

Don't talk to strangers

Test isolation with containers

Hristo Iliev

- SAP
 - NetWeaver Java Sever
 - 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)



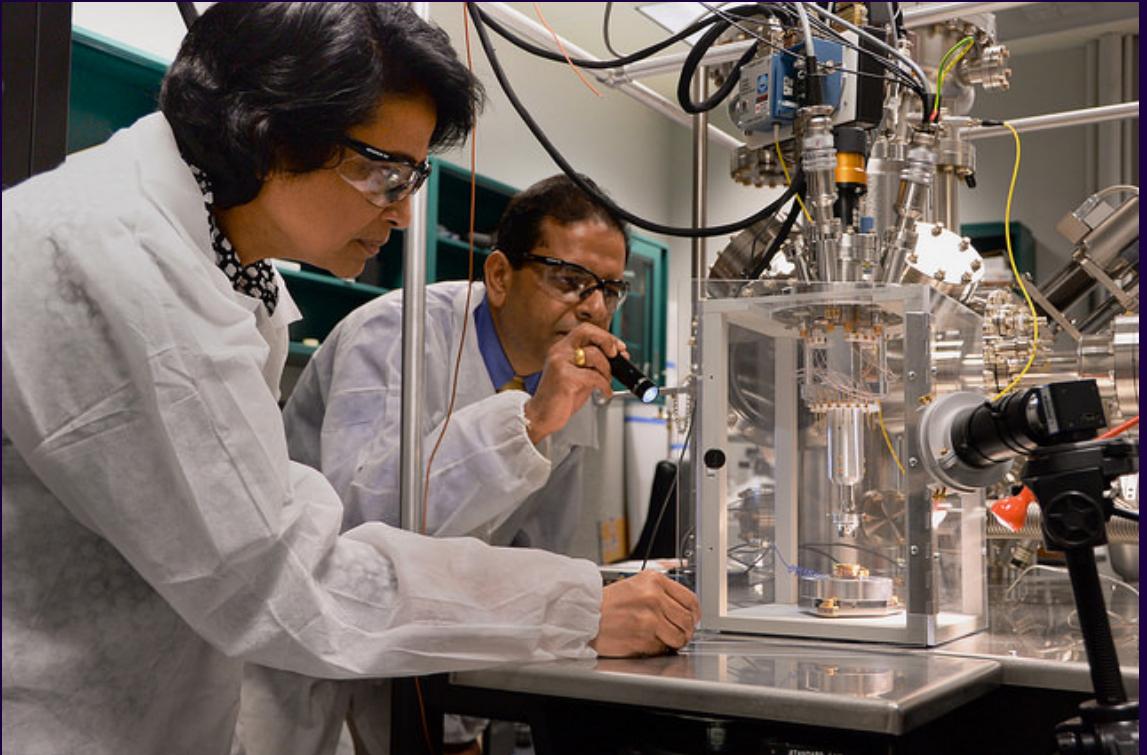
A close-up photograph of the side and rear of a silver car, possibly a hatchback, parked on a dark, rocky surface. In the background, a small white boat with a blue stripe is visible on the water under a cloudy sky.

