Hierarchical MVC

Transform your Monolith

WHO AM I?

- Luis Majano
- Computer Engineer
- Born in El Salvador -> Texas
- CEO of **Ortus Solutions**
- Sandals -> ESRI -> Ortus

Ortus Solutions
A Software Revolution

@lmajano
@ortussolutions

Professional Open Source

Consulting Services

MANY BOXES

COLDBOX

COMMANDBOX

FORGEBOX

CONTENTBOX

WIREBOX

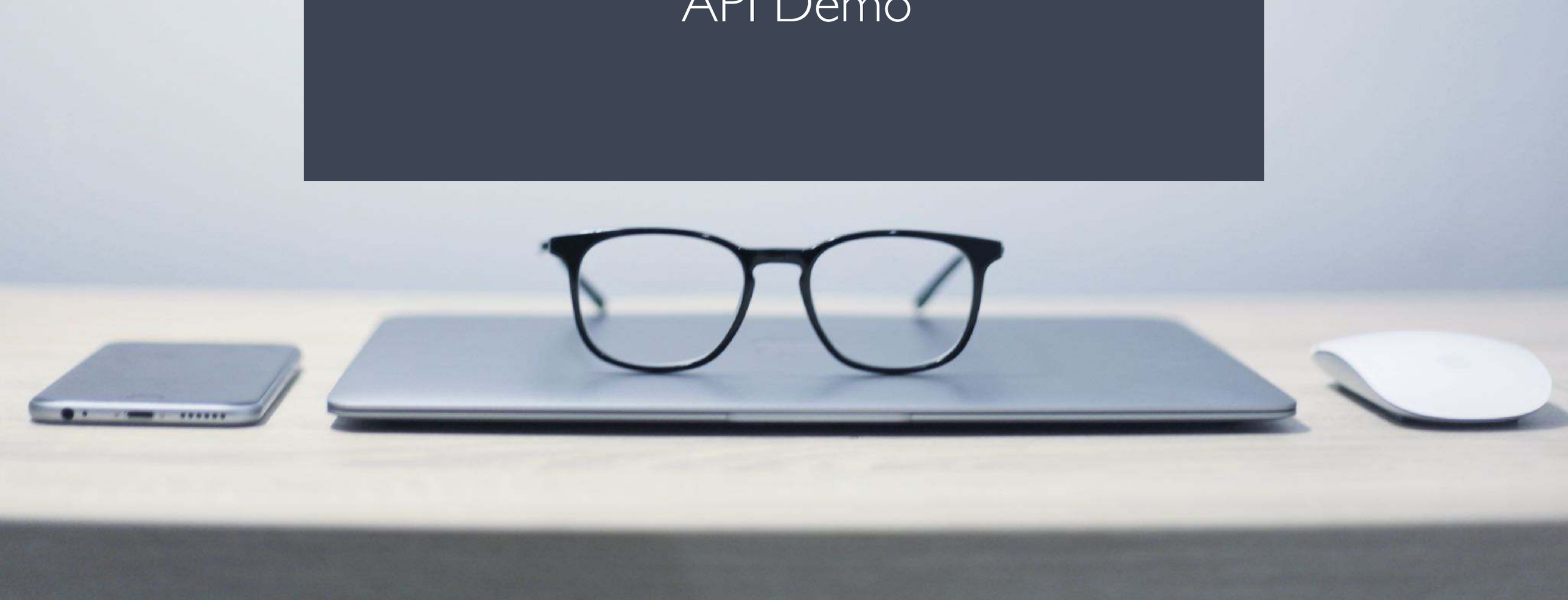
LOGBOX

CACHEBOX

TESTBOX

COLDBOX

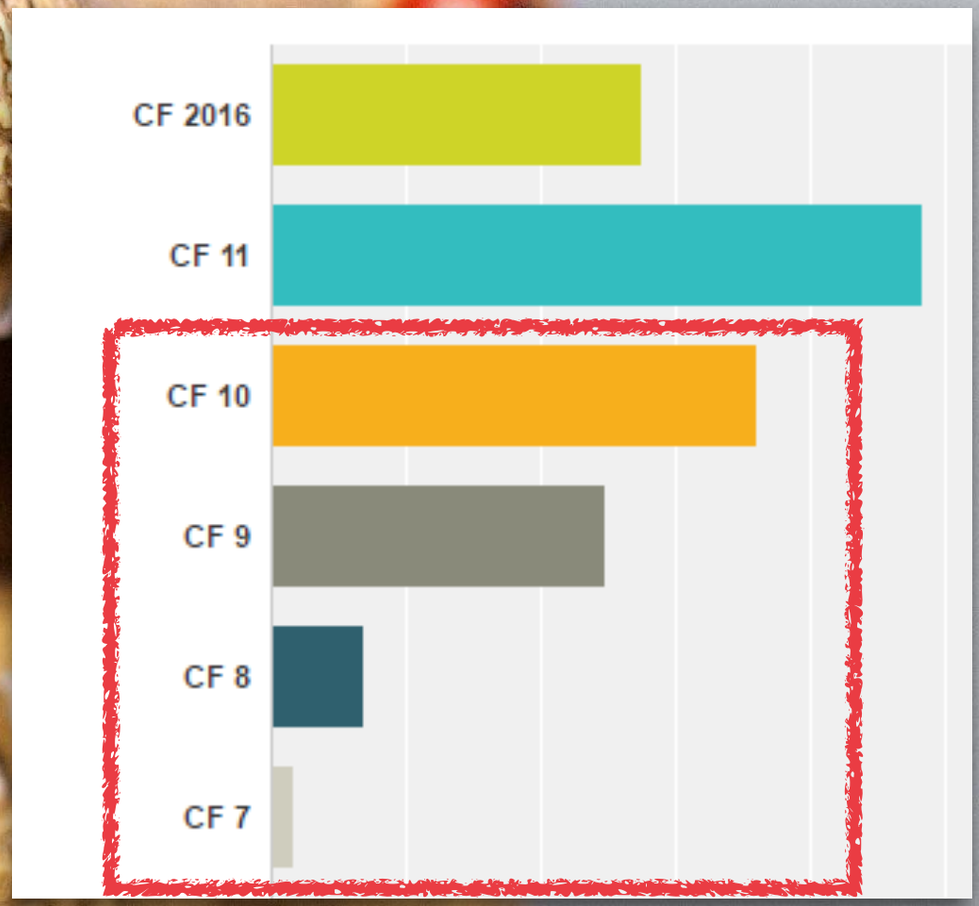
The Legacy Problem
Monolithic Applications
HMVC Architecture
ColdBox Modules
API Demo



