



# 3,2,1...CODE IN CONTAINER

with **Lino Telera** (@linotelera)

# About me...

- Lino «Jan» Telera
- Blogger (<http://blog.linoproject.net>)
- Ex developer SOA and Frontend
- System administrator, cloud architect, CNA coach at LineaCom
- VCP4-5-6 VCP-Cloud VCP-DT vExpert 2015,2016,2017
- VMworld 2016 official blogger
- VMUG.it Leader board member
- TechFieldDay delegate since 2016
- DevOPS enthusiast and VMware «code» member

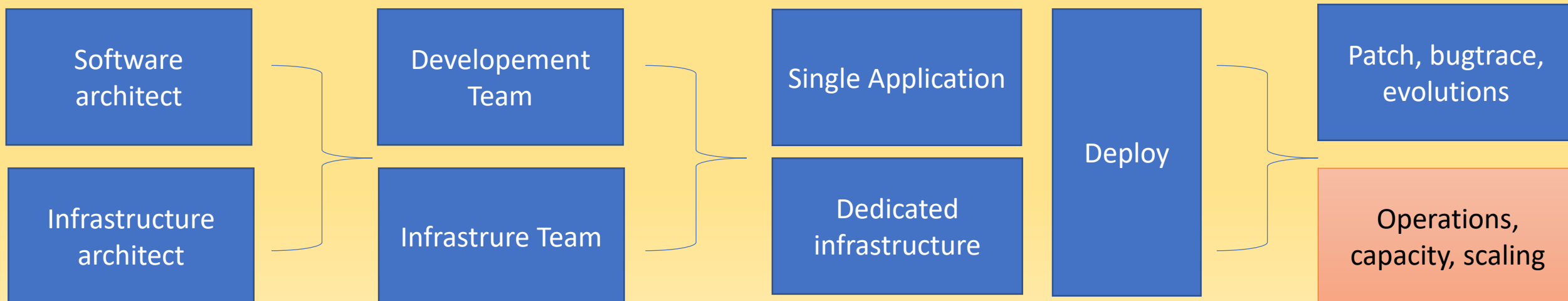
# Agenda

- Cloud Native Application and DevOps concepts
- WTH is a Container
- Container Architecture
- Write a Code in Container
- Deploy a container in-premise and off-premise
- DEMO and questions
- Eat, drink, funs

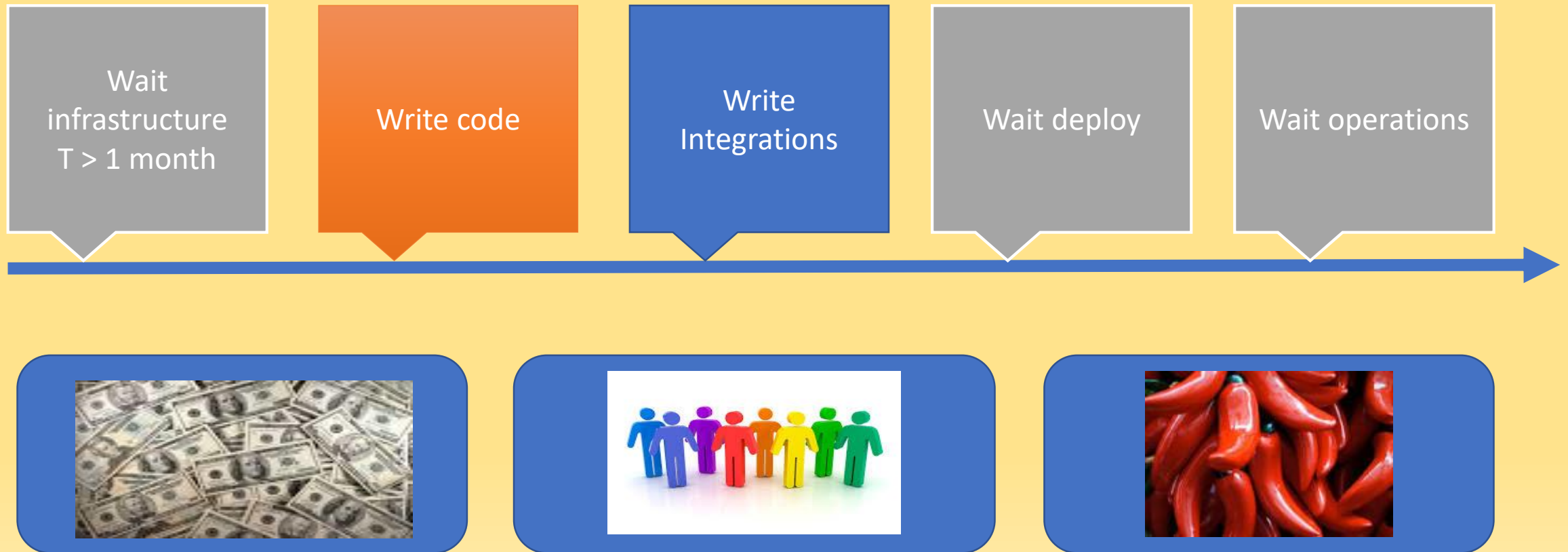
# Traditional VS Cloud Native Application

Old application issues (SOA, Tier-1, 3-Tier,...)

- Big team work
- Orchestrating well! or big failure comes!
- Single purpose or customer driven
- Operations and Scaling nightmare
- DR/DB???



# Deploy Timeline (if all goes well)



# Development workcycle



Sysadmin is an  
Hostage...



