SUSE® Containers, Docker and Beyond

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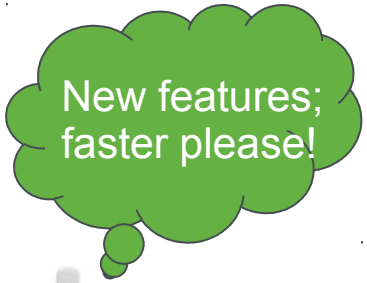
Agenda

- Linux Containers
- Docker
- Demo

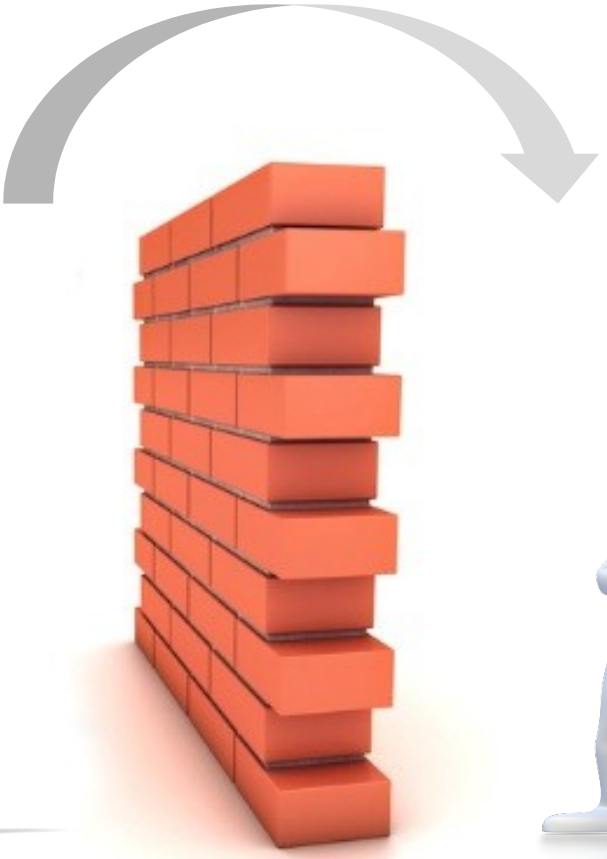
Why Containers?

Challenges to Address



Developers

- Frequent release vs. staged production schedule
- “It works on my machine”



