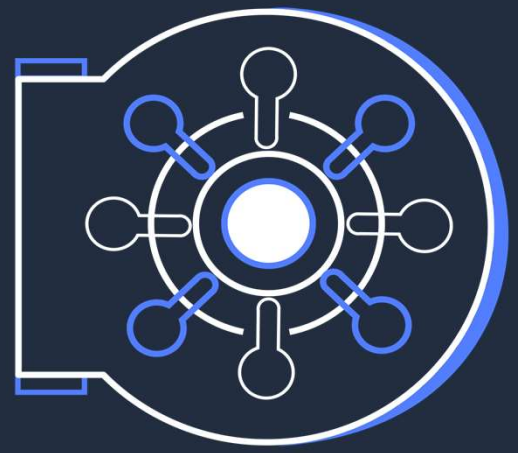
AWS TECHSHIFT

EMBARK

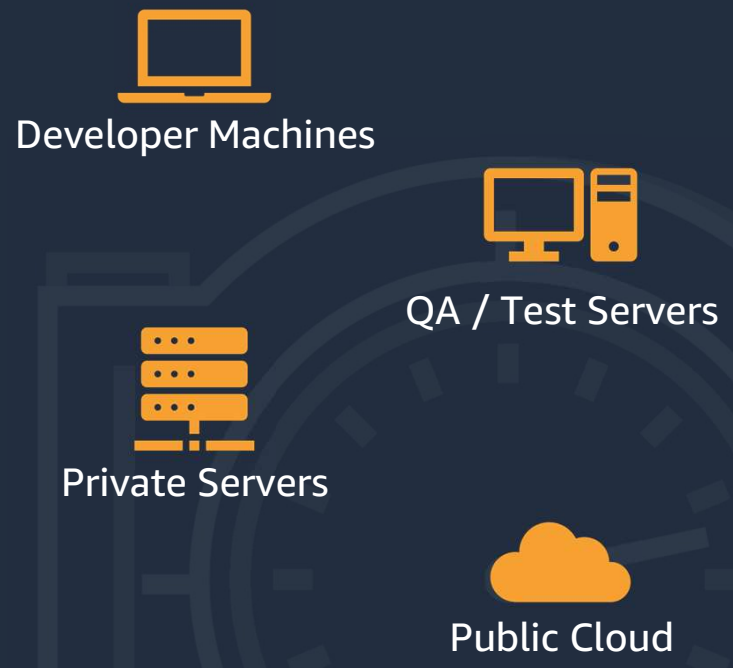


Intro to Containers

AWS TECHSHIFT Why do we need containers?

AWS TECHSHIFT Why do we need containers?

- Different application stacks
- Different hardware deployment environments
- How to run all applications across different environments?
- How to easily migrate from one environment to another?



AWS TECHSHIFT What is a container?

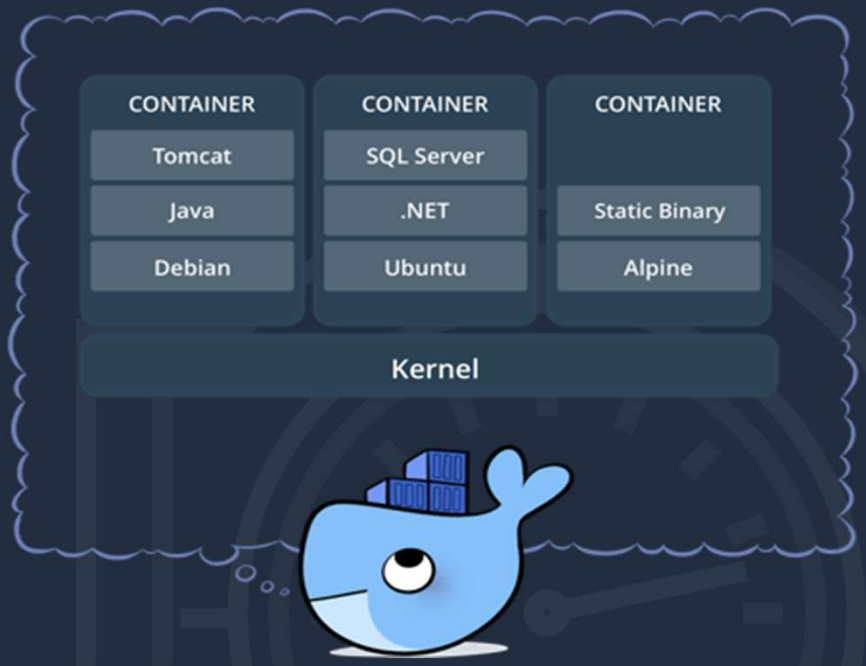
- A lightweight, stand-alone, executable package of software that includes all dependencies
- Containers isolate software from its surroundings
- Long history: chroot, FreeBSD Jails, Solaris Containers, OpenVZ, LXC
- Docker simplified creation/management/operation of containers

