

Unleash the power of feature-based JS development

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<http://bit.ly/feature-u-pres>

slides, syllabus, articles, docs, and repo!



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@kevinast

- Married, Father, Grandfather
- 40 yrs in software (20 yrs consulting)
- JS (since 96, es6 since 2015)
- Retired
- Be nice to the old guy :-)



Unleash the power
of
feature-based JS development

<http://bit.ly/feature-u-pres>
slides, syllabus, articles, docs, and repo!



<https://feature-u.js.org/>

SideBar:
feature-u
docs

The screenshot displays the API documentation for feature-u.js.org. The sidebar on the left contains the following navigation links:

- FEATURE-U (1.0.0)
 - Introduction
 - Benefits
 - Getting Started
- Basic Concepts
 - Usage
 - A Closer Look
 - Application Life Cycle Hooks
 - Cross Feature Communication
 - Feature Based Routes
 - Feature Enablement
 - Best Practices
- Core API
 - createFeature()
 - Built-In aspects ...
 - fassets aspect
 - appWillStart()
 - appDidStart()
 - expandWithFassets()
 - expandWithFassetsCB()
 - launchApp()
 - registerRootAppElem()
 - withFassets()
 - mapFassetsToPropsSt...
 - mapFassetsToProps()
 - Object Refs ...
 - Fassets
 - get()
 - hasFeature()
 - fassetValidations
 - Feature
 - Aspect
 - AspectContent
- Extending feature-u
- Distribution
- Why feature-u?

The main content area shows the documentation for the `launchApp` function:

`launchApp([aspects], features, registerRootAppElem) ⇒ Fassets`

Launch an application by assembling the supplied features, driving the configuration of the frameworks in use (as orchestrated by the supplied set of plugable Aspects).

For more information (with examples), please refer to [Launching Your Application](#).

Please Note this function uses named parameters.

Param	Type	Description
[aspects]	<code>Array.<Aspect></code>	the set of plugable Aspects that extend feature-u , integrating other frameworks to match your specific run-time stack. When NO Aspects are supplied (an atypical case), only the very basic feature-u characteristics are in effect (like fassets and life-cycle hooks).
features	<code>Array.<Feature></code>	the features that comprise this application.
registerRootAppElem	<code>registerRootAppElemCB</code>	the callback hook that registers the supplied root application element to the specific React framework used in the app. Because this registration is accomplished by app-specific code, feature-u can operate in any of the react platforms, such as: <code>react web</code> , <code>react-native</code> , <code>expo</code> , etc. Please refer to React Registration for more details and complete examples.

Returns: `Fassets` - the Fassets object used in cross-feature-communication.

`withFassets(mapFassetsToProps, [component]) ⇒ HoC | HoF`

Promotes a "wrapped" Component (an HoC - Higher-order Component) that injects fasset props into a `component`, as specified by the `mapFassetsToProps` parameter. Please refer to the `mapFassetsToPropsStruct` for the details of what this mapping construct looks like. Examples can be found at [UI Composition](#).

Central to this process, a Higher-order Function (HoF) is created that encapsulates this "mapping knowledge". Ultimately, this HoF must be invoked (passing `component`), which exposes the HoC (the "wrapped" Component).

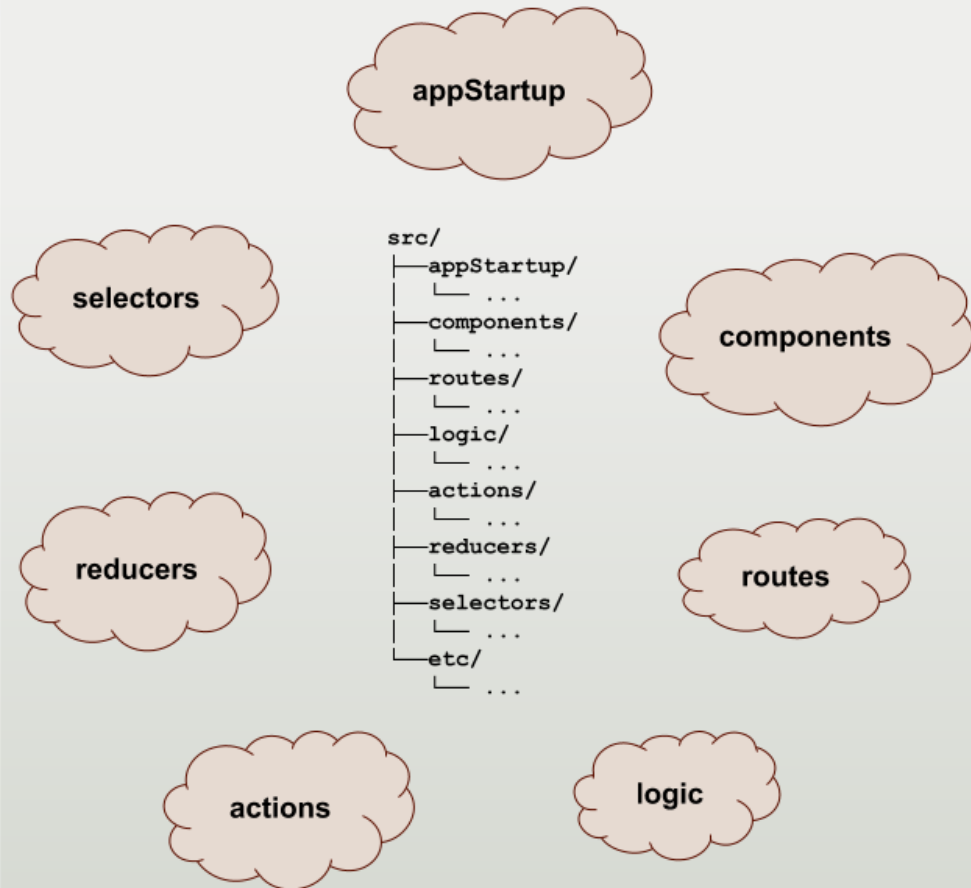
```
+ withFassetsHoF(component): HoC
```

There are two ways to use `withFassets()`:

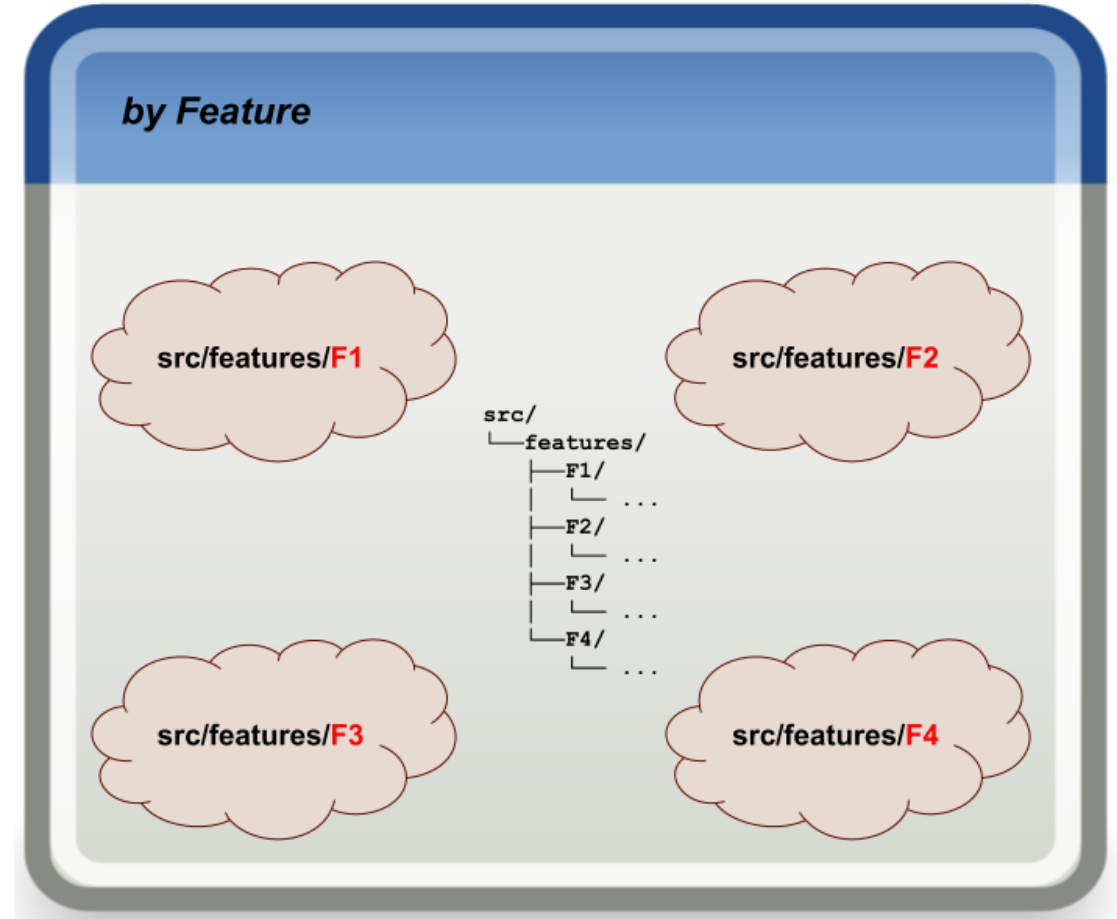
- By directly passing the `component` parameter, the HoC will be returned (internally invoking the HoF). This is the most common use case.
- By omitting the `component` parameter, the HoF will be returned. This is useful to facilitate "functional composition" (functional programming). In this case it is the client's responsibility to invoke the HoF (either directly or indirectly).

