

# Don't talk to strangers

Test isolation with containers

# Hristo Iliev

SAP

- NetWeaver Application Server Java
- SAP HANA Cloud Platform

Open Source

- Eclipse Virgo
- Cloud Foundry (Diego & Abacus)



# Georgi Sabev

SAP

- SAP HANA Cloud Platform

Open Source

- Cloud Foundry (Diego & Abacus)



A close-up photograph of the side and rear of a silver car, possibly a hatchback, parked on a dark, rocky surface. In the background, a small white boat with a blue stripe is visible on the water under a cloudy sky.

# Pictures

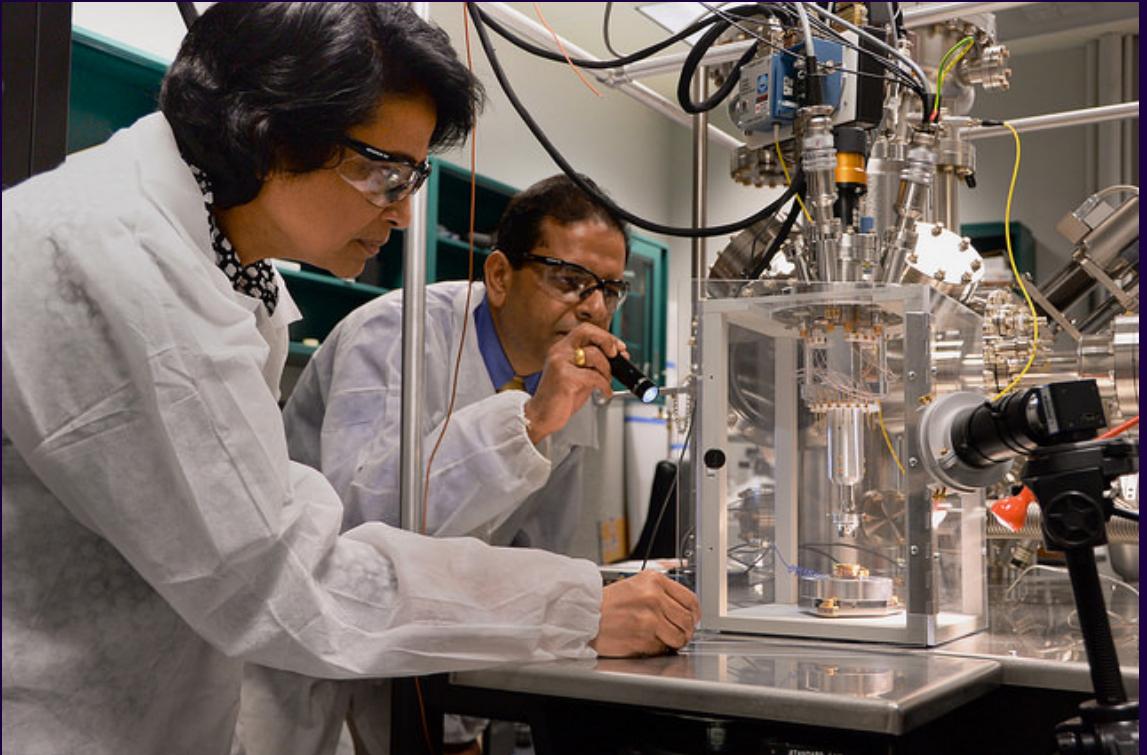
Creative Commons @ Flickr

# Creating Working Software

Tests

Automation

Discipline





# Problems

# Test Pollution

Environment variables

Database records