# Cloud Native Application

Data routing and governance

DNS

Certificate

Orchestrator

Cloud connector

Proxy connector

StateLess

Microservices

Cloud services

Container

business

Temp data

StateFull

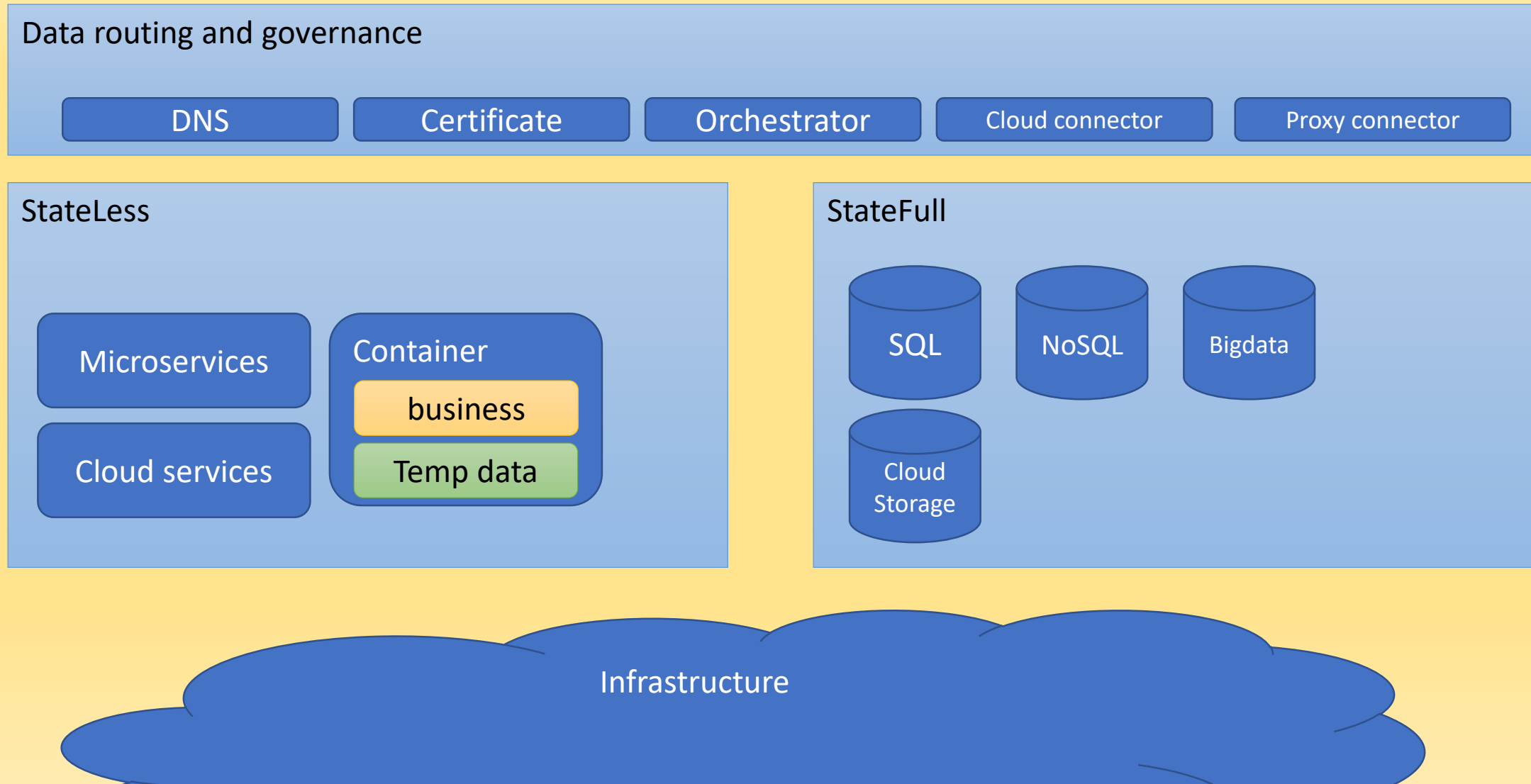
SQL

NoSQL

Bigdata

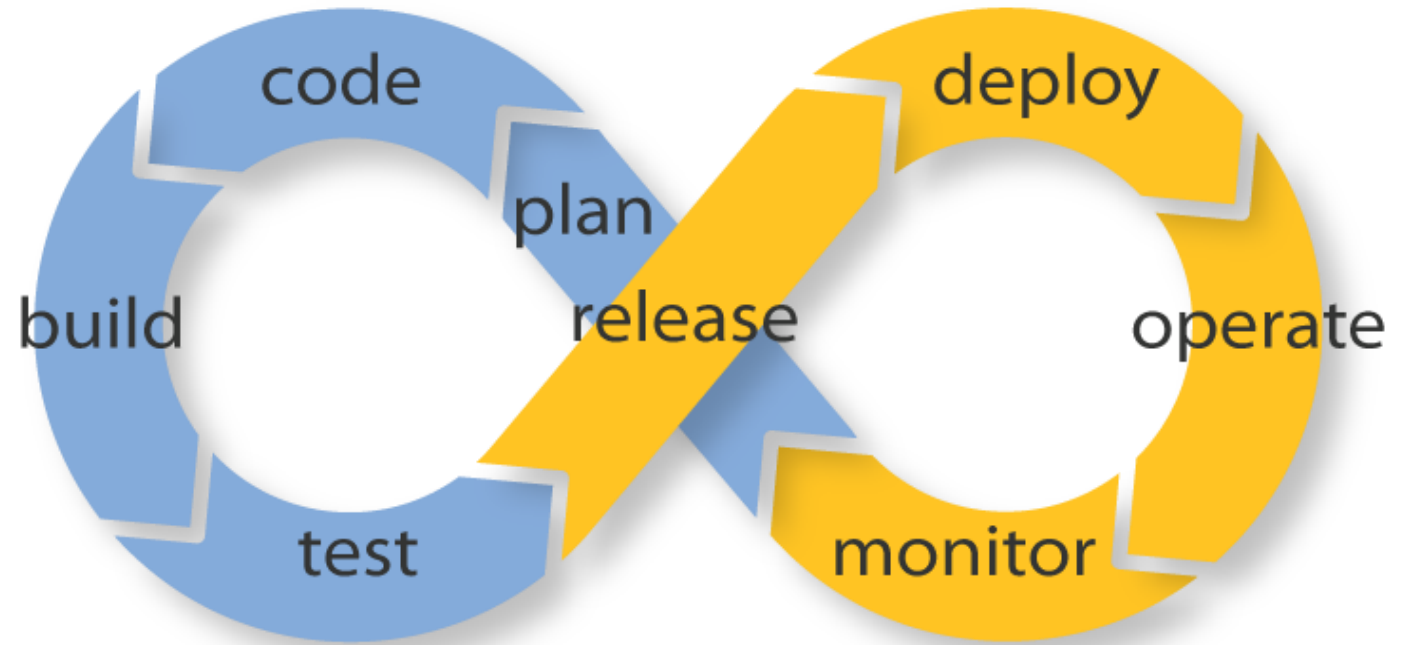
Cloud  
Storage

Infrastructure





# DevOps Workcycle



Endless Possibilities: DevOps can create an infinite loop of release and feedback for all your code and deployment targets.

