



What is Windows Nano Servers

Ricardo Cabral



#546 | OPORTO 2016

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About Ricardo Cabral



- IT Manager Globaltemp
- Degree in Computer Engineering.
- Actively participating, volunteer and/or speaker in the Portuguese community meetings (Arduino/Genuino Day, AzurePT, Netponto, O365PT, PTJUG, PTXUG, SQLPORT, SQLSartuday Lisboa and Porto, etc.).
- Volunteer actively in meetings of Portuguese communities (Arduino/Genuino Day, SQLSaturday Lisboa and Porto, TUGA IT, etc.).
- Is an authentic passionate and self-taught in information technology with over 13 years' of experience in IT management, development and projects.
- Loves sharing, live and learn.



Agenda



- Windows Server 2016
 - How can we try
 - Windows Server installation evolution
- Nano Server
 - Nano Server Challenges
 - Where can we install
 - What can we do
 - Management tools
- Licensing
- Q&A



-
- How many of you have already tried Windows Server 2016 ?
 - How many deployed Nano Server ?
 - How many have heard about nano server ?

Configure AD FS to authenticate users stored in LDAP directories
Configure AD FS to Send Password Expiry Claims
AD FS support for alternate hostname binding for certificate authentication
Auditing Enhancements to AD FS in Windows Server 2016
Customizing user signin for AD FS relying parties
Windows 10 Sign on – enabling device authentication with AD FS
Enabling OpenId Connect with AD FS 2016
Enabling Oauth Confidential Clients with AD FS 2016

Network Controller, Hyper-V Virtual Switch Network
Function Virtualization (NFV)
Software Load Balancer (SLB) and Network Address
Translation (NAT), Datacenter Firewall RAS Gateway

Cluster Operating
Storage Replica
Cloud Witness
Virtual Machine Resiliency
Diagnostic Improvements in
Site-aware Failover Clusters
Workgroup and Multi-domain

New features in Windows PowerShell Desired State
Configuration
New features in Windows PowerShell ISE
New features in Windows PowerShell Web Services
(Management OData IIS Extension)
Notable bug fixes in Windows PowerShell 5.0



WINDOWS SERVER 2016



How can we try

How to try Windows Server 2016

There are 4 ways

Minimal needs:

Processor: 1.4 GHz 64-bit compatible with instructions x64

Ram memory:

- Core 512 MB (virtual machines 800 MB)
- Desktop Experience (GUI) 1GB

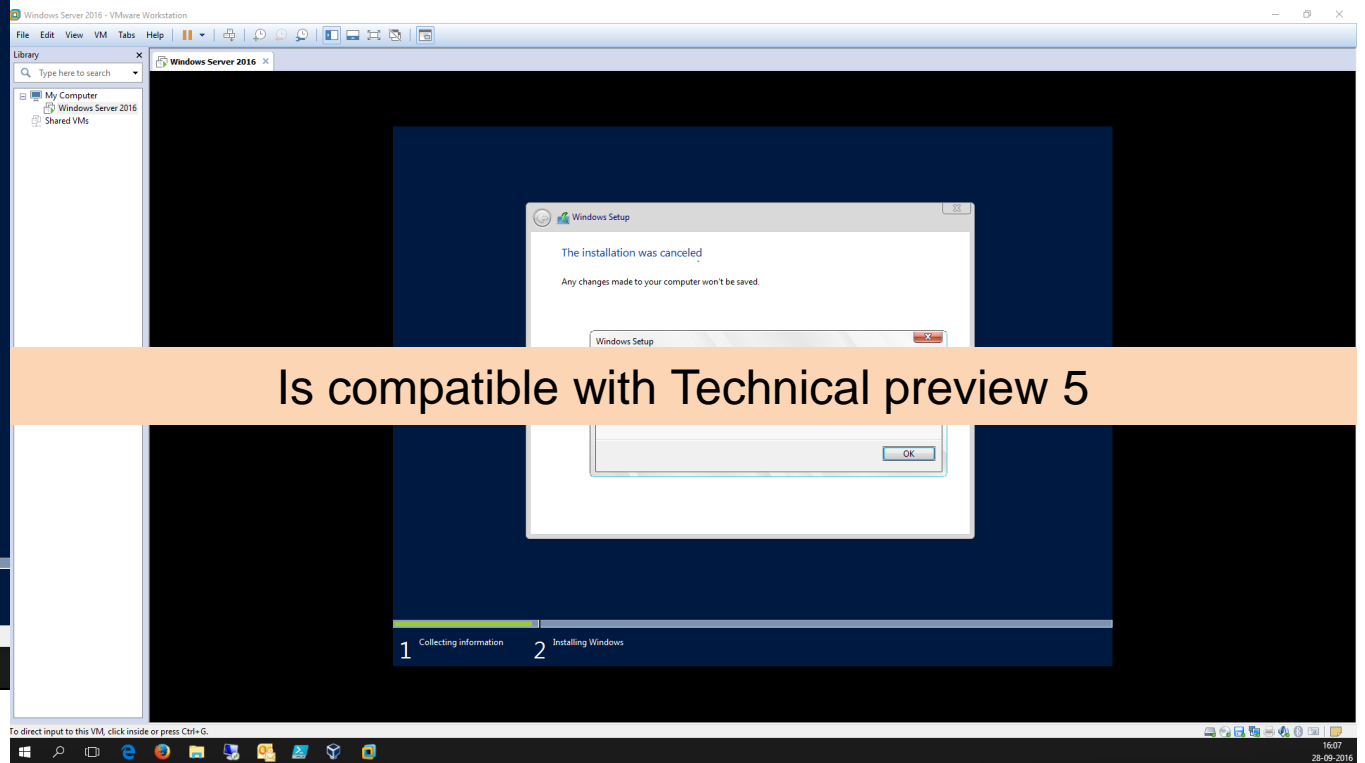
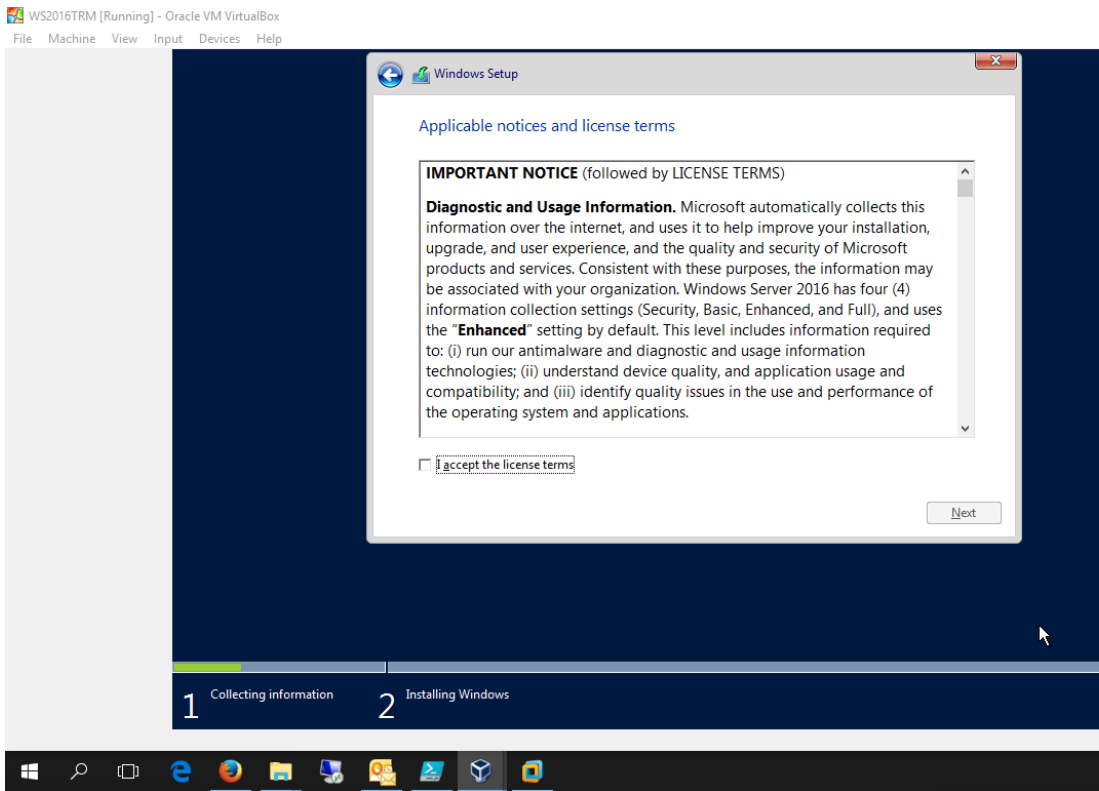
Storage: 32 GB