Operations

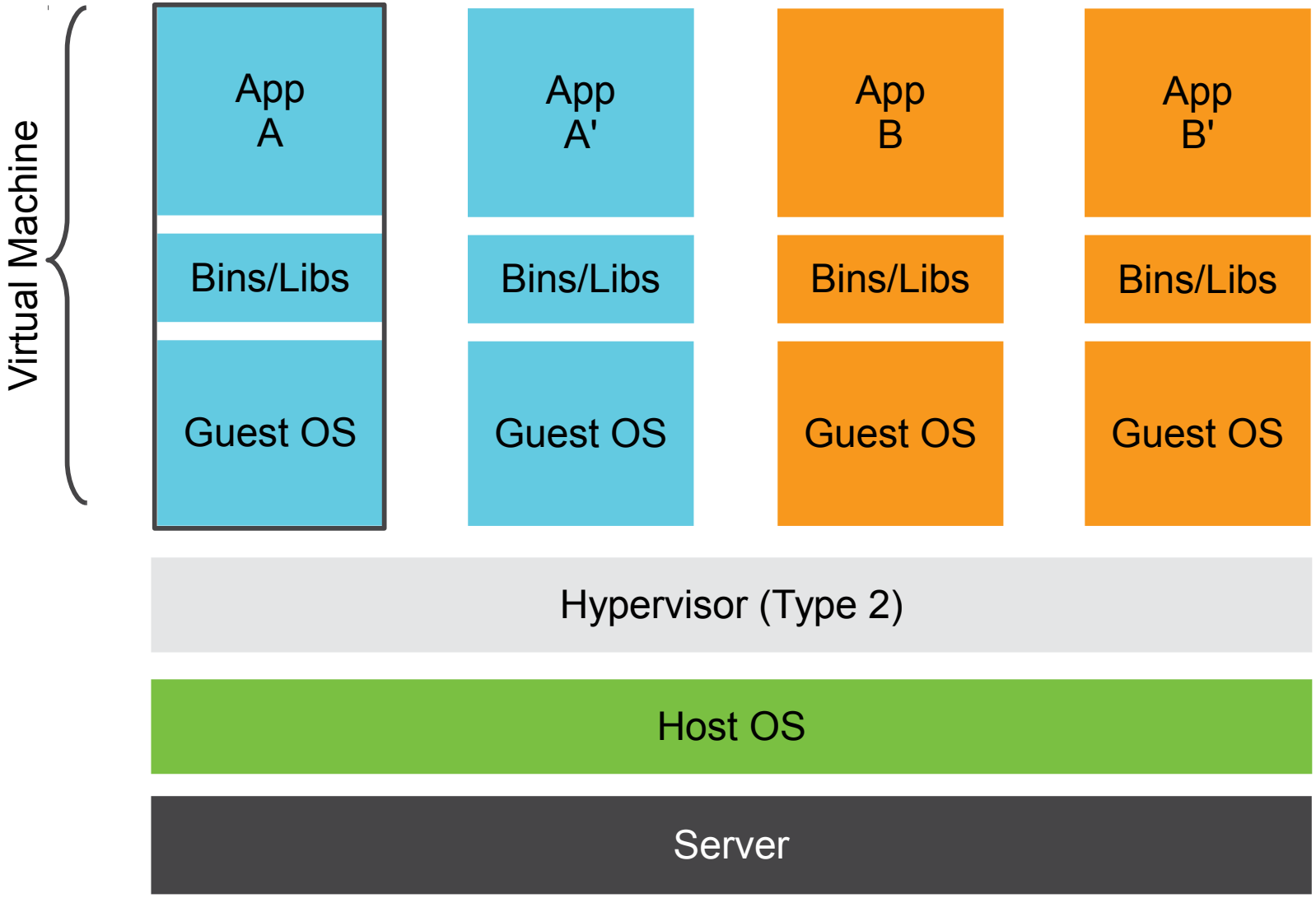
- Managing growing services, from virtual to cloud
- Reliability and uptime when adding new codes
- Time to market, agility and efficiency

