








PowerShell Conference Europe
Hannover, 2016
www.psconf.eu

```
PowerShell Conference EU 2016
Sample Code.ps1 X
# about_me

$speaker = @{
    name='Thorsten Butz'
    jobrole = 'Trainer','Consultant','Author'
    certification = 'MC*','LPIC-2'
     = @thorstenbutz
     = gplus.to/thorstenbutz
     = facebook.com/thbutz
     = thorsten-butz.de
     = slidingwindows.de
}

PSCONF.EU 2016
POWERSHELL CONFERENCE EU
```



jsnover

@jsnover

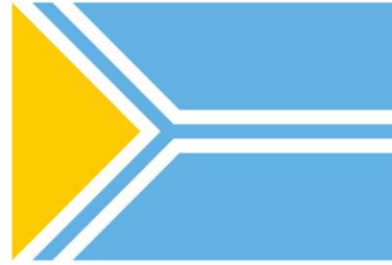
.@mattifestation Nano is probably the most important thing we've done to Windows Server since NT

4:37 PM - 30 Apr 2015



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

Codename Tuva



- Install.wim: 134 MB*
- Headless server
- Zero foot print: no built-in roles or features
- Purpose:
 - "Compute clusters" (Hyper-V-Host, Storage: SoFS, etc)
 - "Born-in-the-cloud"-Applications (Support for Ruby, Python, NoJS, etc)
 - Later/"next 20 years": Everything

* WS 2016, TP 4



"The **Tyva Republic** ([Russian](#): Респу́блика Тыва́, [tr.](#) *Respublika Tyva*; IPA: [\[rɨˈspublʲɪkə tʲɪˈva\]](#); [Tuvan](#): Тыва Республика, *Tyva Respublika*, [\[təˈvɑrɨsˈpublɪkɑ\]](#)), **Tyva** or **Tuva** ([Tuvan](#): Тыва, [Russian](#): Тыва́), is a [federal subject](#) of [Russia](#) (a [republic](#), also defined in the Constitution of the Russian Federation as a state ^[12]). It lies in the geographical center of [Asia](#), in southern [Siberia](#). The republic borders the [Altai Republic](#), the [Republic of Khakassia](#), [Krasnoyarsk Krai](#), [Irkutsk Oblast](#), and the [Republic of Buryatia](#) in Russia and [Mongolia](#) to the south. Its [capital](#) is the [city](#) of [Kyzyl](#). Population: 307,930 ([2010 Census](#)).^[7]

From 1921 until 1944, Tuva constituted a sovereign, independent nation, under the name of [Tannu Tuva](#), officially, the Tuvan People's Republic, or the People's Republic of Tannu Tuva."

Size: 170,500 km²

Population: 307,930

<https://en.wikipedia.org/wiki/Tuva>

The 20 smallest countries in the world:

<http://www.worldatlas.com/articles/the-10-smallest-countries-in-the-world.html>

No1: Vatican – 0.44 km²

Population: 690

Evolution of Windows Server UI

Desktop Experience	Since WS 2008
GUI Shell	
Minimal Server Interface	WS 2012 (R2), removed in WS 2016
Server Core	Since WS 2008



Evolution of Windows Server UI

Desktop Experience	Since WS 2008
Server Core	Since WS 2008
Nano	New in WS 2016

Footprints

ImageName	ImageSize(Byte)	ImageSize(GB)	FileCount	
Windows Server 2012 R2 SERVERSTANDARDCORE	7460490246	6,95	88782	
Windows Server 2012 R2 SERVERSTANDARD	13068182468	12,17	113250	
Windows Server 2012 R2 SERVERDATACENTERCORE	7457459733	6,95	88675	
Windows Server 2012 R2 SERVERDATACENTER	13063091771	12,17	113130	
Windows Server 2016 Technical Preview 4 SERVERSTANDARDCORE	9502098630	8,85	72051	63,9%
Windows Server 2016 Technical Preview 4 SERVERSTANDARD	14856021519	13,84	100412	99,8%
Windows Server 2016 Technical Preview 4 SERVERDATACENTERCORE	9571138021	8,91	71904	64,3%
Windows Server 2016 Technical Preview 4 SERVERDATACENTER	14879901792	13,86	100257	100,0%
CORESYSTEMSERVER_INSTALL	741318375	0,69	8017	5,0%