Local Virtual Machine with Windows Server 2016 RTM



Microsoft Hyper-V and Oracle Virtual box work 100%

VMWare Workstation 12 Pro : can not find the License





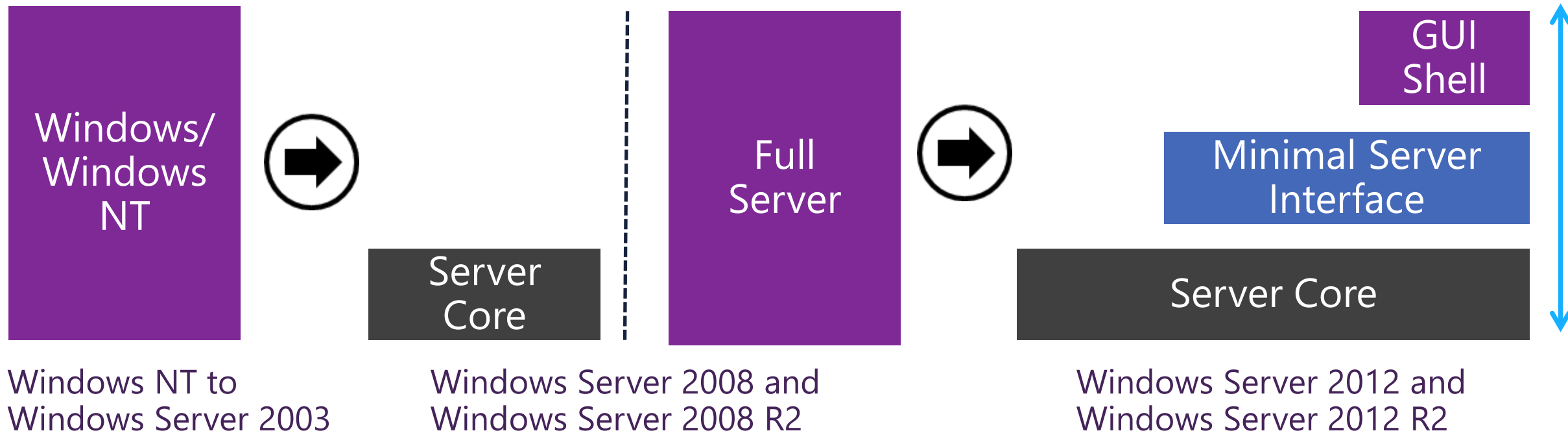
Windows Server upgrade

| Windows Server 2012 edition | Windows Server 2016 editon |
|--|--|
| Windows Server 2012 Standard | Windows Server 2016 Standard or Datacenter |
| Windows Server 2012 Datacenter | Windows Server 2016 Datacenter |
| Windows Server 2012 R2 Standard | Windows Server 2016 Standard or Datacenter |
| Windows Server 2012 R2 Datacenter | Windows Server 2016 Datacenter |
| Windows Server 2012 R2 Essentials | Windows Server 2016 Essentials |
| Windows Storage Server 2012 Standard | Windows Storage Server 2016 Standard |
| Windows Storage Server 2012 Workgroup | Windows Storage Server 2016 Workgroup |
| Windows Storage Server 2012 R2 Standard | Windows Storage Server 2016 Standard |
| Windows Storage Server 2012 R2 Workgroup | Windows Storage Server 2016 Workgroup |

