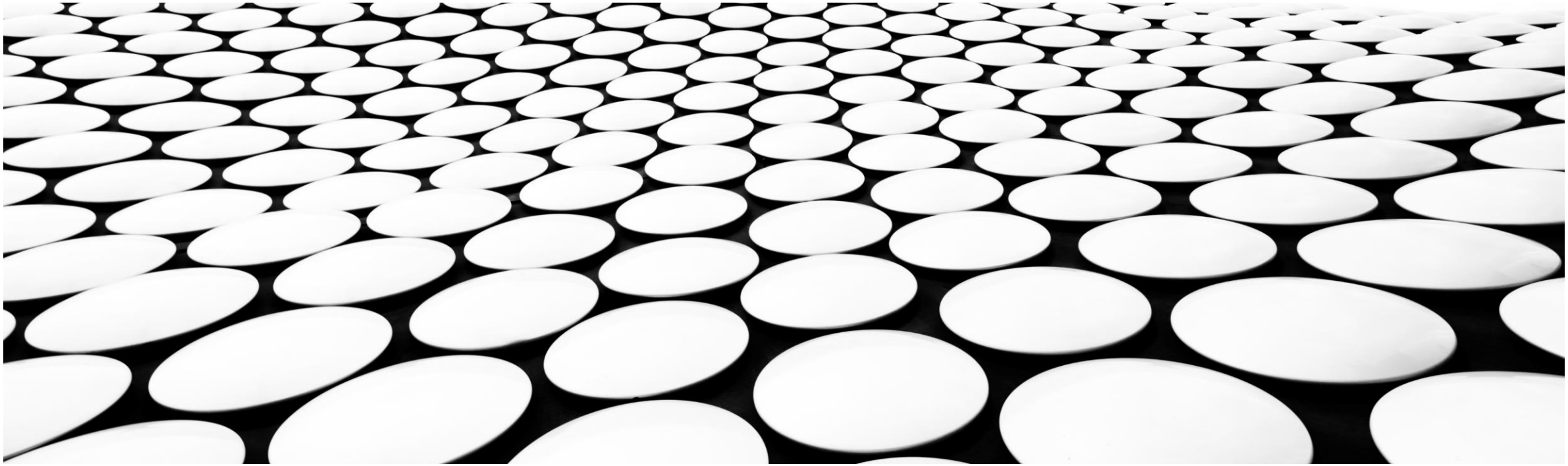
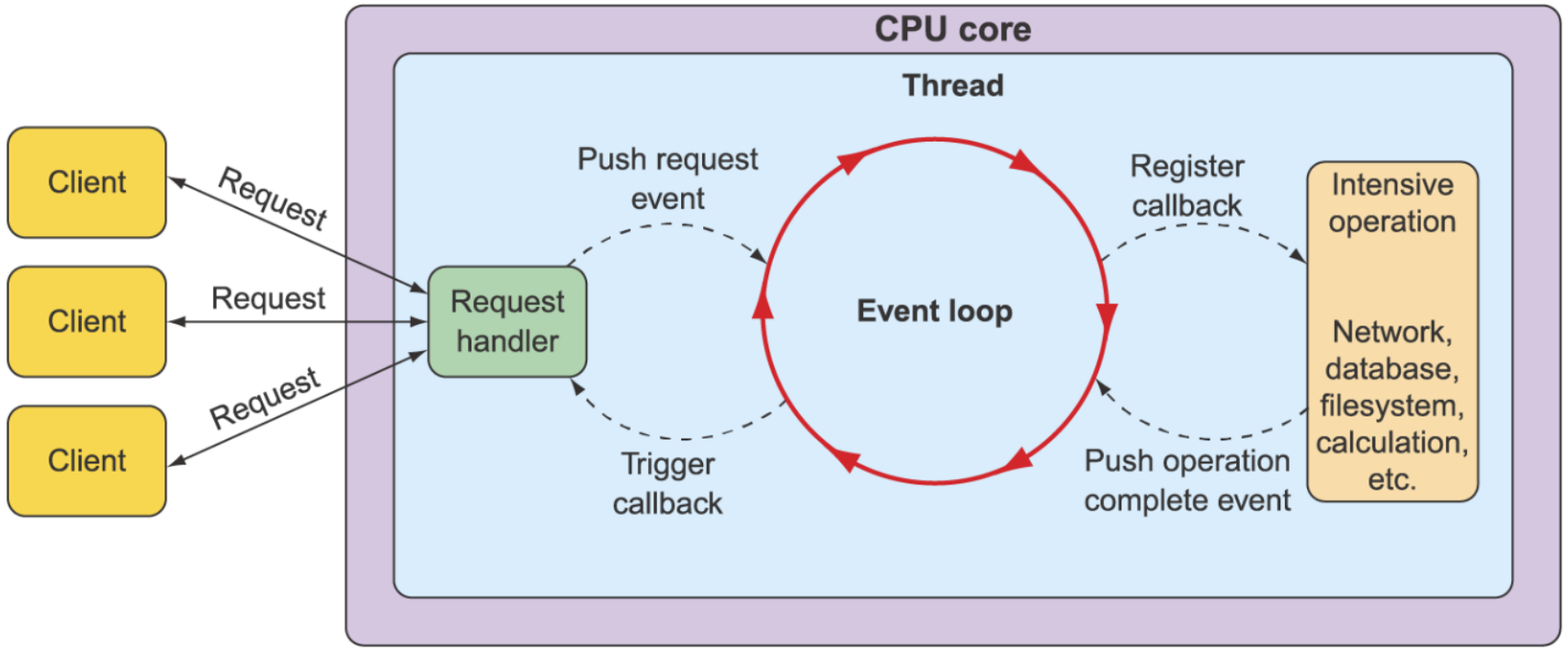