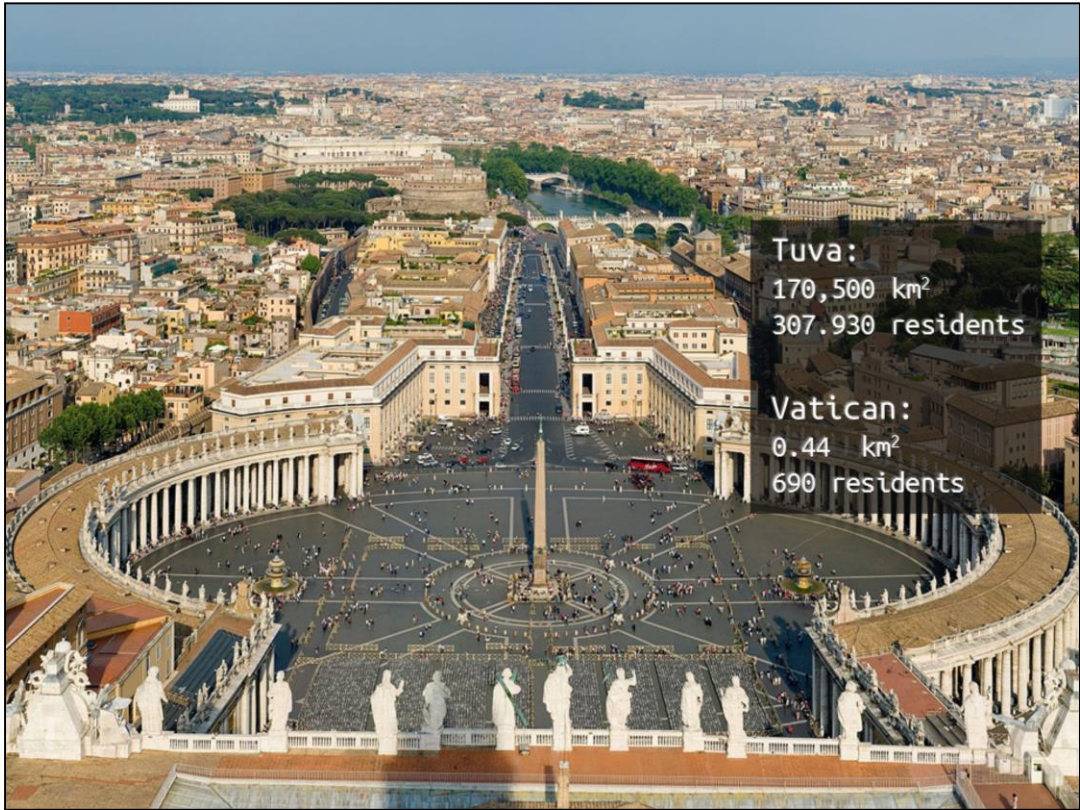
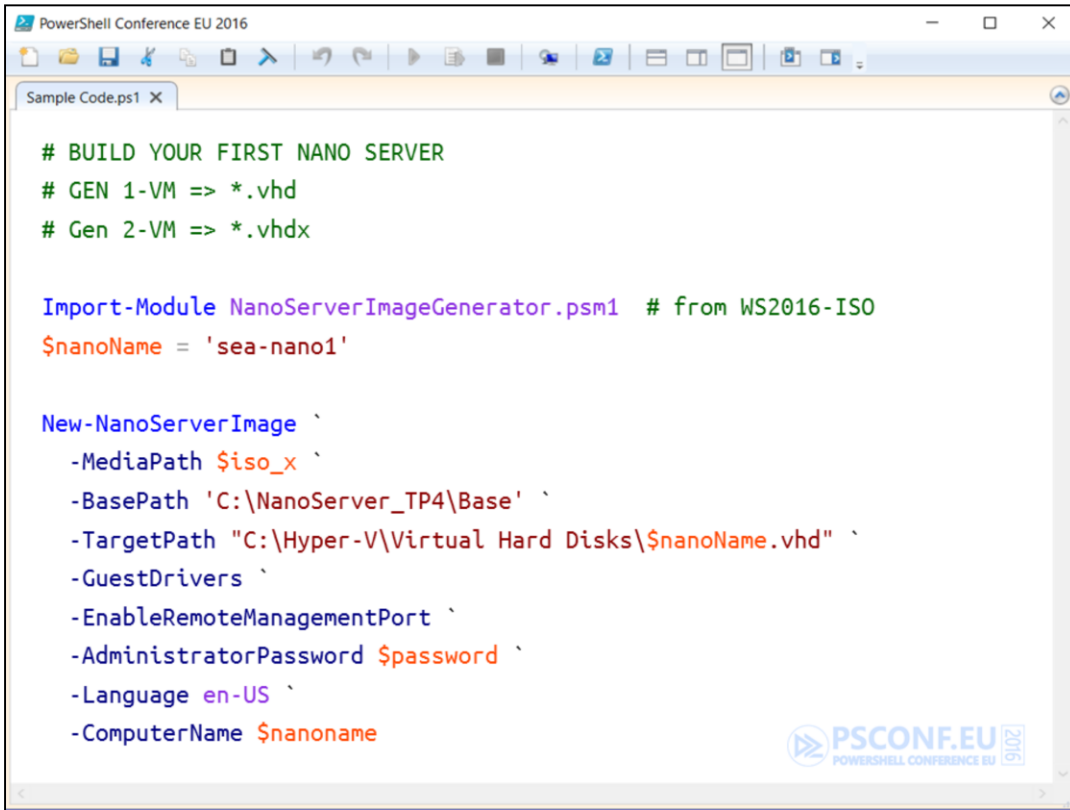


