

@codecentric

Running

# Spring Boot Apps

on

# Docker Windows Containers

with

# Ansible

Jonas Hecht | Senior IT-Nerd |  @jonashackt

Before I start my talk...

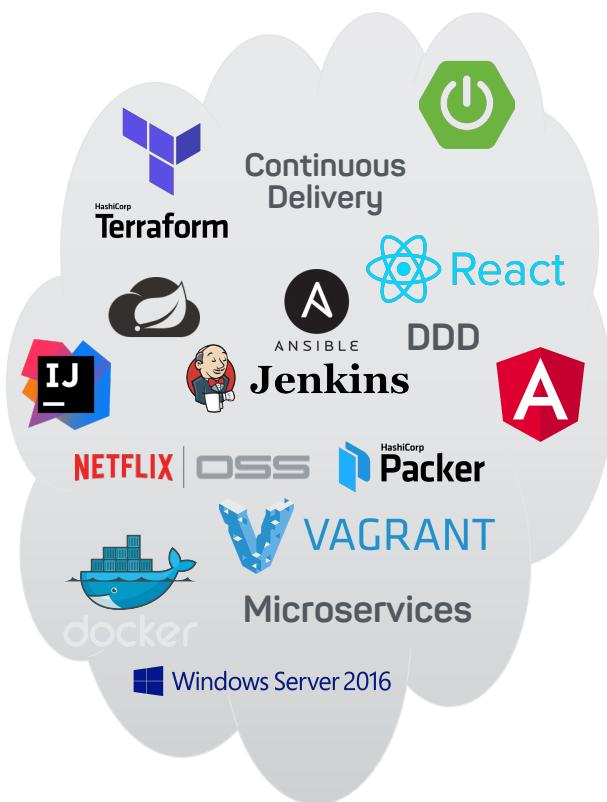


[github.com/jonashackt/ansible-windows-talk](https://github.com/jonashackt/ansible-windows-talk)



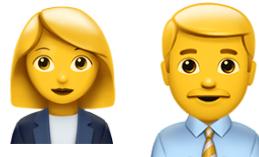
[meetup.com/jugthde](https://meetup.com/jugthde)

tools & methodologies



real world





Build (and scale) a Windows C/C++ backed Spring Boot App!



Make no compromises -  
automate it!

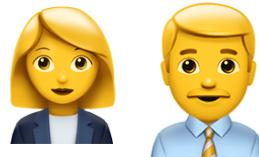
100% comprehensible



Open Source

build it from the ground up

(bit.ly/2q4sD3x)



Build (and scale) a Windows C/C++ backed Spring Boot App!



# Build (and scale) a Windows C/C++ backed Spring Boot App!

1. Windows box
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# 1. Windows box



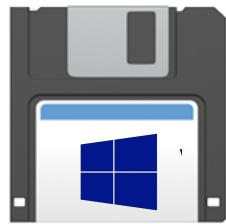
[developer.microsoft.com/en-us/microsoft-edge/tools/vms/](http://developer.microsoft.com/en-us/microsoft-edge/tools/vms/)  
[app.vagrantup.com/boxes/search?q=windows+10](http://app.vagrantup.com/boxes/search?q=windows+10)

ansible-windows-docker-springboot\_default\_1487243623466\_51562 [Running]

```
Administrator: Windows PowerShell
PS C:\Users\vagrant> (Get-ItemProperty -Path c:\windows\system32\hal.dll).VersionInfo.FileVersion
10.0.14393.206 (rs1_release.160915-0644)
PS C:\Users\vagrant> -
```



[microsoft.com/evalcenter/evaluate-windows-server-2016](https://microsoft.com/evalcenter/evaluate-windows-server-2016)



Evaluation ISO



HashiCorp  
**Packer**





Autounattend.xml



windows\_server\_2016\_docker.json



vagrantfile-windows\_2016.template



Evaluation ISO



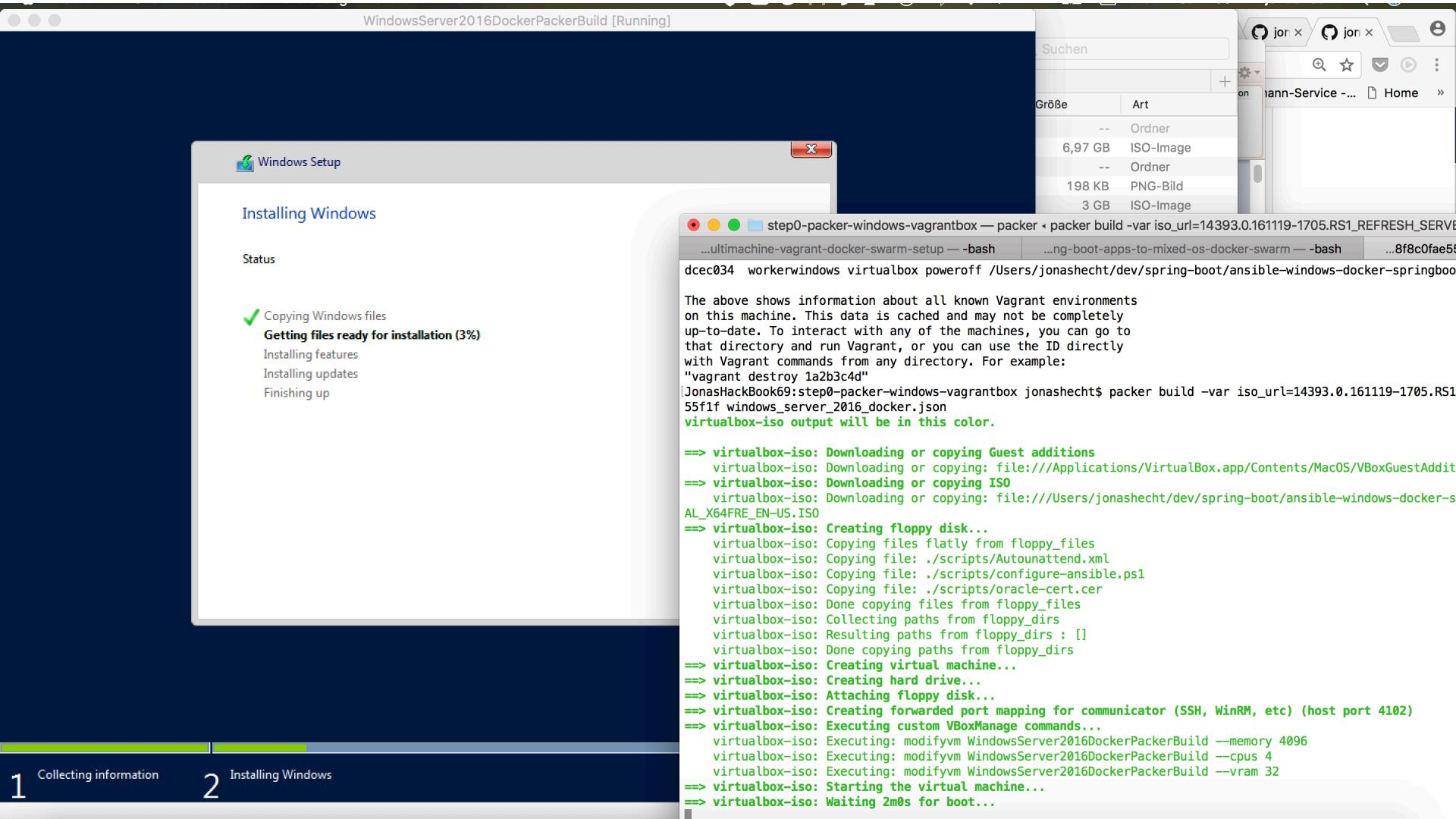
HashiCorp  
**Packer**



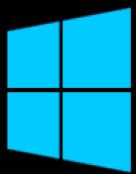


Demo!

[github.com/jonashackt/ansible-windows-talk#prerequisites-1-windows-box](https://github.com/jonashackt/ansible-windows-talk#prerequisites-1-windows-box)



WindowsServer2016DockerPackerBuild [Running]



```
step0-packer-windows-vagrantbox — packer - var iso_
...ultimachine-vagrant-docker-swarm-setup — bash ...ng-boot-apps-to-mix...
The above shows information about all known Vagrant environments
on this machine. This data is cached and may not be completely
up-to-date. To interact with any of the machines, you can go to
that directory and run Vagrant, or you can use the ID directly
with Vagrant commands from any directory. For example:
"vagrant destroy 1a2b3c4d"
[JonasHackBook69:step0-packer-windows-vagrantbox jonashecht$ packer bui
55f1f windows_server_2016_docker.json
virtualbox-iso output will be in this color.

==> virtualbox-iso: Downloading or copying Guest additions
    virtualbox-iso: Downloading or copying: file:///Applications/Virtu
==> virtualbox-iso: Downloading or copying ISO
    virtualbox-iso: Downloading or copying: file:///Users/jonashecht/
AL_X64FRE_EN-US.ISO
==> virtualbox-iso: Creating floppy disk...
    virtualbox-iso: Copying files flatly from floppy_files
    virtualbox-iso: Copying file: ./scripts/Autounattend.xml
    virtualbox-iso: Copying file: ./scripts/configure-ansi.ps1
    virtualbox-iso: Copying file: ./scripts/oracle-cert.cer
    virtualbox-iso: Done copying files from floppy_files
    virtualbox-iso: Collecting paths from floppy_dirs
    virtualbox-iso: Resulting paths from floppy_dirs : []
    virtualbox-iso: Done copying paths from floppy_dirs
==> virtualbox-iso: Creating virtual machine...
==> virtualbox-iso: Creating hard drive...
==> virtualbox-iso: Attaching floppy disk...
==> virtualbox-iso: Creating forwarded port mapping for communicator (
==> virtualbox-iso: Executing custom VBoxManage commands...
    virtualbox-iso: Executing: modifyvm WindowsServer2016DockerPackerB
    virtualbox-iso: Executing: modifyvm WindowsServer2016DockerPackerB
    virtualbox-iso: Executing: modifyvm WindowsServer2016DockerPackerB
==> virtualbox-iso: Starting the virtual machine...
==> virtualbox-iso: Waiting 2m0s for boot...
==> virtualbox-iso: Typing the boot command...
==> virtualbox-iso: Waiting for WinRM to become available...
```