AWS TECHSHIFT What is Docker

- Lightweight container virtualization platform.
- Tools to manage and deploy your applications.
- Licensed under the Apache 2.0 license.
- Built by Docker, Inc.

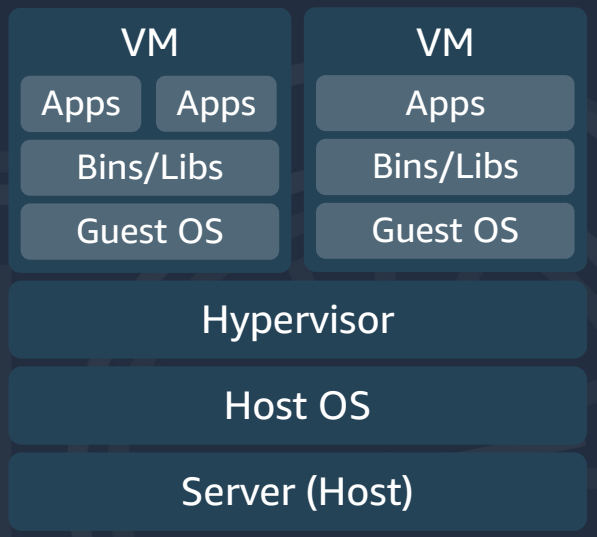
AWS TECHSHIFT Containers vs. Virtual Machines

- Containers share a machine's OS kernel.
- They start instantly and use less compute and RAM.
- Images are constructed from filesystem layers and share common files. This minimizes disk usage and image downloads are much faster.



AWS TECHSHIFT Containers vs. Virtual Machines

- Virtual machines run in a hypervisor that virtualizes all the hardware
- Each virtual machine includes a full copy of the guest operating system
- RAM is pre-allocated at startup
- Virtual machines provide isolation between different OSes



AWS TECHSHIFT Container Benefits

- Portable runtime application environment
- Package application and dependencies in a single artifact
- Run different application versions (different dependencies) simultaneously
- Faster development & deployment cycles
- Better resource utilization

AWS TECHSHIFT What is a container registry

A container registry is a repository for storing built container images. Hosts then download the images so they can be run.

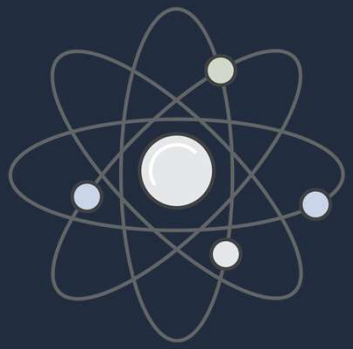
Docker hub is the world's largest container registry with over 100,000 private, public and open-source container images.

AWS TECHSHIFT What is a Amazon ECR

Amazon Elastic Container Registry (ECR) is a fully-managed Docker container registry that makes it easy for developers to store, manage, and deploy Docker container images.

