



Windows Server Management

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Abstract: Windows Server is a line of operating systems developed by Microsoft that are designed to be used in a networked environment, such as a corporate network or a cloud computing environment. Windows Server is designed to provide a secure and reliable platform for business-critical applications, and it offers a range of features and technologies that can help organizations to manage their IT infrastructure efficiently and effectively.

Windows Server is available in a variety of editions, including Windows Server Standard, Windows Server Datacenter, and Windows Server Essentials. Each edition is designed to meet the specific needs of different types of organizations, from small businesses to large enterprises. Windows Server includes features such as support for virtualization, active directory, and a range of security and networking capabilities. It is designed to be scalable, reliable, and secure, and can be managed through a graphical user interface or through command-line tools and scripts.

Windows Server is a popular choice for businesses because it provides a stable and reliable platform for running applications and storing data. It can be easily integrated with other Microsoft products and is compatible with a wide range of hardware and software platforms. Overall, Windows Server is a powerful and flexible operating system that can help organizations to efficiently manage and secure their IT infrastructure and resources.

Keywords: VIRTUALIZATION SOFTWARE, VMWARE, HYPER-V, DHCP, DNS, ACTIVE DIRECTORY.

I. INTRODUCTION

Windows Server is a group of operating systems designed by Microsoft that supports enterprise-level management, data storage, applications, and communications. It is used to power many types of organizations, including schools, government agencies, and businesses of all sizes. Windows Server provides a range of features and technologies that can help organizations manage and secure their IT infrastructure, including Active Directory is a service that allows organizations to manage and secure access to network resources. Windows Server has a long history dating back to the early 1990s. Windows Server offers a wide range of features and capabilities, including support for virtualization, Active Directory, networking, storage, and security.

Windows Server can be deployed in various ways, including on-premises, in the cloud, and as a hybrid solution. It is used to power many types of organizations, including schools, government agencies, and businesses of all sizes. Windows Server provides a range of features and technologies that can help organizations manage and secure their IT infrastructure. A directory service that allows organizations to manage and secure access to network resources. File and Print Services: Tools for managing and sharing files and printers on a network.

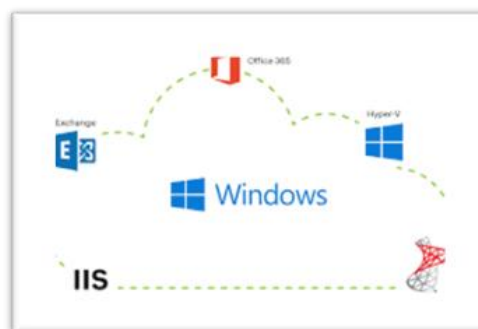


Figure 1: Windows Server Management



II. HYPER-V

Hyper-V uses hardware-assisted virtualization technology to provide a high-performance virtualization platform. This technology allows running multiple VMs on a single physical host without experiencing a significant performance penalty. In live migration, Hyper-V will enable you to move working VMs from one host to another without interrupting the VM or applications. Hyper-V can be useful for maintenance tasks or moving VMs to a different host to balance workloads. Hyper-V includes virtual networking support, allowing you to create virtual switches and adapters to connect VMs to your network. We can use this feature to develop isolated network environments for testing or to provide network connectivity for VMs that don't have physical network adapters. Hyper-V allows you to create snapshots of a VM, which capture the state of the VM at a particular point in time. We can use images to revert to a previous state if something goes wrong or to test changes to a VM without affecting the original.

Tools for managing and sharing files and printers on a network. Remote Desktop Services allows users to connect to and use a Windows Server remotely. Hyper-V is a virtualization platform that enables organizations to run more than one operating system on a single physical server. A network Policy Server is a tool for enforcing network access policies and providing network authentication. Several versions of Windows Server are available, including Windows Server 2012R2, Windows Server 2016, Windows Server 2019, and Windows Server 2022. Each type includes different features and technologies and is designed to meet the needs of various organization. Hyper-V is a virtualization technology included with Windows Server and used to create and manage virtual machines (VMs) on a physical host. It allows you to run multiple operating systems on the same physical hardware, which can help consolidate servers, test software, and develop and deploy applications.

III. VMWARE

VMware is a company that provides a variety of virtualization and cloud computing products and services. This virtualization platform allows you to create and manage virtual machines (VMs) on a physical host. It includes features like live migration, resource management, and high availability to help you build and run scalable and reliable virtual environments. VMware Workstation is a desktop virtualization product that allows you to use multiple operating systems on one workstation. It is commonly used for testing and development purposes, enabling you to run various environments without needing numerous physical devices. VMware Fusion is similar to VMware Workstation but is designed specifically for Mac users. It allows you to run Windows and different operating systems on a Mac, which can be helpful for testing applications or running Windows-only software on a Mac. VMware v Cloud: This cloud computing platform allows you to build and deploy applications in a cloud environment. It includes self-service provisioning, resource management, and integration with popular development tools.

