Server Virtualization and Cloud Computing

Name:

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**Walmart’s environment and its preparedness for virtualization**

 Walmart is the biggest retail chain in the United States which sells goods of all kinds on their discount department stores, chain of supermarkets and grocery outlets. The company is well regarded for innovation and e-commerce. It is the biggest firm in terms of revenue and also the largest employer in the entire world (Gordon-Logan, Faber & CNBC, 2011). Due to the big nature of the company there is need for it to engage in large scale in cloud computing so as to improve efficiency among other benefits

**Walmart’s journey for virtualization**

 Walmart’s virtualization is based on the need to meet new objectives amidst rapid developments. The exponential growth that the company in undergoing/underwent means that it needed new servers to run applications. Rather than dedicating more employees to server management, the company needed virtualization. The company found that the previous process which was more manual and had prolonged timelines did not make even with cloud vision of resource provision in near real time. The company had to do something to cut supply time. Virtualization and cloud computing has led to better sourcing, coordinating resources, logistics and shelf which ensures adequate resources are available to meet demand. The manual process involved the assessing, prioritizing it against the available funding. The ‘submit and get’ cloud provisioning removed these processes which allowed applications to make speedy demand upon operations infrastructure.

 The other contributor to virtualization was the need to address increased demand. Cloud computing is cheaper as compared to traditional methods. Manual processes often brought friction in the provision process but the cloud computing has since made things easier. The need for rationing mechanism also saw the need for virtualization. The company also needed cloud computing due to pressure on IT operations capacity planning. Lastly due to changed budget practices there was a need to shift from paying for a capital asset (CAPEX) to paying for only the compute services they consume (OPEX).

**Microsoft licensing for virtualized environments**

 When considering Microsoft licensing model for virtualized environments, it is recommended to consider the Datacenter and Standard windows server editions. The edition is chosen depending on number of virtual machines at the physical host rather than the convenience of required features. The Windows Server 2012 R2 standard permits an individual to run a maximum of 2 virtual machines. The Windows Server 2012 R2 Datacenter allows a limitless number of virtual machines on a single physical host. The Windows Server 2016/2019 standard license permits one to run up to two virtual machines with Windows Sever on the same physical host. The Windows Sever 2016 and 2019 Datacenter supports a couple of recent technologies that are suitable for virtualization. They include Shielded Virtual Machines, Storage Replica, Microsoft Azure Stack and Network Fabric.

 Microsoft moved from licensing model of physical processors to core based in Windows Server 2016 and 2019 due to the fact server and CPU manufacturers tend to increase number of cores on a single socket and not number of processors. When planning to use physical server as hypervisor where several Virtual Machines with Windows Server will run, the OS chosen should depend on quantity of Virtual Machines that will run on the server (Lee, 2016). The Datacenter license permits to run an unlimited figure of virtual Oss on a licensed host.

 According to Microsoft licensing dogma, virtual machines can operate not only on Hyper-V, but they can also do on any other platform picked, like XEN, VMWare and so on (Arora, 2016). Therefore if one has licensed a physical server (8x WS-Standard dual-core licenses) and install VMWare ESXi / Free Hypervisor, he can therefore run two virtual machines running guest Windows Server 2019.

**Configuration for shared storage, the necessity for high availability and redundancy for virtualization for Walmart**

 The hardware has to be certified for the version of the Windows Server that is to be used. The complete failover cluster solution has to qualify all the checks in the ‘Validate a Configuration Wizard’. The computer servers have to match and must have similar apparatuses. For network adapters, if one uses the iSCSI, every network adapter has to be devoted to each network communication or iSCSI, and not both.

 For the network infrastructure that links the cluster nodes, one should shun single points of failure. If one connects cluster nodes within a single network, it will permit redundancy requirement in the Validate a Configuration Wizard. Nevertheless, the description will have a warning that the network ought not have a single point of failure.

 For storage, Storage Spaces Direct or shared storage which is attuned with Windows Server must be used. SMB 3.0 file shares can be used as shared storage for servers which are running Hyper-V and are designed in a failover cluster. The storage should have several, separate disks which are aligned at the hardware level. For some particular clusters, one disk works as the disk witness. Other disks possess the files needed for clustered roles.

 When it comes to hardware, when generating a failover cluster that comprises clustered virtual machines, the cluster servers have to sustain the hardware requirements for the Hyper-V role. When setting up storage area networks with failover clusters, the compatibility of storage must be confirmed, storage devices isolated, one cluster per device and a consideration of using multipath I/O software or teamed network adapters.

**Windows Azure proficiencies for virtual machines and handling a hybrid cloud comprising Windows Azure Internet as a Service (IaaS) and storage proficiencies**

Microsoft Azure is a darling of companies mainly due to the fact that it is flexible in that users can increase new services, enhance storage and form new applications (Tulloch, 2013) It eliminates need for costly hardware like servers, load balancers and routers. Azure runs datacenters all over the world enabling it cover more regions than any other cloud supplier. Azure reserved Virtual Machine is dedicated on a one or three year basis. Azure offers databases through Cosmos DB, SQL Database, Database for MySQL, Database for PostgreSQL, Data Warehouse among others. These databases platforms enable better storage with built in high availability and security.

 Azure storage options includes Azure Blobs which stores text and data; Azure Files which manages file shares for cloud or on premises deployments; Azure Queues which stress messages between application components and lastly the Azure tables which stores structured data. Other Azure components include Data factory which allows integration of previously soiled data sources ; Azure Data Lake which allows developers, business experts to acquire insights from large complex data sets; Azure search which provides developers APIs and tools for adding a rich search capability over private, assorted content in web, mobile and enterprise applications. Other include Azure Active Directory, Azure Databricks, Azure Stack and Azure Container (Tulloch, 2013).

 Azure Internet as a Service lets one pay for only what they use. It helps them evade expenditure and intricacy of purchasing and handling their private physical servers or other datacenter infrastructure. Here, each resource exists as a discrete service module, and one only needs to rent an exact one for the period they may need it (Tulloch, 2013).

 Walmart stores will need to use cloud computing as it will improve efficiency, have reduced IT costs and guaranteed business continuity .It will also lead to employees being flexible in their work places and allow for accessibility to automatic updates

**References**

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