THE LEGACY PROBLEM

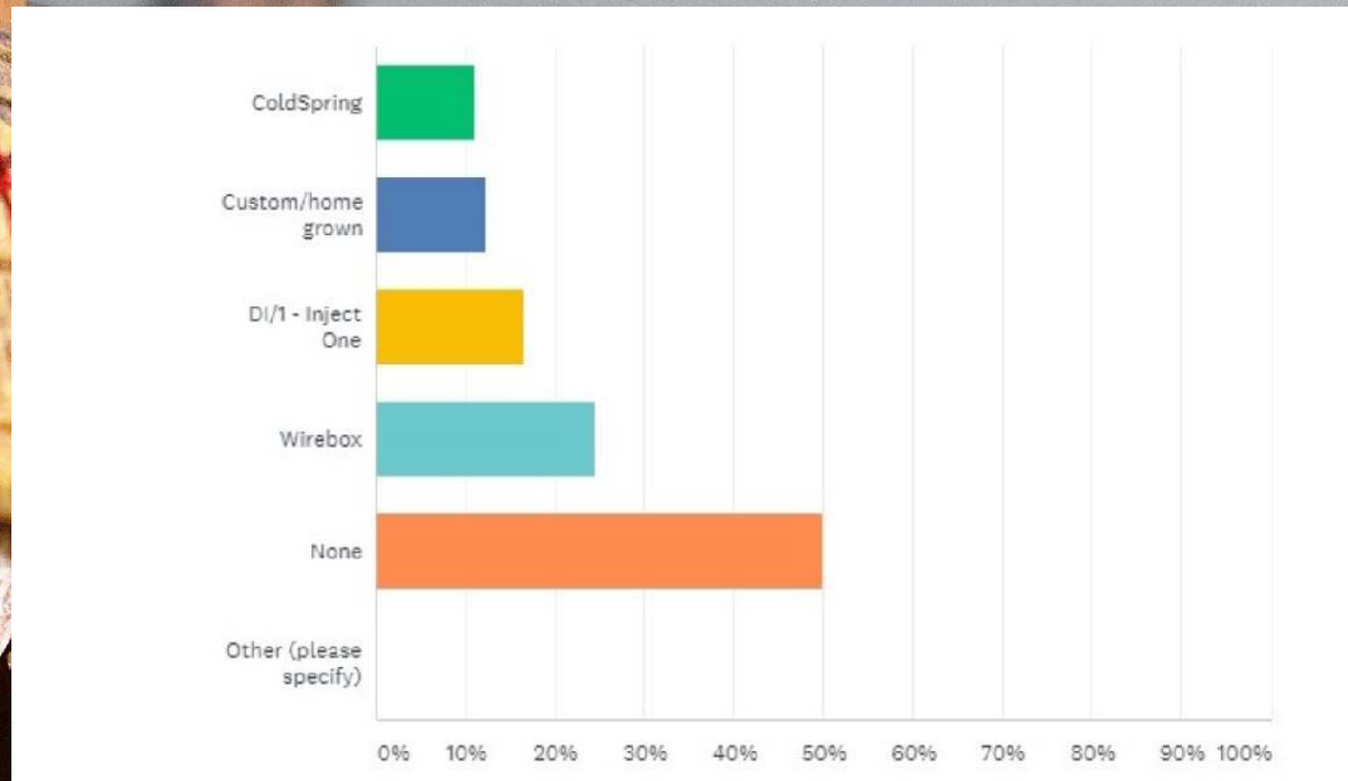
LEGACY PROBLEM

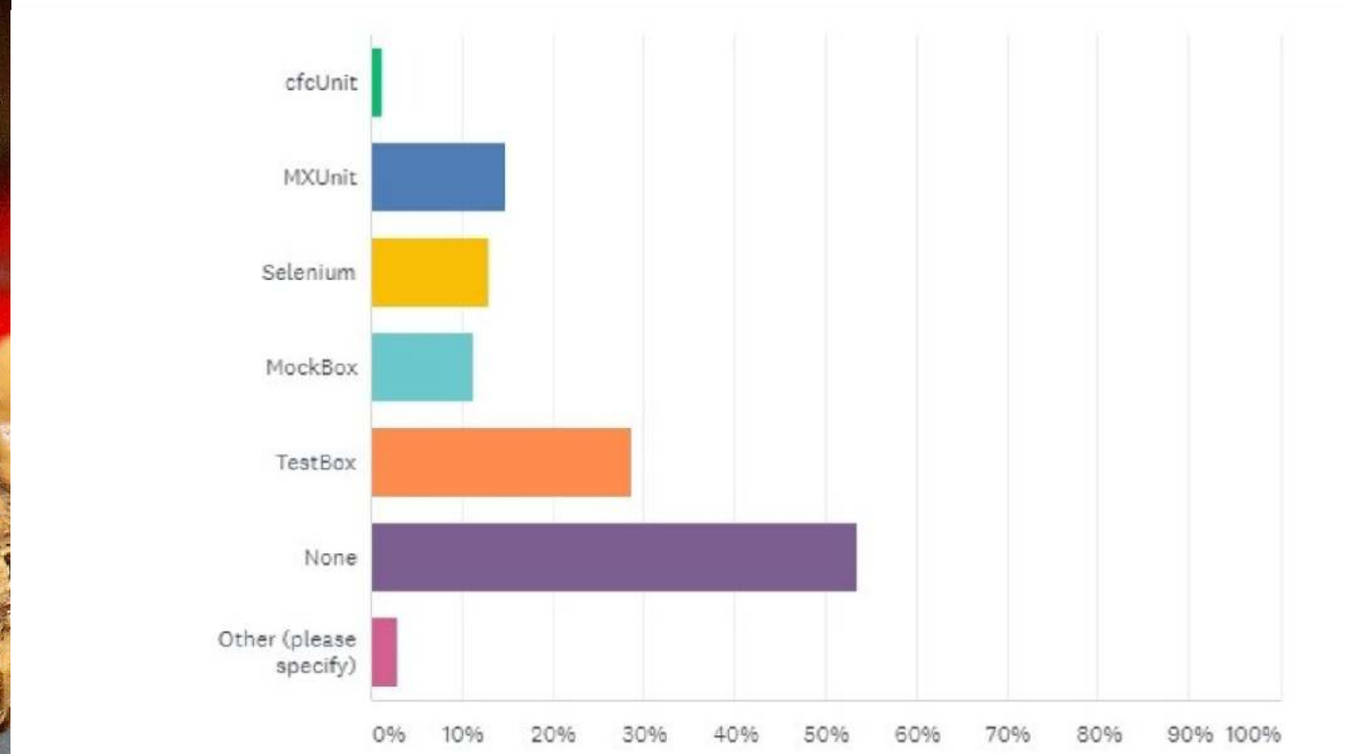
- Gives Any Language a bad name
- Security Issues
- Performance Issues
- Employee Issues
- Development Issues
- Finding Developer Issues



LEGACY PROBLEM

- >55% No MVC
- >50% No DI
- >50% No Testing





Refresh is not valid Testing

LIKE MY CFML APP?

Monolithic Apps

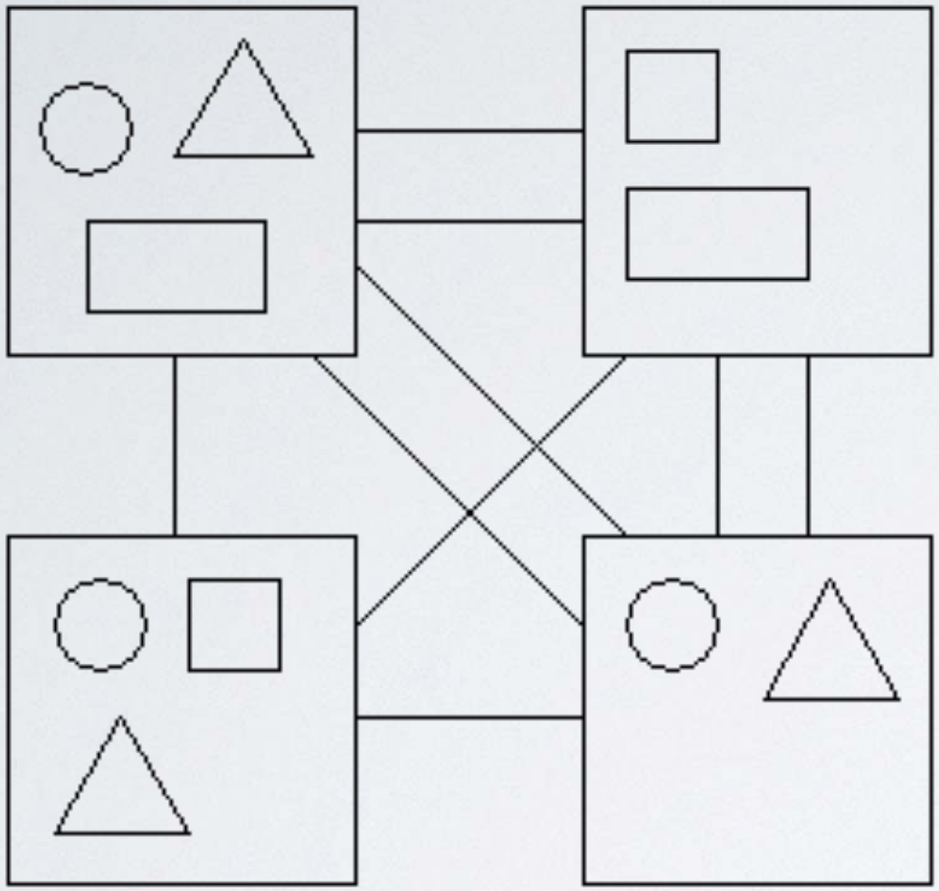
Legacy Fun Comments

```
<!-- Do not remove the following lines or things break -->

<!- Dont’ know what this variable does, but don’t touch it -->

<!-- Remove at your own risk -->

<!-- I have no idea where this variable is set ->
```