Can convert a trial version for retail

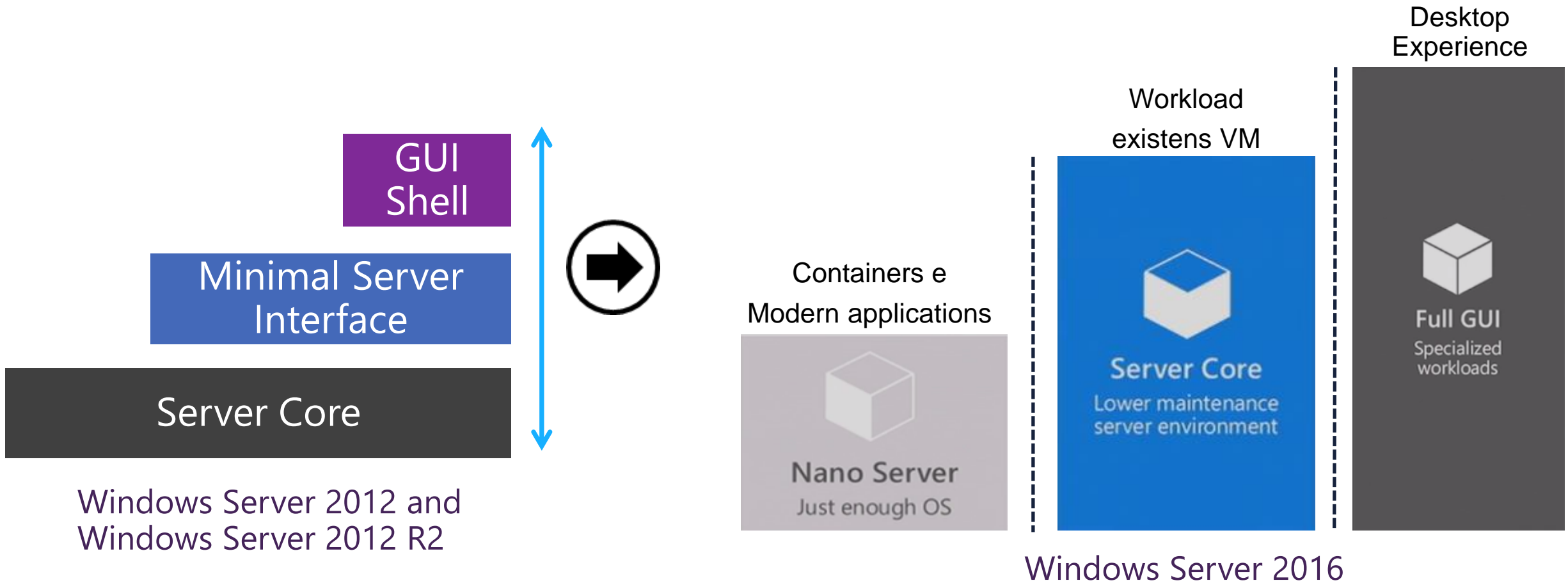
<http://go.microsoft.com/fwlink/?LinkId=825703>