# What is a container

- Isolated instances that include
  - Library
  - Tools
  - Business logic
- Most fashion: Docker
- More and more vendors are «in container» (and sometimes you don't know!)
  - Software as a service
  - Platform as a service
  - Infrastructure as a service
  - Monitoring, backup and orchestrators
  - Storage and computing systems (HCI)
  - Software defined Network

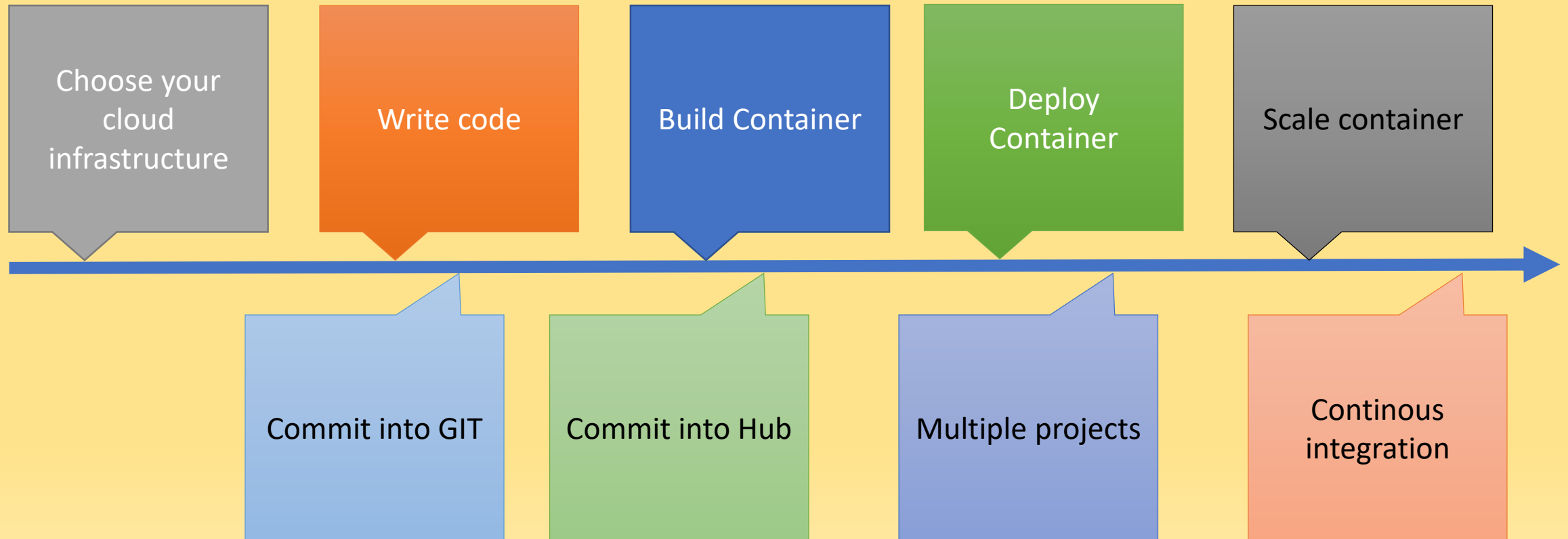
# What is not a container

- VM 2.0
- Framework or Library
- An operative system
- Persistent isolated instances
- New hosting systems

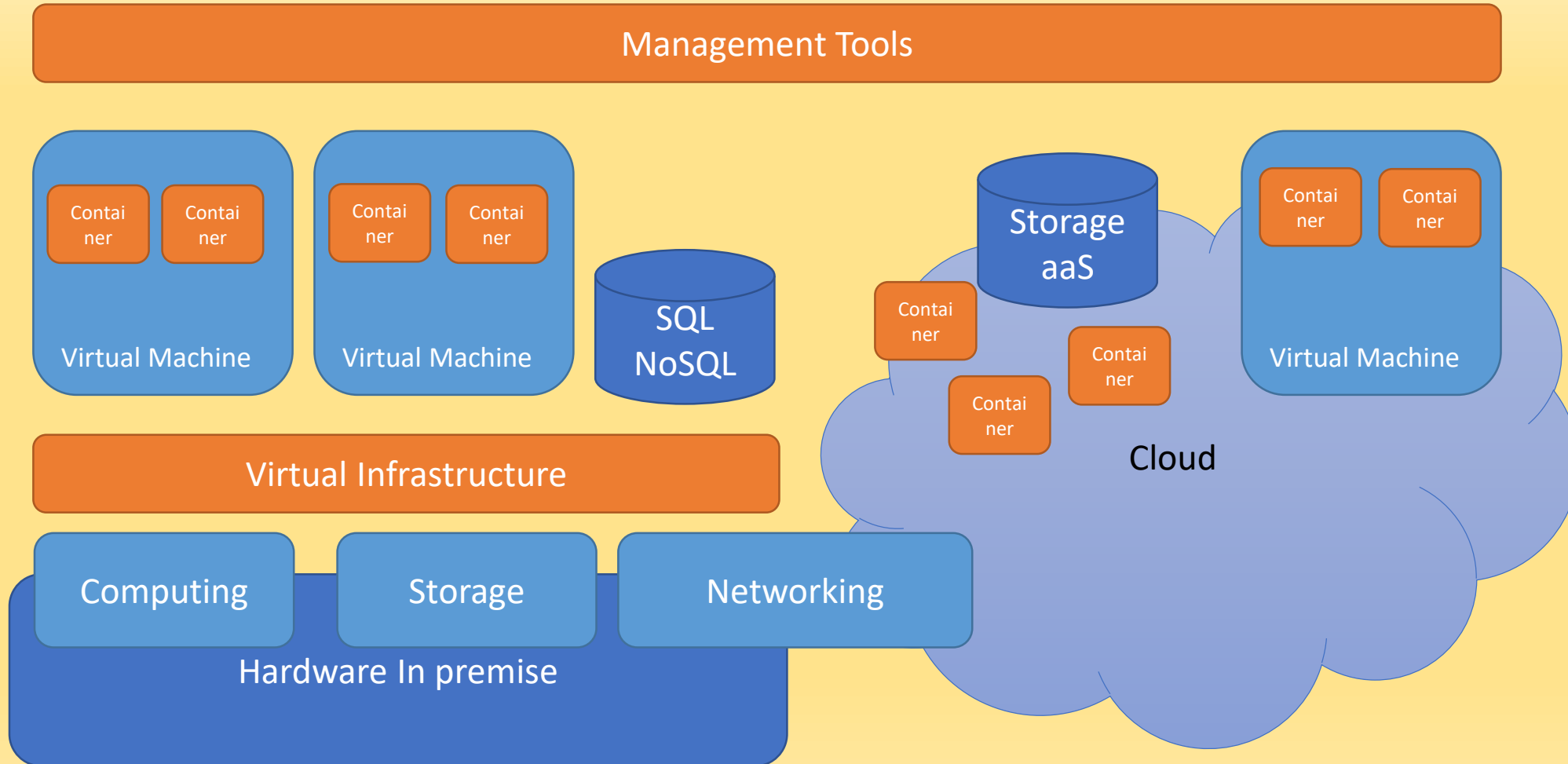
# The container paradigm

- Write your code
- Encapsulate in a «box»
- Deploy without Sysadmin
- Scale start/stop/increase and reduce (app scaling)
- Integrate, patch and deliver (Continuous integration)

