Microsoft Exchange 2010 on Dell Systems

Small and Branch Office Configurations

Solutions for 50 to 1,000 Mailboxes

November 2010

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1 Introduction

1.1 Overview

This Microsoft® Exchange 2010 solution architecture manual contains possible configurations that can be used to architect your Exchange 2010 infrastructure. Samples in the manual are intended to serve as a blueprint or example for organizations whose requirements are similar. Each organization's requirements can differ significantly, though, and include items not accounted for in these configurations (e.g. message hygiene or third party archiving). For a configuration sized to your specific requirements, please contact your Dell representative or use the Dell Exchange 2010 Advisor tool at Dell.com/Exchange.

1.2 Finding Your Solution

Sample configurations for Microsoft Exchange on Dell server and storage hardware are provided in three manuals available from the Dell.com/Exchange landing page to help you find an appropriate solution for your needs. The three documents, which correspond to the three Dell Exchange 2010 architecture models, each contain multiple configurations of varying sizes, requirements and hardware choices.

- Small and Branch Office Model (this manual): Configurations ideal for small and branch offices with up to 1,000 mailboxes.
- Simple Distributed Model: Configurations that are streamlined, dedicated to Exchange, use internal server storage or direct-attached storage (DAS) and take the most advantage of the new high availability (HA) and replication features of Exchange 2010.
- Agile Consolidated Model: Configurations optimized for a shared, consolidated, and possible virtualized infrastructure.

1.3 About the Small and Branch Office Model

These configurations have been designed for organizations or for branch offices of up to 1,000 mailboxes. This model leverages tower or rack servers such as the Dell™ PowerEdge™ T610 to help provide reliable, fully redundant Exchange Server 2010 solutions at a reduced cost. Only internal storage is required and at most two servers (for high availability). Some are virtualized to take advantage of Network Load Balancing (NLB) where the cost of a hardware-based IP load balancer might be prohibitive (needed for client access server (CAS) redundancy). A few of the configurations are single server only (no high availability) for organizations that are very cost conscious.

1.4 Hardware

Sample solutions described in this manual use the following Dell equipment:

- PowerEdge T310
- PowerEdge T410
- PowerEdge R510
- PowerEdge T610

Click on the links to the product landing pages for additional information on each product.

1.5 Virtualization

Those configurations that employ hardware virtualization software assume a platform approved via Microsoft's Server Virtualization Validation Program and deployed consistent with Microsoft's published support guidelines for running Microsoft Exchange Server 2010 on a virtualization platform. The sizing recommendations in this document are based on testing done on various versions of Microsoft® Hyper-V™ and VMware® vSphere™ (including VMware ESX® or VMware ESXi™).

