
Arrow ECS Training

Windows Server 2016: Die Neuerungen im Überblick

Bei technischen Problemen mit GoToMeeting kontaktieren Sie:
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Arrow ECS Training

Get-KnowHow | Select-Object -property 'Essential'

Windows Server 2016: Die Neuerungen im Überblick

Thorsten Butz



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Agenda

Einige
Windows Server 2016: ~~Die~~ Neuerungen im Überblick

- Editionen, Lizenzierung
- Hyper-V, Container
- Nano-Installationsoption
- "The Big Picture"

= 1 h, 2 Demos, 20 Folien



Arrow Education – Trainings & Zertifizierungen



... deutschlandweite Abdeckung

- > München
- > Frankfurt
- > Bochum
- > Berlin
- > Hamburg

...Qualität

- > Supportprofis als Trainer
- > Lerngarantie
- > Garantierte Kursdurchführung
- > Zertifiziertes Testcenter

... Modernste Lernumgebung

- > Highend Laborumgebung
- > Digitale Kursunterlagen
- > Klimatisierte Kursräume

... Einmaliges Kursportfolio

- > Citrix
- > VMware
- > Microsoft
- > Check Point
- > Uvm.

... innovative und zeitgemäße Lernmethoden

- > Klassenraumtraining
- > Virtual Classroom
- > Elearning
- > Videolearning

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Empfohlene Microsoft Kurse:

- Mastering Windows 2012 R2 & Windows 10 // Praxis.Workshop (5 Tage)
- Automating Administration with Windows PowerShell MOC-10961 (5 Tage)
- Installing and Configuring Windows 10 MOC-20697-1 (5 Tage)

Microsoft Partner
Silver Learning

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about_me

```
$speaker = @{  
    name = 'Thorsten Butz'  
    certification = 'MC*/LIPC-2'  
    focus = 'Scripting', 'ServerManagement'  
     = '@thorstenbutz'  
     = 'http://www.thorsten-butz.de'  
}
```

Previously ...

NT 5.0	Windows 2000	// 2000
NT 5.1	Windows XP	// 2001
NT 5.2	Windows Server 2003	// 2003
NT 5.2	Windows Server 2003 (R2)	// 2005
NT 6	Windows Vista	// 2006
NT 6	Windows Server 2008	// 2008
NT 6.1	Windows 7 / WS2008 R2	// 2009
NT 6.2	Windows 8 / WS 2012	// 2012
NT 6.3	Windows 8.1 / WS 2012 R2	// 2013
NT 10	Windows 10	// 2015
NT 10	Window Server "vNext"	// 2016

Rot markiert: Client und Server OS wurden gemeinsam veröffentlicht.

Windows as a Service

JULY 15, 2015 11:37 AM

Build 10240 now available for Windows Insiders in Fast and Slow rings

By [Gabe Aul](#) / Corporate Vice President, Engineering Systems Team

 SHARE  TWEET  SHARE  SKYPE

Hi everyone, today we are releasing a new build to both the Fast and Slow rings. We're just about two weeks away from beginning to offer Windows 10 to the world, [as Terry detailed here](#).

Windows 10

- Jul. 2015
Threshold 1
- Nov. 2015
Threshold 2
- Redstone
____ 2016

<https://blogs.windows.com/windowsexperience/2015/07/15/build-10240-now-available-for-windows-insiders-in-fast-and-slow-rings>

*Virtualize
everything!*

The software defined datacenter

- **Compute**
Core OS, Hyper-V, Containers
- **Networking**
SDN, integrated NAT, ..
- **Storage**
Storage replica, Storage Spaces direct, ..

Codename: Redstone



- Neues Lizenzmodell
- Installationsoption: **Nano Server**
- Hyper-V Verbesserungen
 - "Nested virtualization"
 - Shielded VMS
 - **Miniaturisierter Host (und VMs)**
 - Rolling cluster upgrades
(WS 2012 R2 & WS 2016)
- Container
 - Windows Server Container
 - Hyper-V Container
 - Docker support

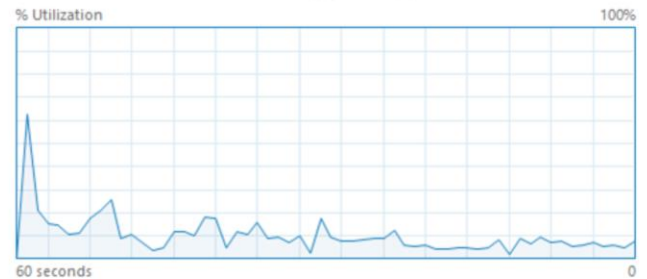
<http://minecraft-de.gamepedia.com/Redstone>

