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COMPREHENSIVE REFRESH OF VMWARE INFRASTRUCTURE helps Maryland Health Department Plan for Future Growth

What Data Networks Did for this Maryland Department of Health

- Strategically refreshed or replaced critical infrastructure components with an eye toward reducing future investments

- Significantly improved backup and recovery processes

- Provided dramatic gains in compute-store-network performance

- Accomlished the migration all at once to reduce downtime and disruptions

Abstract

This critical infrastructure refresh delivered a reliable, scalable solution that extended the life of existing data center investments.

The challenge

Maryland's Health Departments work to ensure quality community health by assessing health needs and advocating for public health issues, providing information on relevant, timely health topics and delivering critical medical and various environmental health services.

This large county health agency is one of many local health offices that comprise the Maryland State Department. The Agency's core mission is to improve the availability of healthcare services to every citizen of the county. To do that, it relies heavily on the technologies housed in its local data center. While the Agency maintained a well-managed IT infrastructure, there were areas of concern:

- Many of the servers, storage, and switches had reached, or were approaching, end of support

- The existing, unsupported servers couldn't be upgraded to the latest versions of several key applications despite entitlements

- The existing single rack had limited space for new components

- There were no funds or time for a solution that required significant administrative or management changes in IT processes or procedures

The solution

The Agency required a system that would be extremely reliable and scalable in order to optimize their investment. Specific project objectives included:

- Compute and network layers compatible with their VMware and other software currently in place

- Minimize disruption with minimal downtime and little to no reconfiguration of provided services

- Further reduce disruption by minimizing training requirements
- Migrate everything at once to mimimize service interruption

Due to the nature of the challenges the Agency faced, it was critical that the Data Networks team replace only those solutions that would increase the life of the existing infrastructure. At its primary site, the Agency had two Dell PowerEdge R720 servers configured as a 2-node VMware vSphere cluster handling 15 virtual and 3 physical workloads. Both were end of life. At its remote site, a disaster recovery server—a more current Dell PowerEdge 740xd, running VMware vSphere—served as a remote backup site; each served as the other's fail-over site.

Data Networks replaced the existing R720s with 1U Dell PowerEdge R640 servers with BOSS controller cards configured to run the newest VMware vSphere Hypervisor. The servers connected to new 10GbE Dell 4112 Switches and to the rest of the infrastructure.

Prior to the project, the Agency's storage handled by a Dell/EMC VNX 5200 that was connected through an iSCSI SAN. This too was reaching EOS. But the Agency did have a well-functioning traditional server and SAN solution that Data Networks saw no need to disrupt. To facilitate peak performance, Data Networks replaced the spindle-based SAN with a Dell/EMC Unity 350F, a very robust and management-friendly flash array.

The Agency had low Internet bandwidth capabilities and depended on Internet services provided by the State. The host servers were connected via 1Gb networking. The secondary site was using 10Gb SFP+ Switches in the top of their rack/access layer. Data Networks replaced the Agency's fibre channel and 1Gbe switches with two Dell EMC S4112F (10GbE) Switches, deploying them at both the ToR access-layer and the SAN fabric switching layer.

Before enlisting Data Networks, data from both physical and virtual systems were stored through Veeam Backup and Replication to a SAN; it was then backed up from the SAN to a local storage target hosted by a Dell EMC Data Domain backup-to-disk appliance. It would then be replicated to a paired Data Domain appliance hosted at another county agency's data center.

The Veeam Backup Essentials Suite was working very well for the Agency and the Data Networks team therefore made minor revisions to the existing backup solutions and instead focused on increasing licensing to meet Veeam data protection requirements and upgrade the Veeam solution to its latest version.

Because the Agency's existing VMware vSphere cluster remained a reliable solution for handling its workloads, Data Networks recommended maintaining the current virtual infrastructure without changes, and ensured that the new VMware vSphere hosts were running the latest version of VMware vSphere.

The result

All workloads are now fully virtual and the Agency benefits from significantly improved compute-store-network performance.

- Workloads were migrated to two PowerEdge R640's with much more dense compute compared to the previous hosts, enabling high performance and

- The end-of-life spindle array was replaced with a scalable all-flash Unity array, yielding a significant increase in Input Output Per Second (IOPS).

- The end-of-life 1-Gigabit fabric switches were replaced with 10-Gigabit Dell Top of Rack switches, resulting in a significant amount of supported bandwidth capability.

- Together these upgrades created a high-performing environment across all aspects of the infrastructure, providing seamless workflows, applications that run at optimal performance, and less administrative concerns and overhead.

- The seamless migration took place at one time, with no downtime or disruption of service.

- The Agency is armed with the knowledge and know-how required to leverage and optimize its new investments