Information Technology Core

Computers • Networking • Consulting • Telephony • Training

Art Pembroke

Friday, April 01, 2011

RE: Groupwise to Exchange 2010

Enterprise Version 4 Sites:

Hardware Needed:
Helena Main Cluster 2 CAS 2 Mailbox
4 Each   HP DL320G7 X5650 6Core Processor 36GB RAM P410i Raid Card with 256MB and BBWC Enabled, DUAL 300GB SAS 10K OS Drives, Redundant Power Supplies, DVD-ROM, ILO3 Advanced, 3 Year **6 Hour Call To Repair** Warranty

	$5,062.55	$20,250.20

1 More Mailbox is conceivable for Triple Mailbox Redundancy if required

3 Additional Site Systems (CAS and Mailbox)
3 Each   HP DL320G7 X5650 6Core Processor 24GB RAM P410i Raid Card with 256MB and BBWC Enabled, DUAL 300GB SAS 10K OS Drives, Redundant Power Supplies, DVD-ROM, ILO3 Advanced, 3 Year **6 Hour Call To Repair** Warranty

	$4,649.00	$13,947.00

Software Needed:

Item	Unit	Total
Windows Server 2008 R2 Enterprise with 2 Years Upgrade Protection 7 Each	$2,685.00	$18,795.00
Windows User CAL R2 with 2 Years Upgrade Protection 520 Each	$33.00	$17,160.00
Exchange Enterprise Server (Supports Full Archiving and Discovery) with 2 Years Upgrade Protection 7 Each	$4,454.00	$31,178.00
End User CAL's Licenses Exchange with 2 Year Upgrade Protection 520 Each	$72.00	$37,440.00
End User CAL's Enterprise Add-on License with 2 Year Upgrade Protection 520 Each	$45.00	$23,400.00
Quest Groupwise To Exchange Migration Utility With Support 520 Each	$19.00	$9,880.00

Labor:
TurnKey Install 350 Hours Including 100 Hours of 3rd Party NetEnrich Support

	$85.00	$29,750.00

Training:
3 Tech Onsite With Travel Per Diem Hotel Flight Vehicle

	$6,400.00	$19,200.00

Total $221,000.20

Exchange 2010 Editions Compared

Feature	Enterprise Edition	Standard Edition
Database stores	100	5
OS Supported	Server 2008 x64 and Server 2008 R2 x64	Server 2008 x64 and Server 2008 R2 x64

Exchange server 2010 Standard Edition

The main difference between two editions is that Standard edition only supports 5 database stores. This can be a major issue with medium to large companies as Microsoft recommends only 100-200GB max per data stores. This version is ideal for CAS and HUB server role for medium to large companies as Enterprise edition will not provide addition features on these server roles.

Exchange server 2010 Enterprise Edition

Enterprise version supports 100 mailbox databases compare to standard. Enterprise edition is a must have for mailbox server role in medium to large companies.

Feature	Exchange Server 2003 Standard Server	Exchange Server 2003 Enterprise Server	Exchange Server 2007 Standard Server	Exchange Server 2007 Enterprise Server	Exchange Server 2010 Standard Server	Exchange Server 2010 Enterprise Server
Mailbox Databases	1-2	3-20	1-5	6-50	1-5	6-100
Database Storage Limit	75GB	None	16TB	16TB	16TB	16TB
Single Copy Cluster	No	Yes	No	Yes	No	No
Local Continuous Replication	No	No	Yes	Yes	No	No
Standby Continuous Replication	No	No	Yes	Yes	No	No
Cluster Continuous Replication	No	No	No	Yes	No	No
Mailbox Resiliency	No	No	No	No	Yes	Yes

These tables capture several changes in licensing Exchange Server 2010 compared with earlier versions. In addition to the new functions, the major changes are:

- The supported number of mailbox databases has increased from 50 to 100 in the Enterprise Server.
- Exchange Server 2003 had different storage limits for Standard Server compared with Enterprise Server. In Exchange Server 2007 and Exchange Server 2010, the storage limit is increased to 16 TB for both Standard and Enterprise Server editions.
- Several high-availability options have been consolidated into just one option for Exchange Server 2010 (Mailbox Resiliency), which is now offered in both the Standard and Enterprise editions. The capabilities of Local Continuous Replication, Standby Continuous Replication, and Cluster Continuous Replication are now unified into the Exchange 2010 Mailbox Resiliency capability. These capabilities enable a simplified approach to high availability and disaster recovery.