Files

Programs / libraries



# Resource contention

Processes compete for

- CPU
- Memory
- I/O



# Multiple environments

OS

Mobile / Desktop

Cloud / Standalone

Databases

Versions



# Test problems summary

Test pollution

Resource contention

Multiple environments



# Solutions

## Traditional

- Dedicated hardware
- Virtual machines
- Cloud: AWS, Azure

## New tools

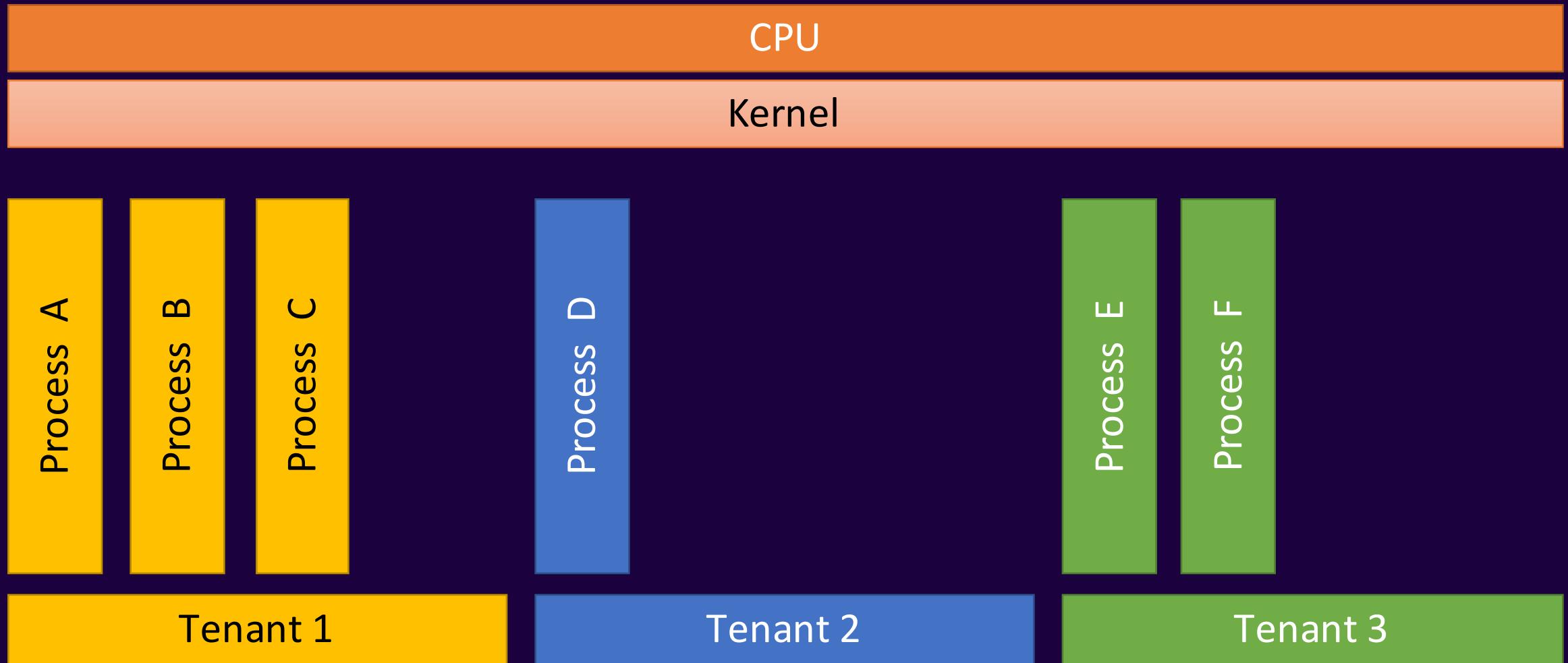




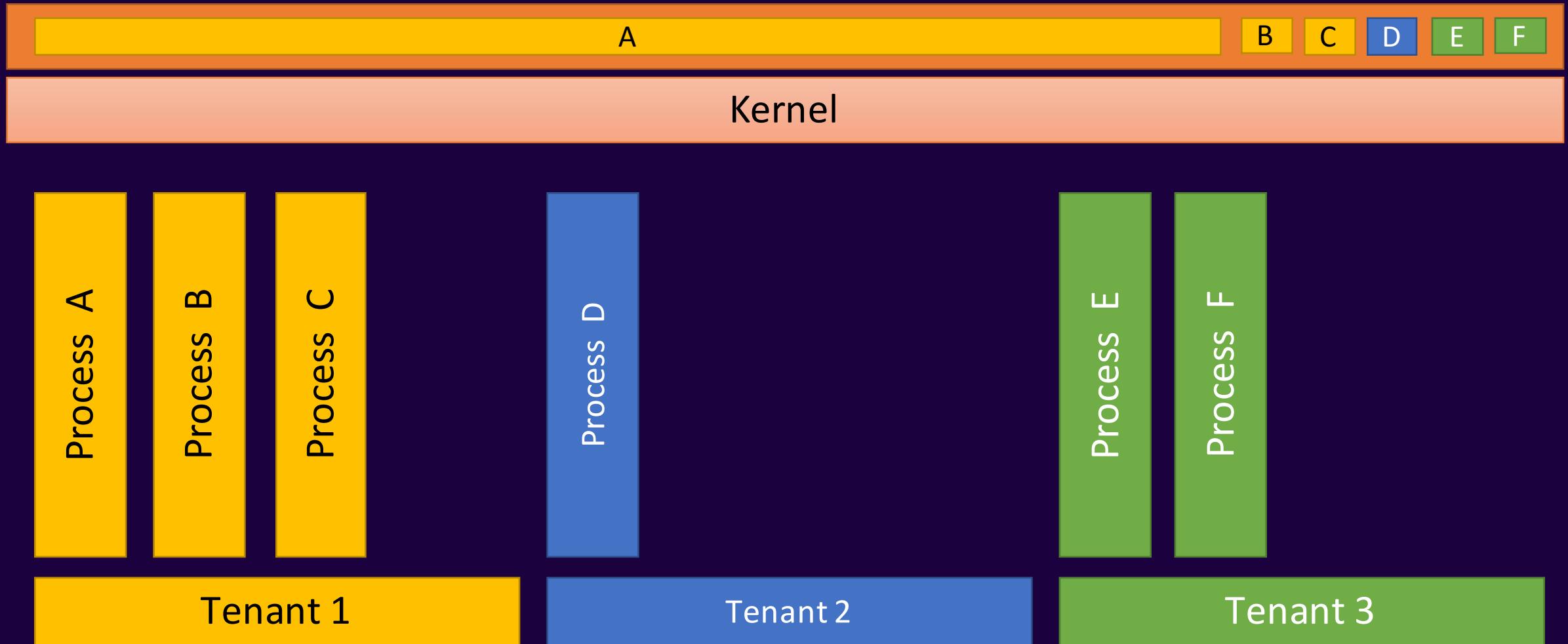
# Containers

build, isolate, ship

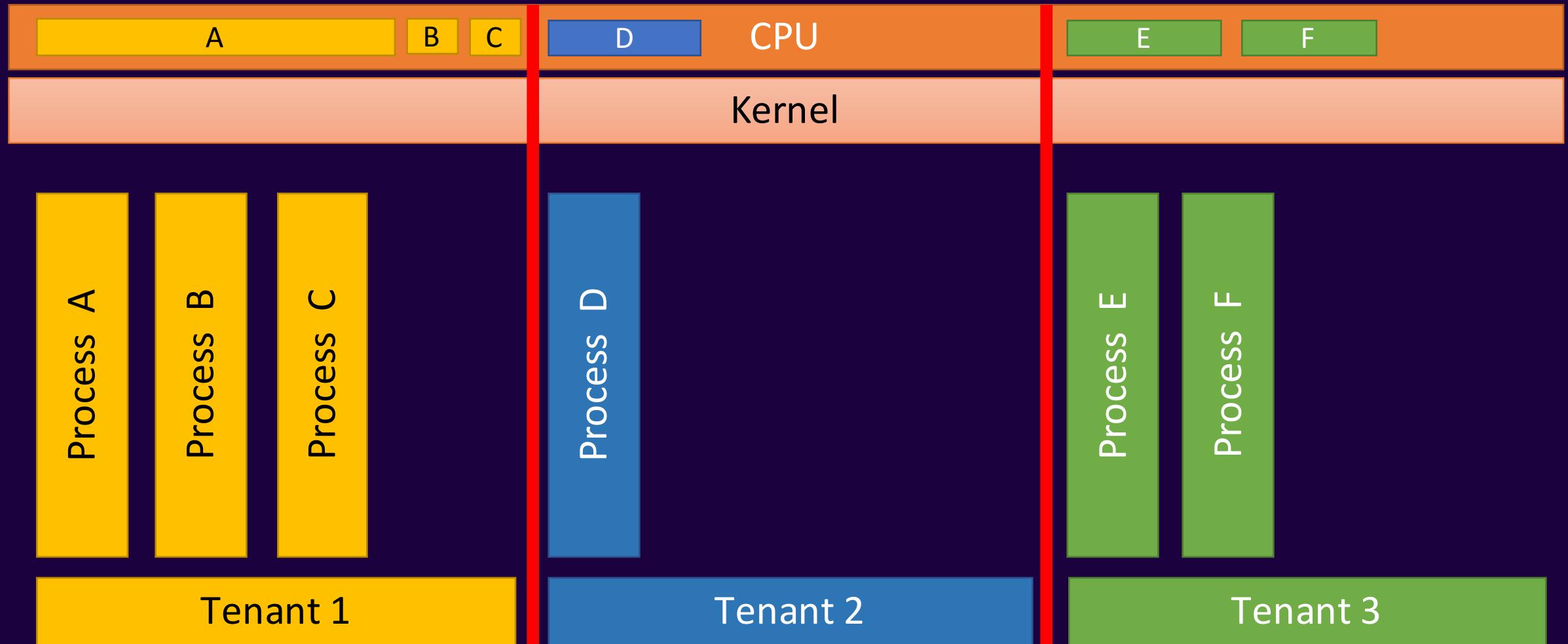
# Container: Resource isolation



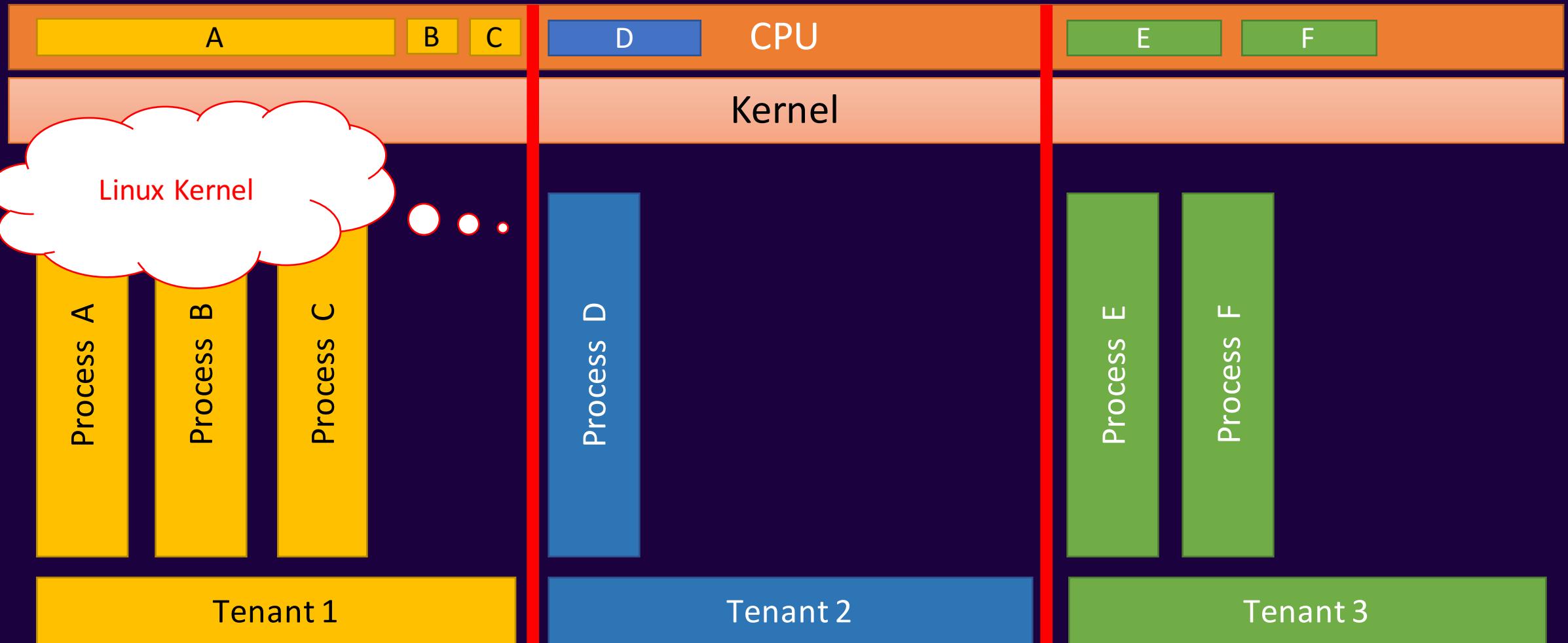
# Container: Resource isolation



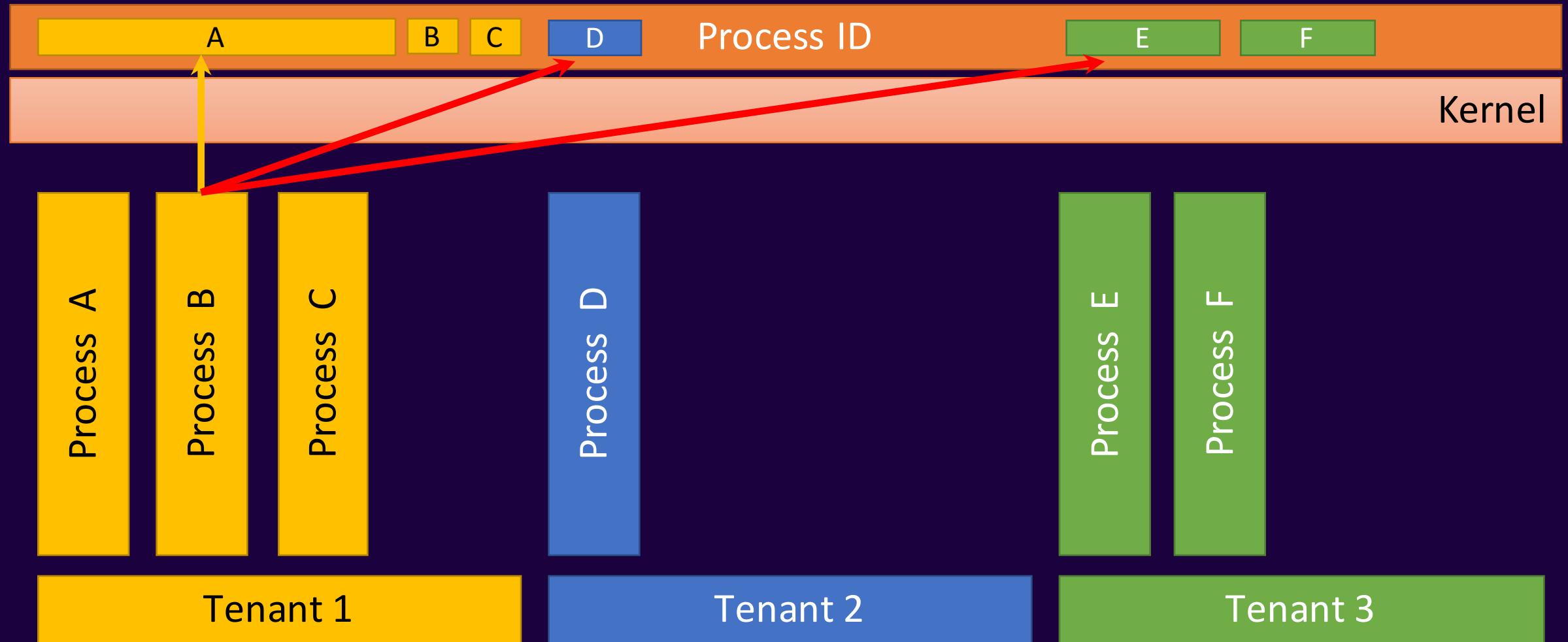
