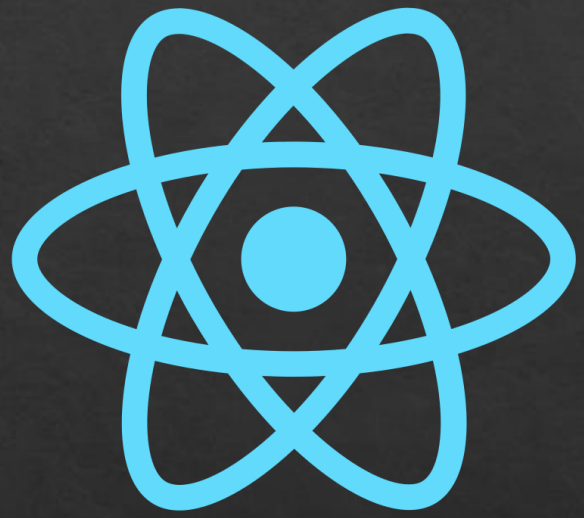
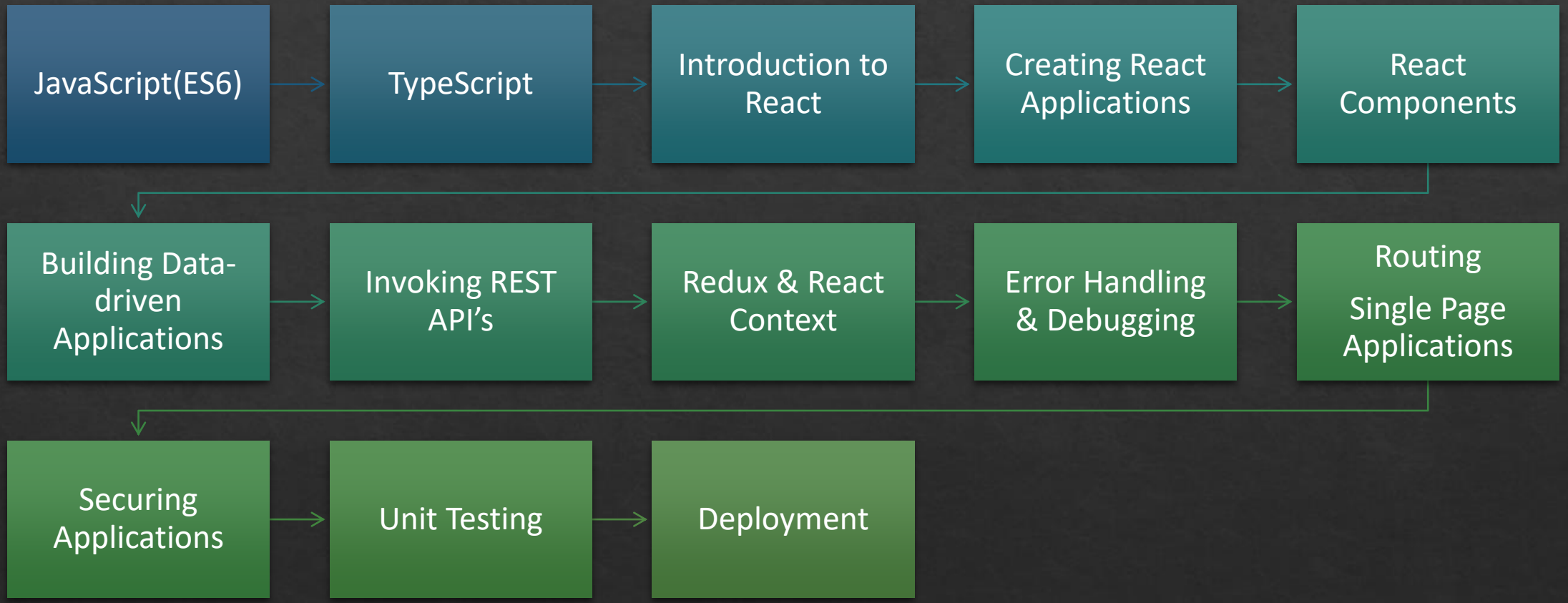
React



ANIL JOSEPH

Presentaed by Anil Joseph(anil.jos@gmail.com)

Agenda



Presentaed by Anil Joseph(anil.jos@gmail.com)

Anil Joseph

Introduction

- Over 20 years of experience in the industry
- Technologies
  - C, C++
  - Java, Enterprise Java
  - .NET & .NET Core
  - **UI Technologies: React, Angular, jQuery, ExtJs**
  - Mobile: Native Android, React Native
- Worked on numerous projects
- Conducting trainings for corporates (700+)

Software

Node.js & NPM

Yarn

(Optional)

HTML, CSS, JavaScript, TypeScript Editor

(**Visual Studio Code)**

Browsers(Chromium)

JavaScript

An interpreted language

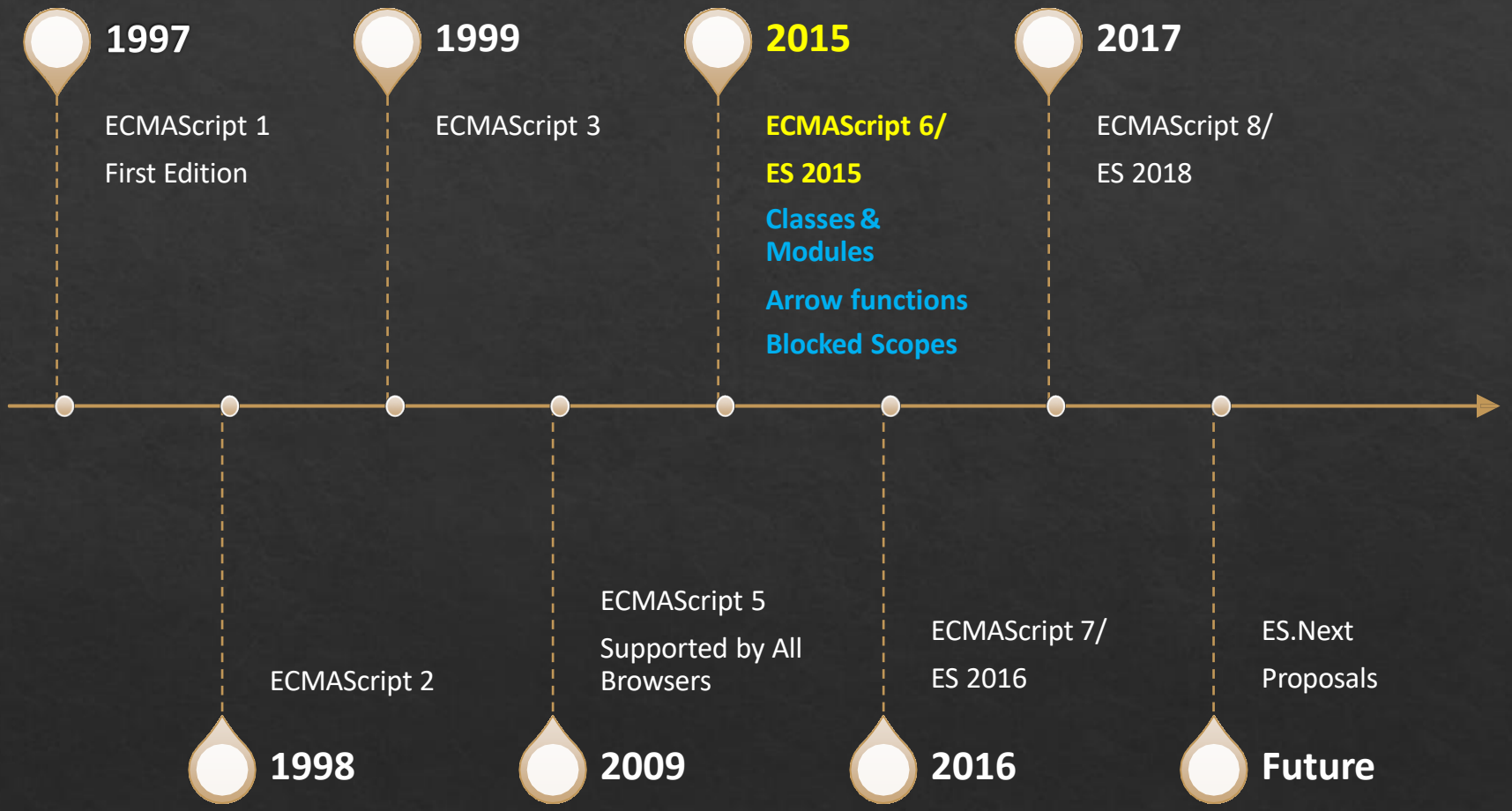
Dynamic

Object-oriented

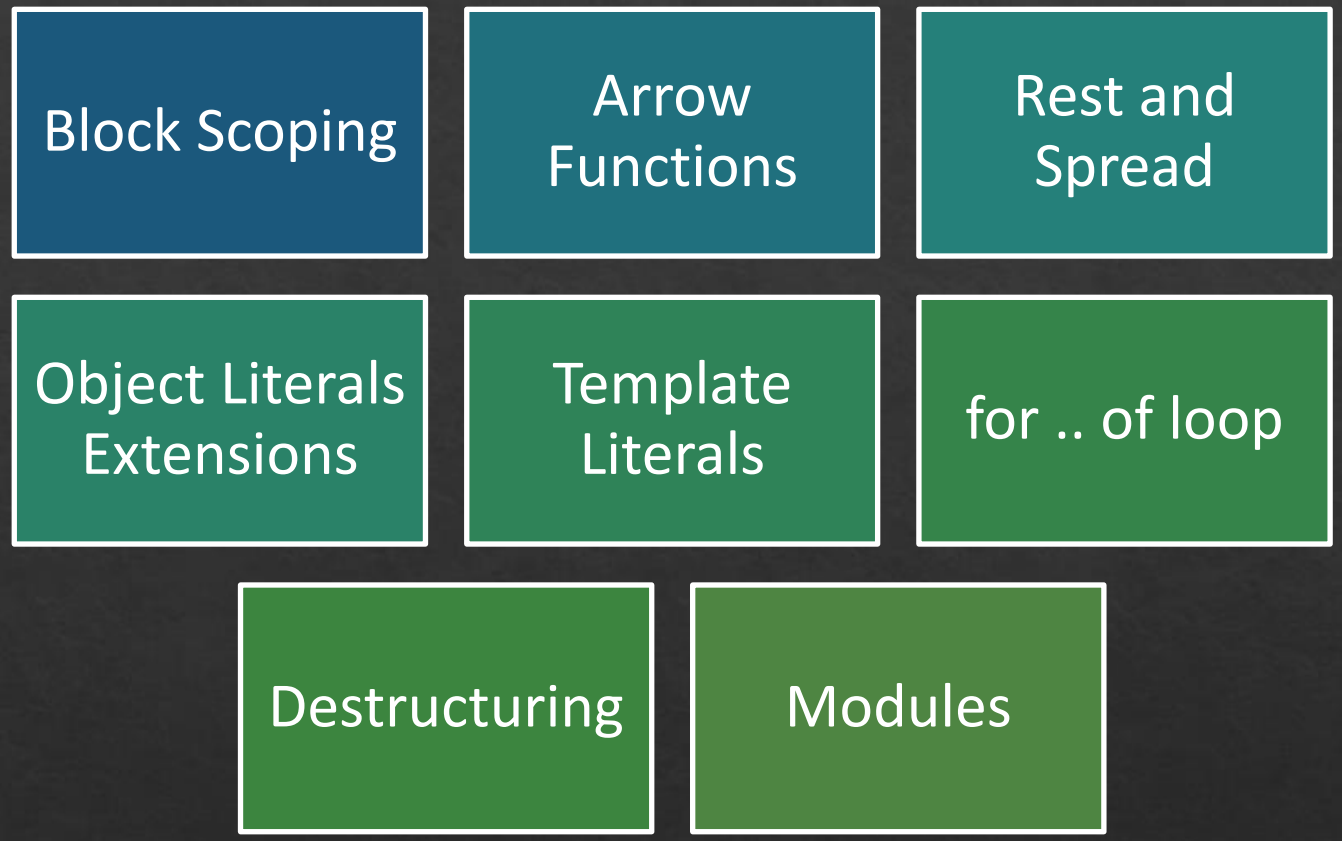
Supports Functional style of programming

Available on the browsers and Node.js

ECMAScript Versions



ES6 New Syntax



Block Scoped Constructs

- **Scope** determines the accessibility (visibility) of variables.
- ES5 supports two scopes
  - Global
  - Functional
- ES 6 introduces the block scoped constructs
  - **let**
  - **const**

Arrow Function

Represents a function expression

An arrow function expression has a shorter syntax than a function expression.

They do not receive the implicit arguments “this” and “arguments”.

Used widely for asynchronous and functional programming

Spread and REST Operators

- **Spread syntax** allows
  - An iterable to be expanded in places where zero or more arguments are expected
  - Example: An array to be converted to a list of arguments of a method.
- **Rest parameter** syntax allows
  - To represent an indefinite number of arguments as an array.

Object Literal Extensions

Simplified Syntax for field assignment

Simplified Syntax for functions

Dynamic field, property and function names

for... of

New for.. Of loop

Iterate over iteratables

Example

- for(var item of names){ }

Template Literals

Allows interpolation on a String template.

Defined inside the back tics (` `)

Example

- `Number: ${number}`

Allows Expressions

Destructuring

Destructuring is a convenient way of extracting multiple values from data stored in (possibly nested) objects and Arrays.

Example:

- var arr = [2300, 3400, 6000]
- var [a, b, c] = arr;

Example

- var employee = {id:1, name: “Anil”, location:“Mumbai”}
- var {id, name, location} = employee;

ES6 Classes

- ES 6 supports class based object-oriented programming
- Classes in ES6
  - Constructor
  - Properties
  - Methods
  - Static methods
  - Inheritance
- Classes are just syntactic sugaring of constructor functions.

Modules

- Use the import and export statements.

```
let foo = function(){
   //some code
}


export default foo;
```

one.js

```
import foo from ‘./one’;

foo();
```

two.js

```
import bar from ‘./one’;

bar();
```

three.js

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Modules

```
export let foo = function(){
   //some code
}


 export let bar = function(){
    //some code
 }
```

one.js

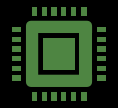
```
import {foo, bar} from ‘./one’;


 foo();
 bar();
```

two.js

Node.js

A server-side JavaScript platform

Created by Ryan Dahl in 2009



Provides an easy way to build scalable network applications

Built on top of Google V8 JavaScript Engine and libuv

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NPM(Node Package Manager)

- NPM is a package manager for the JavaScript programming language.
- Allows users to consume and distribute JavaScript modules that are available on the registry
- The default package manager for Node.
- Comprises of
  - Command line client, also called npm
  - An online database called the npm registry.
    - Public
    - Paid-for private packages
  - NPM website
- The package manager and the registry are managed by npm, Inc.