IV. VMWARE VS HYPER-V

VMware and Hyper-V are virtualization technologies that allow you to create and manage virtual machines (VMs) on a physical host. Both technologies offer similar capabilities, such as running more than operating systems on a single physical machine, live migration, and virtual networking. However, there are some critical differences between the two technologies: Some supported platforms for Hyper-V is a virtualization technology included with Windows Server and available on Windows 10 Pro and higher. VMware provides various products on multiple platforms, including Windows, Linux, and macOS. Hyper-V is a free virtualization technology included with Windows Server and Windows 10 Pro and higher. VMware products, on the other hand, are generally commercial products that require a license. Hyper-V and VMware provide tools for managing and configuring VMs and virtual environments. Hyper-V includes the Hyper-V Manager, a graphical tool for managing VMs on a single host, and System Centre Virtual Machine Manager (SCVMM), a more advanced tool for managing large-scale virtual environments. VMware provides various management tools, including vCenter Server, a centralized management platform for vSphere environments.

Both Hyper-V and VMware offer good performance for virtualization purposes. However, the specific performance characteristics of each technology can depend on different factors, such as the hardware and workloads running on the VMs. It is difficult to say which technology is "better" as it can depend on your specific needs and requirements. Hyper-V and VMware offer a range of features and capabilities that can be useful in different situations. It is worth considering both technologies and evaluating the best fit for your needs.



Figure 2: VMWARE VS HYPER-V

V. ACTIVE DIRECTORY

Active Directory is a service included with Windows Server and used to store and manage information about resources on a network, such as users, computers, and devices. It allows you to centralize the management of network resources, making it easier to administer and secure your network.

The Active Directory includes User and group management allows you to create and manage user accounts and groups, to control access to network resources. You can also assign permissions to users and groups to control which resources they can access. Domain structure in the Active Directory uses a hierarchical domain structure to organize and devices) that can be managed together. You can create multiple domains within a single Active Directory Forest to reflect the structure of your organization. Active Directory provides authentication and authorization services, which allow you to control who can access your network and what resources they can access. Users can authenticate to the network using their Active Directory credentials, and the Active Directory can enforce access controls based on user and group permissions. Active Directory stores information about network resources in a centralized directory database, which can be accessed and queried by applications and services. It can be helpful for applications that need to look up information about users, computers, and other resources on the network.

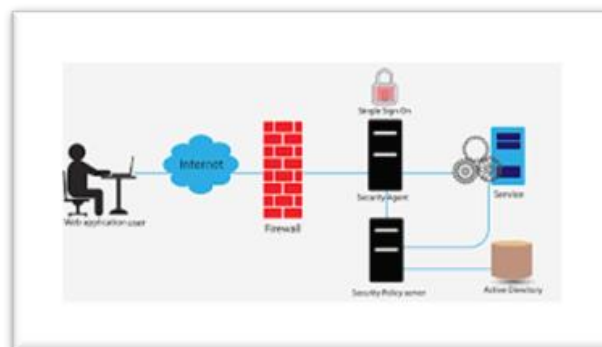


Figure 3: THE ACTIVE DIRECTORY PROCESS

VI. DHCP

Dynamic Host Configuration Protocol (DHCP) is a network protocol that automatically assigns IP addresses and other network configuration parameters to devices on a network. It allows devices to obtain their IP addresses and additional configuration information automatically rather than having to be manually configured.

Here are some key features of DHCP: Automatic IP address assignment: DHCP allows devices to obtain their IP addresses automatically from a DHCP server. The DHCP server maintains a pool of available IP addresses and assigns them to devices as they request them. Network configuration in addition to IP addresses, DHCP assigns other network configuration parameters to devices, such as the default gateway, DNS servers, and subnet masks. Lease Duration is when DHCP assigns IP addresses to devices for a specific period. When the lease expires, the device must request a new lease to continue using the same IP address. This feature allows the DHCP server to reuse IP addresses no longer in use.

DHCP includes support for many optional parameters that can configure additional aspects of the network, such as the domain name, time servers, and network boot servers. DHCP is a widely used protocol essential in managing IP addresses



and other network configuration parameters on many networks. It can help simplify configuring and maintaining a network, allowing devices to obtain their network configuration automatically.