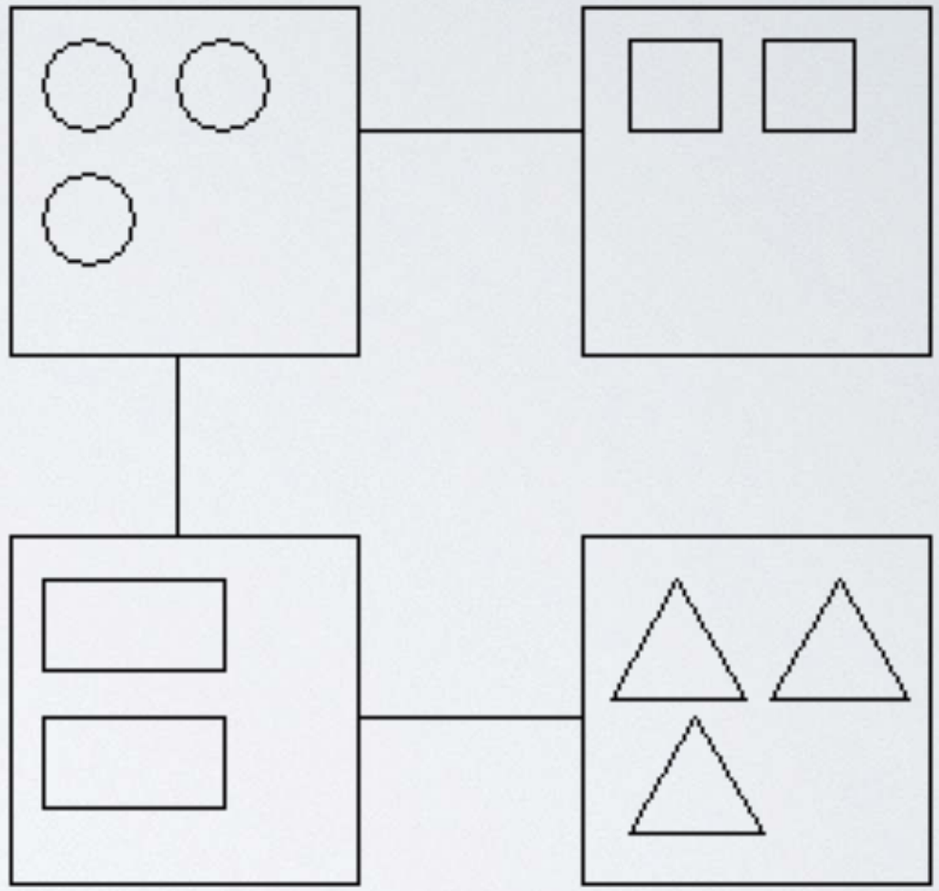
"Software is always bound to change"

BACK TO THE SCHOOL OF ARCHITECTURE

1. COHESION - COUPLING



Low cohesion and high coupling



High cohesion and low coupling

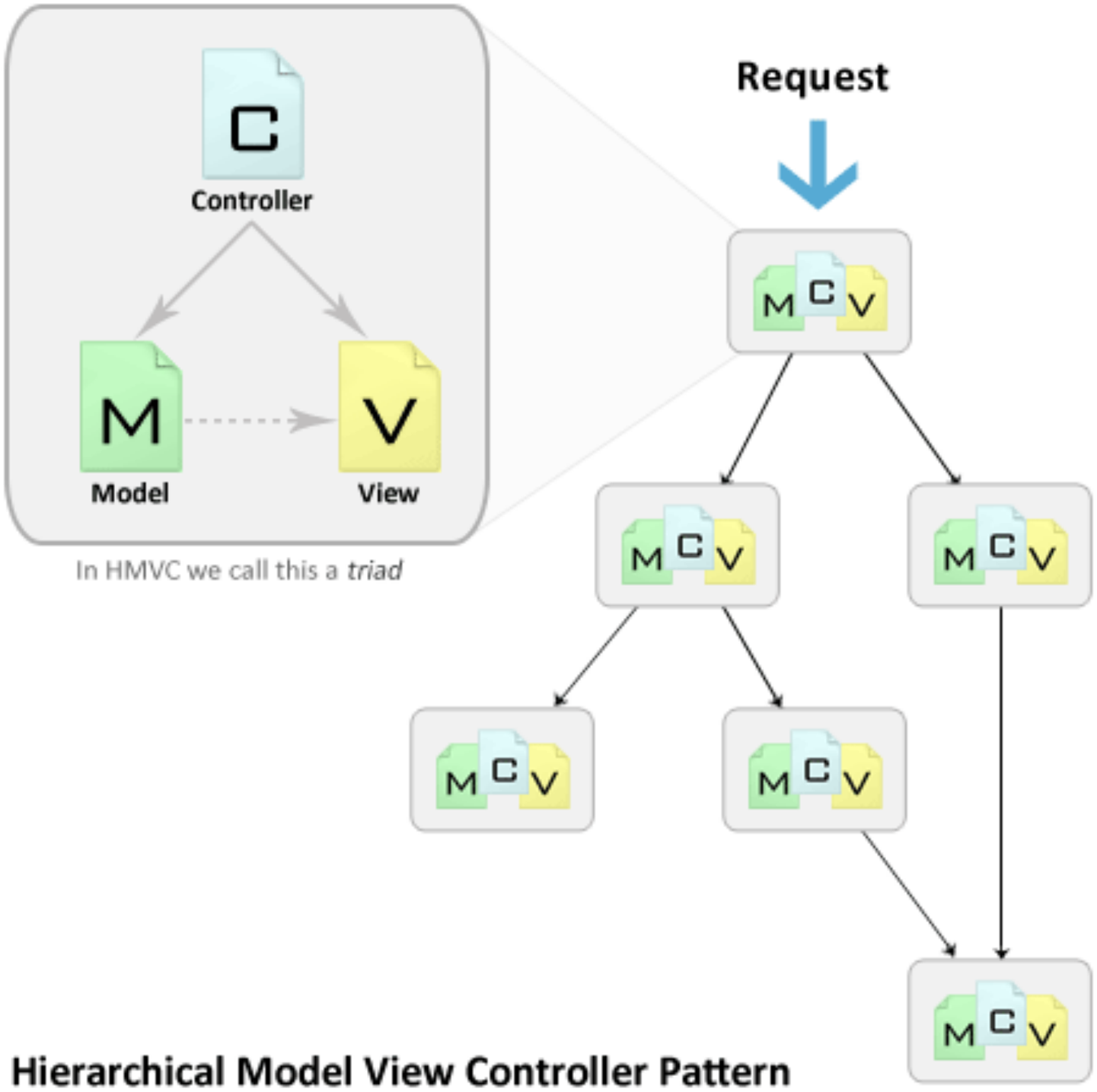
2. MVC

- Separates layers of concerns
- Helps enforce OO
- Specialized team members
- but…..
  - Layers are still tightly coupled
  - MVC Monoliths

3. N-TIER - MEXICAN CHALUPA

- Add more layers for organization
- Layers are still tightly coupled
- Still monolithic!
- Yummy, but hard to eat!