服务端开发-Spring WebFlux

陶召胜

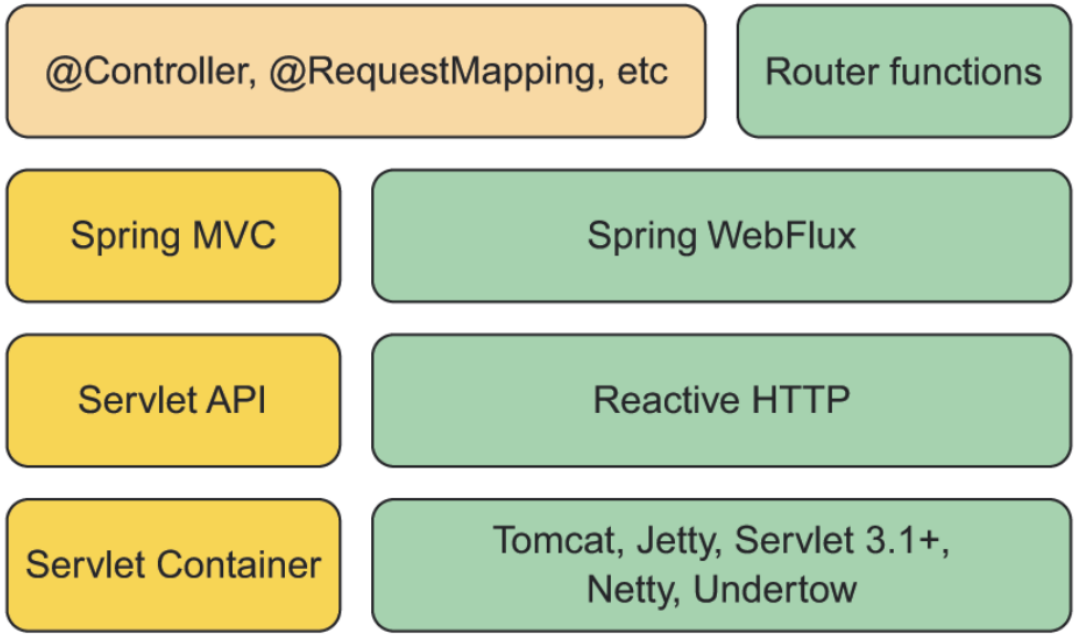
异步Web框架的事件轮询(event looping)机制

- 用更少的线程处理更多的请求，从而减少线程管理的开销



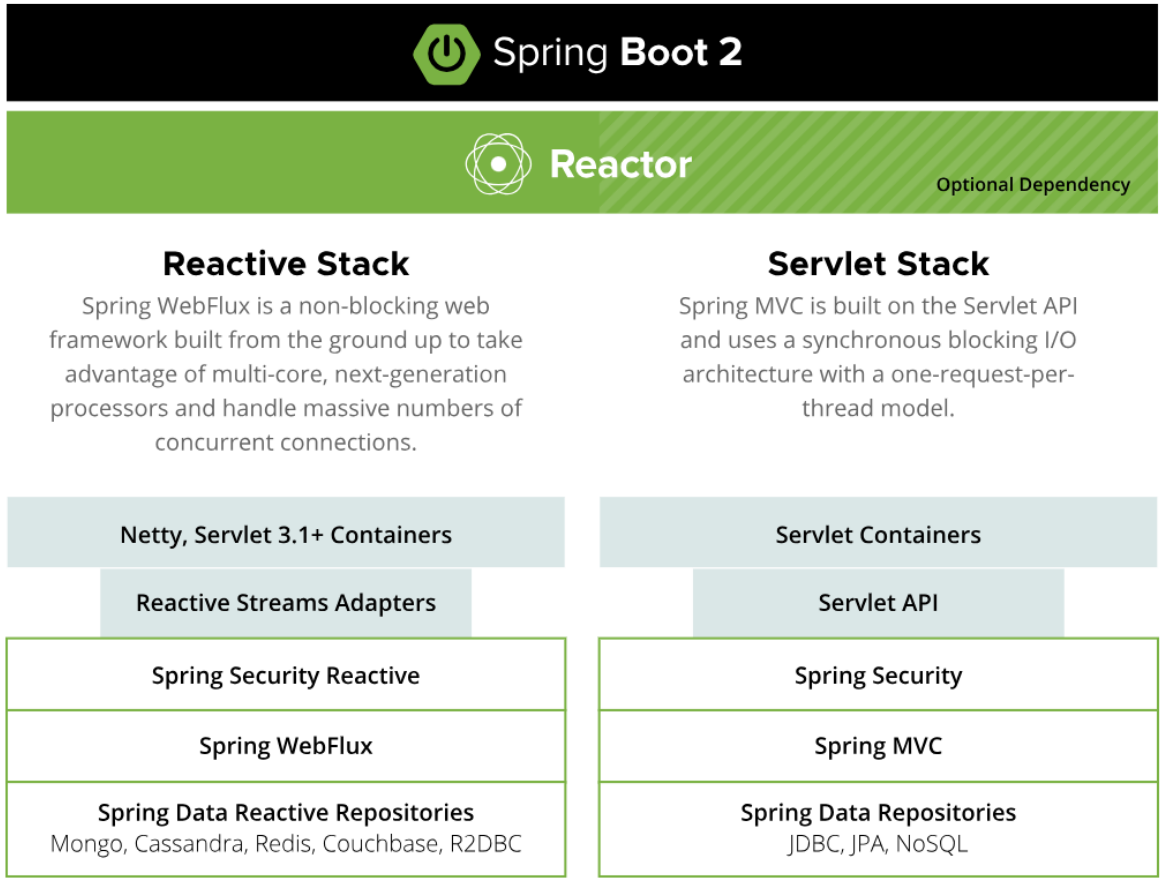
Spring MVC与Spring WebFlux的共性与不同

依赖多线程处理请求



在事件轮询中处理请求

Reactive Microservices With Spring Boot



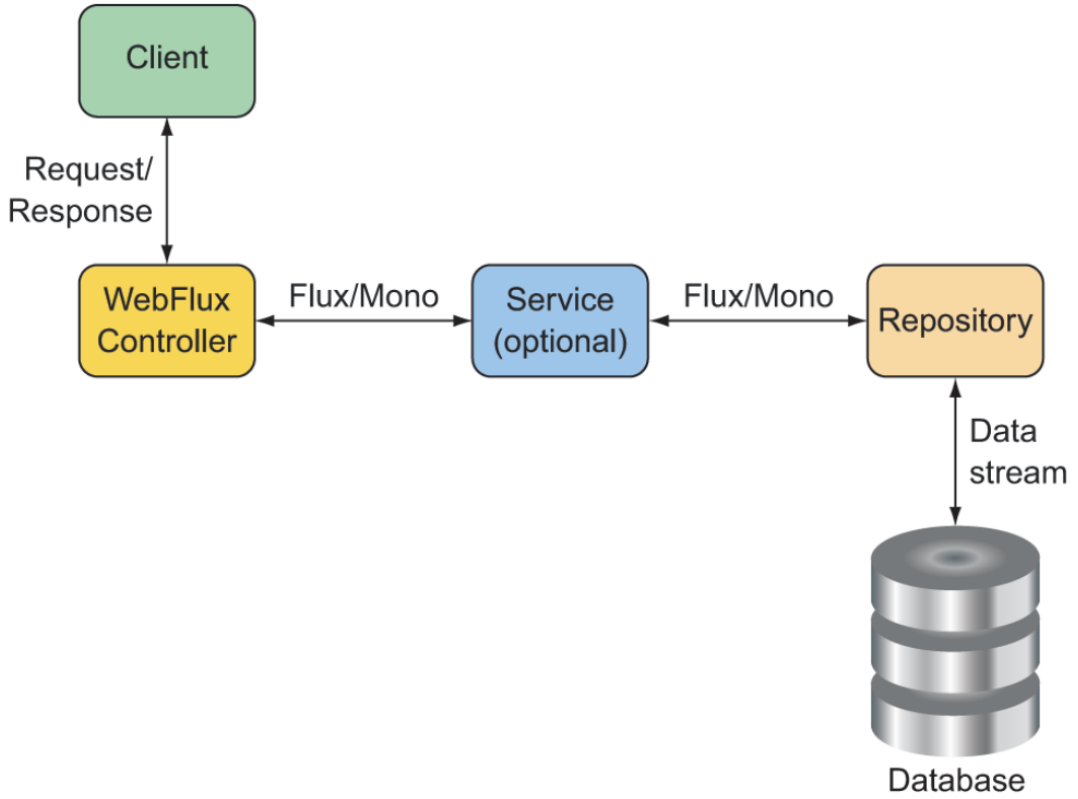
依赖

```
<dependency>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-webflux</artifactId>
</dependency>
```

编写反应式控制器

- Ingredient：Get、Post

端到端反应式栈


Client
Request/
Response
WebFlux
Controller
Flux/Mono
Service
(optional)
Flux/Mono
Repository
Data
stream
Database

R2DBC

- 反应式关系型数据库连接（reactive relational database connectivity）
- 是JDBC的替代方案，实现非阻塞的持久化操作
- 依赖

```
<dependency>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-data-r2dbc</artifactId>
</dependency>
```

- H2数据库和驱动

```
<dependency>
    <groupId>com.h2database</groupId>
    <artifactId>h2</artifactId>
    <scope>runtime</scope>
</dependency>
<dependency>
    <groupId>io.r2dbc</groupId>
    <artifactId>r2dbc-h2</artifactId>
    <scope>runtime</scope>
</dependency>
```