License Types

Exchange Server 2010 on-premises is licensed in the Server / Client Access License (CAL) model in exactly the same way that Exchange Server 2007 was licensed. There are three types of licenses:

1. Server Licenses

A license must be assigned for each instance of the server software that is being run. The Exchange Server license is sold in two server editions:

- Standard Edition: designed for the mailbox needs of small to medium organizations. Also appropriate for non-mailbox roles in a larger Exchange deployment.
- Enterprise Edition: designed for larger organizations that may require a greater number of mailbox databases.

2. Client Access Licenses (CALs)

Exchange requires a CAL for each user or device that accesses the server software. There are two types of CALs for Exchange:

- Standard CAL: designed to help users be more productive from virtually any platform, browser, or mobile device, with new features in Exchange Server 2010 that help manage communications overload and lower helpdesk costs.
- Enterprise CAL: designed to allow organizations to reduce the costs and complexity of meeting compliance requirements with new integrated archiving functionality and information protection capabilities, while also helping you cut costs by replacing legacy voice mail systems with Unified Messaging.

The Enterprise CAL is sold as an add-on to the Standard CAL. To enable Standard CAL features for a user, the user must be licensed with just the Standard CAL. To enable Enterprise CAL features, the user must be licensed with one Standard CAL plus one Enterprise CAL.

Note: Both CALs work with either Server Edition.

3. External Connector Licenses

An External Connector permits an unlimited number of clients to access an Exchange Server in scenarios where the number of CALs is uncertain.

- Access via the External Connector is limited to non-employees such as partners, suppliers, customers, and retirees.
- The number of External Connector licenses required corresponds to the number of servers in the organization's Exchange environment.
- **Prerequisites for Exchange 2010 Server**
- For each Exchange Server 2010 instance, you must also purchase a Windows Server 2008 license. The edition of Windows Server that is required depends on which features of Exchange Server 2010 you will be using. For Exchange 2010 servers that use Mailbox Resiliency features for high availability, either Windows Server 2008 Enterprise or Datacenter editions are required for its clustering features. For all other Exchange 2010 scenarios, Windows Server Standard is appropriate.
- Therefore, these are the possible scenarios and necessary prerequisites:

Exchange Server Edition	Scenario	Windows Server Edition
Exchange Server 2010 Standard Edition	No Mailbox Resiliency	Standard Server
Exchange Server 2010 Enterprise Edition	No Mailbox Resiliency	Standard Server
Exchange Server 2010 Standard Edition	Mailbox Resiliency	Enterprise /Datacenter Server
Exchange Server 2010 Enterprise Edition	Mailbox Resiliency	Enterprise /Datacenter Server

Exchange 2010 Client Access Licenses (CALs)

As with the Server licenses, the Exchange Server 2010 CALs have also been significantly improved from the previous versions of Exchange. The Exchange Enterprise is available in the same two variants as before; Exchange Enterprise CAL without Services and Exchange Enterprise CAL with Services. The following tables provide a detailed feature breakdown for each CAL edition of Exchange Server 2010:

Feature	Standard CAL	Enterprise CAL	Std. + Ent. CAL (with and without Services)
E-mail, Calendar, Contacts, and Tasks	Yes		Yes
Outlook Web App (Internet Explorer, Firefox, and Safari support)	Yes		Yes
Exchange ActiveSync Mobile Access	Yes		Yes
Rich Outlook inbox experience, including enhanced Conversation View and Mail Tips	Yes		Yes
Role Based Administration Control capabilities	Yes		Yes

