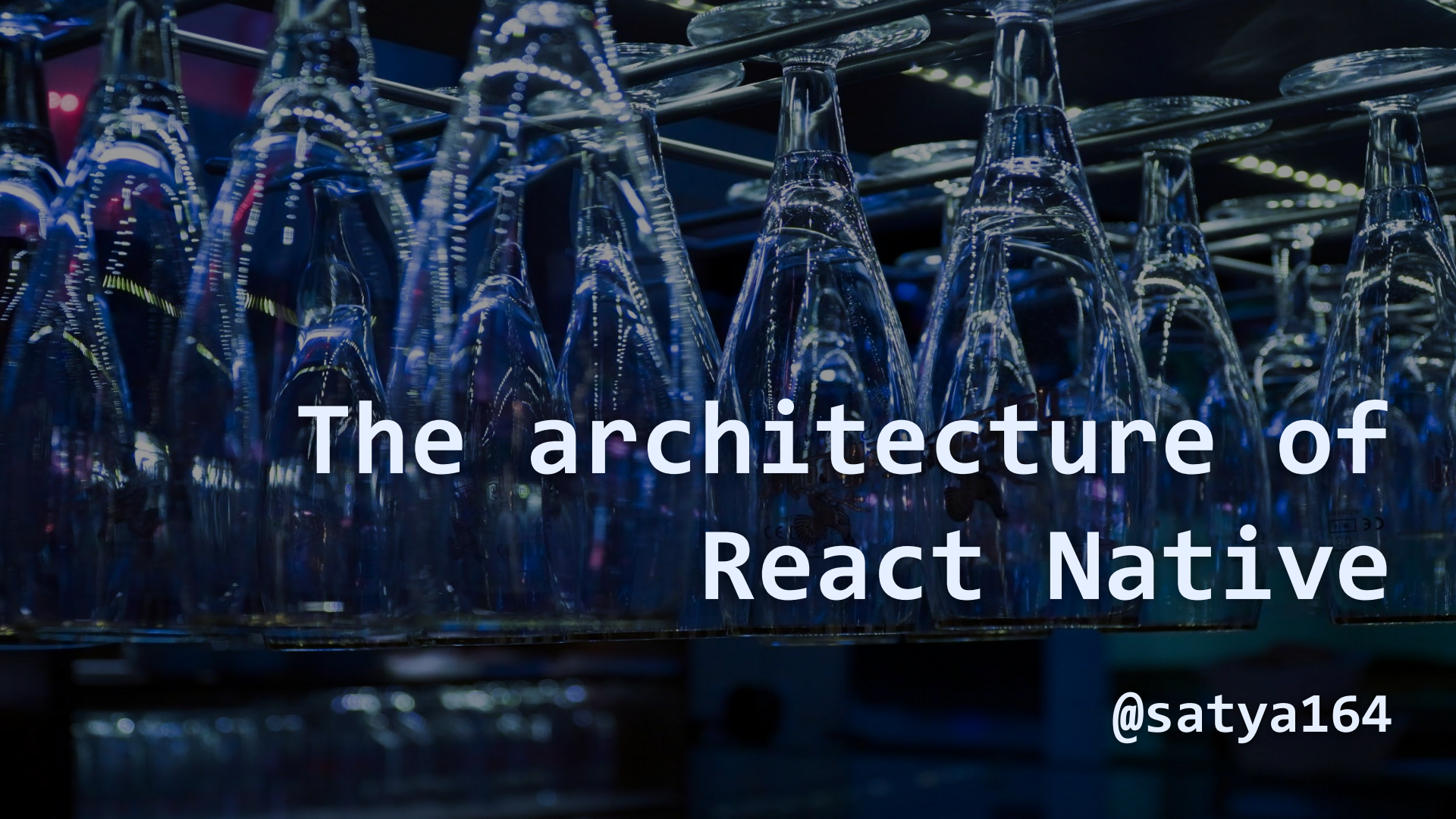


The architecture of React Native

@satya164

Hello

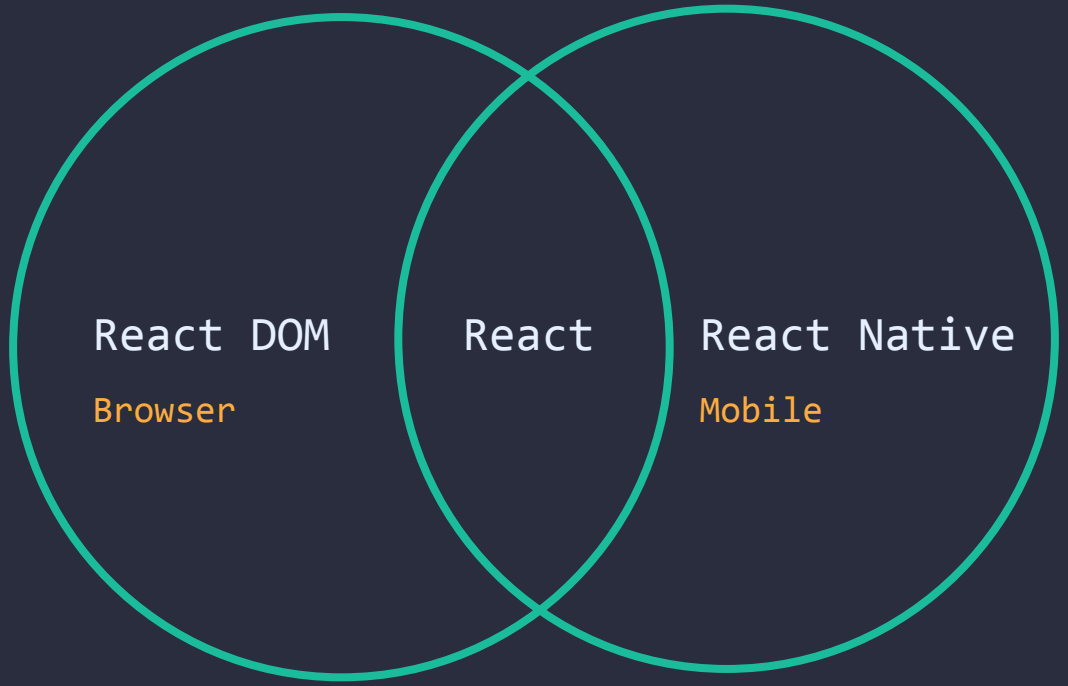
👋 My name is **Satyajit Sahoo**