使用函数式编程范式来定义控制器

- 使用函数式编程风格来定义endpoints的功能
- 框架引入了两个基本组件：HandlerFunction 和 RouterFunction
- HandlerFunction 表示处理接收到的请求并生成响应的函数
- RouterFunction 替代了 @RequestMapping 注解。它用于将接收到的请求路由到处理函数

函数式编程模型涉及的4个类型

- RouterFunction Bean
- org.springframework.web.reactive.function.server
  - ✓ RequestPredicate，声明要处理的请求类型
  - ✓ RouterFunction，声明如何将请求路由到处理器代码中
  - ✓ ServerRequest，代表一个http请求，包括对请求头和请求体的访问
  - ✓ ServerResponse，代表一个http响应，包括响应头和响应体信息

测试反应式控制器

- 处理器函数使用单独的Bean实现，GreetingHandler
- WebTestClient

反应式消费Rest API

- RestTemplate=>WebClient
- GreetingClient

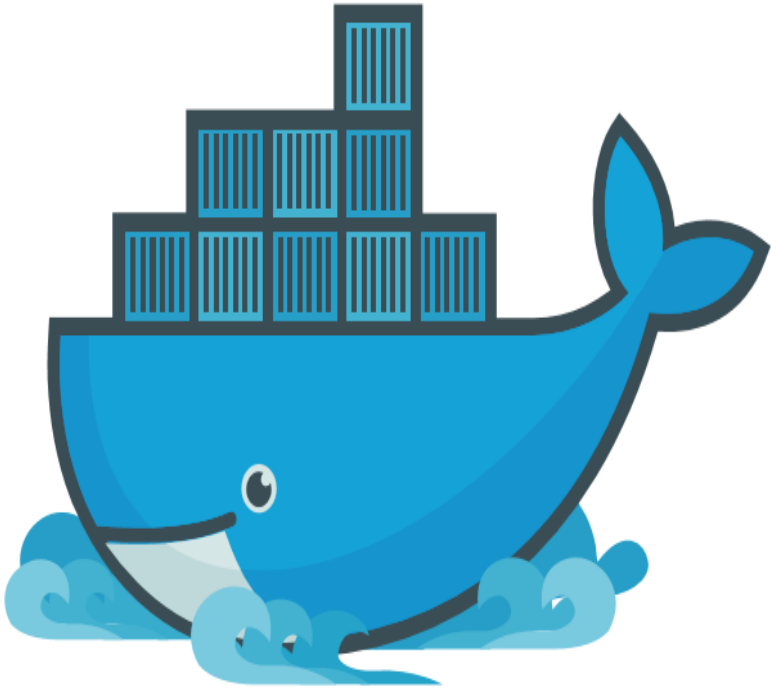
控制器的快速返回

- /mono
- /flux，text/event-stream

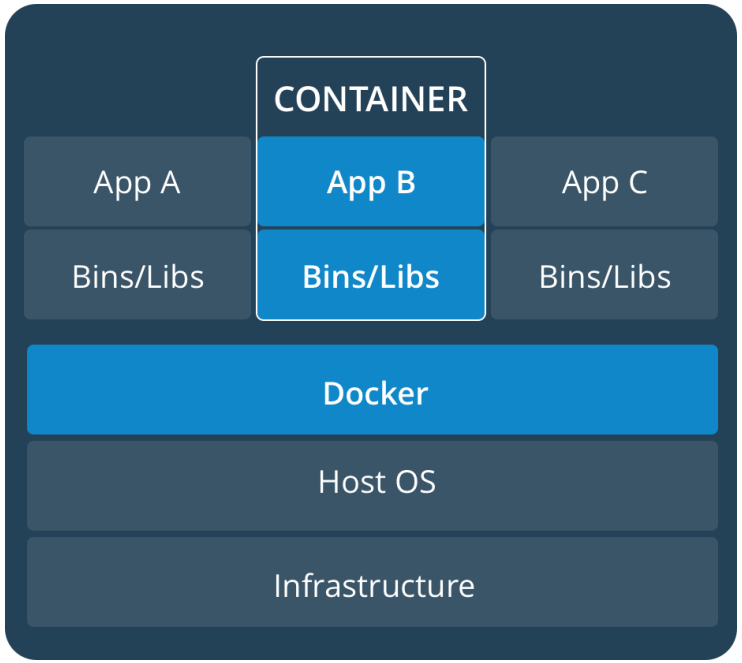
下节课前请安装Docker

