



HP recommended configuration for Microsoft Exchange Server 2010: ProLiant DL370 G6 supporting 1000 - 2GB mailboxes

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Executive summary

With the release of Microsoft® Exchange Server 2010 (Exchange 2010) there are many new design features and configuration options to consider. To better understand how to deploy these new features with HP servers and storage, HP has developed a series of recommended configurations. The recommended configurations provide sizing guidance and deployment options to support the new Exchange 2010 solutions. The configurations described in this guide are meant to assist you in designing solutions that address your email business requirements.

The recommended configurations provide several design options following HP's tiered solutions matrix for Microsoft Exchange 2010. The tiered solution matrix provides recommended configurations that have been designed to support various service levels requirements. The service level requirements range from supporting basic mailbox services to deploying highly available solutions.

This recommended configuration white paper details solutions based on two of the tiered solutions levels, the bronze and silver tiers, and incorporates server and storage guidelines to support the new availability features of Exchange 2010.

This recommended configuration document details solutions based on two of the tiered solutions levels, bronze and silver. The bronze tier is designed using a single Exchange server and is focused on lower cost mailboxes. The silver tier is designed to provide increased availability by providing server redundancy, but also limits cost by consolidating key Exchange 2010 roles onto two servers.

The recommended configuration has been sized to support 1000 users, with 2GB mailboxes, hosted on HP ProLiant DL370 G6 server using internal storage. The recommended configuration provides two disk configuration options, using either Midline Serial ATA (MDL-SATA) or Serial Attached SCSI (SAS) disks. The DL370 G6 server is optimized for internal storage and is ideal building block platform for hosting large numbers of Exchange 2010 mailboxes. The DL370 G6 is also offered as the ML370 G6 in an expandable tower chassis, ideal for remote office locations.

Target audience: The information contained in this white paper is intended for solutions architects, engineers, and project managers involved in the planning and design of Microsoft Exchange Server 2010 solutions. The reader should be familiar with Exchange Server 2010 terminology and best practices. For additional Exchange Server best practices go to:

www.hp.com/solutions/activeanswers/exchange.

This white paper describes sizing performed in September 2009 on the pre-released version of Exchange Server 2010 and is subject to change.

Introduction

The recommended configurations described in this document provide server and storage sizing details to assist you in planning and budgeting for your Exchange 2010 hardware deployments. Details in this recommended configuration provide server and storage requirements to support 1000 mailboxes. Two configurations will be detailed; the first is configured for basic mailbox services using a standalone server configured and the second with increased availability features. The silver tier uses the new Exchange 2010 Database Availability Group (DAG) availability feature.

The DAG replication model supports both (unplanned) failovers and (administrator initiated) switchovers at the database level, unlike CCR (Cluster Continuous Replication) which requires the entire server to be failed over. The DAG concept also integrates the SCR (Standby Continuous Replication) multi-server database replication process but enhances it with the new active manager component. The active manager monitors all of the active databases within a DAG and in the event of a database failure, determines which of the database copies to make the active copy. The DAG availability feature also supports combining the Hub Transport (HT) and Client Access Server (CAS) roles on to the Mailbox server. Unlike CCR which supports only the mailbox role, the DAG configuration removes the cluster limitations and allows multi-role configurations.

In addition to the new replication model, Microsoft has made significant improvements in Exchange 2010 database disk I/O. Some of the key improvements in the Extensible Storage Engine (ESE) database include moving from bursty smaller data I/O patterns in Exchange 2007 to larger less frequent data I/O transfers in Exchange 2010. The database page size has also been increased to improve database cache read performance along with more sequential database writes. These new database I/O changes allow for new storage configurations to be supported which were generally not feasible in Exchange 2007. These new storage configurations are targeted at reducing the overall storage costs; however it is important to match the storage configuration with the appropriate availability and service level options.