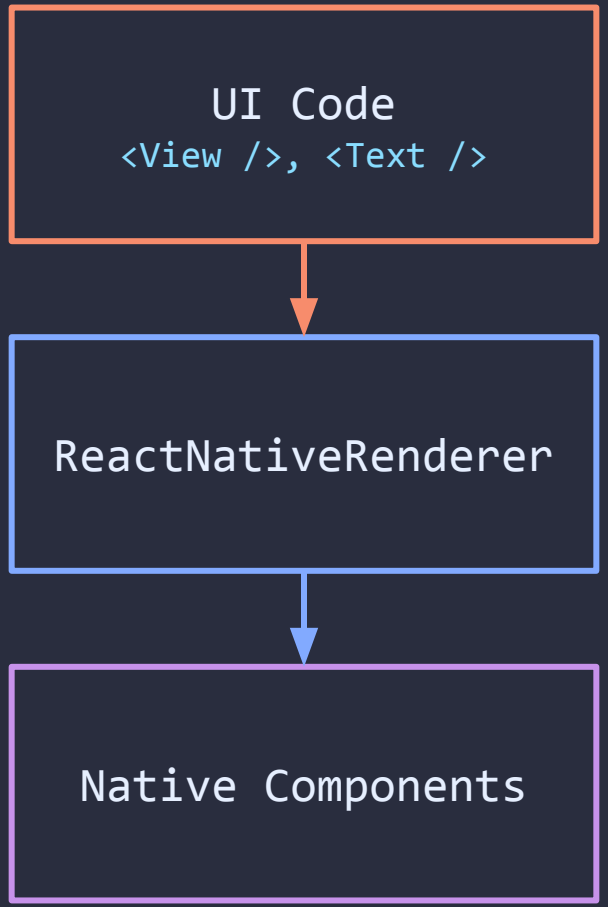
💻 I am a developer at **callstack.com**

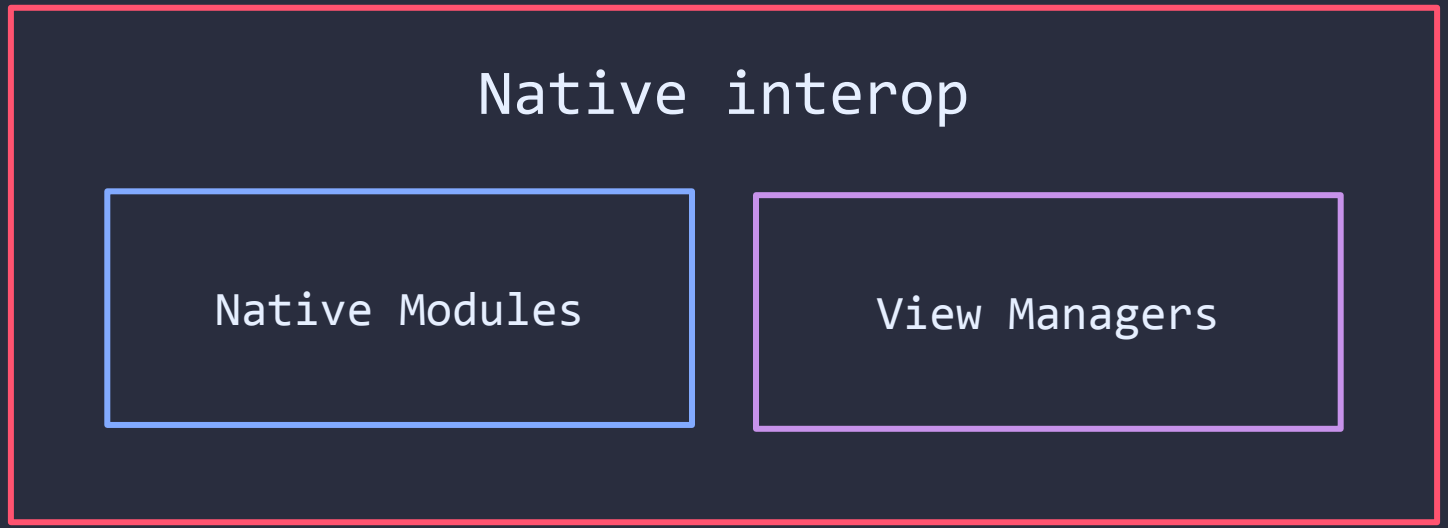
📢 Follow me **@satya164**