Pictures

Creative Commons @ Flickr

Creating Working Software

- Tests
- Automation
- Discipline





Problems

Resources left behind

- 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

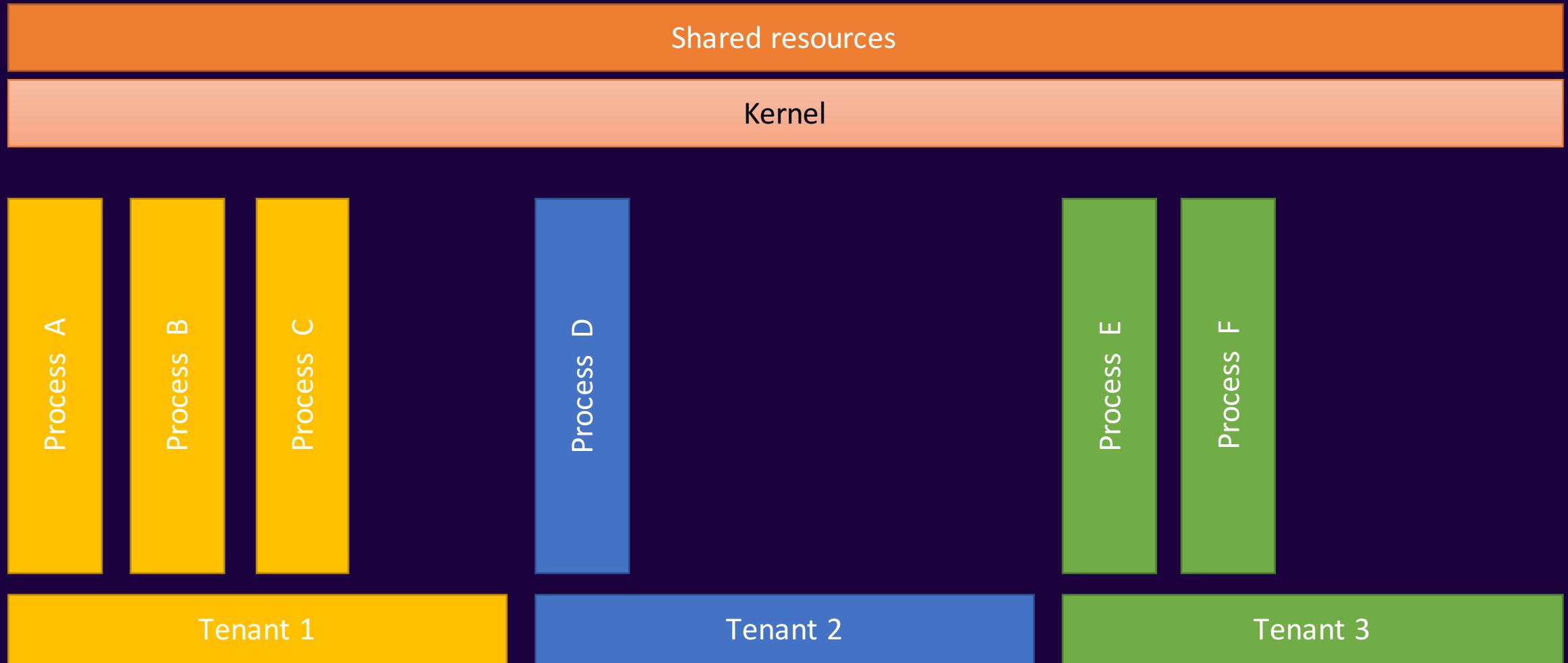