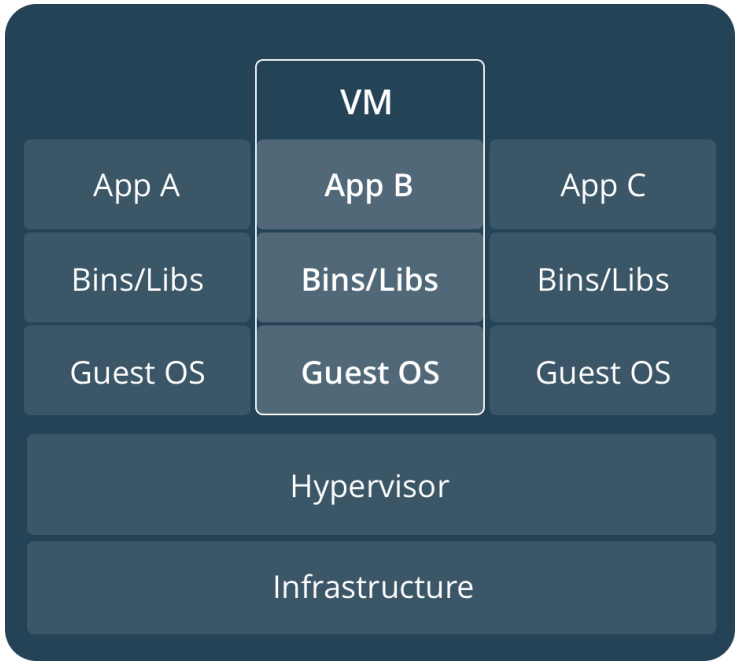
Build, Ship, Run

Docker is the world's leading software containerization platform



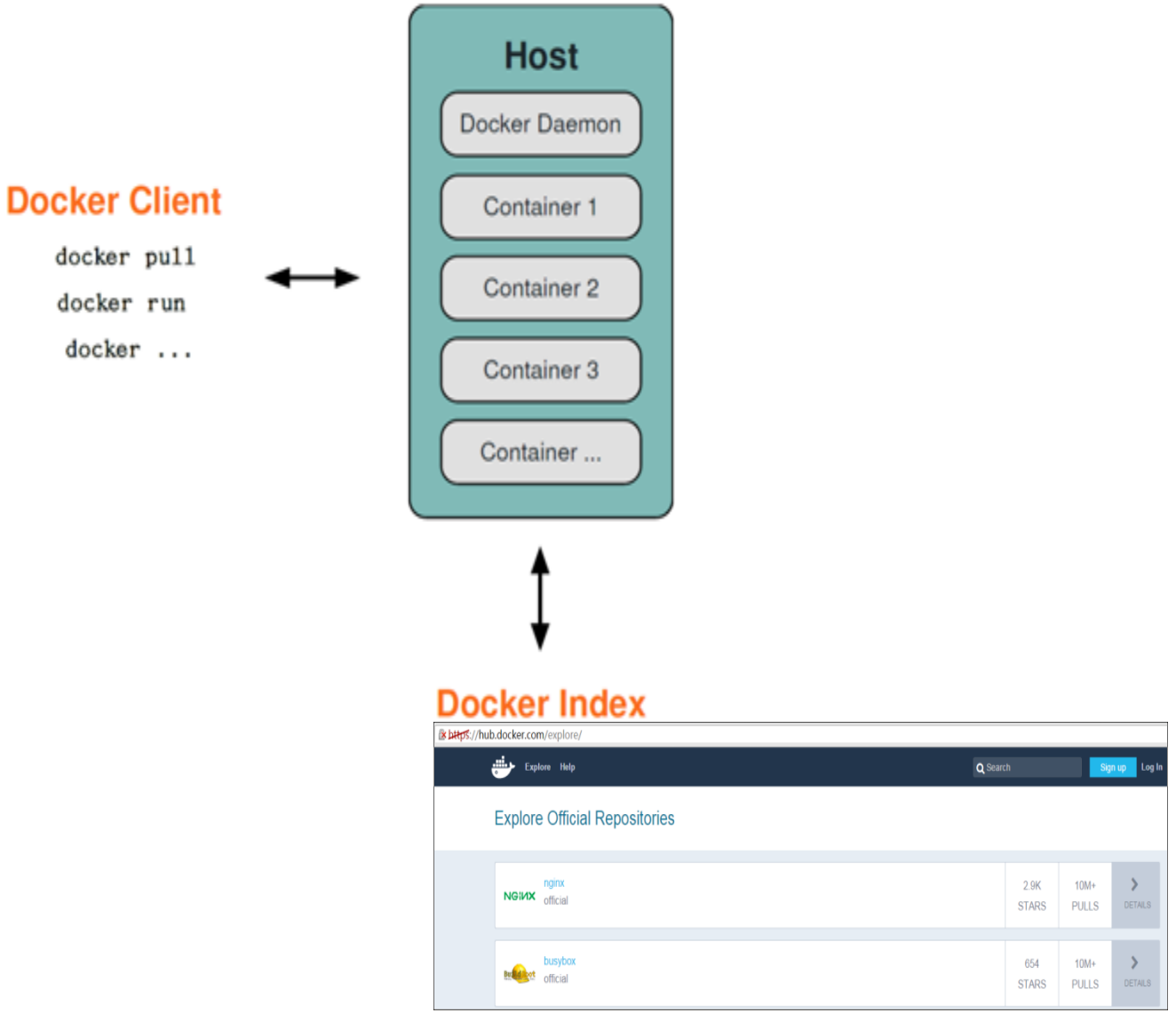
容器与虚机





Docker的3部分

- Docker daemon就是Docker Engine，一般在宿主主机后台运行
- 用户使用client通过pipe、unix socket或tcp直接跟daemon交互
- Docker index指向Docker registries，也叫docker仓库，可以用来让你上传和下载images。Hub.docker.com为docker官方仓库