🎩 I work on **reactnavigation.org**

React Native


React DOM
Browser
React
React Native
Mobile

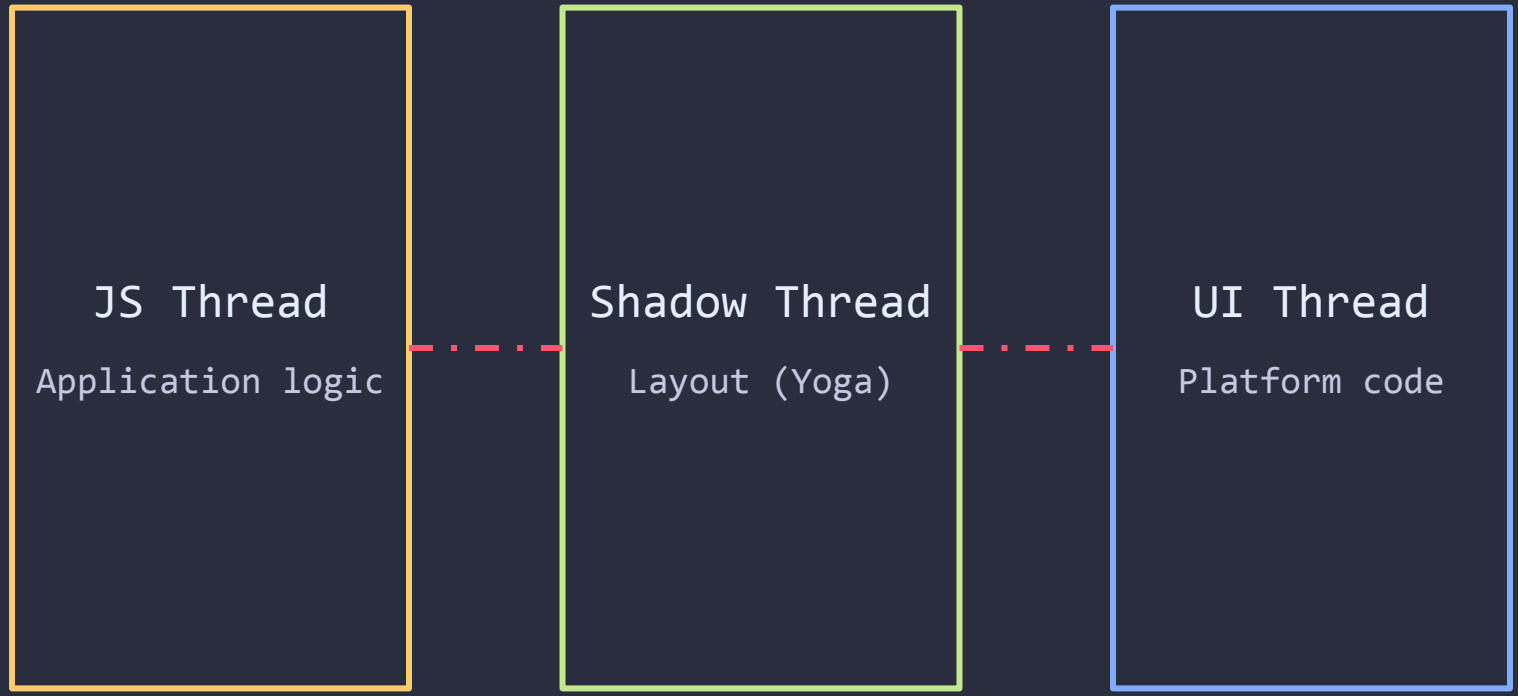

UI Code
