

# Nano Server

and Windows Containers



Rainer Stropek

software architects gmbh

Web

<http://www.timecockpit.com>

Mail

[rainer@timecockpit.com](mailto:rainer@timecockpit.com)

Twitter

@rstropek



**time cockpit**  
Saves the day.

# Your Host

## Rainer Stropek

Developer, Entrepreneur

MVP Microsoft Azure

MVP Development Technologies

MS Regional Director

Senior Consultant IT-Visions

## Contact

software architects gmbh

[rainer@timecockpit.com](mailto:rainer@timecockpit.com)

Twitter: @rstropek



# Windows OS for the Cloud

## Optimized for the cloud (private/public)

Smaller footprint, faster startup, less update, etc.

## How can it be smaller and faster?

Headless (=no GUI)

Limited functionality (e.g. only 64bit, no AD domain controller, no group policy, ...; [details](#))

## Current Branch for Business (CBB)

2-3 feature update/year for Nano Server

Not more than two Nano Server CBB releases behind for support ([details](#))

# Installation

Tip: You can create custom Windows images to be used as a baseline

SSS\_X64FREE\_EN-US\_DV9 > NanoServer

<input type="checkbox"/> Name	Date modified	Type	Size
NanoServerImageGenerator	12.09.2016 05:18	File folder	
Packages	12.09.2016 05:18	File folder	
NanoServer.wim	16.07.2016 19:12	WIM File	168.709 KB
ReadMe.txt	25.05.2016 23:42	Text Document	1 KB

< > < > < > < > This PC > DVD Drive (D:) SSS\_X64FREE\_EN-US\_DV9 > NanoServer > NanoServerImageGenerator >

Quick access

Dropbox

OneDrive

This PC

- Desktop
- Documents
- Downloads
- Music
- Pictures
- Videos

Local Disk (C:)

DVD Drive (D:) SSS\_X64FREE\_EN-US\_DV9

- boot
- efi
- NanoServer
- NanoServerImageGenerator
- Packages
- sources
- support

1 aCia (F:)

<input type="checkbox"/> Name	Date modified	Type
en-US	12.09.2016 05:18	File folder
Convert-WindowsImage.ps1	16.07.2016 04:30	PowerShell script
NanoServerImageGenerator.psd1	25.05.2016 23:42	PowerShell script
<input checked="" type="checkbox"/> NanoServerImageGenerator.psm1	14.07.2016 23:18	PowerShell script

SSS\_X64FREE\_EN-US\_DV9 > NanoServer > Packages >

<input type="checkbox"/> Name
en-US
Microsoft-NanoServer-Compute-Package.cab
Microsoft-NanoServer-Containers-Package.cab
Microsoft-NanoServer-DCB-Package.cab
Microsoft-NanoServer-Defender-Package.cab
Microsoft-NanoServer-DNS-Package.cab
Microsoft-NanoServer-DSC-Package.cab
Microsoft-NanoServer-FailoverCluster-Package.cab
Microsoft-NanoServer-Guest-Package.cab
Microsoft-NanoServer-Host-Package.cab
Microsoft-NanoServer-IIS-Package.cab
Microsoft-NanoServer-OEM-Drivers-Package.cab
Microsoft-NanoServer-SCVMM-Compute-Package.cab
Microsoft-NanoServer-SCVMM-Package.cab
Microsoft-NanoServer-SecureStartup-Package.cab
Microsoft-NanoServer-ShieldedVM-Package.cab
Microsoft-NanoServer-SoftwareInventoryLogging-Package.cab
Microsoft-NanoServer-Storage-Package.cab

# Demo

Install Nano Server

Create VHD

Add virtual Machine

Connect

Remote PowerShell

```

# Location where the Windows Server 2016 ISO is mounted.
# We will copy the Nano Server Image Generator from there.
$winServerInstallRoot = "d:\"
$temp = "c:\temp"
$nanoServerImageGeneratorFolder = "$temp\NanoServerImageGenerator"
$targetPath = $temp + "\demo\NanoServerVM.vhd"
$computerName = "mynanoserver"
$secure_string_pwd = convertto-securestring "pass" -asplaintext -force
[Environment]::SetEnvironmentVariable("TEMP", "c:\temp\tempFolder", `
    "Process")

# Copy Nano Server Image Generator to local disk
if (!(Test-Path -Path "$nanoServerImageGeneratorFolder")) {
    Copy-Item "$winServerInstallRoot\NanoServer\NanoServerImageGenerator" `
        "$nanoServerImageGeneratorFolder" -Recurse -Force
}

# Import Nano Generator module
cd $nanoServerImageGeneratorFolder
Import-Module .\NanoServerImageGenerator -Verbose

# Create Nano Server ISO VHD
New-NanoServerImage -Edition Standard -DeploymentType Guest `
    -MediaPath $winServerInstallRoot `
    -BasePath .\Base -TargetPath $targetPath -ComputerName $computerName `
    -AdministratorPassword $secure_string_pwd `
    -Package Microsoft-NanoServer-Guest-Package -MaxSize 100GB `
    -EnableRemoteManagementPort -Verbose

```

# Installation

Create VHD

<https://github.com/rstropek/DockerVS2015Intro/blob/master/dockerDemos/07-win-container-nano-server/setup-simple-nano-server.ps1>

```
Import-Module Hyper-V  
net start WinRM
```

```
$computerName = "Simple Nano Server"
```

```
$vm = Get-VM -Name $computerName  
$vmIP = (Get-VMNetworkAdapter $vm)[0].IPAddresses[0]
```

```
Set-Item WSMan:\localhost\Client\TrustedHosts $vmIP -Force  
$cred = Get-Credential  
$session = New-PSSession -ComputerName $vmIP -Credential $cred  
Enter-PSSession -Session $session
```

