Windows Server Container ....

@thorstenbutz

Podcast: Sliding Windows

SLW05: Remote Desktops,

Benny Tritsch

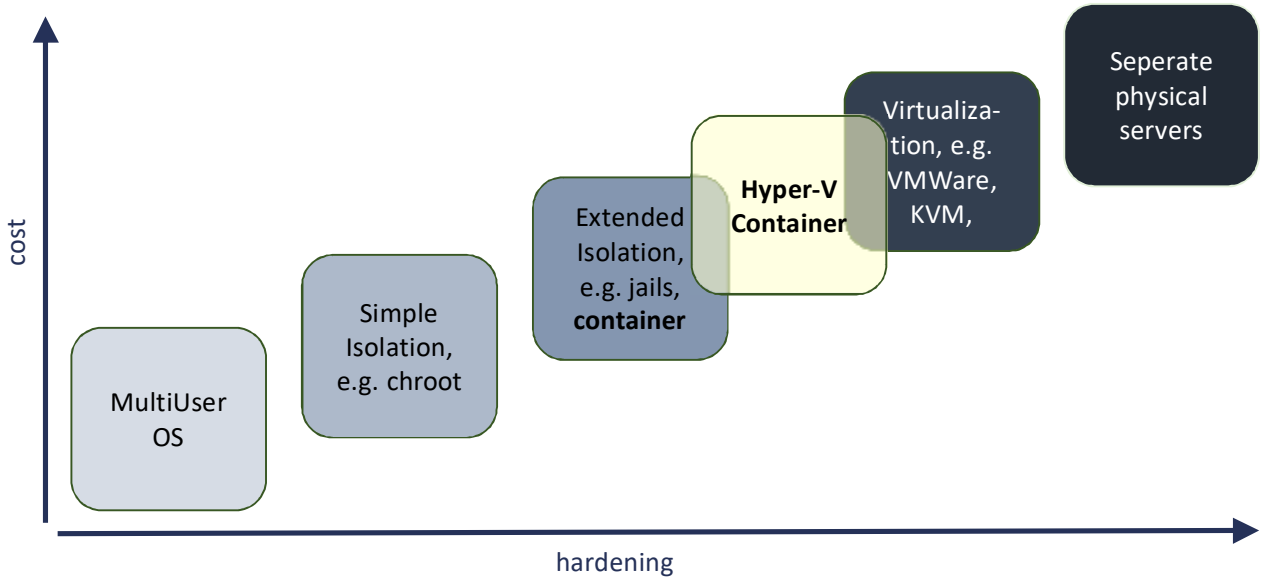
…

www.slidingwindows.de/?feed=slw-mp3

Container

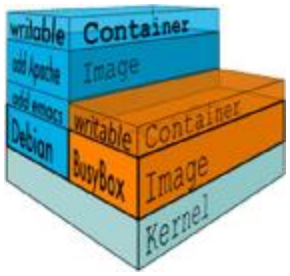
- Linux Container: docker.com
- Container in Windows Server
  1. Windows Server Container
     Hyper-V not required
  2. Hyper-V Container
     requires Hyper-V
  3. LinuxKit
     Announced at DockerCon 2017
- Desktop solutions (Win 10, MacOS ..)

Basic principles



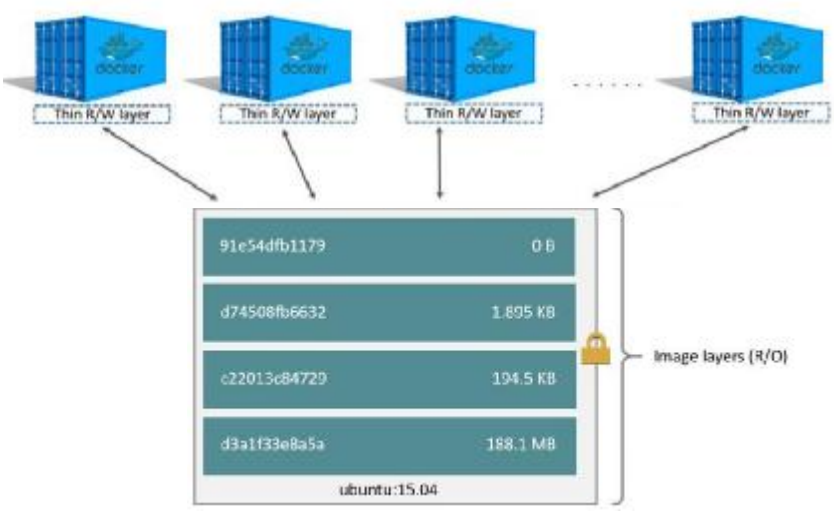
docker.com

- 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

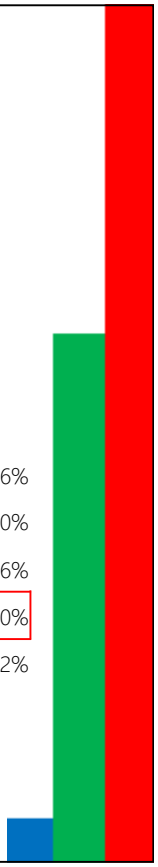
Setup docker (Ubuntu, Debian)

```
# 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
1b854698b126        hello-world         "/hello"            5 minutes ago       Exited (0) 5 minutes ago                        happy_hardeen
root@yakkety:~#
```