<View />, <Text />
ReactNativeRenderer
Native Components

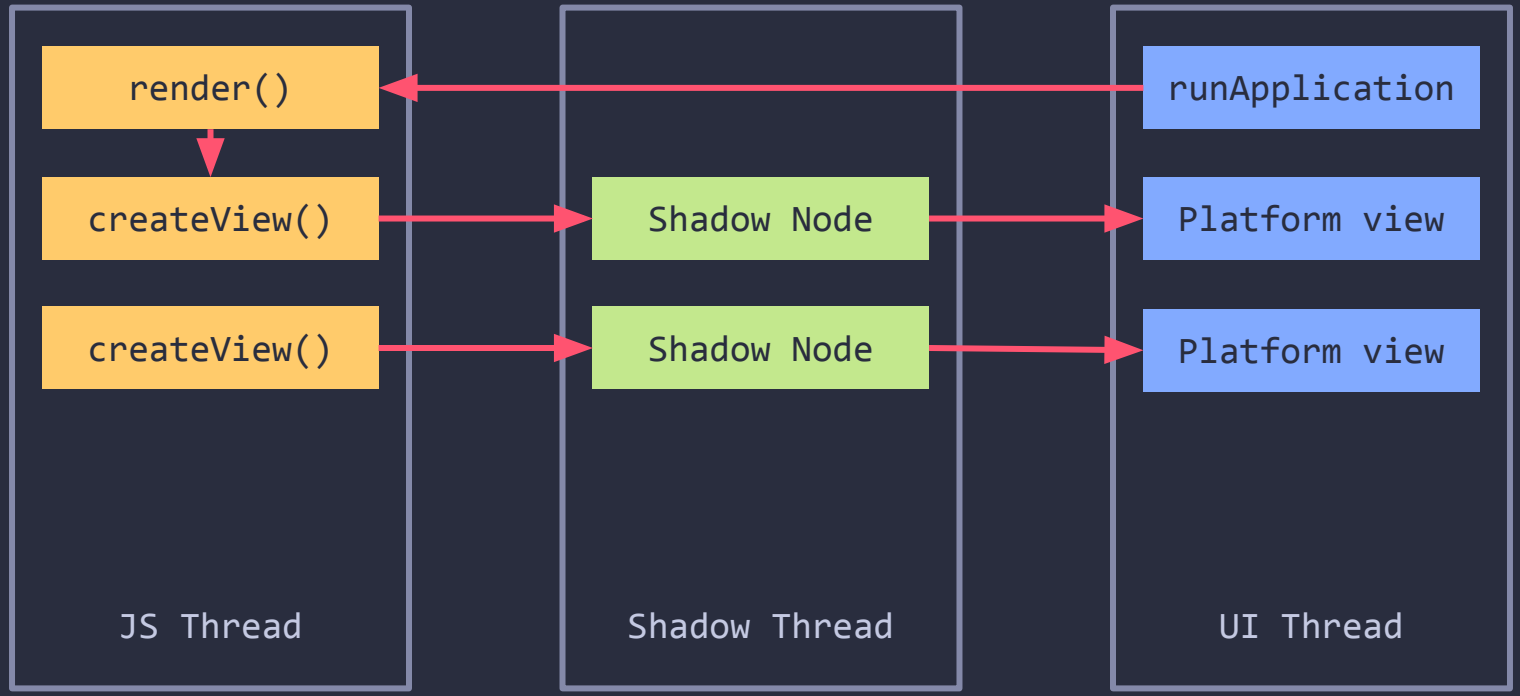

Native interop
Native Modules
View Managers

```
interface UIManager {
  getViewManagerConfig(...args): Object;
  createView(...args): void;
  updateView(...args): void;
  manageChildren(...args): void;
}
```