2 50 Mailboxes on PowerEdge T310

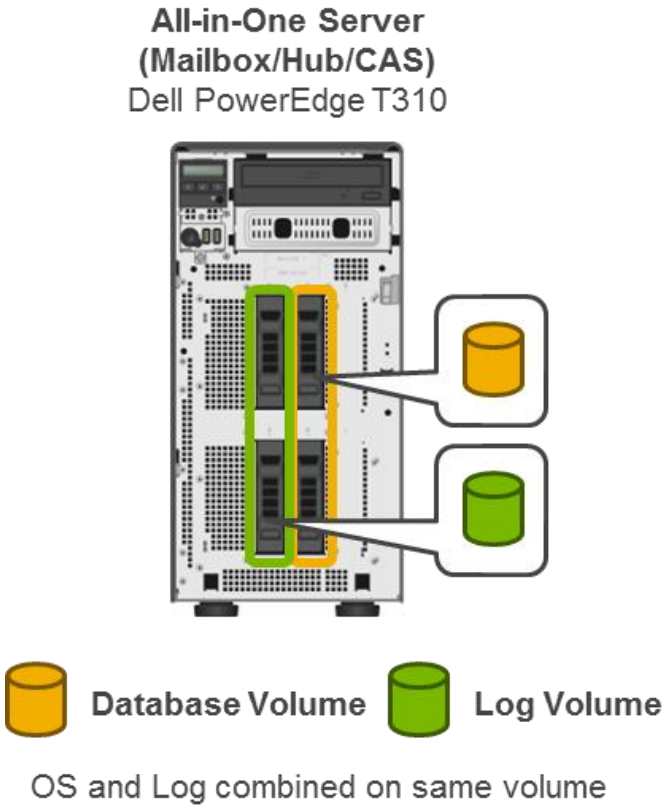
2.1 Solution Requirements

Number of mailboxes	50
Average user I/O profile (messages/day)	.24 IOPS (~200 messages/day)
Average mailbox size limit	4GB
Not included in this solution	High availability Site resiliency UM or Edge roles No backup and Recovery infrastructure

2.2 Recommended Solution

Server Configurations	**Detail**
All-in-one (Mailbox/Hub/CAS) server	1x PowerEdge T310 server 1x quad-core processor and 16GB RAM
Storage Configuration	**Detail**
Database volume	2x 3.5” 10K rpm SAS 600GB drives in RAID 1
Databases	1
Mailboxes per database	50
Log volume	2x 3.5” 10K rpm SAS 600GB drives in RAID 1
Additional details	OS and logs combined on same volume 45% additional storage space available RAID stripe or element size = 128KB or larger NTFS allocation unit size = 64KB for both database and logs

2.3 Architecture Diagram



3 200 Mailboxes on PowerEdge T410

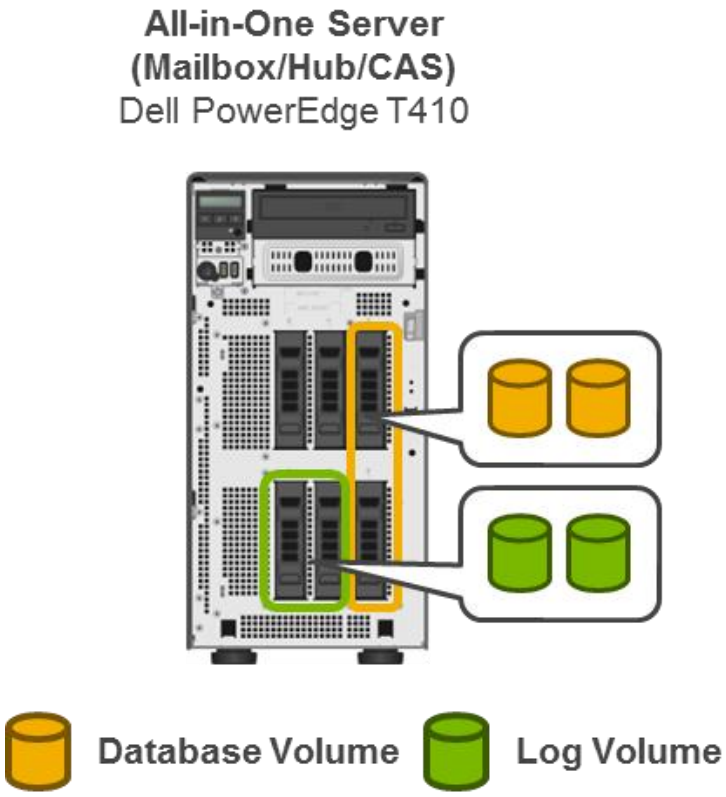
3.1 Solution Requirements

Number of mailboxes	200
Average user I/O profile (messages/day)	.18 IOPS (~150 messages/day)
Average mailbox size limit	4GB
Not included in this solution	High availability UM or Edge roles Backup and recovery infrastructure

3.2 Recommended Solution

Server Configurations	**Detail**
All-in-one (Mailbox/Hub/CAS) server	1x PowerEdge T410 server 2x dual-core processors and 16GB of RAM
Storage Configuration	**Detail**
Database volume	2x 3.5” NL-SAS 2TB drives RAID 1
Databases	2
Mailboxes per database	100
Log volume	2x 3.5” NL-SAS 500GB drives RAID 1
Additional details	Data and logs separate 40% estimated additional storage space available RAID stripe or element size = 128KB or larger NTFS allocation unit size = 64KB for both database and logs