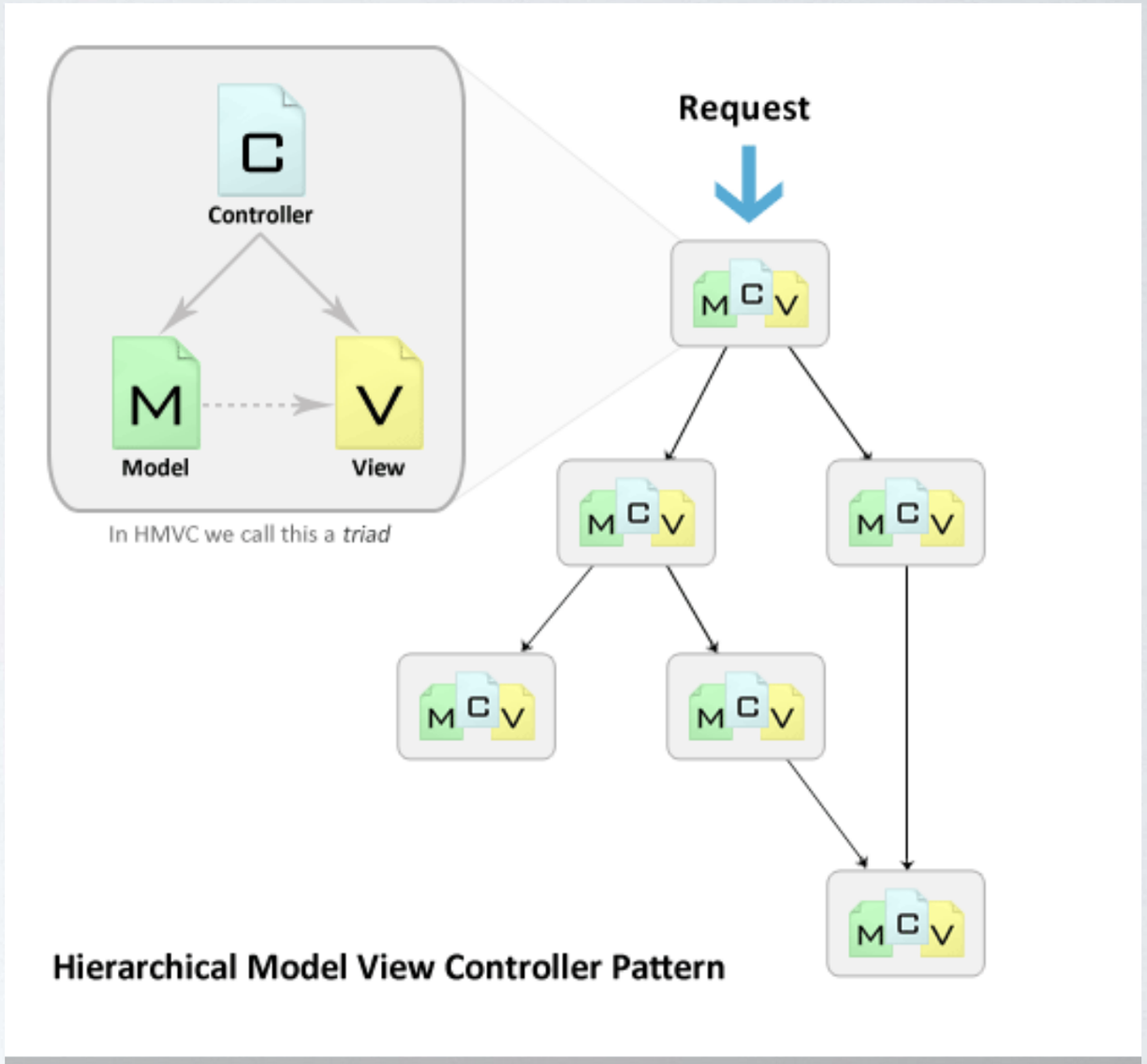
4. HMVC



Hierarchical Model View Controller Pattern

4. HMVC

- Evolution of MVC
- Independent MVC Triads
- Benefits
  - Higher Cohesion
  - Lower Coupling
  - Modularization
- Better
  - Organization
  - Reusability
  - Extensibility
  - Testability



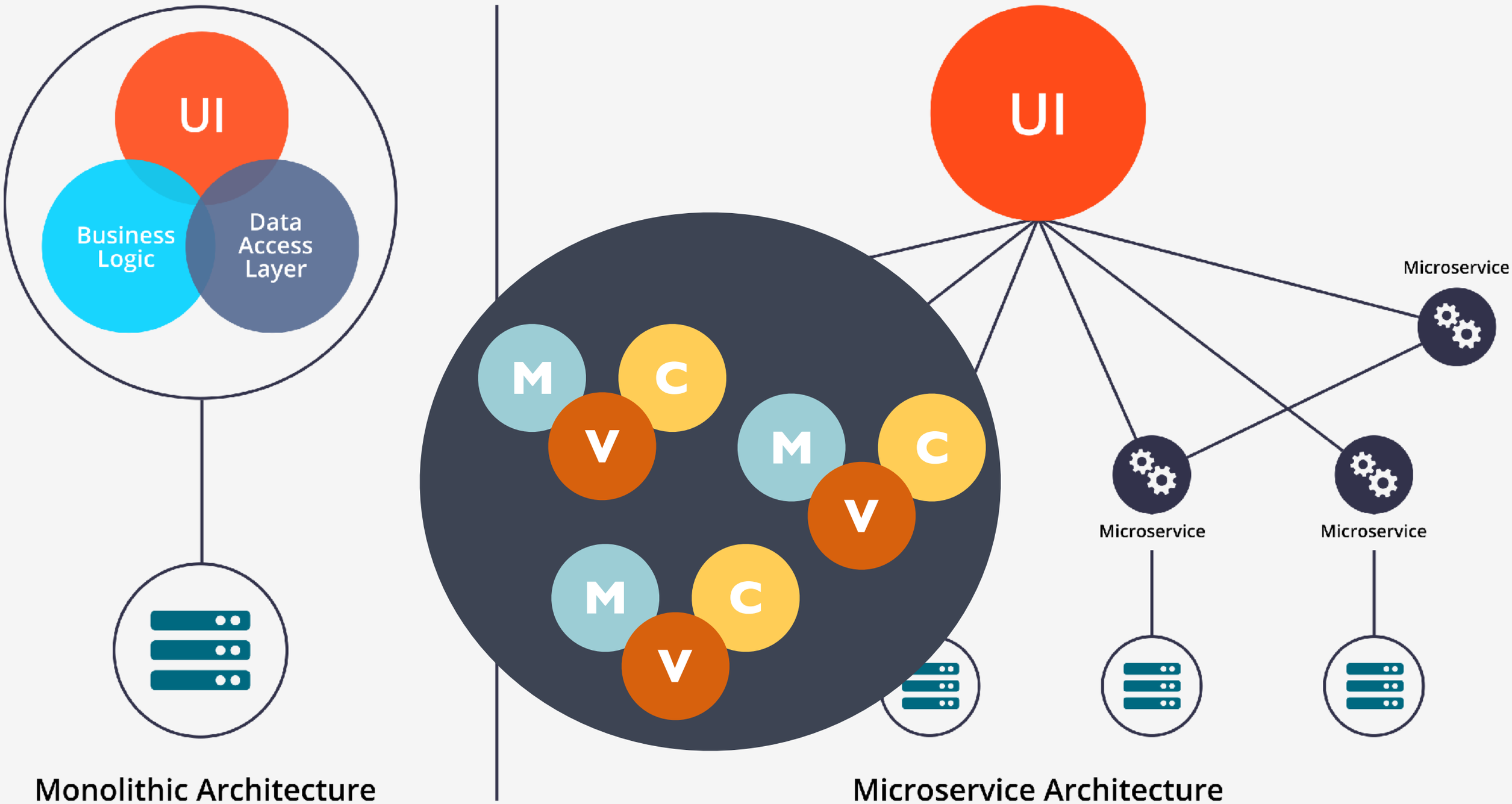
5. MICROSERVICES

AN APPROACH TO DEVELOPING A SINGLE APPLICATION AS A SUITE OF SMALL SERVICES, EACH RUNNING IN ITS OWN PROCESS AND COMMUNICATING WITH LIGHTWEIGHT MECHANISMS.