Linux Containers

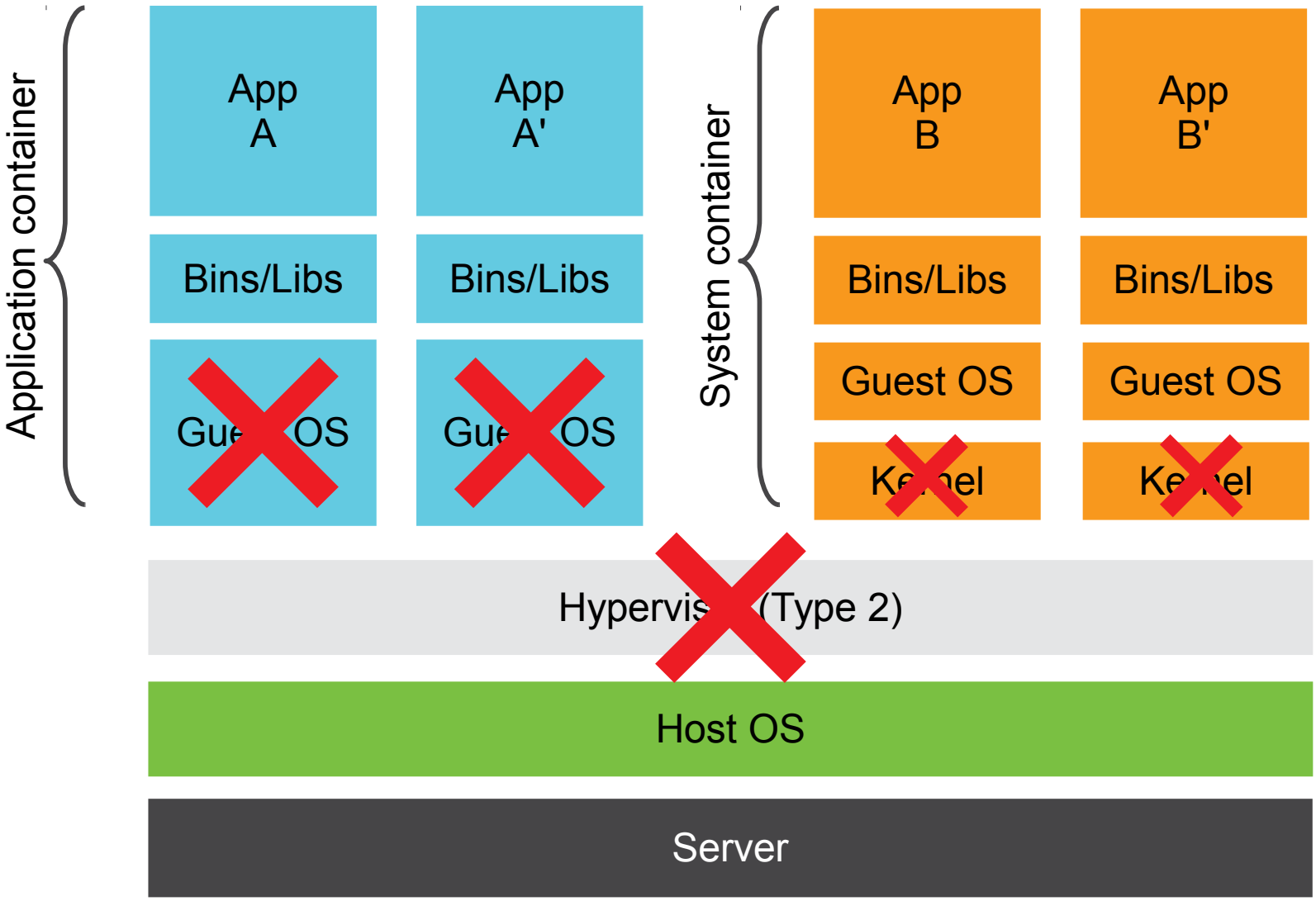
- **Lightweight virtualization**
  - Faster provisioning, less downtime
  - Higher virtualization density
- **Flexibility and agility**
  - Containerized apps can be deployed anywhere
  - Normal I/O, no congestion
- **Near native performance**
  - IBM research: http://ibm.com/Search/?q=rc25482