3.3 Architecture Diagram



4 500 Mailboxes on PowerEdge R510 (No High Availability)

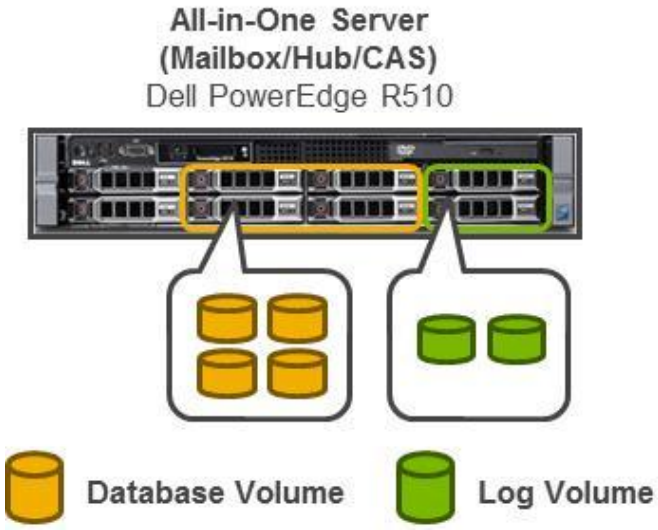
4.1 Solution Requirements

Number of mailboxes	500
Average user I/O profile (messages/day)	.24 IOPS (~200 messages/day)
Average mailbox size limit	5GB
Not included in this solution	High availability UM or Edge roles Backup and recovery infrastructure

4.2 Recommended Solution

Server Configurations	**Detail**
All-in-one (Mailbox/Hub/CAS) server	1x PowerEdge R510 server w/ 8 HDDs 2x quad-core processors and 24GB of RAM
Storage Configuration	**Detail**
Database volume	4x 3.5" NL-SAS 2TB drives RAID 10
Databases	4
Mailboxes per database	125
Log volume	2x 3.5" NL-SAS 500GB drives RAID 1
Additional details	RAID stripe or element size = 128KB or larger NTFS Allocation unit size = 64KB for both database and logs

4.3 Architecture Diagram



5 500 Mailboxes on PowerEdge R510 (High Availability)

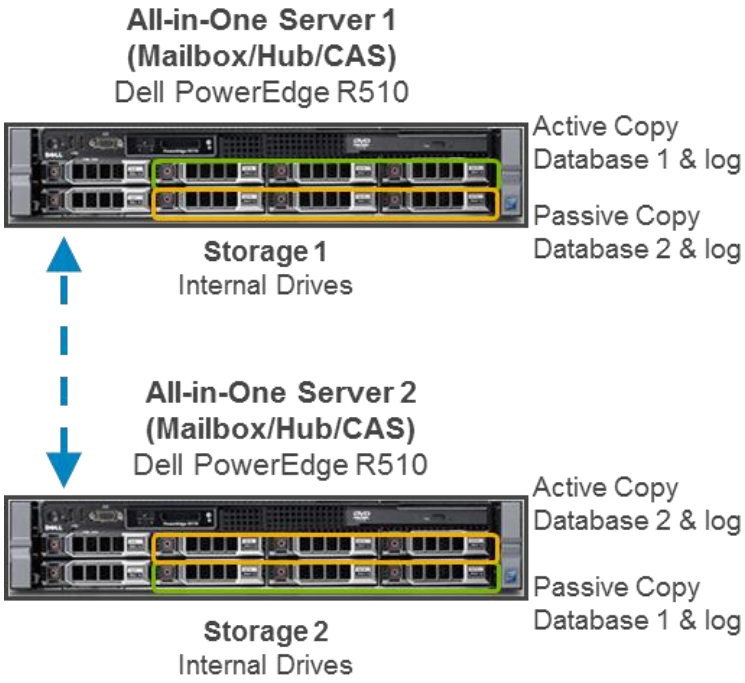
5.1 Solution Requirements

Number of mailboxes	500
Average user I/O profile (messages/day)	.14 IOPS (~160 messages/day)
Average mailbox size limit	4GB
Total active/passive copies per database	2
Not included in this solution	Backup and recovery infrastructure Disaster recovery or site resiliency UM and Edge roles