# Build (and scale) a Windows C/C++ backed Spring Boot App!



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## 2. Ansible provisions Windows



FOREMAN



CFEngine



HashiCorp



[docs.ansible.com](https://docs.ansible.com)



[blog.codecentric.de/en/2017/01/ansible-windows-spring-boot/](http://blog.codecentric.de/en/2017/01/ansible-windows-spring-boot/)

Ansible is a radically simple...



ansible-windows-simple



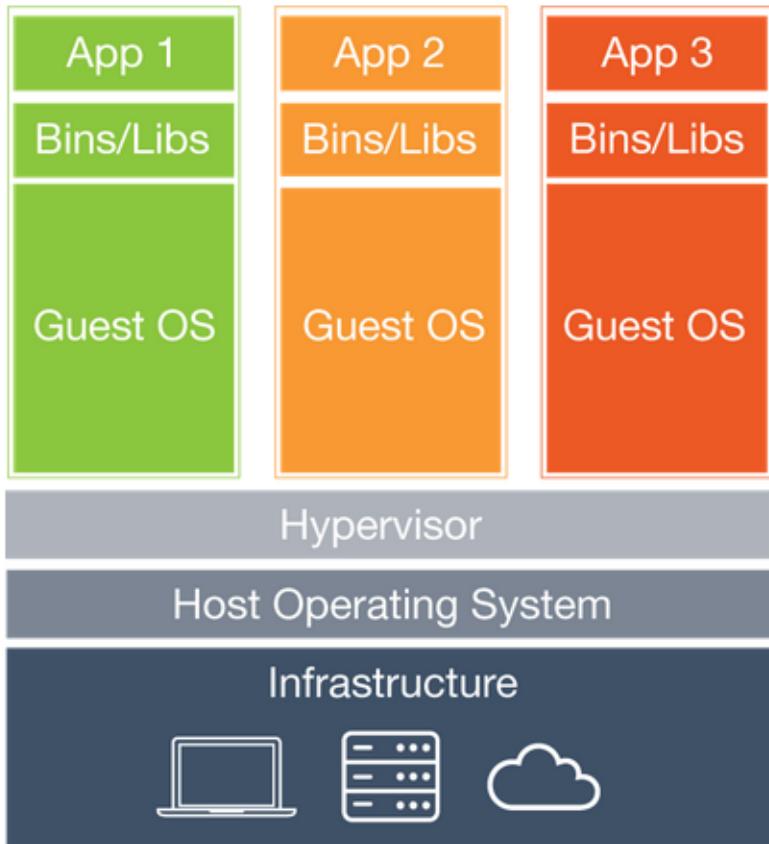
Demo!

[github.com/jonashackt/ansible-windows-talk#2-ansible-provisions-windows](https://github.com/jonashackt/ansible-windows-talk#2-ansible-provisions-windows)

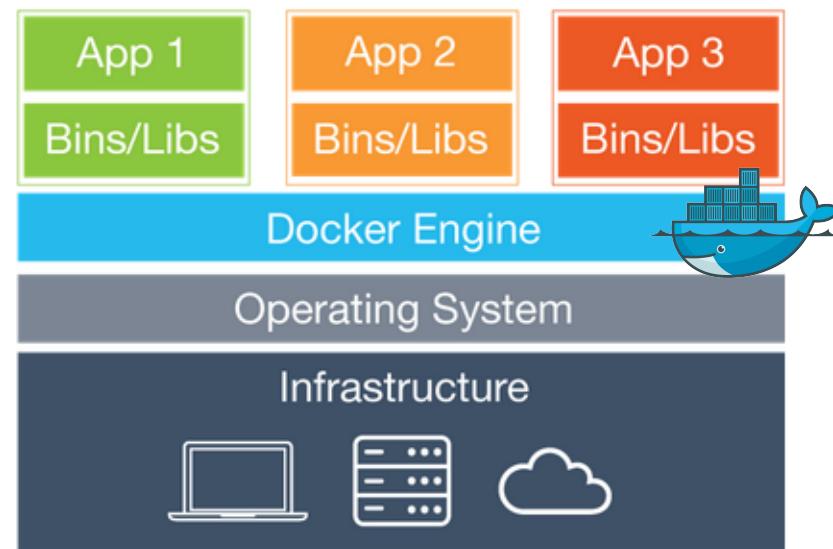
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### 3. Prepare Docker on Windows



Virtual Machines



Containers



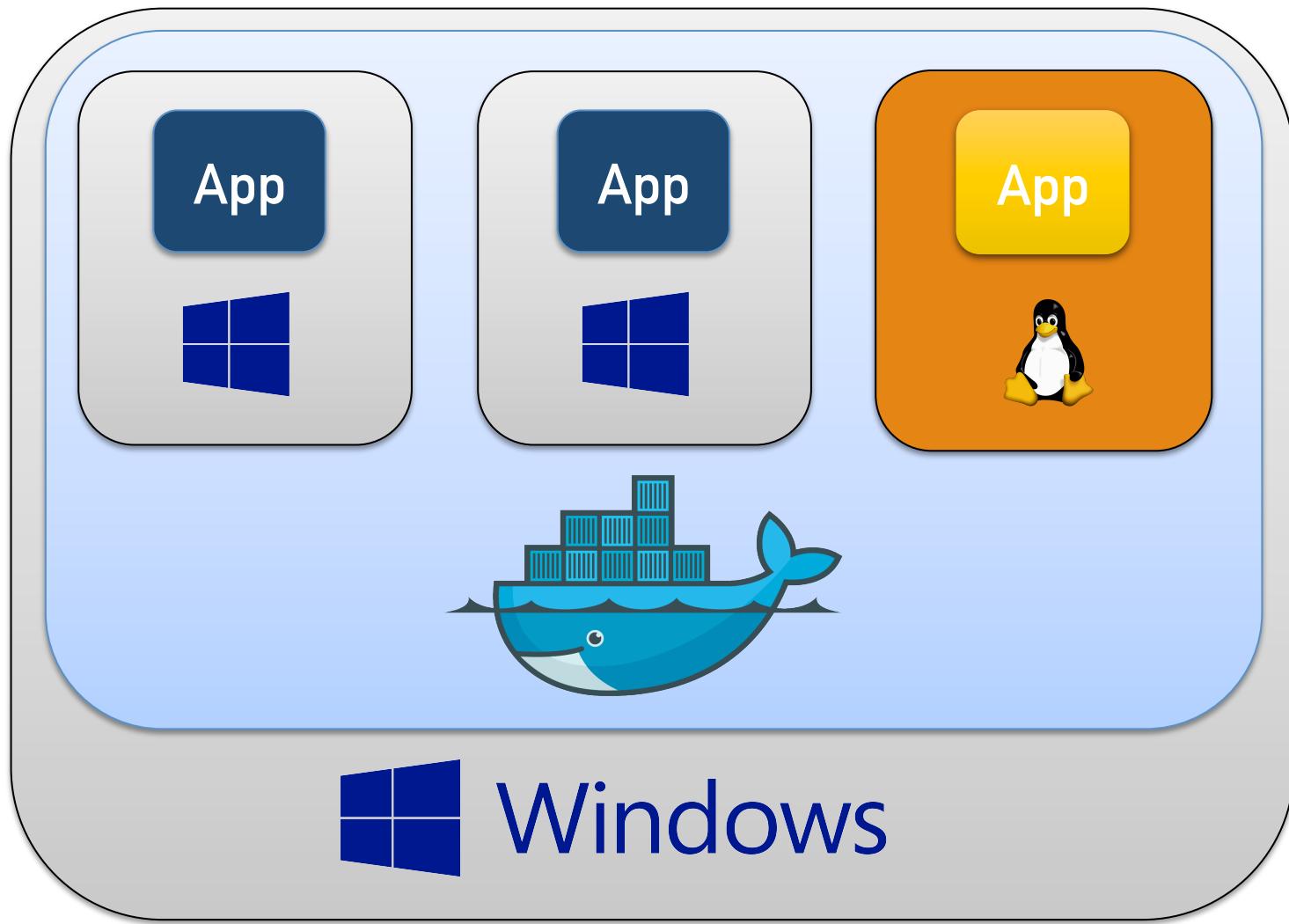
„Ok... I am a bit confused. You're saying, Windows should be able to run Containers containing Windows itself?“



[hub.docker.com/r/microsoft/](https://hub.docker.com/r/microsoft/)

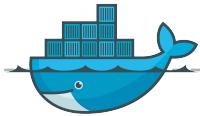


Powershell A blue square icon with a white right-pointing arrow, representing the Microsoft PowerShell command-line interface.