Project Organization

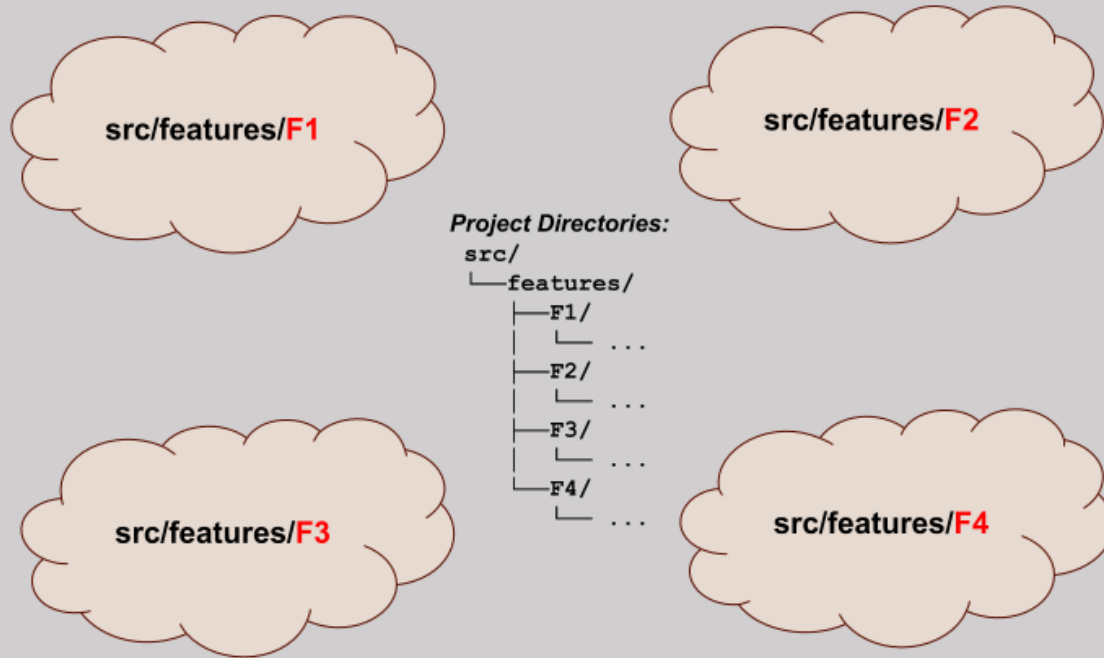
by Type



by Feature



Segregating Features



Goals

- Requirements based
- Encapsulation
- Self Sufficient
- Plug-and-Play

Hurdles

- Isolation vs. Collaboration
- Start-Up Initialization
- Framework Configuration
- UI Composition
- Feature Enablement

In short, how do we achieve a running application from these isolated features?