Windows Server instalation evolution





Windows Server instalation evolution





NANO SERVER

Nano Server Challenges

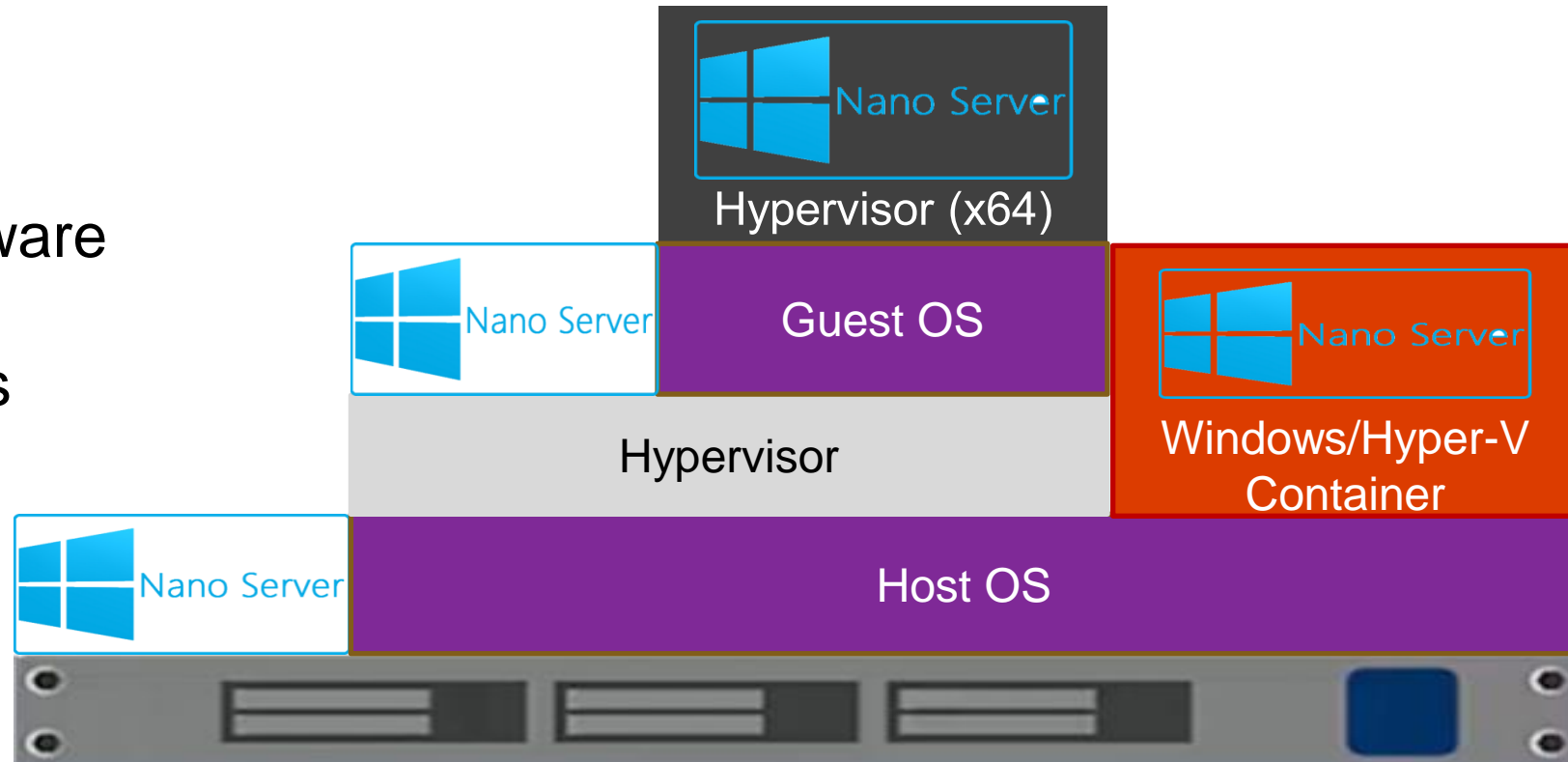




Where can we install

Available as OS Everywhere

- Host OS for physical hardware
- Guest OS in a VM
- Windows server containers
- Hyper-V containers



The use of the physical machines can be used for data infrastructure. Virtual machines for application containers.



What can we do

- Just enough OS (JeOS) model
- Key Roles and Features
 - Host for Hyper-V virtual machines;
 - As a storage host for Scale-Out File Server;
 - DNS server;
 - Web server running Internet Information Services (IIS);
 - Host for applications that are developed using cloud application patterns and run in a container or virtual machine guest operating system.

Key Roles and Features



Technical Preview:

- Basic drivers for a variety of network adapters and storage controllers;
- Data Center Bridging;
- PowerShell Desired State Configuration (DSC);
- DNS Server role;
- File Server role **<- Share and Storage Management snap-in Removed in RTM**
- Host support for Windows Containers;
- Hyper-V guest drivers for hosting Nano Server as a virtual machine;
- Hyper-V role;
- Internet Information Server (IIS);
- Network Performance Diagnostics Service (NPDS);
- Reverse forwarders for application compatibility frameworks such as Ruby, Node.js, etc;
- System Center Virtual Machine Manager agent;
- Windows Defender Antimalware, including a default signature file.
- Shielded VM (RTM available only Datacenter edition)
- Deploying on a Host or virtual machine

Key Roles and Features



Unidade de DVD (D:) SSS_X64FREE_EN-US_DV9 > NanoServer > Packages >

| Nome | Data de modificaç... | Tipo | Tamanho |
|---|----------------------|--------------------|------------|
| en-US | 12/09/2016 04:18 | Pasta de ficheiros | |
| Microsoft-NanoServer-Compute-Package.cab | 16/07/2016 13:38 | Ficheiro CAB | 17 320 KB |
| Microsoft-NanoServer-Containers-Package.cab | 16/07/2016 13:48 | Ficheiro CAB | 13 401 KB |
| Microsoft-NanoServer-DCB-Package.cab | 16/07/2016 13:52 | Ficheiro CAB | 140 KB |
| Microsoft-NanoServer-Defender-Package.cab | 16/07/2016 13:46 | Ficheiro CAB | 120 063 KB |
| Microsoft-NanoServer-DNS-Package.cab | 16/07/2016 13:46 | Ficheiro CAB | 1 717 KB |
| Microsoft-NanoServer-DSC-Package.cab | 16/07/2016 13:46 | Ficheiro CAB | 522 KB |
| Microsoft-NanoServer-FailoverCluster-Package.cab | 16/07/2016 13:48 | Ficheiro CAB | 9 403 KB |
| Microsoft-NanoServer-Guest-Package.cab | 16/07/2016 13:52 | Ficheiro CAB | 5 858 KB |
| Microsoft-NanoServer-Host-Package.cab | 16/07/2016 13:48 | Ficheiro CAB | 5 776 KB |
| Microsoft-NanoServer-IIS-Package.cab | 16/07/2016 13:45 | Ficheiro CAB | 1 899 KB |
| Microsoft-NanoServer-OEM-Drivers-Package.cab | 16/07/2016 13:52 | Ficheiro CAB | 24 986 KB |
| Microsoft-NanoServer-SCVMM-Compute-Package.cab | 16/07/2016 13:52 | Ficheiro CAB | 67 KB |
| Microsoft-NanoServer-SCVMM-Package.cab | 16/07/2016 13:48 | Ficheiro CAB | 883 KB |
| Microsoft-NanoServer-SecureStartup-Package.cab | 16/07/2016 13:46 | Ficheiro CAB | 1 360 KB |
| Microsoft-NanoServer-ShieldedVM-Package.cab | 16/07/2016 13:46 | Ficheiro CAB | 217 KB |
| Microsoft-NanoServer-SoftwareInventoryLogging-Package.cab | 16/07/2016 13:52 | Ficheiro CAB | 193 KB |
| Microsoft-NanoServer-Storage-Package.cab | 16/07/2016 13:46 | Ficheiro CAB | 9 695 KB |



