Recitation 2: Development

January 22, 2018

Topics

- Node
- MVC and MVVM
- Git / GitHub
- Continuous Integration / Travis
- Docker
- Azure / VMs
- Homework 2

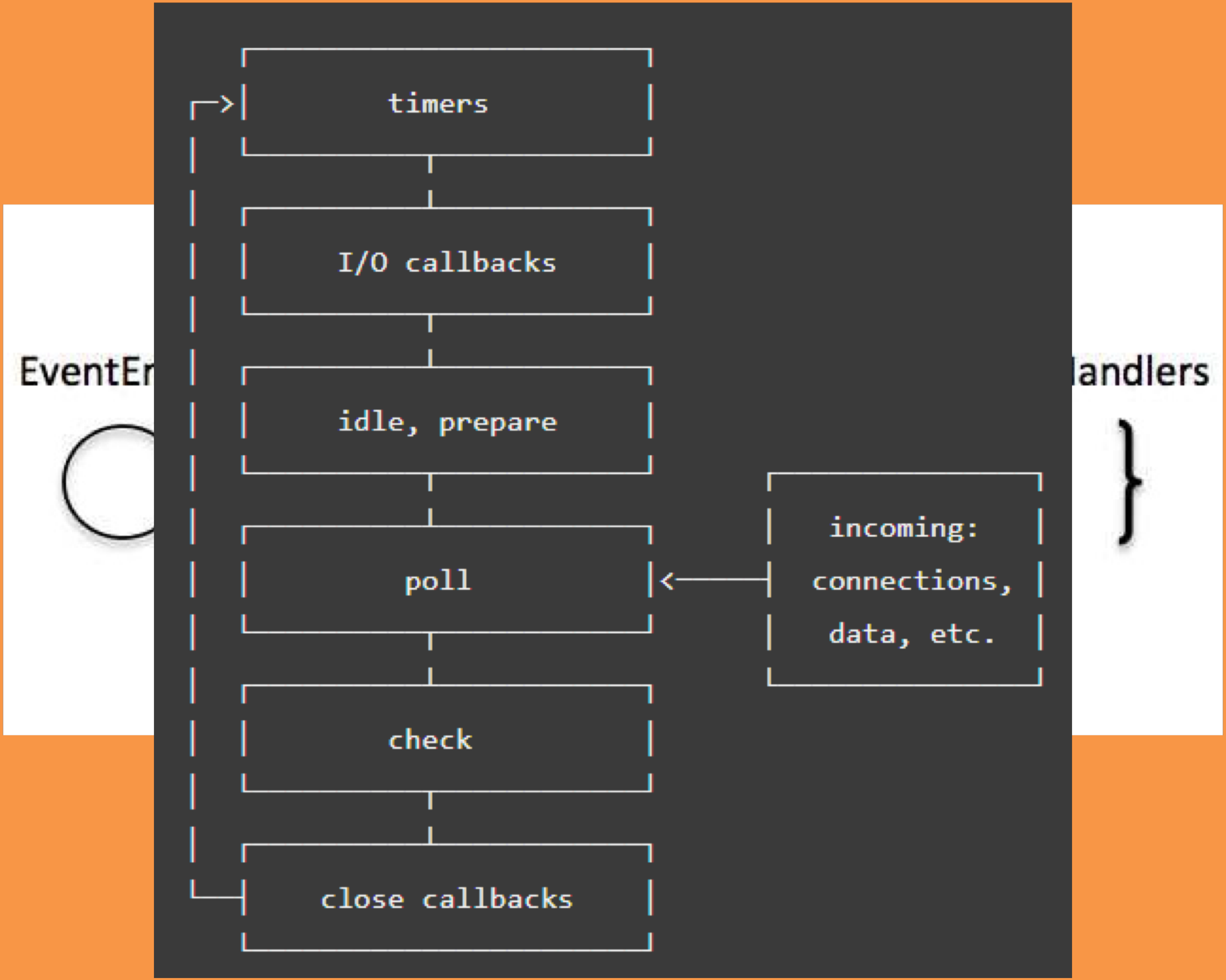
NODE .JS

What is Node?

- JavaScript runtime built on the open source V8 JavaScript engine, which also powers Chrome
- JavaScript that runs on server
- Used to build “somewhat” powerful, fast, scalable web applications
- Uses event-driven, non-blocking I/O model --- built to handle async Javascript via a callback system (classically)

Non-blocking I/O

- Single threaded
- Asynchronous function calls
- Concurrency (in node) refers to the Event Loop's capacity to execute Javascript "callback" functions after completing other work
- Dangers of mixing blocking and non-blocking code



EventEr

andlers

timers

I/O callbacks

idle, prepare

poll

check

close callbacks

incoming:
connections,
data, etc.