Footprints (WS 2016 RTW)

ImageName	ImageSize(Byte)	ImageSize(GB)	FileCount	
Windows Server 2012 R2 SERVERSTANDARDCORE	6897618255	6,42	70229	
Windows Server 2012 R2 SERVERSTANDARD	12069723893	11,24	89410	
Windows Server 2012 R2 SERVERDATACENTERCORE	6876269628	6,4	70120	
Windows Server 2012 R2 SERVERDATACENTER	12066707039	11,24	89288	
Windows Server 2016 SERVERSTANDARDCORE	9353610808	8,71	67418	60,6%
Windows Server 2016 SERVERSTANDARD	15433268353	14,37	113677	100,0%
Windows Server 2016 SERVERDATACENTERCORE	9353315396	8,71	67092	60,6%
Windows Server 2016 SERVERDATACENTER	15440147913	14,38	113554	100,0%
Windows Server 2016 SERVERSTANDARDNANO	800233355	0,75	8182	5,2%



Nano Server in v1607 (initial release of WS 2016)

- Install image NanoServer: 169 MB
- "Zero foot print": no roles and features onboard
- Main purpose: "Compute clusters"
  - Hyper-V-Host
  - Storage: SoFS, etc.
- Purpose 2: "born-in-the-cloud" application
- Usage: physical, virtual, container
- Headless, no local logon
- Only 64-bit applications
- PowerShell Core
- Limited roles (e.g. no dc)
- No activation required/supported
- Manual windows updates
- CBB (only)
- Must be provisioned

From drawbridge to Hyper-V container

- 2008: Hyper-V

  Support for Legacy OS, enlightining modern OS

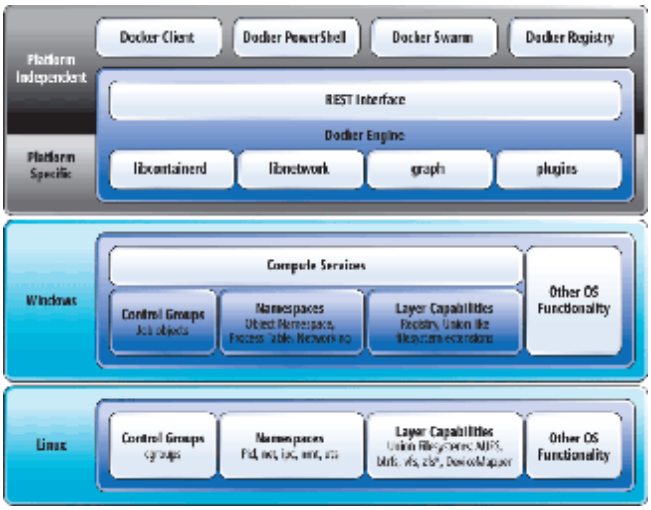
- 2011: Research project "Drawbridge"

  Process isolation container technology for Azure

- 2013: Microsoft & Docker partnering

  Development of a common management interface

Container: 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

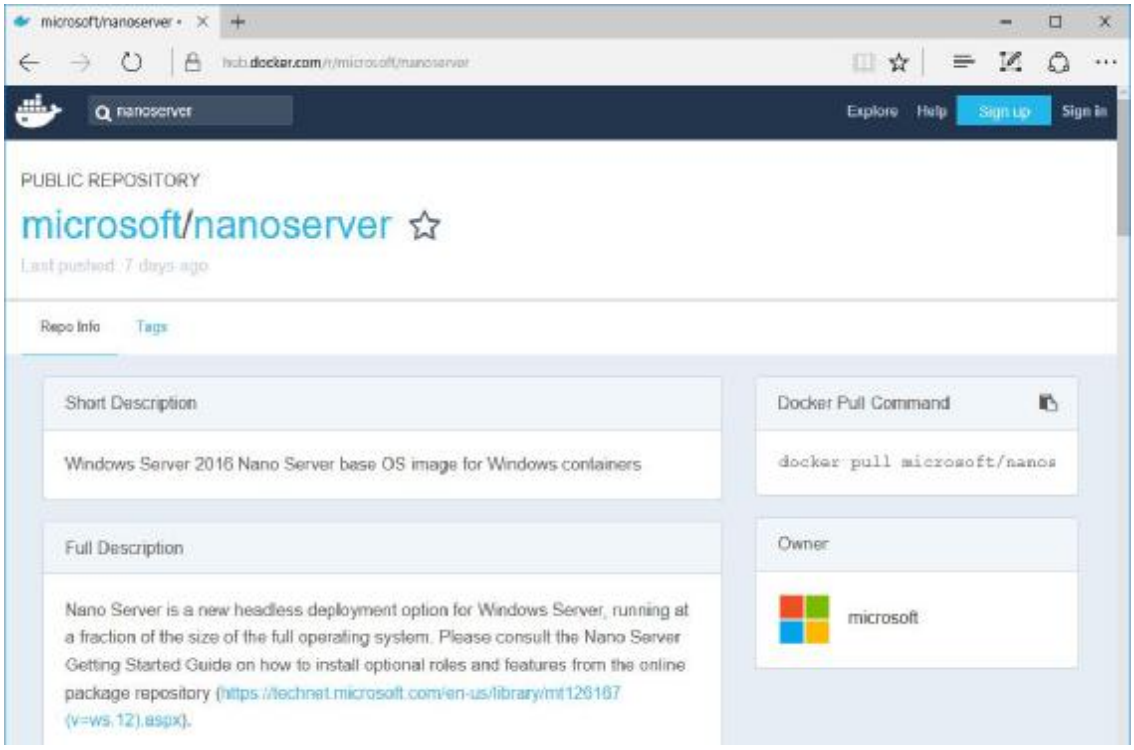
```
C:\>docker info | findstr Isolation
Default Isolation: hyperv

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
```