# Container: Resource isolation



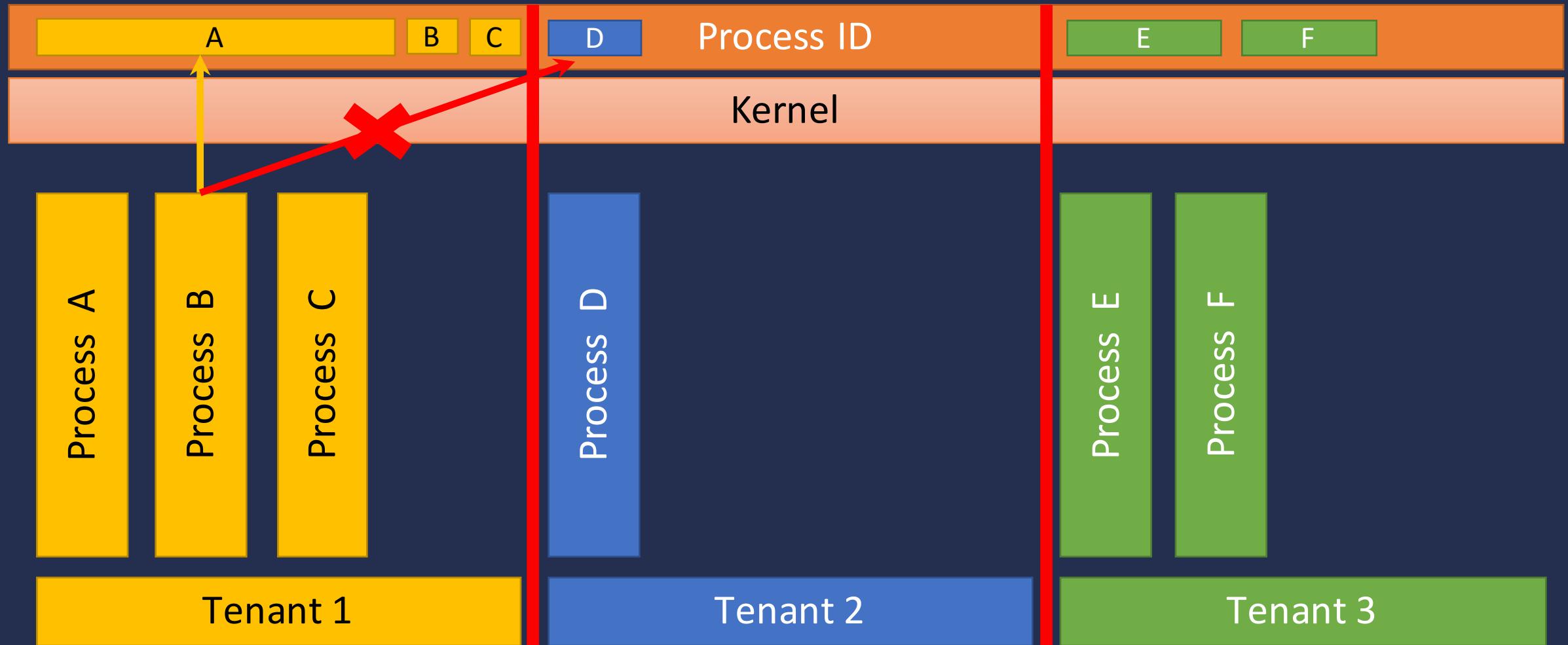
# Container: Resource isolation



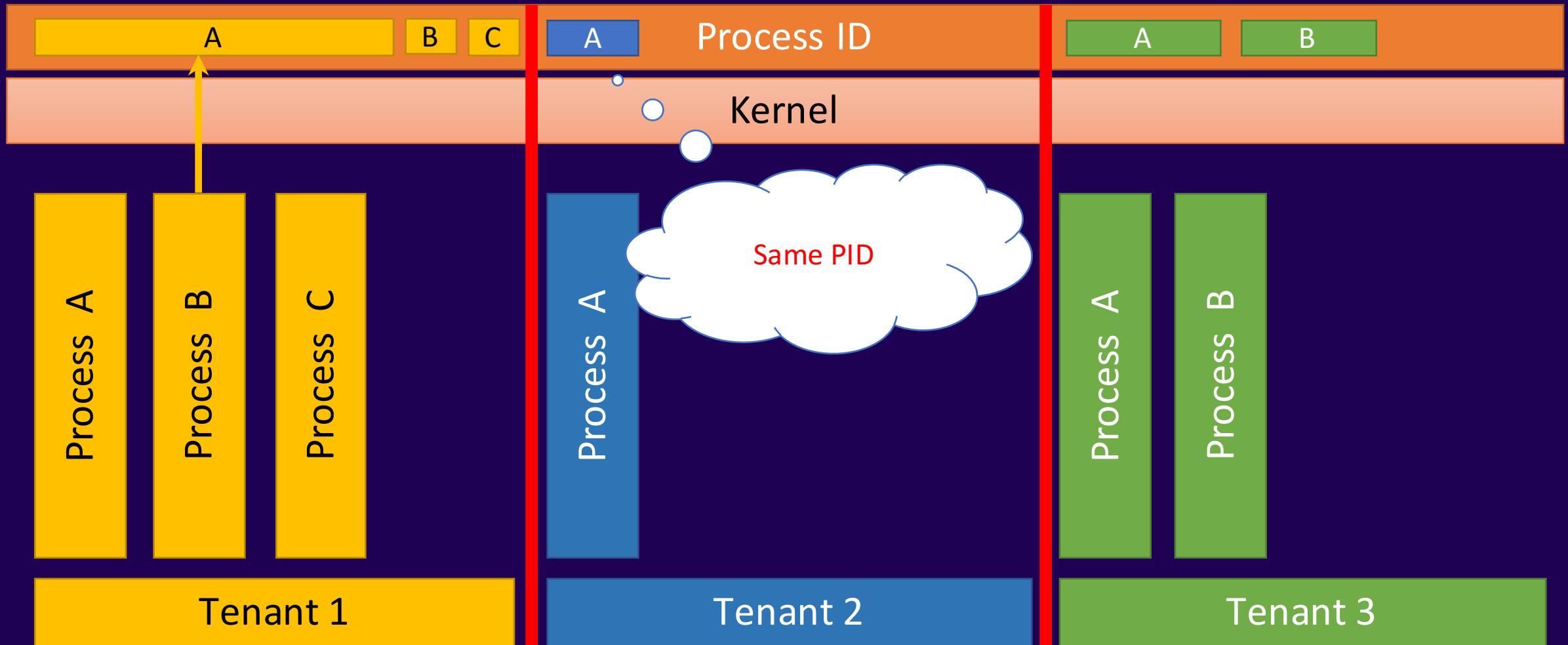
# Container: Namespace isolation



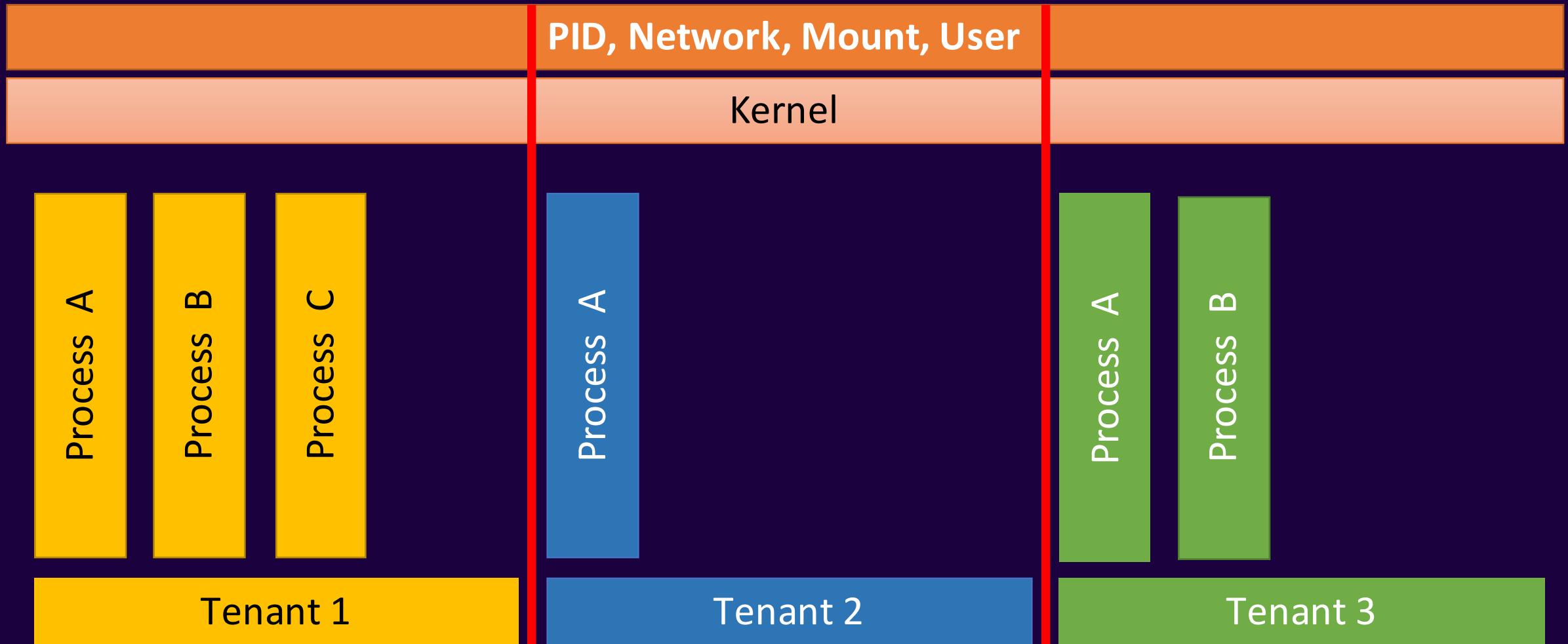
# Container: Namespace isolation



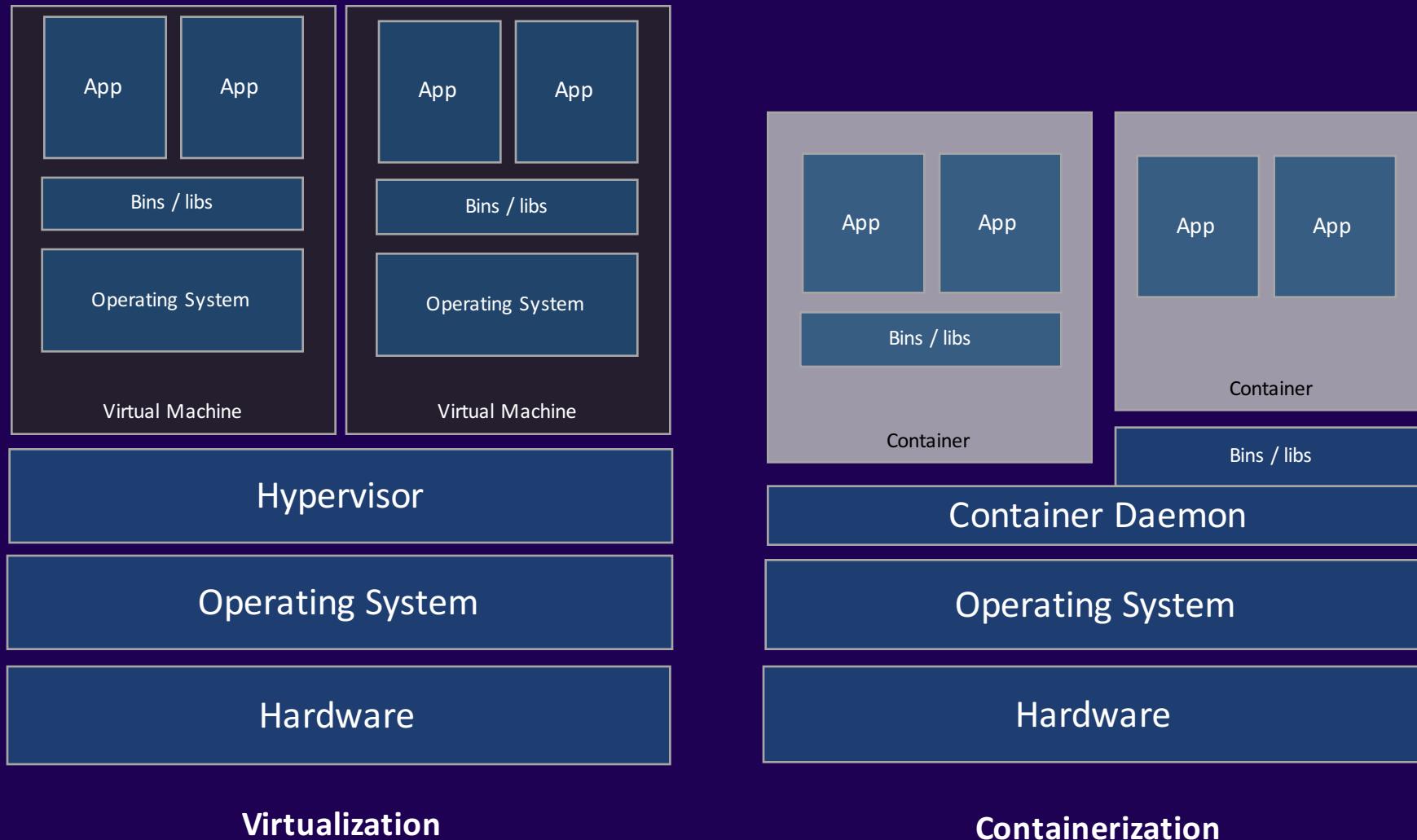
# Container: Namespace isolation



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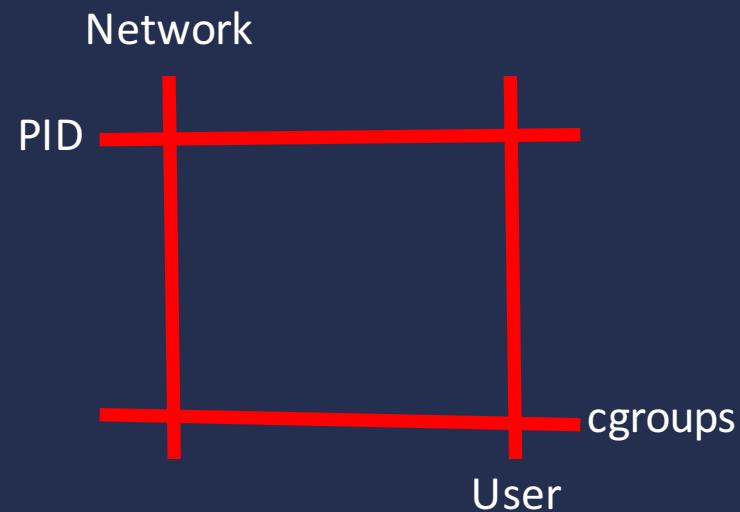