Information Technology Core

Computers • Networking • Consulting • Telephony • Training

Feature	Standard CAL	Enterprise CAL	Std. + Ent. CAL (with and without Services)
Integration of IM, SMS, and RSS	Yes		Yes
Federated Calendar Sharing	Yes		Yes
Exchange ActiveSync Mobile Management Policies	Standard	Advanced	All
Journaling	Per Database	Per User/Distribution List	All
Voicemail with Unified Messaging	No	Yes	Yes
Retention Policies	Default	Custom	All
Integrated Archive	No	Requires Office 2010 Pro Plus Volume Licensing	Requires Office 2010 Pro Plus Volume Licensing
Multi-Mailbox Search and Legal Hold	No	Yes	Yes
Information Protection & Control (IPC): journal decryption, transport protection rules, Outlook protection rules, IRM Search, and Legal Hold	No	Yes	Yes

Customers may buy the standard CAL standalone, but those who want to acquire the Enterprise features as listed above must purchase both the standard and the Enterprise CALs.

The Enterprise CAL with Services has all the above features but also has antivirus and anti-spam service subscriptions from Microsoft Forefront.

Feature	Standard CAL	Std. + Ent. CAL (with Services)*
Forefront Security for Exchange Server	No	Yes
Forefront Online Security for Exchange	No	Yes

Comparison to Earlier Versions

The table below includes detailed information about differences in licensing Exchange Server 2010 compared with Exchange Server 2003 and Exchange Server 2007.

Feature	Exchange Server 2003 Exchange CAL	Exchange Server 2007 Standard CAL	Exchange Server 2007 Enterprise CAL	Exchange Server 2007 Std. + Ent. CAL	Exchange Server 2010 Standard CAL	Exchange Server 2010 Enterprise CAL	Exchange Server 2010 Std. + Ent. CAL
Outlook Client	Yes	No	No	No	No	No	No
Mailbox Manager	Yes	No	No	No	No	No	No
Managed Folders	No	Default	Custom	All	Default	Custom	All
Retention Policies	No	No	No	No	Default	Custom	All
Advanced Exchange ActiveSync Mobile Policies	No	No	Yes	Yes	No	Yes	Yes
Journaling	Per Database	Per Database	Per User/DL	All	Per Database	Per User/DL	All
Voicemail with Unified Messaging	No	No	Yes	Yes	No	Yes	Yes

Apart from new functions, there are several major changes for licensing Exchange 2010 compared to earlier versions:

- The Exchange 2003 license was sold with just one CAL, while the Exchange 2007 and Exchange 2010 licenses are sold with both Standard and Enterprise CALs.

- The Exchange 2003 CAL included rights to the Outlook client. In Exchange 2007 and Exchange 2010, the Outlook client license must be purchased separately.

- Features for managing e-mail retention have evolved from Mailbox Manager in Exchange 2003 to Managed Folders in Exchange 2007 to Retention Policies in Exchange 2010.

- Advanced Exchange ActiveSync mobile policies were introduced in the Exchange 2007 Enterprise CAL at SP1.

- Unified Messaging, Managed Folders, and Per-user/Per-distribution list Journaling were introduced in the Exchange 2007 Enterprise CAL.

Microsoft Exchange Server 2010 reduces the cost and complexity of deploying an e-mail solution that provides the highest levels of server availability and site resilience. Building on the native replication capabilities introduced in Exchange Server 2007, the new high availability architecture in Exchange 2010 provides a simplified, unified framework for both high availability and disaster recovery. Exchange 2010 integrates high availability into the core architecture of Exchange, enabling customers of all sizes and in all segments to be able to economically deploy a messaging continuity service in their organization.

Lessons Learned from Exchange Server 2007
Exchange 2007 decreased the costs of high availability and made site resilience much more economical by introducing new technologies such as local continuous replication (LCR), cluster continuous replication (CCR), and standby continuous replication (SCR). Still, some challenges remained:

- Some administrators were intimidated by the complexity of Windows failover clustering.

- Achieving a high level of uptime can require a high level of administrator intervention.

- Each type of continuous replication was managed differently and separately.

- Recovering from a failure of a single database on a large Mailbox server could result in a temporary disruption of service to all users on the Mailbox server.

- Site resilience solutions were not seamless.