Two Primary Tenets

needed to
Achieve
our
Goal

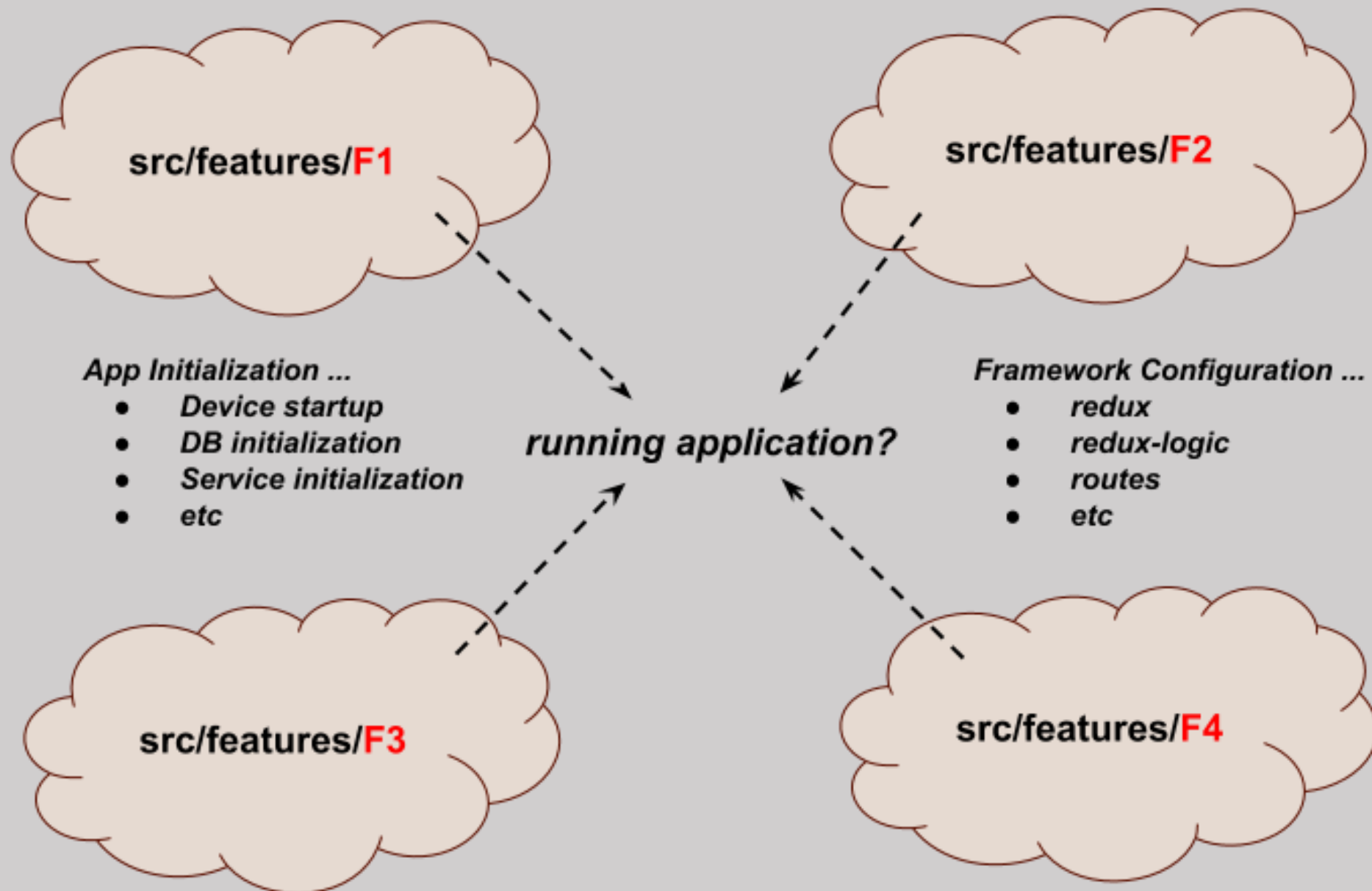


1. Feature Runtime Consolidation

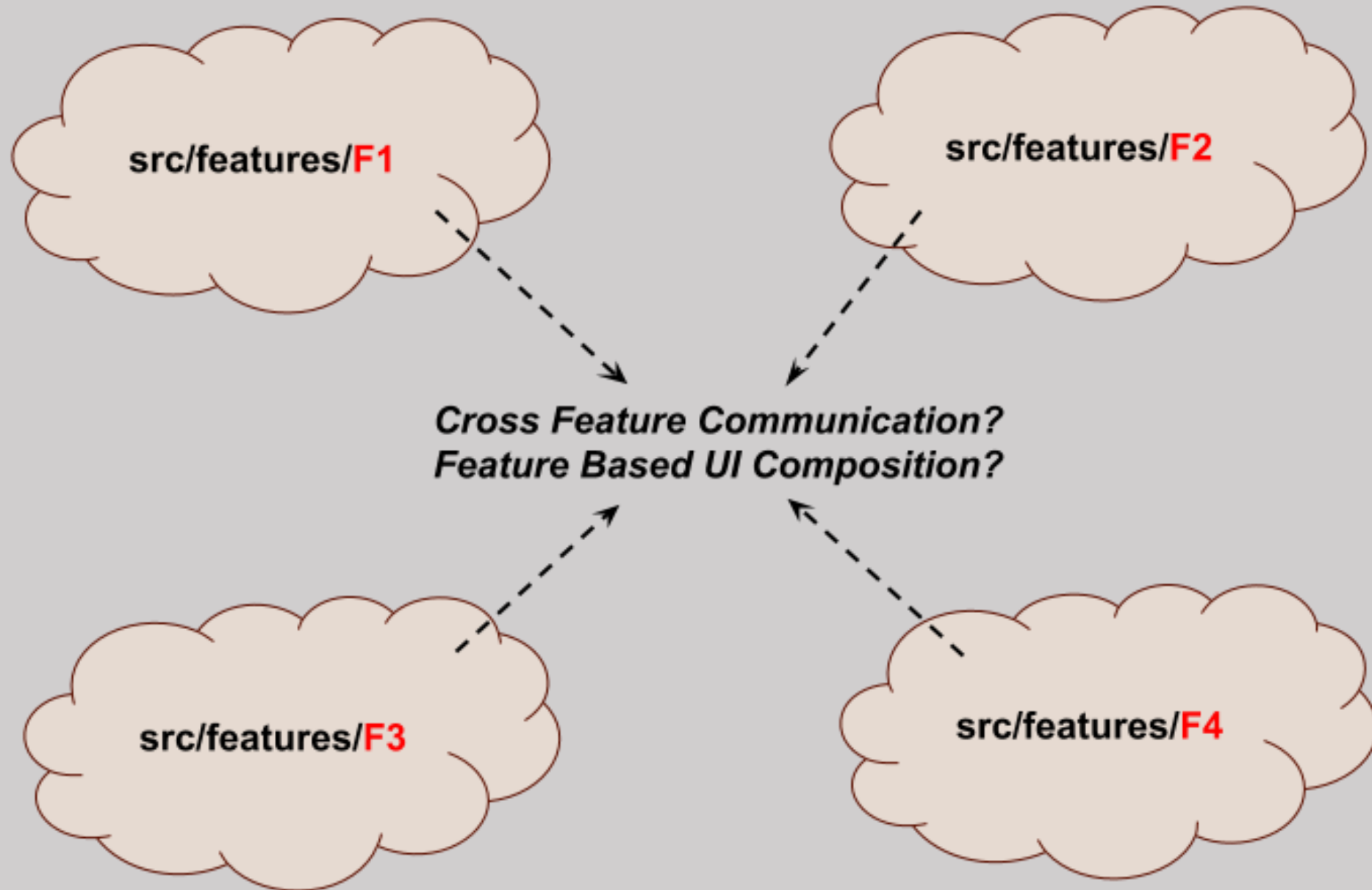


2. Feature Collaboration

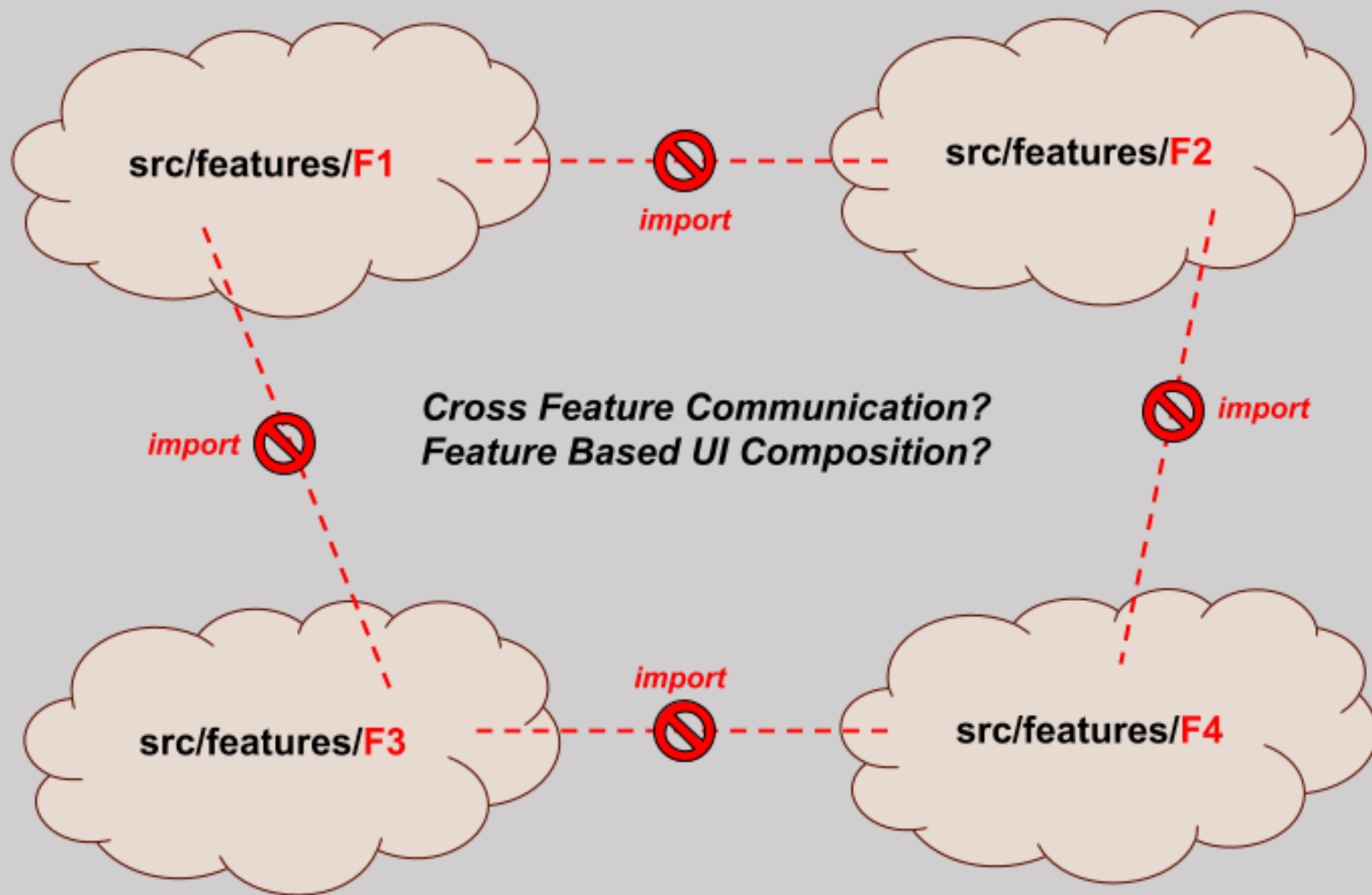
1. Feature Runtime Consolidation



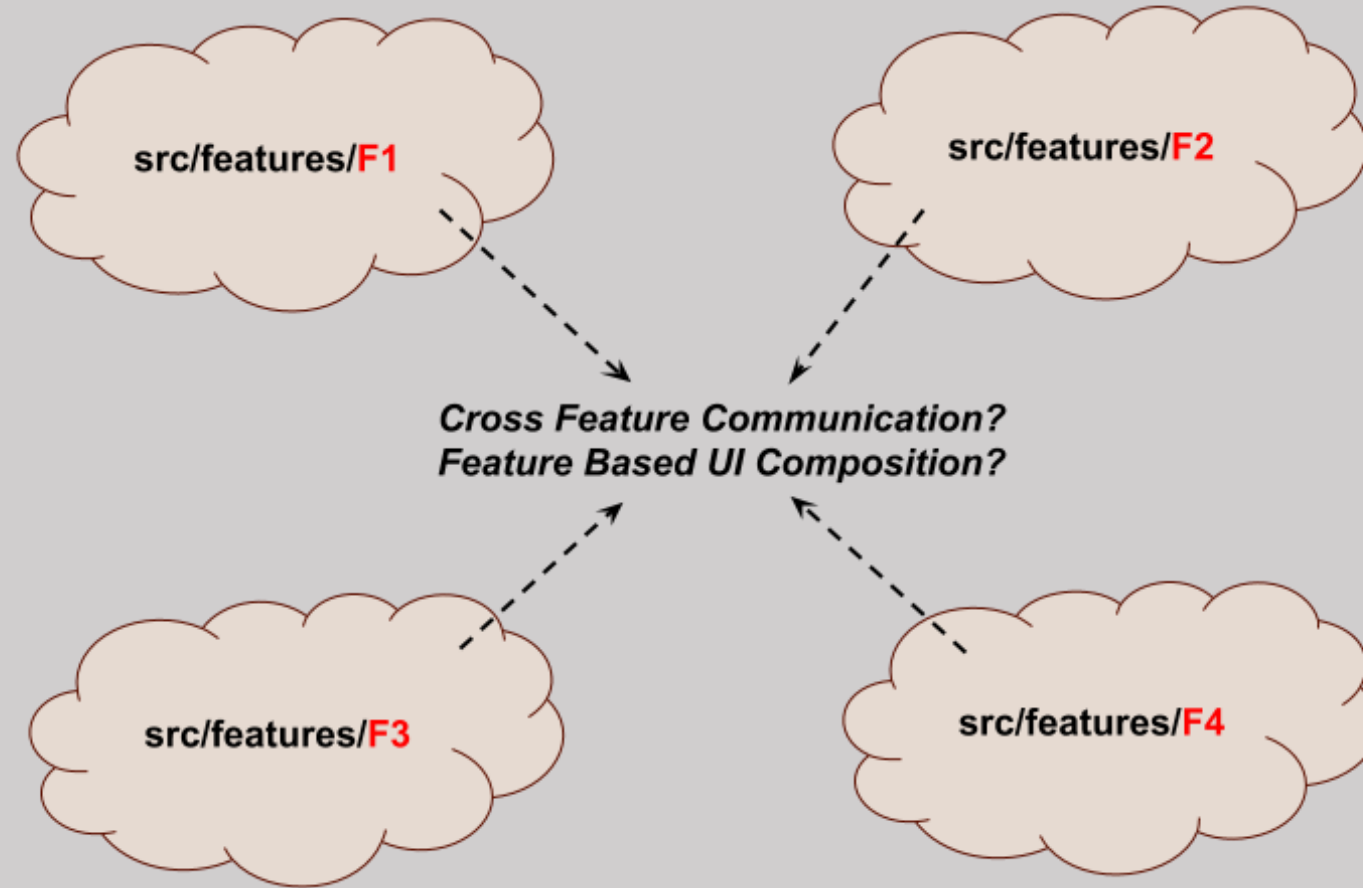
2. Feature Collaboration



~~Cross Feature Imports~~



2. Feature Collaboration

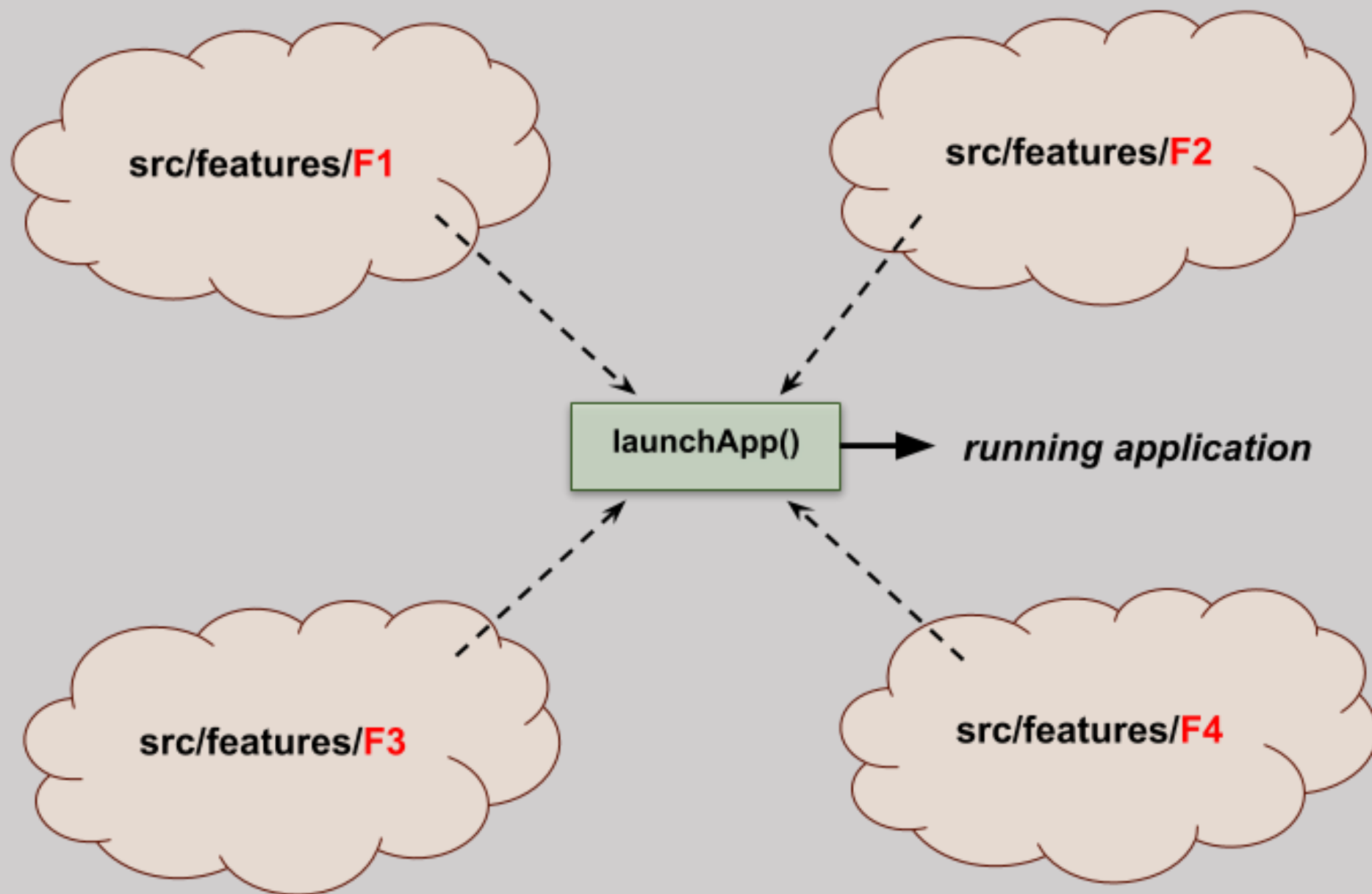