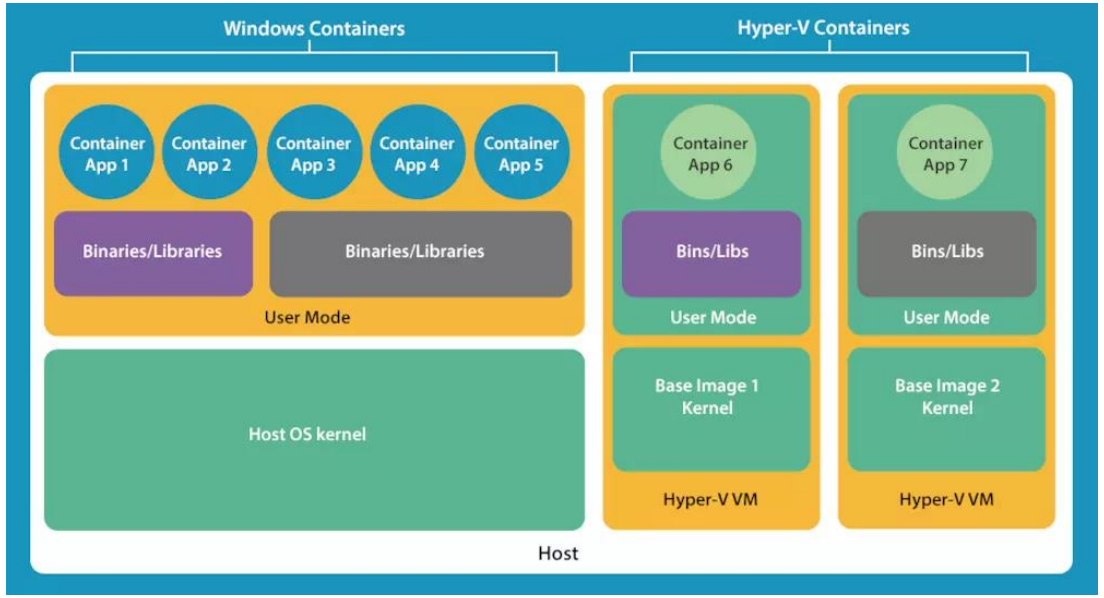


Docker可运行在以下操作系统

- Windows
- OS X
- Linux

Windows下的两类容器

- Windows Container
- linux container



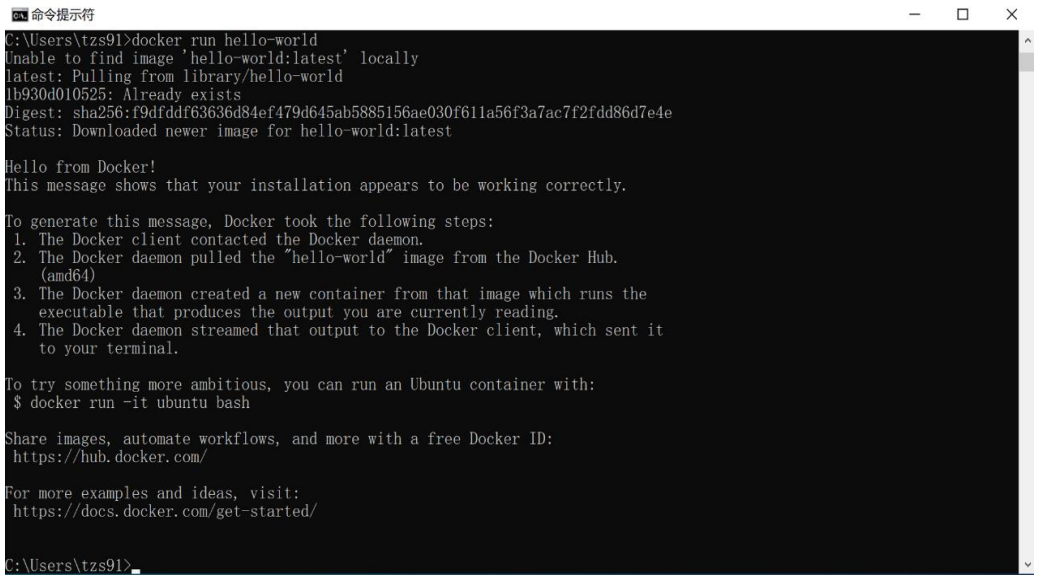
作业：Docker安装请反馈截图

1、docker version 来查看版本号

2、docker run hello-world 载入测试镜像

```
C:\Users\tzs91>docker version
Client:
 Cloud integration: v1.0.20
 Version:           20.10.10
 API version:       1.41
 Go version:        go1.16.9
 Git commit:        b485636
 Built:             Mon Oct 25 07:47:53 2021
 OS/Arch:           windows/amd64
 Context:           default
 Experimental:      true

Server: Docker Engine - Community
 Engine:
  Version:          20.10.10
  API version:      1.41 (minimum version 1.12)
  Go version:       go1.16.9
  Git commit:       e2f740d
  Built:            Mon Oct 25 07:41:30 2021
  OS/Arch:          linux/amd64
  Experimental:     false
 containerd:
  Version:          1.4.11
  GitCommit:        5b46e404f6b9f661a205e28d59c982d3634148f8
 runc:
  Version:          1.0.2
  GitCommit:        v1.0.2-0-g52b36a2
 docker-init:
  Version:          0.19.0
  GitCommit:        de40ad0
```



谢谢观看！