Martin Fowler

5. MICROSERVICES

COMMANDBOX

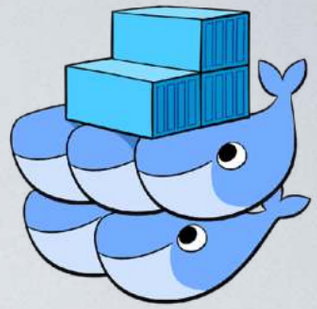


Monolithic Architecture

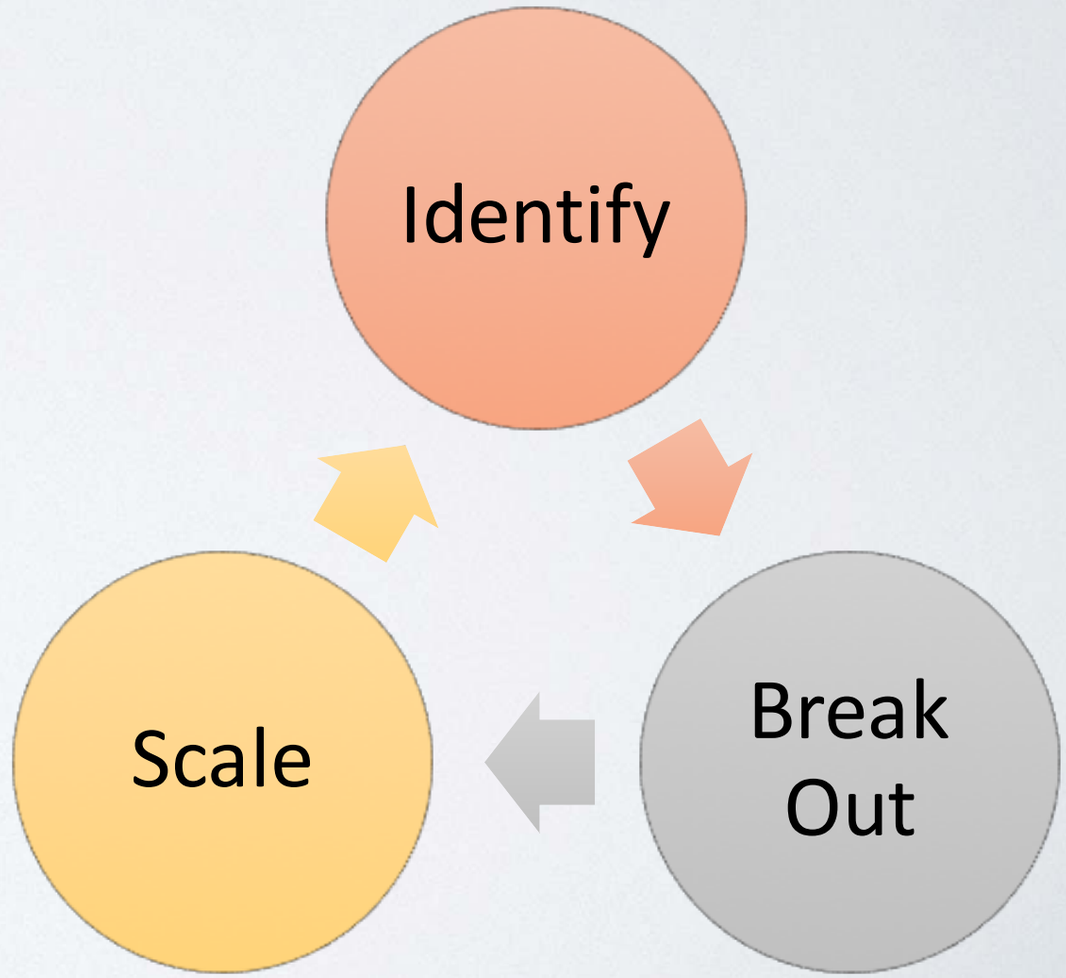
Microservice Architecture

COMMANDBOX

5. MICROSERVICES

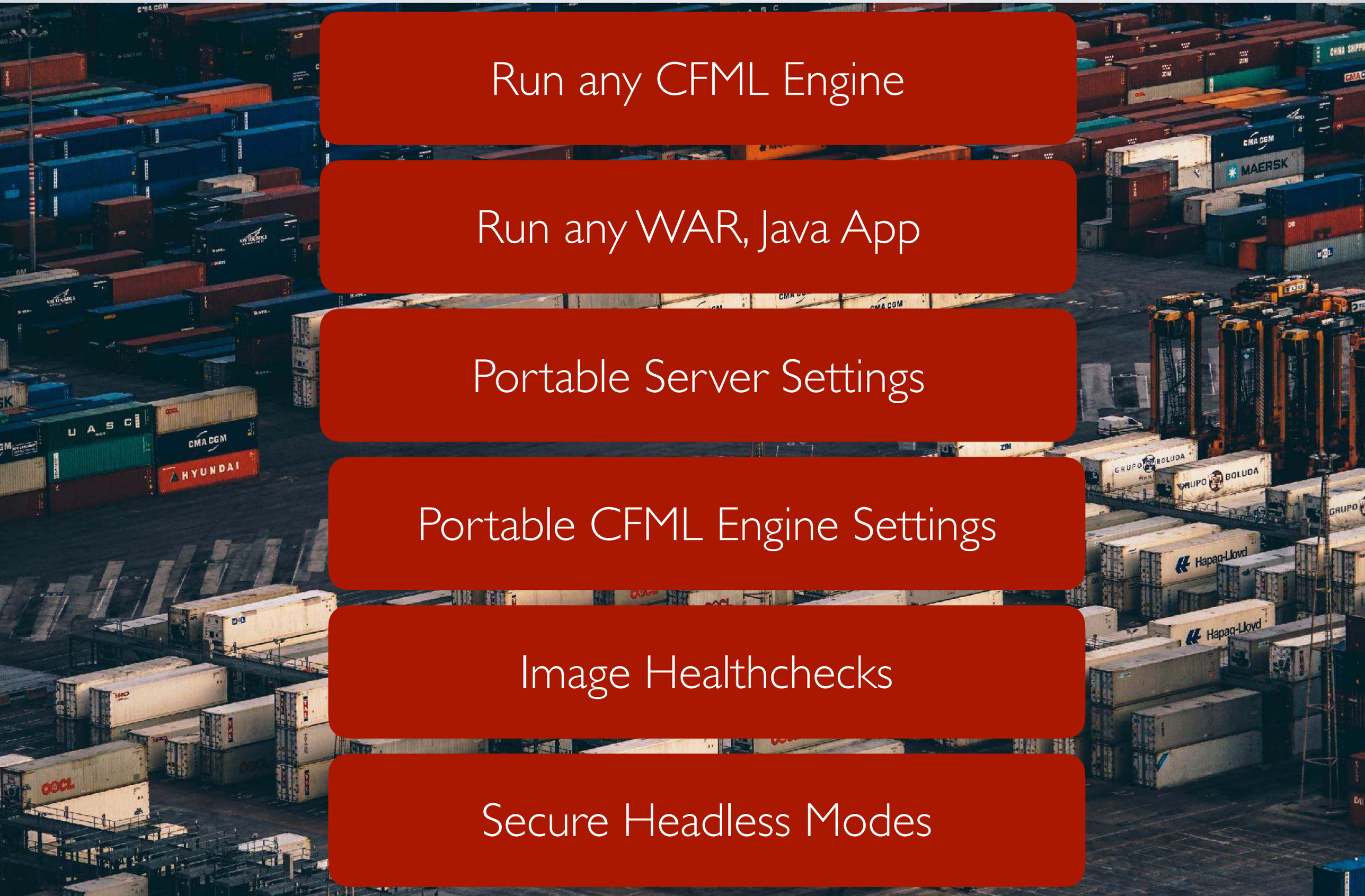


- Legacy code updates less intimidating
- Fault tolerance
- Versionable & Maintainable
- Short release cycles
- Monoliths Evolution