Linux Containers

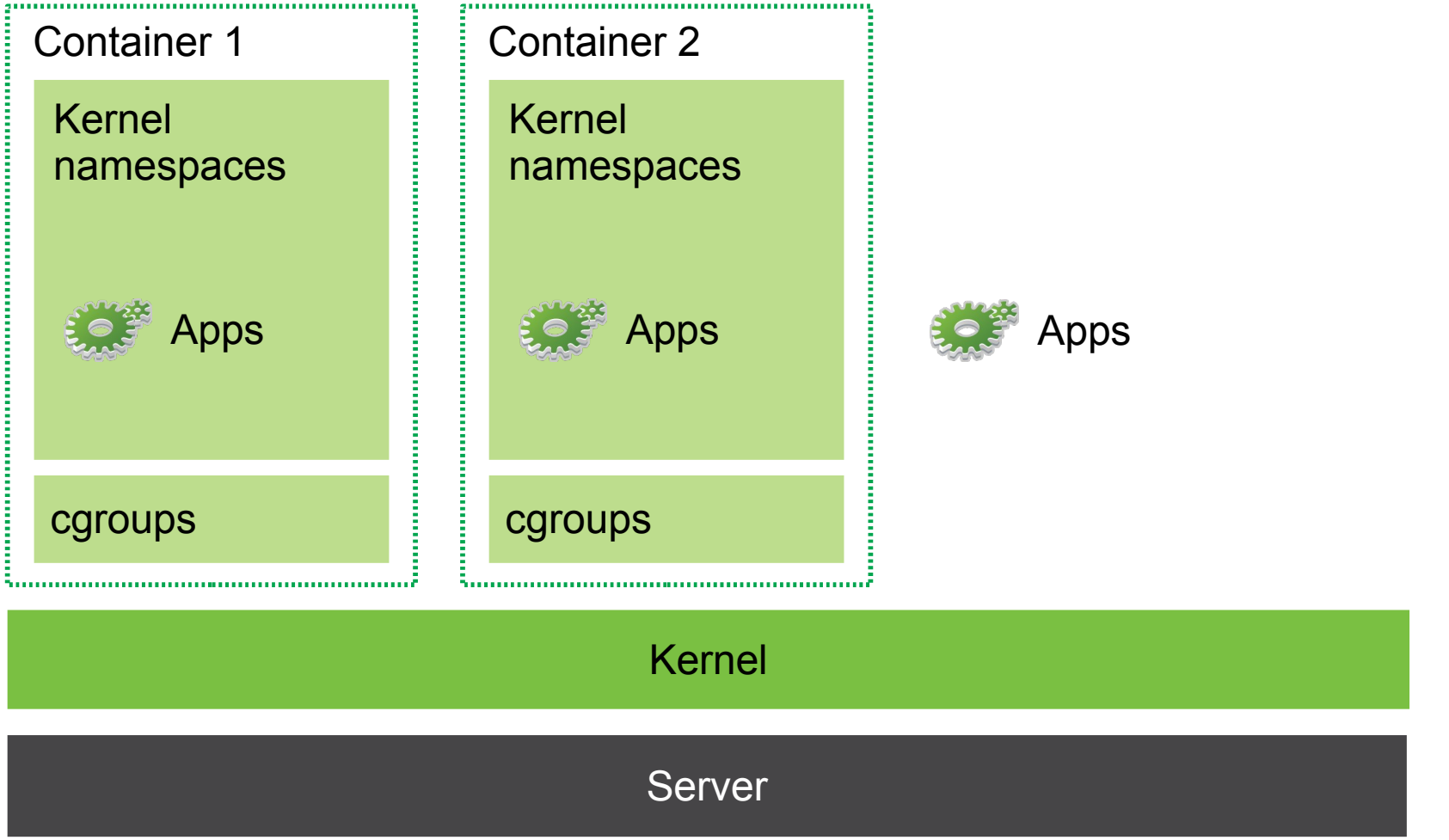
Traditional virtualization



Linux Containers



What is a Linux Container?



Advantages of Linux Containers

- Lightweight virtualization solution
  - Isolated from the other processes
  - 1 kernel to rule them all
  - Normal I/O
  - Dynamic changes possible without reboot
  - Nested virtualization is not a problem
  - No boot time or very short one
- Isolate services (e.g. web server, ftp, ...)
- Provide root read-only access
  - Mount host / as read-only
  - Add only needed resources read-write

Linux Containers Use Cases

- Deploy everywhere quickly
  - Deploy application and their dependencies together.
- Enterprise Data Center
  - Limit applications which have a tendency to grab all resources on a system:
    - Memory (databases)
    - CPU cycles/scheduling (compute intensive applications)
- Outsourcing business
  - Guarantee a specific amount of resources (SLAs!) to a set of applications for a specific customer without more heavy virtualization technologies

Linux Containers – Limitations

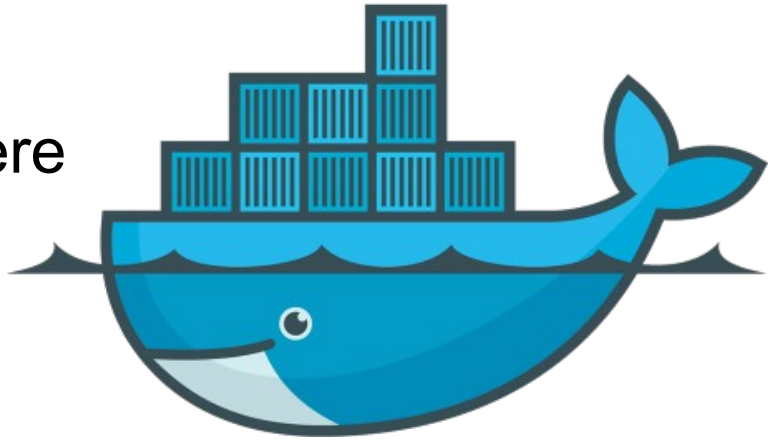
- They cannot run a different OS/architecture
  - Cannot run Windows containers on Linux
- Risk of escaping from containers
  - Solution: user namespaces
- Shared kernel with the host
  - Syscall exploits can be exploited from within the container
  - Solution: seccomp2 (in Linux kernel since 3.5)