NPM Packages

- Packages are reusable code published in the npm registry.
- A directory with one or more files a metadata file called package.json.
- A package is a building block that solves a specific problem.
- An application generally depends on many packages.
- Packages can be used on
  - Server side. Example: Express, Request
  - Client Side. Example Angular, React
  - Command based. Typescript, Angular CLI, JSLint

NPM Commands

- NPM is installed with Node
- Check the version
  - npm –v
- Update npm
  - npm install npm@latest –g
- Find the path to npm's directory:
  - npm config get prefix
- Help
  - npm –h
  - npm [command] –h
  - npm help [command]
  - npm help-search [key]

package.json

- A metadata file for the project
- Used to track dependencies
- Create Scripts
- Command to create package.json
  - npm init
- Setting defaults
  - npm set init-author-name 'Anil Joseph'
  - npm get init-author-name
  - npm config delete init-author-name

Installing Packages

- Install to a project
  - npm install express
- Install and save to dependencies
  - npm install angular --save
- Install and save to development dependencies
  - npm install express --save –dev
- Install globally
  - npm install gulp -g

Install Packages with version

- Specific version
  - npm install underscore@1.8.2
- Latest Version
  - npm install underscore@1.8.x
  - npm install underscore@1.8
  - npm install underscore@1.8.2
  - npm install underscore@1.x
  - npm install underscore@1
  - npm install underscore
- Other Options
  - npm install underscore@”>=1.4.x < 1.6.x”

Listing & Removing Package

- npm list
  - List all packages
  - Shows all dependencies of packages
- npm list --depth 1
  - List packages show dependency depth to 1 level
- npm list --global true
  - List global packages
- npm list --global true --depth 0
  - List global packages show dependency depth to 0 level

Listing & Removing Package

- npm list --dev true
  - List development dependiecies
- npm list --prod true
  - List Production dependencies
- npm ls
  - ls as shortcut
- npm uninstall underscore/ npm rm underscore/ npm un underscore
  - Removes/Uninstall a package
- npm uninstall underscore --save
  - Uninstalls and updates the package.json
- npm uninstall underscore -g
  - Unstall global package

TypeScript

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TypeScript

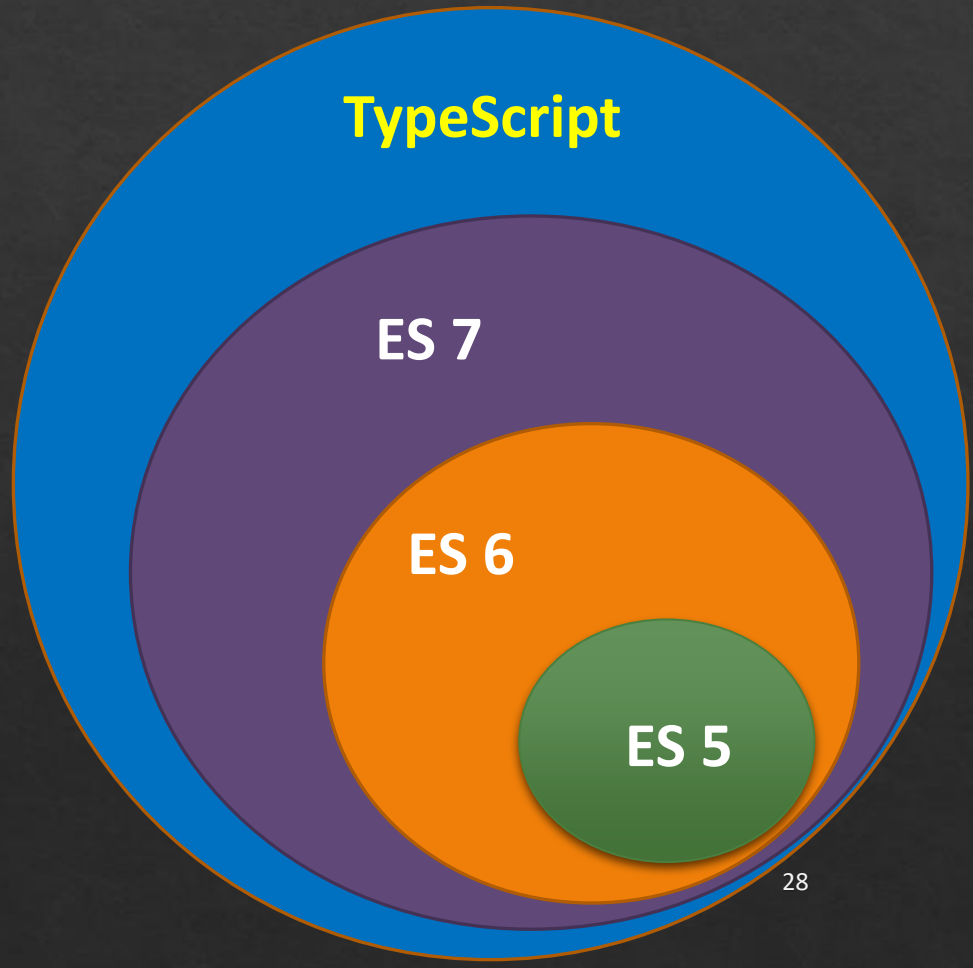
TypeScript is programming language developed and maintained by Microsoft.

TypeScript is a typed superset of JavaScript.

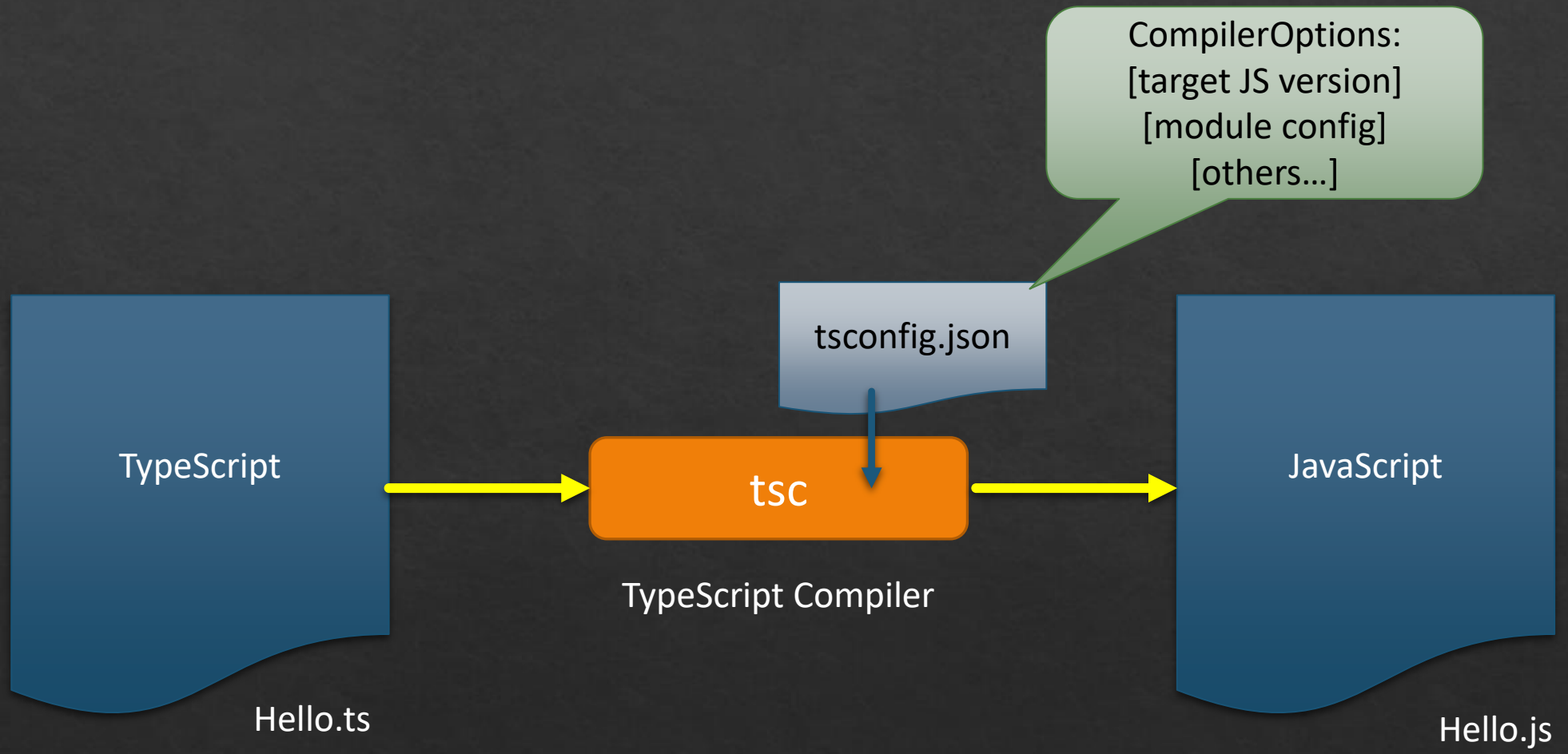
Transcompiles to JavaScript.

Designed for development of large applications.

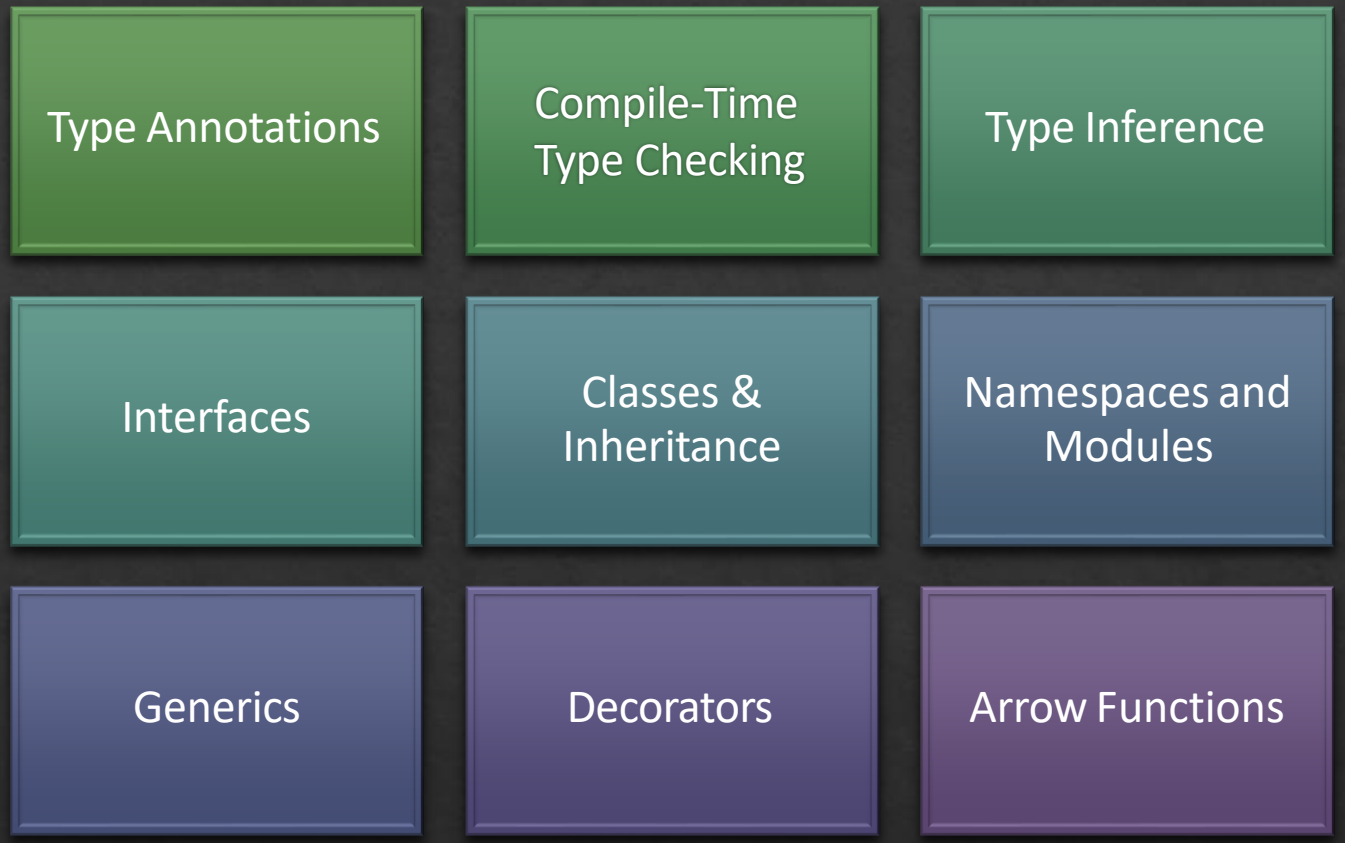
Open Source.



TypeScript


CompilerOptions:
[target JS version]
[module config]
[others…]
tsconfig.json
TypeScript
tsc
JavaScript
TypeScript Compiler
Hello.ts
Hello.js

TypeScript Features



TypeScript Installation

Node.js

- npm install -g typescript

Available with

- Visual Studio 2015 & 2017
- Visual Studio Code

Plugins available with

- Eclipse
- Atom
- Sublime
- WebStrome
- Many more

TypeScript Types

Boolean

- **let** isAvailable: boolean = false;

Number

- **let** age: number = 16;
- **let** hex: number = 0xf00d;

String

- **let** name: string = “Anil";

Array

- **let** list: number[] = [1, 2, 3];
- **let** list: Array<number> = [1, 2, 3];

TypeScript Types

Enum

- **enum** Color {Red, Green, Blue}
- **let** c: Color = Color.Green;

Any

- **let** x: any = 4;
- x = “hello”

Tuple

- let data: [number, string];
- data = [1, "Anil"];

TypeScript Types

void

```
function foo(): void {
    console.log(“foo");
}
```

Null and Undefined

- var x: string = null;
- var y:string= undefined

Interfaces

- Interfaces are a powerful way of defining contracts.
- Example

```
interface Vehicle{

    name: string;
    speed: number;
    gear?: number;

    applyBrakes(decrement: number): void;
}
```

- Interfaces can extend interfaces
  - (keyword extends)
- Classes implements interfaces
  - (keyword implements)

Classes

- Traditional JavaScript uses functions and prototype-based inheritance to build up reusable components.
- Starting with ECMAScript 2015, also known as ECMAScript 6, JavaScript introduces the object-oriented class-based approach.
- TypeScript supports classes that compile down to JavaScript
  - Works across all major browsers and platforms
  - Without having to wait for the next version of JavaScript.

