



HP recommended configuration for Microsoft Exchange Server 2010: ProLiant DL180 G6 supporting 100 - 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 100 users, with 2GB mailboxes, hosted on HP ProLiant DL180 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 DL180 G6 server offers high performance while meeting small and midsize businesses (SMB) budget needs.

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 100 mailboxes. Two configurations will be detailed; the bronze is configured for basic mailbox services using a standalone server and the silver tier is configured with two servers for increased availability. 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 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 DL180 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 100 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 HP ProLiant DL180 G6 is an affordable 2U, dual processor capable server that delivers essential performance and power efficiency for demanding applications like Exchange 2010. The DL180 G6 was developed specifically to address the needs of small and medium businesses. The DL180 G6 is highly versatile, supporting up to 14 LFF or 25 SFF internal disks. Figure 1 depicts both large form factor and small form factor chassis configurations. Note that the 14 LFF configuration places two disks in the rear of the chassis.

For more information on the DL180 G6 go to <http://www.hp.com/servers/dl180>

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 DL180 G6

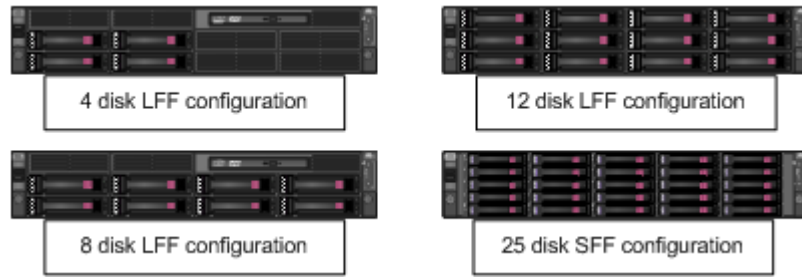


Table 2 provides sizing details for the Exchange 2010 deployed using the DL180 G6 server. There are two server configurations, first is recommended for the standalone server and the second is for the two server configuration with the DAG option.

Table 2. Server configurations

Exchange roles	Memory	Processor configuration	Processor model	GHz
MB/HT/CAS standalone server	6 GB	One quad-core	Intel® Xeon® E5504	2.0GHz 80W/4M
MB/HT/CAS two server DAG option	8 GB	One quad-core	Intel Xeon E5504	2.0GHz 80W/4M

The recommended configurations listed in table 3 provide two internal storage options using MDL-SATA LFF or SAS LFF 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 100 users in terms of both their performance and capacity requirements.

Table 3. Disk configuration options

Storage option	Database RAID type	Disk type	Capacity	Number Database disks	Number Logs disks
MDL-SATA	RAID10	MDL-SATA LFF 7.2K	500GB	2	2 shared with OS
SAS	RAID10	SAS LFF 10K	400GB	2	2 shared with OS

Recommended configuration

Hardware bronze tier server

- One DL180 G6 server
- One Intel Xeon E5504 processor
- 6 gigabytes system memory (DDR3 registered DIMMs)
- P410 storage controller with 256MB BBWC option kit
- Hot plug 4 disk cage kit

Hardware silver tier server

- Two DL180 G6 servers
- One Intel Xeon E5504 processor per server
- 8 gigabytes system memory (DDR3 registered DIMMs) per server
- P410 storage controller with 256MB BBWC option kit per server
- Hot plug 4 disk cage kit
- Redundant power option
- Redundant fan option

MDL-SATA LFF option

- 4 500GB Midline SATA disks 7.2K LFF per server

SAS LFF option

- 4 400GB SAS disks 10K LFF per server

Figure 2 represents the four disk storage layout, using either MDL SATA or SAS disks, two disks are used for the OS and transaction logs and two disks are used for the databases.

Figure 2. LFF 4 disk configuration



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
Server configuration			
2	1	HP ProLiant DL180 G6 Hot Plug SAS/SATA Rack CTO Chassis	507168-B21
2	1	Intel Xeon Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800), FIO	508341-L21
8	3	HP 2GB 2Rx8 PC3-10600R-9 Kit	500656-B21
2	1	HP P410/256 FIO SA Cntrlr w/Battery	491195-B21
2	1	HP 2U G6 4HDD CAGE Kit, FIO	506926-B21
4	1	HP 460W CS HE Power Supply Kit	503296-B21
2	1	HP Slim SATA DVD-ROM Optical Drive	481041-B21
2	0	HP DL180G6 Redundant Fan Kit	516009-B21
MDL-SATA LFF storage option			
8	4	HP 500GB 3G SATA 7.2K 3.5" MDL HDD	458928-B21
SAS LFF storage option			
8	4	HP 400GB 3G 10K 3.5" DP SAS ENT HDD	459508-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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