5.2 Recommended Solution

Server Configurations	**Detail**
All-in-one (Mailbox/Hub/CAS) server	2x PowerEdge R510 servers with 8 HDDs 2x dual-core processors and 12 GB of RAM
Number of DAGs	1
Servers per DAG	2
Number of Active and Passive Mailboxes per Server	250 active + 250 passive
Storage Configuration	**Detail**
Storage target	2x PowerEdge R510 servers' internal drives 8 HDDs per R510—16 drives total (4 for OS only)
Data volumes per mailbox server	2
Databases per volume	1
Mailboxes per database	250
Disk type	3x 3.5" NL-SAS 1TB per volume
RAID type	RAID 5
Additional details	Databases and logs combined 25% est. capacity for growth NTFS allocation unit size = 64KB for database and logs RAID stripe or element size = 256KB

5.3 Architecture Diagram



6 500 Mailboxes on PowerEdge T610

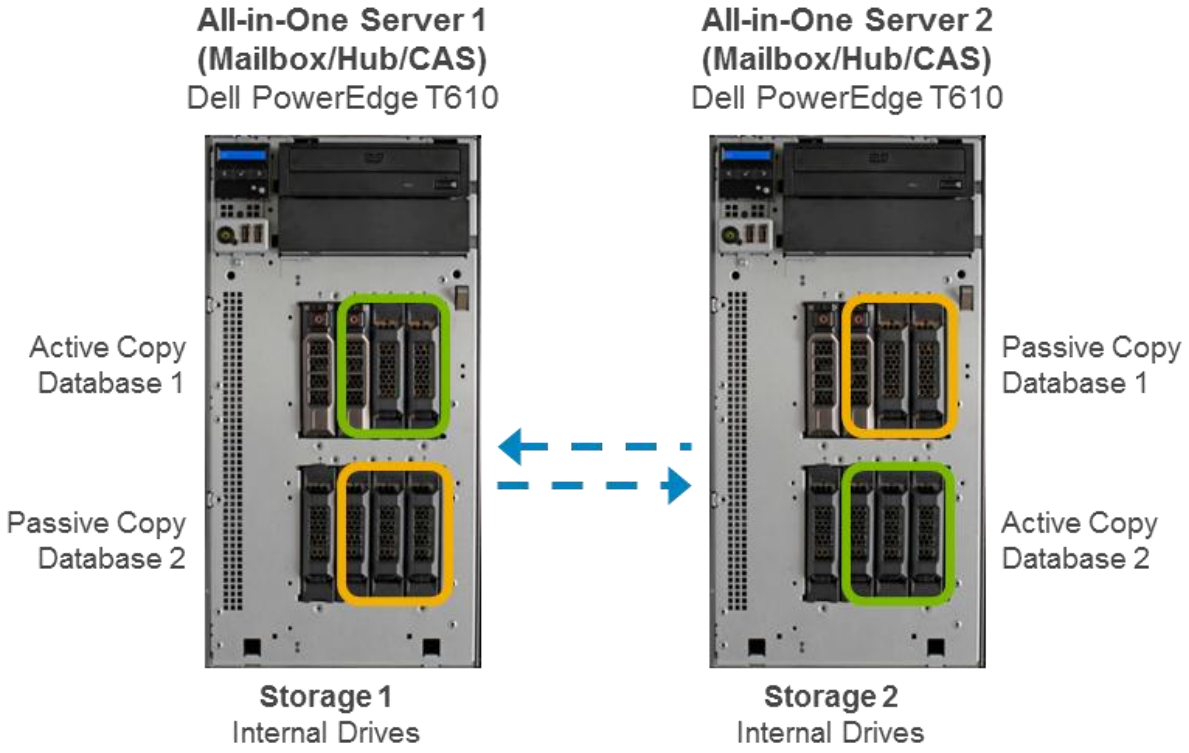
6.1 Solution Requirements

Number of mailboxes	500
Average user I/O profile (messages/day)	.14 IOPS (~160 messages/day)
Average mailbox size limit	2GB
Total active/passive copies per database	2
Not included in this solution	Backup and recovery infrastructure Disaster recovery or site resiliency UM and Edge roles