Classes

- Example

```
class Car implements Vehicle{
    constructor(public name: string, public speed: number, public
    gear: number){

    }
    applyBrakes(decrement: number): void{

    }
}
```

- Modifiers supported
  - public, private, protected
- Can have constructors
- Supports Properties
- Supports static members
- Supports inheritance
- Classes and methods can be abstract

Represents a function expression

An arrow function expression has a shorter syntax than a function expression

They do not receive the implicit arguments “this” and “arguments”

Used widely for asynchronous and functional programming

TypeScript: Modules

- Starting with the ECMAScript 2015, JavaScript has a concept of modules.
- TypeScript shares this concept.
- Modules are executed within their own scope
  - Not in the global scope

Modules

- Use the import and export statements.

```
let foo = function(){
   //some code
}


export default foo;
```

one.js

```
import foo from ‘./one’;

foo();
```

two.js

```
import bar from ‘./one’;

bar();
```

three.js

Modules

```
export let foo = function(){
   //some code
}


 export let bar = function(){
    //some code
 }
```

one.js

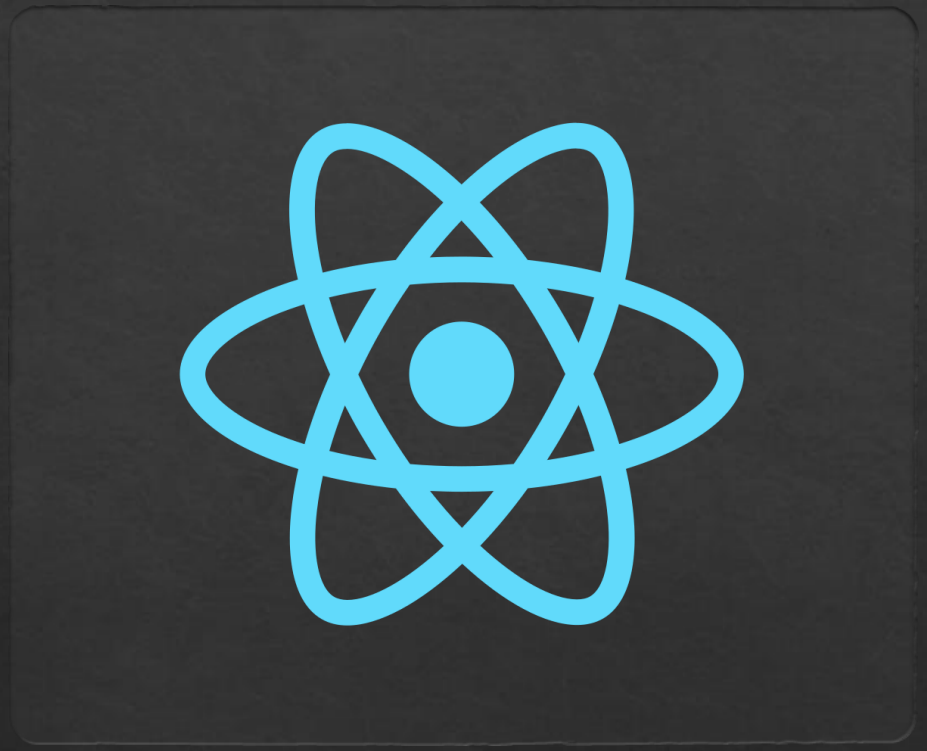
```
import {foo, bar} from ‘./one’;


 foo();
 bar();
```

two.js

NPM Package vs Module

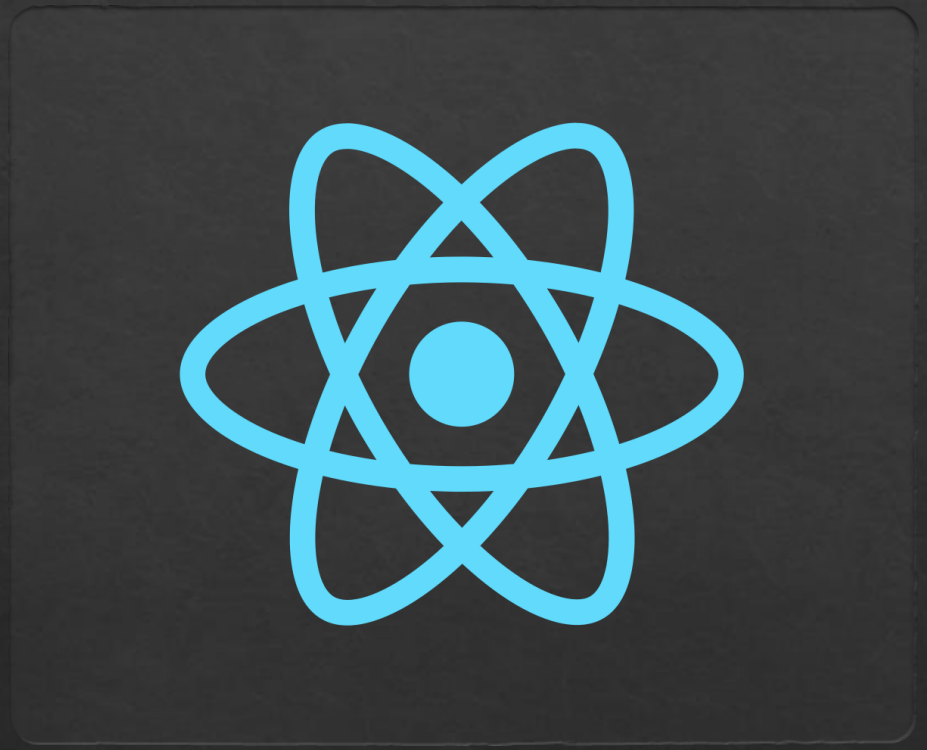
- Module
  - Single JavaScript file with some reasonable functionality
- Package
  - A directory with one or more modules
  - package.json file contains metadata about the package

What is React?



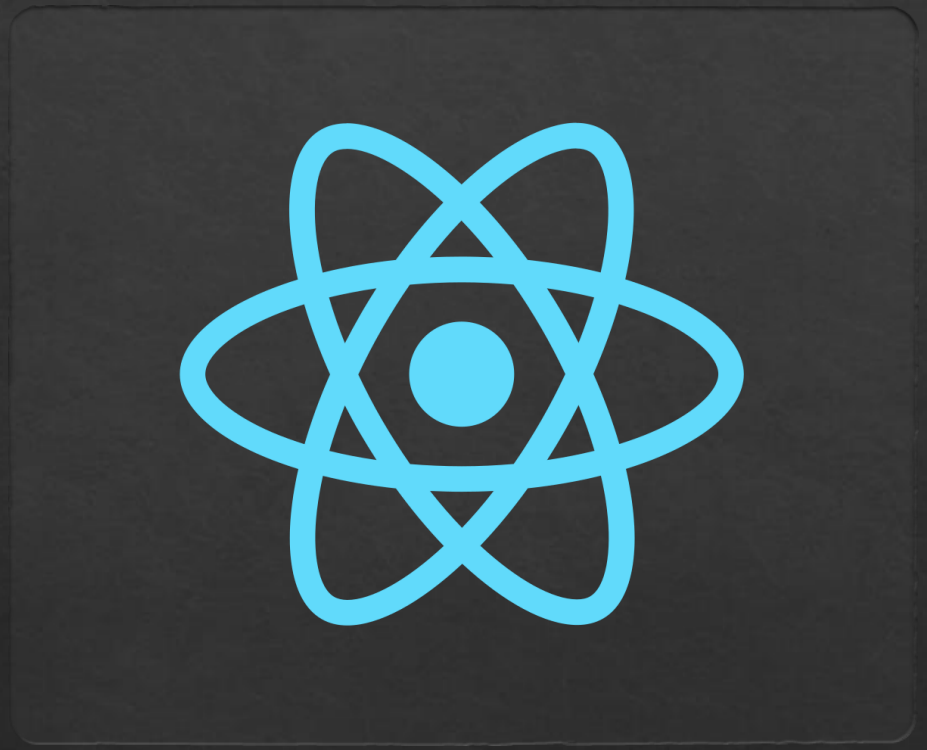
- A JavaScript library to build ***User Interfaces***.
- Building applications for the ***browser***.
- React allows to create custom HTML elements called ***components***.
- Components are used to build ***complex User Interface***
- Reacts promotes writing ***maintainable, manageable and reusable code***.

Why React?



- React handles *State*
  - UI State is difficult to handle with JavaScript
- React focuses on business logic
  - Focus on business logic
- React is *fast*.
  - Apps made in React can handle complex updates and still feel quick and responsive.

Why React?



- React is *modular*
  - Instead of writing large, dense files of code, you can write many smaller, reusable files.
- React is *scalable*.
  - Large programs that display a lot of changing data are where React performs best.
- React has a Huge ecosystem, community

History


React was created by **Jordan Walke**, a software engineer at Facebook.
It was first deployed on **Facebook's** newsfeed in 2011
Later on **Instagram** in 2012.
It was open-sourced in 2013.

Getting Started

Two React Libraries

- React
- ReactDOM

JSX

- A JavaScript extension syntax allowing quoting of HTML

Babel

- The compiler for writing next generation JavaScript.
- Compiles JSX to JavaScript

Creating a React Project

Tool Chains

- A toolchain is a set of programming tools that is used to perform a complex software development task or to create a software product.(Wiki)
- Using a toolchain provides a better developer experience
- Advantages of Tool Chains
  - Scaling to many files and components.
  - Using third-party libraries from npm.
  - Detecting common mistakes early.
  - Live-editing CSS and JS in development.
  - Optimizing the output for production.

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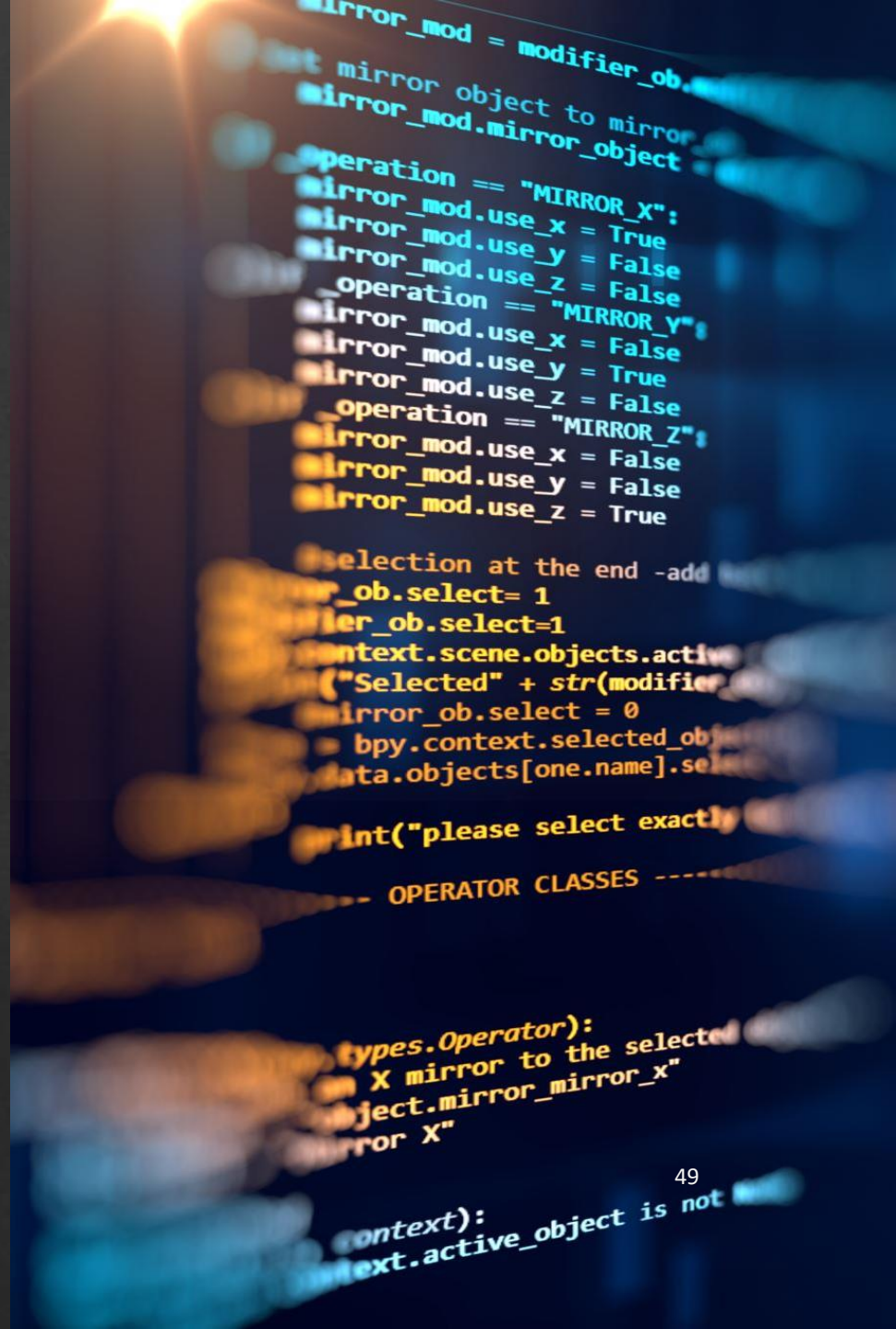
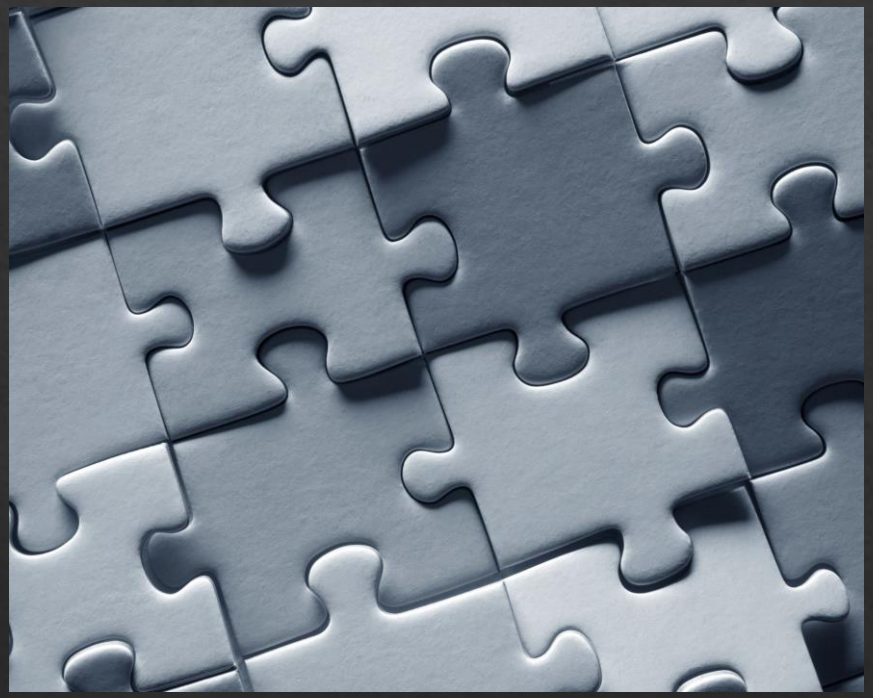