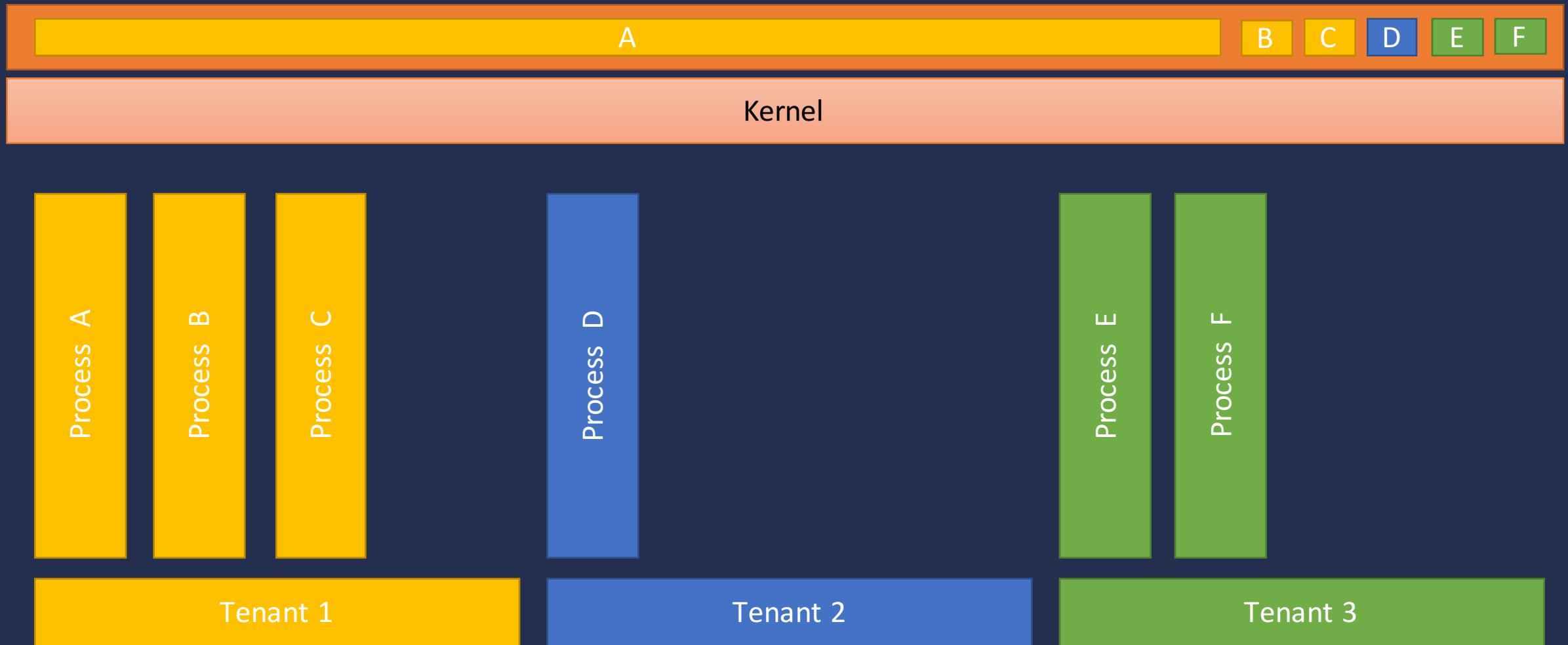
Containers

build, isolate, ship

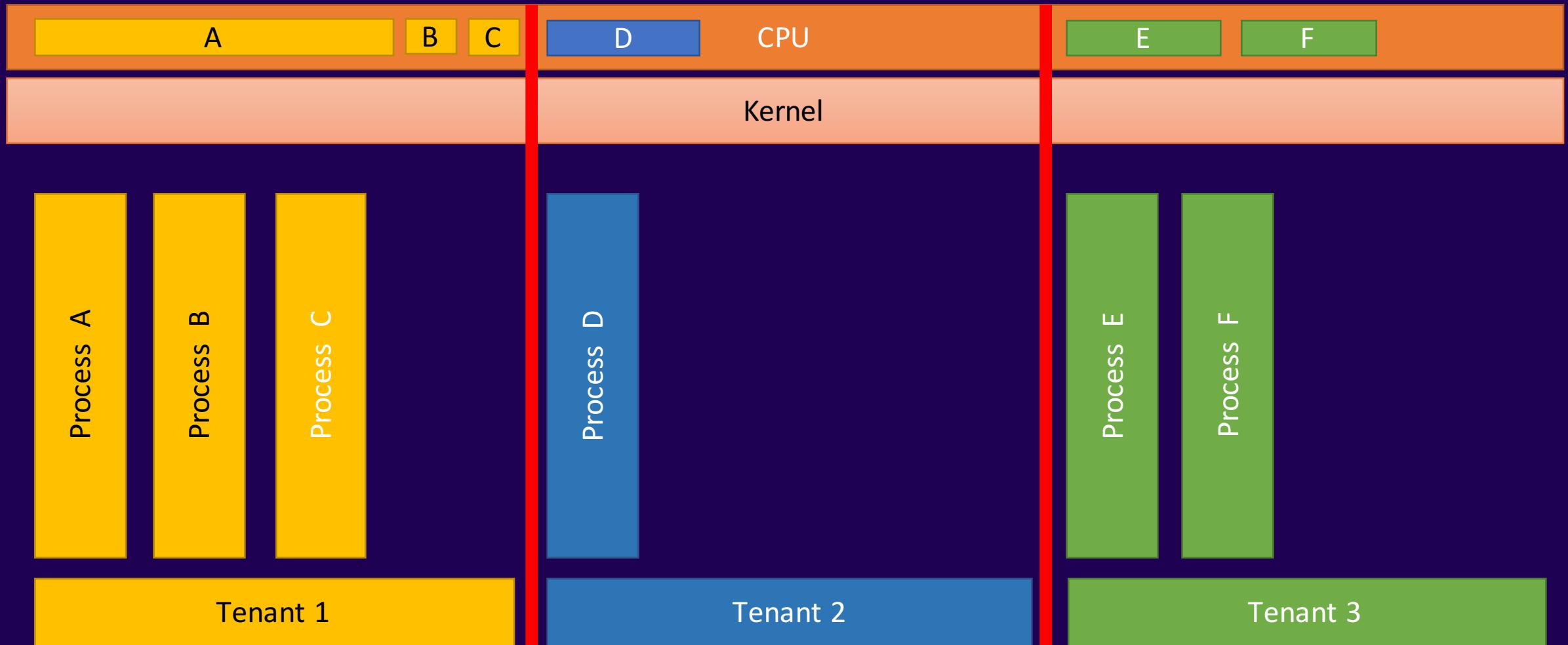
Container: Resource isolation



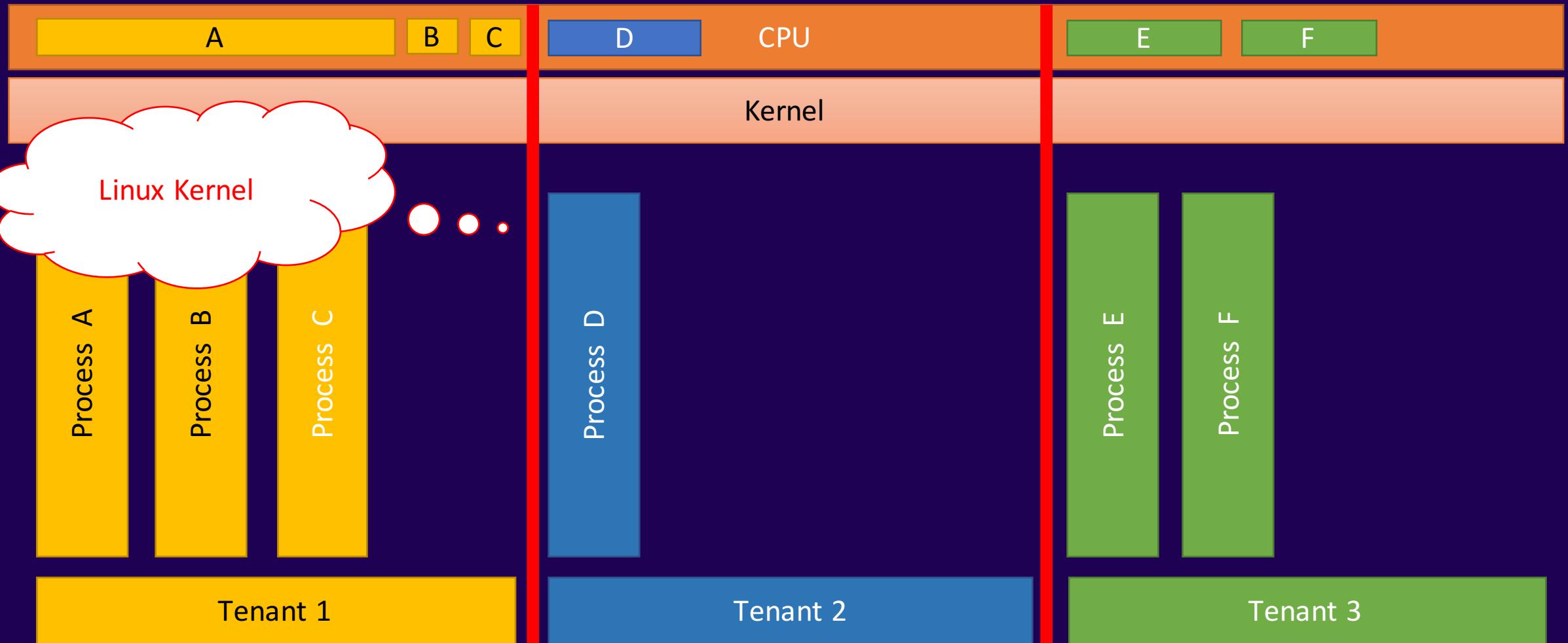
Container: Resource isolation



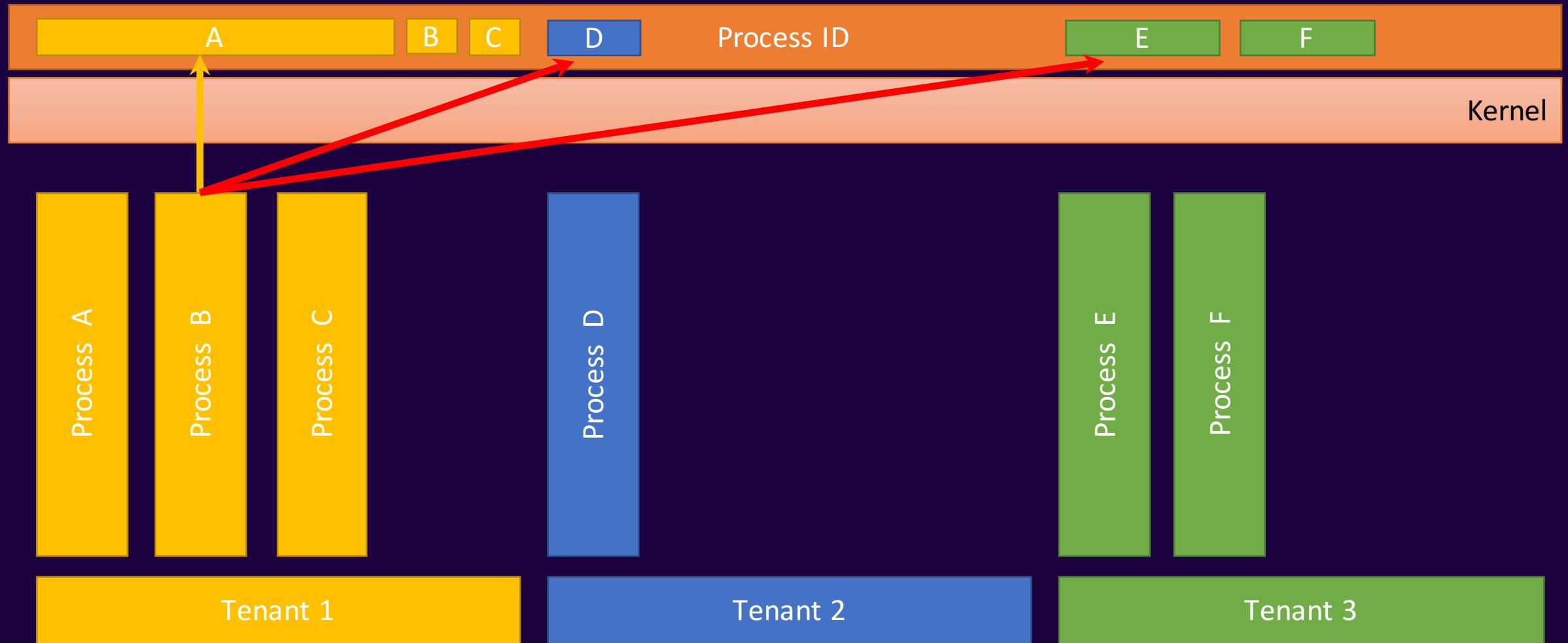