Nano Server build requirements

- The right drivers for physical hardware or Virtual Machine;
- Administrator password;
- Edition;
- Deployment types (Host or VM);
- Computer Name (Optional);
- Server roles or features (Optional);
- IP Address (Optional);
- Size (Optional);

Nano Server build commands



| Command | |
|-------------|---|
| -MediaPath | Specifies a path to the root of the contents of the Windows Server 2016 ISO. |
| -BasePath | (Optional) Specifies a folder that will be created to copy the Nano Server WIM and packages to. |
| -TargetPath | Specifies a path, including the filename and extension, where the resulting VHD. |



Nano Server build commands

| Command | |
|---|---|
| Drivers for physical hardware or VM | -Driver <string> |
| Administrator password | -AdministratorPassword <securestring> |
| Deployment Type | -DeploymentType [Host Guest] |
| Edition | -Edition [Standart Datacenter] |
| Add server roles or features | -Package <string> |
| Computer Name | -ComputeName <string> |
| IP address | -InterfaceNameOrIndex <string> -Ipv6Address <string> -Ipv6DNS <string> -Ipv4Address <string> -Ipv4SubnetMask <string> -Ipv4Gateway <string> -Ipv4Dns <string> |
| Domain join | -Domain Name <string> -DomainBlobPath <string> -ReuseDomainNode |
| VHD size | -MaxSize <unit64> |
| Service Package | -ServicingPackagePath <string> |
| Remote WinRM access | -EnableRemoteManangementPort |
| Debug and/or Enable Emergency Management Services (EMS) | -DebugMethos [Serial Net 1394 USB] -EnableEMS -EMSPort <byte> -EMSBAudRate <unit32> |



Nano Server requirements

- The right drivers for physical hardware or Virtual Machine;
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- Computer Name (Optional)
- Server roles or features (Optional)
- IP Address (Optional)
- Size (Optional)

Developers



- MSI is not supported
 - MSI has significant GUI dependencies;
 - No guarantee that uninstall actually remove all installed assets;
 - Leaves the system in a unknow state.
- WSA (Windows Server app installer)
 - Bases on AppX package format (Nano Server, Server Cores and Desktop);
 - Comom Single installer that run everywere;
 - AppX was full acess to the system.



```
Import-Module d:\nanoserver\NanoServerImageGenerator.psm1
```

```
New-NanoServerImage -MediaPath D:\`
```

```
-BasePath C:\NanoServer `
```

```
-TargetPath C:\NanoServer\NanoServerISS2.VHD `
```

```
-ComputerName "NanoServerISS" `
```

```
-Guestdrivers `
```

```
-Ipv4Address 10.0.2.20 `
```

```
-Ipv4SubnetMask 255.255.255.0 `
```

```
-Ipv4Gateway 10.0.2.2 `
```

```
-Package Microsoft-NanoServer-OEM-Drivers-Package, Microsoft-NanoServer-IIS-Package `
```

```
-Language en-us `
```

```
-AdministratorPassword (ConvertTo-SecureString -String 'P@ssw0rd' -AsPlainText -Force) `
```

```
-Verbose
```