# Installation

Connect and create session

<https://github.com/rstropek/DockerVS2015Intro/blob/master/dockerDemos/07-win-container-nano-server/connect-nano-server.ps1>

# Deployment

Virtual machine from ISO

Physical machine

- Dual boot VHD/VHDX

- PxE-boot and install Nano Server from WDS ([details](#))

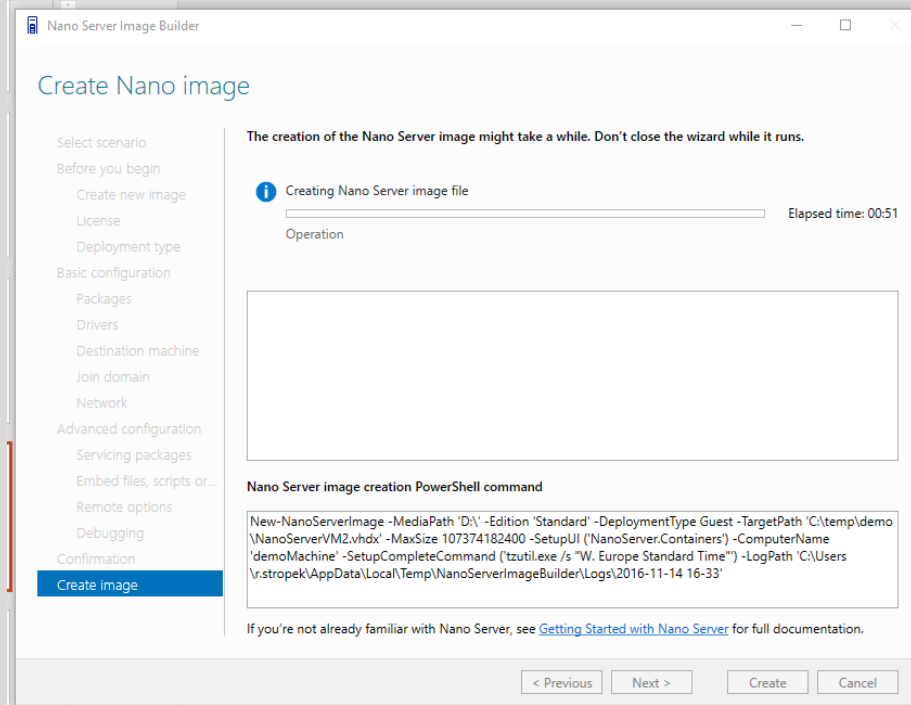
- Booting into [WinPE](#) and deploying Nano Server using a .wim file ([details](#))

Tip: Consider [Nano Server Image Builder GUI](#)



# Install Nano Server

## Nano Server Image Builder



# Demo

<https://blogs.technet.microsoft.com/nanoserver/2016/10/15/introducing-the-nano-server-image-builder/>

# Updates

Use *-ServicingPackagePath* option

*New-NanoServerImage* and *Edit-NanoServerImage*

Apply update to an existing VHD or VHDX

Offline or running

*Add-WindowsPackage* or *dism*

Manage updates using CIM/WMI

```
$sess = New-CimInstance `
-Namespace root/Microsoft/Windows/WindowsUpdate `
-ClassName MSFT_WUOperationsSession

$scanResults = Invoke-CimMethod -InputObject $sess `
-MethodName ScanForUpdates `
-Arguments @{SearchCriteria="IsInstalled=0";OnlineScan=$true}
```

```
$scanResults.Updates | Select Title
```

```
# SAMPLE RESULT:
```

```
# Title
```

```
# -----
```

```
# Cumulative Update for Windows Server 2016 for x64-based Systems (KB3197954)
```

```
# Update for Windows Server 2016 for x64-based Systems (KB3199986)
```

```
# Cumulative Update for Windows Server 2016 for x64-based Systems (KB3200970)
```

```
# DOWNLOAD AND EXPAND UPDATES
```

```
Expand kb3200970.msu -F:* kb3200970
```

```
# COPY CAB FILES
```

```
New-NanoServerImage ... `
-ServicingPackagePath `
"c:\temp\Windows10.0-KB3197954-x64.cab", `
"c:\temp\Windows10.0-KB3199986-x64.cab", `
"c:\temp\Windows10.0-KB3200970-x64.cab" ...
```

# Demo

Install Updates during VHD building

Adding packages....  
Processing.

Adding package 'Windows10.0-KB3200970-x64'....  
Processing.

```
99986-x64.cab /Image: C:\temp\nanoserver\imagegen\
Base\Logs\2016-11-15_08-01-13-79\DISM.log' /Quiet
VERBOSE: dism.exe /Add-Package /PackagePath:'C:\U
```

# PowerShell

PowerShell Core Edition

Limited functionality

[Details in TechNet](#)

Guidelines for porting to PowerShell Core available

[Details in TechNet](#)

# Container

## Container Host

[Installation details](#)

## Container Base Image

*microsoft/nanoserver* on [Docker Hub](#)

# Demo

## Docker and Nano

Start Nano Server as  
Docker Container

[Dockerfile](#)

Nano Server with IIS

Nano Server as  
Docker Host

[Setup](#)

Connect from Docker client

# Summary

Higher hosting density → lower costs

Less updates and reboots → higher availability

Frequent update → faster innovation

Nano Server: Windows OS for the private and public cloud

## Nano Server Workshop

# Q&A

Thank your for coming!



## Rainer Stropek

software architects gmbh

Mail  
Web  
Twitter

rainer@timecockpit.com  
<http://www.timecockpit.com>  
@rstropek



**time cockpit**  
Saves the day.