



## Virtual Solution for Microsoft® Exchange Server 2007 Using VMware® Infrastructure 3 and EMC CLARiiON® CX3-20 iSCSI storage

### What is the VMware-EMC virtual solution for Exchange Server 2007?

The VMware-EMC end-to-end virtual solution addresses all aspects of a Microsoft® Exchange Server 2007 deployment. It is designed for mid-market organizations and features four distinct layers:

- VMware® Infrastructure 3 software
- EMC CLARiiON® CX3-20 iSCSI storage and Replication Manager software
- Server hardware
- Microsoft Exchange Server 2007

VMware has worked with EMC to build and test a model solution in the lab and develop the optimal configuration. This configuration is documented in a corresponding reference architecture document for this solution.

### What kind of testing was done on the solution?

The storage configuration for 1,000 users at 0.5 IOPS and 250 MB mailboxes was tested and validated using the Microsoft Jetstress tool. Results of the testing on VMware were compared to running Exchange Server 2007 in a non-VMware environment. The VMware environment performed as well as or better than the non-virtualized Exchange instance in terms of achieved IOPS and disk latency during the Jetstress testing. Additional testing of the environment was done using the Microsoft LoadGen tool which tests the impact of MAPI clients on Exchange servers to validate the overall solution. The LoadGen results were again compared to native environments running on the same server and storage configurations. Performance was exceptional for the VMware environment and showed minimal impact of running in a virtual machine for the targeted user count.

### How many users is the solution designed for?

Benchmark testing with Jetstress and LoadGen was done with a 1,000 user profile at 0.5 IOPS per user and 250 MB mailboxes. The storage has been designed to grow in 500 user increments, meaning there is a 500 user storage building block, a 1,000 user building block and so on. The solution scales to environments of 2,500 users or more.

More details on the storage design and a summary of expected solution performance can be found in the corresponding reference architecture document for this solution.

### What changes to Exchange have made Exchange 2007 an even better candidate for virtualization than Exchange 2003?

Exchange 2003 ran on 32-bit platforms and was extremely demanding in terms of disk I/O. These disk I/O operations were costly in terms of performance when running inside a virtual machine. With Exchange Server 2007, Microsoft has changed to a 64-bit architecture. This means more of the Exchange databases can be loaded into memory and more I/O operations can be serviced from RAM instead of disk. As a result of this and other enhancements, Exchange Server 2007 performance in a VMware virtual machine has improved significantly over Exchange 2003.

### How is the backup/restore solution addressed?

The solution uses the EMC Replication Manager product to enable array-based SnapView clones of the Exchange databases. Storage has been designed to hold two full days worth of data on disk at all times. This means that there are 48 hours of data available on high-speed disk at all times. When data is required that is older than 48 hours, restore from tape is used. The Replication Manager backups use the Microsoft VSS framework to conform to Microsoft best practices. Additional information on EMC Replication Manager can be found at [http://www.emc.com/products/storage\\_management/replication\\_manager/](http://www.emc.com/products/storage_management/replication_manager/).

### What options exist for replication to a DR site?

There are a number of different methods for replicating to a DR site. Replication Manager can be configured to automatically copy the data to a second array at a DR site using the SAN Copy feature. IT administrators may choose to replicate the data to a DR site and archive it to tape there rather than at their primary site. These design decisions can be addressed with your technology partner for sales and services.

## What is the estimated RPO/RTO for this solution?

For local disasters, Replication Manager can be used for disk-based recovery of Exchange database and logs. With Replication Manager, users can easily perform a roll-forward or point-in-time recovery of Exchange data. The time required for recovery depends on the size of the database being recovered, but is generally measured in minutes for local recovery. Replication Manager with VSS can easily restore 200-300 GB in a matter of minutes. For DR situations at a remote site, the RPO depends on how often data is shipped to the DR site. This can be dependent on the bandwidth between the sites. Using RM in conjunction with log shipping technologies can reduce RPO to a matter of minutes. RTO is dependent on the hardware and software setup at the DR site, but can easily be configured to meet a RTO of an hour or less at a DR site.

## Where can I find information from VMware on support for Microsoft applications?

Information on VMware's support position with Microsoft can be found at [http://www.vmware.com/pdf/ms\\_support\\_statement.pdf](http://www.vmware.com/pdf/ms_support_statement.pdf)

## What support will Microsoft provide for Exchange when running in non-Microsoft virtualization software?

According to Microsoft KB article Q897615, Microsoft will use "commercially reasonable efforts" to investigate issues with Microsoft applications running with non-Microsoft hardware virtualization software for Microsoft customers with Premier-level support. This applies to all Microsoft products. Many VMware partners also provide first-level support for Windows in VMware environments.

Microsoft references:

- <http://support.microsoft.com/kb/Q897615/> (Oct, 2005) – see 3rd paragraph on support for non-Microsoft hardware virtualization software

## Do Microsoft applications get a higher level of support when running in a Microsoft virtualization production such as Virtual Server 2005 than in a VMware production?

According to Microsoft KB article Q897613, Microsoft will also use "commercially reasonable efforts" to investigate issues with Microsoft applications running in a Windows Virtual Server environment – the same verbiage as in KB article Q897615 for non-Microsoft hardware virtualization software (Premiere support customers). As stated, customers get the same level of support for Microsoft and non-Microsoft virtualization products.

Microsoft references:

- <http://support.microsoft.com/kb/Q897613/> (Jan, 2007) – "commercially reasonable support" for Microsoft Virtual Server 2005

It should be noted that Exchange 2007 requires a 64-bit operating system. Virtual Server 2005 does not support 64-bit guests.