Linux Containers – Security

- Do not give root privileges unless needed
- Apply security patches both on the host and on inside of the container
- Drop Kernel capabilities that are not used
- Secure containers with SELinux, AppArmor
  - SELinux policy applies to complete container
  - Support for SELinux with LXC on a case by case basis
  - AppArmor support is ready upstream
- Paranoid? Run the containers inside of a VM

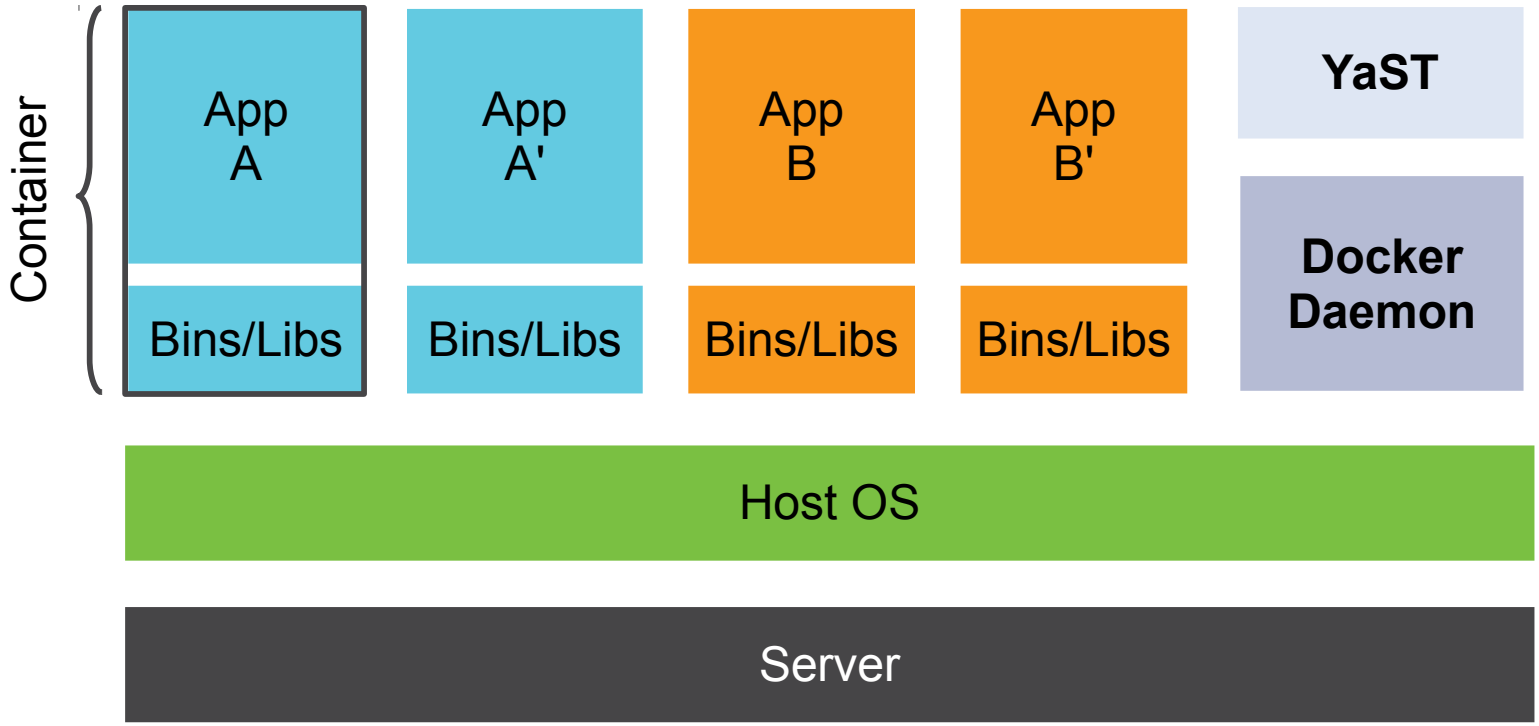
Docker

Why Docker?