The recommended configurations follow the tiered solution matrix which matches server and storage configurations options with different levels of availability in Exchange 2010 to meet different service level requirements. Solutions provided in this recommended configuration document will detail storage solutions configured with MDL-SATA Large Form Factor (LFF) and SAS LFF and SAS Small Form Factor (SFF) disks.

Tiered solution matrix

HP has developed the tiered solutions matrix for Exchange to provide guidance on building Exchange 2010 solutions to meet different Exchange service levels and business requirements. Solutions range from basic mailbox services on HP's entry level server and storage platforms to highly available configurations, built with HP's enterprise server and storage platforms. The HP tiered solutions matrix matches server and storage hardware components and configurations along with the appropriate Exchange 2010 availability features for each of the given tiers. There are four tiers in the matrix: bronze, silver, gold and platinum. These tiers provide guidance in matching different mailbox service levels with appropriate HP server and storage configurations.

The bronze tier is designed for deployments where cost is a driving factor. This tier provides basic services without the additional cost of high availability and is targeted towards smaller, cost-sensitive deployments. The bronze tier uses an all-in-one approach by combining each of the primary Exchange roles Mailbox (MB), Hub Transport (HT) and the Client Access Server (CAS) on to a single server. The silver tier is targeted towards smaller environments supporting sensitive users with limited IT budgets. For increased availability, the silver tier provides support for database replication using DAGs, but limits costs by combining the Exchange roles using the all-in-one approach with two servers. The gold tier is targeted towards a wide range of customer scenarios from small to large

organizations needing a high level of data protection and availability for their important users. This tier expands the servers and storage high availability options along with dedicated Exchange server roles. The highest level in the tiered solutions matrix is the platinum tier which is targeted towards enterprise deployments requiring the highest levels of data protection for their most critical users. The Platinum tier builds on the gold tier offering additional database copies and new storage options including RAID-less JBOD¹ with enterprise server and storage hardware with Exchange's high availability features.

Table 1 lists the details of each of the different tiers of service.

Table 1. Tiers of service

Tiers of service	Data Availability Group	Database copies	Combined Exchange roles	Disk types	Storage type	Combined LOG and Database LUN
Bronze	No	1	MB/HT/CAS	SAS/MDL-SATA	RAID	No
Silver	Yes	2	MB/HT/CAS	SAS/MDL-SATA	RAID	No
Gold	Yes	2	Dedicated	FC/SAS/MDL-SATA	RAID	No
Platinum	Yes	3	Dedicated	FC/ SAS/MDL-SATA	RAID/ JBOD	YES/JBOD

Solution criteria

The recommended configurations have been sized using the ProLiant ML/DL370 G6 server configured with internal storage. The recommended configurations are detailed using bronze and silver tiered solutions. The bronze tier configuration has been sized to provide a standalone server with combined Exchange server roles. The silver tier builds on the bronze tier by adding a second server providing increased availability using the Exchange 2010 DAG feature. The solutions have been sized to support 1000 users with a 2GB mailbox and an Exchange 2010 heavy usage profile².

The bronze tier server configuration (standalone server)

- 1 server with combined MB/HT/CAS

The silver tier server configurations (2 database copies)

- 2 servers with combined MB/HT/CAS configured in a DAG

The new HP ProLiant DL370 G6 is offered in tower (ML 370 G6) or rack mount configurations as shown in figure 1. The DL370 G6 provides dual-processor compute power in a convenient, 4U chassis designed for businesses who want enterprise class features and performance. The HP ProLiant DL370 G6 has been optimized for internal storage and is well-suited for deployment in growing businesses, remote office sites, or datacenters.

For more information on the ML370 G6 tower version go to:

<http://www.hp.com/servers/ml370>

For more information on the DL370 G6 rack version go to:

<http://www.hp.com/servers/dl370>

¹ Minimum of 3 database copies are recommended when using RAID-less JBOD configurations

² For more information on usage profiles go to [http://technet.microsoft.com/en-us/library/dd346699\(EXCHG.140\).aspx](http://technet.microsoft.com/en-us/library/dd346699(EXCHG.140).aspx)

Figure 1. HP ProLiant ML370 G6 tower and DL370 G6 rack configurations



Table 2 provides sizing details for the Exchange 2010 deployed using the DL370 G6 server. There are two server configurations, first is the recommended for the standalone server and the second is for the two server configuration with the DAG option.

