Windows Server: What’s new and what’s next
Modernizing your infrastructure and apps

Jeff Woolsey
Principal PM Manager, Windows Server
@wsv_guy
Two years ago... Windows Server 2016
Windows Server momentum
The use of Shielded VMs reduces our regulatory compliance costs. By reducing our costs, we can put out more competitive bids, which helps us win more deals.

Ted Holland: Director of Global Infrastructure

We love the pristine and predictable environments provided by Windows Server Containers. Service Fabric brings us a safe and consistent deployment strategy that maximizes uptime. The marriage of the two in Microsoft Azure gives us unlimited potential.

Ralph Feltis: Software Engineer

Our new storage solution has greatly improved productivity and alleviated employee frustration. Our employees [can] focus on what they do best: helping troubled youth.

Cliff Reyle: Chief Human Resource and Information Officer
Trends in the IT industry

Enhanced security
60% of enterprises will invest in data loss prevention, protection and encryption tools.

Hyper-converged infrastructure (HCI)
HCI which brings together compute, storage, and networking to provide greater performance and scale while reducing infrastructure costs.

Application Innovation
Use of containers and tools are up, as more enterprises adopt the technology for consistent and flexible apps across environments.

Hybrid datacenter
80% of Enterprises see themselves operating hybrid clouds for the foreseeable future.

Source:
1-Microsoft study, 2017  2-“forecast: information security, worldwide, 2015-2021, 3Q17 update,” Gartner 3-right scale 2016 state of the cloud report
Announcing Windows Server 2019

- Hybrid datacenter
- Hyper-converged infrastructure (HCI)
- Enhanced security
- Application Innovation
Unique hybrid capabilities with Azure

Extend your datacenter to Azure to maximize existing investments and gain new hybrid capabilities

- Azure Backup, Azure Site Recovery, and more
- Storage Migration Services
- Azure Network Adapter for connection to Azure virtual networks
- Windows Admin Center: the hub for hybrid
Windows Admin Center

Over 2 Million servers under management!
Demo: Windows Admin Center
### Windows Admin Center

#### All Connections

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Last Connected</th>
<th>Managing As</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.32.112.207</td>
<td>Server</td>
<td>9/19/2018 2:32:39 PM</td>
<td>REDMOND\wind</td>
</tr>
<tr>
<td>accounting127\redmond.corp.microsoft.com</td>
<td>Server</td>
<td>9/19/2018 3:34:29 AM</td>
<td>REDMOND\wind</td>
</tr>
<tr>
<td>jav-dev2\corp.microsoft.com</td>
<td>Server</td>
<td>9/20/2018 9:06:12 PM</td>
<td>REDMOND\wind</td>
</tr>
<tr>
<td>onpremvm.farcast.corp.microsoft.com</td>
<td>Server</td>
<td>9/20/2018 9:56:49 AM</td>
<td>REDMOND\wind</td>
</tr>
</tbody>
</table>
Demo: Windows Admin Center
Windows Server 2019
Storage Migration Service
Customers told us...

• We need to migrate data and it’s hard
  • All data must transfer
  • All shares and their configuration and file system security must transfer
  • All in-use files must transfer
  • All files you, the operator, don’t have access to must transfer
  • All use of local groups and users must transfer
  • All data attributes, alternate data streams, encryption, compression, etc. must transfer
  • All network addresses must transfer
  • All forms of computer naming and other network resolution must transfer

• Migration has to get *everything*
Storage Migration Service

- Migrates *unstructured* data from anywhere into Azure & modern Windows Servers
- Fast, consistent, and scalable
- Provides an elegant, graphical workflow...
Storage Migration Service

- Windows Admin Center
- Migrates from:
  - Windows Server 2003
  - Windows Server 2008
  - Windows Server 2008 R2
  - Windows Server 2012
  - Windows Server 2012 R2
  - Windows Server 2016
  - Windows Server 2019 Preview
- Included in Windows Server 2019 Standard and Datacenter
Storage Migration Service operates in three phases