- Shipping applications everywhere
- Repository of images
  - https://registry.hub.docker.com/
  - Private repository possible
- Workflow for containers like git
  - Commits; push / pull
  - DevOps oriented
- Better disk usage: changes layers
- Easy to build new images
- Allows for image versioning

Docker


Container
App A
Bins/Libs
App A'
Bins/Libs
App B
Bins/Libs
App B'
Bins/Libs
YaST
Docker Daemon
Host OS
Server

Speak Like Docker

- Registry

  On-line storage for docker images

- Repository

  Bag containing several versions of an image

- Image

  Prepared system to run in a container

- Container

  Linux container running a docker image

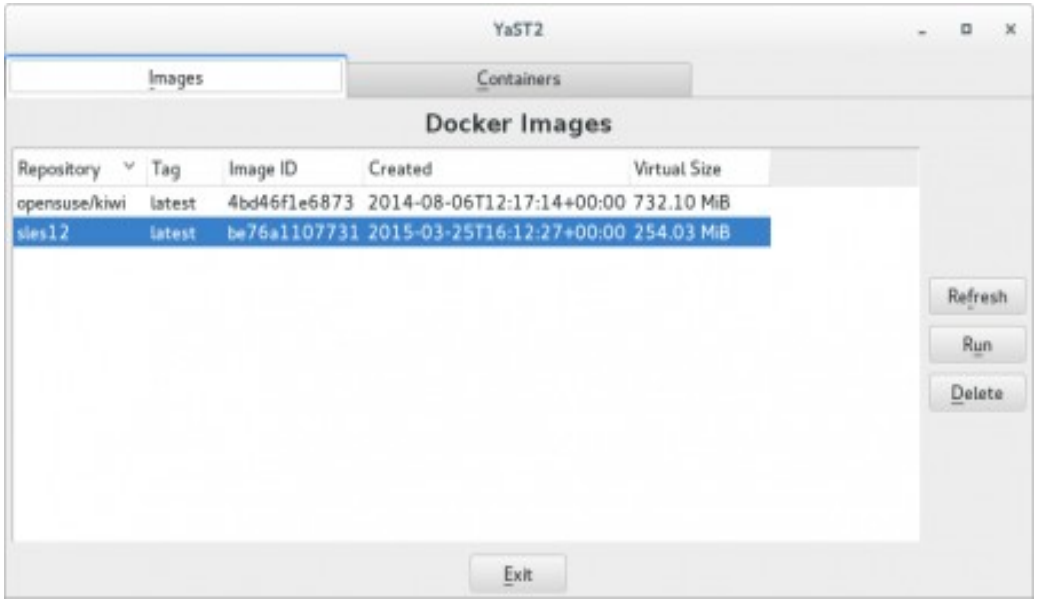
Docker at SUSE

Official images

- Pre-built images ready to be download
- Built from trusted sources
- Actively maintained by SUSE
- Available for different architectures
- Can be audited and inspected with tooling made by SUSE