DEMO Create Nano Server VHD

Management tools



| Remote graphical & Web tools | PowerShell remoting | VM & container management | Deployment & monitoring | Partners & frameworks |
|---|---|--|---|--|
| <ul style="list-style-type: none">• Server manager• Azure Portal tools• Task manager• Registry editor• File explorer• Server configuration• Event viewer• Disk manager• Device & driver management• Performance• Users & groups | <ul style="list-style-type: none">• Core PowerShell engine, language, and cmdlets• Windows Server cmdlets (network, storage, etc.)• PowerShell DSC• Remote file transfer• Remote script authoring & debugging• PowerShell Web access | <ul style="list-style-type: none">• Hyper-V manager• Hyper-V cmdlets• PowerShell Direct over PSRP• CimSession support• Docker• SCVMM agent & console• 3rd-party agents & consoles | <ul style="list-style-type: none">• DISM online & VHD support• Unattended setup• Visual Studio integration• DSC Local Config Manager• Setup & boot eventing• SCOM agent• VSO App Insights• Azure Op Insights | <ul style="list-style-type: none">• Chef integration• .NET Core and CoreCLR• ASP.NET 5• Python, PHP, Ruby, Node.js• PowerShell Classes• PS Script Analyzer• PowerShell Gallery• PowerShellGet |

Management tools



By Mark Russinovich

Updated: August 29, 2016



[Download Sysinternals Suite \(20.2 MB\)](#)

[Download Sysinternals Suite for Nano Server \(4.4 MB\)](#)

<https://technet.microsoft.com/en-us/sysinternals/bb842062>

[AccessChk](#)
[AccessEnum](#)
[AdExplorer](#)
[AdInsight](#)
[AdRestore](#)
[Autologon](#)
[Autoruns](#)
[BgInfo](#)
[CacheSet](#)
[ClockRes](#)
[Contig](#)
[Coreinfo](#)
[Ctrl2Cap](#)
[DebugView](#)
[Desktops](#)
[Disk2vhd](#)
[DiskExt](#)
[DiskMon](#)
[DiskView](#)
[Disk Usage \(DU\)](#)
[EFSDump](#)
[FindLinks](#)
[Handle](#)

[Hex2dec](#)
[Junction](#)
[LDMDump](#)
[ListDLLs](#)
[LiveKd](#)
[LoadOrder](#)
[LogonSessions](#)
[MoveFile](#)
[NTFSInfo](#)
[PendMoves](#)
[PipeList](#)
[PortMon](#)
[ProcDump](#)
[Process Explorer](#)
[Process Monitor](#)
[PsExec](#)
[PsFile](#)
[PsGetSid](#)
[PsInfo](#)
[PsPing](#)
[PsKill](#)
[PsList](#)
[PsLoggedOn](#)

[PsLogList](#)
[PsPasswd](#)
[PsService](#)
[PsShutdown](#)
[PsSuspend](#)
[RAMMap](#)
[RegDelNull](#)
[Registry Usage \(RU\)](#)
[RegJump](#)
[SDelete](#)
[ShareEnum](#)
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Start the WinRM Service

```
net start WinRM
```

```
Set-Item WSMan:\localhost\Client\TrustedHosts -Value "servername or IP"
```

```
Set-Item WSMan:\localhost\Client\TrustedHosts -Value "servername or IP, servername or IP"
```

```
Set-Item WSMan:\localhost\Client\TrustedHosts -Value "*"
```

```
Enter-PSSession -ComputerName "servername or IP" -Credential servername\Administrator
```

```
Enter-PSSession -VMName "VMName" -Credential servername\Administrator
```

DEMO Powershell WinRM and management



LICENSING

LICENSING



It is available for consult Windows Server 2016 and System Center 2016 FAQ (May 2016)

- <https://download.microsoft.com/download/7/2/9/7290EA05-DC56-4BED-9400-138C5701F174/WSSC2016LicensingFAQ.pdf>

Windows Server 2016 is licensing by the number of cores in the server, similar to the Microsoft SQL Server licensing. Minimum license requirements: 8 cores per processor, 16 cores per server.

Nano Server is a deployment option within Windows Server 2016. It is included as part of the licensing of the edition from which it is deployed. There is no unique or separate licensing for Nano Server.

