034	0.000	1.989	0.000	209721.557	0.000
Instance5748.5	30.471	6.814	148.368	1.437	38472.879	32768.000	7.135	0.000	1.796	0.000	209727.976	0.000
Instance5748.6	28.974	7.672	151.860	1.463	38671.405	32768.000	14.829	0.000	1.829	0.000	209658.954	0.000
Instance5748.7	27.685	6.924	153.830	1.466	38626.490	32574.107	10.363	0.000	1.832	0.000	208447.480	0.000
Instance5748.8	26.244	7.245	166.457	1.607	38543.241	32768.000	11.949	0.000	2.008	0.000	209653.565	0.000
Instance5748.9	29.969	6.837	146.811	1.415	38603.520	32768.000	8.655	0.000	1.768	0.000	209770.454	0.000
Instance5748.10	26.976	7.240	164.378	1.590	38509.598	32768.000	11.363	0.000	1.988	0.000	209587.559	0.000
Instance5748.11	27.315	6.839	155.361	1.502	38717.160	32768.000	9.000	0.000	1.878	0.000	209712.422	0.000
Instance5748.12	25.611	6.557	168.266	1.608	38539.310	32768.000	11.904	0.000	2.017	0.000	209741.887	0.000
Instance5748.13	27.838	6.844	155.463	1.489	38604.928	32670.476	6.970	0.000	1.861	0.000	209075.751	0.000
Instance5748.14	26.879	6.987	159.580	1.529	38563.841	32669.598	13.345	0.000	1.912	0.000	209030.132	0.000

Background Database Maintenance I/O Performance

MSExchange Database ==> Instances	Database Maintenance IO Reads/sec	Database Maintenance IO Reads Average Bytes
Instance5748.1	0.000	0.000
Instance5748.2	0.000	0.000
Instance5748.3	0.000	0.000
Instance5748.4	0.000	0.000
Instance5748.5	0.000	0.000
Instance5748.6	0.000	0.000
Instance5748.7	0.000	0.000
Instance5748.8	0.000	0.000
Instance5748.9	0.000	0.000

Instance5748.10	0.000	0.000
Instance5748.11	0.000	0.000
Instance5748.12	0.000	0.000
Instance5748.13	0.000	0.000
Instance5748.14	0.000	0.000

Total I/O Performance

MSExchange Database ==> Instances	I/O Database Reads Average Latency (msec)	I/O Database Writes Average Latency (msec)	I/O Database Reads/sec	I/O Database Writes/sec	I/O Database Reads Average Bytes	I/O Database Writes Average Bytes	I/O Log Reads Average Latency (msec)	I/O Log Writes Average Latency (msec)	I/O Log Reads/sec	I/O Log Writes/sec	I/O Log Reads Average Bytes	I/O Log Writes Average Bytes
Instance5748.1	27.309	7.101	158.672	1.534	38627.906	32768.000	5.594	0.000	1.918	0.000	209723.337	0.000
Instance5748.2	26.695	6.634	161.077	1.563	38680.571	32768.000	9.899	0.000	1.954	0.000	209728.760	0.000
Instance5748.3	29.577	6.772	148.391	1.422	38628.332	32580.218	8.967	0.000	1.778	0.000	208520.799	0.000
Instance5748.4	26.528	6.563	165.283	1.591	38640.042	32768.000	11.034	0.000	1.989	0.000	209721.557	0.000
Instance5748.5	30.471	6.814	148.368	1.437	38472.879	32768.000	7.135	0.000	1.796	0.000	209727.976	0.000
Instance5748.6	28.974	7.672	151.860	1.463	38671.405	32768.000	14.829	0.000	1.829	0.000	209658.954	0.000
Instance5748.7	27.685	6.924	153.830	1.466	38626.490	32574.107	10.363	0.000	1.832	0.000	208447.480	0.000
Instance5748.8	26.244	7.245	166.457	1.607	38543.241	32768.000	11.949	0.000	2.008	0.000	209653.565	0.000
Instance5748.9	29.969	6.837	146.811	1.415	38603.520	32768.000	8.655	0.000	1.768	0.000	209770.454	0.000
Instance5748.10	26.976	7.240	164.378	1.590	38509.598	32768.000	11.363	0.000	1.988	0.000	209587.559	0.000
Instance5748.11	27.315	6.839	155.361	1.502	38717.160	32768.000	9.000	0.000	1.878	0.000	209712.422	0.000
Instance5748.12	25.611	6.557	168.266	1.608	38539.310	32768.000	11.904	0.000	2.017	0.000	209741.887	0.000
Instance5748.13	27.838	6.844	155.463	1.489	38604.928	32670.476	6.970	0.000	1.861	0.000	209075.751	0.000
Instance5748.14	26.879	6.987	159.580	1.529	38563.841	32669.598	13.345	0.000	1.912	0.000	209030.132	0.000