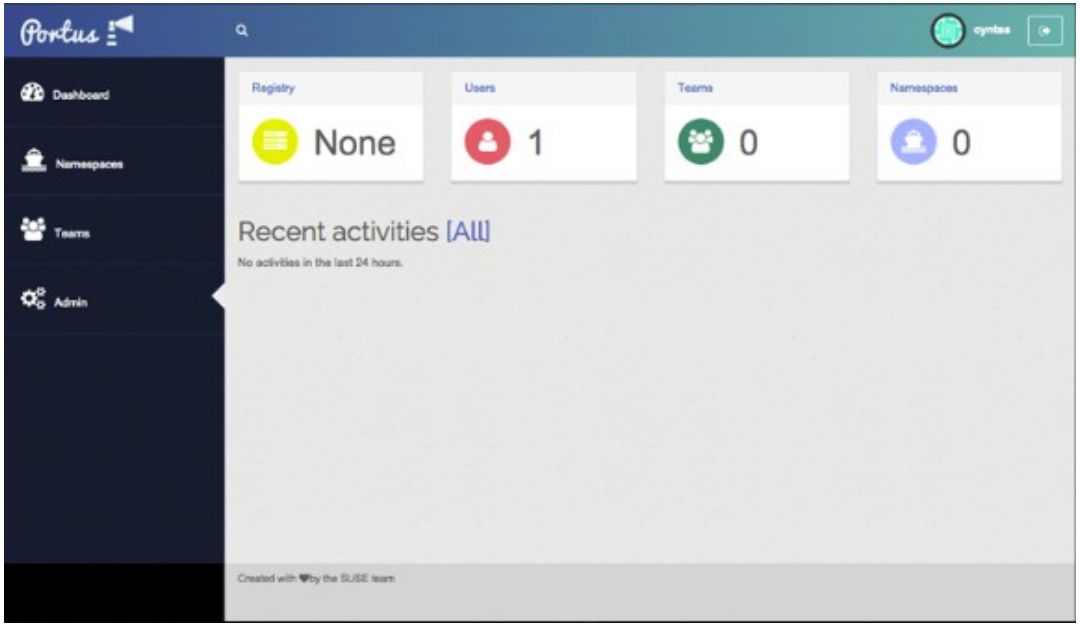
YaST module

- Simple solution to get started with Docker
- Manage the available Docker images
- Run Docker images
- Control of running containers



Portus

- Authentication: control access to your images
- Easy of use: navigate and search your catalog of images
- Collaboration: organize your users with teams
- Auditing: keep everyting under control



What's Next – SLES 12 SP1

- Portus fully supported
- Patch and update of images/containers
- OpenStack integration
- Support for IBM Power and System z
- Docker Security

Outlook

- Patch and update UI and integration
- Minimal OS (JeOS)
- Orchestration
- Physical to Docker migration

Docker from SUSE, Fully Supported

Enterprise-ready

- Images from trusted source (repository)
- Full control over your data: on-premise registry, authentication
- Pre-built Docker images

Operational Efficiency

- Complementary virtualization of Xen/KVM
- Btrfs support
- Higher virtualization density

Easy-to-use tools

- YaST interface
- sle2docker, zypper-docker
- Portus

Learn More

- **We listen! Join our Docker beta program**:

- Docker mini-course videos
  - https://www.suse.com/promo/sle/docker.html
- Try SUSE Linux Enterprise Server 12
  - https://www.suse.com/products/server/download/
- SUSE Docker QuickStart
  - https://www.suse.com/documentation/sles-12/singlehtml/dockerquick/dockerquick.html
- More information in SUSE Linux Enterprise 12
  - https://www.suse.com/promo/sle12.html

It's Demo Time!

Thank you.

Docker at SUSECon 2015

TUT19930 - Docker & Portus : A Winning Duo for Your Infrastructure

- Tue, Nov 3rd, 3:15 PM – 4:15 PM

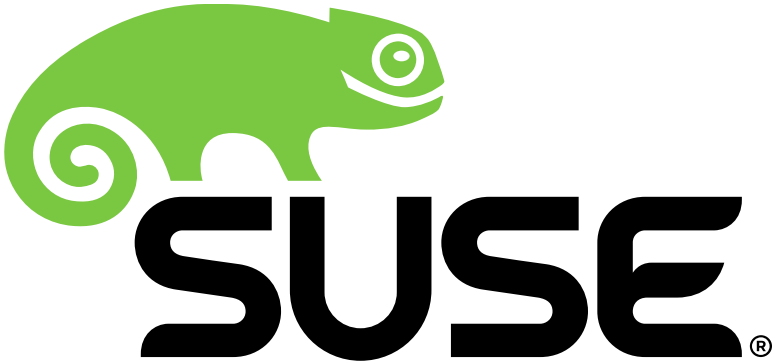
  5 Roland Holst kamer

HO19929 - Hands on session on Docker

- Wednesday, Nov 4th, 2:15 PM - 4:15 PM

  B-Keurzaal
- Thursday, Nov 5th, 9:00 AM - 11:00 AM

  B-Keurzaal



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