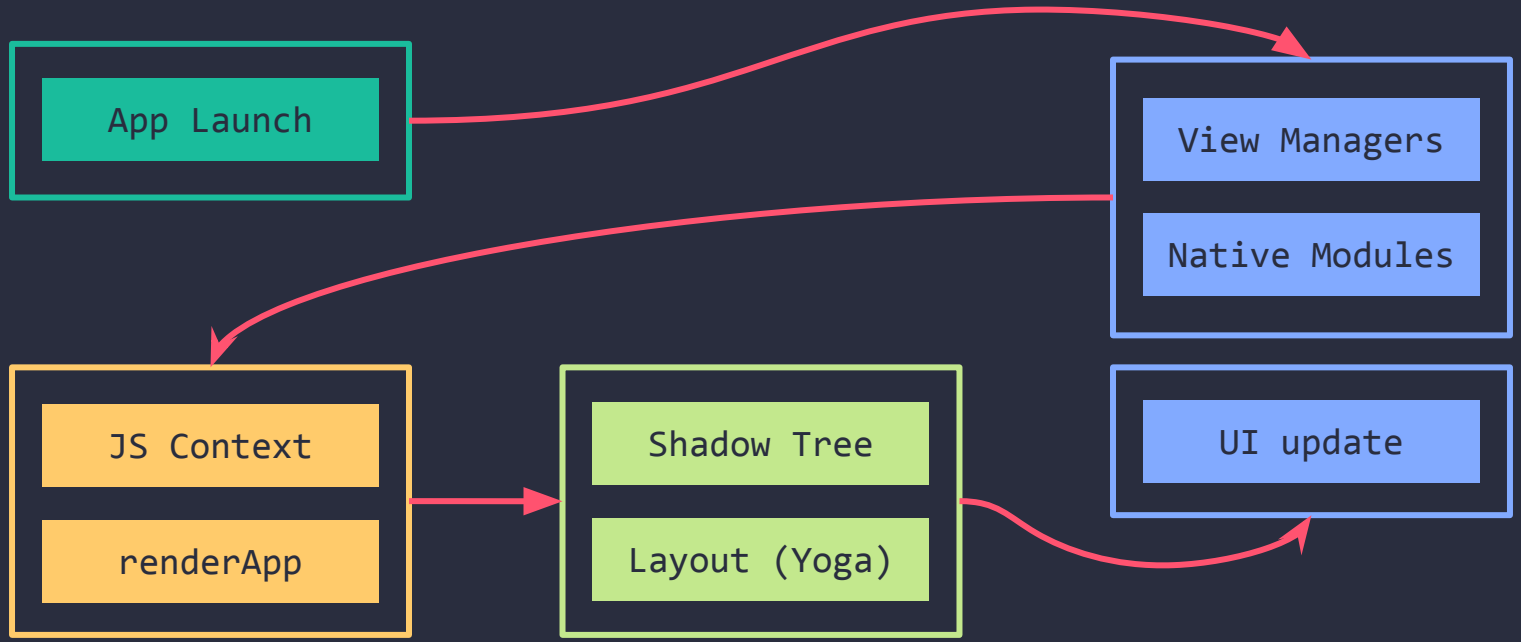
The Bridge

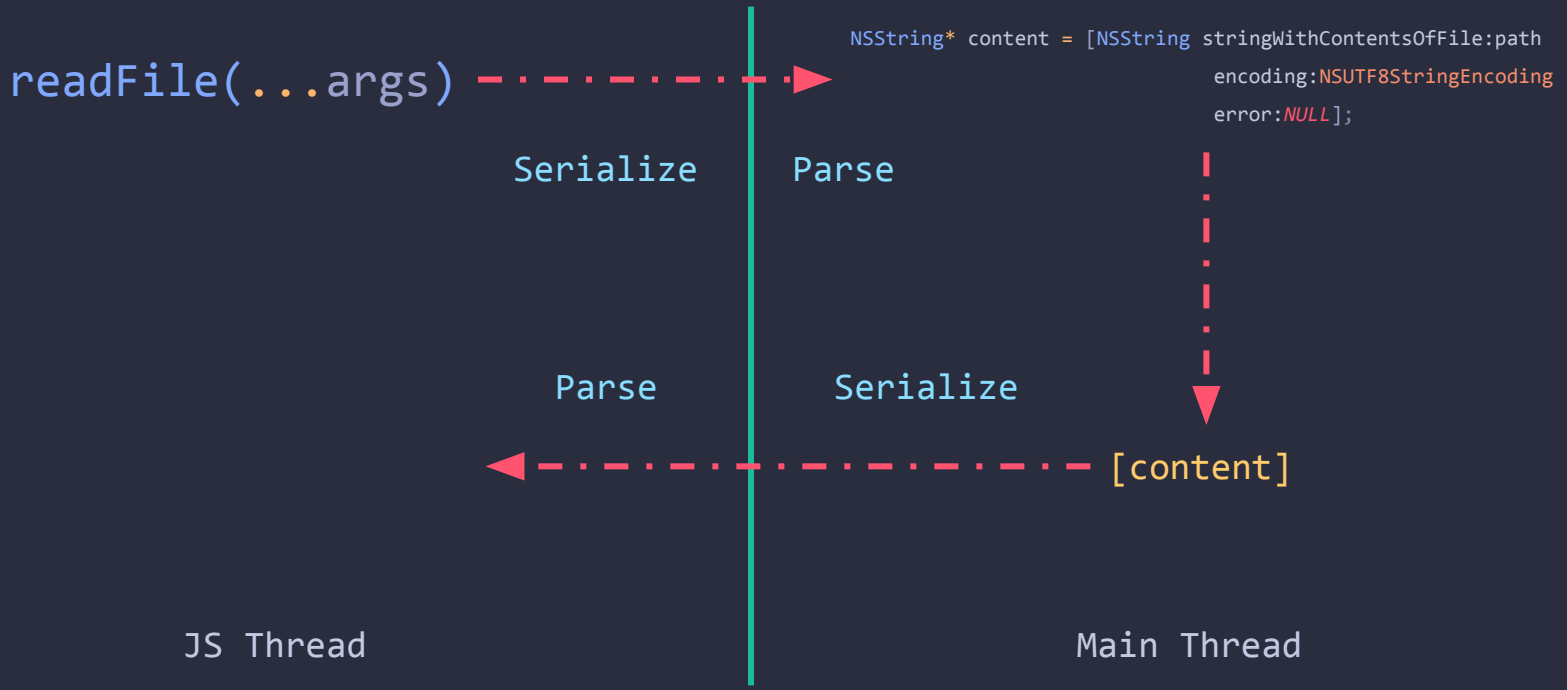
JavaScript
createView(...)
manageChildren(...)
[
["createView", ...],
["manageChildren", ...]
]
Bridge
Native
Platform APIs