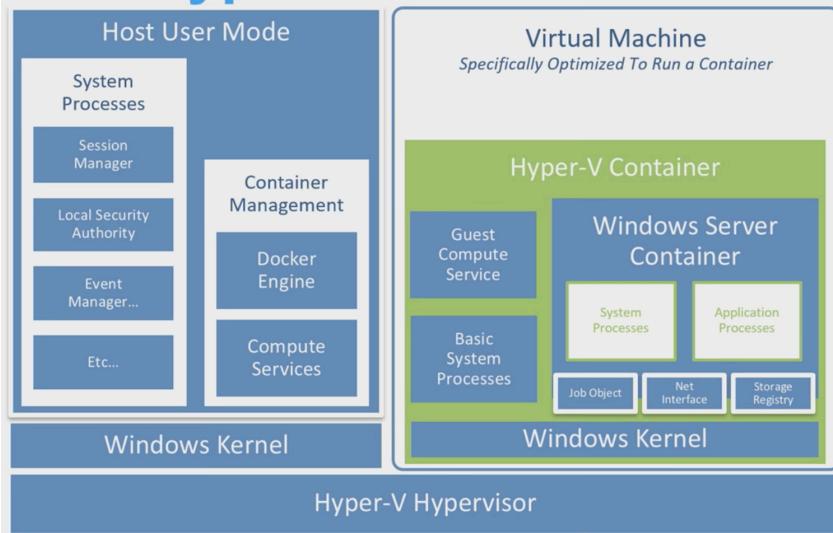


[blog.docker.com/2016/09/docker-microsoft-partnership/](http://blog.docker.com/2016/09/docker-microsoft-partnership/)

[github.com/docker/for-win](https://github.com/docker/for-win)



# Hyper-V Containers

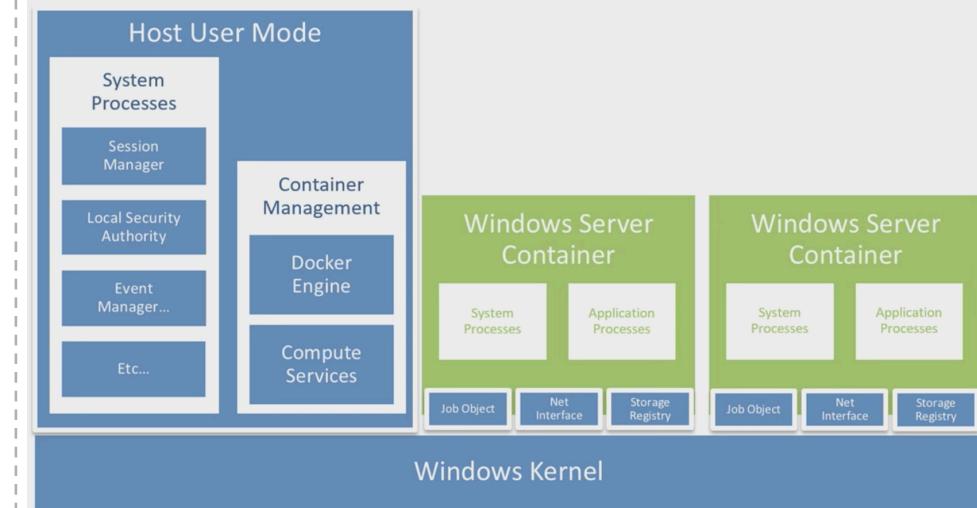


Windows Server 2016

Windows 10



# Windows Server Containers



Windows Server 2016





dockercon 16



13:16 / 45:15

## Base images

- Distributed by Microsoft
- Two options
  - windowsservercore: large (huge?), highly compatible
  - nanoserver: small, fast, smaller API surface

Administrator: C:\Windows\System32\cmd.exe					
REPOSITORY	TAG	IMAGE ID	CREATED	SIZE	
windowsservercore	10.0.14300.1000	5bc36a335344	5 weeks ago	9.354 GB	
windowsservercore	latest	5bc36a335344	5 weeks ago	9.354 MB	
nanoserver	10.0.14300.1016	3f5112ddd185	5 weeks ago	810.2 MB	
nanoserver	latest	3f5112ddd185	5 weeks ago	810.2 MB	

dockercon 16

FROM microsoft/windowsservercore:latest



VS.

FROM microsoft/nanoserver:latest





ANSIBLE



WinRM

1. Check minimum build number
2. Install Windows Features Containers and Hyper-V
3. Install current Docker version & register service
4. Install Docker Compose
5. Run first container on Windows
6. Building Spring Boot base image



Demo!

[github.com/jonashackt/ansible-windows-talk#3-prepare-docker-on-windows](https://github.com/jonashackt/ansible-windows-talk#3-prepare-docker-on-windows)



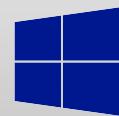
Demo again!

[github.com/jonashackt/ansible-windows-talk#3-prepare-docker-on-windows](https://github.com/jonashackt/ansible-windows-talk#3-prepare-docker-on-windows)

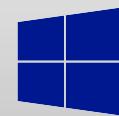


ANSIBLE

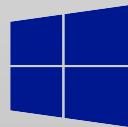
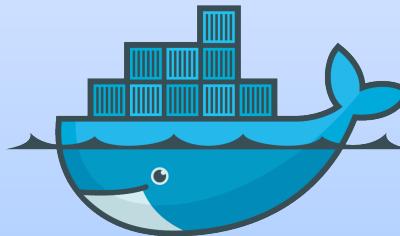
App



App



App



Windows



VAGRANT



VirtualBox

macOS

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## 4. Run Spring Boot App on Docker Windows Container



### SPRING IO PLATFORM

Provides a cohesive, versioned platform for building modern applications. It is a modular, enterprise-grade distribution that delivers a curated set of dependencies.



### SPRING FRAMEWORK

Provides core support for dependency injection, transaction management, web apps, data access, messaging and more.



### SPRING CLOUD

Provides a set of tools for common patterns in distributed systems. Useful for building and deploying microservices.



### SPRING BOOT

Takes an opinionated view of building Spring applications and gets you up and running as quickly as possible.



### SPRING INTEGRATION

Supports the well-known Enterprise Integration Patterns via lightweight messaging and declarative adapters.



### SPRING BATCH

Simplifies and optimizes the work of processing high-volume batch operations.



### SPRING SOCIAL

Easily connects your applications with third-party APIs such as Facebook, Twitter, LinkedIn, and more.



### SPRING AMQP

Applies core Spring concepts to the development of AMQP-based messaging solutions.



### SPRING CLOUD DATA FLOW

A cloud native programming and operating model for composable data microservices on a structured platform.



### SPRING SECURITY

Protects your application with comprehensive and extensible authentication and authorization support.



### SPRING HATEOAS

Simplifies creating REST representations that follow the HATEOAS principle.



### SPRING MOBILE

Simplifies the development of mobile web apps through device detection and progressive rendering options.



### SPRING FOR ANDROID

Provides key Spring components for use in developing Android applications.



### SPRING CLOUD

Provides a set of tools for common patterns in distributed systems. Useful for building and deploying microservices.



### SPRING DATA

Provides a consistent approach to data access – relational, non-relational, map-reduce, and beyond.



### SPRING WEB FLOW

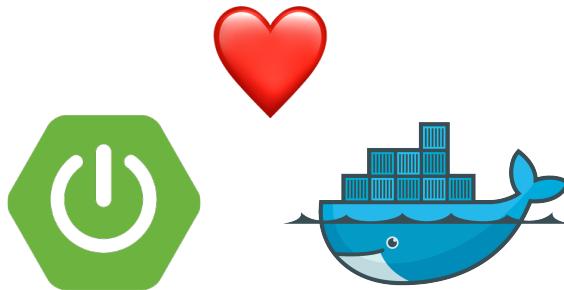
Supports building web applications with controlled navigation such as checking in for a flight or applying for a loan.



### SPRING WEB SERVICES

Facilitates the development of contract-first SOAP web services.

spring.io/projects



„Takes an opinionated view of building **production-ready** Spring applications. **Spring Boot** favors convention over configuration and is designed to get you **up and running as quickly as possible**.“

```
java -jar weatherbackend-0.0.1-SNAPSHOT.jar
```



Demo!

[github.com/jonashackt/ansible-windows-talk#4-run-spring-boot-app-on-docker-windows-container](https://github.com/jonashackt/ansible-windows-talk#4-run-spring-boot-app-on-docker-windows-container)

## Dockerfile



```
FROM springboot-oraclejre-nanoserver:latest

MAINTAINER Jonas Hecht

# Expose the apps Port
EXPOSE 8088

# Add Spring Boot app.jar to Container
ADD weatherbackend-0.0.1-SNAPSHOT.jar app.jar

# Fire up our Spring Boot app by default
CMD ["java.exe", "-jar app.jar --server.port=8088"]
```

```
docker build . --tag myRealCoolImage:latest
```

[docs.docker.com/engine/reference/builder/](https://docs.docker.com/engine/reference/builder/)



Demo!