COMMANDBOX

DOCKER PULL ORTUSSOLUTIONS/COMMANDBOX



Run any CFML Engine

Run any WAR, Java App

Portable Server Settings

Portable CFML Engine Settings

Image Healthchecks

Secure Headless Modes

FORMULA FOR SUCCESS

COLDBOX

HMVC

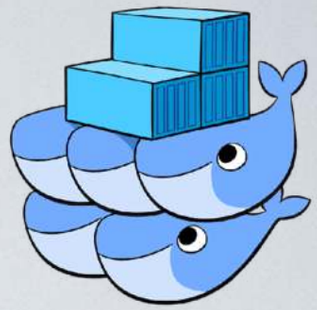
+

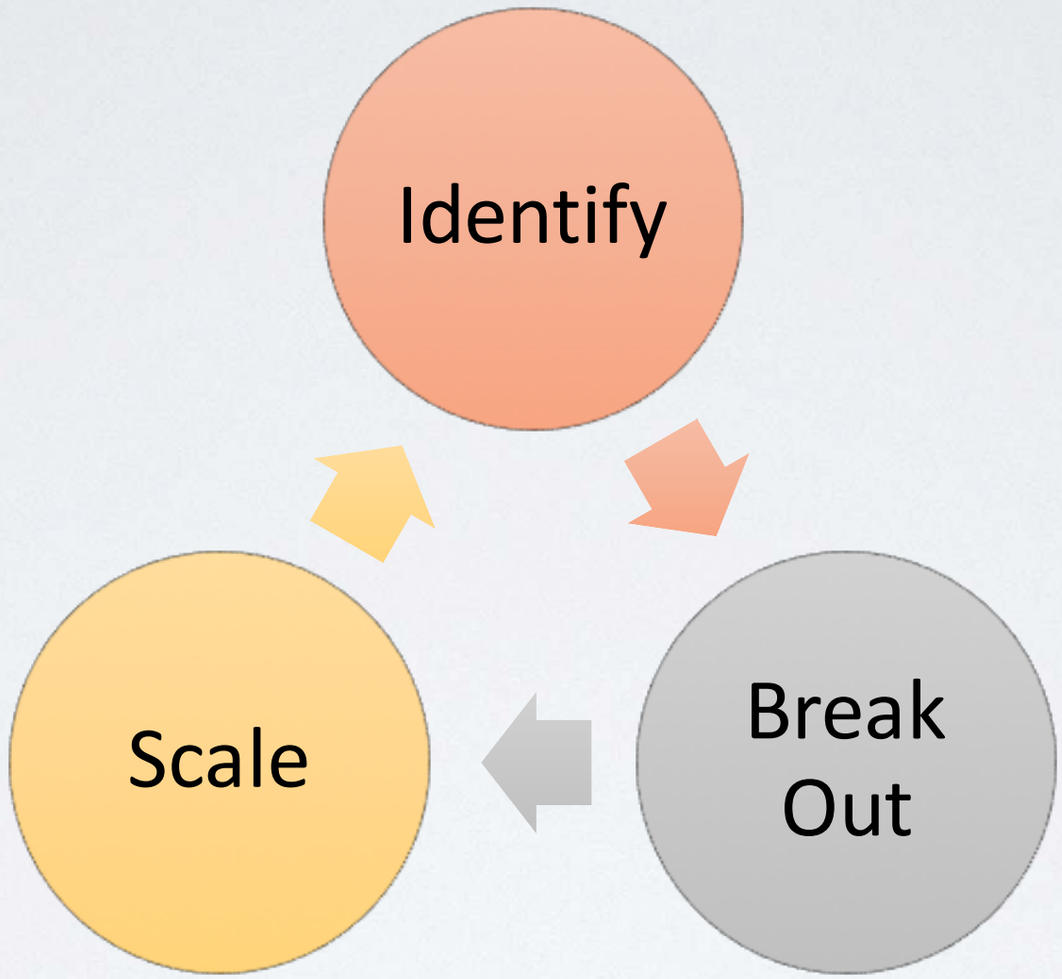
COMMANDBOX

Microservices

COMMANDBOX

FORMULA FOR SUCCESS



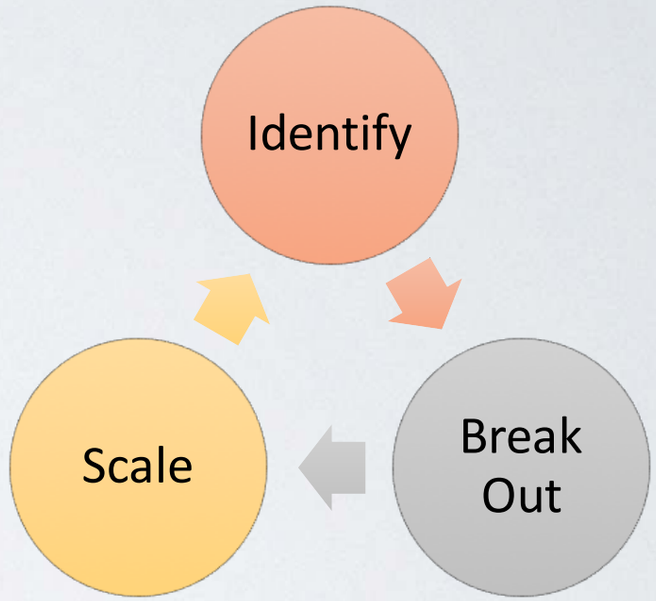


COLDBOX

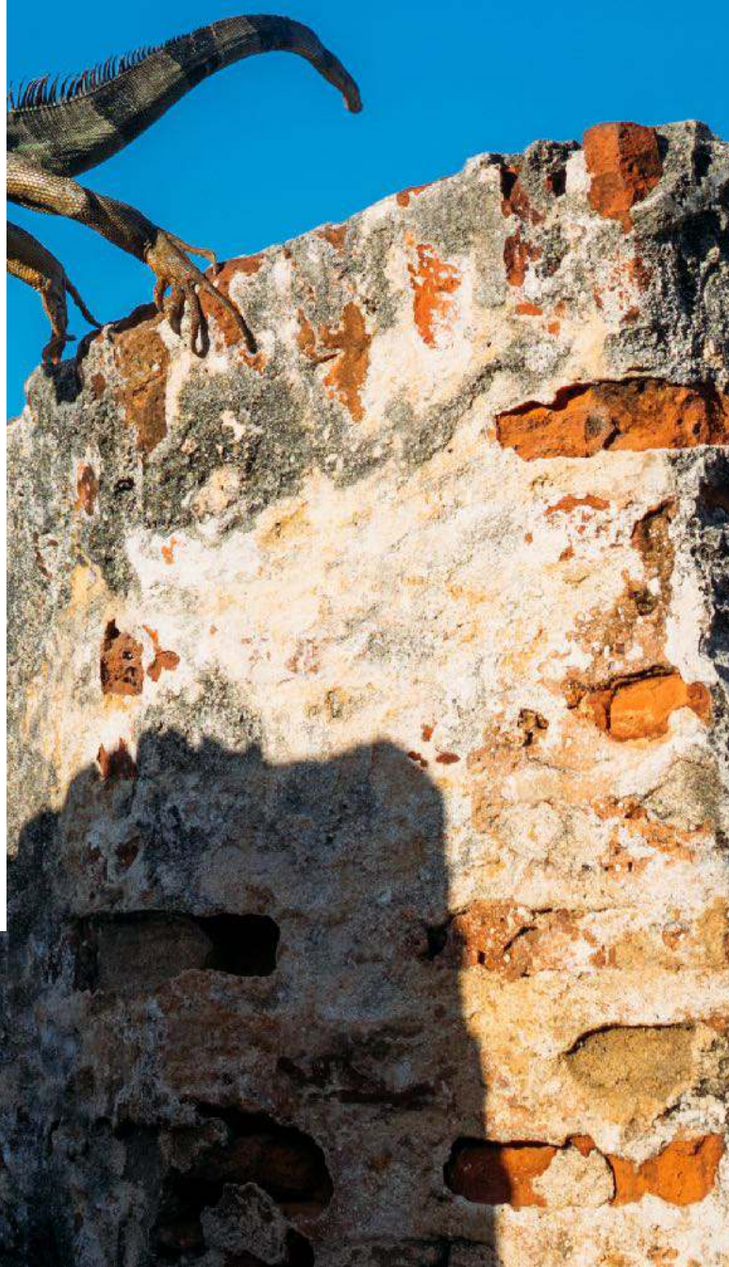
TESTBOX

RULES OF ENGAGEMENT

- Install ColdBox app alongside legacy app
- Modify `Application.cfc` for dual routing: legacy/modern
- All new features go to ColdBox
- All new features have automated BDD tests
- Identify features to modernize:
  - Build out as ColdBox Modules
  - Break out to micro services (ColdBox REST APIs)
- JUST DO IT!



MODERNIZE...



PARADIGM SH

A

FUNDAMENTA

CHANGE IN

APPROACH O

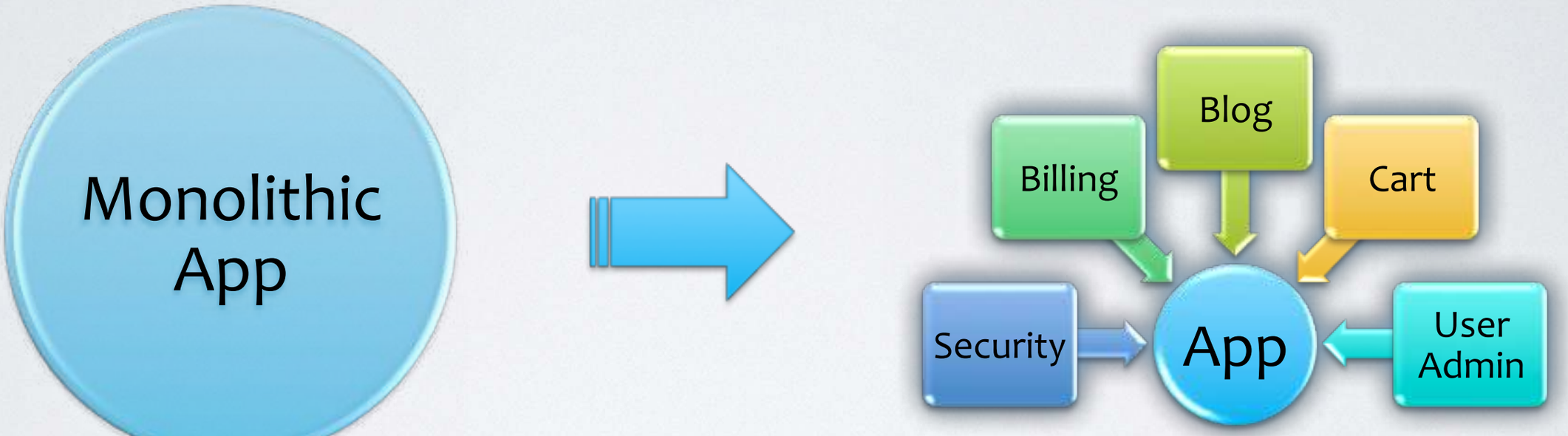
UNDERLYING

ASSUMPTIONS.

COLDBOX

Let's Begin!

EVOLVE TO HMVC MODULES



"As a system **evolves**, It's **complexity** will **increase** unless work is done to maintain or reduce it."
Lehman's 2nd Law of software evolution

WHAT IS A MODULE?