Table 2. Server configuration

Exchange roles	Memory	Processor configuration	Processor model	GHz
MB/HT/CAS standalone server	12 GB	One quad-core	Intel® Xeon® E5504	2.0GHz 80W/4M
MB/HT/CAS two server DAG option	16GB	One quad-core	Intel Xeon E5530	2.4GHz 80W/8M

The DL370 G6 can be configured with up to 14 LFF or 24 SFF internal disks. The recommended configurations listed in table 3 provide three internal storage options using MDL-SATA LFF, SAS LFF and SFF disks. Sizing details include the disk type, capacity and the number of disks needed. Sizing recommendations provide the minimum number of disks needed to support the 1000 users in terms of both their performance and capacity requirements.

Table 3. Disk configuration storage options (per Mailbox server)

Storage option	Database RAID type	Disk type	Capacity	Number Database	Number Logs disks
MDL-SATA	RAID10	MDL-SATA LFF 7.2K	1TB	10	2
SAS	RAID5	SAS LFF 15K	450GB	10	2
SAS	RAID5	SAS SFF 10K	300GB	15	2

Recommended configuration

Hardware bronze tier server

- One DL370 G6 server
- One Intel Xeon E5504 processor
- 12 gigabytes system memory (DDR3 registered DIMMs)
- 512MB BBWC option kit per server
- SAS expander card

Hardware silver tier server

- Two DL370 G6 servers
- One Intel Xeon E5530 processor per server
- 16 gigabytes system memory (DDR3 registered DIMMs) per server
- 512MB BBWC option kit per server
- SAS expander card
- Redundant power option
- Redundant fan option

MDL-SATA LFF option

- LFF backplane kit (6 disk enclosure expansion option) per server
- LFF drive cage kit (2 disk enclosure expansion option) per server
- Two 146GB SAS disks 15K LFF (for operating system) per server
- 12 1TB Midline SATA disks 7.2K LFF per server

SAS LFF option

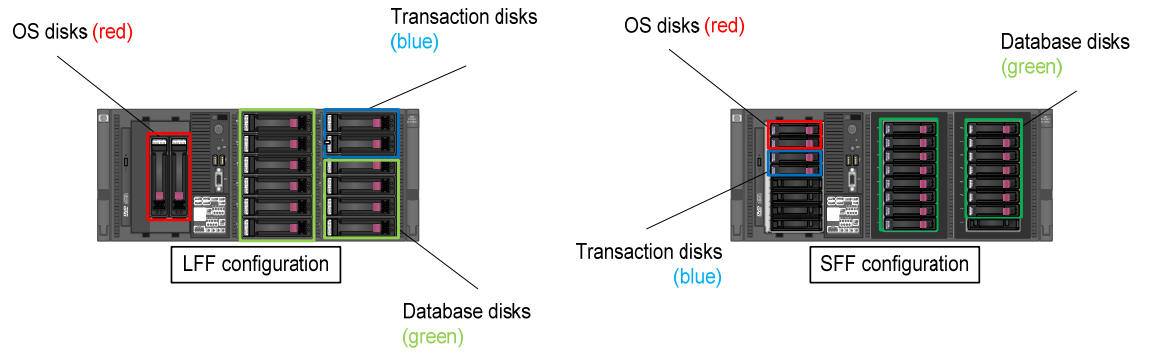
- LFF backplane kit (6 disk enclosure expansion option) per server
- LFF drive cage kit (2 disk enclosure expansion option) per server
- Two 146GB SAS disks 15K LFF (for operating system) per server
- 12 450GB SAS disks 15K LFF per server

SAS SFF option

- 2 SFF drive cage kits (8 disk enclosure expansion options) per server
- Two 146GB SAS disks 15K SFF (for operating system) per server
- 17 300GB SAS disks 10K SFF per server

Figure 2 represents the storage layout for LFF and SFF disk configurations. The LFF configuration uses all 14 disks bays, 2 for the operating system, 2 for logs and 10 for database disks. The SFF configuration uses 19 of the 24 disk bays, 2 for the operating system, 2 for logs and 15 for the database disks.