ECR is integrated with AWS services such as Amazon Elastic Container Service (ECS) and AWS Identity and Access Management (IAM)

AWS TECHSHIFT Amazon ECR



Fully Managed

- Tight Integration with Amazon EC
- Integration with Docker Toolset
- Management Console and AWS CLI

Highly Available

- Amazon S3 backed
- Regional endpoints

Secure

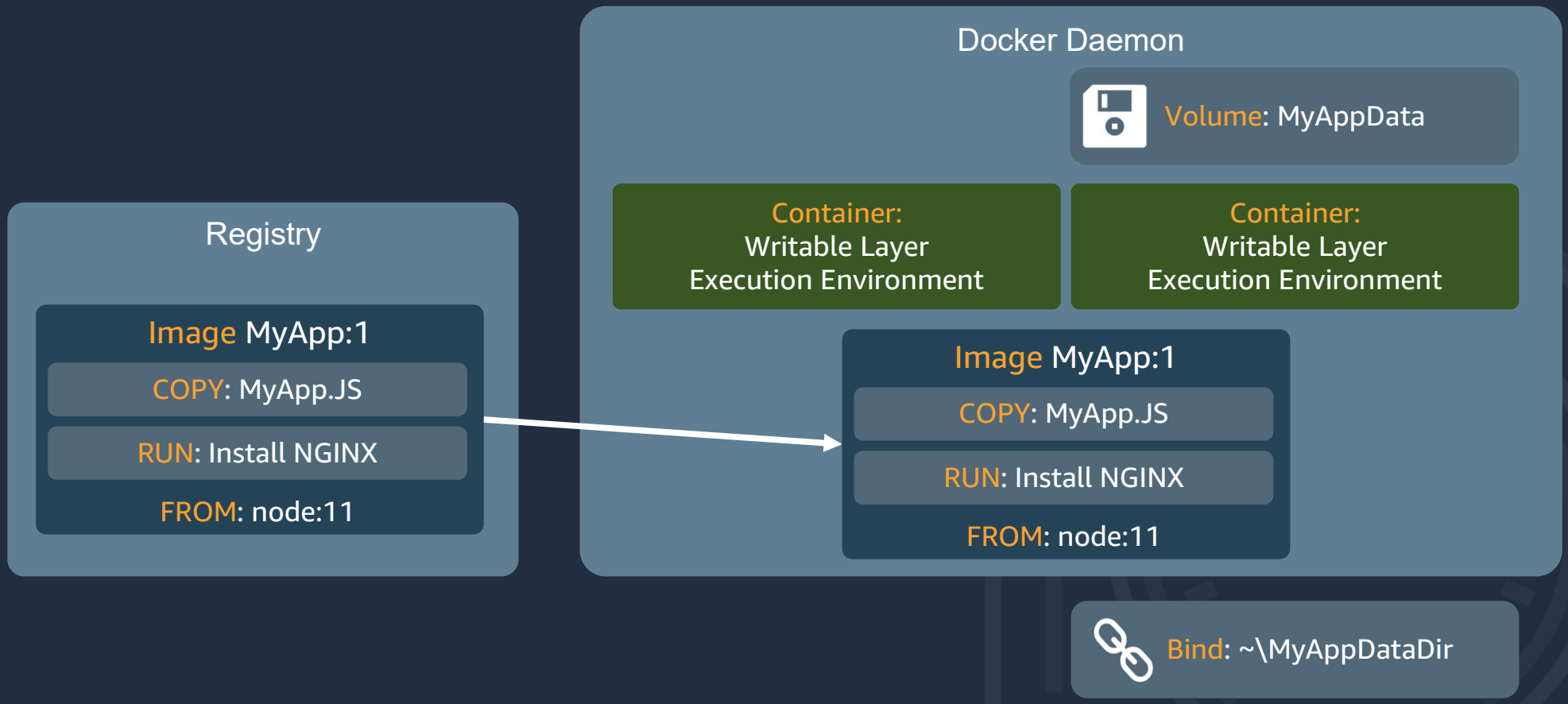
- IAM Resource-based Policies
- AWS CloudTrail Audit Logs
- Images encrypted at transit and at rest