Async Options?

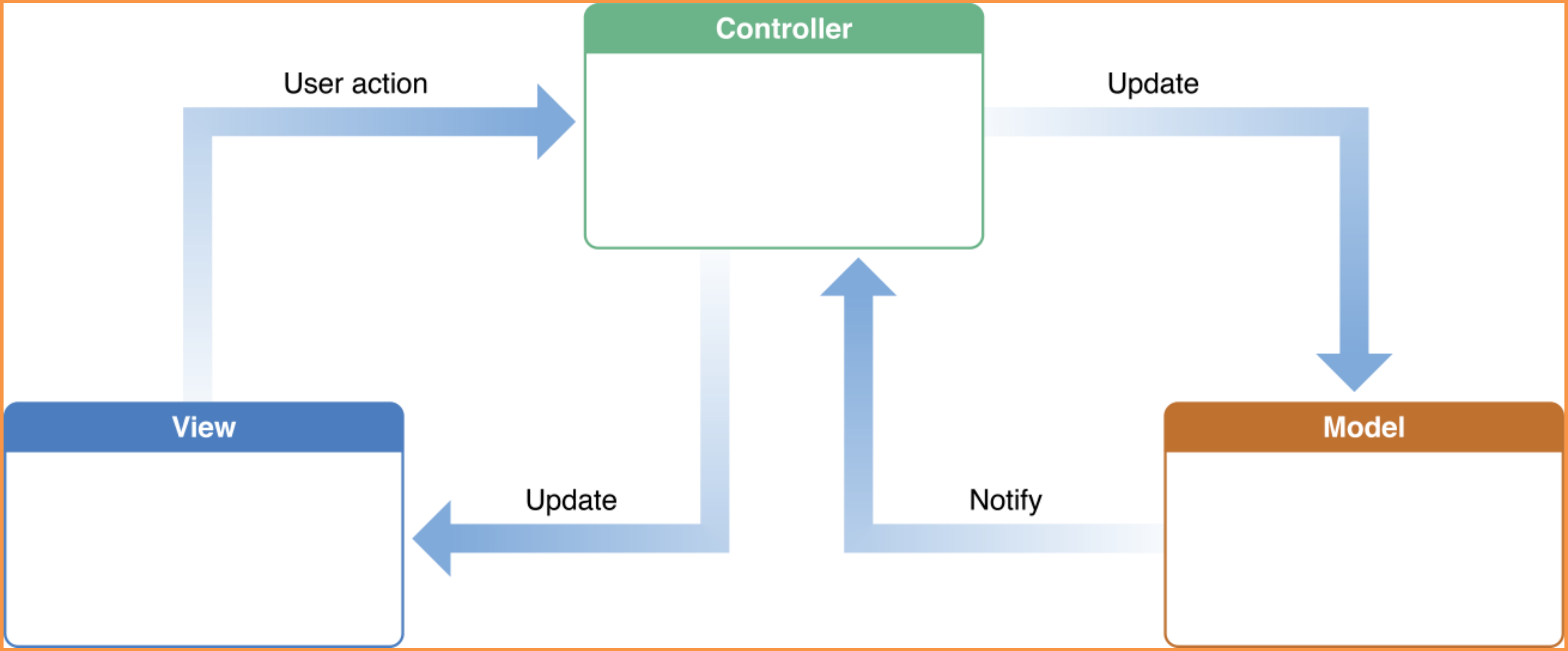
- Callbacks: functions passed to another functions ~ CALLBACK HELL!
- Promises (and promise chains): structured callbacks
- Generators: functions which can be exited/paused and later re-entered
- Async/Await: combining generators and promises ~ *async code ”made” imperative*