KEEP
CALM
IT'S
DEMO
TIME



Delivering continuous innovation with Windows Server

Erin Chapple (General Manager, Windows Server), 2017-06-15:

"Based on that feedback, we are making an important change to Nano Server. This next release will focus on making Nano Server the very best container image possible. From these changes, customers will now see the Nano Server images shrink in size by more than 50 percent, further decreasing startup times and improving container density. As part of this effort to focus on containers, we will be removing the functionality for infrastructure-related roles."

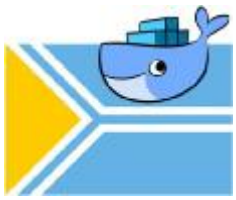
Ryan Yates 90

Basically you need to forget about it being a Developer only focused world (because it still is far from that) and bring back the infrastructure roles to Nano Server.

This is just a HUGE step backwards in innovation.

https://blogs.technet.microsoft.com/hybridcloud/2017/06/15/delivering-continuous-innovation-with-windows-server/

Nano Server in v1709 (2nd release of WS 2016)



- > 50% in size compared to previous
- No infrastructure roles
- No hyper-V, SoFS
- Main purpose: Support of .NET Core applications
- Usage: container, IoT Core installations
- Windows PowerShell, .NET Core, WMI: no longer included by default (can be included when building a container)
- No install image, no servicing stack included (anymore);
  instead: docker hub

DESKTOP

Dazed and confused ..

a) Docker Toolbox

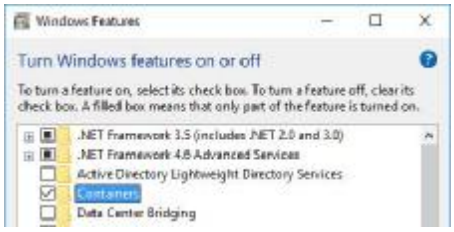
Legacy: "older Mac + Windows OS",
uses Virtualbox

b) Docker for Windows

uses Hyper-V + Windows Containers
Linux + Windows Containers

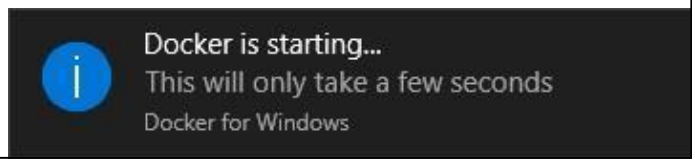
c) Containers for Windows

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
```



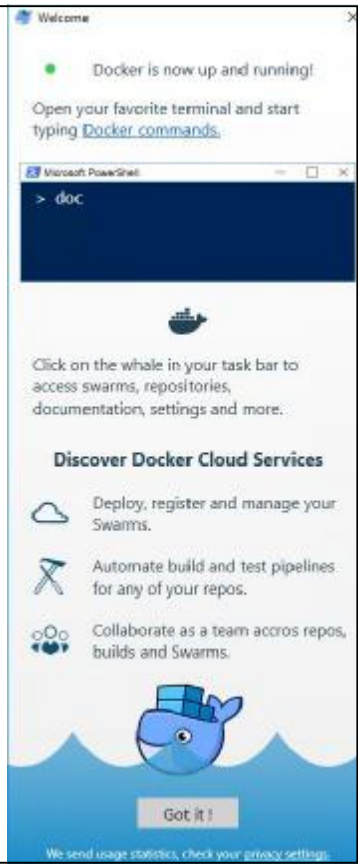
"Docker on Windows" (Sept. 2017)

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

  `Version 17.06.2-ce (Client, Server)`
- Supports Windows Containers,

  Hyper-V isolation only
- Supports Linux Containers

  via Alpine Linux VM in Hyper-V



PowerShell Cmdlets for Docker (September 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

Get-Help about_me

```
$speaker = @{
   name = Thorsten Butz
   jobrole = Trainer, Consultant, Author
   certification = MC*,LPIC-2
   <twitter> = thorstenbutz
   <facebook> = facebook.com/thbutz
   <home> = www.thorsten-butz.de
}
```