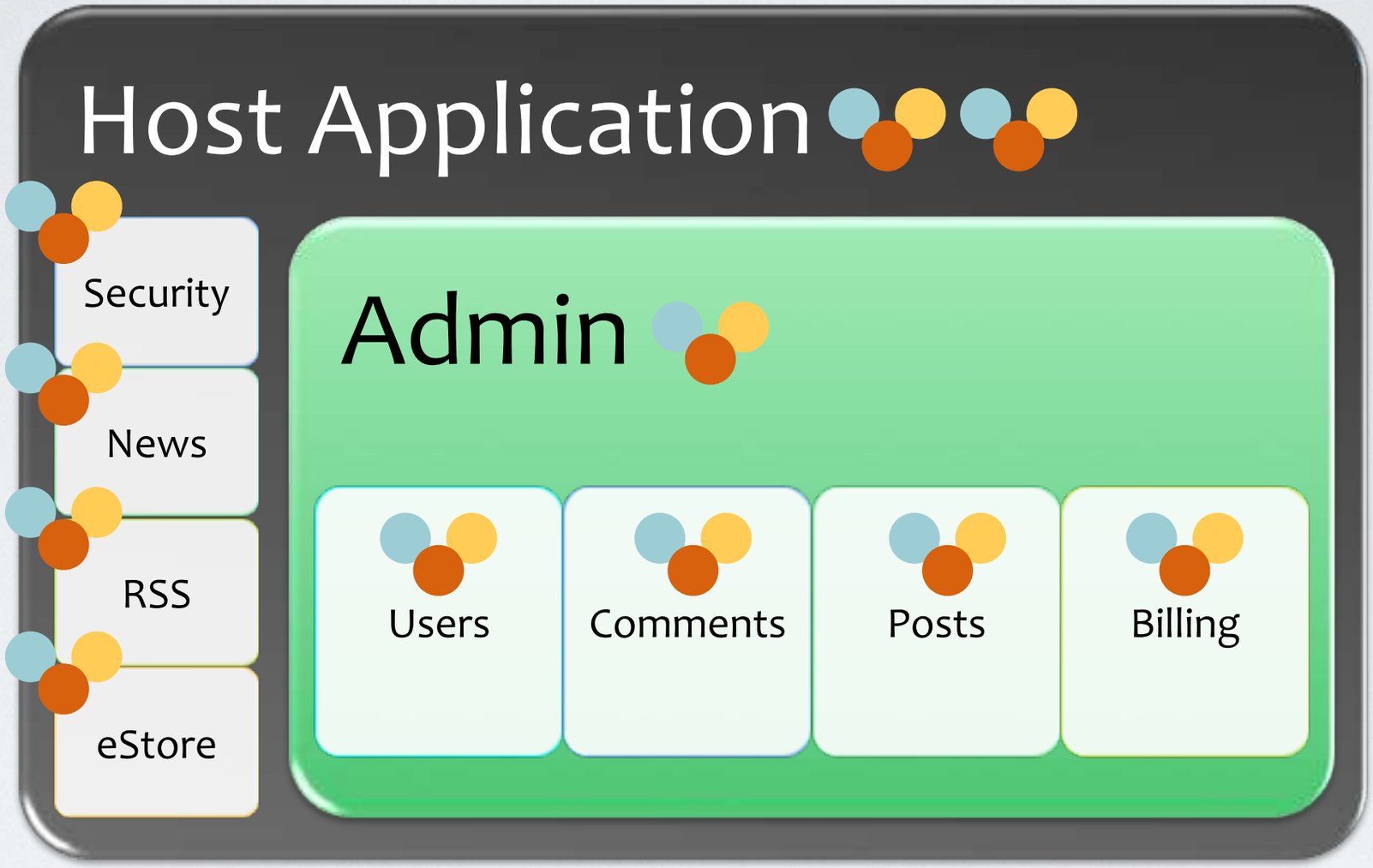
"In structured design and data-driven design, a module is a generic term used to describe a **named** and **addressable** group of **program** statements"
by Craig Borysowich (Chief Technology Tactician)

"A software module is a **deployable**, **manageable**, natively **reusable**, **composable**, unit of software that provides a concise interface to consumers."
by Kirk Knoernschild

COLDBOX MODULES = **SUPER POWERS**

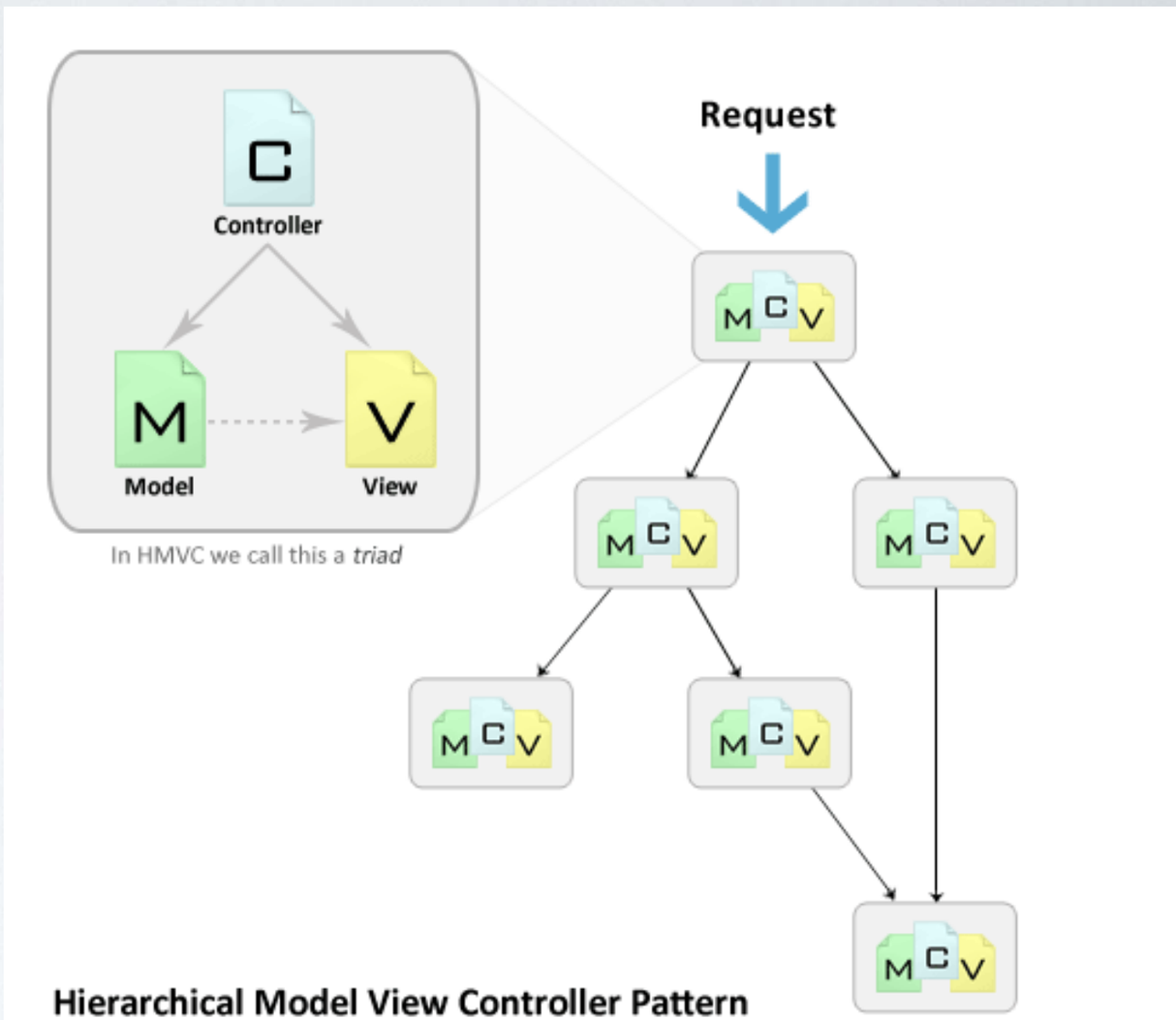
- Supports HMVC since 2011
- MVC triads = **Modules**
- Addressable
- Composed (Inception)
- Dependencies
- At Runtime:
  - Installed
  - Reloaded
  - Unloaded

COLDBOX MODULE TRIADS



WHAT DO YOU GET?

- MVC Conventions
- **Automatic** Model Mappings (DI)
- **Automatic** CFML Mappings
- **Automatic** URL Routing
- **Automatic** Interceptors
- Overridable Settings
- Environment Detection
- Module Dependencies



ColdBox MVC Application

box.json

Lists Dependencies

handlers

layouts

models

modules

Tracked by CommandBox

modules_app

Custom

views

Anatomy of a Module

Module Name (unique on disk)

box.json

ModuleConfig.cfc

handlers

layouts

models

modules

modules_app

views

box.json

```
{
    "name":"cbSwagger-shell",
    "version":"1.1.0",
    "slug":"cbSwagger-shell",
    "private":false,
    "dependencies":{
        “coldbox":"^5.0.0",
        “workbench":"git+https://github.com/ortus/unified-workbench.git",
        "cbjavaloader":">1.0.0",
        "swagger-sdk":">0.0.9"
    },
    "devDependencies":{
        "testbox":"^2.8.0"
    },
    "installPaths":{
        "coldbox":"coldbox/",
        "testbox":"testbox/",
        "cbjavaloader":"modules/cbjavaloader/",
        "swagger-sdk":"modules/swagger-sdk/",
        "workbench":"workbench"
    },
    "testbox":{
        "runner":"http://localhost:49616"
    },
    "scripts":{
        "postVersion":"recipe workbench/bump.boxr"
    }
}
```

MODULECONFIG.CFC

- Simple CFC
- Bootstraps your module
- Must exist in the root of your module folder
- Has **public** properties
- Several callback methods
- Tier-detection enabled
- It's an interceptor too!