**How is Cross Feature Communication achieved
in a way that doesn't break encapsulation?**

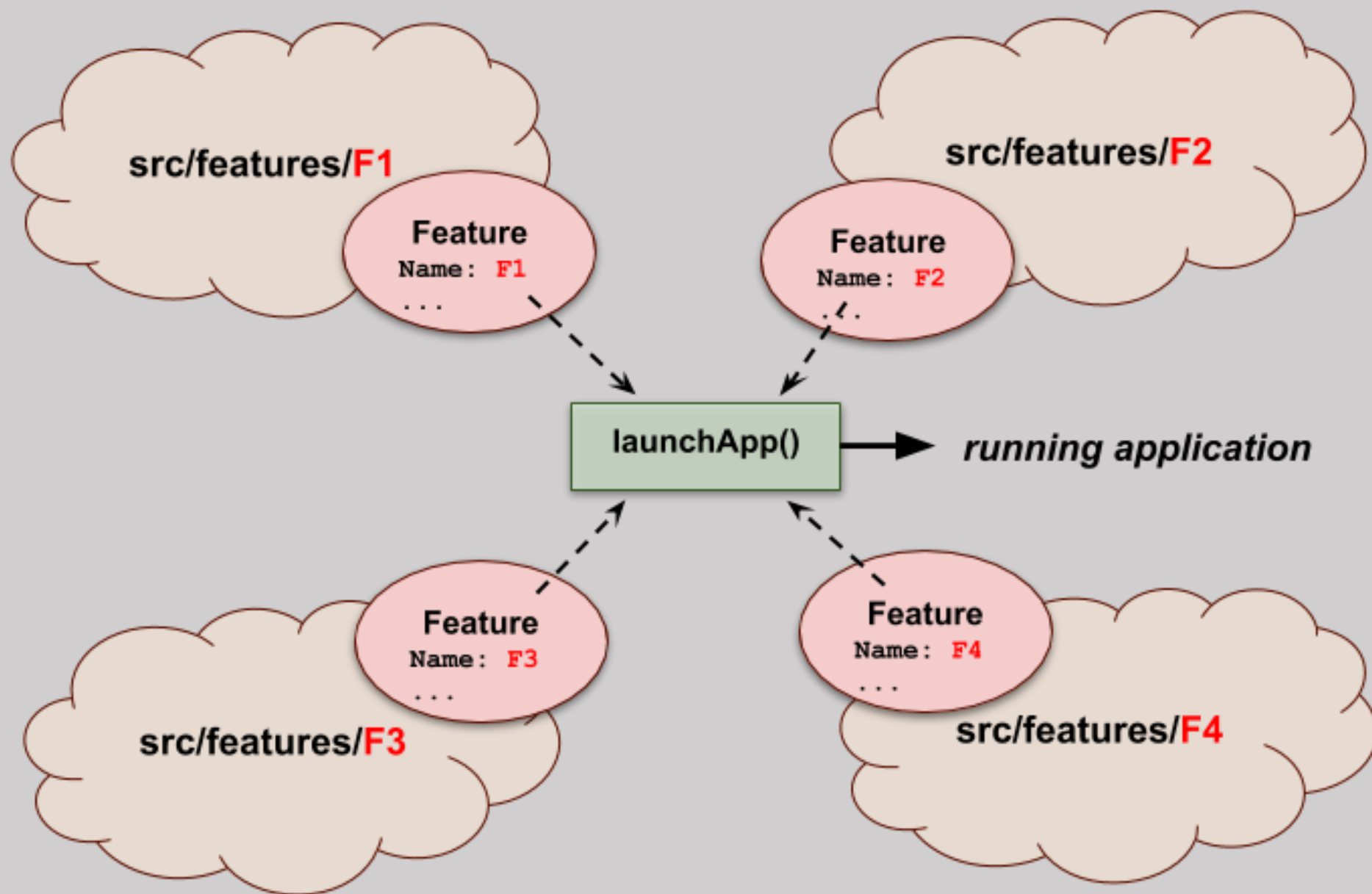


The feature-u Solution

Introducing: *launchApp()*



Introducing: Feature Object



Introducing: aspects

src/features/**F1**

Internal Aspects <private>

- UI Components
- Routes
- State Management
 - ... actions, reducers, selectors
- Business Logic
- Startup Initialization Code
- etc