AWS TECHSHIFT Docker Images

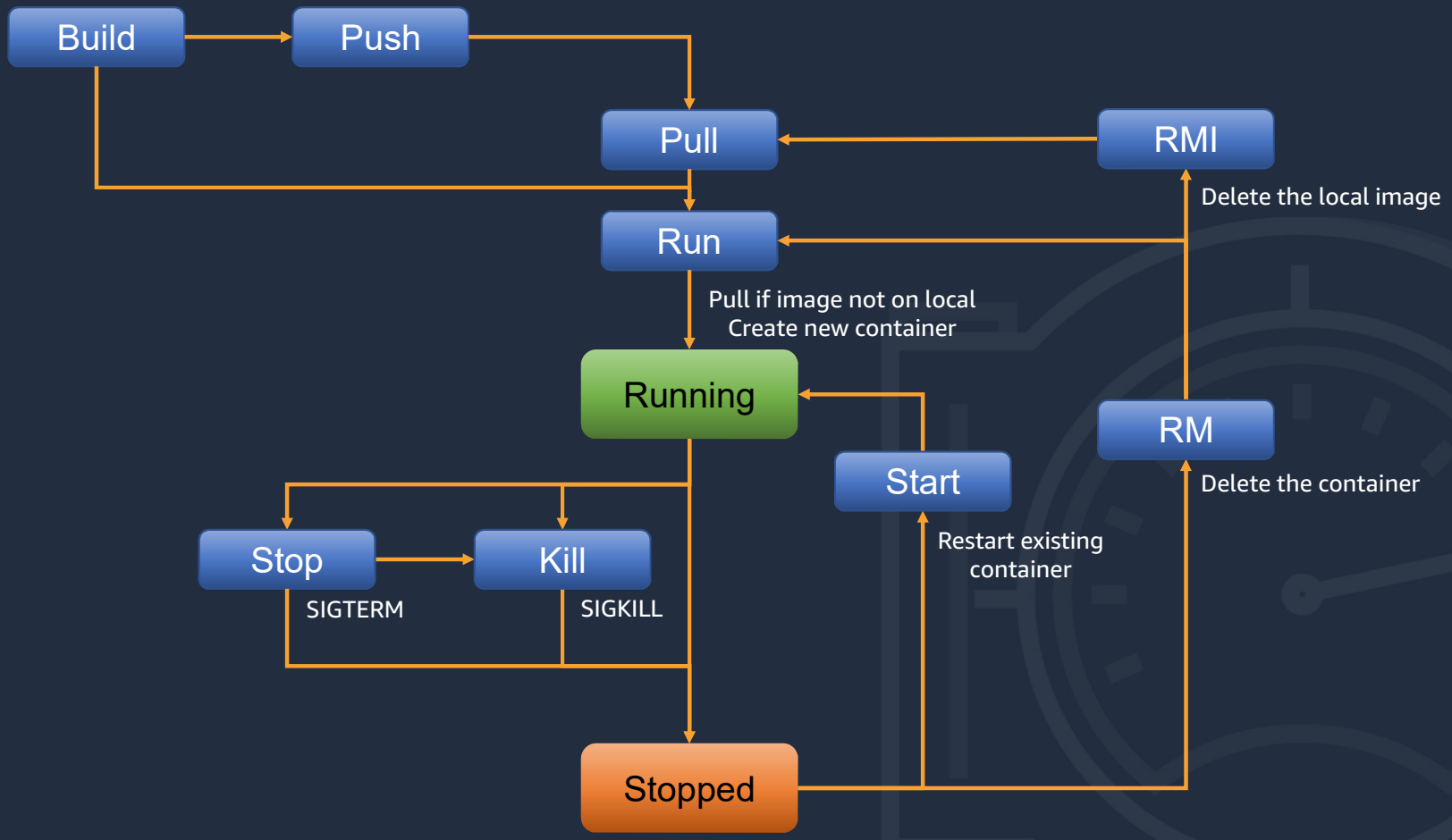
- Read-only template used to launch container
- Union file systems to combine different layers into a single image
- Docker images built from base image, instructions to add layers on top
- Instructions stored in Dockerfile

```
FROM node:11
RUN apt-get install nginx

WORKDIR /usr/src/app
COPY package*.json ./
COPY . .
EXPOSE 3000

CMD [ "npm", "start" ]
```

AWS TECHSHIFT Docker lifecycle



AWS TECHSHIFT Container Lifecycle



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