Container: Resource isolation



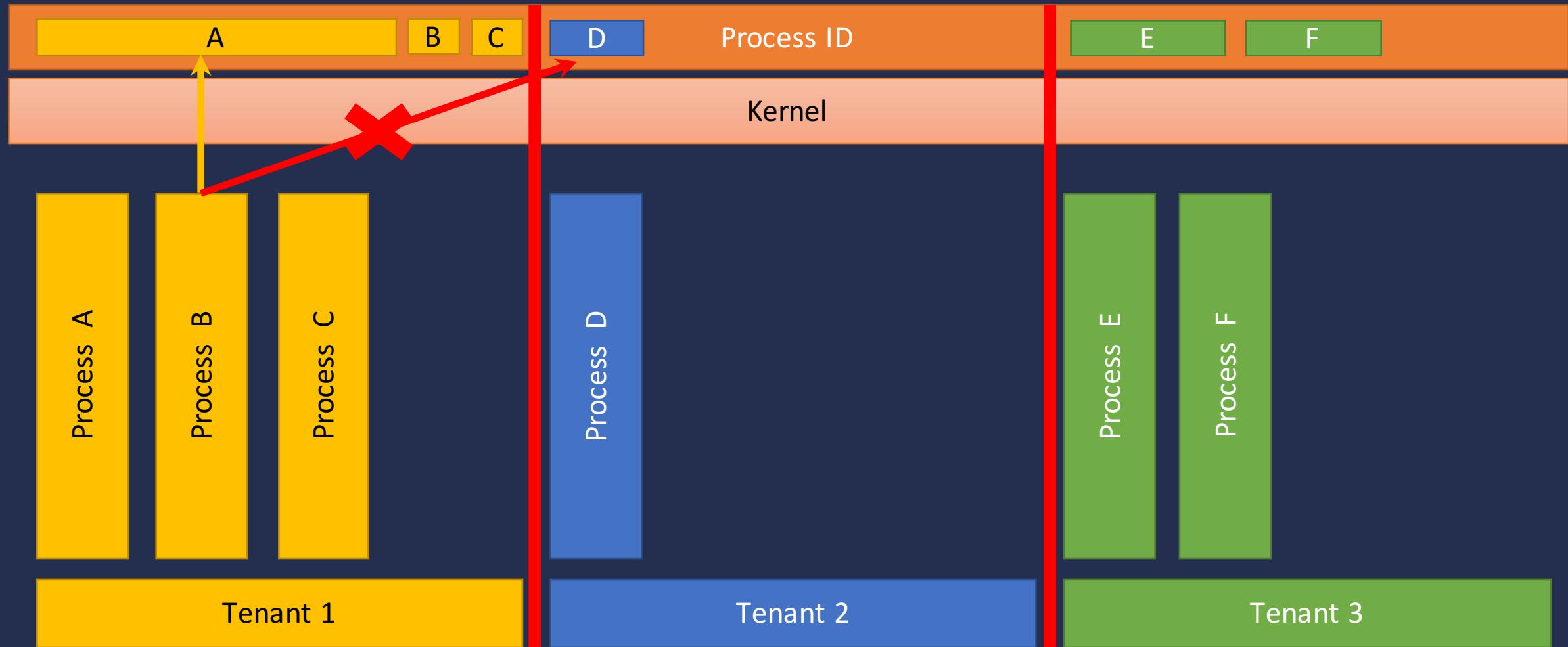
Container: Resource isolation



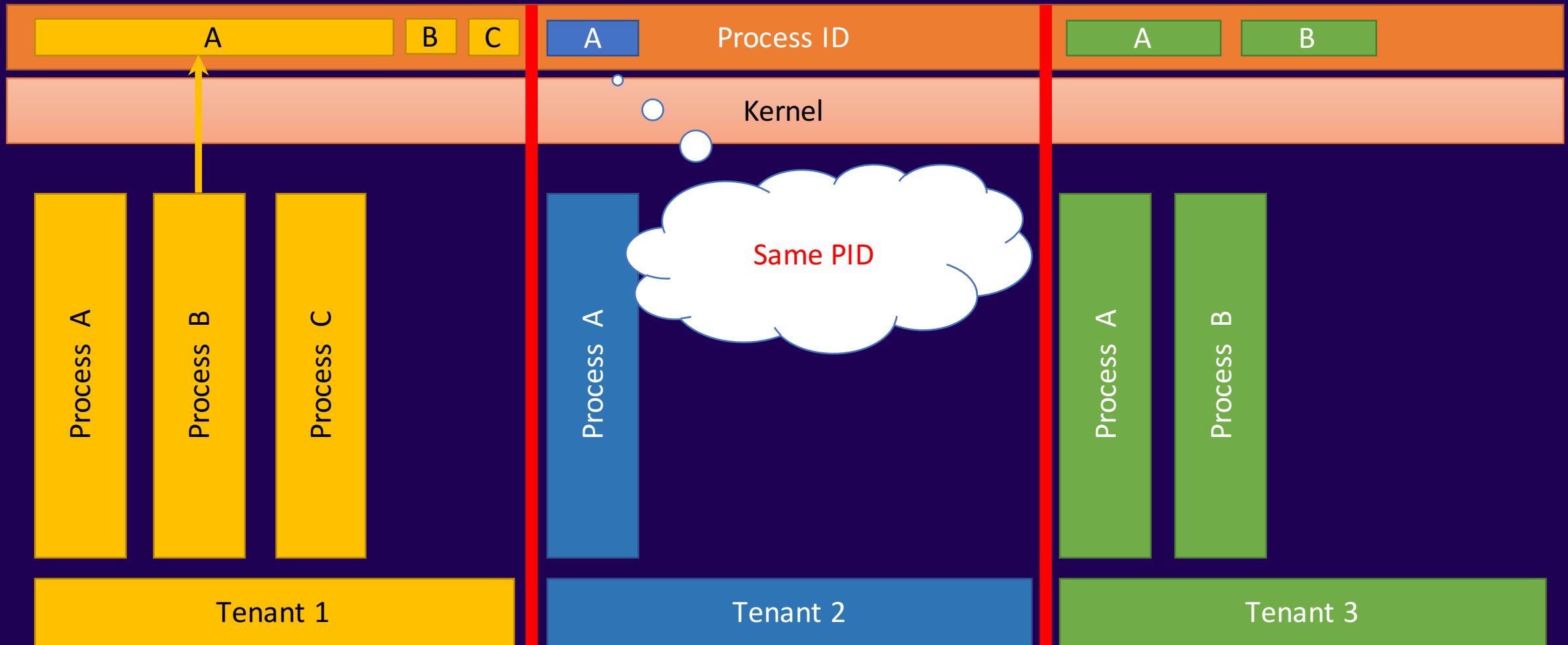
Container: Namespace isolation



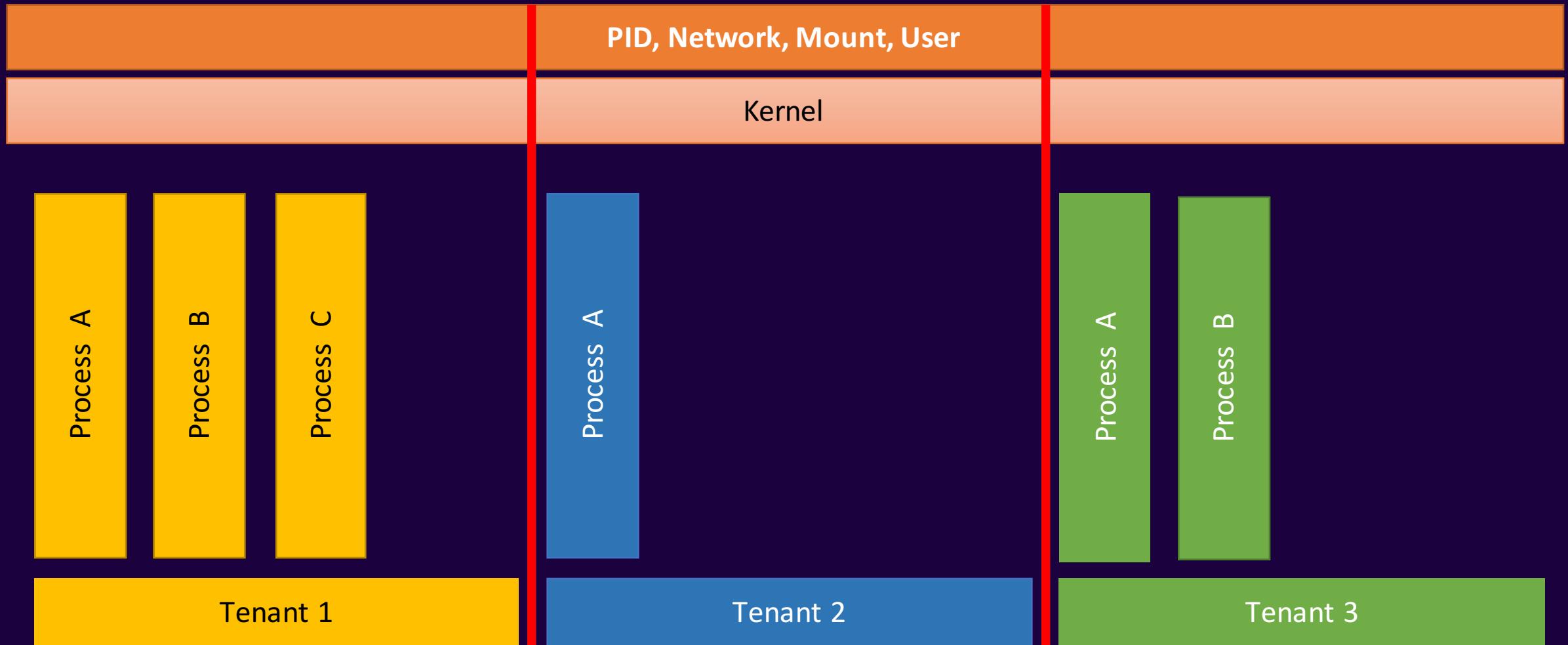