[github.com/jonashackt/ansible-windows-talk#4-run-spring-boot-app-on-docker-windows-container](https://github.com/jonashackt/ansible-windows-talk#4-run-spring-boot-app-on-docker-windows-container)

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[www.google.de](http://www.google.de)



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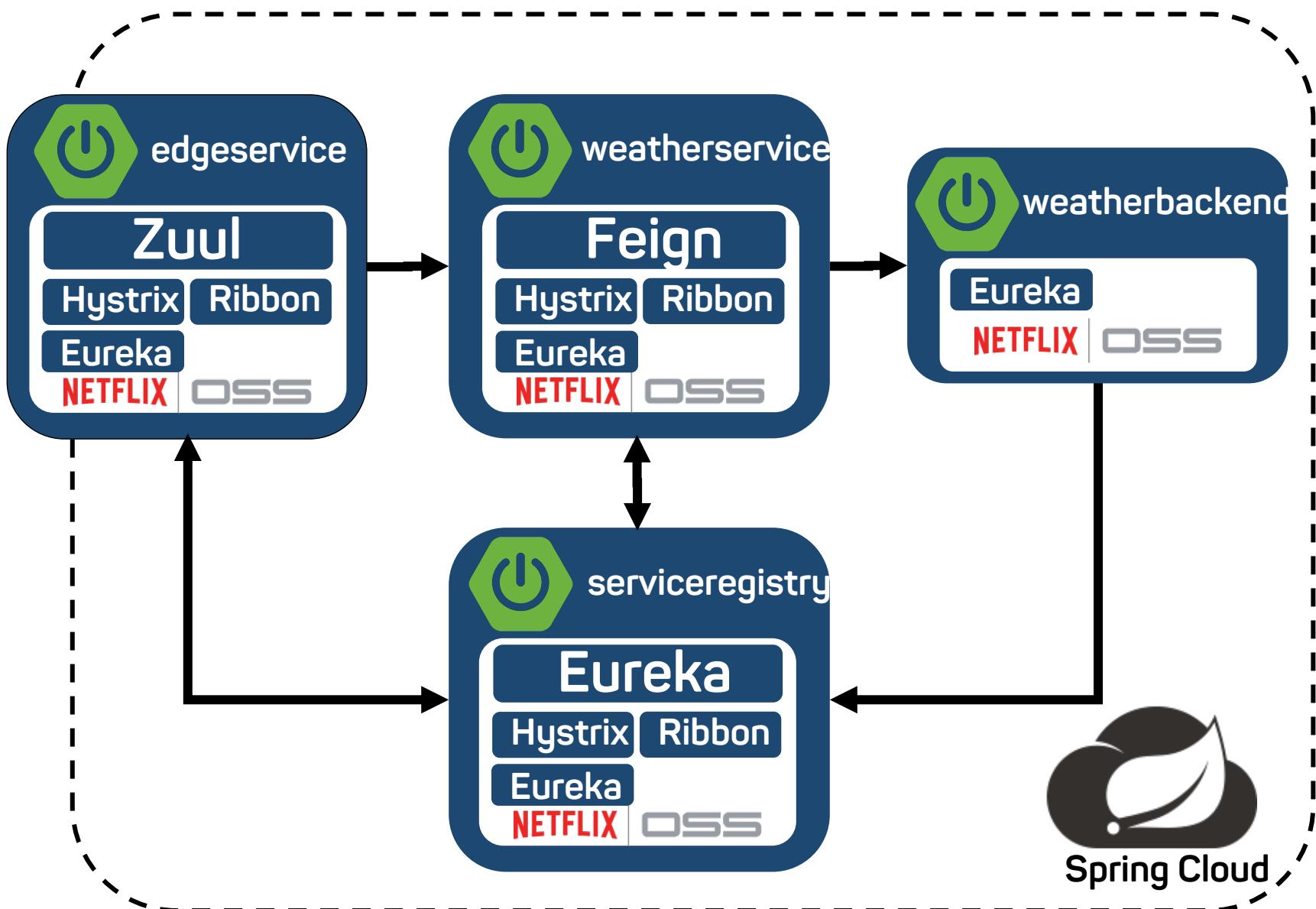
Supports building web applications with controlled navigation such as checking in for a flight or applying for a loan.

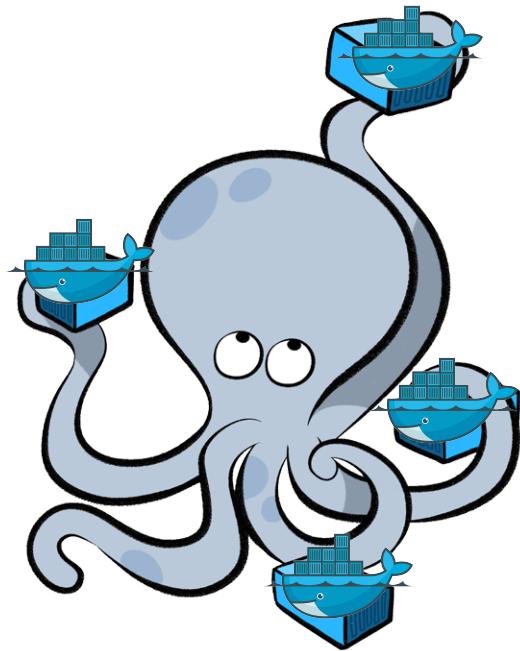


### SPRING WEB SERVICES

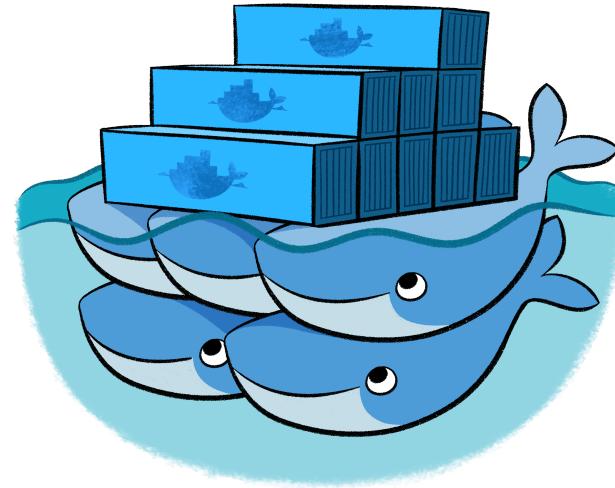
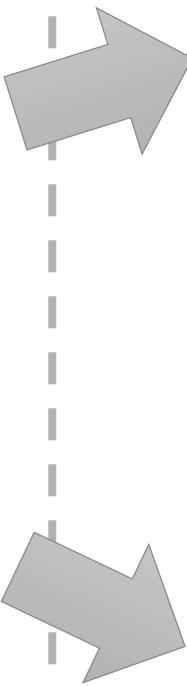
Facilitates the development of contract-first SOAP web services.