# Containerization = Lightweight Virtualization



# Container

?

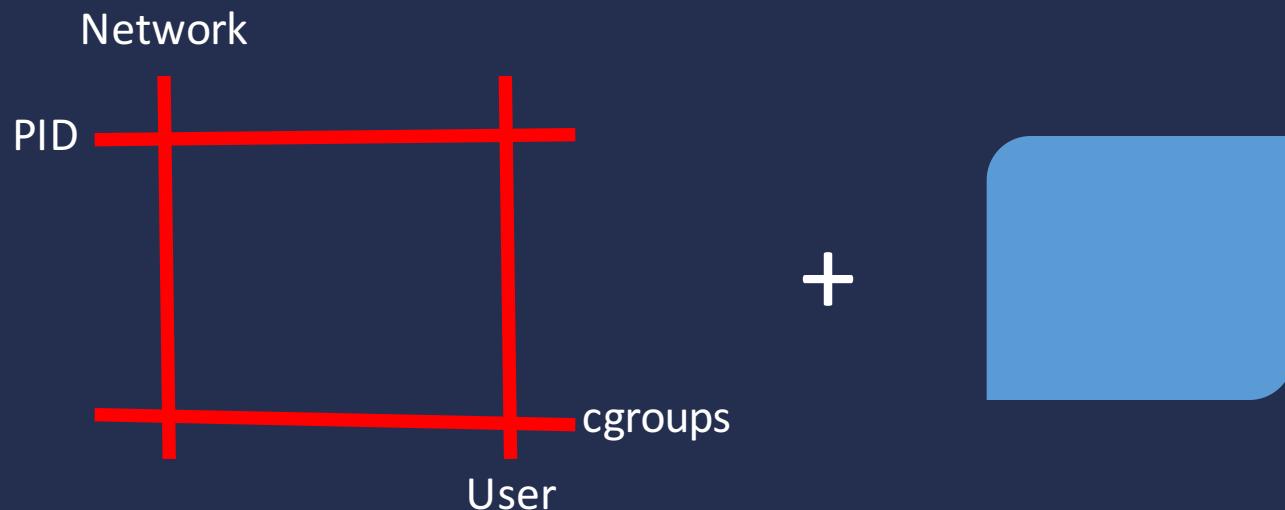
# Container



Isolation



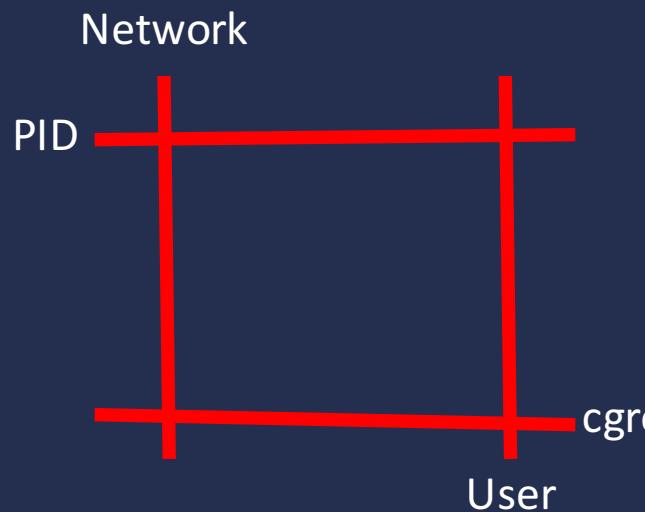
# Container



Isolation



# Container



+



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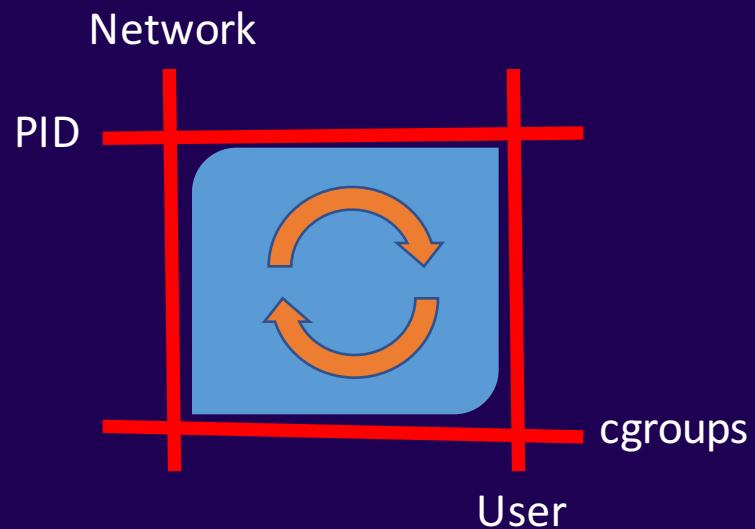
Isolation