Create React App



- Create React App is an officially supported way to ***create single-page React applications***.
- It offers a modern build setup with no configuration.
- Sets up the development environment to use the latest JavaScript features.
- Optimizes the application for production.
- Integrates the tools: NPM, Babel, Webpack, Webpack development server

Create Project

1

Install NodeJs

- **Runtime to run/execute JavaScript on the machine/server**
- **This installation also installs npm(Node Package Manager)**

2

Install Toolchain

- **Install create-react-app**
- **npm install create-react-app -g**

3

Create React Application

- **create-react-app the-react-app**

4

Start the Application

- **cd the-react-app**
- **npm start**

Create Project

1

Install NodeJs

- Runtime to run/execute JavaScript on the machine/server
- This installation also installs npm(Node Package Manager)

2

Create React Application

- **npx create-react-app the-react-app**

3

Start the Application

- **cd the-react-app**
- **npm start**

Create Project-Typescript

1

Install NodeJs

- Runtime to run/execute JavaScript on the machine/server
- This installation also installs npm(Node Package Manager)

2

Create React Application

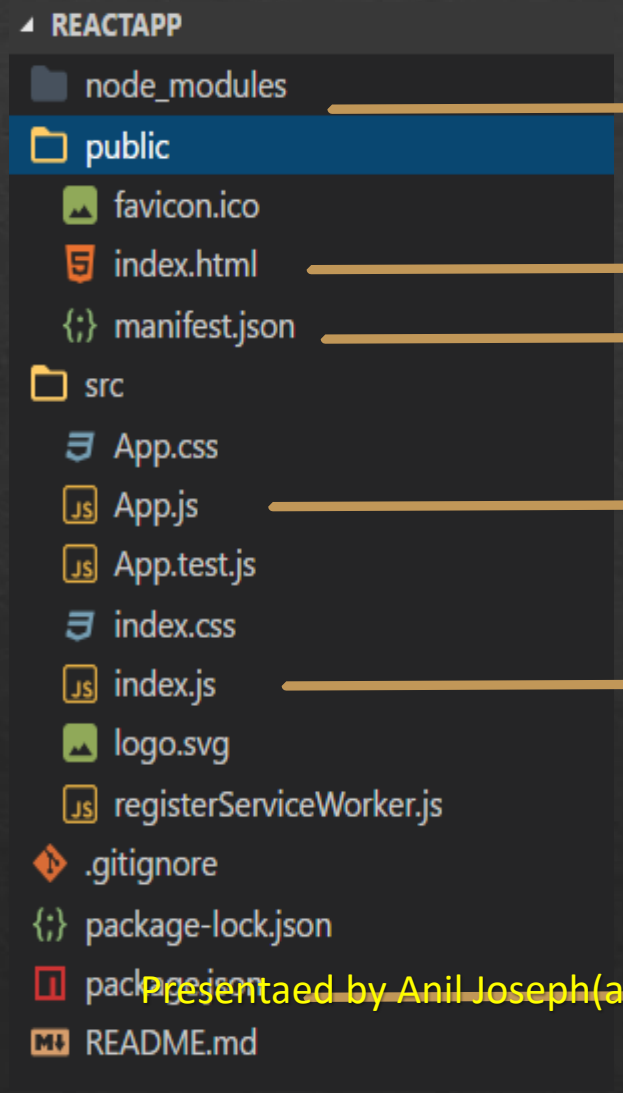
- **npx create-react-app the-react-app –template typescript**

3

Start the Application

- **cd the-react-app**
- **npm start**

Project Structure



Folder with all downloaded dependencies

The page displayed in the browser

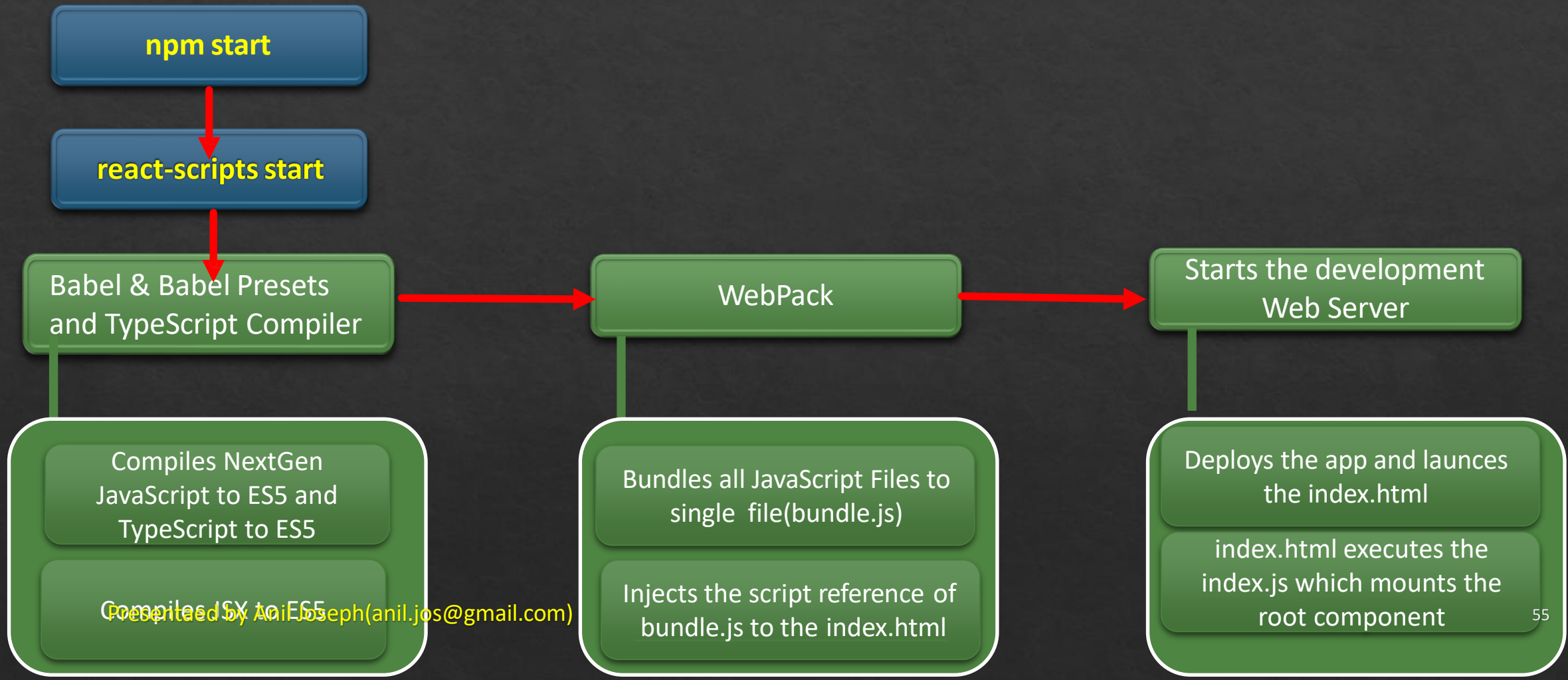
The Web Application Manifest (for installable web applications)

The root component

Initial Script executed on page load. Renders the root component

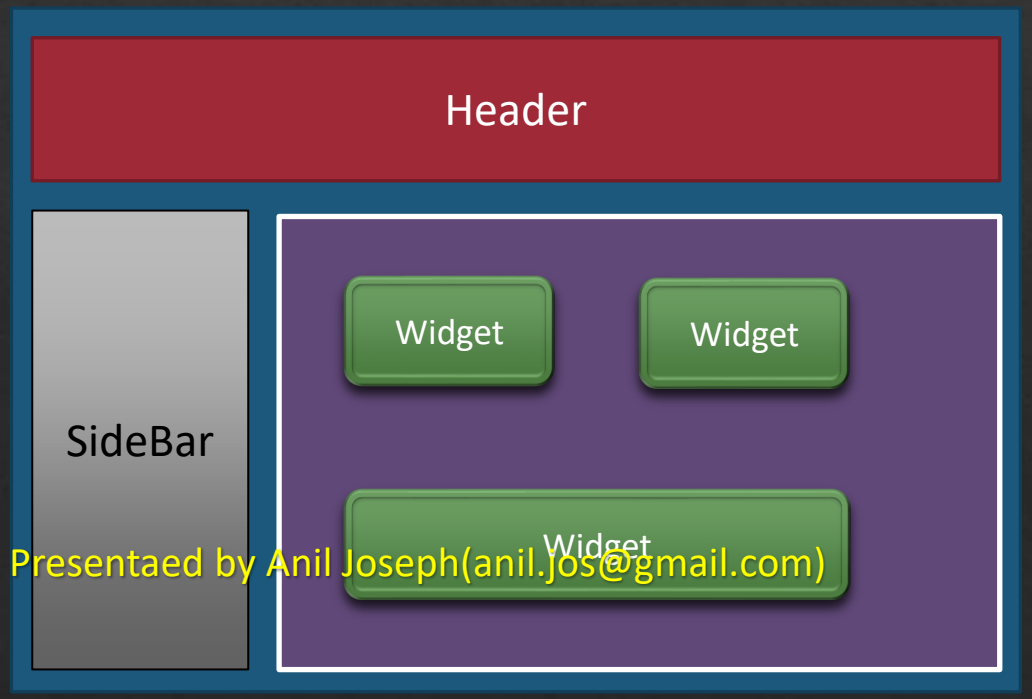
NPM configuration file, contains the dependencies and scripts

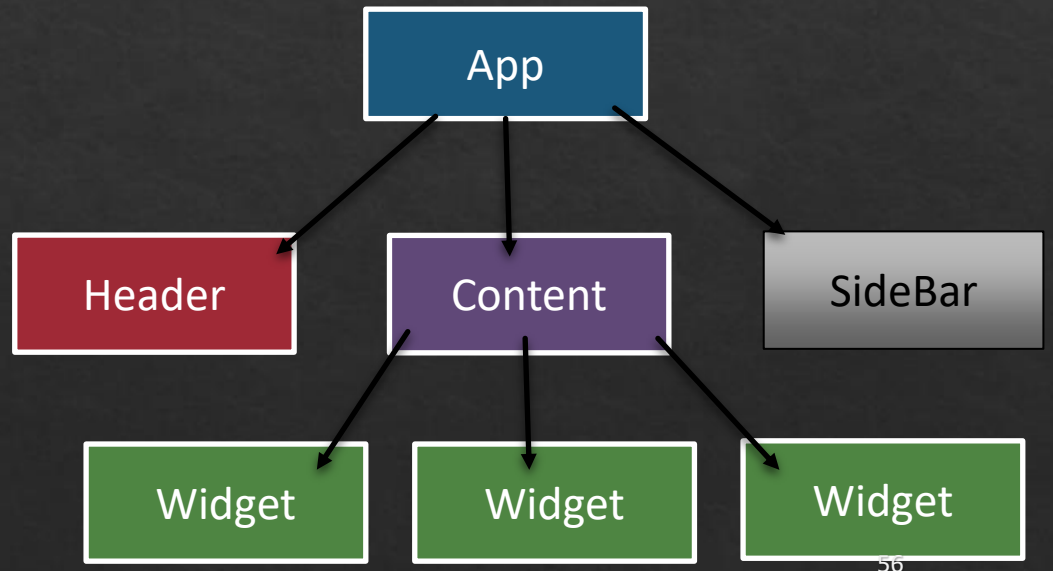
Project Execution



React Components

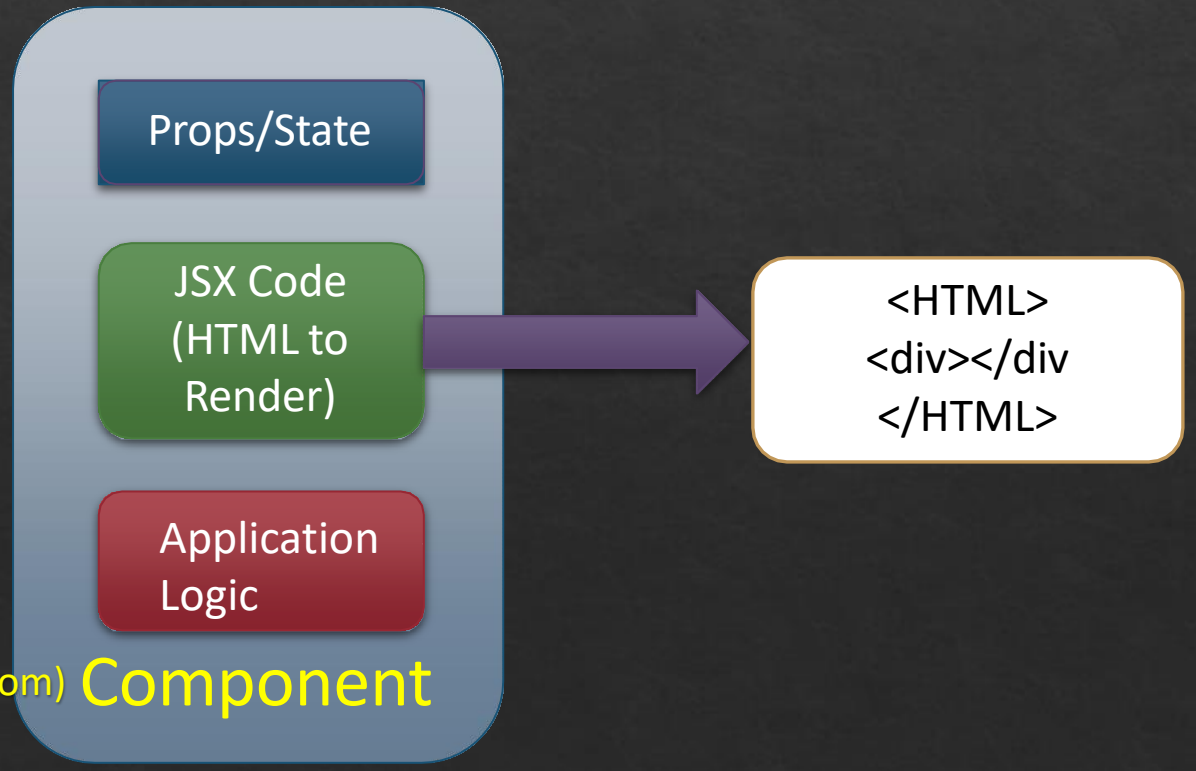
- Components are the core building blocks in React
- Creating a React applications is all about designing and implementing components
- A React application can be depicted as a component tree.