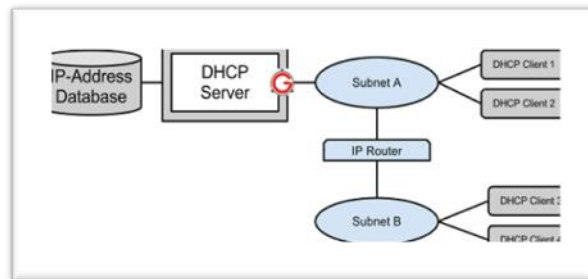


Figure 4: DHCP SERVER FLOW

VII. GROUP POLICY

Group Policy is a Windows feature to centrally manage and configure the settings of computers and users in an Active Directory domain. It will enable you to define and enforce policies for a group of computers or users, which can help implement security and compliance requirements or standardize your network's configuration.

In policy management, Group Policy allows you to create policies that define the settings of a group of computers or users. These policies can configure various locations, including security settings, software installations, and user interface configurations. Group Policy objects can be connected to Active Directory objects, such as users, computers, or organizational units (OUs). Group Policy allows you to apply policies to specific groups of users or computers rather than to the entire domain. Group Policy uses a hierarchical processing model, which means that policies are applied in a specific order based on their location in the Active Directory hierarchy. Group Policy includes a set of predefined policy settings called administrative templates, which allow you to configure a wide range of settings for Windows and other Microsoft products. These templates can control the behaviour of many different aspects of the operating system and other applications.

VIII. DNS

Domain Name System (DNS) is a network protocol used to translate domain names into numerical IP addresses that computers can use to communicate. It plays a critical role in the functioning of the internet and is used by almost all networks to resolve domain names to IP addresses. Here is how DNS works in Windows Server: Domain name resolution is when a user types a domain name into their web browser or when an application makes a request to a server using a domain name. The DNS system resolves the domain name to an IP address, allowing the computer to communicate with the Server or device using the IP address. DNS servers: DNS servers are responsible for storing and managing the DNS records that map domain names to IP addresses. There are multiple types of DNS records, including A forms (which map domain names to IPv4 addresses), AAAA records (which map domain names to IPv6 addresses), and CNAME records (which map one domain name to another). The DNS client is a component of the operating system that handles domain name resolution on a computer. It sends DNS queries to DNS servers to request the IP address associated with a particular domain name. DNS servers and clients can cache DNS records to improve the performance of the DNS system. When a DNS query is made and the result is returned, the Server or client can store the result in its cache. When the same query is made in the future, the result shows more quickly without sending another query to a DNS server.

IX. WINDOWS SERVER VS LINUX SERVER

Windows Server and Linux are both operating systems commonly used for server applications. Some key differences between the two operating systems are ownership and development. Windows servers are developed and maintained by Microsoft, while Linux is a free and open-source operating system developed by a community of volunteers. User interface: Windows Server uses a graphical user interface (GUI) like the one used on Windows desktop operating systems, while Linux typically uses a command-line interface. Some Linux distributions also include a GUI, but it is generally less feature-rich than the one provided by Windows Server. Licensing: Windows Server is a commercial product that requires a license, while Linux is generally free to use. Some Linux distributions, such as Red Hat Enterprise Linux, offer paid versions with additional features and support, but these are generally less expensive than Windows Server. Both Windows



Server and Linux include security features to protect against threats such as viruses and malware. However, Linux is generally considered more secure than Windows due to its open-source nature, and hackers less commonly target it.

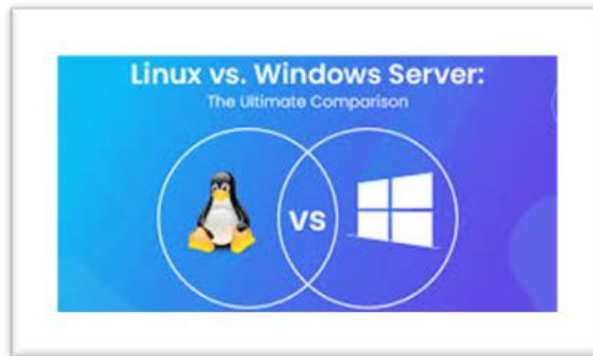


Figure 5: WINDOWS SERVER VS LINUX SERVER

X. CONCLUSION

Windows Server is a group of operating systems designed by Microsoft that provides a range of features and technologies for managing and securing IT infrastructure. It is used by organizations of all sizes, including schools, government agencies, and businesses, to power their networks, servers, and applications.

Windows Server and Linux support a wide range of software applications, but the specific applications available for each platform can vary. Windows Server supports many commercial software applications, while Linux generally has a more extensive selection of free and open-source applications..

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BIOGRAPHY



Professor Meshal Fawaz Aldhamen Work for the higher Institute of Telecommunication & Navigation. Department of Computer Technology, Kuwait. Citrix Certified Administrator (CCA), Citrix Certified Instructor (CCI), A+ Certification, Empire WHO'S WHO Award.