**Inventory** – admin selects nodes to migrate, Storage Migration Service orchestrator node interrogates their storage, networking, security, SMB share settings, and data to migrate

**Transfer** – admin creates pairings of source and destinations from that inventory list, decides what data to transfer and performs one more or transfers

**Cutover** – the admin assigns the source networks to the destinations and the new servers take over the identity of the old servers. The old servers enter a maintenance state where they are unavailable to users and applications for later decommissioning while the new servers use the subsumed identities to carry on all duties.
Demo: Storage Migration
Storage Migration Service

• Migrate to Azure IaaS VM

• Migrate to Windows Server On-Premises
  • Upgrade to modern secure HW/OS

• Migrate to Windows Server with Azure File Sync
  • Use File Server as hot cache on-prem
  • Virtually bottomless storage with tiering to Azure
  • Encrypted backup in Azure
Azure File Sync

Simplify your life with cloud-based services

Centralize File Services in Azure

Transform Your Windows file servers into hot caches of your data

Your request: MORE...
Announcing

Azure File Sync support

100 TiB
### Azure File Sync

#### Overview

**Sync service registration**
- **Status**: Registered
- **Storage sync service**: WACAPS Demo

<table>
<thead>
<tr>
<th>Service connectivity</th>
<th>Network proxy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud management status: <strong>Online</strong></td>
<td>Sync-specific network proxy: No proxy has been set</td>
</tr>
<tr>
<td>Cloud monitoring status: <strong>Online</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Server agent**
- **Installed agent version**: 4.0.1.0
- **No expiration data set**
- **Latest available agent version**: 4.0.1.0

#### Web links
- Azure portal: [Manage this registered server](#)
- Documentation: [Plan for an Azure File Sync deployment](#)
- Deployment guide: [](#)
- Proxy and firewall settings guide: [](#)
- Troubleshooting guide: [](#)
Azure File Sync
Worldwide Server Market Revenue Grew 43.7% Year Over Year to a Record $22.5 Billion During the Second Quarter of 2018, According to IDC

FRAMINGHAM, Mass., September 5, 2018 — According to the International Data Corporation (IDC) Worldwide Quarterly Server Tracker, vendor revenue in the worldwide server market increased 43.7% year over year to $22.56 billion during the second quarter of 2018 (2Q18). Worldwide server shipments increased 20.5% year over year to 2.9 million units in 2Q18.

The overall server market continues to experience strong demand with 2Q18 marking the fourth consecutive quarter of double-digit revenue growth and its highest total revenue ever. Volume server revenue increased by 42.7% to $18.4 billion, while midrange server revenue grew 60.2% to $2.5 billion. High-end systems grew 10.4% to $1.7 billion.

“The worldwide server market continues to flourish amid a market-wide enterprise refresh cycle and increasing demand for cloud services,” said Satya Mudda, senior research analyst, Servers and Storage at IDC. “Enterprises continue to invest in new infrastructure to support next-generation applications and achieve cloud-like benefits on premise. Enterprises also continue to update and expand their datacenter footprint, benefiting IDM Direct suppliers. Server revenue growth has also been driven by increasing average selling prices (ASP). This is due to richer configurations, DRAM prices, and processor platforms.”

Overall Server Market Standings, by Company

Dell Inc. achieved the number one position in the worldwide server market for the first time in 2Q18 with 18.8% and 52.9% growth. HP Inc./New H3C Group was the second largest supplier with 16.6% share of total vendor revenue. IBM and Lenovo were statistically tied for third position in the market with respective shares of 11.1%. Cisco, and Huawei rounded out the top five, all statistically tied with 8.4%, 8.4%, and 4.3% respective revenue. The IDM Direct group of vendors increased their collective revenue by 55.9% (year over year) to $4.4 billion in 2Q18 and led the worldwide server market in terms of unit shipments, accounting for 19.5% of all units shipped in 2Q18.