Photo (By Diliff - Own work, CC BY-SA 3.0)

<https://commons.wikimedia.org/w/index.php?curid=2065989>



```
# BUILD YOUR FIRST NANO SERVER
# GEN 1-VM => *.vhd
# Gen 2-VM => *.vhdx

Import-Module NanoServerImageGenerator.psm1 # from WS2016-ISO
$nanoName = 'sea-nano1'

New-NanoServerImage `
  -MediaPath $iso_x `
  -BasePath 'C:\NanoServer_TP4\Base' `
  -TargetPath "C:\Hyper-V\Virtual Hard Disks\$nanoName.vhd" `
  -GuestDrivers `
  -EnableRemoteManagementPort `
  -AdministratorPassword $password `
  -Language en-US `
  -ComputerName $nanoname
```

Recovery console

```

                                Nano Server Recovery Console
=====
Computer Name: VAN-NAN03
Domain:       van.contoso.com
OS:           Microsoft Windows Server 2016 Technical Preview 4 Tuva
Local date:   Thursday, February 18, 2016
Local time:   11:54 PM
Time zone:    Pacific Standard Time

-----

Ethernet
192.168.0.51 fe80::b5ec:90c0:b86:86b3 00-15-5D-FB-22-17

-----

                                > Networking
                                > Firewall

Up/Dn Scroll|ESC Log out|CtI+F6 Restart|CtI+F12 Shutdown|TAB