Container: Namespace isolation



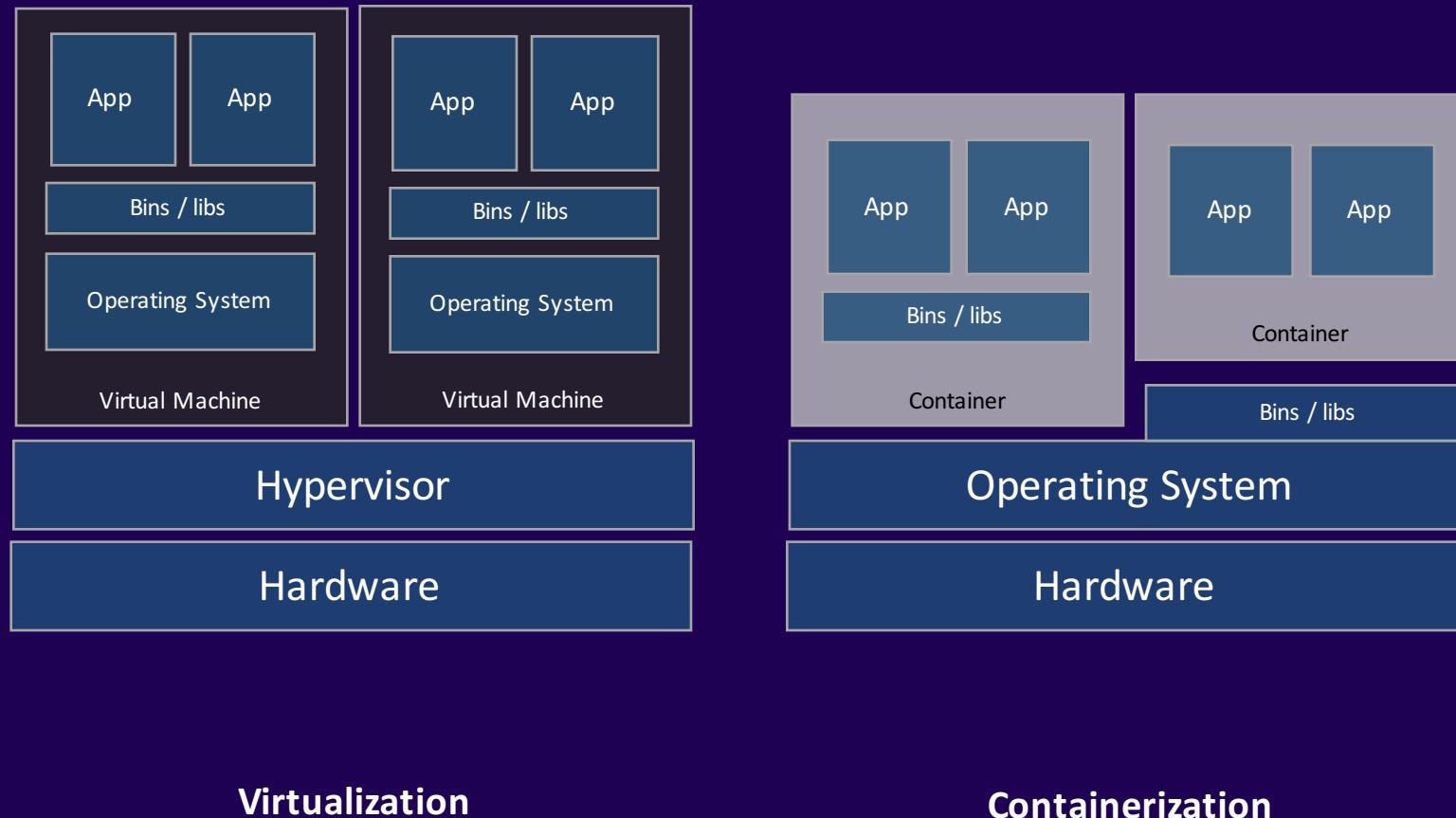
Container: Namespace isolation



Container: Namespace isolation



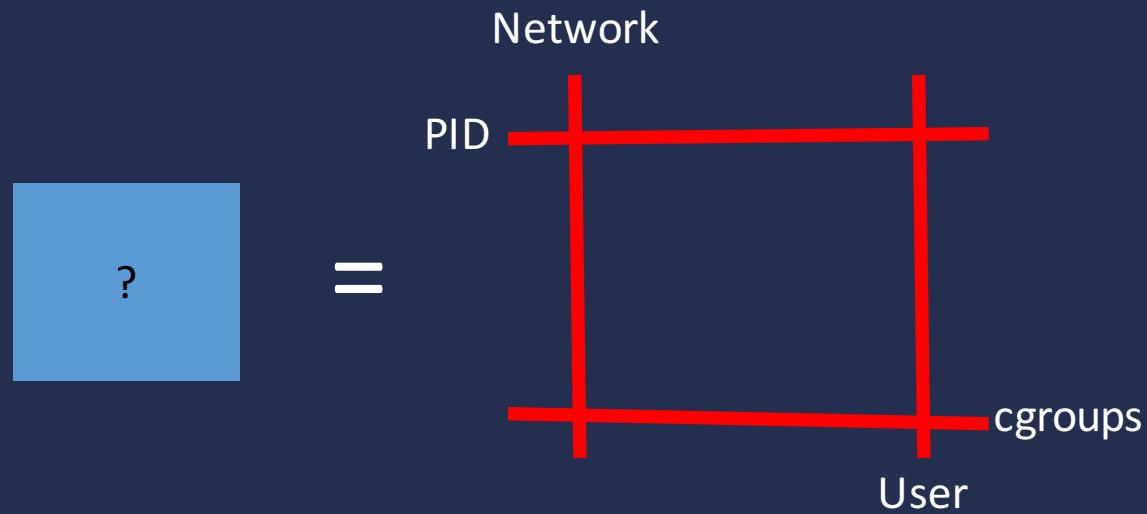
Containerization = Lightweight Virtualization



Container

?