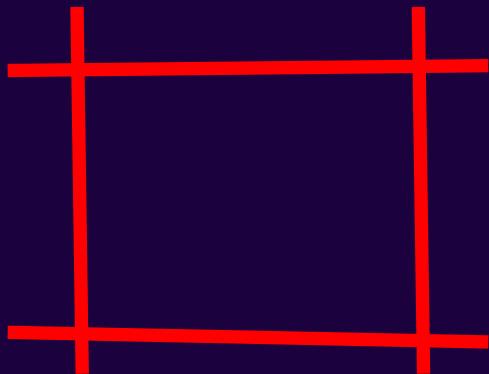
Content

Processes

# Container

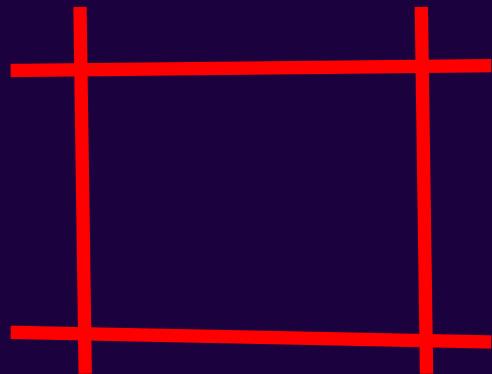


# Container actions



**Make me a container**

# Container actions

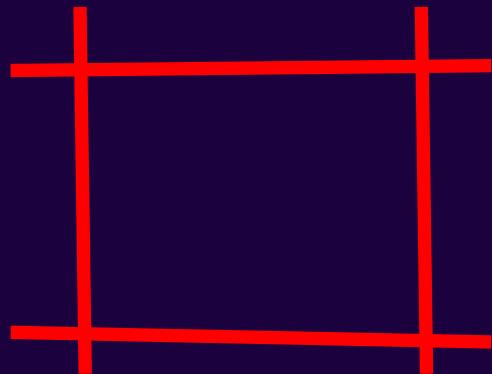


**Make me a container**



**Put this in it**

# Container actions



**Make me a container**



**Put this in it**

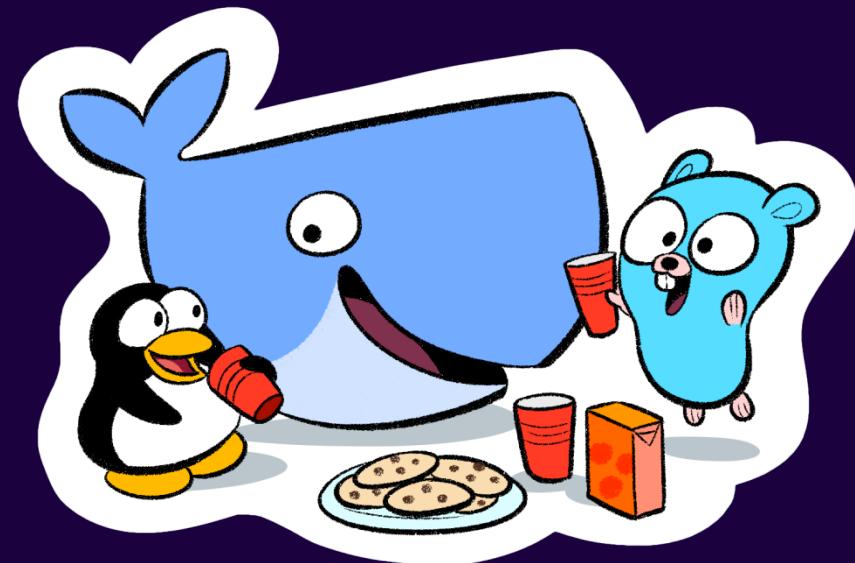


**Run this for me**

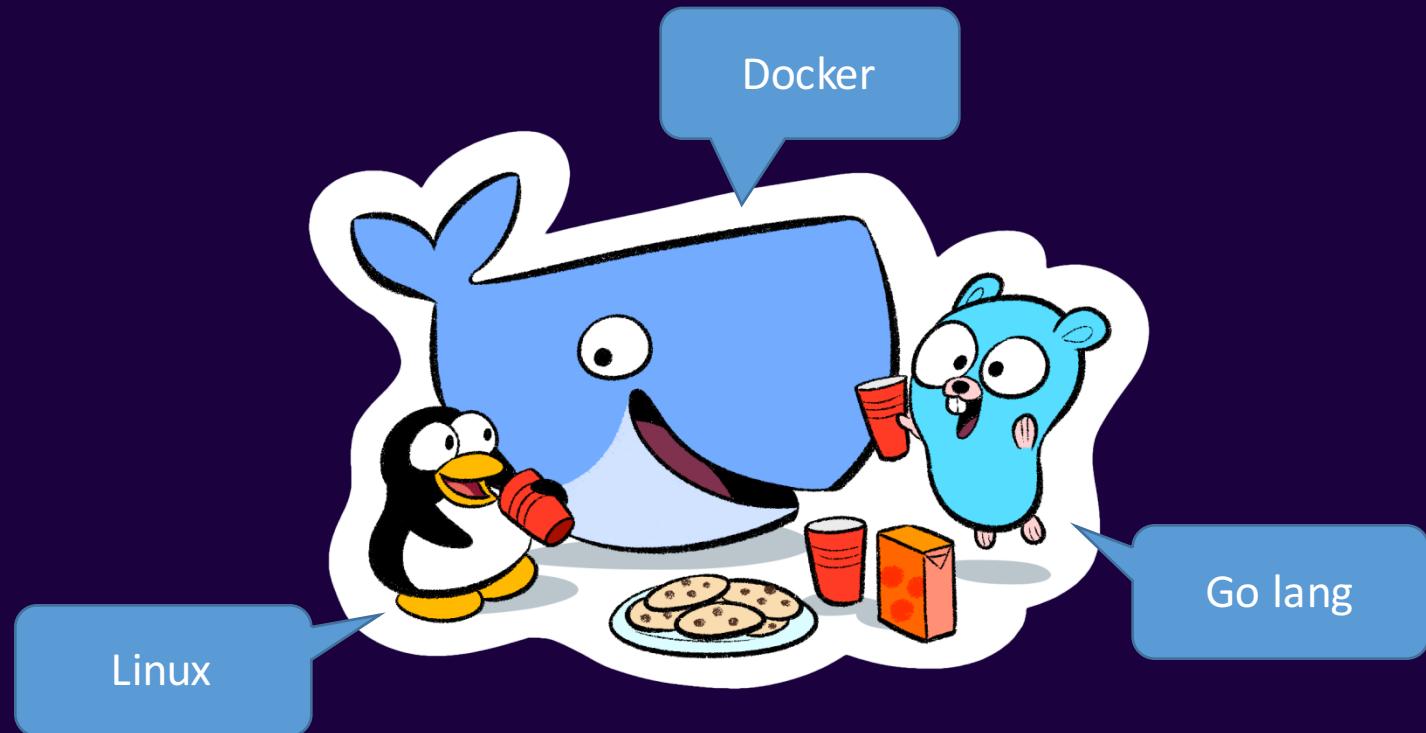
# Docker

## “Build, Ship, Run” Containers

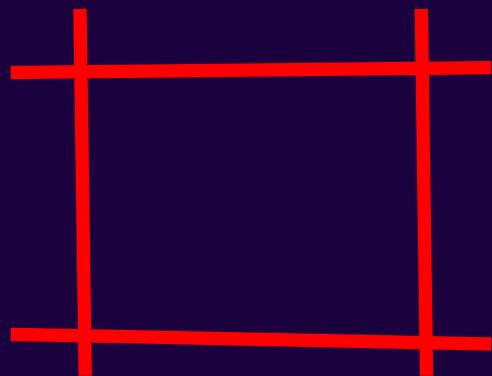
- Dockerfile
- Docker image
- Docker Hub



# Logos



# Dockerfile



**Make me a container**



**Put this in it**



**Run this for me**

# Dockerfile

- Example:

```
FROM debian:stable
RUN apt-get update && apt-get install -y --force-yes apache2
EXPOSE 80 443
VOLUME [ "/var/www", "/var/log/apache2", "/etc/apache2" ]
ENTRYPOINT [ "/usr/sbin/apache2ctl", "-D", "FOREGROUND" ]
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# Demo



“



<https://github.com/hsiliev/strangers>

“

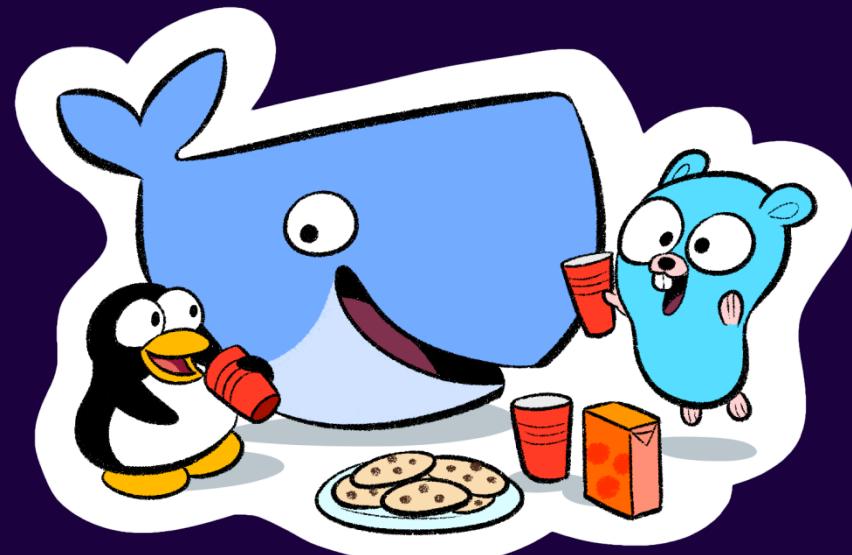
# Containers: Pros & Cons

## Pros

- Isolation