Feature

```
name:      F1
enabled:   true
fassets:   {...public...}
reducer:   myReducers
logic:     myLogic
appWillStart() ...
```

Aspect container

built-in
extended

How does
feature-u
accommodate:

1. Feature Runtime Consolidation

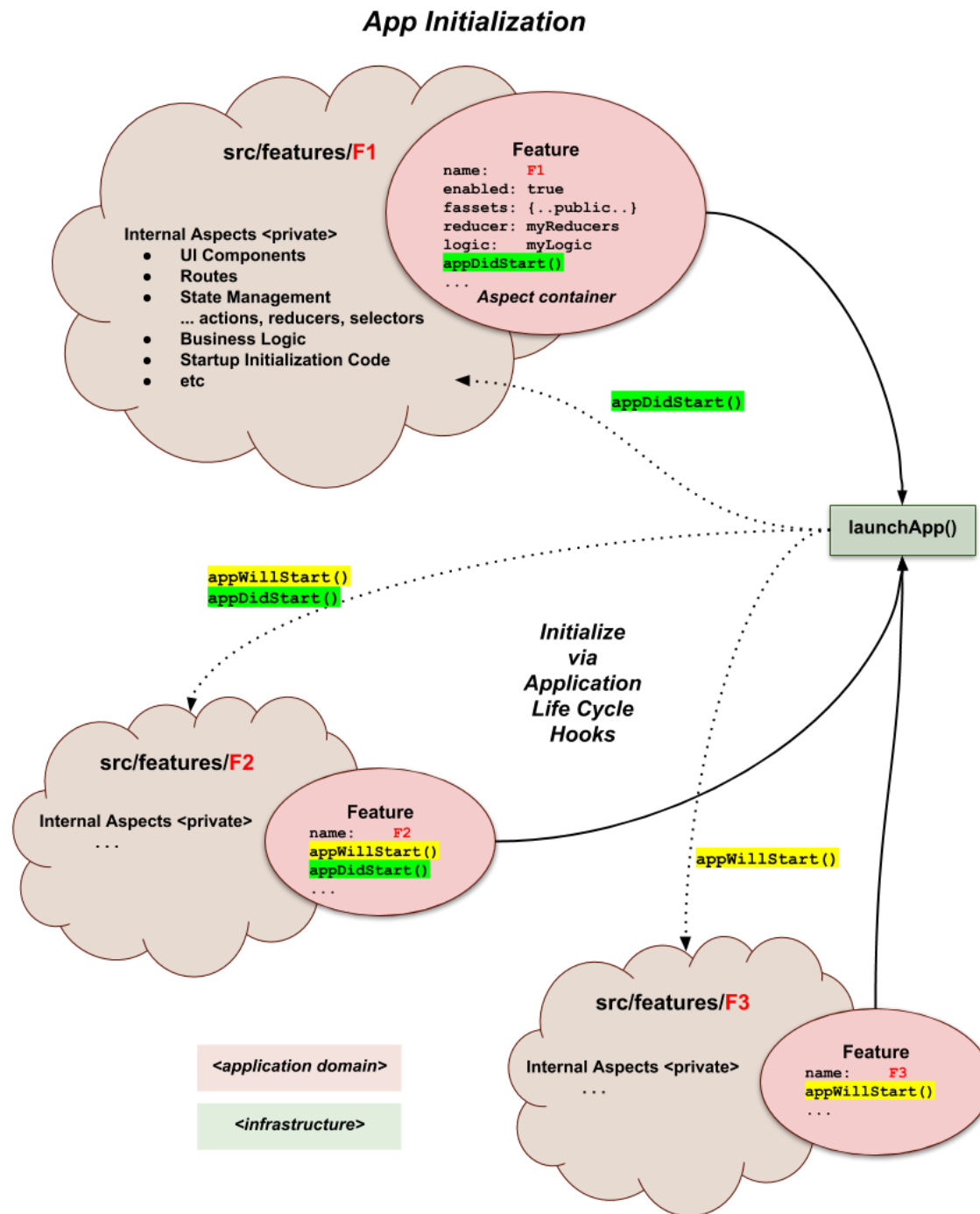


APP INITIALIZATION



FRAMEWORK
CONFIGURATION

Application Life Cycle Hooks



appWillStart():

invoked one time at app startup time

appDidStart():