Lizensierung

- Lizensierung pro **CORE** (zuvor: CPU)
- Minimum pro physischem Server:
 - 2 **SOCKETs**
 - **8 COREs** je **SOCKET**= Minimum **16 COREs**
- Wie gehabt:
 - Standard Edition: 1 + 2 OSE
 - Datacenter Edition: ∞ OSE

CPU

Intel(R) Xeon(R) CPU E5520 @ 2.27GHz



Utilization	Speed	Maximum speed:	2,27 GHz
8%	1,59 GHz	Sockets:	1
Processes	Threads	Cores:	4
49	1009	Logical processors:	8
Up time		Virtualization:	Enabled
0:00:40:23		L1 cache:	256 KB
		L2 cache:	1,0 MB
		L3 cache:	8,0 MB

OSE: Operating System Environment

Quellen :

- "Windows Server 2016 and System Center 2016 Standard and Datacenter Editions Pricing and licensing FAQ December 2015"
<https://t.co/fR2ybzbVx>
- Windows Server 2016 Standard and Datacenter Editions Licensing Datasheet
<https://t.co/H1bu72R65v>
- Mary Jo Foley: Microsoft Windows Server 2016 to move to per-core licensing
<http://www.zdnet.com/article/microsoft-windows-server-2016-to-move-to-per-core-licensing/>
- Wes Miller (Twitter)
<https://twitter.com/getwired/status/672498239552098305>

Lizenisierung: WS 2012 R2 vs. WS 2016

Number of 2-core pack licenses needed (Minimum 8 cores/proc; 16 cores/server)					
Procs per server	Physical cores per processor				
	2	4	6	8	10
	1	8	8	8	8
	2	8	8	8	10
4*	16	16	16	16	20

* Standard Edition may need additional licensing

Licensing costs are same as 2012 R2
Additional licensing required

Quelle: Windows Server 2016 Standard and Datacenter Editions Licensing Datasheet

Editionen

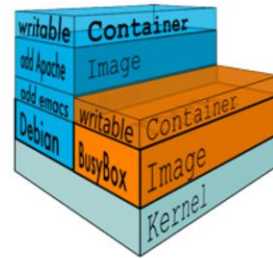
- Standard: 882 \$
- Datacenter: 6.155 \$

Quelle (ebd.): Windows Server 2016 Standard and Datacenter Editions Licensing Datasheet

Windows Server 2016 Editions		
	Datacenter	Standard
Core functionality of Windows Server	•	•
OSEs / Hyper-V containers*	Unlimited	2
Windows Server containers	Unlimited	Unlimited
Nano Server	•	•
New storage features including Storage Spaces Direct and Storage Replica*	•	
New Shielded Virtual Machines and Host Guardian Service*	•	
New networking stack*	•	

Container

- Linux Container: docker.com
- Container in WS 2016
 1. Hyper-V Container
Hyper-V erforderlich
 2. Windows Server Container
Hyper-V nicht erforderlich
 3. Docker Container



Abbildungen: www.docker.com/what-docker

“Docker containers wrap up a piece of software in a complete filesystem that contains everything it needs to run: code, runtime, system tools, system libraries – anything you can install on a server. This guarantees that it will always run the same, regardless of the environment it is running in.”

<https://www.docker.com/what-docker>

Storage

- Storage Spaces Direct
 - Hyper-converged (VMs)
 - Converged (multiple Server)
- ReFS
 - Effiziente Snapshots/Checkpoints und Sicherungen durch Änderungen der Metadaten
 - Manipulation von VHDX-Dateien durch ändern der Metadaten: hohe Geschwindigkeit
- Storage Replica
 - Volumen- und blockbasierte Replizierung zwischen verschiedenen Hosts
- SMB 3.1.1

<http://blogs.technet.com/b/josebda/archive/2015/05/05/what-s-new-in-smb-3-1-1-in-the-windows-server-technical-preview-2.aspx>

<https://www.veeam.com/de/videos/windows-server-2016-neuerungen-ueberblick-de-7160.html>

Hyper-V Verbesserungen

- Änderungen im laufenden Betrieb
 - "Hot Add/Remove" von Netzwerkkarten
 - Änderungen des Hauptspeichers
- Cluster Rolling Upgrades
- PowerShell Direct (via VMBus)
- "Nested virtualization"
- Integriertes NAT/IP-Masquerading
- "Shielded VMs"