```



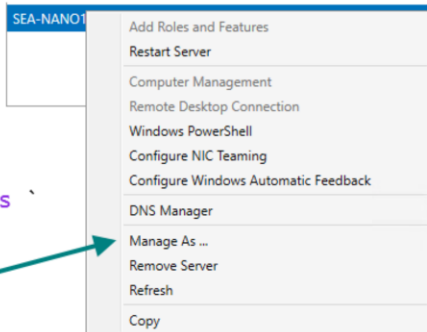
Workgroup vs. Domain

- Workgroup

a) ConfigureTrustedHost list:

```
Set-Item `
    WSMAN:\localhost\Client\TrustedHosts `
    -Value 192.168.0.100 -Force
```

b) "Manage As ..." from ServerManager



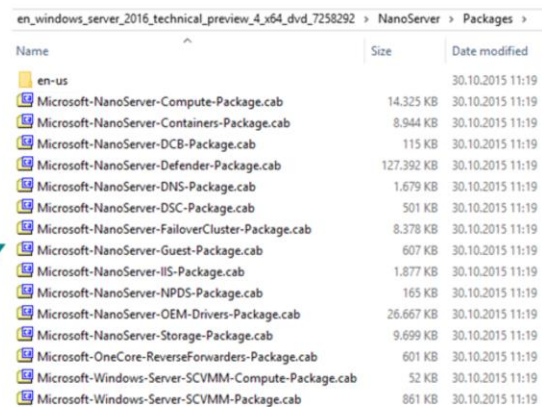
- Domain

PreCreate AD membership:

```
djoin.exe /Provision /Domain contoso
    /Machine "sea-nano1" /SaveFile "c:\depot\sea-nano1.djoin"
```

Running apps on Nano

- Compatible API (subset)
- Reverse Forwarders:
"DLL shims" forward
api calls to new
DLLs (optional
package)
- Appx:
Windows Server
App (WSA) Installer,
no MSI support
- "Built-In" roles: optional package



Name	Size	Date modified
en-us		30.10.2015 11:19
Microsoft-NanoServer-Compute-Package.cab	14.325 KB	30.10.2015 11:19
Microsoft-NanoServer-Containers-Package.cab	8.944 KB	30.10.2015 11:19
Microsoft-NanoServer-DCB-Package.cab	115 KB	30.10.2015 11:19
Microsoft-NanoServer-Defender-Package.cab	127.392 KB	30.10.2015 11:19
Microsoft-NanoServer-DNS-Package.cab	1.679 KB	30.10.2015 11:19
Microsoft-NanoServer-DSC-Package.cab	501 KB	30.10.2015 11:19
Microsoft-NanoServer-FailoverCluster-Package.cab	8.378 KB	30.10.2015 11:19
Microsoft-NanoServer-Guest-Package.cab	607 KB	30.10.2015 11:19
Microsoft-NanoServer-IIS-Package.cab	1.877 KB	30.10.2015 11:19
Microsoft-NanoServer-NPDS-Package.cab	165 KB	30.10.2015 11:19
Microsoft-NanoServer-OEM-Drivers-Package.cab	26.667 KB	30.10.2015 11:19
Microsoft-NanoServer-Storage-Package.cab	9.699 KB	30.10.2015 11:19
Microsoft-OneCore-ReverseForwarders-Package.cab	601 KB	30.10.2015 11:19
Microsoft-Windows-Server-SCVMM-Compute-Package.cab	52 KB	30.10.2015 11:19
Microsoft-Windows-Server-SCVMM-Package.cab	861 KB	30.10.2015 11:19

When used in any of these configuration Nano Server has the same API surface available for running applications. The Nano Server API surface is a subset of what is available in Server Core and Server with a Desktop Experience. As a subset, any application, tool, or agent that is written to run on Nano Server will run without modification on Server Core or Server with a Desktop Experience.

en_windows_server_2016_technical_preview_4_x64_dvd_7258292 > NanoServer > Packages >			
Name	New-NanoServerImage -Packages Microsoft-NanoServer-DNS-Package [...]		
en-us			30.10.2015 11:19
Microsoft-NanoServer-Compute-Package.cab	14.325 KB		30.10.2015 11:19
Microsoft-NanoServer-Containers-Package.cab	8.944 KB		30.10.2015 11:19
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Microsoft-Windows-Server-SCVMM-Package.cab	861 KB		30.10.2015 11:19

Packages with explicit parameters (WS 2016, TP4)