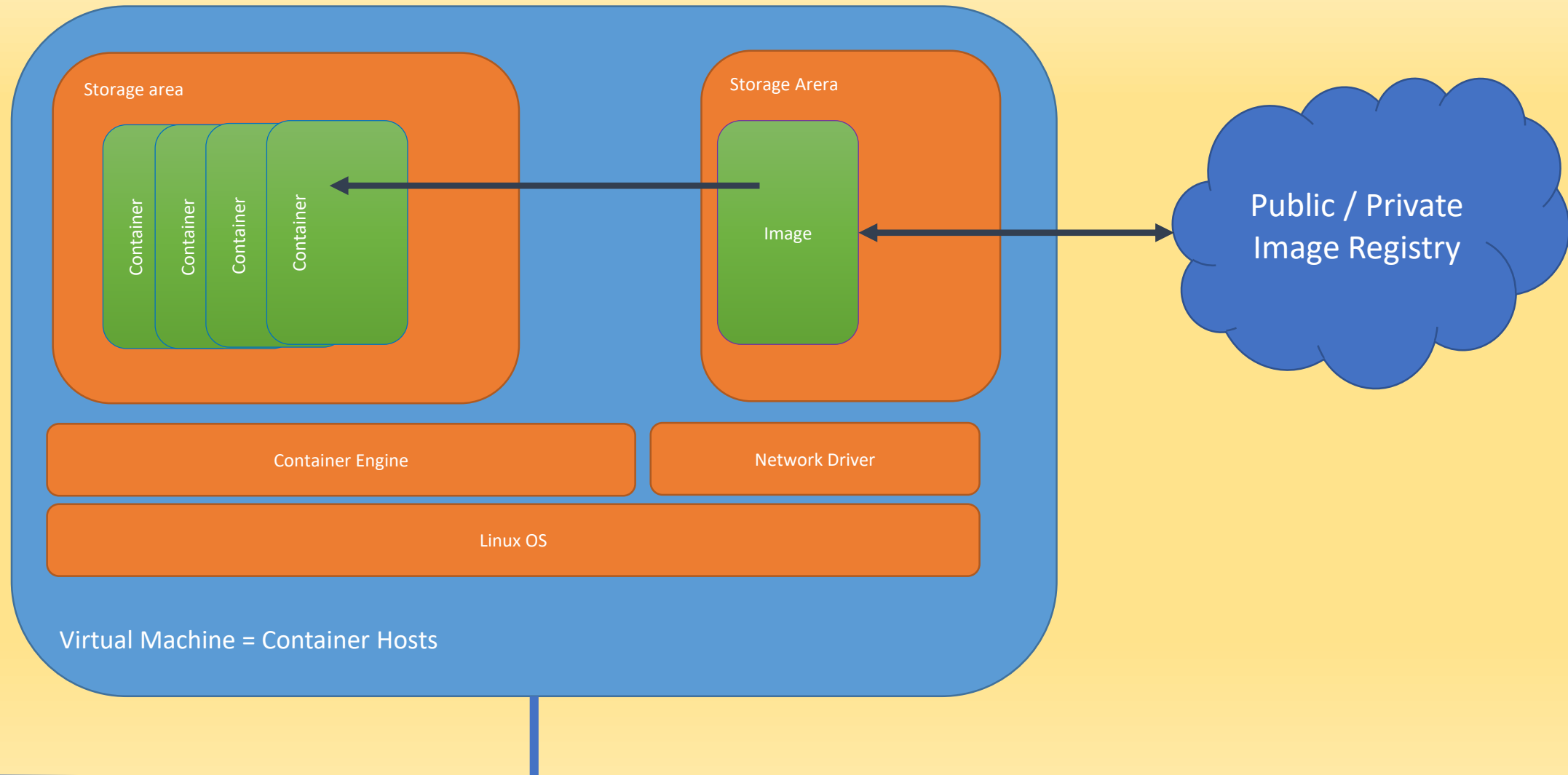
# Deploy Timeline



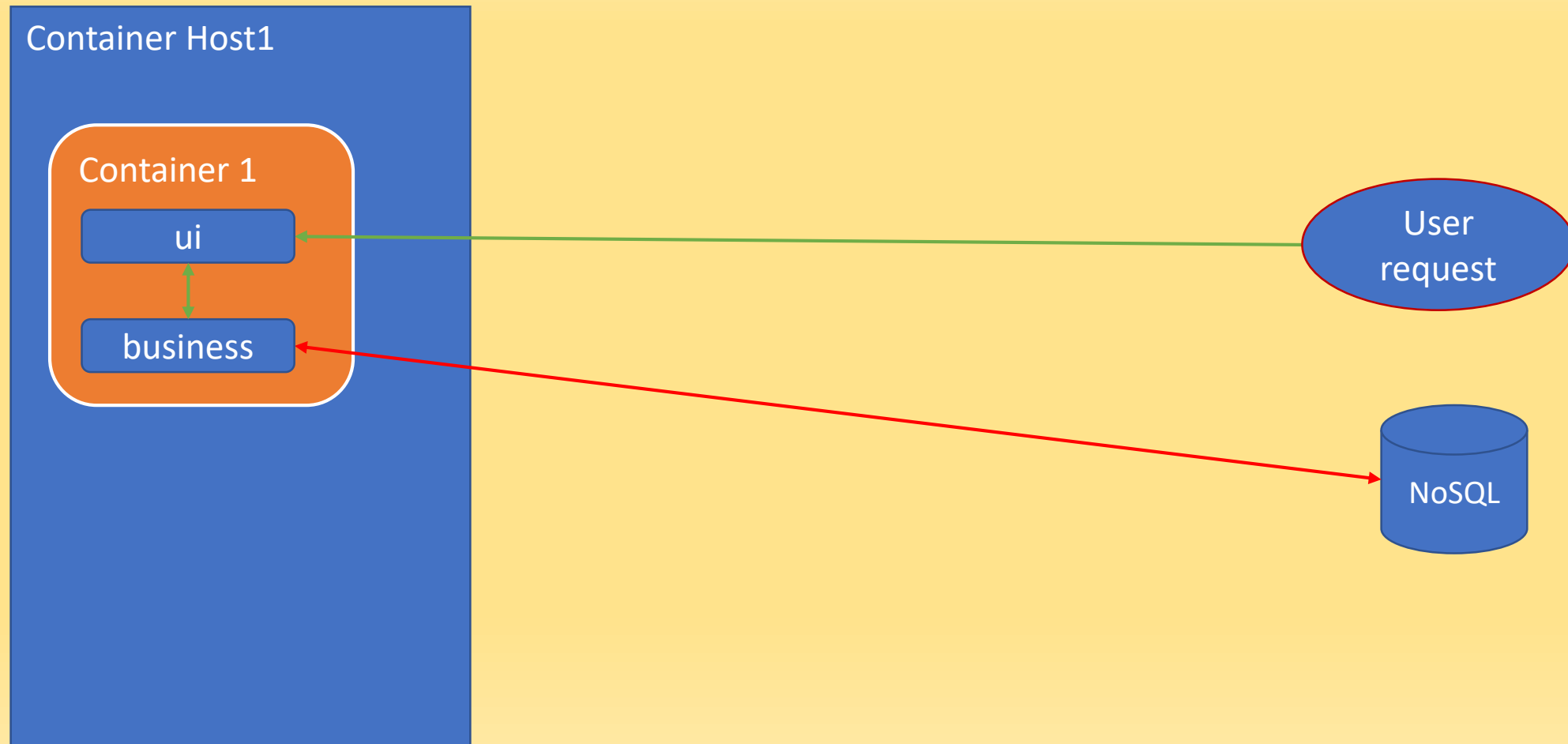
# Stack IT



# Inside a container host

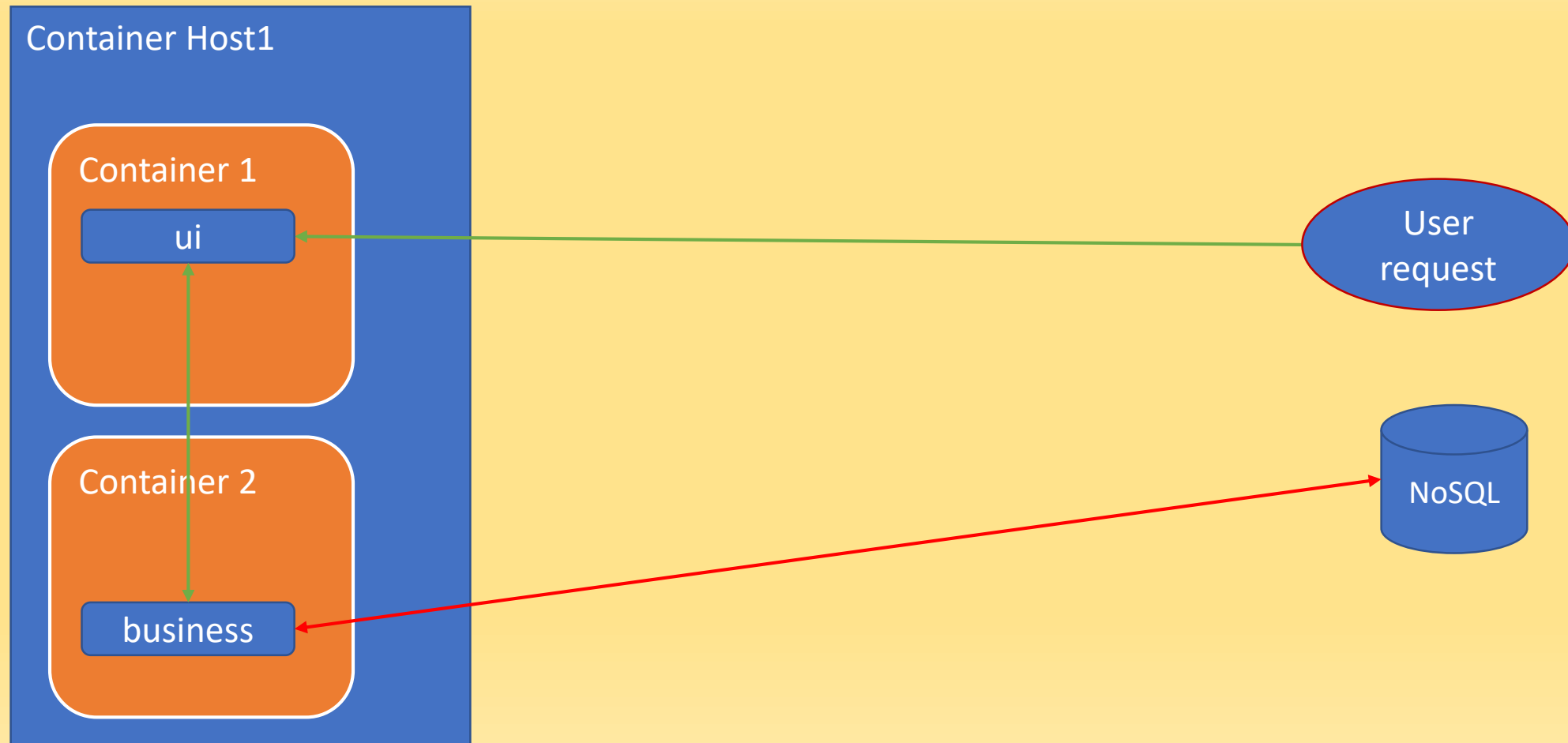


# Application in container Step1

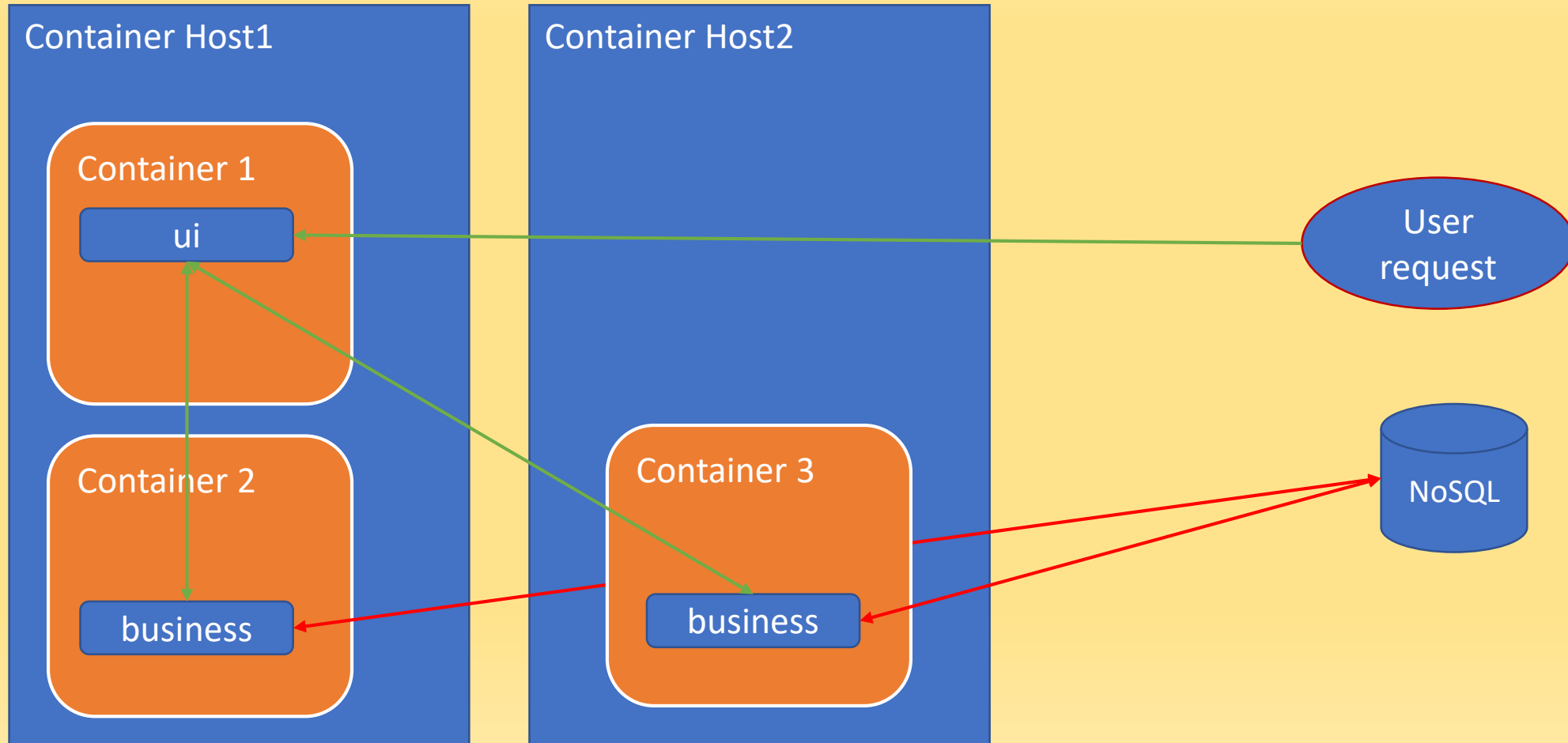




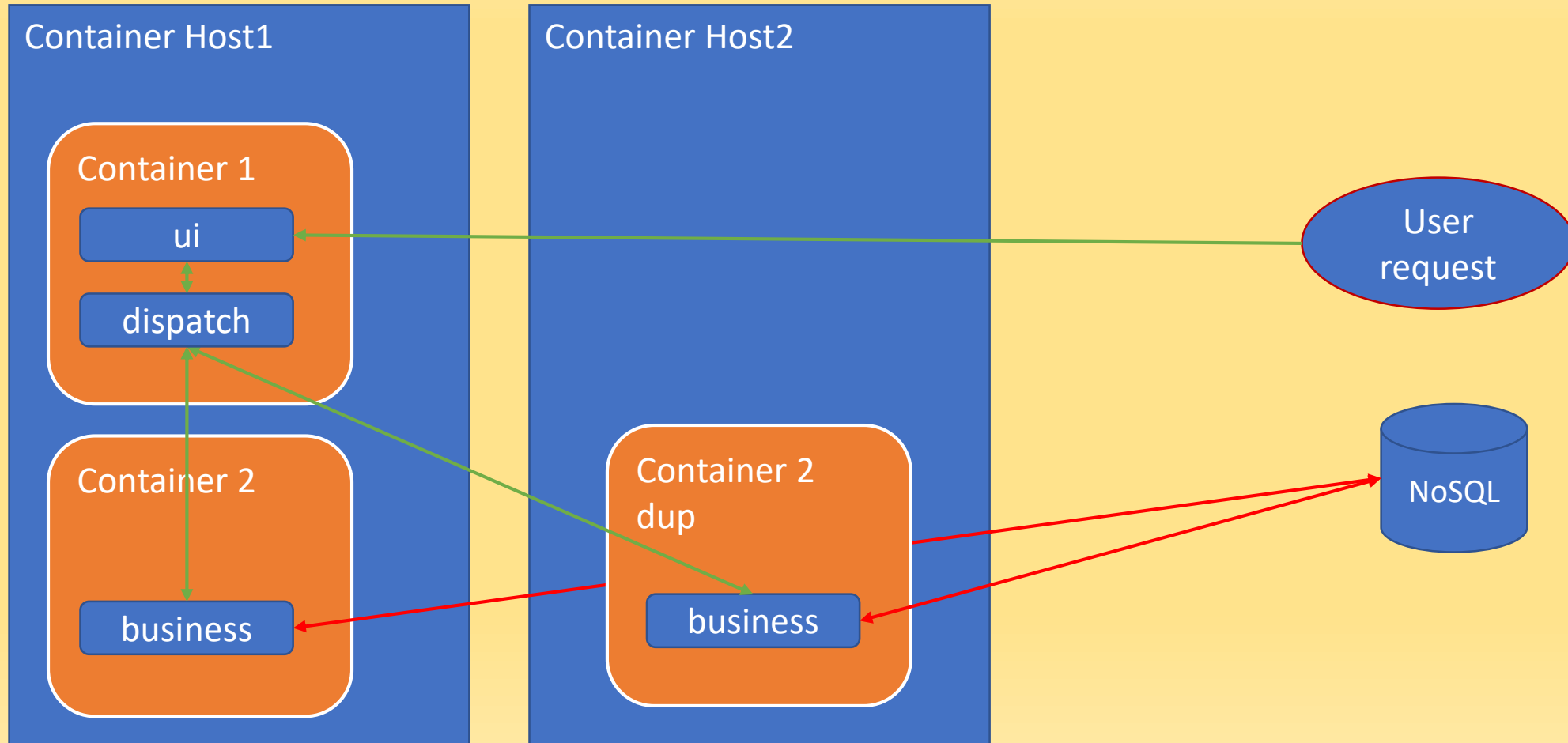
# Application in container Step2



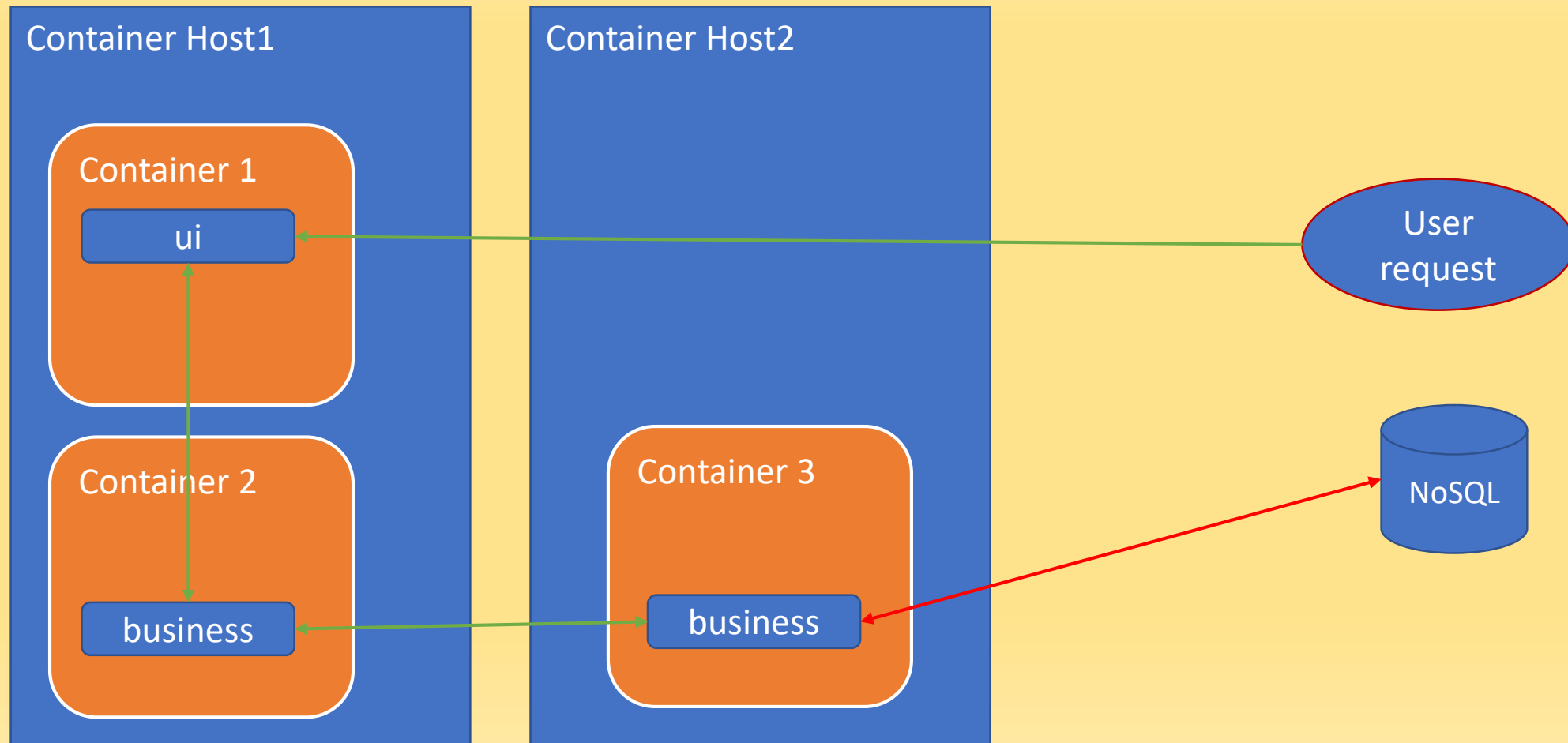
# Application in container Step3a



# Application in container Step3b



# Application in container Step4

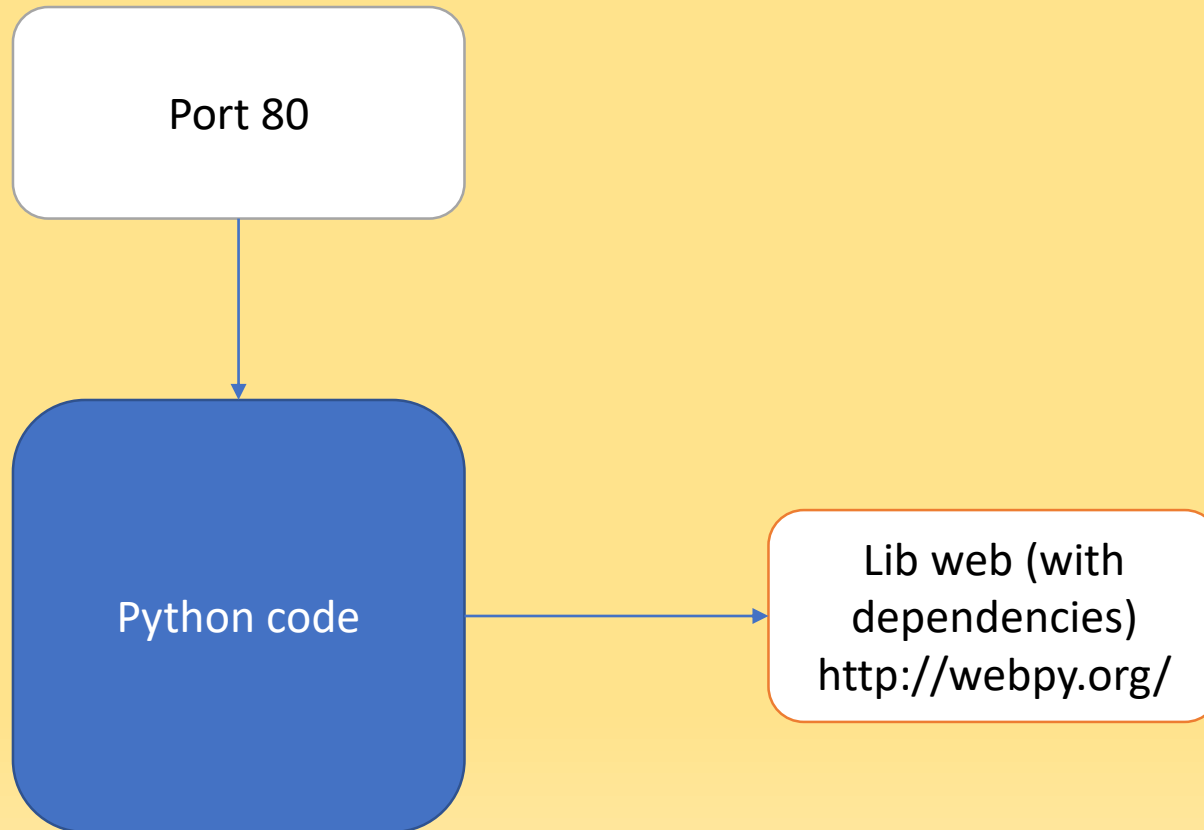


# Your datacenter in a box with Docker

- Like an homelab WAF (Wife Acceptance Factor)
  - Location
  - Size
  - Noise
  - Power and Cooling
  - Cost
- Your PC/MAC! (64bit, VT, 8GB RAM)
- «Single» package installation from <https://www.docker.com/products/docker-toolbox>
- Build your own with Vmware/Photon/Docker-machine...
- Use your Development Tool
- Amazon EC2???



# Just an example: Architecture



# Just an example – The code

```
#!/usr/bin/env python
import web

urls = (
    '/say_hello', 'say_hello'
)

app = web.application(urls, globals())

class say_hello:
    def GET(self):