Three ways to trial Azure



Microsoft Azure

Monthly credit: €170

Duration: 1 month

<https://azure.microsoft.com/en-us/free/>

Microsoft IT Pro Cloud Essentials

Monthly credit: €88

Duration: 3 months

<https://www.itprocloudessentials.com/>

Valid until 2016/12/31

Visual Studio Dev Essentials

Monthly credit: €25

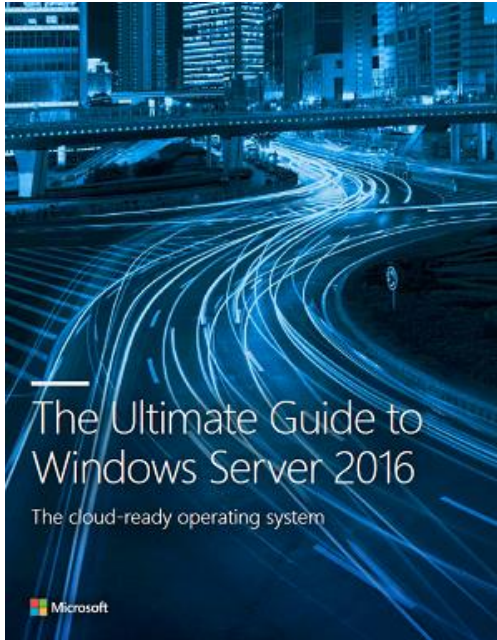
Duration: 12 months

[https://www.visualstudio.com/products/visual-studio-dev-essentials-vs /](https://www.visualstudio.com/products/visual-studio-dev-essentials-vs/)



FREE EBOOKS

The Ultimate Guide to Windows Server 2016



The Ultimate Guide to Windows Server is ebook with 18 page that include:

- Introducing the cloud.
- Feature Comparison Summary between Windows Server 2016, Windows Server 2012 R2, and Windows Server 2008 R2.
- Cloud-Ready application platform for developers.

<https://info.microsoft.com/TheUltimateGuideToWindowsServer2016.html>



Introducing Windows Server 2016

 Kim Spilker September 26, 2016

 0  206  188  0



We're happy to announce the availability of our newest free ebook, *Introducing Windows Server 2016* (ISBN 9780735697744), by John McCabe and the Windows Server team. Enjoy!

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Update version with 180 page deep-dive.

ePub and Mobi for Kindle formats will be available soon.

Windows Server has powered a generation of organizations, from small businesses to large enterprises. No matter what your area of expertise, this book will introduce you to the latest developments in Windows Server 2016. Each chapter has been written by either field experts or members of the product group, giving you the latest information on every improvement or new feature that is included in this version of Windows Server.

<https://blogs.msdn.microsoft.com/microsoftpress/2016/09/26/free-ebook-introducing-windows-server-2016/>

Feedback



<https://windowsserver.uservoice.com/>

Windows Server

General Feedback

Do you have an idea or suggestion based on your experience with Windows Server? We would love to hear it! Please take a few minutes to submit your idea in the one of the forums available on the right or vote up an idea submitted by another Windows Server customer. All of the feedback you share in these forums will be monitored and reviewed by the Microsoft engineering teams responsible for building Windows Server. Suggestions can apply to both released and Technical Preview versions of Windows Server.

This forum (General Feedback) is used for any broad feedback related to Windows Server. If you have feedback on a specific aspect of Windows Server, for example Storage, Networking, Virtualization, Nano Server, etc., please submit your feedback in one of the forums available on the right.

Remember that this site is only for feature suggestions and ideas!

If you have technical questions or need help with Windows Server, please visit our [TechNet Forums](#).

To see our work in progress, please go ahead and install the [Windows Server Technical Preview](#). More information on what's new in the Technical Preview can be found [here](#). You can join the conversation about the Technical Preview and swap advice with others at [Technical Preview Forums](#).

To improve Windows Server I suggest you ...

Hot Top New ideas Category Status My feedback

1 votes

New age operating system. What i designed is a operating system where Kids have their own platform Olderen and adults. Easy to use

Vote

New age operating system.
What i designed is a ooperatino system where Kids have their own platform

[https://windowsserver.uservoice.com/forums/295068-nano-server /](https://windowsserver.uservoice.com/forums/295068-nano-server/)

Windows Server

Nano Server

How can we improve Nano Server?

Hot Top New ideas Category Status My feedback

5 votes

Nano Server as RODC in SMB3 scenario

Vote

When the storage for a Hyper-V cluster only consists of SMB3, a circular dependency occurs. For example, in case of a power outage the SMB3 share cannot be brought up when all DCs for the domain are located on the SMB3 share. A workaround would be to use Nano Server as an RODC on local storage, so that authentication for the SMB3 share can take place and the storage share can be brought up.

0 comments · Roles & features · Flag idea as inappropriate...

2 votes

Start-Transcript support

Vote

Please support PowerShell Transcript noun. Since Nano Server is designed to be managed remotely, it would make it easier to debug scripts executing remotely if the PowerShell transcript capability were supported. Right now, Start-Transcript is not supported, so one can't see the results of simple PowerShell scripts executed remotely without building significant error handling and logging into the script.



QUESTIONS ?



Source: www.gocomics.com/calvinandhobbes



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