spring.io/projects





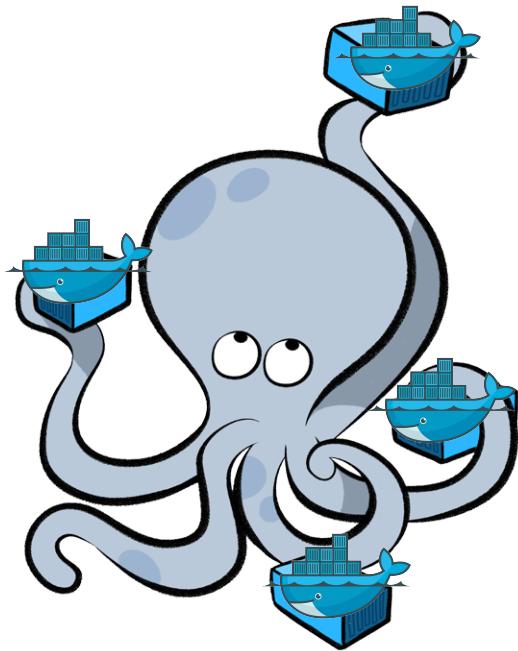
Docker Compose



Docker Swarm



**kubernetes**



## Docker Compose

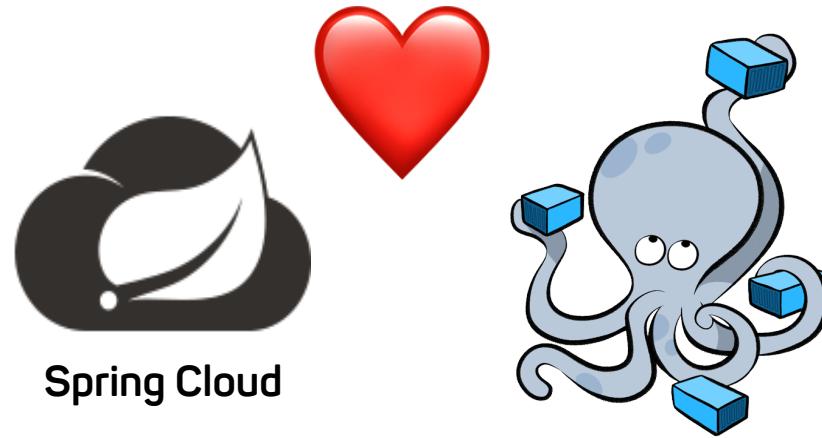
```
version: '3.1'

services:
  weatherbackend:
    build: ./weatherbackend
    ports:
      - "8090"
    tty:
      true
    restart:
      unless-stopped

  weatherservice:
    build: ./weatherservice
    ports:
      - "8095:8095"
    tty:
      true
    restart:
      unless-stopped

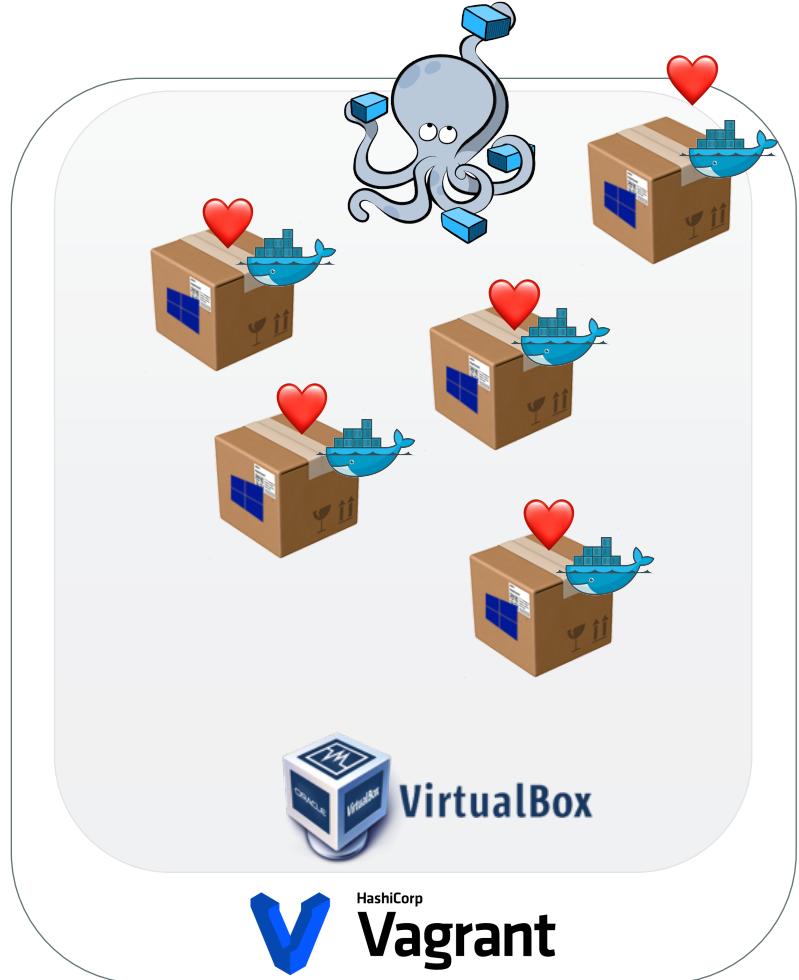
networks:
  default:
    external:
      name: "nat"
```