invoked one time immediately after app has started

Extendable
Aspect
Plugins

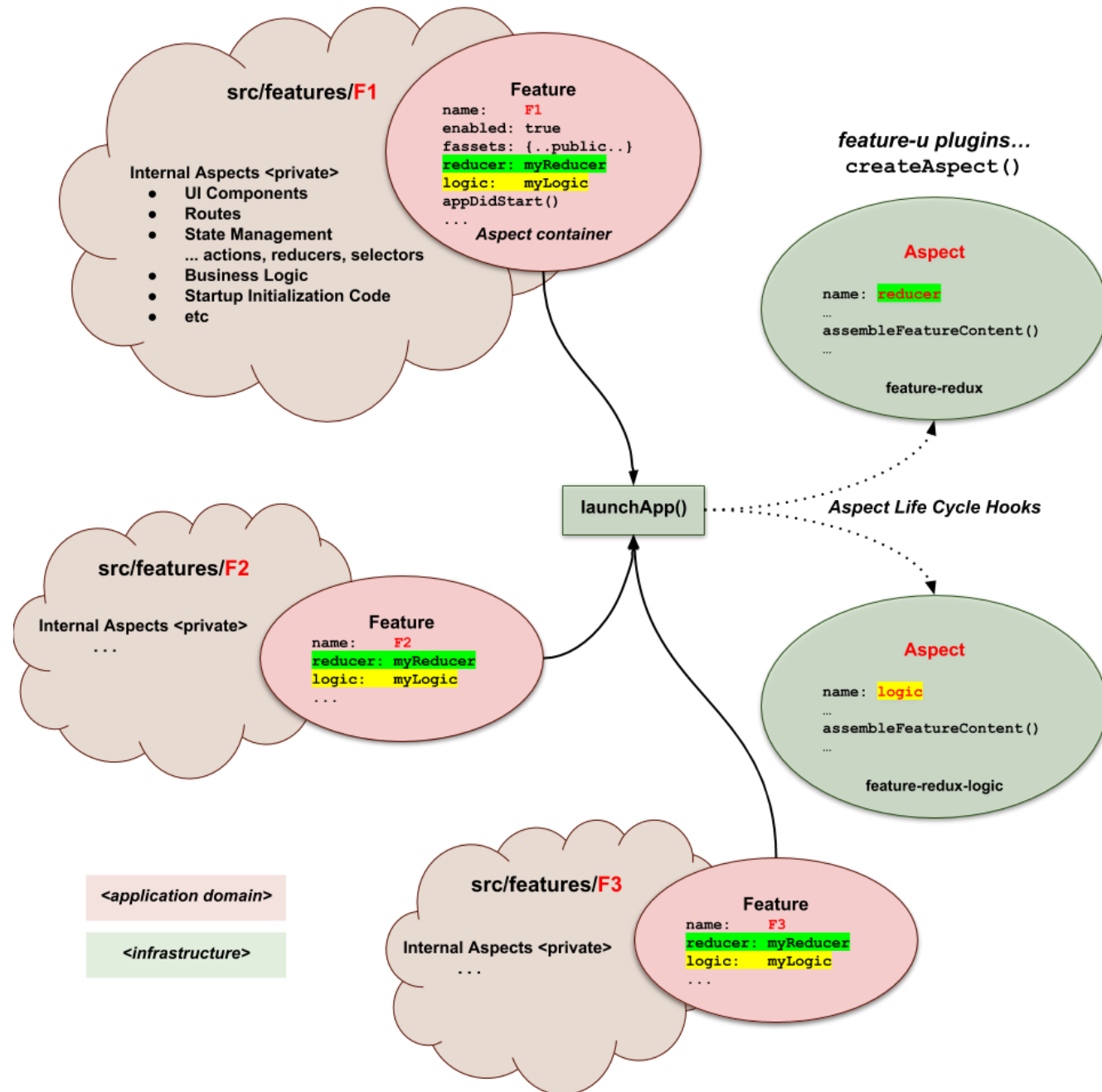


Framework Configuration Goal

feature-u is extendable!

Extendable Aspect Plugins

Framework Configuration



1. Feature
Runtime
Consolidation



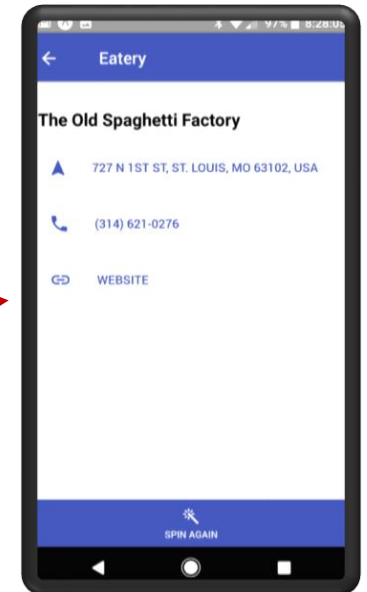
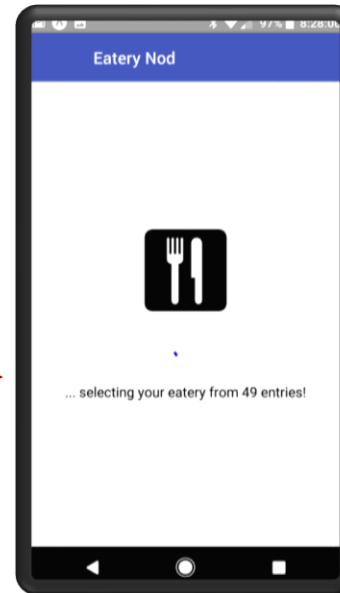
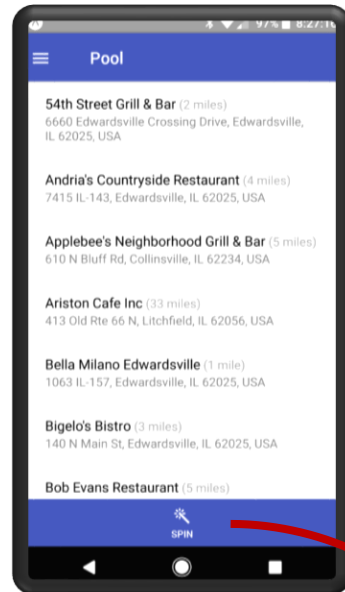
eatery-nod



<https://github.com/KevinAst/eatery-nod>



1. Feature Runtime Consolidation



[illegible]

Our App is running from
isolated/independent
features ...

