CYSE 280 – Windows Systems Management and Security

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Research Paper: The Evolution of Microsoft Window Servers

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Windows Server has a long and intricate history. The development of Microsoft Windows Servers began in the 1980s. Windows Servers are many operating systems created by Microsoft that supports data storage, applications, and more. There were two different types of operating systems, MS-DOS for personal use, and a server operating system called Windows NT. In the past, versions of the Windows Server have focused on networking, stability, security, and, of course, various improvements to the file system. Other improvements focus on deployment technologies and hardware.

First, what is a server? A server is described as a computer program or device that provides services to another device. Servers are designed to handle a heavy workload. A Windows server is described as a family or group of operating systems. It typically supports companies or small to medium-sized businesses. Windows servers provide data storage, applications, and more. It consists of several features designed to help with network management. There are plenty of features that make Windows Servers unique. One example is an Active Directory. This is a service that helps with the management of user data, such as credentials.

The first Operating System that was released for Windows Servers is Windows NT 3.1 Advanced Server in 1993. It was released 30 years ago on July 27, 1993. NT was Microsoft's branding for New Technologies. NT 3.1 was a 32-bit system while Windows 3.1 was mostly a 16-bit environment. In September of 1994, its successor was introduced as Windows NT Server 3.5. Most networks ran on Unix or Novell servers, so it was important for Windows Server to be compatible with those two systems. In 1995, Microsoft produced Windows NT Server 3.51 to have computers run on Windows 95.

This eventually led to the first implementation of the Windows GUI with the Taskbar and Start menu. 3.51 also gained the capability to manage software licenses for and install and update Windows 95 over the network. A year later was the release of Windows NT Server 4.0. 4.0 was the first release of Windows that included DirectX upon release. DirectX is a collection of APIs that deal with media-related tasks. This mostly applies to videos and gaming/game programming.

In the year 2000, Microsoft did without the “NT” branding, as it was a new era for Windows. Windows 2000 came with plenty of new features. It welcomed new GUI features, such as transition effects, transparency, and more. The Start menu could now be personalized. It allowed the ability to open multiple programs without closing the menu. Windows 2000 introduces the Windows search box, auto-complete, expandable folders, and more. There were also accessibility updates, such as sticky key, high contrast visual impairment settings, on-screen keyboards, screen magnifier, Microsoft narrator, and more. Windows Server 2003 was released soon after in April - March of 2003. Soon after Microsoft updated to a 64-bit environment. Windows Server 2003 R2 (Release 2) was released in 2005. There were updates to the Active Directory services. Windows Server 2008 allowed users to run multiple operating systems on a singular server. Windows Server 2012 had many new features. There were four different versions of Windows Server 2012. The different versions for different purposes, which included Standard, Essentials, Foundation, and Datacenter. Cloud Operating System was pushed. There was also an implementation of the start screen GUI. Windows Server 2016 also had multiple versions.

Windows Server 2016

	Standard Edition	Datacenter Edition
Containers	Yes (Windows containers: unlimited; Hyper-V: 2 max)	Yes; unlimited
Enhanced Storage	Yes	Yes
Host Guardian Hyper-V Support	No	Yes
Software Load Balancer	No	Yes

In the Standard Edition, VM systems were added with an encryption system for Hyper-V. The Datacenter Edition is targeted at large organizations. The Datacenter version's difference from the standard edition is that it has a greater capacity. Windows Server 2019 was announced on March 20, 2018, and consisted of plenty of new features. Windows Server 2019 introduced enhanced security. Windows Server 2019 was more stable than its predecessors. It also had smaller and more efficient containers. There was support for Linux containers under Windows. There were also multiple versions of Windows Server 2019. The versions include Essentials, Standard Edition, and Datacenter Edition.

Windows Server 2019

	Essentials Edition	Standard Edition	Datacenter Edition
Max Users	25	Limited by number of CALs	Limited by number of CALs
Licensing	Per server	Per processor core	Per processor core
Max memory	64 GB	24 TB	24 TB

Max processor sockets	2	64	64
Can join a domain	Only to enable migration	Yes	Yes
Max file sharing connections	16.8 million	16.8 million	16.8 million
Max remote access connections	50	Unlimited	Unlimited
Hyper-V	No	Yes (2 VMs)	Yes (unlimited VMs)
Containers	No	Yes (unlimited)	Yes (unlimited)

Windows Server 2022 was released on August 18, 2021. Similar to previous servers, this server had multiple versions, including Essentials, Standard, Datacenter, and Azure Datacenter.

Windows Server 2022

	Standard Edition	Datacenter Edition
Storage spaces	Yes	Yes
Max number of users	Based on CALs	Based on CALs
Max RAM	48 TB	48 TB
Network Controller	No	Yes
Windows Server containers	Unlimited	Unlimited
Storage Replica	Yes	Yes; unlimited
Inherited activation	As guest if hosted on Datacenter	Can be host or guest

As time goes on, Microsoft made sure to further incorporate cloud advancements. The Azure edition helps the user to use the benefits of the cloud in order to keep VMs up to date while simultaneously minimizing downtime. In regard to security Windows Server 2022 in-depth defense protection against advanced threats. Multi-layer security is implemented to provide the the protection that servers would need to acquire in this day in age.

Description	Windows Server Standard, Datacenter	Windows Server Datacenter: Azure Edition
New releases	Typically 2-3 years	Typically 2-3 years
Product updates	With new release	Yearly, with two major updates in the first 3 years
Support	5 years of mainstream support, plus 5 years of extended support	5 years of mainstream support, plus 5 years of extended support
Servicing channels	Long-Term Servicing Channel	Long-Term Servicing Channel
Who can use it?	All customers through all channels	Software Assurance, Windows Server subscription and cloud customers only
Installation options	Server Core, Server with Desktop Experience, Nano Server container image	Server Core and Server with Desktop Experience only. Windows Server containers aren't supported.
Operating system environments (OSE)	Physical or virtual	Virtual only
Associated virtualization rights	2 virtual OSEs for Standard, Unlimited virtual OSEs for Datacenter	None

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In conclusion, Windows Server has a long history filled with continuous building blocks of improvement. As stated prior the development of Microsoft Windows Servers began in the 1980s. The first operating system released was in 1993. It has officially been exactly 30 years of innovation. There has been a mass amount of evolution over the years. Windows servers have provided data storage, applications, and plenty of new computing capabilities.

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