- The transport dumpster feature of the Hub Transport server could only protect messages destined for mailboxes in an LCR or CCR environment. If a Hub Transport server fails while processing messages and can't be recovered, it could result in data loss.

Exchange 2010 includes significant core changes that integrate high availability deep in its architecture, making it even less costly and easier to deploy and maintain than Exchange 2007 for all customers. Organizations can now deploy a fully redundant Exchange organization with just two servers, and benefit from database-level failovers. Customers benefit from automatic, database-level failover capabilities without having to become experts in Windows failover clustering. Moreover, you can add site resilience to your existing high availability deployments with less complexity.

Exchange 2007 introduced many new architectural changes designed to make deploying high availability and site resilience solutions for Exchange faster and simpler. These improvements included an integrated Setup experience, optimized out-of-box configuration settings, and the ability to manage most aspects of the high availability solution using native Exchange management tools.

Still, management of an Exchange 2007 high availability solution required administrators to master some clustering concepts, such as the concept of moving network identities and managing cluster resources. In addition, when troubleshooting issues related to a clustered Mailbox server, administrators had to use Exchange tools and cluster tools to review and correlate logs and events from two different sources: one from Exchange and one from the cluster.

Two other limiting aspects of the Exchange 2007 architecture have also been re-evaluated and re-engineered based on customer feedback:

- Clustered Exchange 2007 servers require dedicated hardware. Only the Mailbox server role could be installed on a node in the cluster. This meant that a minimum of four Exchange servers were required to achieve full redundancy of the primary components of a deployment, that is, the core server roles (Mailbox, Hub Transport, and Client Access).

- In Exchange 2007, failover of a clustered Mailbox server occurs at the server level. As a result, if a single database failure occurred, the administrator had to fail over the entire clustered Mailbox server to another node in the cluster (which resulted in brief downtime for all users on the server, and not just those users with a mailbox on the affected database), or leave the users on the failed database offline (potentially for hours) while restoring the database from backup.

Mailbox Resiliency

Exchange 2010 has been re-engineered around the concept of *mailbox resiliency*, in which the architecture has changed so that automatic failover protection is now provided at the individual mailbox database level instead of at the server level. In Exchange 2010, this is known as *database mobility*. As a result of this and other database cache architectural changes, failover actions now complete much faster than in previous versions of Exchange. For example, failover of a clustered Mailbox server in a CCR environment running Exchange 2007 with Service Pack 2 (SP2) completes in about two minutes. By comparison, failover of a mailbox database in an Exchange 2010 environment completes in 30 seconds or less (measured from the time when the failure is detected to when a database copy is mounted, assuming an available copy that's healthy and up to date with log replay). The combination of database-level failovers and significantly faster failover times dramatically improves an organization's overall uptime.

The mailbox resiliency architecture built into Exchange 2010 provides new benefits for organizations and their messaging administrators:

- Multiple server roles can coexist on servers that provide high availability. This enables small organizations to deploy a two-server configuration that provides redundancy of mailbox data and service, while also providing redundant Client Access and Hub Transport services.

- An administrator no longer needs to build a failover cluster to achieve high availability. Failover clusters are now created by Exchange 2010 in a way that's invisible to the administrator. Unlike previous versions of Exchange clusters which used an Exchange-provided cluster resource DLL named ExRes.dll, Exchange 2010 no longer needs or uses a cluster resource DLL. Exchange 2010 isn't a clustered application, and it uses only a small portion of the failover cluster components, namely, its heartbeat capabilities and the cluster database, to provide database mobility.

- Administrators can add high availability to their Exchange 2010 environment after Exchange has been deployed, without having to uninstall Exchange and then redeploy in a highly availability configuration.

- Exchange 2010 provides a view of the event stream that coalesces and combines the events from the operating system with the events from Exchange.

- Because storage group objects no longer exist in Exchange 2010, and because mailbox databases are portable across all Exchange 2010 Mailbox servers, it's easy to move databases when needed.

For more information, see High Availability and Site Resilience.