- Compute (Microsoft-NanoServer-Compute-Package.cab)
- Containers (Microsoft-NanoServer-Containers-Package.cab)
- Defender (Microsoft-NanoServer-Defender-Package.cab)
- Clustering (Microsoft-NanoServer-FailoverCluster-Package.cab)
- GuestDrivers (Microsoft-NanoServer-Guest-Package.cab)
- OEMDrivers (Microsoft-NanoServer-OEM-Drivers-Package.cab)
- Storage (Microsoft-NanoServer-Storage-Package.cab)
- ReverseForwarders (Microsoft-OneCore-ReverseForwarders-Package.cab)

Packages installed via "-packages" (WS 2016, TP4)

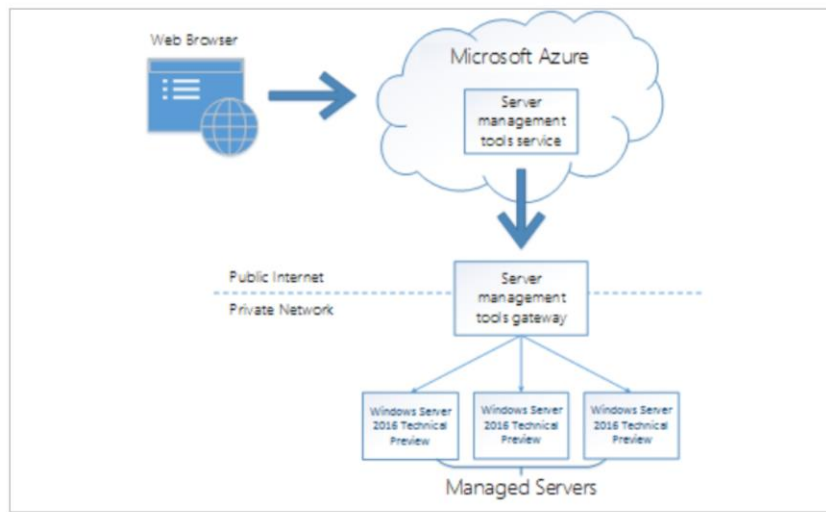
- packages Microsoft-NanoServer-DCB-Package.cab
- packages Microsoft-NanoServer-DNS-Package.cab
- packages Microsoft-NanoServer-DSC-Package.cab
- packages Microsoft-NanoServer-IIS-Package.cab
- packages Microsoft-NanoServer-NPDS-Package.cab
- packages Microsoft-Windows-Server-SCVMM-Compute-Package.cab
- packages Microsoft-Windows-Server-SCVMM-Package.cab

Demo

Build NANO server,
configure NANO server



Remote Server Mgmt Tools



<http://blogs.technet.com/b/nanoserver/archive/2016/02/09/server-management-tools-is-now-live.aspx>

RSMT: Processes

Settings
10.0.0.5 - PREVIEW

Properties

Computer identification

Local Administrators

IP addresses

TOOLS

Device Manager

Event Viewer

PowerShell

Processes

Registry Editor

Roles and Features

Services

Processes
10.0.0.5 - PREVIEW

Run process

Columns

Refresh

NAME	PID	USER NAME	CPU	WORKING S...
System Idle Pro...	0	SYSTEM	99	4 K
System interrupts	1	SYSTEM	0	0 K
System	4	SYSTEM	0	80 K
smss.exe	220	SYSTEM	0	1136 K
csrss.exe	300	SYSTEM	0	1684 K
wininit.exe	324	SYSTEM	0	3628 K
services.exe	348	SYSTEM	0	5008 K
lsass.exe	364	SYSTEM	0	11380 K
svchost.exe	488	SYSTEM	0	5556 K
svchost.exe	504	LOCAL SERVICE	0	9680 K
svchost.exe	520	NETWORK SER...	0	5884 K



<http://blogs.technet.com/b/nanoserver/archive/2016/02/09/server-management-tools-is-now-live.aspx>

RSMT: Regedit

Settings
10.0.0.5 - PREVIEW

Properties >

Computer identification >

Local Administrators >

IP addresses >

TOOLS

Device Manager >

Event Viewer >

PowerShell >

Processes >

Registry Editor >

Roles and Features >

Services >

Registry Editor
10.0.0.5 - PREVIEW

Search

KEY NAME

HKEY_CLASSES_ROOT ...