        return "hello from container"

if __name__ == "__main__":
    app.run()
```

# Just an example – Dockerfile 1

```
FROM ubuntu:trusty
MAINTAINER Lino Telera Linoproject.net <linotelera@gmail.com>

# Install base packages
RUN apt-get update && \
DEBIAN_FRONTEND=noninteractive apt-get -yq install \
    python \
    python-pip python-dev build-essential \
    openssh-server \
    libffi-dev libssl-dev \
    git
```



# Just an example – Dockerfile 2

```
RUN pip install --upgrade pip
```

```
RUN pip install --upgrade virtualenv
```

```
RUN pip install requests[security]
```

```
RUN pip install pyopenssl ndg-httpsclient pyasn1
```

```
WORKDIR /opt/services/
```

```
RUN easy_install web.py
```

# Just an example – Dockerfile 1






```
EXPOSE 80
```

```
ADD ws.py /opt/services/ws.py
```

```
CMD ["python", "/opt/services/ws.py", "80"]
```

# Just an example – Build, Publish, Deploy, Run

- Docker build . -t="linoproject/ws1"
  - Docker login
  - Docker push linoproject/ws1:latest
  - Docker push linoproject/ws1:1
  - docker run -d -p 80:80 \
- name ws1 linoproject/ws1

	<a href="#">linoproject/web_apachephp_mysql</a> public	0 STARS	246 PULLS	<a href="#">➤</a> DETAILS