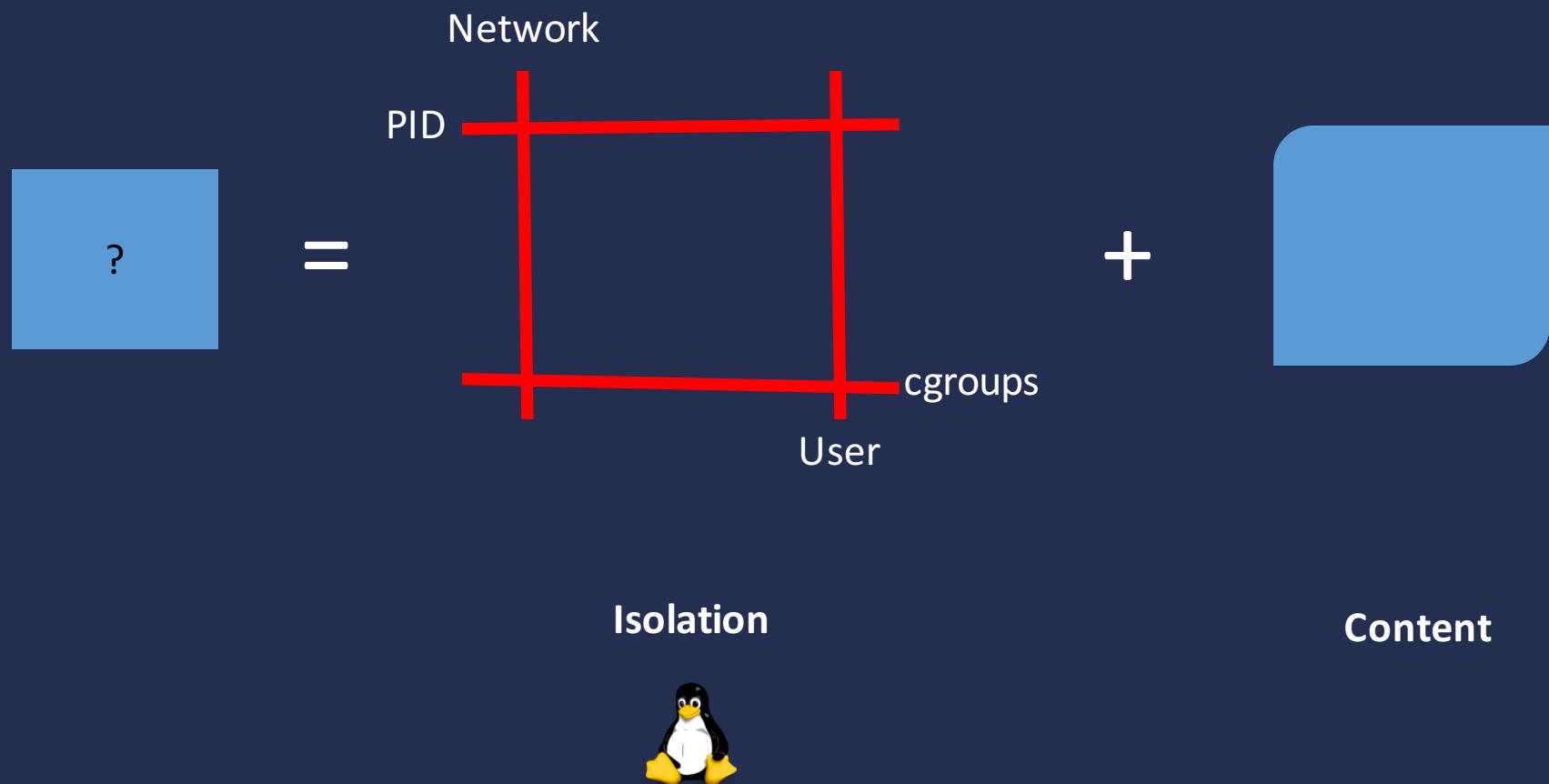
Container



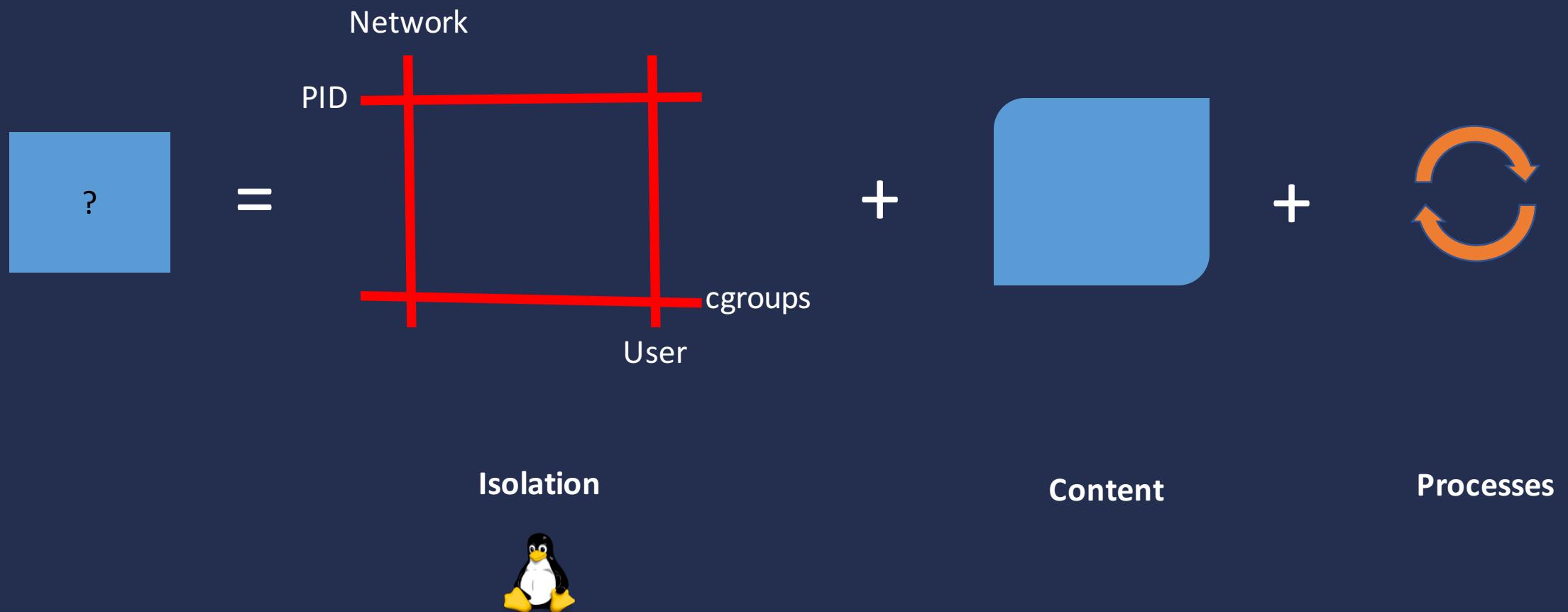
Isolation



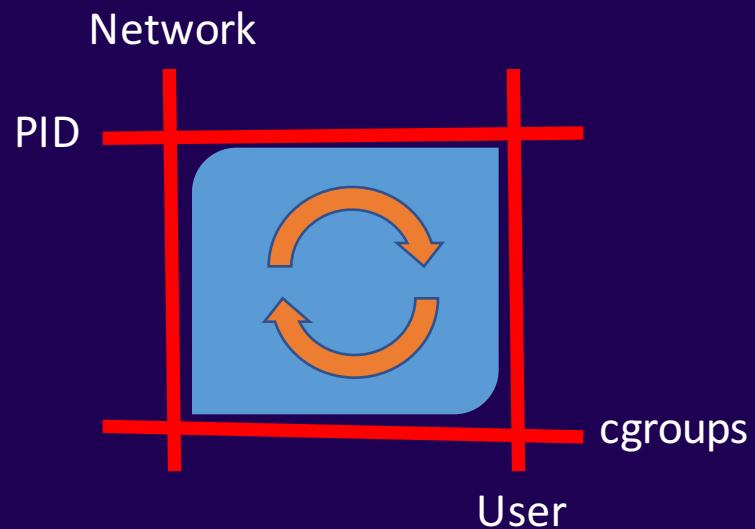
Container



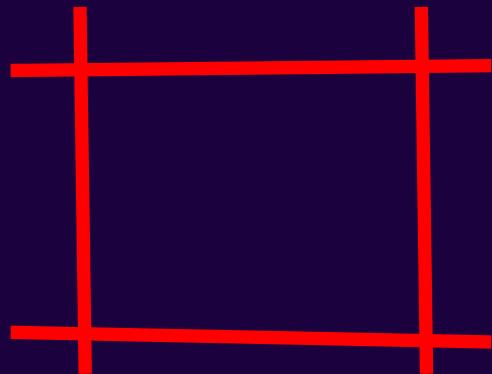
Container



Container



Container actions



Make me a container



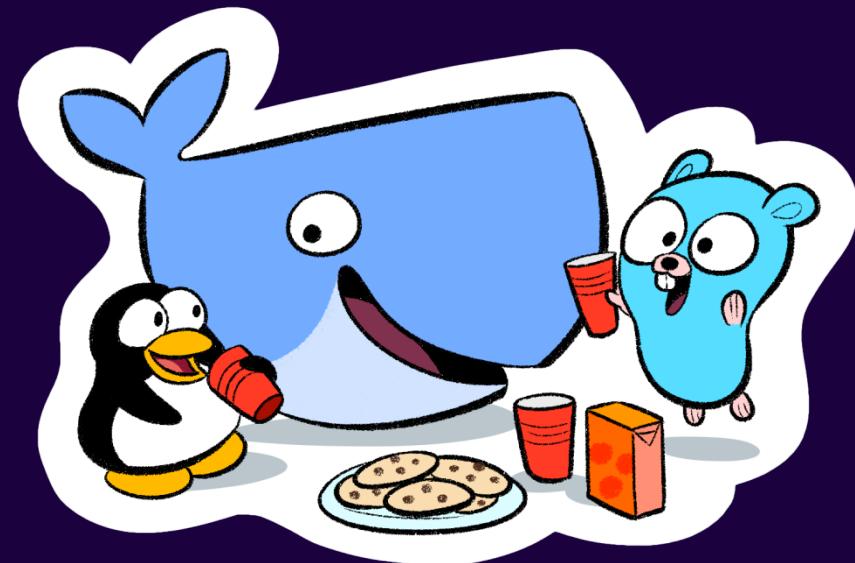
Put this in it



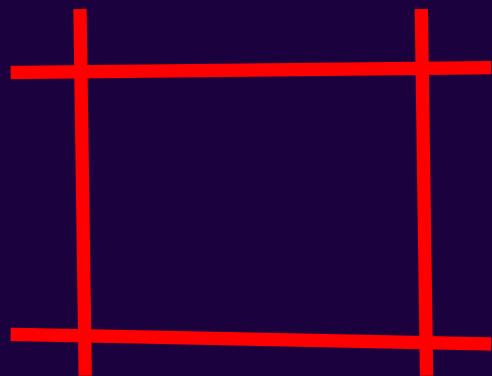
Run this for me

Docker

- “Build, Ship, Run” **Containers**
 - Dockerfile
 - Docker image
 - Docker Hub



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" ]
```

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" ]
```

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" ]
```

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" ]
```



“



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

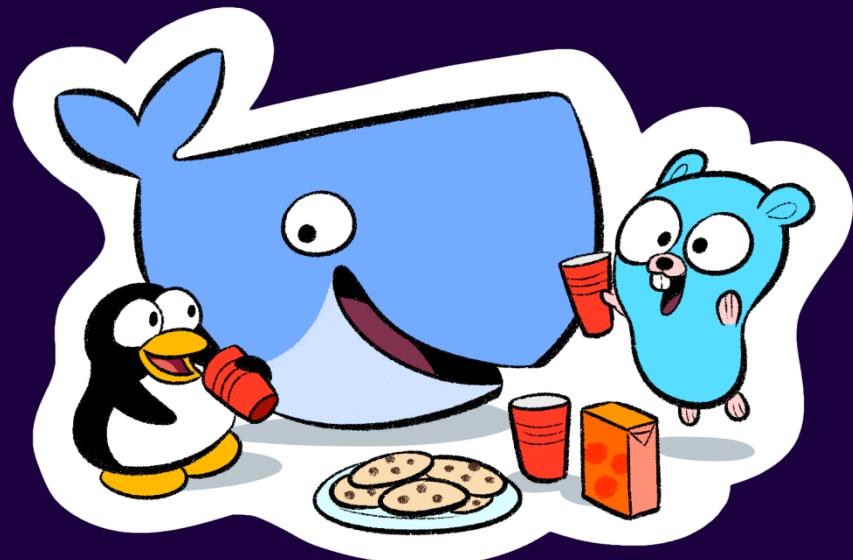
“

Demo



Containers: Pros & Cons

- Pros
 - Isolation
 - Reproducible environment
 - Easy to maintain
- Cons
 - Multi-platform
 - Discipline