- **App Initialization**
- **Framework Configuration**

[illegible]

```
export default launchApp({
  aspects: appAspects(),
  features,
  registerRootAppGlm(rootAppGlm) {
    Expo.registerRootComponent(() => rootAppGlm);
  }
});
```

```
import React      from 'react';
import PlatformSetup from './PlatformSetup';
import Notify      from './../util/notify';

//
// An app-level life-cycle hook, initializing our feature by:
// - performing platform-specific setup (iOS/Android)
// - inject our notify utility in the root DOM
//
export default function appLevelStart({assets, curAppAppId}) {
  // platform-specific setup (iOS/Android)
  PlatformSetup();

  // Initialize notify utility, by injecting it in our App root
  return React.Children.toArray(curAppAppId).map(key=>{notify=key})>>0;
}
```

```
import (createFeature) from 'feature-u';
import {initFirestore} from './init/initFirestore';

/**
 * The "Firestore" feature initializes the google firestore service,
 * and provides a placeholder for future API abstractions.
 */
export default createFeature({
  name: 'Firestore',

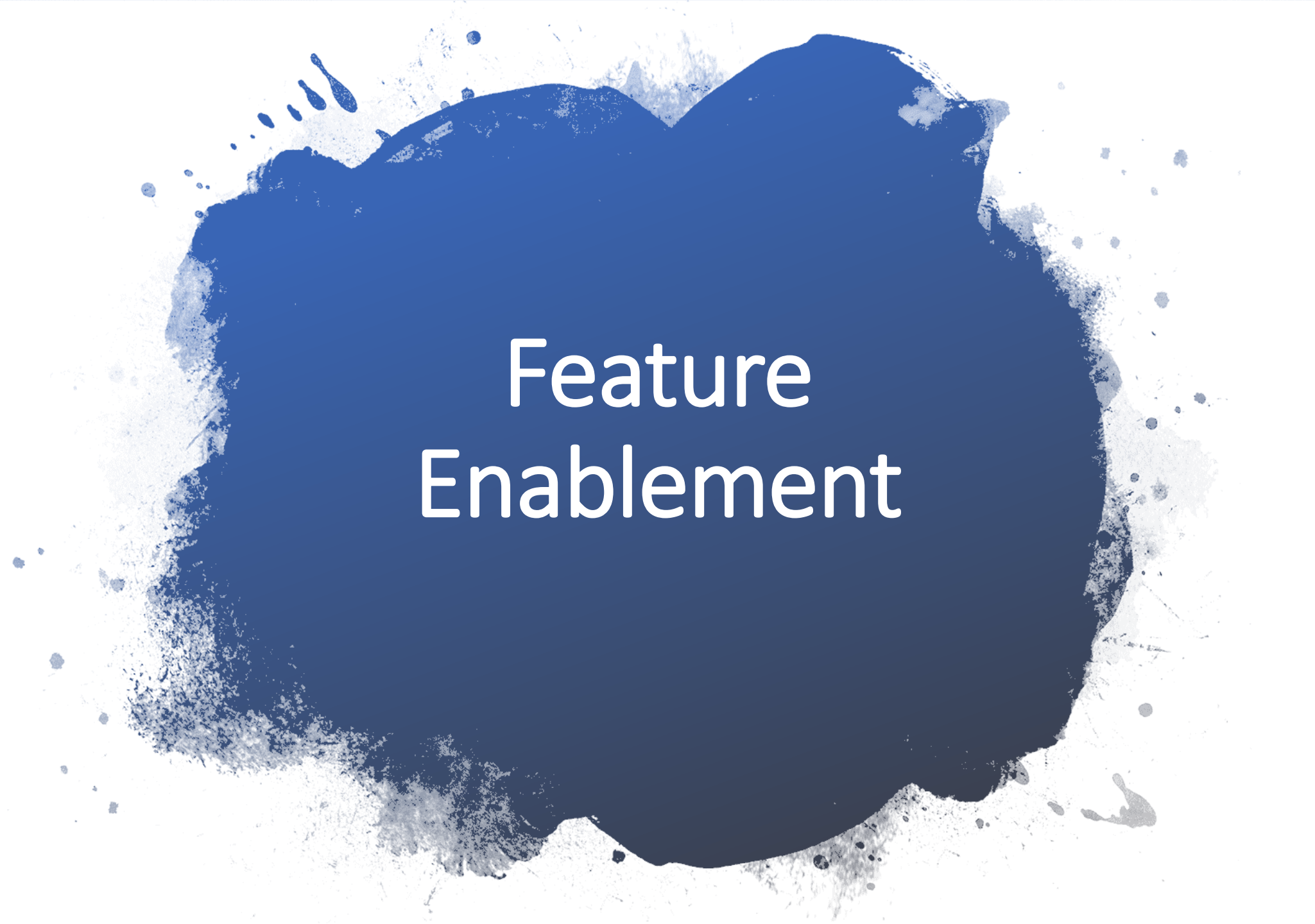
  appWillStart: ([assets, currentUser]) {
    initFirestore(); // Initialize Firestore
  },
});
```

```
import React      from 'react';
import {Drawer}   from 'native-base';
import {
  registerDrawer,
  closeDrawer
} from './comp/Drawer';

//
// Inject our Drawer/Drawer component at the root of our app
//
export default function appInitStart({assets, curRootAppIn:
  {
    Drawer: ref => ref = registerDrawer(ref)
    content: <Drawer>
    onClose: <closeDrawer>
  }
  {curRootAppIn:
    {Drawer:
  }
  }
}
```

```
import actions from './actions';

/*
 * An app-level life-cycle hook that dispatches our bootstrap action
 * that gets the ball rolling!
 */
export default function appOnStart({assets, appState, dispatch}) {
  dispatch(actions.bootstrap());
}
```



Feature Enablement

Feature Enablement

Feature Enablement

- by default all Features are active
- can be disabled via Feature.enabled built-in aspect

src/feature/sandbox/feature.js

```
export default createFeature({  
  name: 'sandbox',  
  enabled: inDevelopmentMode(),  
  ... snip snip  
});
```

**Made possible because feature-u is
in control of App Startup**



How does
feature-u
accommodate:

2. Feature Collaboration



Cross Feature
Communication

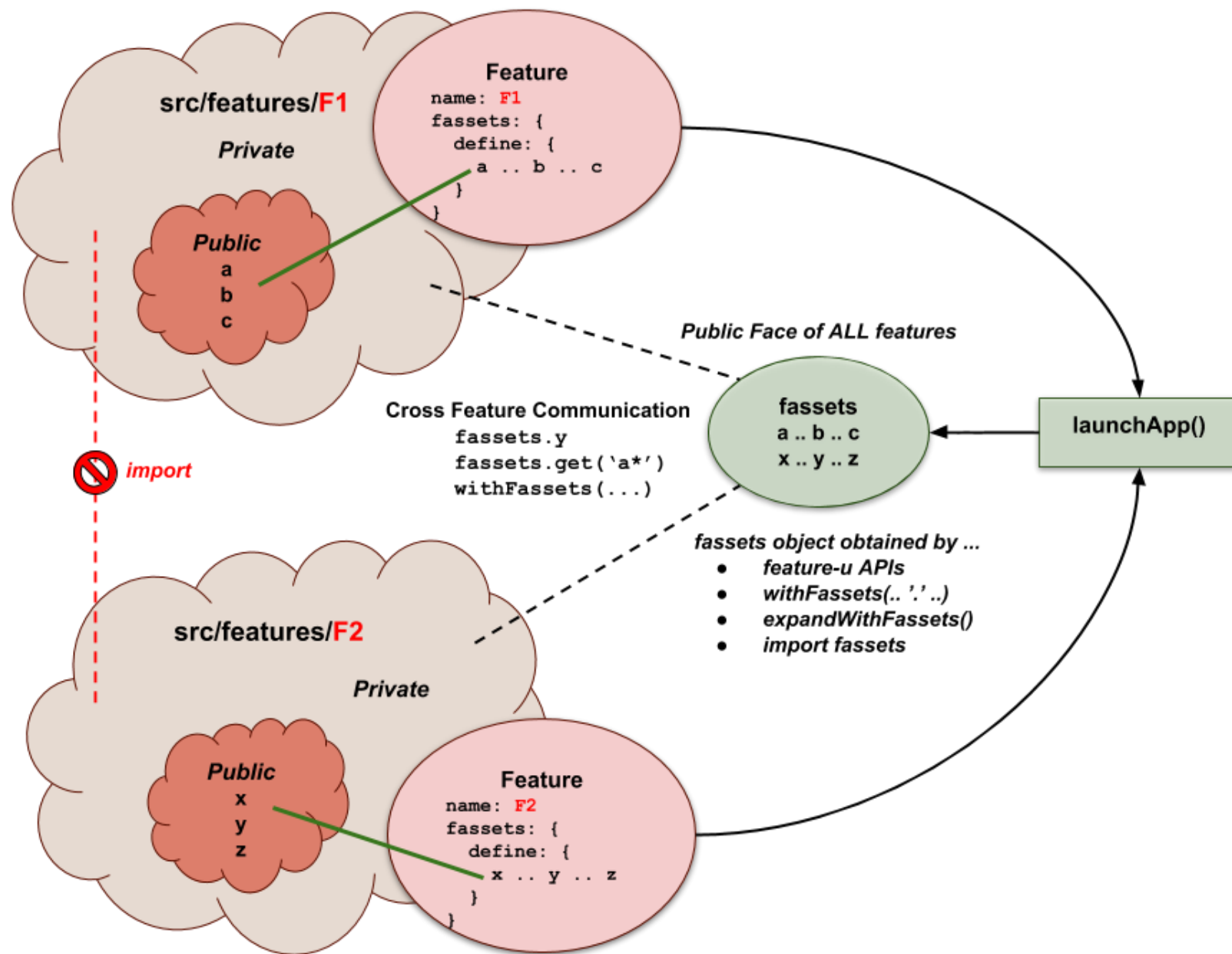


Feature Based
UI Composition

Cross Feature Communication

fassets

Cross Feature Communication



Cross Feature Communication

fassets

code snippet ...

defining fassets

```
export default createFeature({  
  
  name:      'featureA',  
  
  fassets: {  
    define: {  
      'actions.openView': actions.view.open,      // openView(viewName): Action  
      'sel.currentView':  selector.currentView,   // currentView(appState): viewName  
      'sel.isDeviceReady': selector.isDeviceReady, // isDeviceReady(appState): boolean  
    },  
  },  
  
  ...  
});
```

using fassets

```
if (fassets.sel.isDeviceReady(appState)) {  
  ...  
}
```

NOTE: This uses a push philosophy

Feature Based UI Composition withFassets()


code snippet ...

defining logo

```
export default createFeature({  
  
  name: 'common',  
  
  fassets: {  
    define: {  
      'company.logo': () => , // a react component  
    },  
  },  
  
  ...  
});
```

injecting fasset component properties

```
function MyComponent({Logo}) {  
  return (  
    <div>  
      <Logo/>  
    </div>  
    ... snip snip  
  );  
}  
  
export default withFassets({  
  component: MyComponent,  
  mapFassetsToProps: {  
    Logo: 'company.logo',  
  }  
});
```