React Components

- The UI in a React Application is composed of components, the building blocks.
- Components are designed to be reusable



Types of Components

Functional

- Presentational
- Stateless (till React 16.8)
- Stateful (using React Hooks)

Class based

- Containers
- Stateful

JSX

- *JSX* is a syntax extension for JavaScript.
- It was written to be used with React.
- JSX code looks a lot like HTML.
  - **It's actually JavaScript**
- A *JSX compiler* will translate any JSX into regular JavaScript.
- JSX elements are treated as JavaScript *expressions*.
  - They can go anywhere that JavaScript expressions can go.
- That means that a JSX element can be
  - Saved in a variable
  - Passed to a function
  - Stored in an object or array

Components: Dynamic Content

- Dynamic content is outputted in the JSX using an expression.
- The syntax
  - { expression }
- This can be any one line expression
- Complex functionalities can be done by calling functions
  - { invokeSomeMethod() }

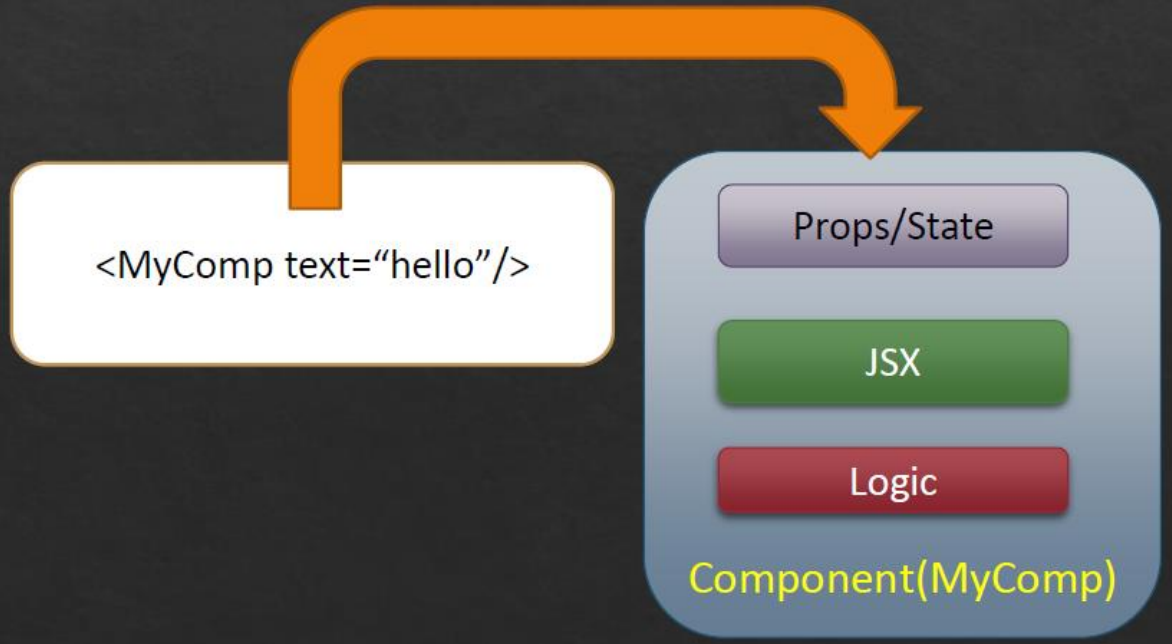
Components: Properties(props)

Most components can be customized with different parameters when they are created.

These creation parameters are called ***"props"***.

Props are used similar to HTML attributes.

Changes to props will automatically re-render the component.



Component State

State holds information about the component

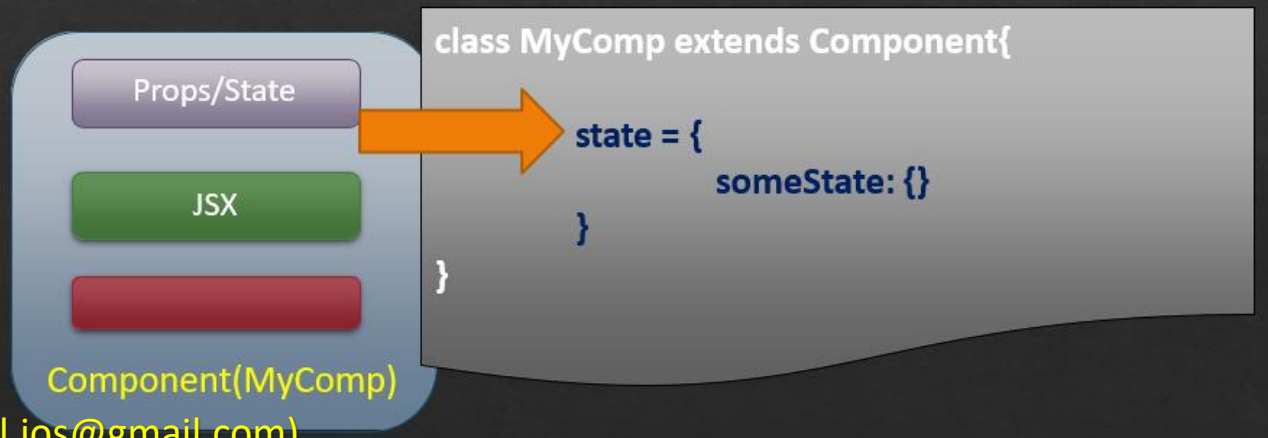
State is used when a component needs to keep track of information between renderings.

State is created and initialized in the component itself.

State is available only with Stateful components(Class Based).

Component state should be always updated using the setState method

State updates trigger a rerender of the component.



Props and State

"props" and "state" are CORE concepts of React.

Only changes in "props" and/ or "state" trigger React to re-render the components and potentially update the DOM in the browser

props allow you to pass data from a parent (wrapping) component to a child (embedded) component.

State is used to change the component from within.

Event Handling

- Handling events with React elements is very similar to handling events on DOM elements with some syntactic differences.
- React events are named using camelCase, rather than lowercase.
- With JSX you pass a function as the event handler, rather than a string.
- Event handlers will be passed instances of ***SyntheticEvent***
  - A cross-browser wrapper around the browser's native event
- Details
  - https://reactjs.org/docs/events.html

Component Lifecycle

Component Lifecycle(Mount)

constructor

- Setup State
- Don’t cause side-effects

componentWillMount

- Setup State
- Don’t cause side-effects
- Configuration

render

- Prepare and Structure the View

Render Child Components

componentDidMount

- Cause side-effects
- Initialize anything that relies on the DOM

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Component Lifecycle(Update)

componentWillReceiveProps(nextProps)

- Sync State to Props
- Don’t Cause Side-Effects

shouldComponentUpdate(nextProps, nextState)

- Decide whether to Continue or Not
- Don’t Cause Side-Effects

componentWillUpdate(nextProps, nextState)

- Sync State to Props
- Don’t Cause Side-Effects

render()

Update/Render Child Components

componentDidUpdate

- Cause Side-Effects
- Don’t update state

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Component Lifecycle(Unmount)

- componentWillUnmount
  - Remove Listeners
  - Cancel Active network calls
  - Invalidate Timers

AJAX and APIs

- React does not have any API's for AJAX calls.
- We have to use an AJAX Library for server communications
- Popular Libraries
  - Axios
  - jQuery AJAX
  - Fetch API
- In a component AJAX calls to fetch data from the server should be made in the ***componentDidMount*** lifecycle method.

axios

- Promise based HTTP client for the browser and node.js
- Installation
  - npm install axios
- Features
  - Make http requests
  - Supports the Promise API
  - Intercept request and response
  - Transform request and response data
  - Cancel requests
  - Automatic transforms for JSON data
  - Client side support for protecting against XSRF

axios methods

axios.request({config})

axios.get(url, {config})

axios.post(url,{data}, {config})

axios.delete(url, {config})

axios.put(url,{data}, {config})

axios global defaults

Base URL

- axios.defaults.baseURL = 'https://abc.com’;

Headers

- axios.defaults.headers.common['Authentication'] = AUTH_TOKEN;

Headers for specific methods

- axios.defaults.headers.post['Content-Type'] = 'application/json';

AJAX and APIs

- React does not have any API's for AJAX calls.
- We have to use an AJAX Library for server communications
- Popular Libraries
  - Axios
  - jQuery AJAX
  - Fetch API
- In a component AJAX calls to fetch data from the server should be made in the ***componentDidMount*** lifecycle method.

axios

- Promise based HTTP client for the browser and node.js
- Installation
  - npm install axios
- Features
  - Make http requests
  - Supports the Promise API
  - Intercept request and response
  - Transform request and response data
  - Cancel requests
  - Automatic transforms for JSON data
  - Client side support for protecting against XSRF

axios methods

axios.request({config})

axios.get(url, {config})

axios.post(url,{data}, {config})

axios.delete(url, {config})

axios.put(url,{data}, {config})

axios global defaults

Base URL

- axios.defaults.baseURL = 'https://abc.com’;

Headers

- axios.defaults.headers.common['Authentication'] = AUTH_TOKEN;

Headers for specific methods

- axios.defaults.headers.post['Content-Type'] = 'application/json';

React Hooks

React hooks was introduced in version 16.8

Many React features like state, lifecycle hooks etc. were available only with class-based components prior to 16.8.

Hooks let us use state and other React features in a functional component.

React team recommends the functional components over class-based since they can be highly optimized by the tools.

React Hooks

State Hooks(useState)

- Equivalent of state in class-based components

Effect Hooks(useEffect)

- Used to perform side-effects in a function
- component
- Equivalent to lifecycle hooks in class-based components

Context Hooks(useContext)

- Used to access the React Context;

React Hooks

Callback Hooks(useCallback)

- Returns a memoized callback.
- Used to optimize the components

Memo Hooks(useMemo)

- Returns a memoized value.
- Used to optimize the components

Ref Hooks(useRef)

- Returns a mutable ref object

Custom Hooks

- A functions
- Uses Other Hooks

Debugging

- Error Messages
  - Messages generated by React during development mode
- Browser Developer Tools
- React Tools
  - Tools for Chrome and Firefox
- Error Boundaries
  - Error boundaries are React components that **catch JavaScript errors anywhere in their child component tree**
  - **Log errors**
  - **Display a fallback UI**

Virtual DOM

The Virtual DOM (VDOM)

- Where a “virtual”, representation of a UI is kept in memory
- This is synced with the “real” DOM.
- This process is called reconciliation.

Reconciliation

- When the render() function is called it creates a tree of React elements.
- On the next update render() will return a different tree
- React then figures out how to efficiently update the UI to match the most recent tree.
- Uses the Diff algorithm

Higher-order Components

- A Higher Order Component is just a React Component that wraps another one.
- Higher Order Components is a Pattern used extensively with React
- Uses
  - Code reuse, logic and bootstrap abstraction
  - Render Highjacking
  - State abstraction and manipulation
  - Props manipulation
- Its basically a functions that returns a class component with the Wrapped Component.

Single Page Applications

A single-page application is an application that works inside a browser and does not require page reloading during use.

SPA is fast, as most resources (HTML+CSS+Scripts) are only loaded once throughout the lifespan of application. Only data is transmitted back and forth.

Routing

- Routers allow to navigate between the different views in the application using JavaScript on the client-side.
- Navigations are updated to the browser history which allows to go back and forward
- Usage of path and search parameters are allowed
- React does not provide any API for routing.
- Many other Libraries available which integrates with React
  - React-router(The de-facto standard)
  - Director
  - Aviator
  - Finch

React Router v4

- React Router is a collection of **navigational components** that compose declaratively with your application.
- Installation
  - npm install react-router-dom

React Router Components

<BrowserRouter>

- A <Router> that uses the HTML5 history to keep your UI in sync with the URL.

<HashRouter>

- A <Router> that uses the hash portion of the to keep your UI in sync with the URL.

<Route>

- The Route component is perhaps the most important component in React Router

<Link>

- Provides declarative, accessible navigation around your application.

<NavLink>

- A special version of the <Link> that will add styling attributes to the rendered element when it matches the current URL.

Presentaed by Anil Joseph(anil.jos@gmail.com)

State Management

React Context

- Available from React 16.3

React Redux

- Library to manage state

Types of State

Local UI State

- Show/Hide UI
- Handled By the Component

Persistent State

- Orders, Blogs
- Stored on Server, can be managed by Redux or React Context

Client State

- IsAuntenticated, Filter Information
- Managed by Redux or React Context

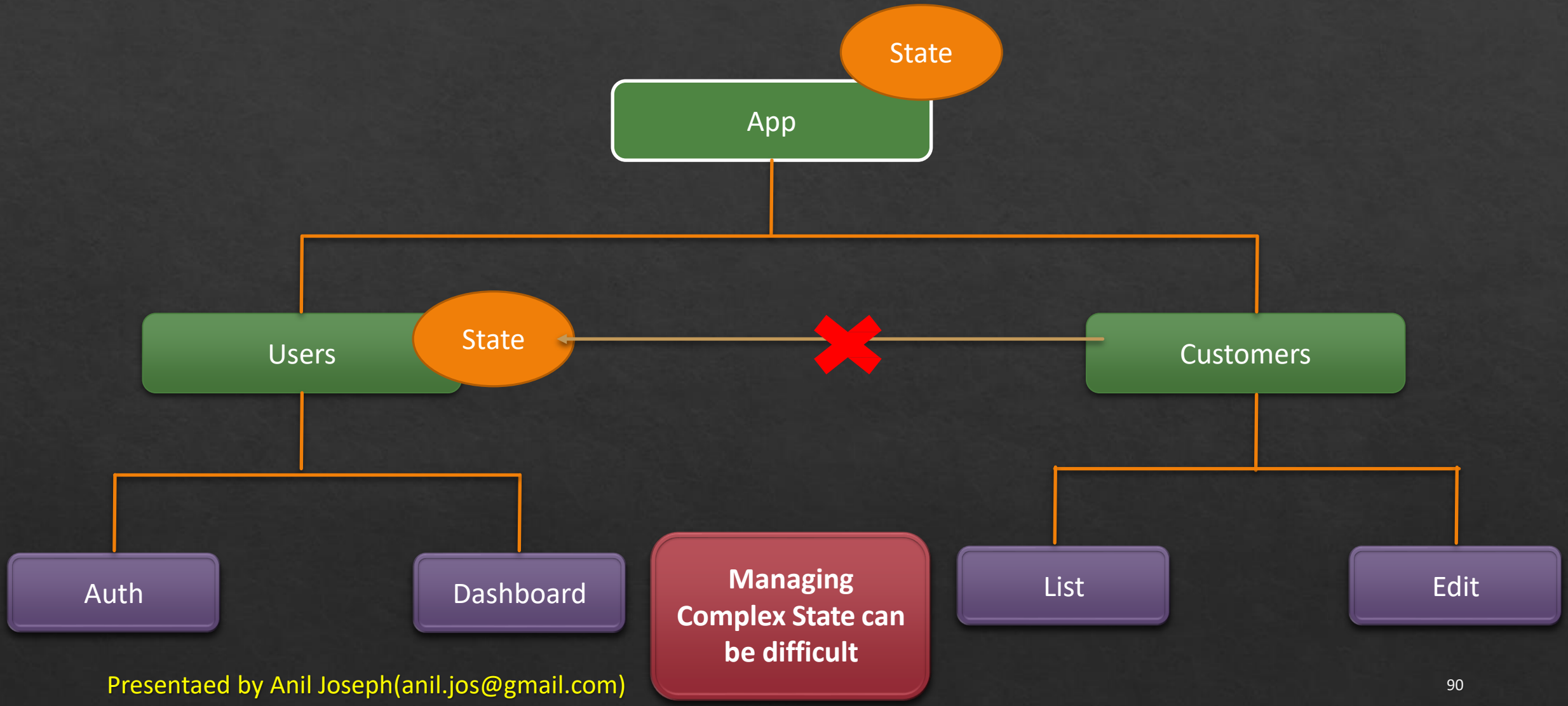
Redux

Redux is an open-source JavaScript library designed for managing application state.