Software Production

- Complexity
- Tests
- Automation





Pipelines

Multiple-builds

Continuous Integration & Delivery

- Multiple
 - Environments
 - Products
 - Teams
- Final release



Popular solutions

- Build servers
 - Jenkins
 - Travis
 - ...
- Homegrown





Concourse

CI, Pipelines, Delivery

Concourse

- CI
 - Original name: “Concorde”
 - Reproducible builds
 - Simple building blocks
 - Docker containers

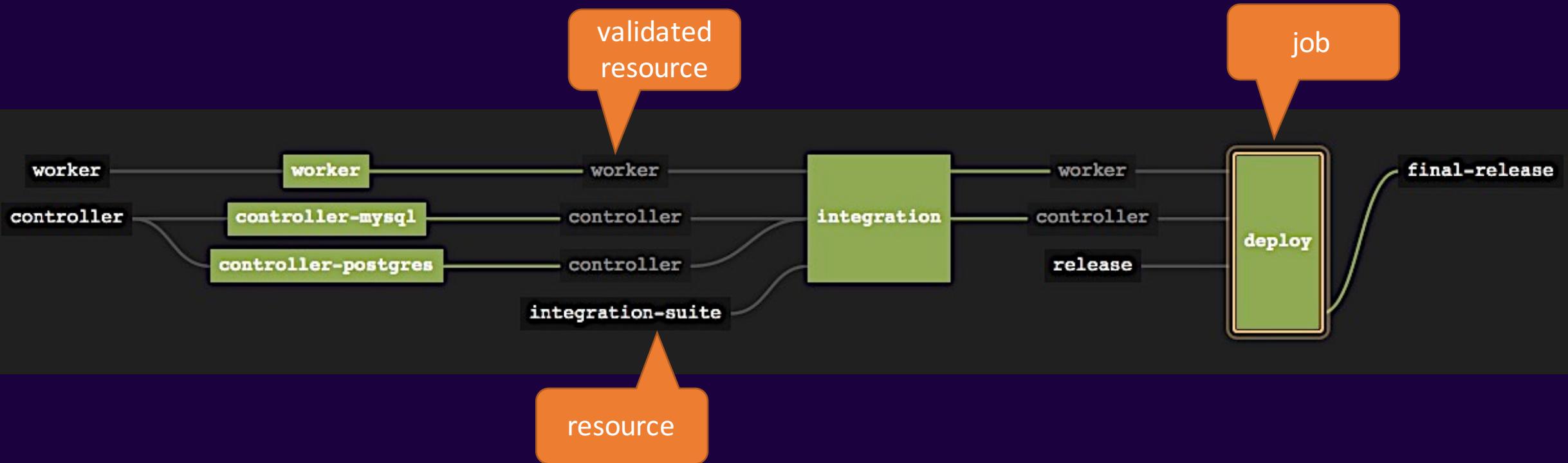


Concourse: Concepts

- 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

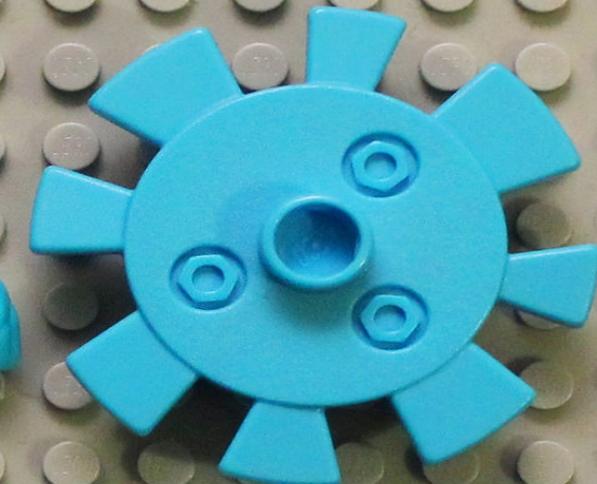
“



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

“

Demo

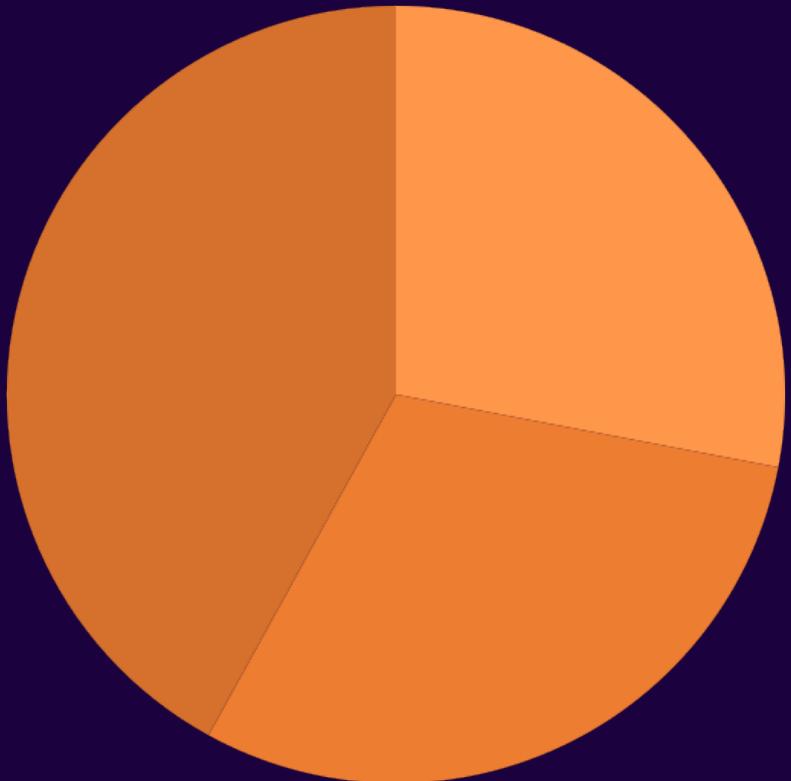


Concourse: Pros & Cons

- Pros
 - Reproducible environment
 - Native pipeline support
 - Release process modeling
- Cons
 - Maturity
 - Pipeline management
 - Scripting

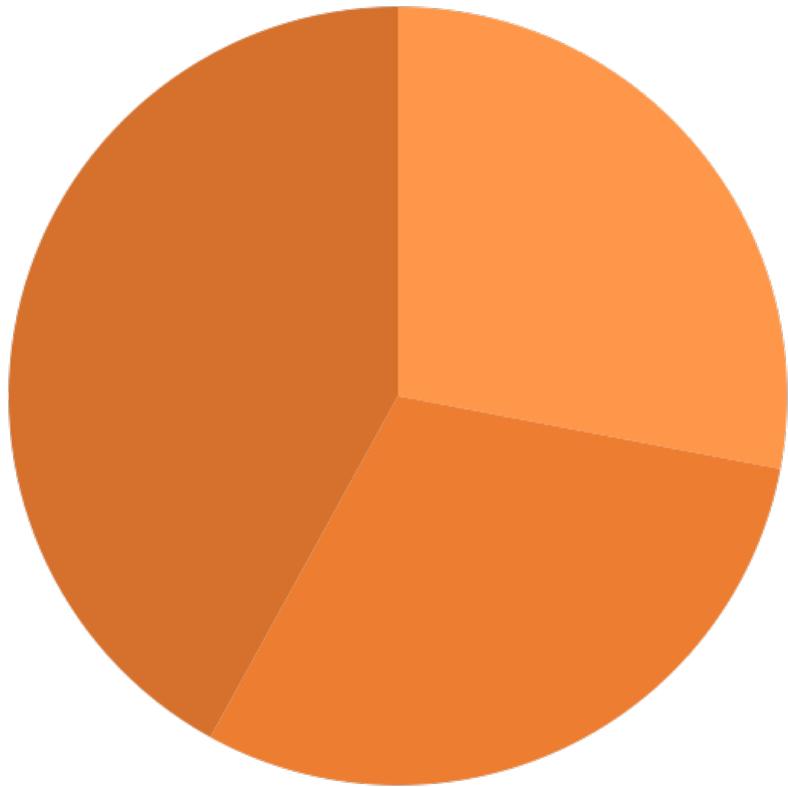


Integer tincidunt libero a ex venenatis cursus. Vivamus accumsan congue tristique.