6.2 Recommended Solution

Server Configurations	**Detail**
All-in-one (Mailbox/Hub/CAS) server	2x PowerEdge T610 servers 2x dual-core processors and 12 GB of RAM
Number of DAGs	1
Servers per DAG	2
Number of Active and Passive Mailboxes per Server	250 active + 250 passive
Storage Configuration	**Detail**
Storage target	2x PowerEdge T610 servers' internal drives 8x drives each—16 drives total (4x for OS)
Data volumes per mailbox server	2
Databases per volume	1
Mailboxes per database	250
Disk type	3x 3.5" NL-SAS 750GB drives per volume
RAID type	RAID 5
Additional details	Databases and logs combined 46% estimated capacity for growth RAID stripe or element size = 256KB NTFS allocation unit size = 64KB

6.3 Architecture Diagram



7 500 Mailboxes on PowerEdge T610 Virtualized

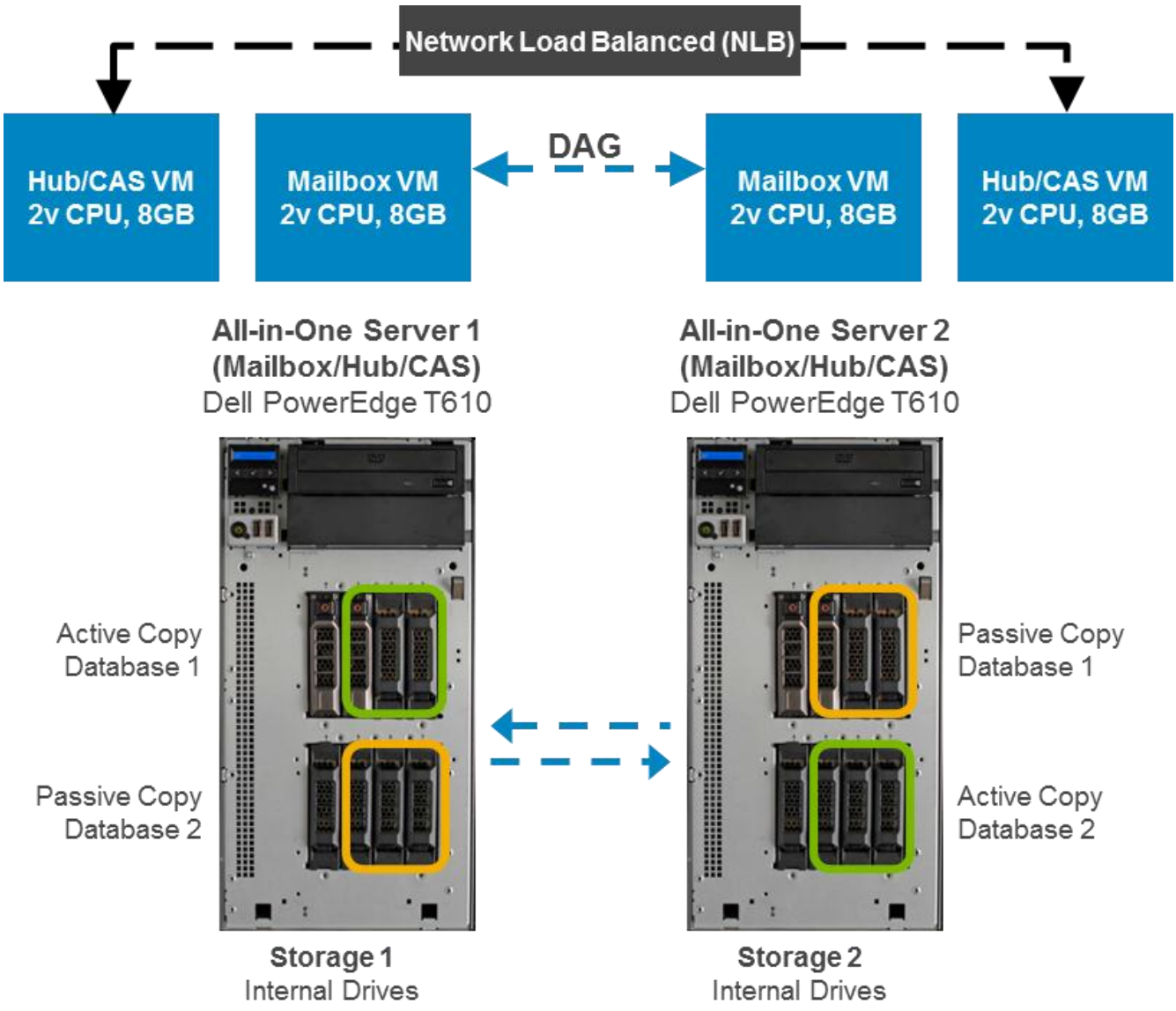
7.1 Solution Requirements

Number of mailboxes	500
Average user I/O profile (messages/day)	.14 IOPs (~160 messages/day)
Average mailbox size limit	4GB
Total active/passive copies per database	2
Not included in this solution	Backup and recovery infrastructure Disaster recovery or site resiliency UM and Edge roles

7.2 Recommended Solution

Server Configurations	**Detail**
Virtualization server(s)	2x PowerEdge T610 servers 2x dual-core processors and 18GB of RAM
Mailbox server virtual machine (VM)	1x VM per PowerEdge T610 server 2x vCPU and 8GB virtual memory each
Number of database availability groups (DAGs)	1
Mailbox server VMs per DAG	2
Number of active and passive mailboxes per mailbox server VM	250 active + 250 passive
Hub/CAS server VM	1x VM per PowerEdge T610 server 2x vCPU and 8GB of virtual memory each
Storage Configuration	**Detail**
Hardware	2x PowerEdge T610 servers' internal storage 8x drives each, 16x total drives (4x for OS)
Data volumes per mailbox server	2
Databases per volume	1
Mailboxes per database	250
Disk type	3x 3.5" Nearline SAS 1TB drives per volume
RAID type	RAID 5
Additional details	Databases and logs combined 15% estimated capacity for growth NTFS allocation unit size = 64KB RAID stripe or element size = 256KB