Top 5 Companies, Worldwide Server Vendor Revenue, Market Share, and Growth, Second Quarter 2018 (in US$ Million)

<table>
<thead>
<tr>
<th>Company</th>
<th>2Q18 Revenue</th>
<th>2Q18 Market Share</th>
<th>2Q17 Revenue</th>
<th>2Q17 Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dell Inc.</td>
<td>$4,346.1</td>
<td>18.8%</td>
<td>$2,776.2</td>
<td>16.6%</td>
</tr>
<tr>
<td>2. HP Inc./New H3C Group</td>
<td>$3,740.8</td>
<td>16.6%</td>
<td>$3,341</td>
<td>16.6%</td>
</tr>
<tr>
<td>3. IBM</td>
<td>$1,637.5</td>
<td>7.3%</td>
<td>$1,007.9</td>
<td>5.9%</td>
</tr>
<tr>
<td>4. Lenovo</td>
<td>$1,549.1</td>
<td>6.9%</td>
<td>$1,017.9</td>
<td>5.9%</td>
</tr>
<tr>
<td>5. Inspur</td>
<td>$1,007.9</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

IDC Quarterly Server Tracker, 2Q18
Unprecedented hyper-converged infrastructure

Evolve your datacenter infrastructure to achieve greater efficiency and security

Windows Admin Center management
Best for two-node HCI at the edge
Industry-leading performance and scale
Storage Class Memory support
Demo – Windows Server 2019 with Intel® Optane™ DC persistent memory
Hyper-V + Storage Spaces Direct + SDN

Windows Server 2019
PREVIOUS IOPS RECORD

6, 6, 9, 6, 5, 4, 2

Monday, September 26, 2016 | 16 server nodes running Windows Server 2016
High performance storage  Direct load/store access  Native persistence

128 GB, 256 GB, 512 GB  Up to 3 TB per socket
Native support in Windows Server 2019

Manage in Windows Admin Center

Automate with PowerShell
The very latest from Intel

- **12** x Intel® S2600WFT
- 384 GiB (12 x 32 GiB) memory
- 2 x 28-core future Intel® Xeon® Scalable processor
- 1.5 TB Intel® Optane™ DC persistent memory as cache
- 32 TB NVMe (4 x 8TB Intel® DC P4510) as capacity
- 2 x Mellanox ConnectX-4 25 Gbps

The very latest from Microsoft

- Windows Server 2019 – Insider Preview
- Insider Preview, build 17713
- Hyper-V + Storage Spaces Direct
NEW IOPS RECORD
NEW IOPS RECORD

Monday, September 24, 2018 | Windows Server 2019 with Intel® Optane™ DC persistent memory

© 2018 Microsoft
Hyper-converged infrastructure with over 300 virtual machines
Hyper-converged infrastructure with over 300 virtual machines
Hyper-converged infrastructure with over 300 virtual machines

Server 01 | Server 02 | Server 03 | Server 04 | Server 05 | Server 06

Server 07 | Server 08 | Server 09 | Server 10 | Server 11 | Server 12
Hyper-converged infrastructure with over 300 virtual machines
Hyper-converged infrastructure with over 300 virtual machines

<table>
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<tr>
<th>Server 01</th>
<th>Server 02</th>
<th>Server 03</th>
<th>Server 04</th>
<th>Server 05</th>
<th>Server 06</th>
</tr>
</thead>
<tbody>
<tr>
<td>VM On</td>
<td>VM On</td>
<td>VM On</td>
<td>VM Off</td>
<td>VM Off</td>
<td>VM Off</td>
</tr>
<tr>
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<td>VM On</td>
<td>VM On</td>
<td>VM Off</td>
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</table>

<table>
<thead>
<tr>
<th>Server 07</th>
<th>Server 08</th>
<th>Server 09</th>
<th>Server 10</th>
<th>Server 11</th>
<th>Server 12</th>
</tr>
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<tr>
<td>VM Off</td>
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</tbody>
</table>

© 2018 Microsoft
11-05-18

Shared under NDA
Hyper-converged infrastructure with over 300 virtual machines
NEW IOPS RECORD

1, 3, 7, 9, 8, 6, 7, 4

Monday, September 24, 2018 | Windows Server 2019 with Intel® Optane™ DC persistent memory

