
Arrow ECS Training

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

Windows Server Container

Thorsten Butz



Agenda

Windows Server Container

- Container basics
- Linux Container: docker
- Windows Server Container, Hyper-V Container
- Desktop solutions
- "The big picture"



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



Arrow Education – Meisterklassen

Microsoft Windows Server 2016 in der Praxis

(MS-WS10)

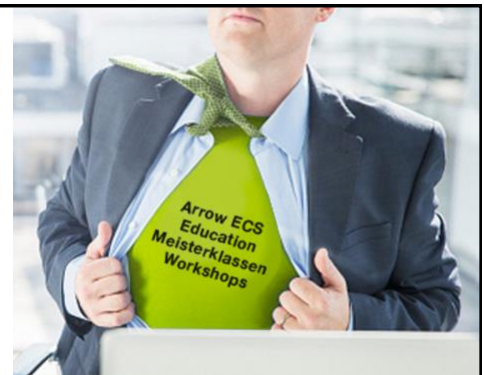
- München, Bochum, Dreieich (bei Frankfurt)

je 5 Tage ab: 19.6.2017, 11.9.2017, 23.10.2017, 11.12.2017 ff.

<http://education.arrowecs.de/marketing/meisterklasse.cfm>

Microsoft Partner

Silver Learning



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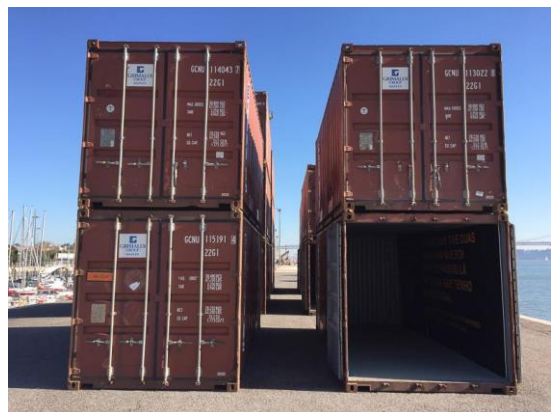
about_me

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

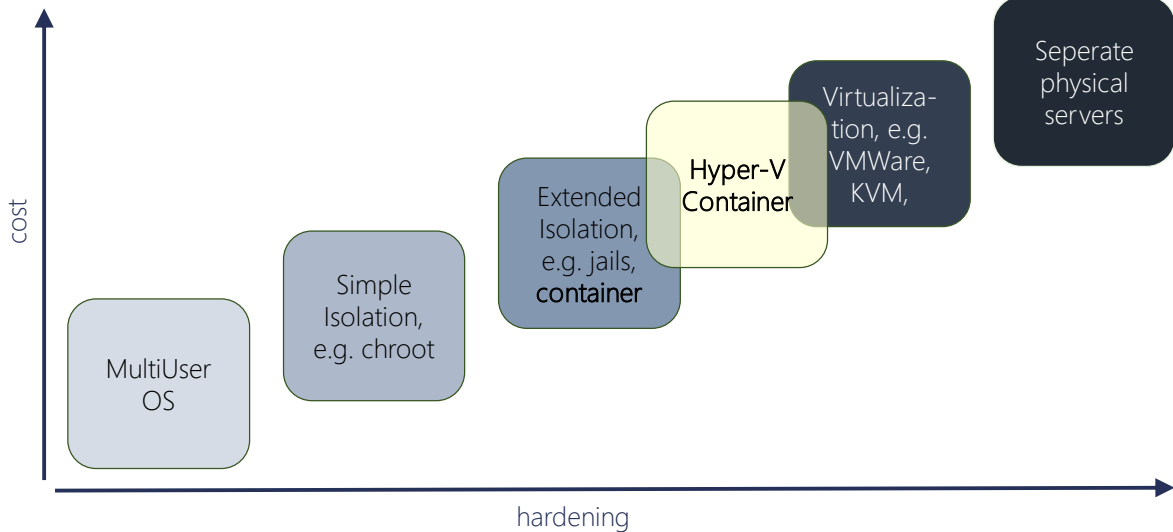


Container

- Linux Container: docker.com
- Container in Windows Server
 1. Windows Server Container
Hyper-V not required
 2. Hyper-V Container
requires Hyper-V
 3. LinuxKit
Announced at DockerCon 2017
- Desktop solutions (Win 10, MacOS ..)