Verschlüsselte VMs, können auf keiner anderen Hardware starten

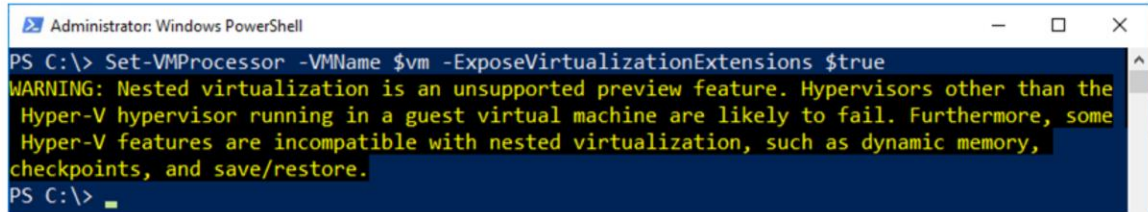
<https://technet.microsoft.com/en-us/library/dn765472.aspx>

<http://www.aidanfinn.com/?p=17424>

<https://hyperv.veeam.com/blog/new-features-windows-server-hyper-v-2016/>

<http://www.thomasmaurer.ch/2015/05/whats-new-in-windows-server-2016-hyper-v/>

Nested VMs



```
Administrator: Windows PowerShell
PS C:\> Set-VMProcessor -VMName $vm -ExposeVirtualizationExtensions $true
WARNING: Nested virtualization is an unsupported preview feature. Hypervisors other than the
Hyper-V hypervisor running in a guest virtual machine are likely to fail. Furthermore, some
Hyper-V features are incompatible with nested virtualization, such as dynamic memory,
checkpoints, and save/restore.
PS C:\> █
```

- Supported OS: WS 2016, W10 Build 10565
- Dynamic memory: OFF
- Minimum RAM für VM: 4 GB
- VM NIC: MAC Address Spoofing: ON
- Hardware: Intel VT-x

Microsoft stellt ein Script zur Anpassung bereit, das mit dem folgenden Aufruf direct aus dem Web genutzt werden kann (als 1-Zeiler interpretieren):

```
Invoke-WebRequest https://raw.githubusercontent.com/Microsoft/Virtualization-Documentation/master/hyperv-tools/Nested/Enable-NestedVm.ps1 -OutFile ~/Enable-NestedVm.ps1
~/Enable-NestedVm.ps1 -VmName "VmName"
```

Mehr:

<http://www.thomasmaurer.ch/2015/10/hyper-v-nested-virtualization-in-windows-10-build-10565/>

<http://www.thomasmaurer.ch/2015/11/nested-virtualization-in-windows-server-2016-and-windows-10/>

Demo 1



Weitere Beispiele: http://www.thorsten-butz.de/neuerungen_ws2016

Name of the Hyper-V host

`$vm = 'sv1'`

Stop VM:

`Stop-VM -VMName $vm`

Get information about relevant features for newsted virt.

`(Get-VMProcessor -VMName $vm).ExposeVirtualizationExtensions`

`(Get-VMNetworkAdapter -VMName $vm).MacAddressSpoofing`

`Get-VMemory -VMName $vm | fl Startup, Dyn*`

Set required

`Set-VMProcessor -VMName $vm -ExposeVirtualizationExtensions $true`

`Set-VMNetworkAdapter -VMName $vm -MacAddressSpoofing On`

`Set-VMemory -VMName $vm -DynamicMemoryEnabled:$false -StartupBytes 4GB`

Start

`Start-VM -VMName $vm`



jsnover @jsnover

.@mattifestation Nano is probably the most important thing we've done to Windows Server since NT

<https://twitter.com/jsnover/status/593786221404422144>

Nano server (codename: Tuva)



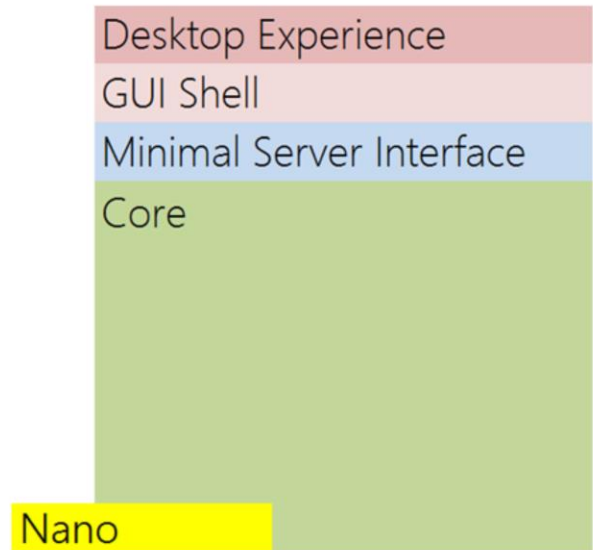
- Installationsabbild NanoServer: 134 MB
- "Zero foot print": keine Rollen und Funktionen an Bord
- Verwendungszweck 1: "Compute clusters"
 - Hyper-V-Host
 - Storage: SoFS, etc.
- Verwendungszweck 2: "born-in-the-cloud"-Anwendungen