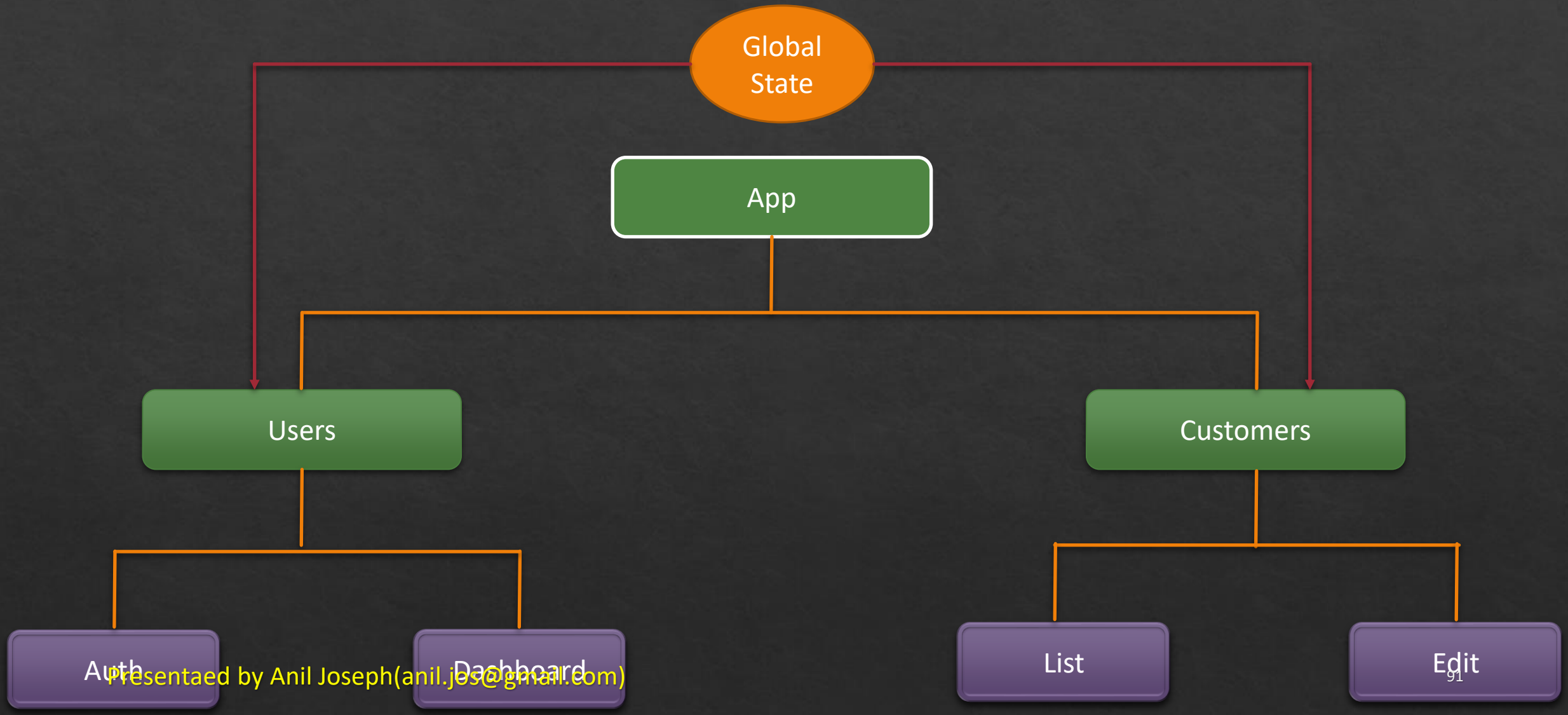
It is primarily used together with React or Angular for building user interfaces.

Redux was built on top of functional programming concepts.

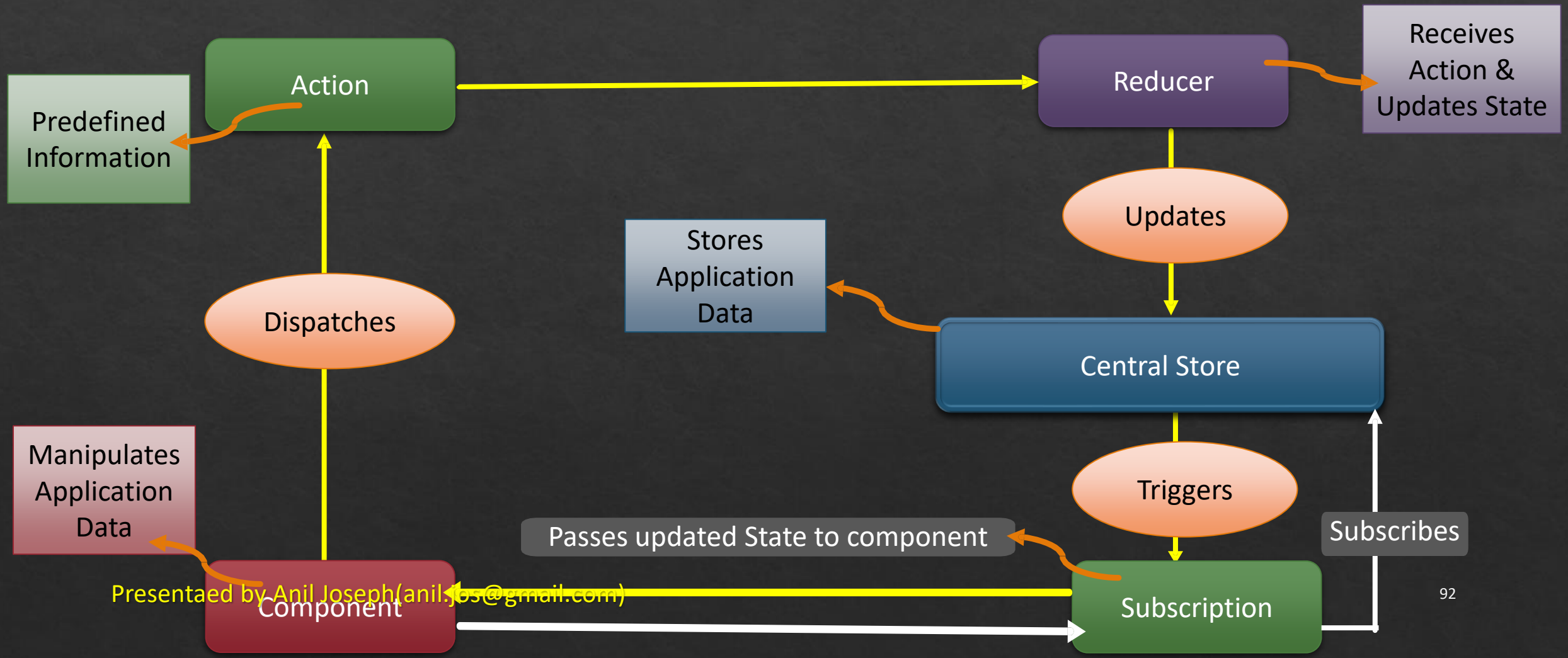
Why Redux?


State
App
Users
State
Customers
Auth
Dashboard
Managing Complex State can be difficult
List
Edit

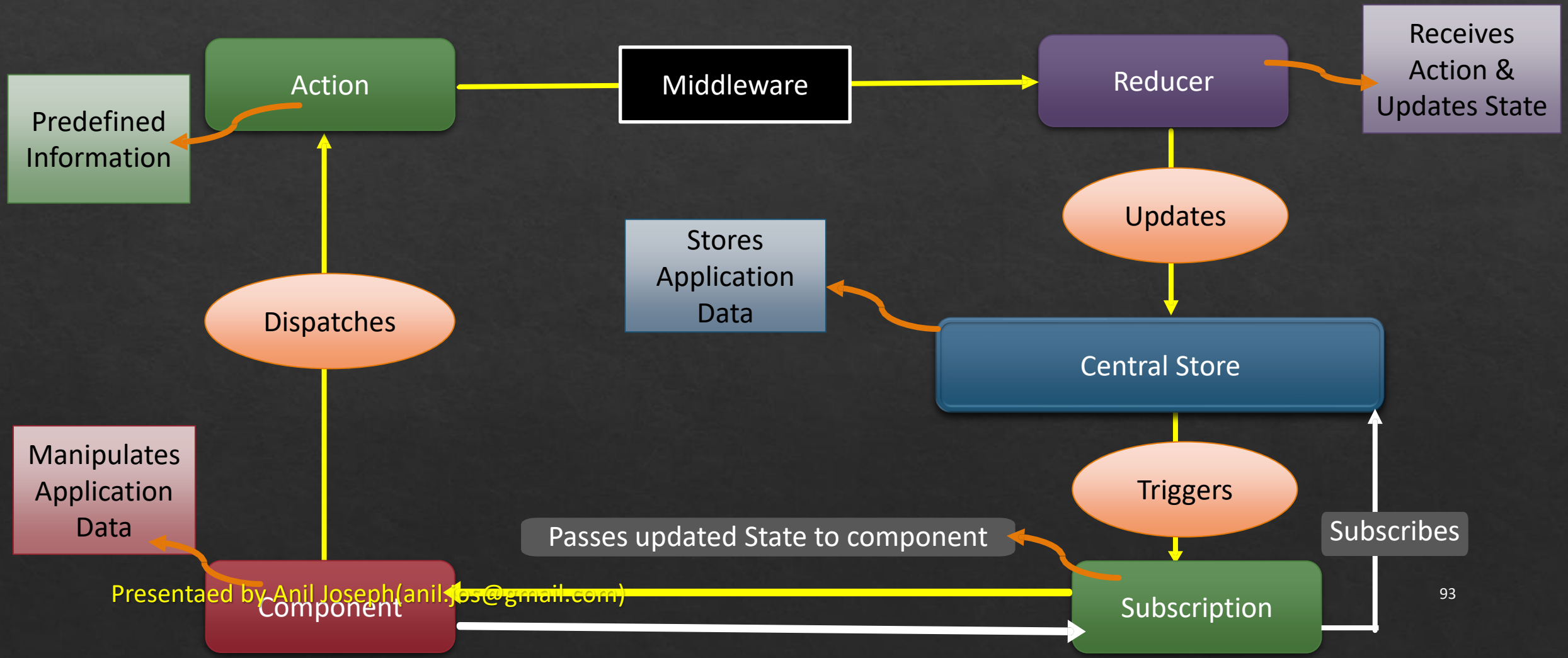
Why Redux?



Redux Flow

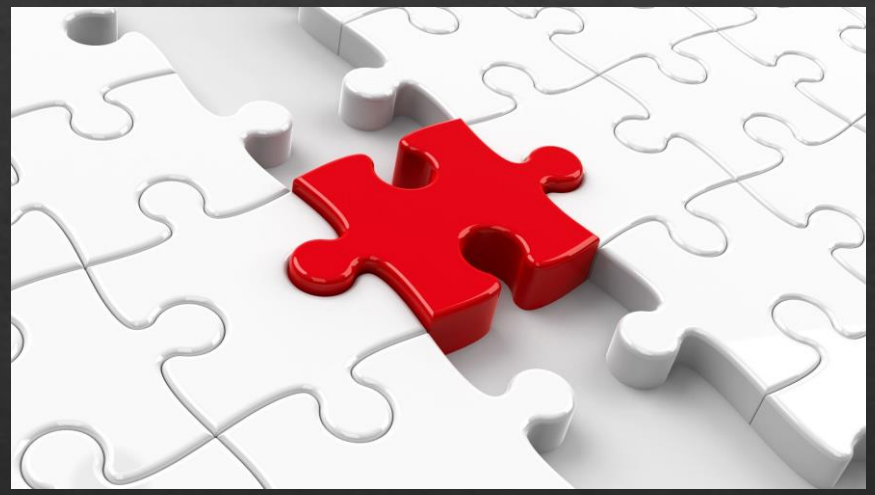

Action
Predefined Information
Reducer
Receives Action & Updates State
Updates
Stores Application Data
Dispatches
Central Store
Manipulates Application Data
Triggers
Passes updated State to component
Subscribes
Component
Subscription

Redux Flow


Action
Middleware
Reducer
Receives Action & Updates State
Predefined Information
Updates
Stores Application Data
Dispatches
Central Store
Manipulates Application Data
Triggers
Passes updated State to component
Subscribes
Component
Subscription

React Redux

- Redux react is a library that integrates Redux to a React Application
- Comprises of Components & Functions
- Installation
  - npm install react-redux



Error Boundaries

- Error boundaries are React components that catch JavaScript errors anywhere in their child component tree
  - Used to log errors
  - Display a fallback UI
- Error boundaries do not catch errors for:
  - Event handlers
  - Asynchronous code
  - Server side rendering
  - Errors thrown in the error boundary itself
- A class component becomes an error boundary if it defines(either one)
  - componentDidCatch
  - static getDerivedStateFromError()

React Context

- Context provides a way to pass data through the component tree without having to pass props down manually at every level.
- Example of props to be passed down
  - Theme
  - Locale
  - Authenticated user
- API
  - React.createContext