Feature Based
UI Composition

Resource
Contracts

UI Composition can be a "contract"

- Supported by additional **fasset** directives
 - **fassets.use**: specify a series of injection needs
 - **fassets.defineUse**: supply this content
- **NOTE: This uses a pull philosophy**
- **Wildcards (*)** provide additional dynamics
 - allowing content to be **injected autonomously**

Feature Based UI Composition

Resource Contracts

src/features/main/feature.js

```
createFeature({  
  name: 'main',  
  
  fassets: {  
    use: [  
      'MainPage.*.link',  
    ],  
  },  
});
```

code snippet ...

src/features/main/comp/MainPage.js

```
function MainPage({mainLinks}) {  
  return (  
    <div> { /* links section */}  
    {mainLinks.map( (MainLink, indx) => <MainLink key={indx}/>)}  
    </div>  
  );  
}  
  
export default withFassets({  
  component: MainPage,  
  mapFassetsToProps: {  
    mainLinks: 'MainPage.*.link',  
  },  
});
```

**We have switched to a pull philosophy
with autonomous injection!!**

src/features/cart/feature.js

```
createFeature({  
  name: 'cart',  
  
  fassets: {  
    defineUse: {  
      'MainPage.cart.link': () => <Link to="/cart">Cart</Link>,  
    },  
  },  
});
```

src/features/search/feature.js

```
createFeature({  
  name: 'search',  
  
  fassets: {  
    defineUse: {  
      'MainPage.search.link': () => <Link to="/search">Search</Link>,  
    },  
  },  
});
```

UI Composition

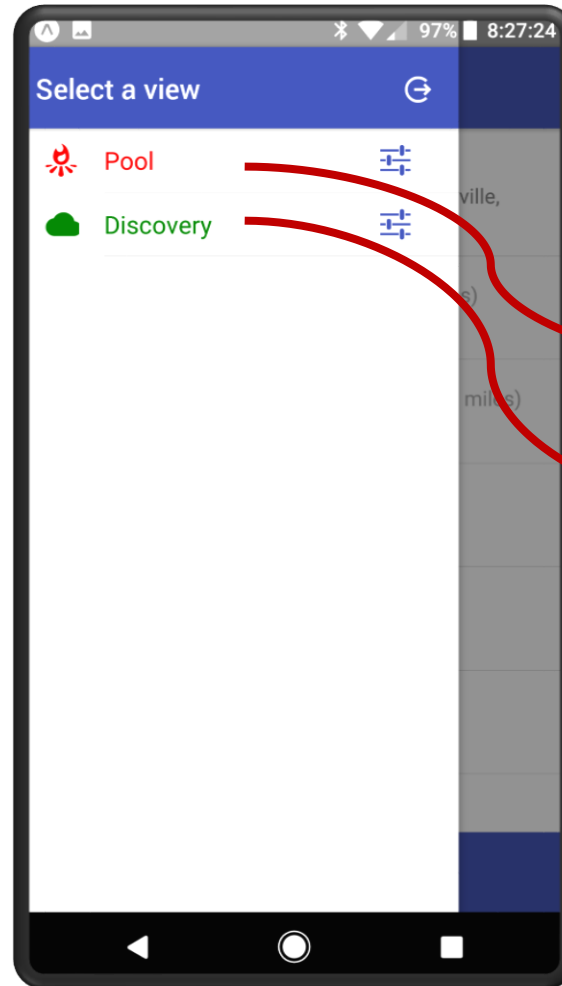
Resource
Contracts



eatery-nod



<https://github.com/KevinAst/eatery-nod>



leftNav feature

eatery screens

discovery screens

A/B Testing

change a feature to a new version

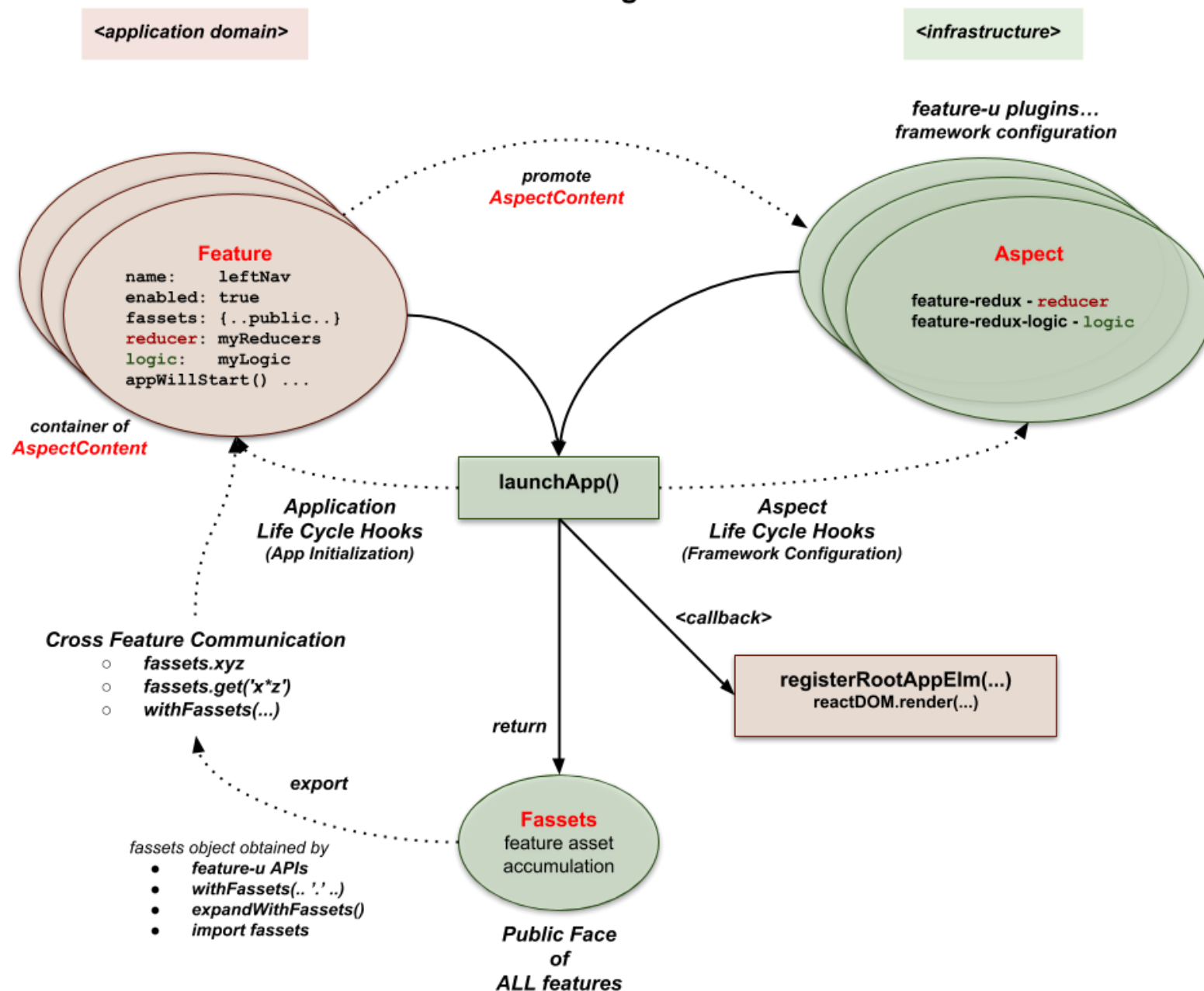
or swap out to a mock service

or turn on a new feature in it's entirety



In Summary

feature-u Context Diagram



A final word
about
Feature Based
Development

Features should mirror requirements

Features are a Higher Level Abstraction

- ***because** they contain other programming paradigms*
- *features are more about a “logical packaging”
so they **plug-and-play***

What does this mean in terms of **feature-u**?

Question: "*How does **feature-u** impact my design constructs?*"

Answer: It doesn't!

feature-u is NON Intrusive!

- you employ same constructs and styles
- you use same frameworks in the same way
- *only diff:* your scope is smaller (*i.e. a feature*)

feature-u *frees you up to focus your attention
on the "business end" of your features!*

