Arrow ECS Training

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

Windows Server Container

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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

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Silver Learning

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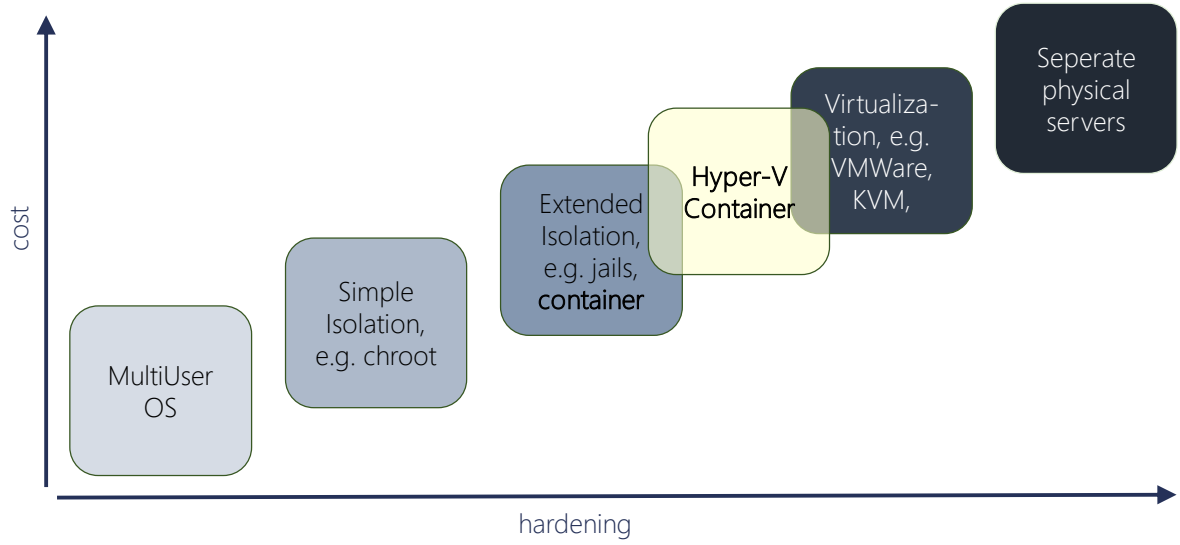
about_me

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

Container

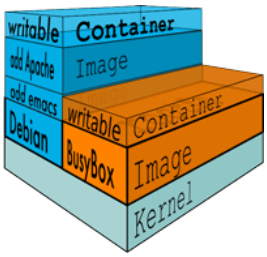
- Linux Container: docker.com
- Container in Windows Server
  1. Windows Server Container
     Hyper-V not required
  2. Hyper-V Container
     requires Hyper-V
  3. LinuxKit
     Announced at DockerCon 2017
- Desktop solutions (Win 10, MacOS ..)