- Reproducible environment
- Easy to maintain

## Cons

- Multi-platform
- Discipline



# Software Production

Complexity

Tests

Automation





# Pipelines

## Multiple-builds

# Popular solutions

Build servers

Jenkins

Travis

...

Homegrown





# Concourse

## CI, Pipelines, Delivery

# Concourse

Reproducible builds

Simple building blocks

Docker containers



# Concourse: Concepts

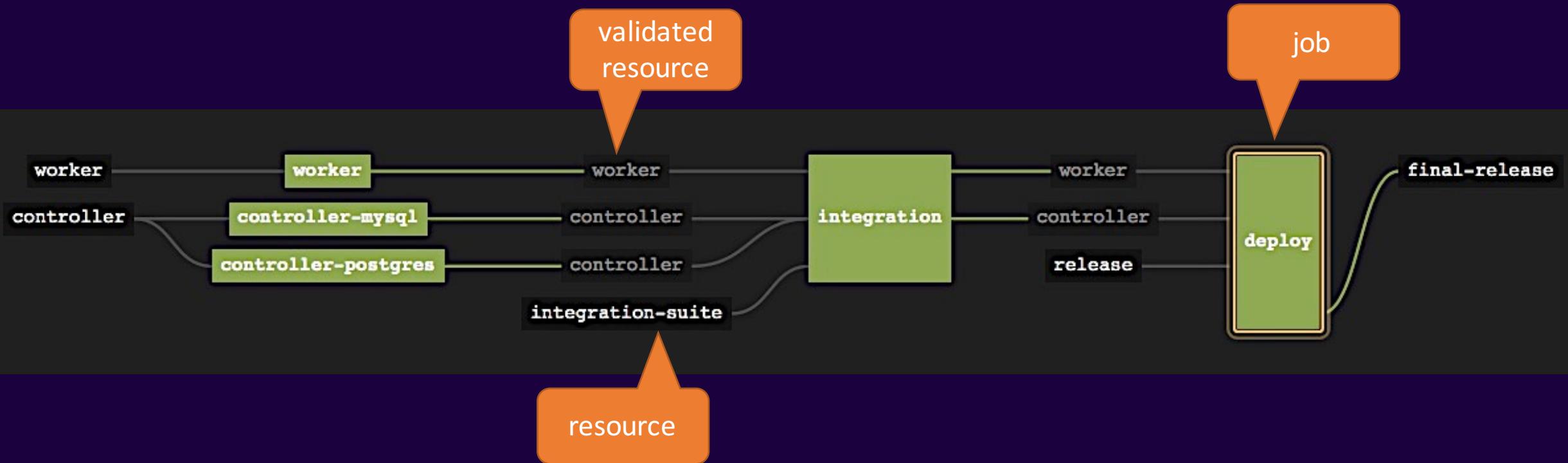
Resources

Tasks

Jobs



# Concourse: Pipeline



# Concourse: Pipeline YML

resources:

- name: source

type: git

source:

uri: source.git

branch: master

jobs:

- name: build

plan:

- get: source

- task: build

file: build.yml

# Demo



“



<https://github.com/hsiliev/strangers>

“

# Concourse: Pros & Cons

## Pros

- Reproducible environment
- Native pipeline support
- Release process modeling

## Cons

- Maturity
- Scripting



A close-up photograph of a wooden pencil writing the letters "Q&A" in cursive on a sheet of white paper with blue horizontal ruling lines. The pencil tip is dark and slightly worn.

# Q&A

# Thank you!



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