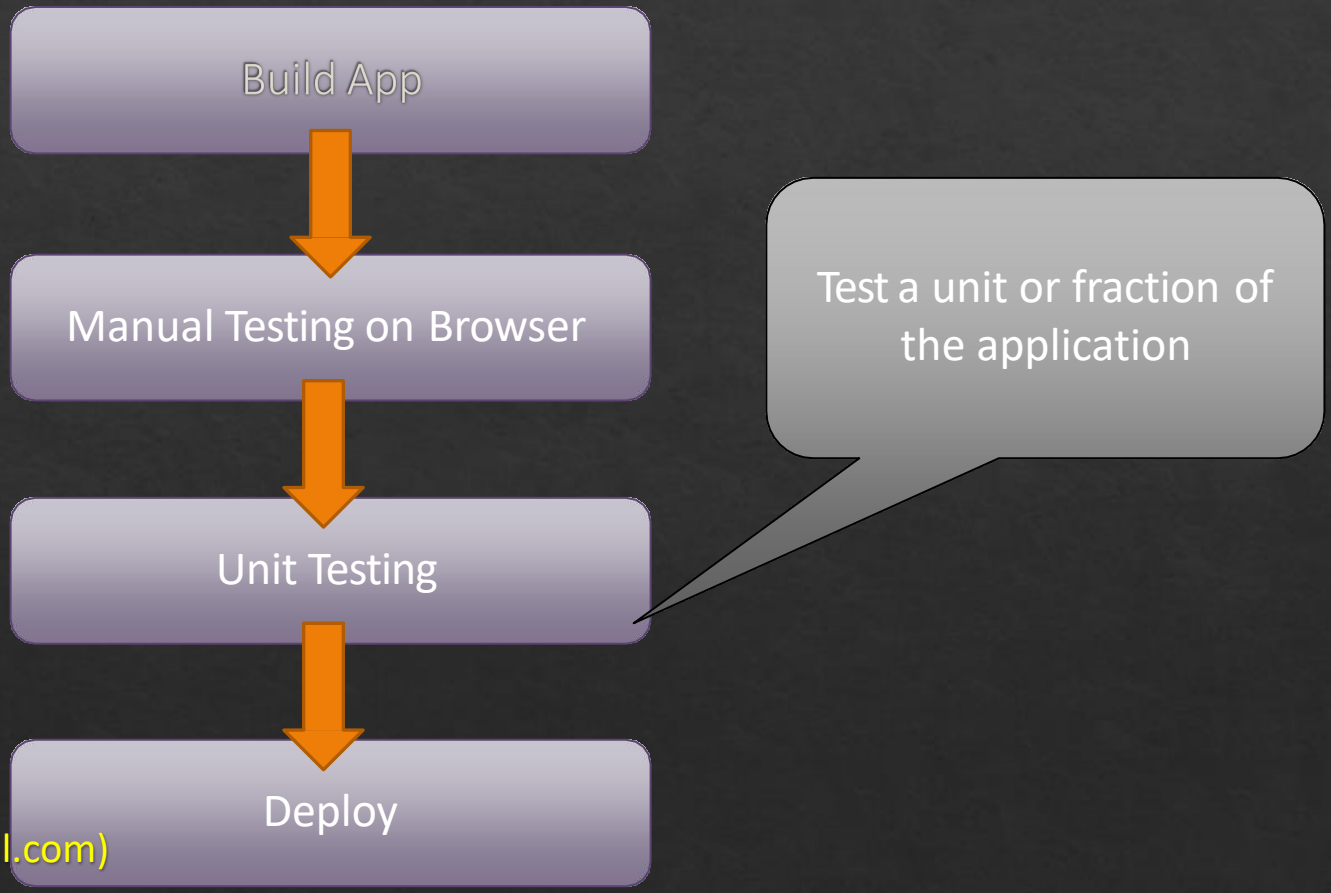
Code Splitting

- Code splitting allows you to split your app into separate bundles which your users can progressively load.
- API
  - React.lazy
  - Suspense

Using Sass

- Sass is a style sheet language
- Install for create-react-app
  - npm i node-sass
- Rename .css to .scss

Testing


Build App
Manual Testing on Browser
Unit Testing
Deploy
Test a unit or fraction of the application

Testing Tools

Testing API
&
Test Runner

Write the Unit Test.
Executes the Unit Tests.

Jest
(Built over Jasmine)

Test Utilities

Simulate the React App

react-test-renderer

enzyme

testing-library/react

Jest

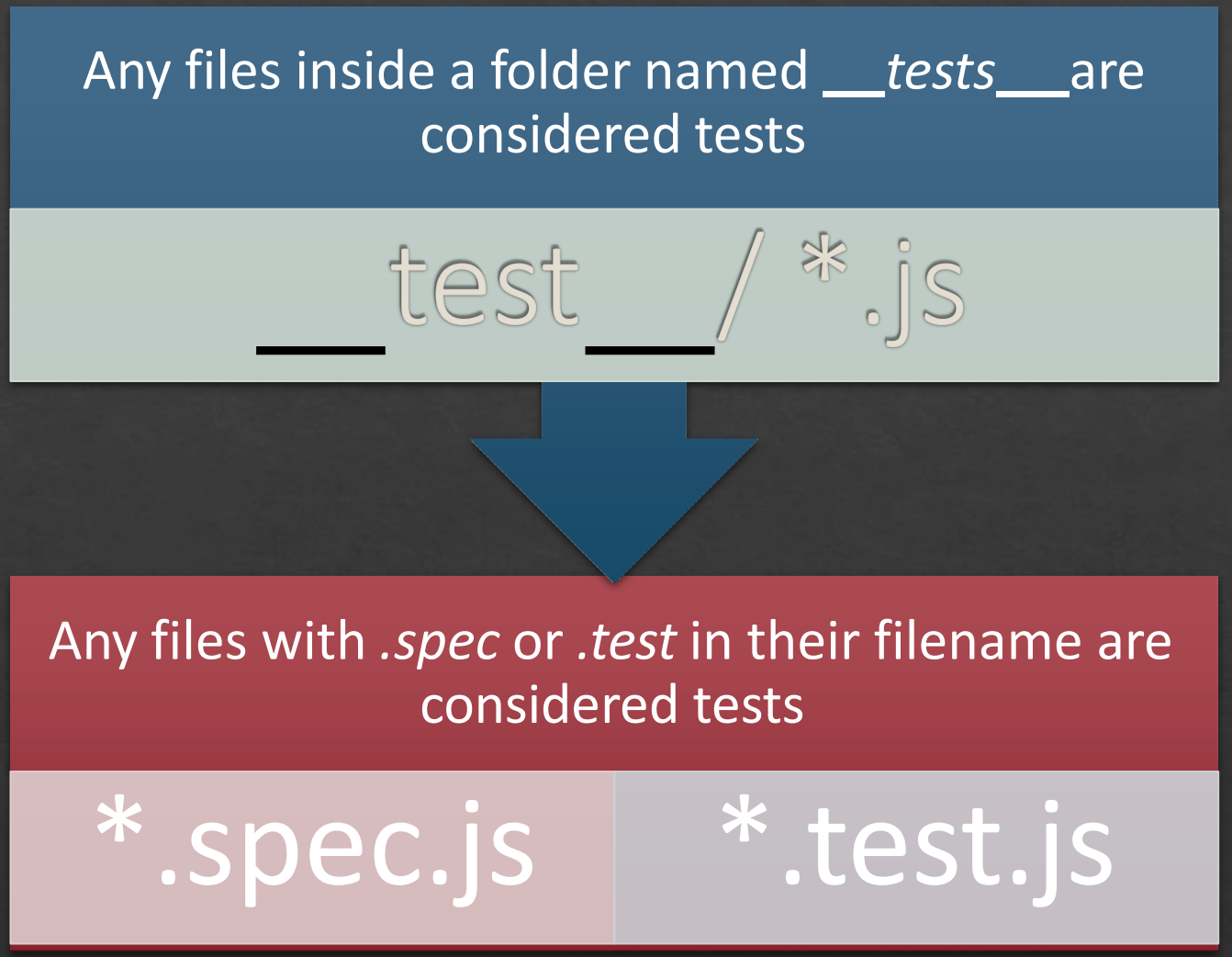
A testing library and test runner with handy features

Created by the members of the React team and the recommended tool for unit testing react

Built on top of Jasmine/Mocha

Additional features like mocking and snapshot testing

Jest: Identifying Test files



Jest Global Methods

it

- Method which you pass a function to, that function is executed as block of tests by the test runner.
- Alias name: test

describe

- An optional method for grouping any number of *it* or *test* statements
- Alias name: suite

Setup & Teardown Global functions

beforeEach	BeforeEach runs a block of code before each test
afterEach	Runs a block of code after each test
beforeAll	BeforeAll runs code just once, before the first test
afterAll	Runs a block of code after the last test)

What to Test?

Test Isolated Components

Test Conditional Outputs

Don’t Test Library Functions

Don’t Test Complex Connection

Installation

```
npm install enzyme react-test-renderer
enzyme-adapter-react-16
```

End to End Test

End-to-end testing is a methodology used to test whether the flow of an application is performing as designed from start to finish.

The purpose of carrying out end-to-end tests is to identify system dependencies and to ensure that the right information is passed between various system components and systems.s

E2E Tools

Cypress

Pupeeter

Selenium Webdriver

Nightwatch.js

React UI Components

- There are many UI Libraries available in the React Eco space
- Libraries
  - React-bootstrap
  - Material UI
  - Grommet
  - Ant Design React
  - React Desktop
  - React Belle

Deployment

Set basePath of Router

- <BrowserRouter basename="/app/">

Set homepage in package.json

- "homepage": "/app"

Build and Optimize npm run build

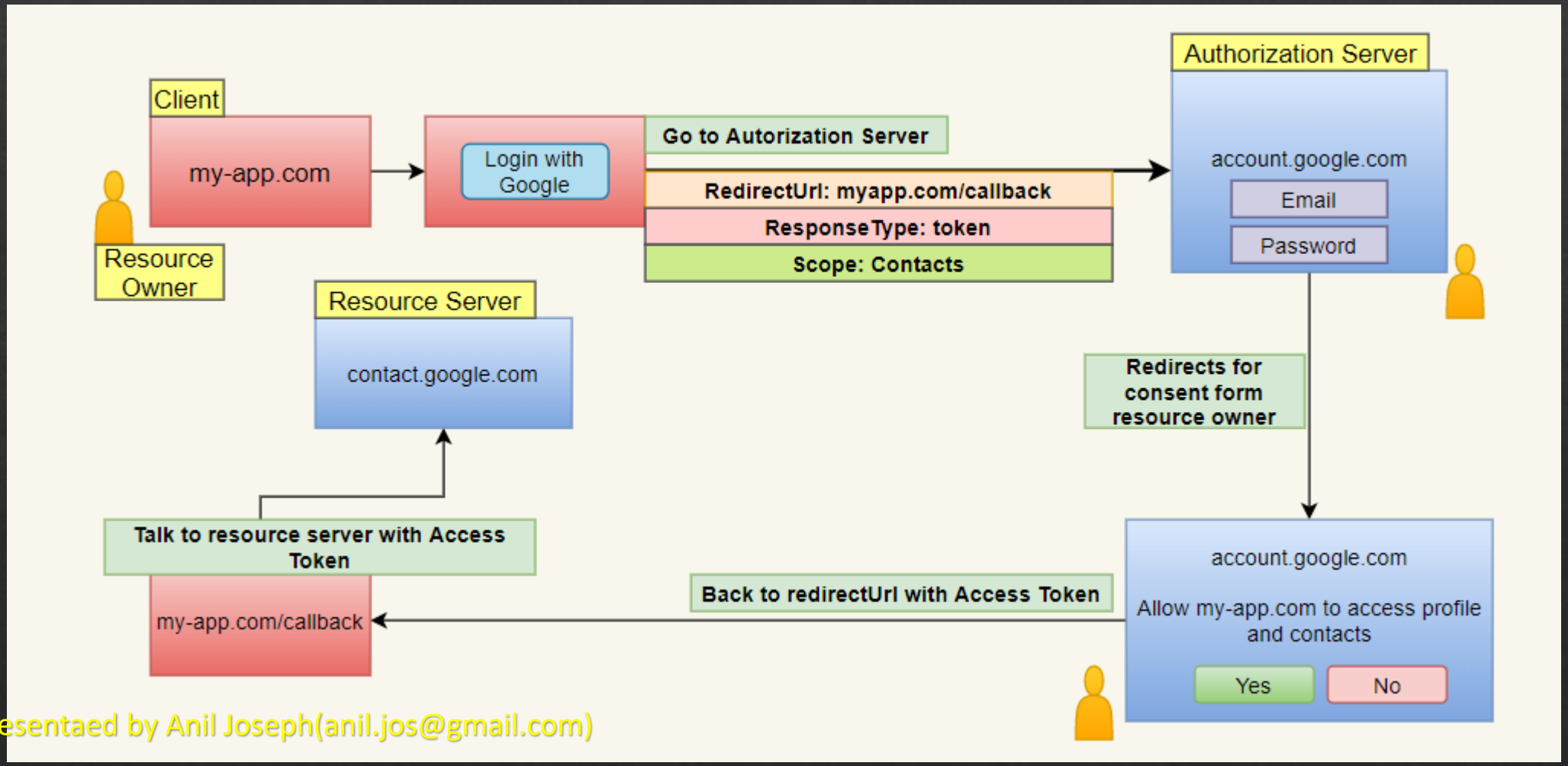
Server must Always serve index.html

Deploy artifacts to Web Server

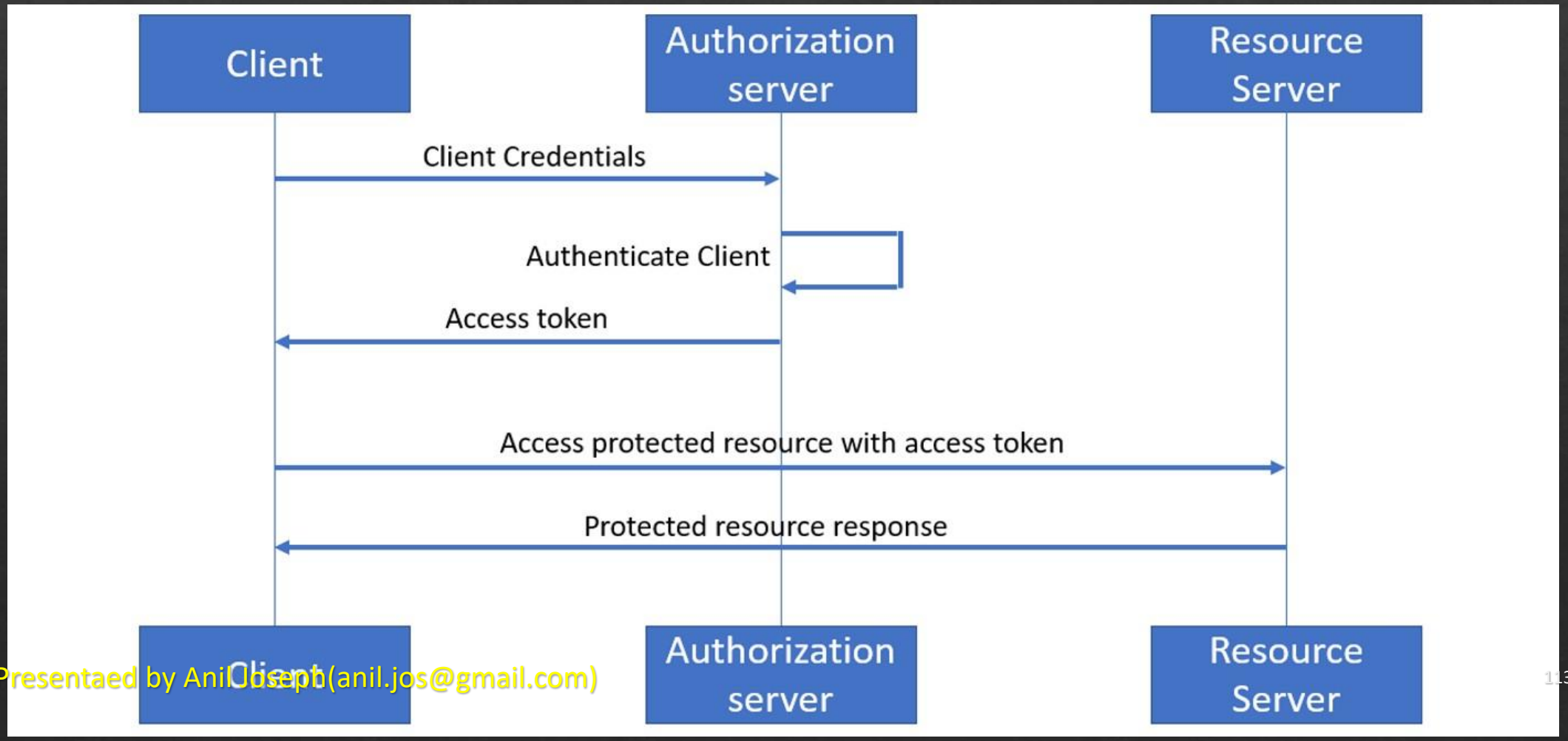
OAuth 2.0

- OAuth is an open standard for access delegation.
- Used as a way for Internet users to grant websites or applications access to their information on other websites but without giving them the passwords.
- Commonly used by companies such as Amazon, Google, Facebook, Microsoft and Twitter to permit the users to share information about their accounts with third party applications or websites.