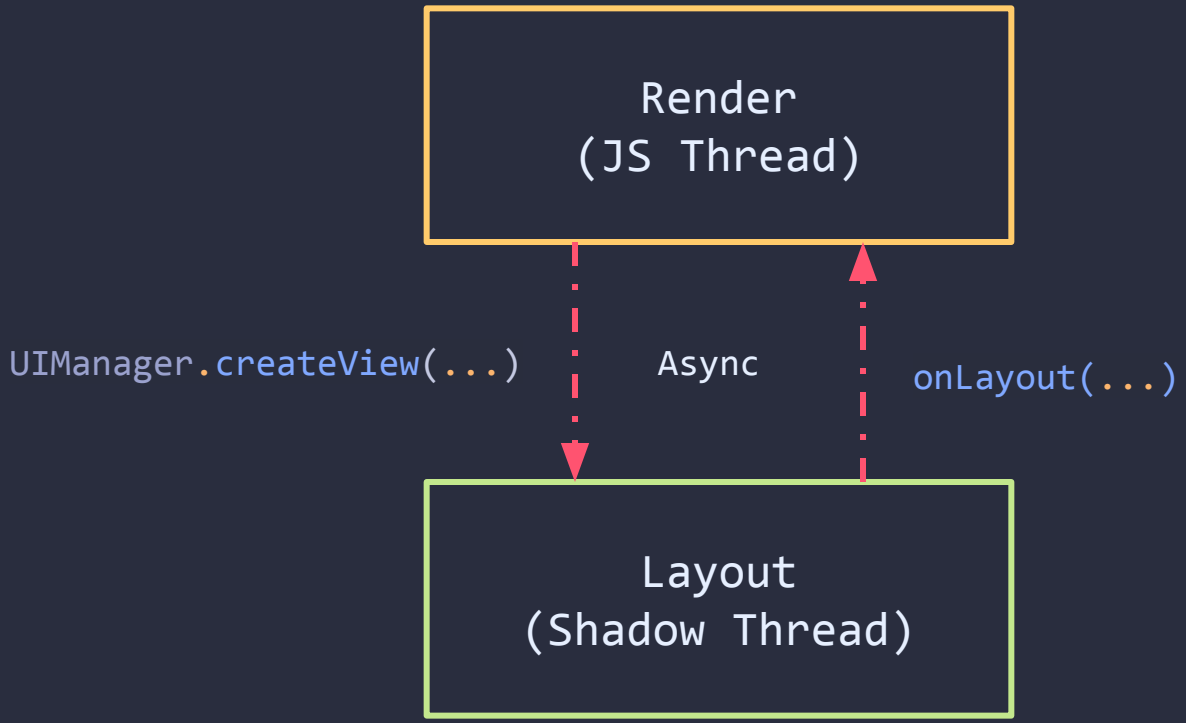

JS Thread
Application logic
Shadow Thread
Layout (Yoga)
UI Thread
Platform code


render()
createView()
createView()
Shadow Node
Shadow Node
runApplication
Platform view
Platform view
JS Thread
Shadow Thread
UI Thread

Problems


App Launch
View Managers
Native Modules
JS Context
renderApp
Shadow Tree
Layout (Yoga)
UI update
JS Thread
Shadow Thread
UI Thread


readFile(...args)
Serialize
Parse
NSString* content = [NSString stringWithContentsOfFile:path
encoding:NSUTF8StringEncoding
error:NULL];
Parse
Serialize
[content]
JS Thread
Main Thread


Render
(JS Thread)
UIManager.createView(...)
Async
onLayout(...)
Layout
(Shadow Thread)

Gestures

ListView

BackHandler

JSI

```
const el = document.createElement('img')
```

Reference to image element instantiated in C++

Calls method defined in C++

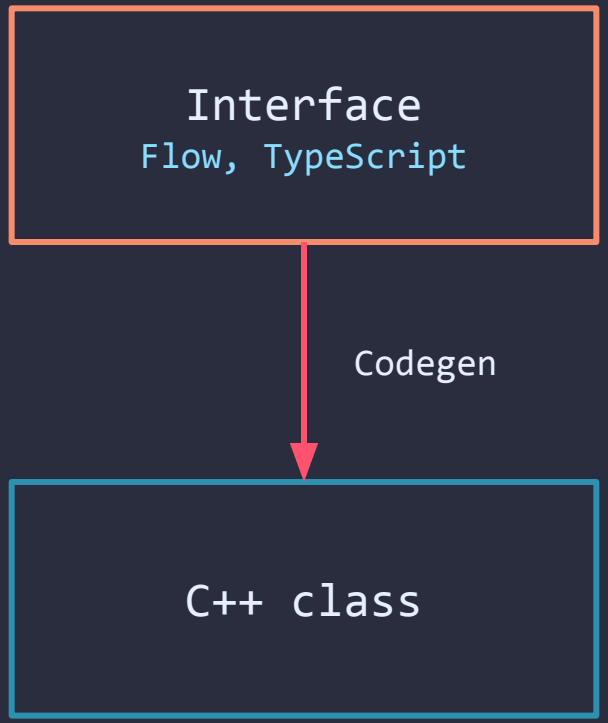
```
el.setAttribute('src', '...')
```

```
const el = UIManager.createView('Image')
```

Reference to image element instantiated in C++

Calls method defined in C++

```
el.setNativeProps({ source: '...' })
```


Interface
Flow, TypeScript
Codegen
C++ class

Fabric

Fabric

Enable recomputing on any thread

Make shadow nodes immutable

Switch to React Async mode

Sync (High priority)

Layout

Gesture (Touches, Scroll)

Animations

UI updates (TextInput)

Async (Low priority)

Data fetching

Updating stores

Lighter Bridge

Lifecycle of native modules tied to JavaScript instances

Lazy initialization of native modules

Code generation instead of runtime initialization of modules

Reduce serialization and copying data

Resources

github.com/react-native-community/discussions-and-proposals/issues/4

@satya164
Thank you