Dockerfile-SpringBoot-App.j2

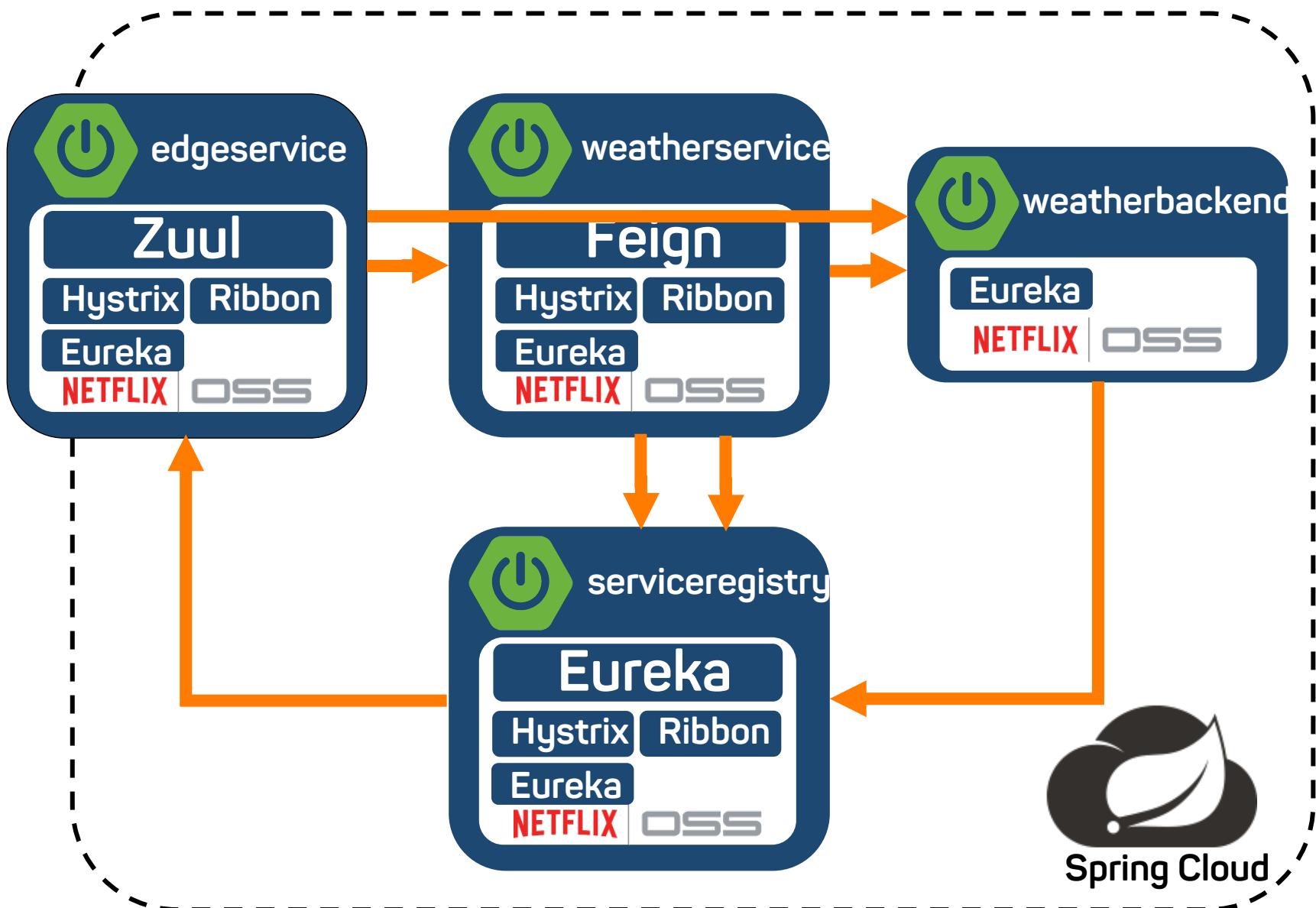


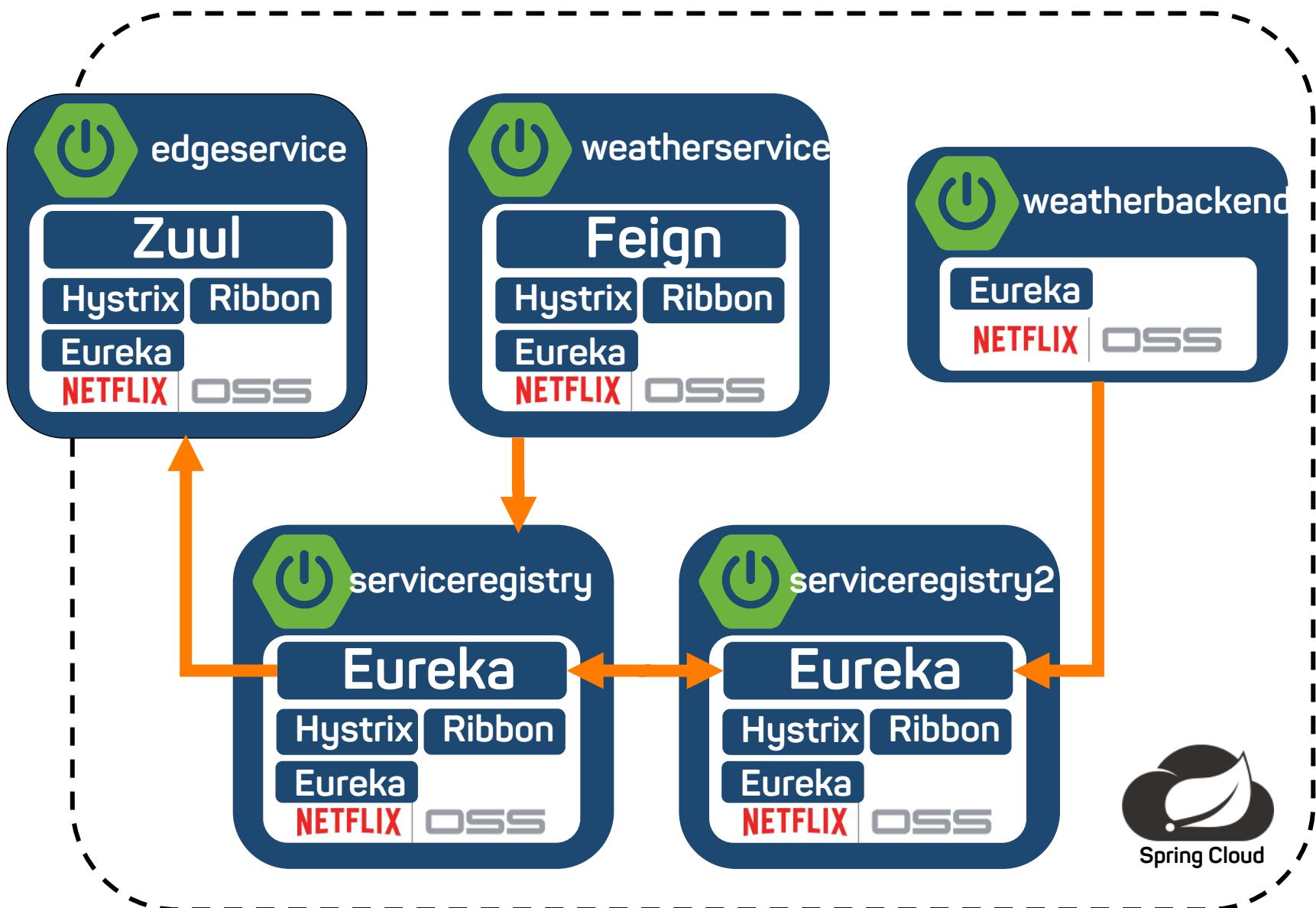


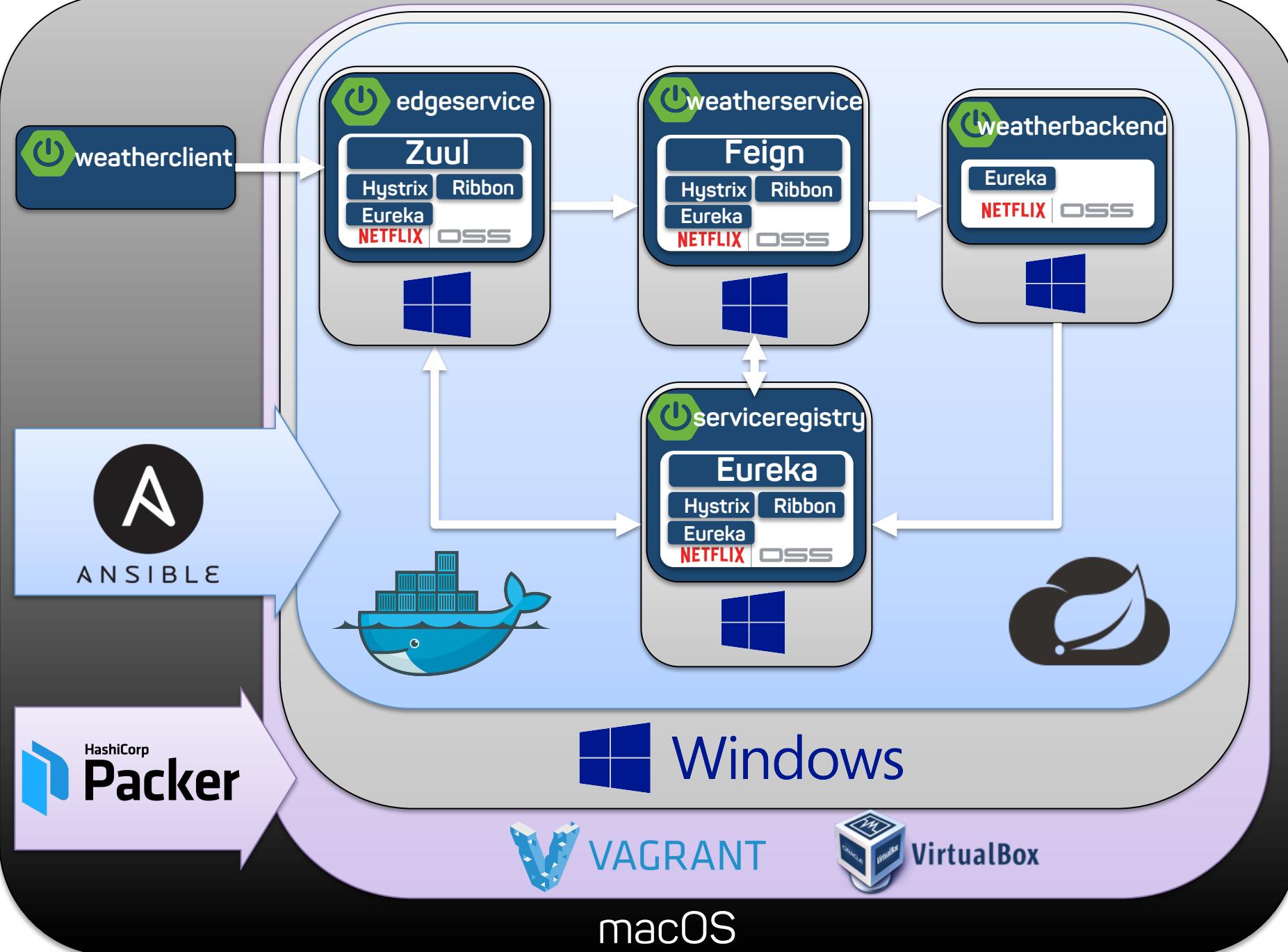
Demo!



[github.com/jonashackt/ansible-windows-talk#5-scale-spring-boot-apps](https://github.com/jonashackt/ansible-windows-talk#5-scale-spring-boot-apps)









Demo!

[github.com/jonashackt/ansible-windows-talk#run-final-weatherclient-test](https://github.com/jonashackt/ansible-windows-talk#run-final-weatherclient-test)

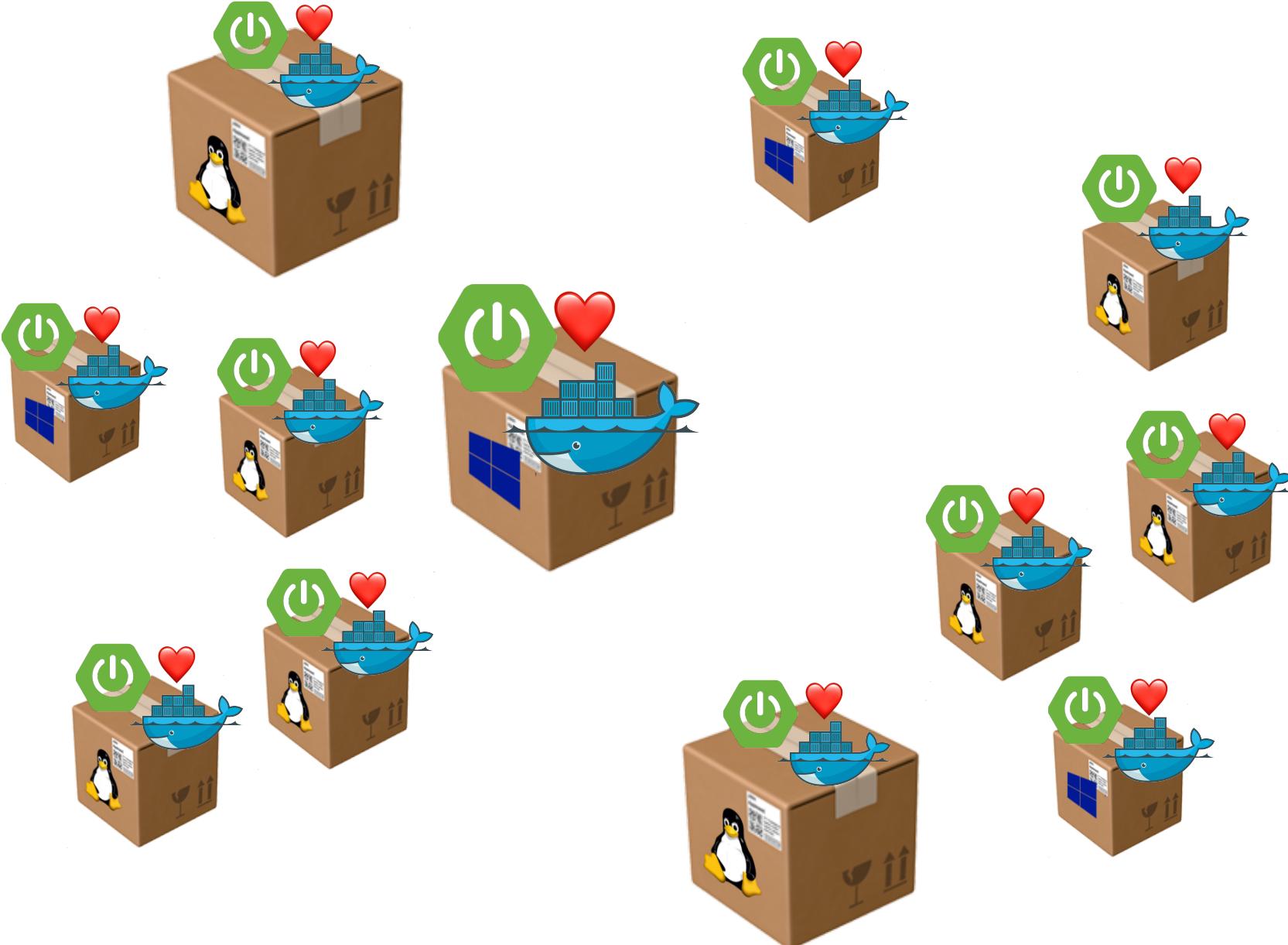
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## 6. Cloud-Scaling?