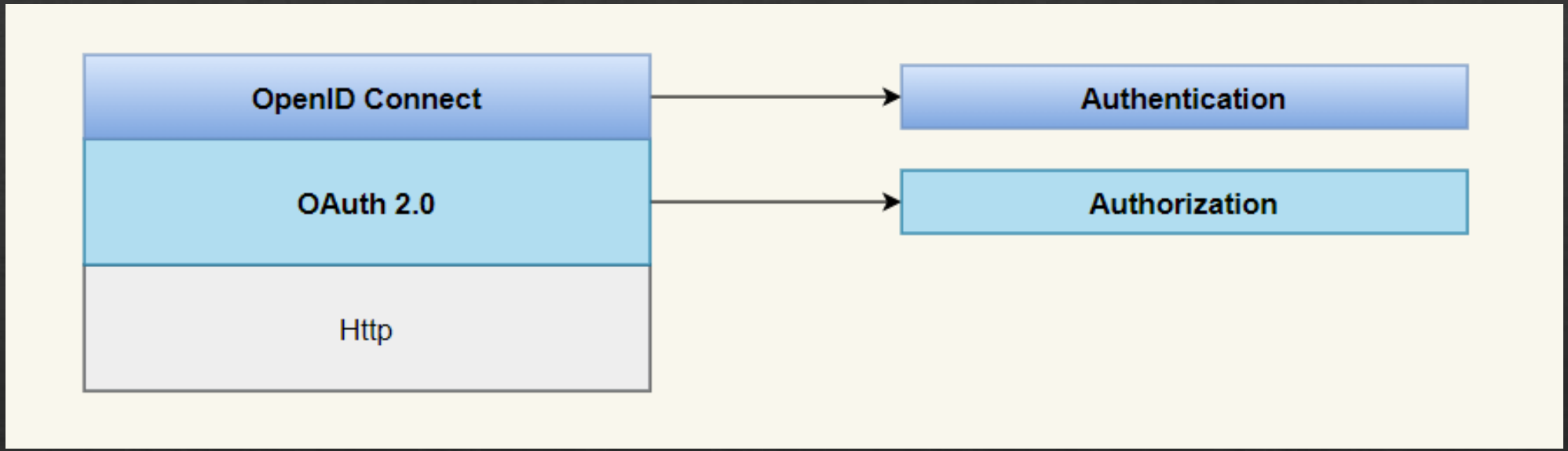
OAuth 2.0


Client
my-app.com
Resource Owner
Login with Google
Go to Autorization Server
RedirectUrl: myapp.com/callback
ResponseType: token
Scope: Contacts
Authorization Server
account.google.com
Email
Password
Resource Server
contact.google.com
Redirects for consent form resource owner
Talk to resource server with Access Token
my-app.com/callback
Back to redirectUrl with Access Token
account.google.com
Allow my-app.com to access profile and contacts
Yes
No

OAuth 2.0


Client
Authorization server
Resource Server
Client Credentials
Authenticate Client
Access token
Access protected resource with access token
Protected resource response
Client
Authorization server
Resource Server

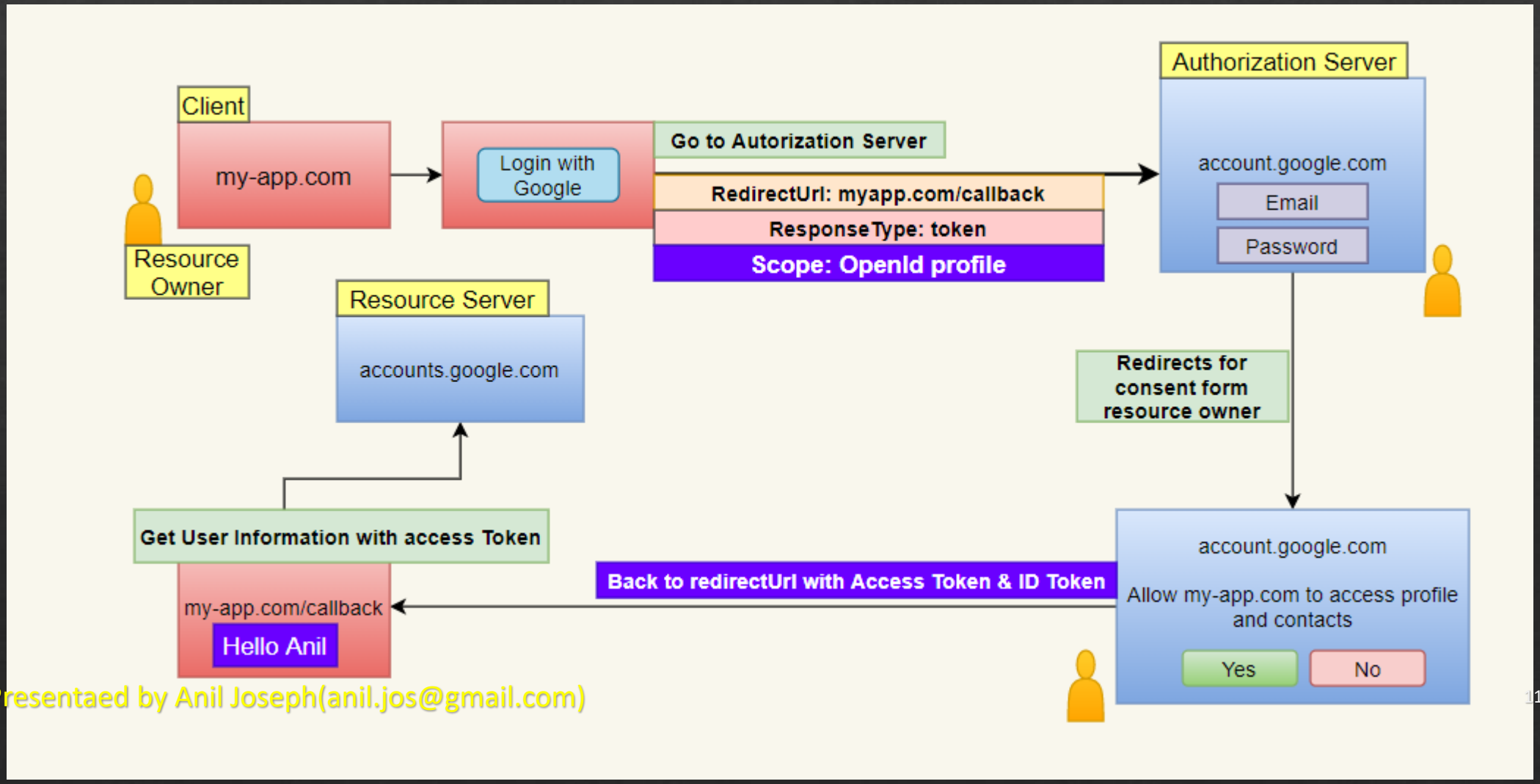
OpenID Connect



OpenID Connect

- OpenID Connect is a simple identity layer on top of the OAuth 2.0 protocol.
- Allows Clients to verify the identity of the End-User based on the authentication performed by an Authorization Server.
- Can obtain basic profile information about the End-User in an interoperable and REST-like manner.

OpenID Connect



Json Web Token

- JSON Web Token (JWT) is an open standard that defines a compact and self-contained way for securely transmitting information between parties as a JSON object.
- Digitally Signed
- User for Authorization and Information Exchange

JWT

eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.

eyJpc3MiOiJPbmxpbmUgSldUIEJ1aWxkZXIiLCJpYXQiOjE2MDA5OTkzMDAsImV4cCI6MTYzMjUzNTMwMCwiYXVkIjoid3d3Lm15LWFwcC5jb20iLCJzdWIiOiJhbmlsLmpvc0BnbWFpbC5jb20iLCJHaXZlbk5hbWUiOiJBbmlsIiwiU3VybmFtZSI6Ikpvc2VwaCIsIkVtYWlsIjoiYW5pbC5qb3NAZ21haWwuY29tIiwiUm9sZSI6IkNvbnN1bHRhbnQifQ.

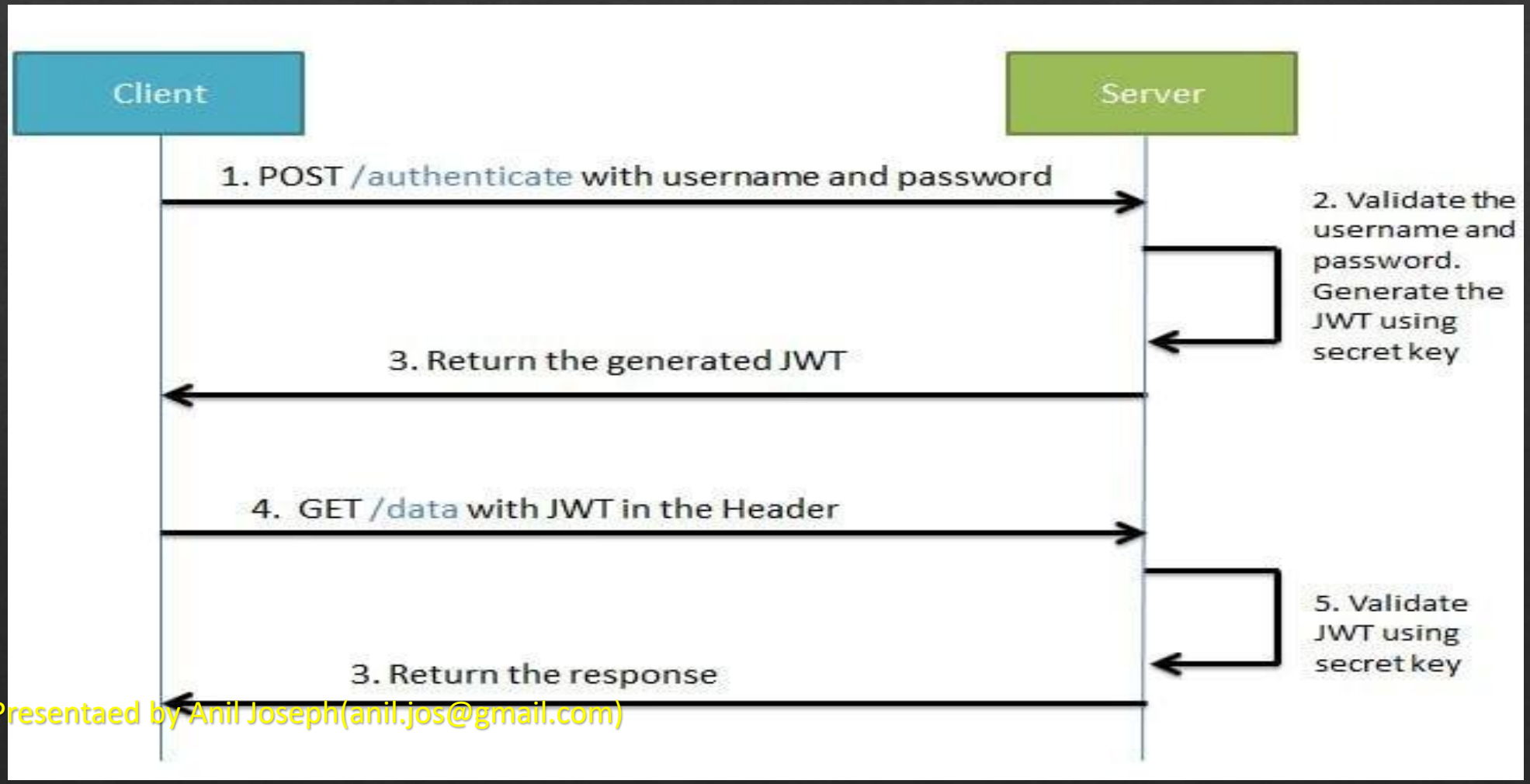
FrX-qAOPEDaYDh5IOJ6ipbFsrPBzaBzK7A2Hk5Yd2vk


```
{
  "typ": "JWT",
  "alg": "HS256"
}
```

```
{
  "iss": "Online JWT Builder",
  "iat": 1600999300,
  "exp": 1632535300,
  "aud": "www.my-app.com",
  "sub": "anil.jos@gmail.com",
  "GivenName": "Anil",
  "Surname": "Joseph",
  "Email": "anil.jos@gmail.com",
  "Role": "Consultant"
}
```


Signature

JWT with Simple Forms Login



Progressive Web Applications

- PWAs are web apps developed using a number of specific technologies and standard patterns to allow them to take advantage of both web and native app features.
- Key Features
  - Discoverable
  - Installable
  - Linkable
  - Network Independent
  - Progressively Enhanced
  - Re-engageable
  - Responsive
  - Secure

Progressive Web Applications

- Service Workers
  - Service workers essentially act as proxy servers that sit between web applications, the browser, and the network (when available).
  - Enable the creation of effective offline experiences
  - Allow access to push notifications and background sync APIs
- Manifest
  - Lists all the information about the website in a JSON format
  - Information includes: Application Name, Path, Icons
- Https
  - Applications should be served using the Https protocol

React: Resources

- Official Site
  - https://reactjs.org/
- Awesome React tutorials
  - https://github.com/enaqx/awesome-react
- EggHead
  - https://egghead.io/browse/frameworks/react
- Youtube Channel(React Conf channel)
  - https://www.youtube.com/channel/UCz5vTaEhvh7dOHEyd1efcaQ

Thank You

ANIL JOSEPH

anil.jos@gmail.com