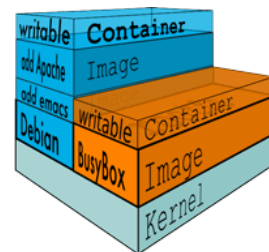
Basic principles



docker.com

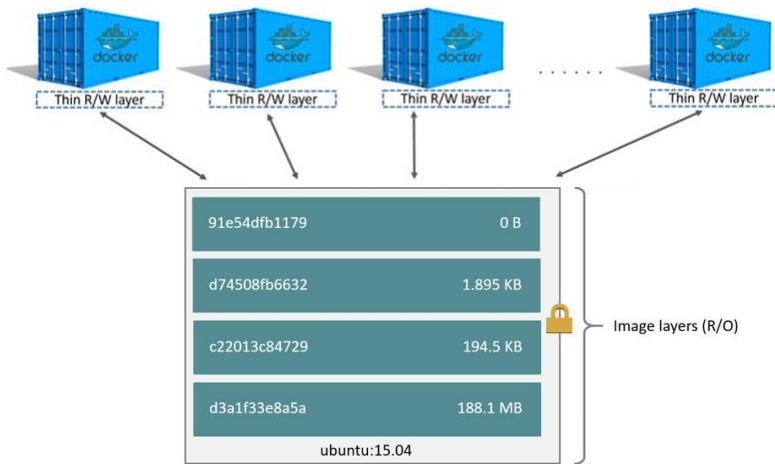


- Founded 2013
- Initially built upon "LinuX Containers" (LXC), since v0.9: libcontainer
- Requires Linux 3.8 or later, using "Control Groups" (Cgroups), "Namespaces"
- Unifying FS: AUFS, OverlayFS, ZFS ..



Figures: www.docker.com/what-docker

docker: Images and layers



<https://docs.docker.com/engine/userguide/storagedriver/imagesandcontainers/>

Setup docker (Ubuntu, Debian)

Install, verify

```
apt-get install docker.io
```

```
docker version
```

```
docker info
```

List containers

```
docker ps
```

List images

```
docker images
```

Search the docker hub

```
docker search hello-world
```

```
docker run hello-world
```

```
root@yakkety:~# docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
hello-world         latest             48b5124b2768      6 weeks ago       1.84 kB
root@yakkety:~# docker ps -a
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS              NAMES
1b853698b126      hello-world        "/hello"           5 minutes ago      Exited (0) 5 minutes ago
root@yakkety:~#
```

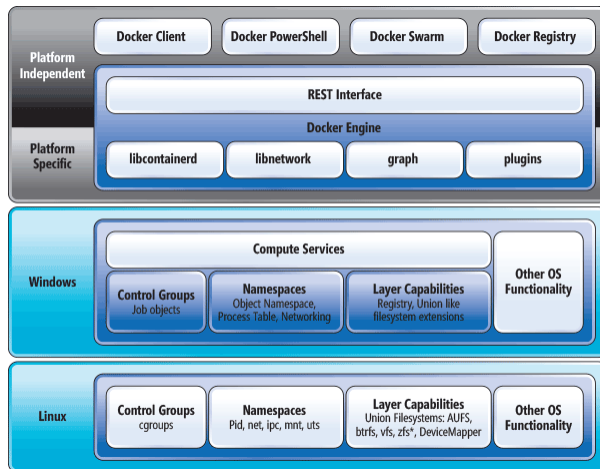


KEEP
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IT'S
DEMO
TIME

From drawbridge to Hyper-V containers

- 2008: Hyper-V
Support for Legacy OS, enlightening modern OS
- 2011: Research project "[Drawbridge](#)"
Process isolation container technology for Azure
- 2013: Microsoft & Docker partnering
Development of a common management interface

Containers: Linux vs. Windows



"Comparing the Basic Architecture of Containers and Docker Across Windows and Linux",
<https://msdn.microsoft.com/en-us/magazine/mt797649.aspx>

Windows isolation modes

- Windows supports:
 - (default)
 - process
 - hyperv
- Hyper-V Container (Hyper-V must be enabled):
 - VM worker process "vmwp" on host, each container has it's own csrss process

```
C:\>docker info | findstr Isolation
Default Isolation: hyperv

C:\>docker run --interactive --isolation process --tty microsoft/nanoserver
docker: Error response from daemon: Windows client operating systems only support Hyper-V containers.
See 'docker run --help'.
```

Setup Windows Server Containers

```
# Enable Windows feature(s)
Install-WindowsFeature -Restart -Name Containers
Install-WindowsFeature -Restart -Name Hyper-V # Optional

# Get docker
Install-Module -Name DockerMsftProvider -Repository PSGallery
Install-Package -Name docker -ProviderName DockerMsftProvider

# Reboot
Restart-Computer

# Verify setup
Get-ComputeProcess
docker version
docker info
```

The screenshot shows a web browser window displaying the Docker Hub repository page for `microsoft/nanoserver`. The browser address bar shows `hub.docker.com/r/microsoft/nanoserver`. The page header includes a search bar with `nanoserver` entered, and navigation links for `Explore`, `Help`, `Sign up`, and `Sign in`. The main content area is titled `PUBLIC REPOSITORY` and features the repository name `microsoft/nanoserver` with a star icon and the text `Last pushed: 7 days ago`. Below this, there are two tabs: `Repo Info` (selected) and `Tags`. The `Repo Info` tab is divided into four sections: `Short Description` (containing `Windows Server 2016 Nano Server base OS image for Windows containers`), `Full Description` (containing a paragraph about Nano Server and a link to the Getting Started Guide), `Docker Pull Command` (containing `docker pull microsoft/nanos`), and `Owner` (displaying the Microsoft logo and the name `microsoft`).

