Windows Embedded Server

Embedded Operation System

Windows Embedded Server

Features

- Windows Server for Embedded Systems offers a dynamic infrastructure that can scale and secure workloads, and increase hardware ROI and reduce total cost of ownership
- The platform features diverse storage choices that can help achieve high-performance, availability and resource efficiency through virtualization and optimization
- Windows Server for Embedded Systems also automates a broad set of management tasks, and simplifies deployment of workloads, helping move an organization toward full, lights-out automation and easy remote management
- Deliver centralized access and audit policies, leverage built-in security capabilities, and help lock down your appliances

Introduction

Windows® Embedded Server is binary identical to Windows Server, with built-in security, reliability, and availability features intended for use in an embedded solution consisting of purpose-built hardware and application software. Windows® Embedded Server allows OEMs to more easily design, build, and deploy dedicated solutions.

Feature Details

Server Availability

Network adapter teaming enables multiple network adapters to be placed into a team interface for bandwidth aggregation and traffic failover.

Data Security and Integrity

- Claims-based file access allows the flexibility to restrict access to files based on various claims.
- Centralized access and audit policies enable targeted auditing of certain data sets.
- Improvements include auto-encryption and file classification.
- Dynamic Host Protocol (DHCP) guard protection helps prevent your server appliance security from being compromised.

Management Efficiency

- Improved automation with Windows PowerShell helps reduce errors and improves availability of server appliances.
- Remote server administration allows enterprises deploying server appliances to remotely manage server appliances across roles from a single UI.
- Helps automate routine tasks.

Data Deduplication

- Throttles CPU and memory consumption to maintain a low impact on server appliance workloads; can be configured to run at specific times, and is highly scalable.
- Uses checksum, consistency and identity validation, in addition to maintaining redundancy for metadata and data most frequently accessed.

Storage Reliance

- Create storage reliance and availability with Storage Spaces and Storage Pools. Enables you to virtualize storage by grouping industry-standard disks into Storage Pools and then creating Storage Spaces from the available capacity in the Storage Pools. With Windows Server for Embedded Systems, you have the ability to virtualize your storage solution. Storage Spaces gives you the ability to consolidate all your SAS and SATA connected disks—whether they are SSDs or traditional HDDs—and consolidate them as Storage Pools.
- Windows Server for Embedded Systems includes a redesigned data persistence layer that is based on a new version of the VHD format called VHDX (VHD 2.0). VHDX has a much larger storage capacity than the older VHD format. iSCSI Target Server also provides data corruption protection during power failures and optimizes structural alignments of dynamic and differencing disks to prevent performance degradation on new, large-sector physical disks.

Virtual Machine Performance

Use Non-Uniform Memory Access (NUMA) in Hyper-V to speed up the performance of virtual machines.

Data Availability

Resilient File System (ReFS) helps maximize data availability and online operation, despite errors that would historically cause data loss or downtime.

Business Intelligence

PowerView, a new feature in the Business Intelligence and Enterprise editions of Microsoft SQL Server for Embedded Systems Reporting Services, provides a method for users who are not business analysts to explore data stored in PowerPivot for SharePoint.

Windows Client Interoperability

Client machines connecting to server appliances from locations with low-bandwidth connections can quickly adapt to different network conditions through improvements in Remote Desktop Protocol.

Windows Server 2016 – The cloud-ready operating system

Windows Server has been developed for several versions for Embedded Systems, 2003(EOL), 2008, 2012, to now 2016. Windows Server 2016 has an innovative breakthrough to evolve your datacenter with more flexibility and to save cost from the utilization of Microsoft Azure. Security to be increased by adding multiple layers of protection built into the operating system that reduces risk from business. Windows Server 2016 also can help you to innovate faster by utilizing microservices architecture.

Security

Windows Server 2016 gives you capabilities to help prevent attacks and detect suspicious activity, with features to control privileged access, help protect virtual machines, and harden the platform against emerging threats.