Basic principles



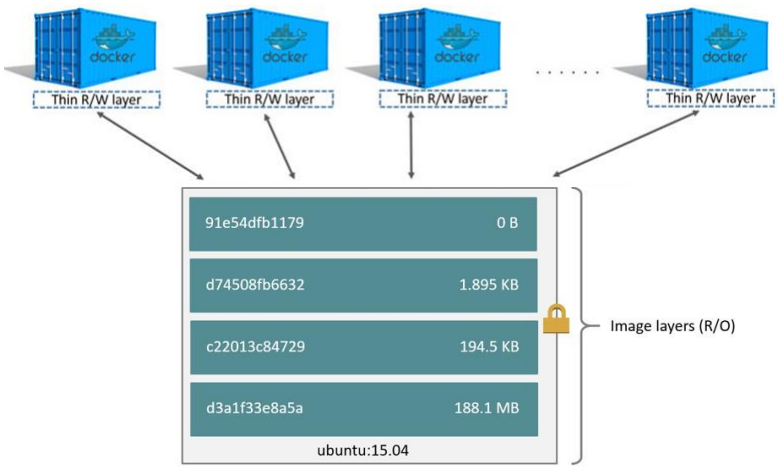
docker.com

- 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/

LINUX

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            happy_bardeen
root@yakkety:~#
```

KEEP
CALM
IT'S
DEMO
TIME

From drawbridge to Hyper-V containers

- 2008: Hyper-V

  Support for Legacy OS, enlightining modern OS

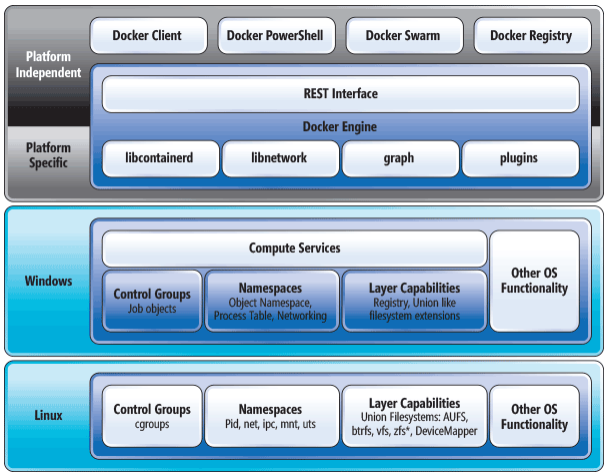
- 2011: Research project "Drawbridge"

  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'.
```

WINDOWS SERVER

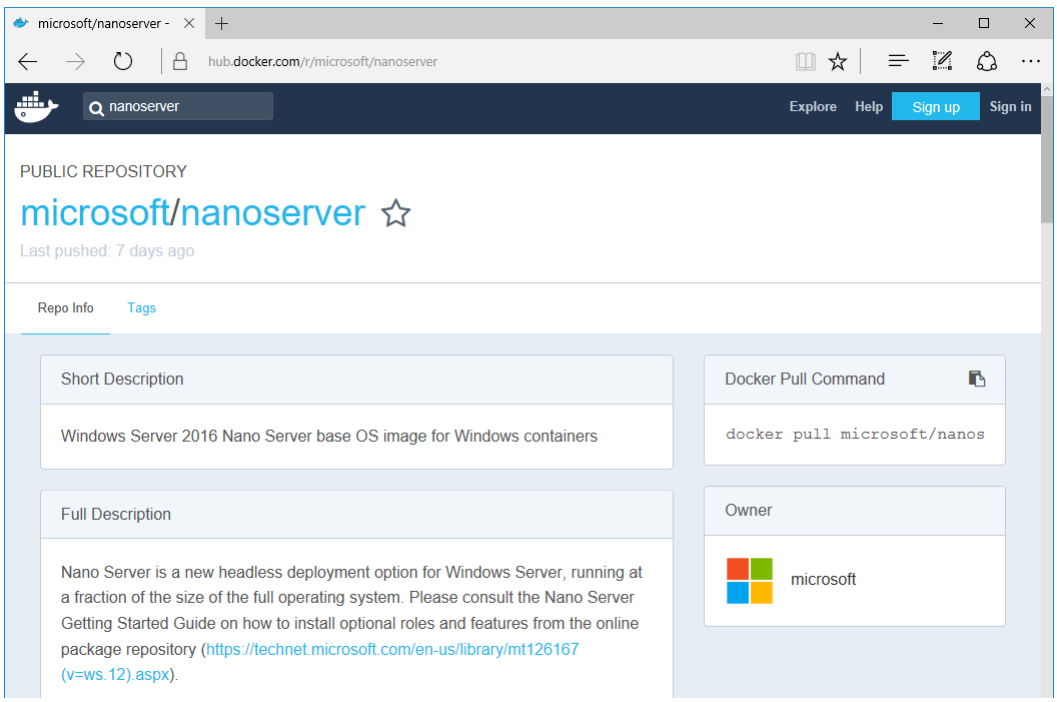
Setup Windows Server Containers

```
# 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
```



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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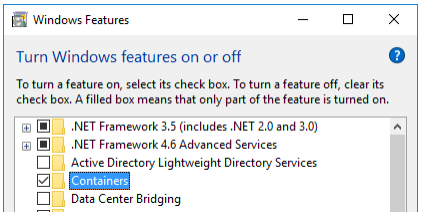
DESKTOP

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

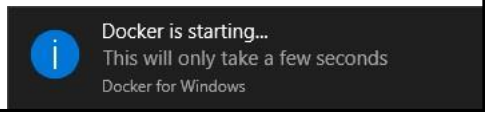
c) Containers for Windows
native Windows Containers,
no (G)UI, Isolation: Hyper-V