# One more thing...

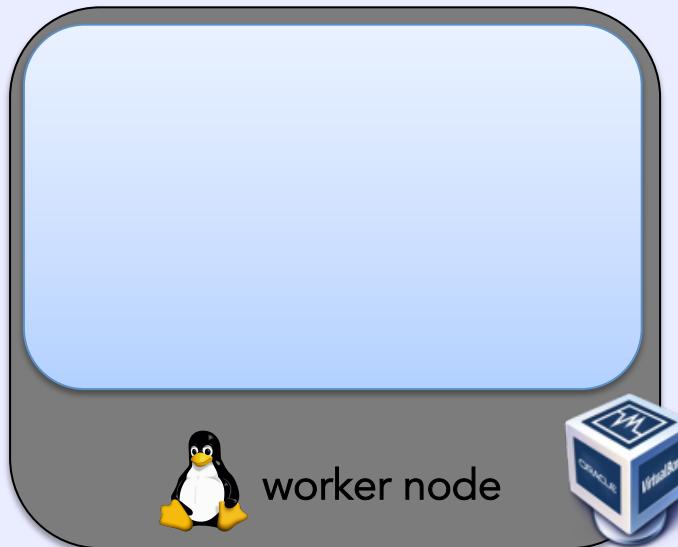
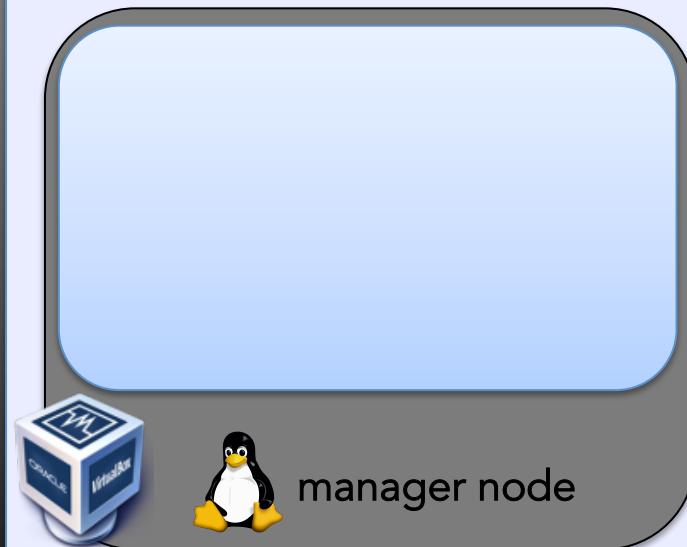
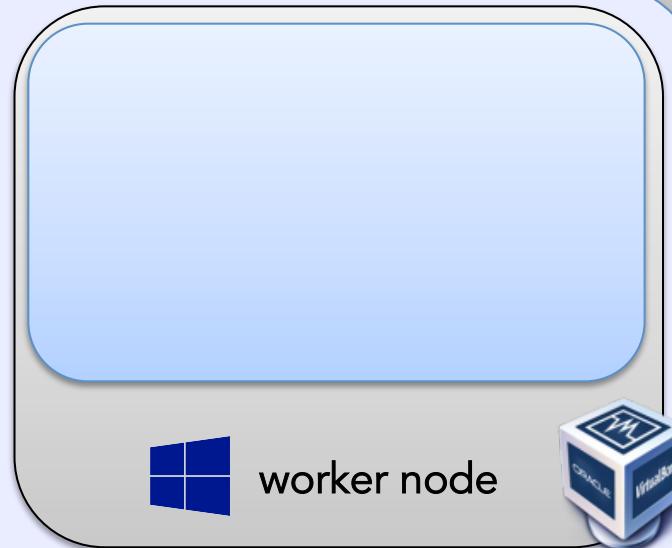
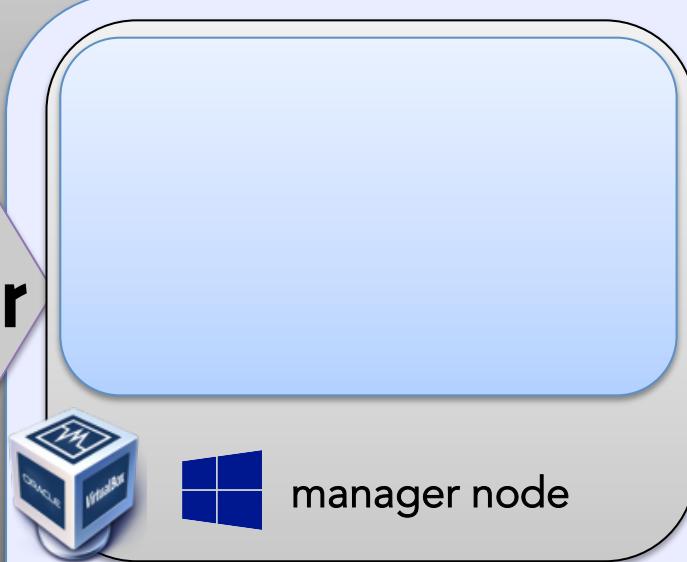




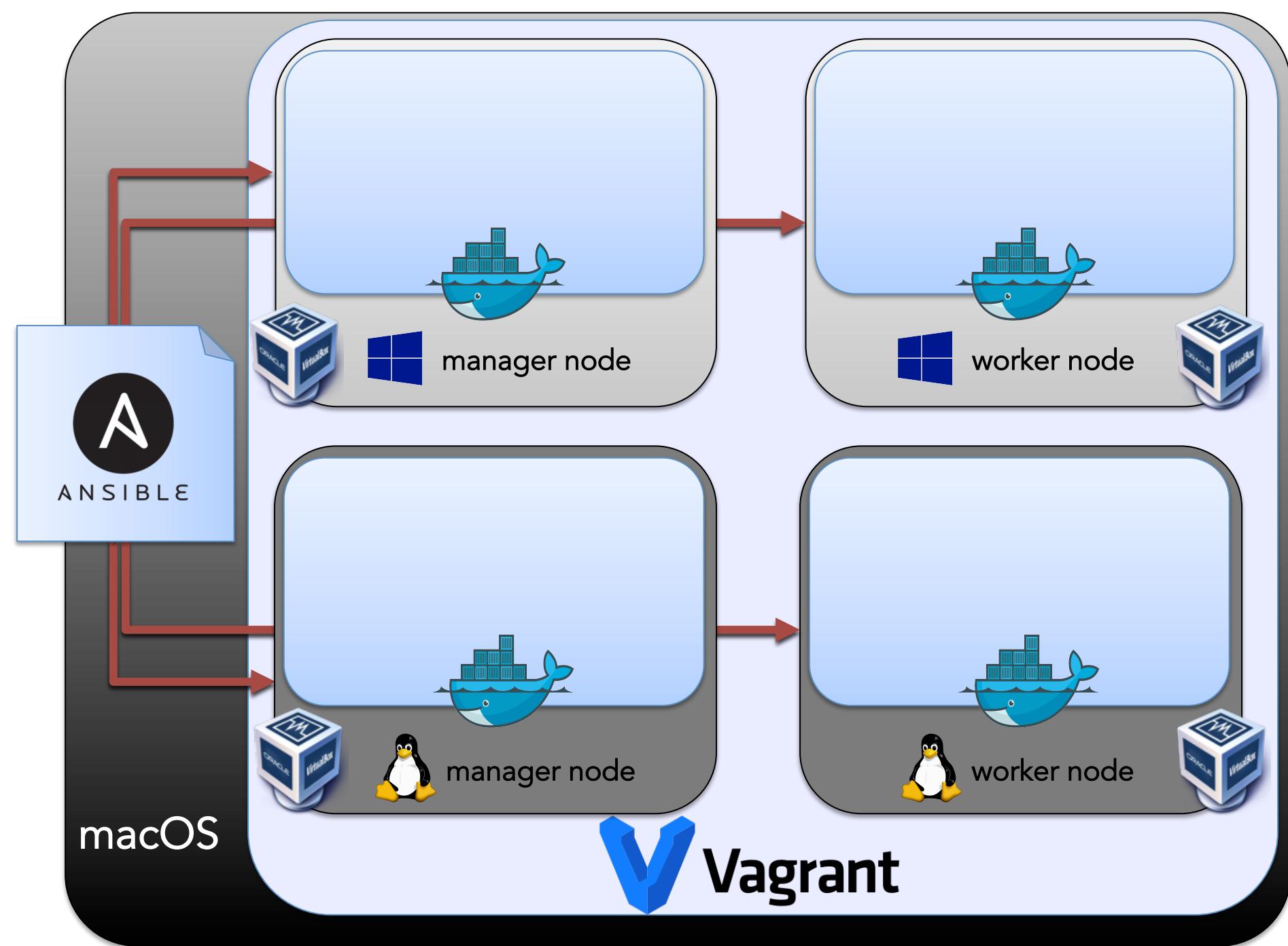
[www.google.de](http://www.google.de)