The new Shielded Virtual Machine feature that protects VMs from attacks and compromised administrators in the underlying fabric, extensive threat resistance components built into the Windows Server 2016 operating system and enhanced auditing events that will help security systems detect malicious activity. Remote Credential Guard helps you protect your credentials over a Remote Desktop connection. Code Integrity can protect Remote Desktop Services to lock down what applications can run within the user sessions. It's how the multiple protections achieve the higher security function for Windows Server 2016.

Datacenter operation

Windows Server 2016 exhibits capabilities to meet operational and security challenges, freeing up IT resources to plan and innovate on future solutions that drive business success. For example, the direct local storage space and storage replica between servers help on building highly availability and scalable software defined storage. Furthermore, the new role in Windows Server 2016 is that enables low cost-per-seat by allowing multiple users to run their own sessions while connected to one machine.

Faster innovation

Windows Server 2016 also supports developers to modernize apps or services no matter from on-premises or any cloud, by using technologies such as containers and microservices architectures. For example, Windows containers provide greater isolation enabling many isolated applications to run on one computer system, which including Windows Server containers and Hyper-V container.

- Nano Server can be the container OS for both types of Windows containers.
- Container data management capabilities are enabled with container shared folders.
- Container resource policies can be implemented.
- Move your traditional applications into a modern DevOps environment with little or no code changes using containers. Windows Server

Containers bring the agility and density of containers to the Windows ecosystem, enabling agile application development and management. Use Hyper-V isolation for a unique additional level of security for Linux and Windows containerized applications without any changes to the container image. Use Active Directory identity mapped to your Windows Server Containers.

- Microsoft, Docker Inc. and the Docker Community have partnered to provide the Docker Enterprise Edition with support for new container technologies in Windows Server 2016.
- Use Nano Server as the container image for the agility and flexibility today's application developers need. Optimized for use inside containers, it's the perfect option for working with microservices.
- Run traditional first-party applications such as SQL Server 2016 with best-in-class performance, security and availability.

The comparison between Microsoft 2008/2008R2, 2012/2012 R2, and 2016 are listed below.

Features	Server 2008 / 2008 R2	Server 2012	Server 2012 R2	Server 2016
Identity and Access				
Active Directory Services	●	●	●	●
Dynamic Access Control	–	●	●	●
AD virtualization support	–	●	●	●
Virtualization				
Shared-nothing live migration	–	●	●	●
Hyper-V Replica	–	●	●	●
Hyper-V clustering	●	●	●	●
Virtual Desktop Infrastructure	●	●	●	●
Storage				
Storage Spaces with tiering	–	–	●	●
Shared VHDX	–	–	●	●
Live storage migration	–	●	●	●
Storage QoS	–		●	●
Cluster share volume	●	●	●	●
Web and App Plat				
Multi-tenant high density websites	●	●	●	●
NUMA aware scalability	–	●	●	●
Dynamic IP restrictions	–	●	●	●
Networking				
Hyper-V Network Virtualization	–	●	●	●
NIC teaming	–	●	●	●
IP address management	–	●	●	●
Management and Automation				
Server Core	●	●	●	●
Multiserver management		●	●	●
Windows PowerShell	●	●	●	●
Windows PowerShell Workflow and Web Access	–	●	●	●

Licensing Model

Windows Server 2016 for Embedded Systems

Feature	Standard	Datacenter
Cores	Each license covers up to 16,20, or 24 Cores	Clients Access Licenses required.
Virtualization Rights	Two virtual instances	Unlimited virtual instances

Windows Server 2012 For Embedded Systems and Windows Server 2012 R2 For Embedded Systems

Feature	Standard	Datacenter
Processor supported	1-4	1-4
Virtualization technology	2 to 4 virtual license instances	unlimited virtual license instances

Windows Server 2008 For Embedded Systems and Windows Server 2008 R2 For Embedded Systems

Feature	Standard	Enterprise
Processor supported	1-4	1-8
Virtualization technology	2 to 4 virtual license instances	unlimited virtual license instances

