Mini-Project 12: Desktop Virtualization

Exodus Development Virtualization Use Case Overview

1. Which groups or departments should be virtualized, and why?

The Customer Service Department would be one group that can utilize virtualization. As mentioned, we (Exodus Development) are currently facing challenges with keeping the computers in the CS department up-to-date, login and network issues, and external problems with an on-time arrival. Implementing virtualization will enable us to solve each of these challenges.

a. Software Updates: Creating virtual machines allows IT to conduct mass updates on one virtual machine and clone this machine to everyone in the CS department. This ensures that everyone is running on the same version of the software at all times. Using Active Directory to send updates to each machine is an option; however, these types of updates often require the end user to take some form of action. With virtualization, once a PC is set up with a virtualizer (Hyper-V or other), IT will push a virtual machine to dump PCs that will simply boot the virtual environment. Virtualization also adds the benefit of controlling the software/hardware devices installed.
b. Login challenges: With virtualized systems, IT can quickly troubleshoot why a user is not able to log in. Additionally, virtualization allows for checkpoints. Before running any system update, we are able to save a checkpoint of the most recent known working virtual machine. After sending out updated VMs, we can roll back these VMs if we notice that many representatives are having issues with the most recently deployed VMs.
c. Network Challenges: We can use hypervisors to create virtual networks that allow us to create abstraction from physical devices. This allows for better on-the-fly management of network resources. We pool the physical infrastructure together and use virtual networks to partition network resources. Additionally, if we have network issues with a physical machine, we can live-migrate to a new machine without any significant downtime as compared to having to physically replace and update the new machine with all the software needed for the new machine.
d. Arrival to work: Virtualization can allow for proper remote setup of PCs. If we so choose, our CS representatives can work from home, reducing commute. We can deliver a complete cloned system to a remote site. We will be able to maintain the security and availability of the virtual machine remotely.

The other department that will benefit from virtualization will be the software development team. Virtualization will allow software developers to use VMs as sandboxes for projects. They can quickly spin up VMs to build and test the software before deploying it live. Additionally, they will utilize the benefit of creating checkpoints and rollbacks.

2. Which virtualization product would be the best fit, Hyper-V and VMware?

Each virtualizer has its benefits and challenges. For Exodus Development, I would pick Hyper-V over VMware for 2 in 1 reason:

a. Our current network is managed by Microsoft Active Directory. Hyper-V virtual networks will use the same directory, which will allow for easier integration. Additionally, both Hyper-V and Active Directory are provided by Microsoft. VMware can be integrated to work with Microsoft Active Directory, but it involves additional configurations and compatibility challenges.
b. We are Azure tenants. Even though it is not used at the moment, Azure is Microsoft's cloud resource. It is likely, that as we grow, we will need to scale our network. Again, we would likely use Azure resources to run our VM as opposed to any local servers we currently use.

3. What primary benefits would the company realize for the following?

a. **Productivity and Availability:** Since VMs are easily cloned, we can create redundant virtualized environments with exceptionally high availability. (Powell, 2022) states, "by automatically monitoring VM status and rapidly switching to backup VMs in an outage, virtualization provides an extremely reliable system with no single point of failure in hardware or software." Additionally, we are able to remotely monitor, configure, and restart an entire VM, providing IT with constant access.
b. Endpoint Management: VM's provisioning of a virtual environment allows IT to centrally manage and control operating systems, applications, and data. Additionally, endpoints can be managed and updated remotely in a virtualized system, reducing onsite manual intervention. Finally, VMs allow for multiple operating systems to be used.
c. Security: The virtual environment helps improve security by isolating applications and operating systems from physical devices, reducing the risks of malware and other security threats.
d. Software Development: "Virtualization provides on-demand access to an infinite number of perfectly replicated virtual machines for developers to play with (Powell, 2022). Developers take advantage of virtualization to help them expedite updates, improve software security, and maintain an efficient pipeline between development, testing, and deployment.
e. Future growth: A virtualized server environment is not bound to hardware like a traditional environment. You can easily back up, copy, and clone VMs to different physical hardware (Powell, 2022). We can scale quickly due to the ease of setting up or cloning VMs.

4. What potential pitfalls might be encountered if a virtualization project were to be approved?

a. Virtual machines do not inherently provide graphic support, so we would have to maintain an independent physical network for Design and Marketing which means managing 2 separate systems.
b. Because of ease of installation, we can run into VM sprawl where we create more VMs than are needed. If these VMs are not properly managed, our contract workers may continue to have access to our resources when they are no longer working on any of our projects.

c. Storage and Backup can be a challenge because deleting a VM means losing all information, so we would need to create a network drive to save data. Additionally, since there is no actual hard drive on which data and systems can be backed up, frequent software updates can make it difficult to access backups at times (GDH, 2018).
d. Licensing Compliance can be an issue because “using existing licensed software in a virtual environment can lead to compliance issues if more VMs are created than the company is licensed to use the software on” (GDH, 2018). We would need to update our software licensing because they license virtual environments differently from physical environments.

References

GDH. (2018, May 9). *7 Common Virtualization Challenges - And How to Overcome Them - GDH*. GDH Consulting. Retrieved February 6, 2023, from https://gdhinc.com/7-common-virtualization-challenges-and-how-to-overcome-them/

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