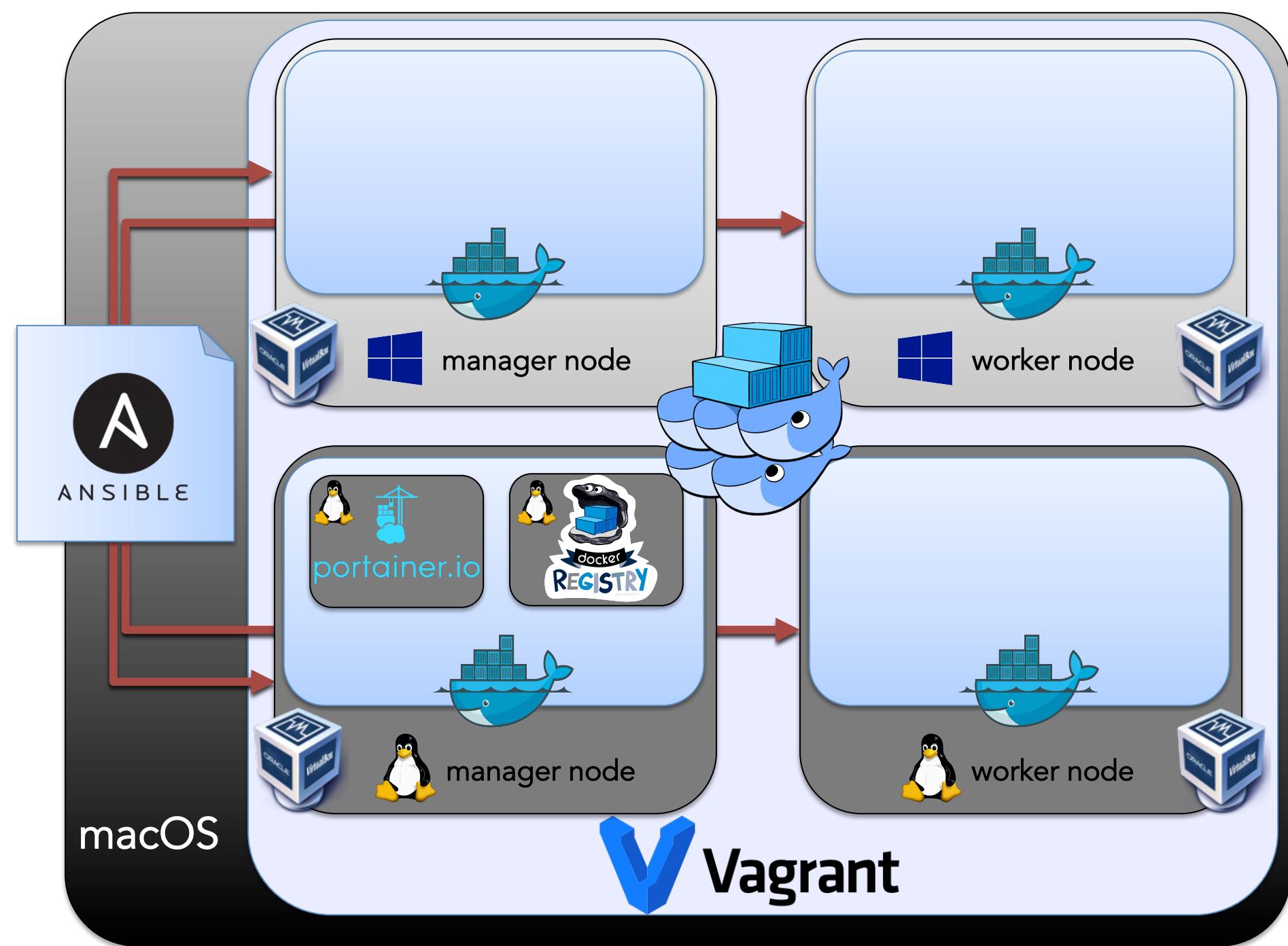


macOS



Vagrant

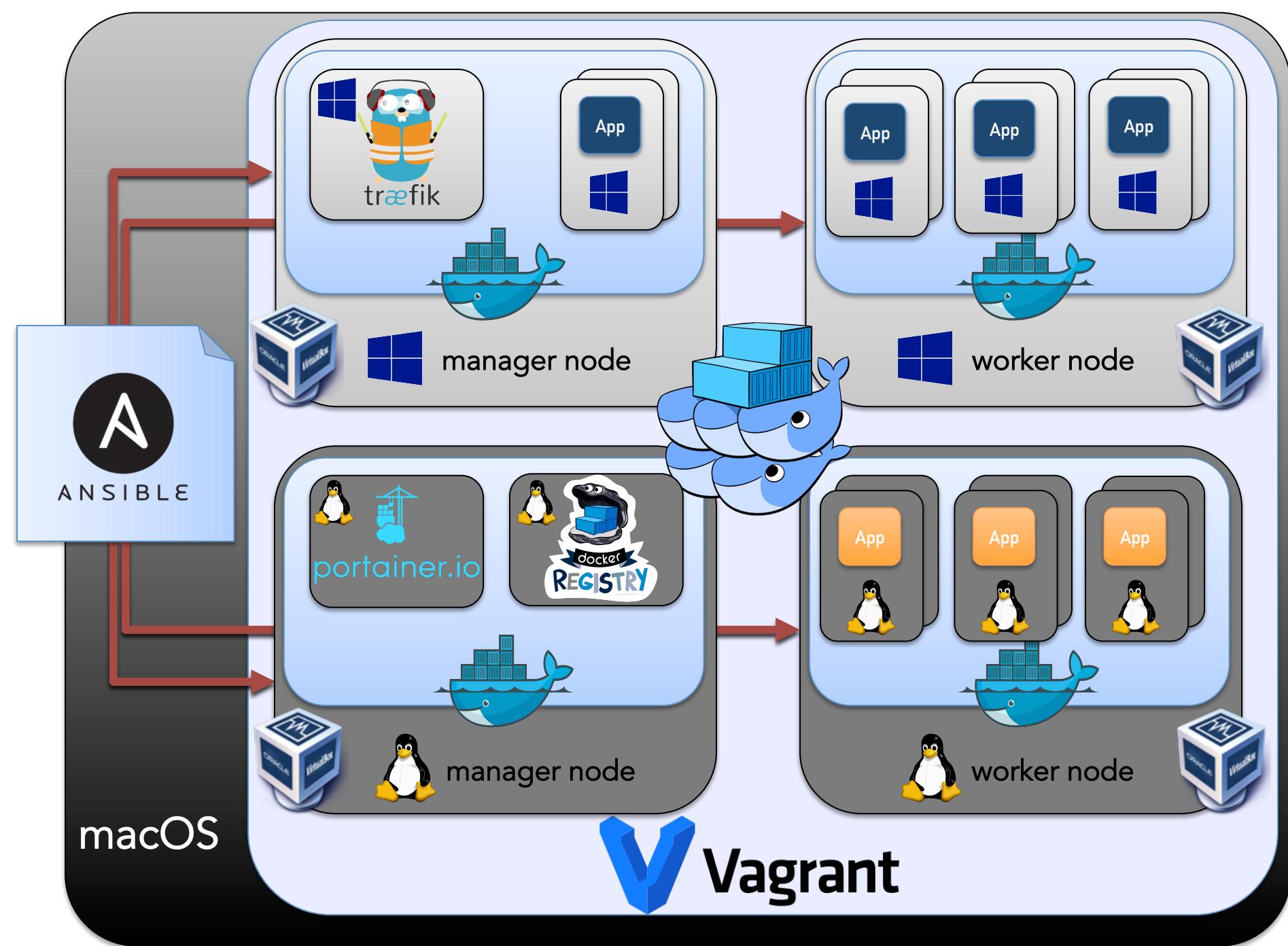






Demo!

<https://github.com/jonashackt/ansible-windows-talk#x-one-more-thing>





Demo!

<https://github.com/jonashackt/ansible-windows-talk#x-one-more-thing>

# Thank you!



Sources of logos & graphics used:

emojies: <https://emojipedia.org/>

Docker Swarm <https://blog.docker.com/2014/12/announcing-docker-machine-swarm-and-compose-for-orchestrating-distributed-apps/>

Docker Compose <http://www.willhoeft-it.com/2016/06/03/docker-compose.html>

Windows <https://upload.wikimedia.org/wikipedia/commons/c/c9/Windows-server-2016.png>

Docker <https://www.docker.com/>

Ansible <https://www.ansible.com/>

Packer <https://www.packer.io/>

Vagrant <https://www.vagrantup.com/>

VirtualBox <https://www.virtualbox.org/>

Spring Cloud <https://github.com/spring-cloud>

Spring Boot <https://projects.spring.io/spring-boot/>

Netflix OSS <https://netflix.github.io/>

Kubernetes <https://www.devopsnexus.com/consultancy-areas/containerization>

Powershell <https://bloq.appliedis.com/tag/powershell/>

Difference Docker VMs <https://stackoverflow.com/questions/16047306/how-is-docker-different-from-a-normal-virtual-machine>

GitHub <https://github.com/logos>

One-more-thing <https://www.mactechnews.de/gallery/picture/WWDC-Keynote-one-more-thing--76710.html>

Portainer <https://github.com/portainer/portainer>

Traefik <https://traefik.io/>