	<a href="#">linoproject/wordpress</a> public	0 STARS	108 PULLS	<a href="#">➤</a> DETAILS
	<a href="#">linoproject/pyvmomi</a> public	0 STARS	46 PULLS	<a href="#">➤</a> DETAILS
	<a href="#">linoproject/ws1</a> public	0 STARS	34 PULLS	<a href="#">➤</a> DETAILS
	<a href="#">linoproject/moodle</a> public	0 STARS	34 PULLS	<a href="#">➤</a> DETAILS



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# Demo... and questions

What will happen?



# Not all application are container «ready»

- UI, business and data separation rule the decision
- Tier-1 are born to be in a same «container»... No chance to be a CNA
- Some old application could be in container (drupal, wordpress,...) when is possible:
  - Separate business and data logic
  - Federate and/or be a web service
- Microsoft applications?
  - Starting with Windows 2016 container could be a Nano-instance with Win64bit code

# Data logic nightmare

- Containers are not persistent!
- Containers could share data but split-brain may occurs!
- Data separation should be handled everywhere
  - Working data
    - Primitive
    - Derivate
  - Configuration data
  - Messages
- Use DB in container in two cases:
  - LAB
  - Single instance
- Container could be a good database proxy connector (eg.: Nifi with Hadoop)

# Who is working on

- Docker! (in premise and datacenter)
- Amazon
  - EC2
  - EC2 Container service (ECS)
- Vmware
  - In premise Photon, VIC
  - vCloudAir or Partner Service Provider (vCloud Director)
- Microsoft
  - Azure
  - Windows Server 2016 «nano server in container»

# VMware and Microsoft announcements

- Windows 2016 comes with native container
  - Docker hub has windows and linux container images
  - Windows Server could deliver both windows (aka native) and linux container (hyper-v)
- VMware (<https://vmware.github.io/>)
  - Photon and Photon controller (opensource!)
  - Admiral and Harbor (management and registry)
  - vSphere Integrated Container
    - Good for sysadmin management
    - Good for Security (NSX and microsegmentation)





- 100.000 Users and 200 local groups
- 1 local group in Italy: vmugit (<http://www.vmug.it>)
- In Italy (since 2016) new devops track!
- Italian Events in 2017
  - Meeting north 5 Apr Padova
  - Meeting south 9 May Rome
  - User Conference 2017 14 Nov Milan
  - Next??? Stay tuned!
- VMUG is your place! Join and share your experience!

# Summary

- Containers...
- Not all applications are ready for docker
- A lot of old applications could be «dockerized»
- DevOPS with Freedom & Control!
- Code, Build, Integrate, Deploy
- Make IT better and don't stress your Sysadmin
- You must try (Docker toolbox, Photon... Windows Server 2016)

# Online resources

- My Blog: <http://blog.linoproject.net>
  - Experience with Bigdata and containers
- Good presentation by Stephen Foskett at Emerging Technology Summit 2016
  - <https://www.youtube.com/watch?v=hT6tROPVdXU>
- Blog <http://www.it20.info/> by Massimo ReFerrè
- Blog <http://cormachogan.com/> by Cormac Hogan
- VMware CNA on github <https://vmware.github.io/>
- Docker <https://www.docker.com/>



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# Questions



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# Thanks... and...

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# Thanks to Brewbox!!!!!!! Cobox, CRIT, Lineacom

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