Host System Performance

Counter	Average	Minimum	Maximum
% Processor Time	0.299	0.000	0.763
Available MBytes	89488.333	89257.000	92899.000
Free System Page Table Entries	16555721.085	16555182.000	16556032.000
Transition Pages RePurposed/sec	0.000	0.000	0.000
Pool Nonpaged Bytes	126534858.486	126427136.000	126656512.000
Pool Paged Bytes	153560833.446	153481216.000	153821184.000
Database Page Fault Stalls/sec	0.000	0.000	0.000

Test Log

```
6/24/2015 10:40:34 AM -- Preparing for testing ...
6/24/2015 10:40:48 AM -- Attaching databases ...
6/24/2015 10:40:48 AM -- Preparations for testing are complete.
6/24/2015 10:40:48 AM -- Starting transaction dispatch ..
6/24/2015 10:40:48 AM -- Database cache settings: (minimum: 448.0 MB, maximum: 3.5 GB)
6/24/2015 10:40:48 AM -- Database flush thresholds: (start: 35.8 MB, stop: 71.7 MB)
6/24/2015 10:41:02 AM -- Database read latency thresholds: (average: 20 msec/read, maximum: 100 msec/read).
6/24/2015 10:41:02 AM -- Log write latency thresholds: (average: 10 msec/write, maximum: 100 msec/write).
6/24/2015 10:41:04 AM -- Operation mix: Sessions 21, Inserts 40%, Deletes 20%, Replaces 5%, Reads 35%, Lazy Commits 70%.
6/24/2015 10:41:04 AM -- Performance logging started (interval: 15000 ms).
6/24/2015 10:41:04 AM -- Generating log files ...
6/24/2015 1:18:48 PM -- D:\Log\Log-DB01 (102.2% generated), D:\Log\Log-DB02 (103.2% generated), E:\Log\Log-DB03 (100.4% generated), E:\Log\Log-DB04 (101.4% generated), F:\Log\Log-DB05
(101.8% generated), F:\Log\Log-DB06 (102.0% generated), G:\Log\Log-DB07 (100.2% generated), G:\Log\Log-DB08 (101.4% generated), H:\Log\Log-DB09 (101.4% generated), H:\Log\Log-DB10
(102.4% generated), I:\Log\Log-DB11 (102.4% generated), I:\Log\Log-DB12 (101.6% generated), J:\Log\Log-DB13 (101.4% generated) and J:\Log\Log-DB14 (103.0% generated)
6/24/2015 1:18:48 PM -- Performance logging has ended.
6/24/2015 1:18:48 PM -- JetInterop batch transaction stats: 17039, 17039, 17039, 17039, 17039, 17039, 17039, 17039, 17039, 17039, 17039, 17039, 17039 and 17038.
6/24/2015 1:18:48 PM -- Dispatching transactions ends.
6/24/2015 1:18:48 PM -- Shutting down databases ...
6/24/2015 1:19:12 PM -- Instance5748.1 (complete), Instance5748.2 (complete), Instance5748.3 (complete), Instance5748.4 (complete), Instance5748.5 (complete), Instance5748.6 (complete),
Instance5748.7 (complete), Instance5748.8 (complete), Instance5748.9 (complete), Instance5748.10 (complete), Instance5748.11 (complete), Instance5748.12 (complete), Instance5748.13 (complete)
and Instance5748.14 (complete)
6/24/2015 1:19:12 PM -- C:\Jetstress Result\EXCH1\21T-SoftRecovery\Performance_2015_6_24_10_41_2.blg has 630 samples.
6/24/2015 1:19:12 PM -- Creating test report ...
6/24/2015 1:19:16 PM -- Instance5748.1 has 14.1 for I/O Database Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.1 has 0.1 for I/O Log Writes Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.1 has 0.1 for I/O Log Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.2 has 13.9 for I/O Database Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.2 has 0.1 for I/O Log Writes Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.2 has 0.1 for I/O Log Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.3 has 16.2 for I/O Database Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.3 has 0.1 for I/O Log Writes Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.3 has 0.1 for I/O Log Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.4 has 15.7 for I/O Database Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.4 has 0.1 for I/O Log Writes Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.4 has 0.1 for I/O Log Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.5 has 15.1 for I/O Database Reads Average Latency.