HKEY_CURRENT_USER ...

HKEY_LOCAL_MACHINE ...

HKEY_USERS ...

HKEY_CURRENT_CONFIG ...

HKEY_CURRENT_USER
10.0.0.5 - PREVIEW

Search Add Rename Refresh

Search in the list below

KEY NAME

Control Panel ...

Environment ...

Software ...

<http://blogs.technet.com/b/nanoserver/archive/2016/02/09/server-management-tools-is-now-live.aspx>

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RSMT: DevMgmt

Device Manager
10.0.0.5 - PREVIEW

Refresh

7 device(s) require attention

- ▶ Computer
- ▶ Disk drives
- ▶ DVD/CD-ROM drives
- ▶ IDE ATA/ATAPI controllers
- ▶ Keyboards
- ▼ Network adapters
 - Microsoft Hyper-V Network Adapter
 - Microsoft Kernel Debug Network Adapter
- ▶ Other devices
- ▼ Processors
 - Intel(R) Xeon(R) CPU E5-2673 v3 @ 2.40GHz
- ▼ Storage controllers
 - Microsoft Hyper-V SCSI Controller
 - Microsoft Hyper-V SCSI Controller (1)
 - Microsoft Storage Spaces Controller
- ▶ Storage volumes
- ▶ System devices

Intel(R) Xeon(R) CPU E5-2673 v3...
10.0.0.5 - PREVIEW

Enable Disable

DEVICE STATUS

This device is working properly

DEVICE TYPE

Processors

MANUFACTURER

Intel

DRIVER DATE

21.04.2009

DRIVER VERSION

10.0.10586.0

DRIVER PROVIDER

Microsoft

2016
PSCONF.EU
POWERSTELL CONFERENCE EU

<http://blogs.technet.com/b/nanoserver/archive/2016/02/09/server-management-tools-is-now-live.aspx>

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Shadows of the past

The legacy of Windows Server	The future of Windows Server
<ul style="list-style-type: none">• MMC.EXE compmgmt.msc, dsa.msc, dnsmgmt.msc ...• RPC/DCOM• WMI• NetBT• RDP	<ul style="list-style-type: none">• WinRM• Web-based mgmt: Remote Server Management Tools (RSMT)• Open-SSL support



The slide has a blue background with a yellow 'build 2011' stamp in the top right corner. The title 'GUIs on Servers Are Evil' is in white. The list of points is in white text. The URL 'www.buildwindows.com' is in small white text at the bottom left.

GUIs on Servers Are Evil

- Low friction deployment
 - Require large amounts of code to support the GUI
- Multi-Machine Automation
 - Often call private APIs instead of public formal management APIs
 - Thwarts remote management which thwarts multi-machine management
- Modern multi-machine management GUIs
 - Require GPUs
 - Takes large amounts of resources away from the server workload

www.buildwindows.com

Jeffrey Snover, Andrew Mason (Build 2011)

"Windows Server 8 apps must run without a GUI"

<https://channel9.msdn.com/Events/BUILD/BUILD2011/SAC-416T>

Slides:

http://video.ch9.ms/build/2011/slides/SAC-416T_Mason.pptx



jsnover
@jsnover

Make no mistake about it Nano Server is the
future of the datacenter

blogs.technet.microsoft.com/windowsserver/

11:24 PM - 10 Feb 2016



<https://twitter.com/jsnover/status/697546729466392576>

<https://blogs.technet.microsoft.com/windowsserver/2016/02/10/exploring-nano-server-for-windows-server-2016/>

PowerShell Conference EU 2016

Questions?

@thorstenbutz

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