Combinations

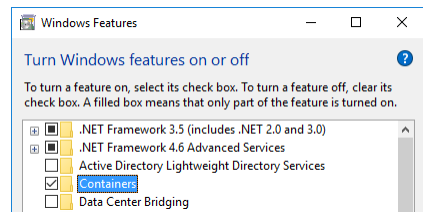
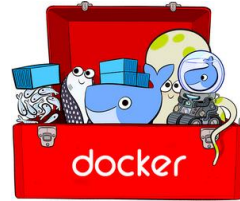
HOST OS	Windows Server Container		Hyper-V Container		Linux Container	
	Nano	Core	Nano	Core	Hyper-V VM	LinuxKit
WS 2016 Nano	✓	-	✓	✓		?
WS 2016 Core	✓	✓	✓	✓		?
WS 2016 SaD	✓	✓	✓	✓		?
Windows 10	-	-	✓	✓	✓	?



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Dazed and confused ..

- a) Docker Toolbox
Legacy: "older Mac + Windows OS",
uses Virtualbox
- b) Docker for Windows
uses Hyper-V + Windows Containers
Linux + Windows Containers
- c) Containers for Windows
native Windows Containers,
no (G)UI, Isolation: Hyper-V



Install "Docker for Windows" (on Win 10)

#Requires -RunAsAdministrator

Enable-WindowsOptionalFeature -Online -NoRestart

-FeatureName 'Microsoft-Hyper-V-All', 'Containers'

Invoke-WebRequest

-uri 'https://download.docker.com/win/stable/InstallDocker.msi'

-OutFile 'c:\InstallDocker.msi'

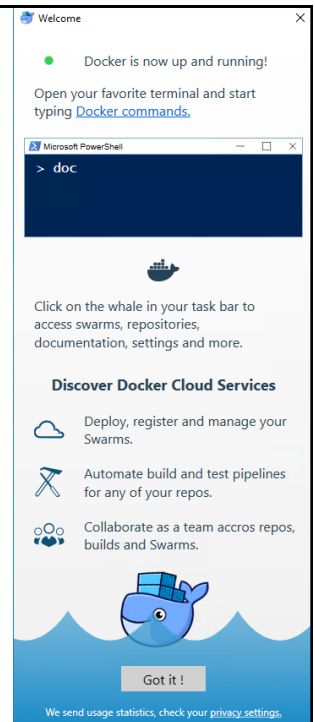
msiexec.exe /i 'c:\InstallDocker.msi' /passive /forcerestart



Docker is starting...
This will only take a few seconds
Docker for Windows

"Docker on Windows" (April 2017)

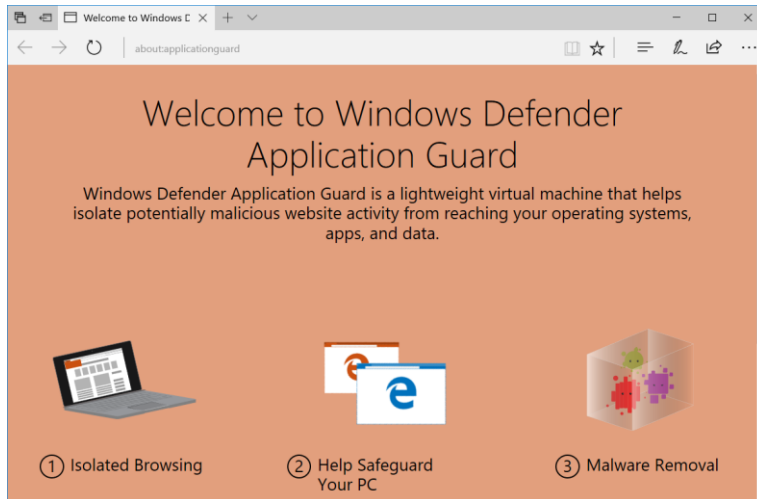
- "Community Edition"
- **docker version:**
Version 17.03.1-ce (Client, Server)
- Supports Windows Containers, Hyper-V isolation only
- Supports Linux Containers via Alpine Linux VM in Hyper-V



PowerShell Cmdlets for Docker (April 2017)

<https://github.com/Microsoft/Docker-PowerShell/releases>

What's beyond ...



Project Barcelona,
Windows 10 v1703

Wrap up!

- docker.exe or Cmdlets?
- Will Hyper-V be obsolete?
- Pets or cattles ?
- #LinuxKit