© 2018 Microsoft
DOUBLE THE IOPS WITH 25% FEWER SERVERS

12 server nodes running Windows Server 2019 with Intel® Optane™ DC persistent memory

Random 4 kB read I/O to 18 TB active working set by VM Fleet (i.e. DISKSPD inside Hyper-V virtual machines)

Volumes use three-way mirror resiliency, scoped to 3 server nodes each
Memory cache OFF. Relevant side-channel mitigations all applied
Windows Server Software-Defined (WSSD)

Now with 13 partners
Welcome Axellio, Hitachi, Huawei, SecureGuard
Fujitsu Extension

Now generally available!
DataOn Extension

Version 2 now available!
Enhanced security capabilities

Elevate your security posture by protecting the datacenter starting with the operating system

- Shielded VMs for Linux
- Integrated Windows Defender ATP
- Exploit Guard
- System Guard Runtime
Summary of new Shielded VM capabilities in Windows Server 2019

- Run Linux in a Shielded VM
- Highly Available Host Guardian Service
- Offline startup of Shielded VMs
- Single-host binding for Shielded VMs
- New, simple attestation mode
- VMConnect & PowerShell Direct with Shielded VMs
- Improved deployment tools
Windows Server 2016
Initial launch of containers
Process and Hyper-V isolation
Docker EE Basic Included at no additional cost

Windows Server version 1709
- Optimized container images for Nano Server and Server Core
- Platform level support for Linux containers
- Windows Subsystem for Linux
- Networking enhancements for overlays and SDN

Windows Server, version 1803
- Optimized Server Core image
- App compat improvements
- Native command line tools—curl.exe, tar.exe and SSH
- Enhancements to the Windows Subsystem for Linux
- Networking enhancements for greater density and quicker endpoint creation
- Improved network security with Calico Open source storage plugins for Kubernetes
- Platform functionality required for Kubernetes conformance

Windows Server 2019
- Optimized Server Core image
- App compat improvements
- Enhanced Group Managed Service Account support
- Platform functionality for Kubernetes and Microsoft Service Fabric
- Performance and density improvements
- Platform and open source work on CNI networking plugins such as Calico and Flannel
- Enhancements to the Windows Subsystem for Linux

...you will have to wait

Application Innovation
Faster innovation for applications

Enable developers and IT pros to create cloud native, modernize their traditional apps using containers and micro-services

- Linux Containers on Windows host
- Service Fabric & Kubernetes for container orchestration
- Windows Subsystem for Linux
- Optimized Images for Server Core and Nano Server
Containers & Admin Center
### Containers Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Image</th>
<th>Status</th>
<th>Port configuration</th>
<th>CMD</th>
<th>ID</th>
<th>Created</th>
<th>CPU percentage</th>
<th>Memory usage</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>my hypertex</td>
<td>microsoft/hyperserver</td>
<td>Created</td>
<td></td>
<td>[c:\windows\system32...</td>
<td>c01ee12e34090561c616...</td>
<td>2018-06-30 22:02:58 -07:00</td>
<td>0.00%</td>
<td>0B</td>
<td>0B</td>
</tr>
<tr>
<td>my containers</td>
<td>microsoft/hyperserver</td>
<td>Up 9 days</td>
<td></td>
<td>[c:\windows\system32...</td>
<td>090561c616f71fa616c...</td>
<td>2018-08-30 12:43:37 -07:00</td>
<td>0.00%</td>
<td>43.29MB</td>
<td>0B</td>
</tr>
<tr>
<td>myWAC</td>
<td>wacalinux</td>
<td>Up 9 days</td>
<td>0.0.0.6516-444/tcp</td>
<td>[powershell -command ...</td>
<td>f169e53c25d6f54a2b063e...</td>
<td>2018-08-23 17:26:18 -07:00</td>
<td>0.00%</td>
<td>158MB</td>
<td>0B</td>
</tr>
</tbody>
</table>

### Details - myWAC

Connecting to myWAC...