6/24/2015 1:19:16 PM -- Instance5748.5 has 0.1 for I/O Log Writes Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.5 has 0.1 for I/O Log Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.6 has 13.9 for I/O Database Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.6 has 0.1 for I/O Log Writes Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.6 has 0.1 for I/O Log Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.7 has 15.9 for I/O Database Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.7 has 0.1 for I/O Log Writes Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.7 has 0.1 for I/O Log Reads Average Latency.
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6/24/2015 1:19:16 PM -- Instance5748.8 has 15.6 for I/O Database Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.8 has 0.1 for I/O Log Writes Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.8 has 0.1 for I/O Log Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.9 has 15.9 for I/O Database Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.9 has 0.1 for I/O Log Writes Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.9 has 0.1 for I/O Log Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.10 has 15.4 for I/O Database Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.10 has 0.1 for I/O Log Writes Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.10 has 0.1 for I/O Log Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.11 has 15.8 for I/O Database Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.11 has 0.1 for I/O Log Writes Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.11 has 0.1 for I/O Log Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.12 has 15.4 for I/O Database Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.12 has 0.1 for I/O Log Writes Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.12 has 0.1 for I/O Log Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.13 has 14.2 for I/O Database Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.13 has 0.1 for I/O Log Writes Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.13 has 0.1 for I/O Log Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.14 has 13.8 for I/O Database Reads Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.14 has 0.1 for I/O Log Writes Average Latency.
6/24/2015 1:19:16 PM -- Instance5748.14 has 0.1 for I/O Log Reads Average Latency.
6/24/2015 1:19:16 PM -- Test has 0 Maximum Database Page Fault Stalls/sec.
6/24/2015 1:19:16 PM -- The test has 0 Database Page Fault Stalls/sec samples higher than 0.
6/24/2015 1:19:16 PM -- C:\Jetstress Result\EXCH1\21T-SoftRecovery\Performance_2015_6_24_10_41_2.xml has 629 samples queried.
6/24/2015 1:19:16 PM -- C:\Jetstress Result\EXCH1\21T-SoftRecovery\Performance_2015_6_24_10_41_2.html was saved.
6/24/2015 1:19:17 PM -- Performance logging started (interval: 4000 ms).
6/24/2015 1:19:17 PM -- Recovering databases ...
6/24/2015 1:43:05 PM -- Performance logging has ended.
6/24/2015 1:43:05 PM -- Instance5748.1 (1331.5867442), Instance5748.2 (1320.2046566), Instance5748.3 (1408.7568992), Instance5748.4 (1273.7315646), Instance5748.5 (1416.2065187), Instance5748.6 (1389.3419888), Instance5748.7 (1363.5336234), Instance5748.8 (1260.5948826), Instance5748.9 (1427.3010682), Instance5748.10 (1289.2610771), Instance5748.11 (1360.4553622), Instance5748.12 (1262.6484209), Instance5748.13 (1358.640006) and Instance5748.14 (1344.4371941)
6/24/2015 1:43:06 PM -- C:\Jetstress Result\EXCH1\21T-SoftRecovery\SoftRecovery_2015_6_24_13_19_16.blg has 354 samples.
6/24/2015 1:43:06 PM -- Creating test report ...