Flexible Mailbox Protection

Exchange 2010 includes several new features and core changes that, when deployed and configured correctly, can provide flexible mailbox protection that eliminates the need to make traditional backups of your data. Using the high availability features built into Exchange 2010 to minimize downtime and data loss in the event of a disaster can also reduce the total cost of ownership of the messaging system. By combining these features with other built-in features, such as Legal Hold, organizations can reduce or eliminate their dependency on traditional point-in-time backups and realize the cost savings of doing so.

In addition to determining whether Exchange 2010 enables you to move away from traditional point-in-time backups, we also recommend that you evaluate the cost of your current backup infrastructure. Consider the cost of end-user downtime and data loss when attempting to recover from a disaster using your existing backup infrastructure. Also, include hardware, installation and license costs, as well as the management cost associated with recovering data and maintaining the backups. Depending on the requirements

of your organization, it is quite likely that a pure Exchange 2010 environment with at least three mailbox database copies will provide lower total cost of ownership than one with backups.

For more information about flexible mailbox protection, see Understanding Backup, Restore and Disaster Recovery.

Changes to High Availability from Previous Versions of Exchange
Exchange 2010 includes many changes to its core architecture. Exchange 2010 combines the key availability and resilience features of CCR and SCR into single high availability solution which handles both onsite data replication and offsite data replication. Mailbox servers can be defined as part of a database availability group (DAG) to provide automatic recovery at the individual mailbox database level instead of at the server level. Each mailbox database can have up to 16 copies. Other new high availability concepts are introduced in Exchange 2010, such as *database mobility* and *incremental deployment*. The concepts of an organization without backups and RAID are also being introduced in Exchange 2010.

To summarize, the key aspects to data and service availability for the Mailbox server role and mailbox databases are:

- Exchange 2010 uses an enhanced version of the same continuous replication technology introduced in Exchange 2007. For more information, see Changes to Continuous Replication from Exchange Server 2007 later in this topic.

- Storage groups no longer exist in Exchange 2010. Instead, there are simply mailbox databases, mailbox database copies, and public folder databases. The primary management interfaces for Exchange databases has moved within the Exchange Management Console from the Mailbox node under **Server Configuration** to the Mailbox node under **Organization Configuration**.

- Some Windows Failover Clustering technology is used by Exchange 2010, but it's now completely managed by Exchange. Administrators don't need to install, build, or configure any aspects of failover clustering when deploying highly available Mailbox servers.

- Each Mailbox server can host as many as 100 databases, and each database can have as many as 16 copies.

- In addition to the transport dumpster feature, a new Hub Transport server feature named *shadow redundancy* has been added. Shadow redundancy provides redundancy for messages for the entire time they're in transit. The solution involves a technique similar to the transport dumpster. With shadow redundancy, the deletion of a message from the transport database is delayed until the transport server verifies that all of the next hops for that message have completed delivery. If any of the next hops fail before reporting back successful delivery, the message is resubmitted for delivery to that next hop. For more information about shadow redundancy, see Understanding Shadow Redundancy.

Incremental Deployment
In previous versions of Exchange, service availability for the Mailbox server roles was achieved by deploying Exchange in a Windows failover cluster. To deploy Exchange in a cluster, you had to first build a failover cluster, and then install the Exchange program files. This process created a special Mailbox server called a clustered Mailbox server (or Exchange Virtual Server in previous versions of Exchange). If you had already installed the Exchange program files on a non-clustered server and you decided you wanted a clustered Mailbox server, you had to build a cluster using new hardware, or remove Exchange from the existing server, install failover clustering, and reinstall Exchange.

Exchange 2010 introduces the concept of incremental deployment, which enables you to deploy service and data availability for all Mailbox servers and databases after Exchange is installed. Service and data redundancy is achieved by using new features in Exchange 2010 such as DAGs and database copies.

Database Availability Groups
A DAG is a set of up to 16 Mailbox servers that provide automatic database-level recovery from failures that affect individual databases. Any server in a DAG can host a copy of a mailbox database from any other server in the DAG. When a server is added to a DAG, it works with the other servers in the DAG to provide automatic recovery from failures that affect mailbox databases, such as a disk failure or server failure.