{sme-demo1.redmond.corp.microsoft.com}: [f169e53c25d6f54a2b063e...]

PS C:\Users\ContainerAdministrator\Documents}
Containers & Admin Center
## SQL Server 2019 Preview

<table>
<thead>
<tr>
<th>1. Harness the power of big data</th>
<th>2. Bring AI to your workloads</th>
<th>3. Eliminate the need for data movement</th>
<th>4. Explore and interact with visual data</th>
<th>5. Run real-time analytics on operational data</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Spark" /></td>
<td><img src="image" alt="AI gear" /></td>
<td><img src="image" alt="Data virtualization" /></td>
<td><img src="image" alt="Visual data exploration" /></td>
<td><img src="image" alt="In-memory technologies" /></td>
</tr>
<tr>
<td>Big data clusters with scalable compute and storage composed of SQL Server, Spark, and HDFS. Cache data in scale-out data marts.</td>
<td>A complete AI platform to train and operationalize models in SQL Server ML Services or Spark ML using Azure Data Studio notebooks.</td>
<td>Data virtualization allows queries across relational and non-relational data without movement or replication.</td>
<td>Visual data exploration and interactive analysis using SQL Server BI tools and Power BI Report Server.</td>
<td>In-memory technologies for analytics on operational data using HTAP. Higher concurrency and scale through persistent memory.</td>
</tr>
<tr>
<td><img src="image" alt="Intelligent Query Processing" /></td>
<td><img src="image" alt="Greater uptime with more online indexing operations" /></td>
<td><img src="image" alt="SQL Server enables layers of security including protection of computations in Always Encrypted secure enclaves" /></td>
<td><img src="image" alt="Data Discovery &amp; Classification labeling for GDPR and Vulnerability Assessment tool to track compliance" /></td>
<td><img src="image" alt="Support for your choice of Windows, Linux, and containers. Run Java code on SQL Server and store and analyze graph data" /></td>
</tr>
<tr>
<td>Intelligent Query Processing improves scaling of queries and Automatic Plan Correction resolves performance problems.</td>
<td>Greater uptime with more online indexing operations. Now run Always On availability groups on containers using Kubernetes.</td>
<td>SQL Server enables layers of security including protection of computations in Always Encrypted secure enclaves.</td>
<td>Data Discovery &amp; Classification labeling for GDPR and Vulnerability Assessment tool to track compliance.</td>
<td>Support for your choice of Windows, Linux, and containers. Run Java code on SQL Server and store and analyze graph data.</td>
</tr>
</tbody>
</table>
Exchange Server 2019 GA

Now supported in Server Core!
System Center 2019

Support Windows Server 2019

Best-in-class Operations

Extensible management to multiple systems

Azure integration

Coming in H1 2019
Windows Admin Center complements existing management solutions

- Azure security and management
- System Center
- Remote Server Administration Tools
- Remote Desktop + in-box tools

Cloud/hybrid deployments
Large deployments
Small deployments
Time to upgrade the platforms

2017

2018

2019

You are here

SQL 2008/R2
July 2019

Windows Server 2008/R2
January 2020

2020
Announcing

Windows Server Upgrade Center

http://aka.ms/UpgradeCenter
Looking forward

**INSIDERS**

Every 2 weeks

- **October 2017**: Windows Server, version 1709
- **April 2018**: Windows Server, version 1803
- **September 2018**: Windows Server, version 1809
- **H1/CY2019**: Windows Server, version 19XX
- **H2/CY2019**: Windows Server, version 19XX

**SEMI-ANNUAL CHANNEL**

Every 6 months

- **October 2016**: Windows Server 2016
- **September 2018**: Windows Server 2019

**LONG-TERM SERVICING CHANNEL**

- **October 2016**: Windows Server 2016
- **September 2018**: Windows Server 2019

2-3 Years
Microsoft Azure

Hybrid Datacenter

Windows Server/WSSD
SQL/.NET/Containers

On-premises

Hybrid Cloud

Azure Stack

Hybrid

Hyper-converged Infrastructure

Security

Application Innovation
Thank you!