Figure 2. LFF and SFF disk configurations



Bill of materials

The following bill of materials lists the major server and storage hardware components needed for each of the recommended configurations, however this is not an exhaustive listing of all the necessary components needed to build the complete solutions. For complete configuration details, please contact your HP Reseller or HP Sales Representative.

Table 4. Bill of materials

Silver Tier QTY	Bronze Tier QTY	Description	Part Number
Large Form Factor Server configuration			
2	1	HP ProLiant DL370 G6 LFF CTO Chassis	483873-B21
2	0	Intel Xeon Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2), FIO	495938-L21
0	1	Intel Xeon Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800), FIO	495944-L21
8	3	HP 4GB 2Rx4 PC3-10600R-9 Kit	500658-B21
2	1	512MB BBWC	462967-B21
2	1	24 inch SFP Battery Cable	496029-B21
2	1	HP SAS Expander Card	468406-B21
2	1	(6) Large Form Factor (LFF) Backplane Kit	507810-B21
2	1	(2) Large Form Factor (LFF) Drive Cage Kit	487936-B21
4	2	HP 146GB 3G SAS 15K 3.5" DP ENT HDD	384854-B21
4	1	HP 750W CS HE Power Supply Kit	512327-B21
2	1	HP Half-Height SATA DVD-ROM Optical Drive	447326-B21
2	0	Redundant Fan Kit	508107-B21
MDL-SATA LFF storage option			
24	12	HP 1TB 3G SATA 7.2K 3.5" MDL HDD	454146-B21
SAS LFF storage option			
24	12	HP 450GB 3G SAS 15K 3.5" DP ENT HDD	454232-B21

Silver Tier QTY	Bronze Tier QTY	Description	Part Number
Small Form Factor Server configuration			
2	1	HP ProLiant DL370 G6 SFF CTO Chassis	483874-B21
2	0	Intel Xeon Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2), FIO	495938-L21
0	1	Intel Xeon Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800), FIO	495944-L21
8	3	HP 4GB 2Rx4 PC3-10600R-9 Kit	500658-B21
2	1	512MB BBWC	462967-B21
2	1	24 inch SFP Battery Cable	496029-B21
2	1	HP SAS Expander Card	468406-B21
4	2	(8) Small Form Factor (SFF) 2nd Drive Cage Kit	507803-B21
4	2	HP 146 GB 3G SAS 15K SFF DP ENT HDD	504062-B21
34	17	HP 300GB 3G SAS 10K SFF DP ENT HDD	492620-B21
4	1	HP 750W CS HE Power Supply Kit	512327-B21
2	1	HP Half-Height SATA DVD-ROM Optical Drive	447326-B21
2	0	Redundant Fan Kit	508107-B21

Implementing a proof-of-concept

As a matter of best practice for all deployments, HP recommends implementing a proof-of-concept using a test environment that matches as closely as possible the planned production environment. In this way, appropriate performance and scalability characterizations can be obtained. For help with a proof-of-concept, contact an HP Services representative (<http://www.hp.com/hps/contacts/index.html>) or your HP partner.

For more information

For more information on planning, deploying, or managing Microsoft Exchange Server on HP ProLiant servers and HP storage see:

www.hp.com/solutions/exchange

For HP ActiveAnswers sizing tools and best practices on Microsoft Exchange Server see:

www.hp.com/solutions/activeanswers/exchange

For more information on HP ProLiant servers see:

www.hp.com/go/proliant

For more information on HP storage solutions see:

www.hp.com/go/storage

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http://h20219.www2.hp.com/ActiveAnswers/us/en/solutions/technical_tools_feedback.html.

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