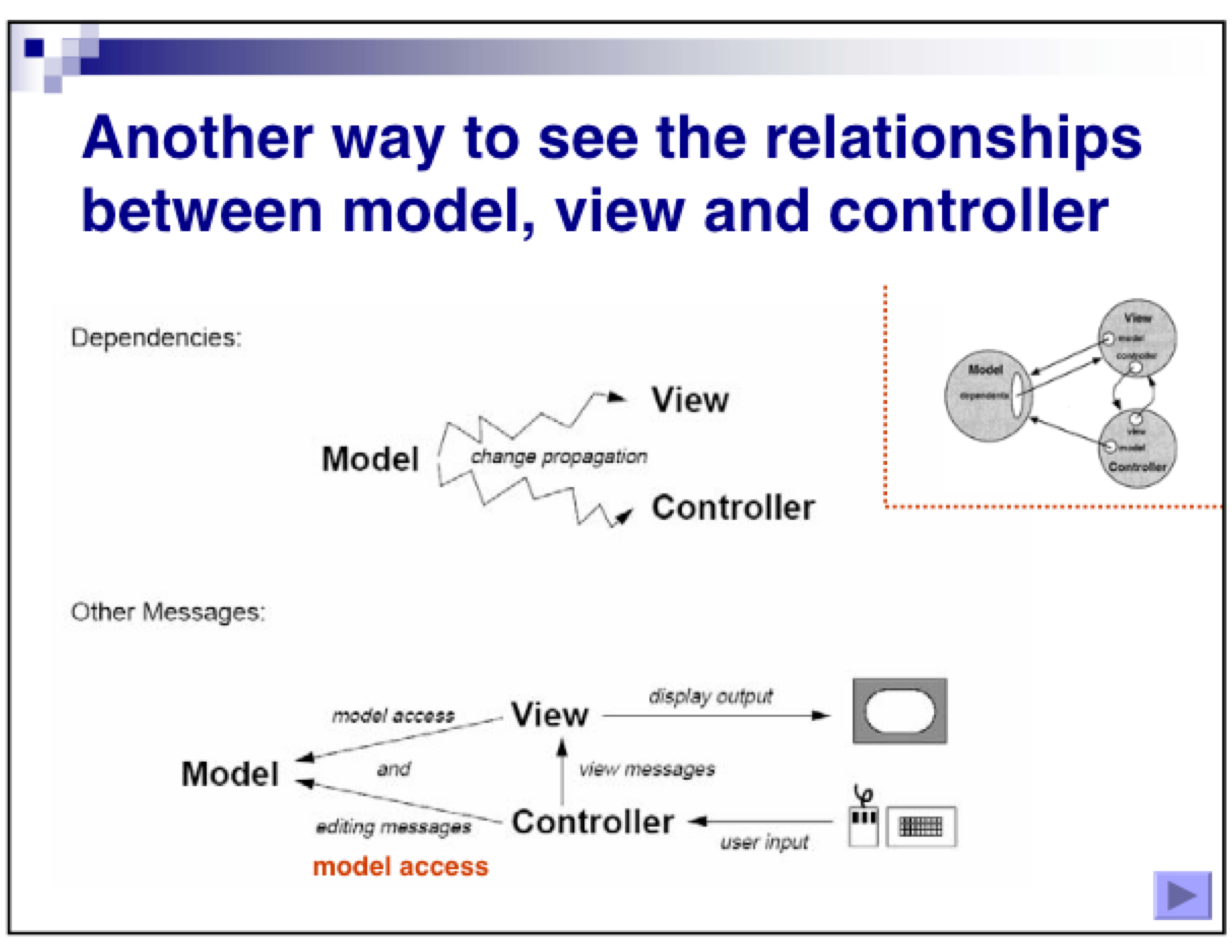
NPM

- Node Package Manager
- The largest ecosystem of open source libraries in the world ~ **probably**