7.3 Architecture Diagram



8 1,000 Mailboxes on PowerEdge T610

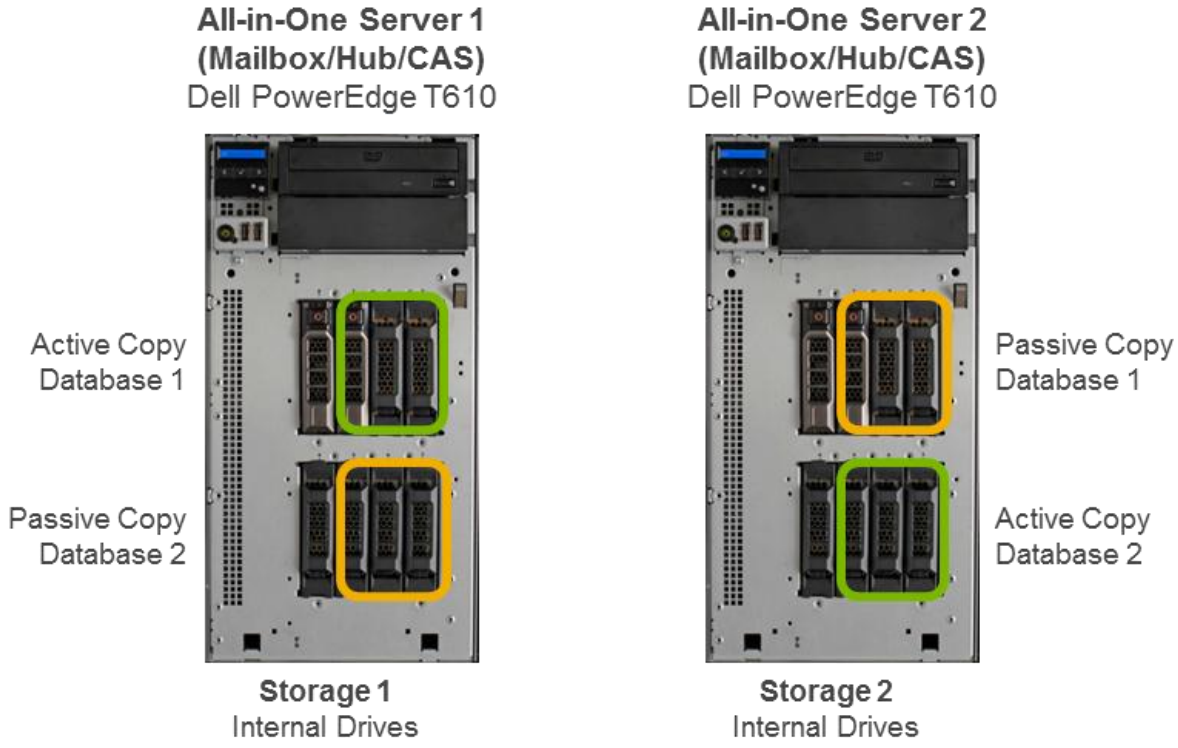
8.1 Solution Requirements

Number of mailboxes	1,000
Average user I/O profile (messages/day)	.14 IOPS (~160 messages/day)
Average mailbox size limit	1GB
Total active/passive copies per database	2
Not included in this solution	Backup and recovery infrastructure Disaster recovery or site resiliency UM or Edge roles

8.2 Recommended Solution

Server Configurations	**Detail**
All-in-one (Mailbox/Hub/CAS) server	2x PowerEdge T610 servers with 8 HDD 2x dual-core processors and 24GB of RAM
Number of DAGs	1
Servers per DAG	2
Number of Active and Passive Mailboxes per Server	500 active and 500 passive
Storage Configuration	**Detail**
Storage target	2x PowerEdge T610 servers' internal drives 8 HDDs per server—16 total drives (4 for OS)
Data volumes per mailbox server	2
Databases per volume	1
Mailboxes per database	500
Disk type	3x 3.5" SAS 10K RPM 600GB
RAID type	RAID 5
Additional details	Databases and logs combined 25% estimated capacity for growth NTFS allocation unit size = 64KB RAID stripe or element size = 256KB

8.3 Architecture Diagram



9 1,000 Mailboxes on PowerEdge R510

9.1 Solution Requirements

Number of mailboxes	1,000
Average user I/O profile (messages/day)	.14 IOPS (~160 messages/day)
Average mailbox size limit	1GB
Total active/passive copies per database	2
Not included in this solution	Backup and recovery infrastructure Disaster recovery or site resiliency UM or Edge roles

9.2 Recommended Solution

Server Configurations	**Detail**
All-in-one (Mailbox/Hub/CAS) server	2x PowerEdge R510 servers with 8 HDD, dual-core processors, and 24GB of RAM
Number of DAGs	1
Servers per DAG	2
Number of Active and Passive Mailboxes per Server	500 active and 500 passive
Storage Configuration	**Detail**
Storage target	2x PowerEdge R510 servers' internal drives 8x drives per server; 16x drives total (4x for OS)
Data volumes per mailbox server	2
Databases per volume	1
Mailboxes per database	500
Disk type	3x 3.5" 10K RPM SAS 600GB
RAID type	RAID 5
Additional details	Databases and logs combined 25% estimated capacity for growth NTFS allocation unit size = 64KB RAID stripe or element size = 256KB

9.3 Architecture Diagram