Ordering Information

Windows Server 2016 for Embedded Systems

Advantech PN	MS PN	Item Name	End of Support	End of License
968TS16D16	9ZU-00056	Win Svr Emb Dtcntr 2016 64Bit MultiLang ESD OEI 16 Core	2027/1/11	2031/12/31
968TS16D24	9ZU-00057	Win Svr Emb Dtcntr 2016 64Bit MultiLang ESD OEI 24Core	2027/1/11	2031/12/31
968TS16DA4	9ZU-00043	Win Svr Emb Dtcntr 2016 64Bit MultiLang ESD OEI 4Cr NoMedia/NoKey AddLic	2027/1/11	2031/12/31
968TS16S16	6FA-00297	Win Svr Emb Std 2016 64Bit MultiLang ESD OEI 16 Core Std	2027/1/11	2031/12/31
968TS16S20	6FA-00298	Win Svr Emb Std 2016 64Bit MultiLang ESD OEI 20 Core Std	2027/1/11	2031/12/31
968TS16S24	6FA-00299	Win Svr Emb Std 2016 64Bit MultiLang ESD OEI 24 Core Std	2027/1/11	2031/12/31
968TS16SA4	6FA-00308	Win Svr Emb Std 2016 64Bit MultiLang ESD OEI 4Core NoMedia/NoKey AddLic	2027/1/11	2031/12/31
968TS16C1D	6KA-00073	Win Svr Emb CAL 2016 64Bit MultiLang ESD OEI 1 Clt Device CAL	2027/1/11	2031/12/31
968TS16C1U	6KA-00074	Win Svr Emb CAL 2016 64Bit MultiLang ESD OEI 1 Clt User CAL	2027/1/11	2031/12/31
968TS16C5D	6KA-00075	Win Svr Emb CAL 2016 64Bit MultiLang ESD OEI 5 Clt Device CAL	2027/1/11	2031/12/31
968TS16C5U	6KA-00076	Win Svr Emb CAL 2016 64Bit MultiLang ESD OEI 5 Clt User CAL	2027/1/11	2031/12/31
968TS16S5C	6FA-00300	Win Svr Emb Std 2016 64Bit MultiLang ESD OEI 5 Clt 16 Core Std	2027/1/11	2031/12/31

Windows Server 2012 R2 for Embedded Systems

- **Standard Version**

Advantech PN	MS PN	Item Name	End of Support	End of License
968TS12R2U	6FA-00235	Win Svr Emb Std 2012 R2 x64 EMB MultiLang ESD OEI 2 CPU Std	2023/1/10	2027/6/30
968TS12R25	6FA-00241	Win Svr Emb Std 2012 R2 x64 EMB MultiLang ESD OEI 2 CPU 5 Clt Std	2023/1/10	2027/6/30
968TS12R20	6FA-00244	Win Svr Emb Std 2012 R2 x64 EMB MultiLang ESD OEI 2 CPU 10 Clt Std	2023/1/10	2027/6/30
968TS12R4U	6FA-00238	Win Svr Emb Std 2012 R2 x64 EMB MultiLang ESD OEI 4 CPU Std	2023/1/10	2027/6/30
968TS12R45	6FA-00247	Win Svr Emb Std 2012 R2 x64 EMB MultiLang ESD OEI 4 CPU 5 Clt Std	2023/1/10	2027/6/30
968TS12R40	6FA-00250	Win Svr Emb Std 2012 R2 x64 EMB MultiLang ESD OEI 4 CPU 10 Clt Std	2023/1/10	2027/6/30

- **DataCenter Version**

Advantech PN	MS PN	Item Name	End of Support	End of License
968TS12RD2	9ZU-00028	Win Svr Emb Dtcntr 2012 R2 x64 EMB MultiLang ESD OEI 2 CPU	2023/1/10	2027/6/30
968TS12RD4	9ZU-00031	Win Svr Emb Dtcntr 2012 R2 x64 EMB MultiLang ESD OEI 4 CPU	2023/1/10	2027/6/30