- Up to
- Six bullets
- For best results
- Up to
- Six bullets
- For best results

Integer tincidunt libero a ex venenatis cursus. Vivamus
accumsan congue tristique.

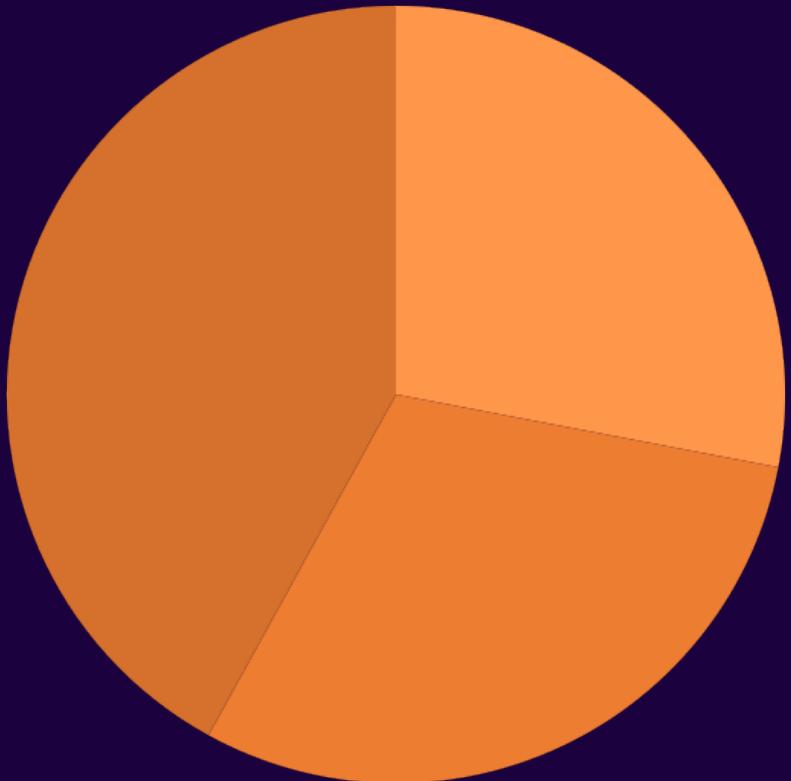


- Up to
- Six bullets
- For best results
- Up to
- Six bullets
- For best results

Major point without a picture

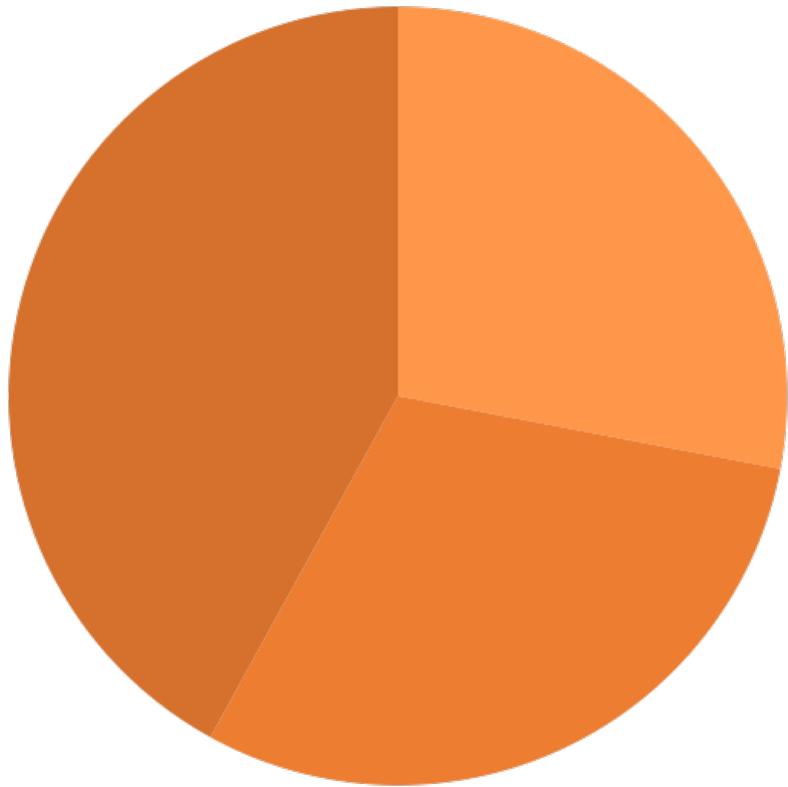
And its subtitle

Integer tincidunt libero a ex venenatis cursus. Vivamus accumsan congue tristique.



- Up to
- Six bullets
- For best results
- Up to
- Six bullets
- For best results

Integer tincidunt libero a ex venenatis cursus. Vivamus
accumsan congue tristique.



- Up to
- Six bullets
- For best results
- Up to
- Six bullets
- For best results

”

Integer tincidunt libero a
ex venenatis cursus.

Vivamus accumsan congue
tristique.

”

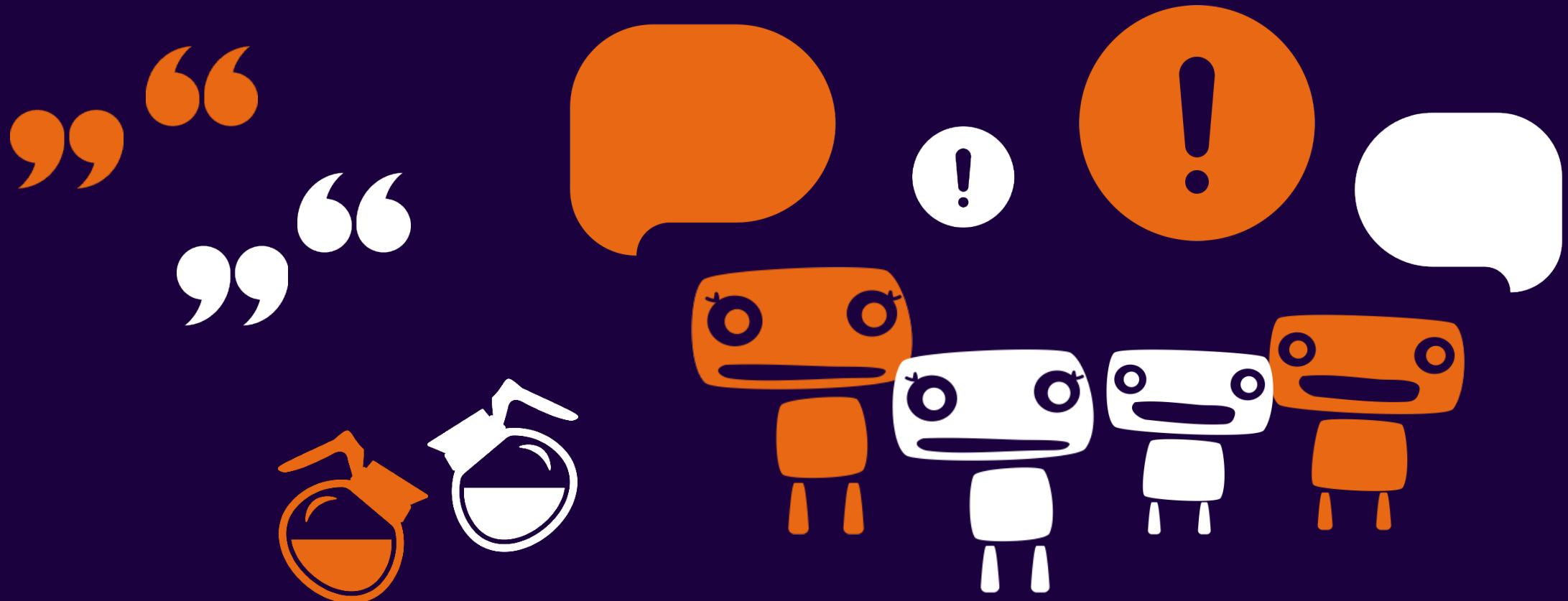
”

Integer tincidunt libero a
ex venenatis cursus.

Vivamus accumsan congue
tristique.

”

Some icons for use throughout the presentation



Thank you!



hristo.iliev@sap.com



georgi.sabev@sap.com