Case Study: SOX Compliant Cluster-in-a-Box

Client Profile
- Biotech company (Seattle-based, publically traded) creating oncology products that improve the lives and outcomes of cancer patients.
- Focus on therapeutic candidates aimed at targeting cancer in specific/effective ways
- Pipeline includes synthetic vaccines for a variety of cancer indications

Challenges
- Current production servers aging, ranging in age from 4-10 years old
- Need for modernization and infrastructure restructuring
- Upgrades needed for performance, security, compliance, and to enable the implementation of new technology solutions.

Actions
Consolidated entire compute and storage infrastructure onto a single DataON CiB-9220V. The previous compute and storage system involved 2 virtualization servers, 9 physical servers, and 3 storage appliances. This consolidation resulted in significant hardware savings to the client. Additionally, the IT maintenance costs and procedures were significantly reduced.

This infrastructure change allowed the client to seamlessly comply with SOX regulations, which was a burdensome process in their previous environment. Specific results are further explained below.

Above all, the client is pleased that their system runs without any performance issues while providing an expandable foundation for their entire Microsoft Hyper-V environment.

Results

SOX compliance
- Compliance report reduced from 150 pages (2013) to 30 pages (2014 Q1)
- System Center DPM-based backup, self-contained in the CiB, solved all backup reporting and auditing problems.

Change Management is vastly simplified by the new CiB, from check-pointing production systems, cloning systems to test changes, performing rollbacks from Hyper-V checkpoints or DPM backups.

“Fully compliant change management has gone from being almost impossible to an afterthought.”

Performance
- 24 virtual machines running with up to 30 tested on CiB in production without any performance issues
“Storage Spaces SSD auto-tiering in new CiB more than met the client’s IO needs”
“The 256GB per-node in the CiB has allowed us to have up to 128GB of VMs running at any given time so that the entire environment can fail-over to a single node”

Backup & Disaster Recovery
“Licensing ... Windows Server and the entire System Center suite, the client was able to back up their environment to a VM DPM server (located on the CiB) which is then backed-up off-site over a site-to-site VPN by a secondary/collocated DPM server.”

Storage
“Mirrored and Tiered Storage Spaces performance is awesome. The SSD tiering has exceeded our IO requirements meaning that we now have a solid foundation for the entire virtualization environment.”

Future Expansion
“Adding a server now is as easy as duplicating our Library base VMs out of System Center Virtual Machine Manager. We can now create a new VM and have it up and running with VMM in under 2 minutes.”

**Before & After**

**Before:**

**After:**
# Workloads

## Virtualized Workloads:
- AD FS 2.0 Proxy Server
- AD Server – Tertiary (DC/GC/DNS)
- Azure Active Directory (AAD) Sync + AD FS 2.0
- BES 5 Server (Windows Server 2008)
- CentOS Linux: Asterisk Server for VoIP conference phones
- Exchange 2013 Hybrid Coexistence Server
- Linux: VMware vCenter 4.1 Server
- Management Server (RSAT + Other Tools)
- Server 2008 R2 SSTP/PPTP VPN + ‘Remote Desktop Gateway’ Server
- SharePoint 2007 Server
- SharePoint 2010 Server
- SharePoint 2013 Server
- SQL Server 2008 R2 Standard
- Ubuntu Linux: Clinical MySQL Database
- Ubuntu Linux: Lab backups
- Ubuntu Linux: Lab Freezer Monitoring
- Ubuntu Linux: Lab MySQL Database

## Physical Workloads:
- AD (DC/GC, NPS, AD CS)
- BackupExec 2010 R3
- ERP application
- ERP Terminal Server
- Exchange 2007 Server
- File servers (2)
- Print server
- SQL Server 2005 Standard (ERP SQL)

## Hardware

### Virtualization servers, vSphere 4.1 (2):
- Dell R610, 64GB RAM, RAID1 146GB 15k SAS, 8x1GbE
- Dell R620, 64GB RAM, RAID1 146GB 15k SAS, 8x1GbE

### Physical Servers (9):
- Dell PowerEdge 2950, 16GB, 3x73GB 10k SAS, 4x1GbE
- Dell PowerEdge 2950, 16GB, 3x73GB 10k SAS, 4x1GbE
- Dell PowerEdge 1950, 16GB, 250GB (7.2k SATA), 2x1GbE
- Dell R200, 4GB, 2x 160GB, 2x 1GbE
- Dell R200, 4GB, 160GB (2x 160GB 7.2k SATA), 2x 1GbE
- Dell R710, 4GB, 5x500GB RAID5, 4x1GbE
- HP, 16GB, 3x RAID1 73GB SAS, 4x1GbE
- HP, 16GB, 1x RAID1 73GB SAS, 4x1GbE
- HP, 16GB, 1x RAID1 73GB SAS, 4x1GbE

### Storage (3):
- Dell MD3000 SAS DAS, 5TB (6x1TB 3.5" 7.2k RAID5)
- EMC VNXe iSCSI SAN, 10TB (12x1TB 3.5" 7.2k RAID6)
- FiberChannel DAS, 2.4TB (16x300GB 3.5" 15k RAID6)

## All Workloads:
- All workloads running as Hyper-V VMs on CiB
- Windows Server 2012 R2 Datacenter

## All Servers and Storage:
- DataON CiB-9220V

### Per node:
- 256GB RAM, 128GB SSD SATA RAID1, 2x10GbE SFP+

### Internal SAS JBOD:
- *Storage Spaces Pool:* 4x 200GB STEC SSD, 8x 4TB 7.2k SAS
- *Storage Spaces Virtual Disks:* 6TB Tiered Mirrored (primary VM storage), 4GB Mirrored (quorum), 8TB Parity (Local backup storage),

### Clustered Volumes:
- 6TB ReFS CSV for VMs, 4GB NTFS Quorum, 8TB ReFS CSV for Backups
Contact
Aaron Marks IT Consulting: aaronmarks.com
221 First Avenue West, Suite 109
Seattle, Washington 98119
+1 (425) 818-3176

DataON Storage: dataonstorage.com
1247 North Lakeview Avenue, Suite C
Anaheim, California 92807
+1 (888) 726-8588

Microsoft: microsoft.com
One Microsoft Way
Redmond, Washington 98052
+1 (800) 642-7676