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
```



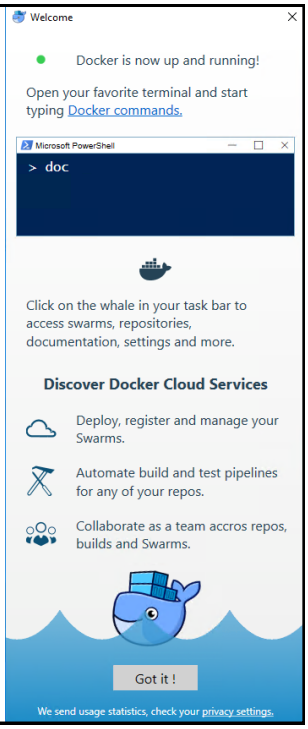
"Docker on Windows" (April 2017)

- "Community Edition"
- **`docker version:`**

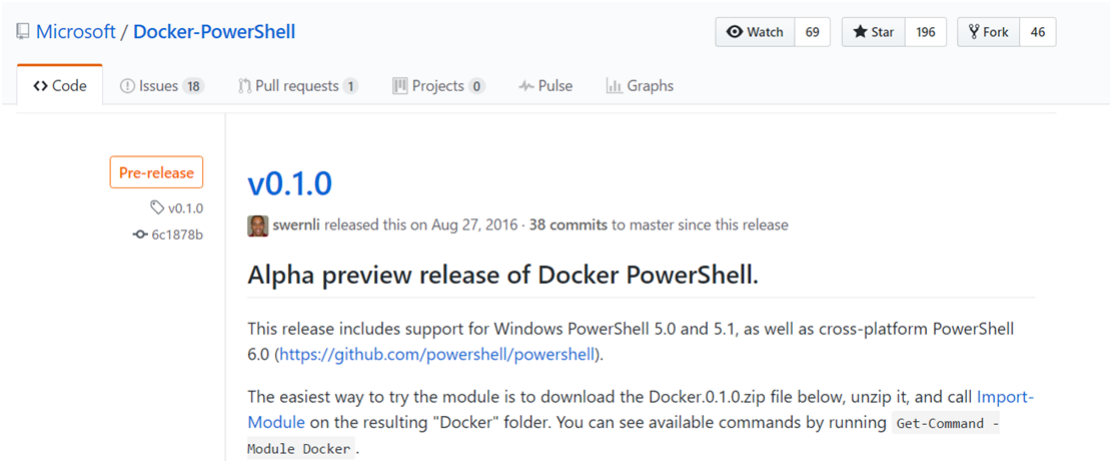
  `Version 17.03.1-ce (Client, Server)`
- Supports Windows Containers,

  Hyper-V isolation only
- Supports Linux Containers

  via Alpine Linux VM in Hyper-V

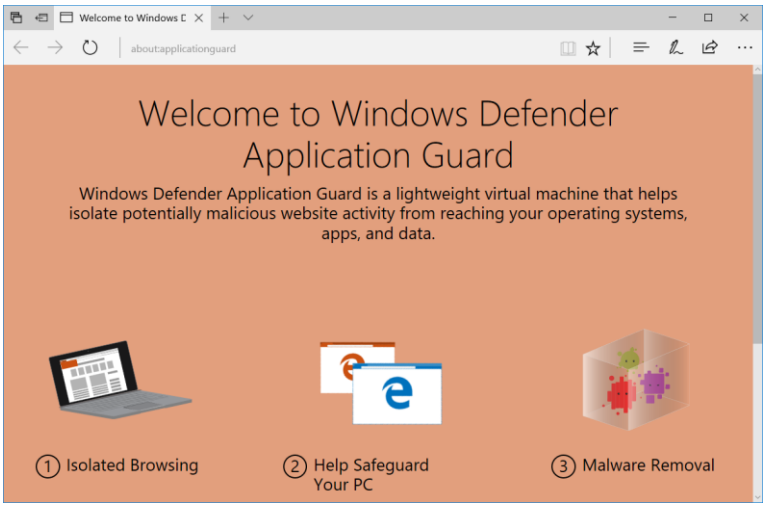


PowerShell Cmdlets for Docker (April 2017)



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