COLDBOX

MODULE PROPERTIES

```
component{
    this.activate               = true;
    this.disabled               = false;
    this.title                  = "My Test Module";
    this.author                 = "Luis Majano";
    this.webURL                 = "http://www.coldbox.org";
    this.description            = "A funky test module";
    this.version                = "1.0.0";
    this.viewParentLookup   = true;
    this.layoutParentLookup = true;
    this.entryPoint             = "/testing";
    this.inheritEntryPoint  = true;
    this.autoMapModels          = true;
    this.modelNamespace         = "cbstore";
    this.cfmapping              = "cbstore";
    this.aliases                = [ "store", "ecommerce", "shop" ];
    this.dependencies           = [ "JavaLoader", "CFCouchbase" ];
}
```

CALLBACK METHODS

Method	Purpose
`configure()`	Only interact with this module. Use `onLoad()` for cross-module, cross-framework dependencies.
`onLoad()`	When you need the framework loaded first
`onUnload()`	Undo what you did in load

MODULECONFIG.CFC **CONFIGURE**

```
function configure(){
        settings = {
            caching = false,
            mailTo  = "lmajano@ortussolutions.com"
        };

        layoutSettings = { defaultLayout = "relax.cfm" };

        i18n = {
            resourceBundles = {
                "cbcore" = "#moduleMapping#/i18n/cbcore"
            },
            defaultLocale = "en_US",
            localeStorage = "cookie"
        };

        interceptorSettings = {
            // ContentBox Custom Events
            customInterceptionPoints = [
                // Code Rendering
                "cb_onContentRendering", "cb_onContentStoreRendering"
            ]
        };

        router.
          route( “/“ ).to( “Main.index” )
          route( “/:handler/:action” ).end();
    }
```

Bonus:
ModuleConfig is also an interceptor
`box install cors`

```
component {

    this.name = "cors";
    this.author = "Eric Peterson";
    this.webUrl = "https://github.com/elpete/cors";

    function configure() {}

    function preProcess( event, interceptData, buffer, rc, prc ) {
        event.setHTTPHeader(
            name = "Access-Control-Allow-Origin",
            value = "*"
        );
    }

}
```

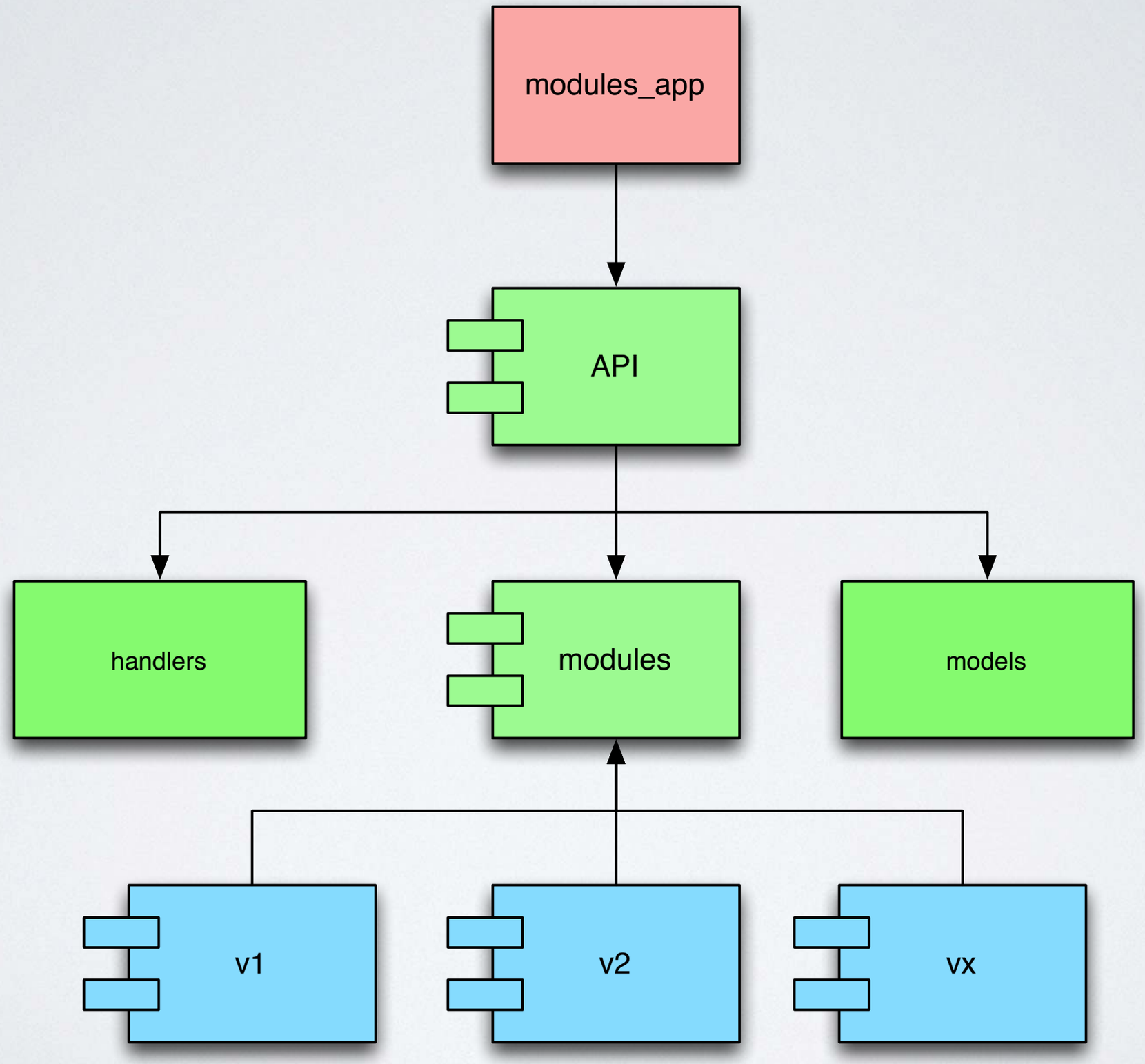
LEVERAGING WIREBOX

- Automatically maps all your models in the **models** folder:
  - `{modelName}@{moduleName}`
  - `property name="builder" inject="builder@qb"`
- If you have a model with the **same** name as your module, we have a shortcut injection:
  - `property name="mockdataCFC" inject="@mockdataCFC"`

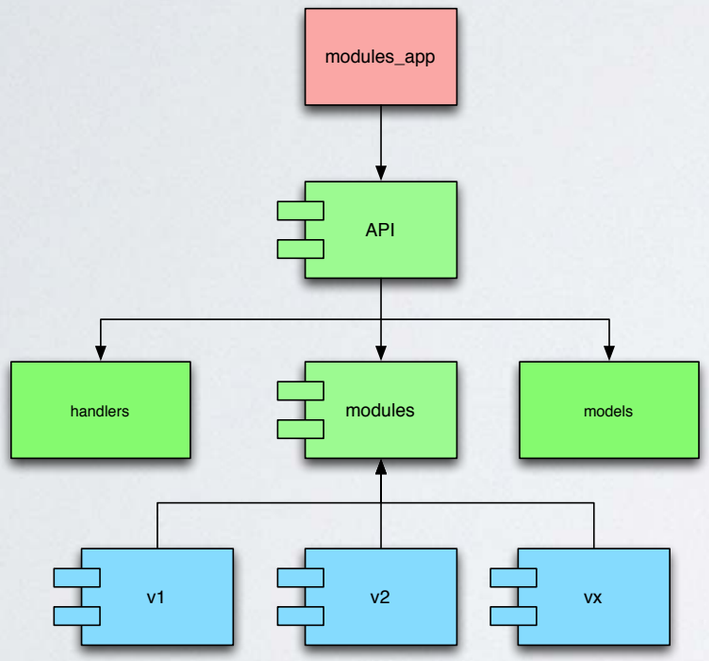
MODULAR EXECUTION

#runEvent(‘module:users.dashboard')#

Demo Time!



Requirements



- Contacts RESTFul API
  - `/contacts - List all`
  - `/contacts/:id - Get one`
- Versioned
- Don't have a DB yet, Mock it!
- Self-documenting (openApi compliant)
- Tests, yes TESTS!
- Containerize it!

10 minutes or less

QUESTIONS?

Go Modularize!

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