MVC AND MVVM

MVC

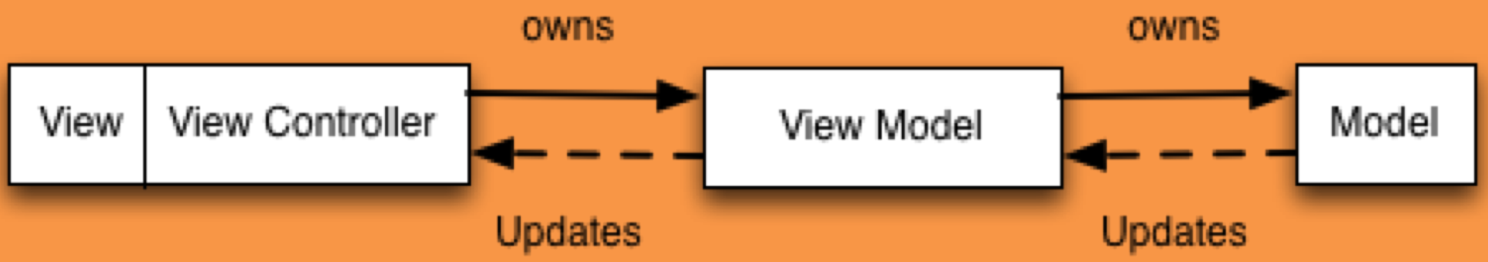




Another way to see the relationships between model, view and controller

model access

MVVM


owns
owns
View
View Controller
View Model
Model
Updates
Updates

GIT / GITHUB

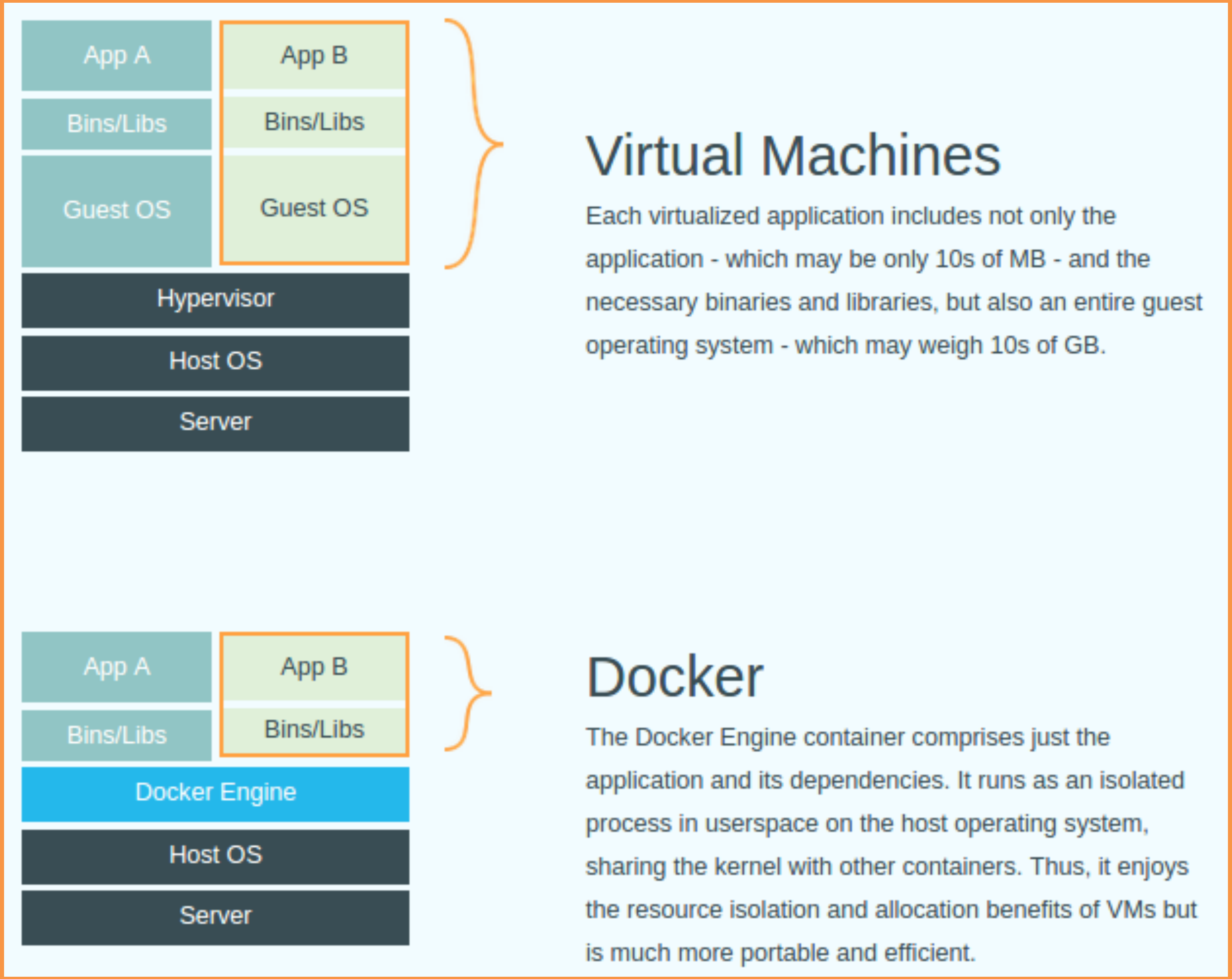
CONTINUOUS INTEGRATION

DOCKER

What is Docker?

- Running applications in an isolated, sandboxed environment, executing only necessary applications
- Lightweight and faster start times
- "Run Anywhere"
- A daemon and a cli
- docker-machine
  - a tool that lets you install *Docker Engine* on virtual hosts

Docker vs. VM



Virtual Machines

Each virtualized application includes not only the application - which may be only 10s of MB - and the necessary binaries and libraries, but also an entire guest operating system - which may weigh 10s of GB.

Docker

The Docker Engine container comprises just the application and its dependencies. It runs as an isolated process in userspace on the host operating system, sharing the kernel with other containers. Thus, it enjoys the resource isolation and allocation benefits of VMs but is much more portable and efficient.

AZURE OR AWS OR GCE