<https://de.wikipedia.org/wiki/Tuwa>

<http://windowsitpro.com/windows-server/top-ten-what-you-need-know-about-microsoft-nano-server>

Nano vs. Core vs. GUI Shell

- Installationsgröße
> 500 MB vs. < 4 GB
- Wichtige Updates in 2014: *
9 vs. 23 vs. 26
- Kritische Updates in 2014:
2 vs. 8 vs. 23
- Hierdurch notwendige Neustarts:
3 vs. 6 vs. 11



* Zahlen/Hochrechnung: Veeam

<http://www.thomasmaurer.ch/2015/12/recording-best-of-windows-server-2016-the-new-foundation-of-windows/>

Demo 2



```
## Weitere Beispiele: http://www.thorsten-butz.de/neuerungen\_ws2016
```

```
# Learn more: http://aka.ms/nanoserver
```

```
# Nano creation module (from WS 2016 ISO)
```

```
Import-Module C:\NanoServer_TP4\NanoServerImageGenerator.psm1
```

```
# Variables
```

```
$password =
```

```
    ConvertTo-SecureString -AsPlainText -Force -String 'Pa$$w0rd'
```

```
$iso_X =
```

```
    'C:\en_windows_server_2016_technical_preview_4_x64_dvd_7258292\'
```

```
# Example: 1 Nano creation: GEN 1 VM
```

```
New-NanoServerImage `
```

```
    -MediaPath $iso_X `
```

```
    -BasePath C:\NanoServer_TP4\Base `
```

```
    -TargetPath C:\NanoServer_TP4\myNano1.vhd `
```

```
    -GuestDrivers -EnableRemoteManagementPort `
```

```
    -AdministratorPassword $password `
```

```
    -Language en-US `
```

```
    -ComputerName ('tuva' + (get-random)) `
```

```
    -Packages 'Microsoft-NanoServer-DNS-Package'
```

Das Ende einer Ära: Adieu Downgrade

Microsoft updates support policy: New CPUs will require Windows 10

In a change to its longstanding support policy, Microsoft says PCs based on new CPU architectures, including Intel's Skylake chips, will require Windows 10. A list of preferred systems will support older Windows versions on new hardware, but only for 18 months.



By Ed Bott for The Ed Bott Report | January 15, 2016 -- 18:30 GMT (18:30 GMT) | Topic: Enterprise Software

a) Microsoft updates support policy: New CPUs will require Windows 10 (Ed Bott:)

<http://www.zdnet.com/article/microsoft-updates-support-policy-new-cpus-will-require-windows-10/>

b) Microsoft: Support für neue Prozessoren zukünftig nur noch beim neuesten Windows

(Thorsten Leemhuis)

<http://www.heise.de/newsticker/meldung/Microsoft-Support-fuer-neue-Prozessoren-zukuenftig-nur-noch-beim-neuesten-Windows-3072791.html>

c) Windows 10 Embracing Silicon Innovation (Terry Myerson)

<https://blogs.windows.com/windowsexperience/2016/01/15/windows-10-embracing-silicon-innovation/>

"Windows 7 will continue to be supported for security, reliability, and compatibility through January 14, 2020 on previous generation silicon. Windows 8.1 will receive the same support through January 10, 2023. This includes most of the devices available for purchase today by consumers or enterprises."

Windows 10 und Windows Server 2016: ein (vorläufiges) Fazit

- Das beständige Downgrade (der Clients) wird zukünftig sehr "schwierig"
- Die Serverdichte kann erheblich gesteigert werden
- Die neue Plattform macht ein Umdenken/Umgewöhnen des täglichen Arbeitens erforderlich

Hyper-V + Container + Nano -eq 'Most Important'

Save the date:
02. Feb. 2016, 17:15 h

Citrix - Update von NetScaler 10.1 und 10.5 auf NetScaler 11

http://education.arrowecs.de/seminare/kurse/training_kurse.cfm?courseId=AAAAEMR

http://education.arrowecs.de/seminare/kurse/training_kurse.cfm?courseId=AAAAELM
