Microsoft Exchange on Scale Computing's HC3™ System

Benefits of Virtualizing Microsoft Exchange

Virtualizing Microsoft Exchange has gained traction in small to mid-size businesses as companies take the normal cycle of hardware refreshes and Operating System upgrades as an opportunity to consolidate servers in a virtualized environment. By doing so, these companies benefit from:

- Better availability;
- Flexibility in managing unplanned growth (both performance and capacity); and
- Lower costs from better hardware utilization.

Traditionally, the virtualized environment necessary to meet the availability requirements for Exchange required a complex implementation of a hypervisor and shared SAN management. This increased cost due to complexity diluted the benefits gained from virtualizing Exchange.

Virtualizing Microsoft Exchange on HC3

Approximately 70% of Scale Computing customers deploying HC3 have chosen to virtualize Microsoft Exchange as part of their virtualized environment. These customers rely on HC3 to provide the level of availability and performance required given the mission-critical nature of the application.

Availability of Microsoft Exchange on HC3

HC3 VM Failover™ and HC3 Protect™

The simplicity of HC3 is that all VMs created on the system are automatically made highly available. In the event of a node failure, the VMs running on the failed node will automatically failover to other nodes in the system with no manual intervention from the user. HC3 VM Failover™ relies on the HC3 Protect™ feature that effectively acts as network RAID 10, by striping and mirroring data across the cluster so that it can tolerate any single point of failure. Because of HC3 Protect™, disk failures in the HC3 environment also have little effect on the VMs running on the system. Following a disk failure, HC3 will automatically re-generate mirror copies of any data blocks that had been stored on the failed disk which will result in a temporary increase in read and write load on the remaining disks in the cluster. If a full node is off-line, it's missing disks would reduce the overall number of disks in the cluster available to process I/O.

For most small to mid-size businesses deploying HC3, the automatic failover inherent in the system meets the required level of availability for their environment. Those companies requiring a greater level of availability can combine application-level clustering with the high availability of HC3 to provide failover at multiple levels. Scale recommends using Microsoft Best Practices to set up application-level clustering if this level of availability is required in the user's environment.

HC3 Live Migration

Often users deploy multiple role server VMs when using Exchange for load balancing across the cluster (see Performance of Microsoft Exchange on HC3). HC3 allows users to live-migrate these VMs to redistribute the workload across the cluster non-disruptively using the Move feature. This will keep workloads up and running while the host is changed from one node to another in the system.

Maintaining Uptime when Adding HC3 Nodes and New Role Servers

As the workloads in a user's environment grow, adding compute and storage capacity to an HC3 system is as simple as adding a node to the rack and giving it an IP address. The system will subsume the resources of the new node into the system without any downtime adding to both the capacity and the performance of the environment. Once new nodes are added, users can create new role servers such as an Exchange Mailbox Server to expand the capacity of Exchange deployment. This process is magnitudes faster than the procurement and setup of a new server in a physical infrastructure and requires no downtime.

Performance of Microsoft Exchange on HC3

HC3 Sizing for Performance

The HC3 storage layer uses "wide striping" to distribute I/O load across all disks in the cluster, aggregating their performance as well as providing the data storage redundancy described in the ***HC3 VM Failover™ and HC3 Protect™*** feature above. Adding additional nodes to the cluster adds more disk IOPs improving the overall performance of Exchange when running on HC3. This allows a wide range of demanding mailbox servers to perform well on HC3 systems as demonstrated in our Microsoft Exchange Solution Reference Architecture Application Note (see Resources below). In addition to the IOPs required for Exchange, HC3 VM's support up to 8 vCPU's up to 60GB RAM per VM* which is significantly greater than what most Exchange environments require.

A major benefit of the scale-out nature of HC3 is the flexibility that comes when sizing an HC3 system to meet the performance and capacity requirements of the user's workload. Start with 3 like-sized nodes and then mix and match nodes with differing drive capacities and speeds as appropriate to scale-out the system as needed. With the variety of HC3 systems that can be built, Microsoft Exchange on HC3 meets or exceeds the performance and capacity requirements of most small and mid-size exchange deployments. This functionality also allows you to purchase just what is needed for the Exchange infrastructure today and scale the mailboxes and services to support increasing workloads by quickly adding VMs and nodes when the user needs to expand the compute or storage capacity. Multiple exchange roles can be run in separate VMs and load balanced across the HC3 cluster to maximize the performance of the deployment. Scale recommends following Microsoft Best Practices using Microsoft tools to determine how to best split your exchange server roles across the different virtual machines on HC3.

* On certain nodes, greater than 30GB not recommended to optimize VM failover placement.

Additional Microsoft Exchange Sizing Resources

Microsoft provides a number of great resources and tools for sizing Exchange environments to your specific situation. Links to a number of these are listed in the resources section below.

Resources

1. Solution Reference Architecture: Microsoft Exchange on the Scale HC3 Cluster 250 - 500 Users
2. Exchange Load Generator 2010 http://www.microsoft.com/en-us/download/details.aspx?id=20322
3. Exchange 2010 Mailbox Server Role Requirements Calculator http://gallery.technet.microsoft.com/office/Exchange-2010-Mailbox-Server-Role-
4. Microsoft Client Access Server Load Balancing http://technet.microsoft.com/en-us/library/ee332317.aspx

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