

React Native Rendering Phases and Architectures

Three Phases of Rendering in React Native

1. Render Phase:

- React calls component functions to calculate the **virtual DOM**.
- No actual changes are made to the UI yet.
- This phase is **pure** and can be paused or restarted.

Example: When props or state change, React calculates the new virtual DOM.

```
function MyComponent({ count }) {  
  console.log("Render Phase: Calculating the virtual DOM");  
  return <Text>Count: {count}</Text>;  
}
```

2. Reconciliation Phase:

- React compares the new virtual DOM with the previous one (diffing process).
- Identifies the **minimal changes** required to update the UI.
- No actual UI updates occur yet.

3. Commit Phase:

- The calculated updates are applied to the **actual UI**.
- React Native interacts with the Native layer to update the screen.

Side effects like `useEffect` are triggered here.

```
useEffect(() => {  
  console.log("Commit Phase: Running side effects");  
}, [count]);
```

React Native Old vs. New Architecture

1. Old Architecture (Bridge-based):

- Uses a **Bridge** to communicate between the JavaScript and Native layers.
- Communication is **asynchronous** and uses **JSON serialization**.
- **Limitations:**
 - Slower updates, especially for animations or frequent UI updates.
 - High serialization costs.
 - Debugging is more complex due to the Bridge.

2. New Architecture (Fabric):

- Introduced in React Native 0.68+ as part of the New Architecture.
- Uses **JSI (JavaScript Interface)** for direct communication between JavaScript and Native layers.
- Eliminates the Bridge for faster, more efficient updates.

Key Differences Between Old and New Architectures

Feature	Old Architecture	New Architecture (Fabric)
Communication Layer	Bridge (JSON serialization)	JSI (Direct JavaScript-Native)
Performance	Slower	Faster, reduced overhead
Animation & Gestures	Limited by Bridge	Smooth and responsive
Rendering Improvements	None	Supports Concurrent Rendering
Debugging	Complex	Easier with improved tooling

How to Check If You're Using the New Architecture

1. Check your **React Native** version:
 - Fabric is available in **React Native 0.68+**.
2. Look for **ENABLE_NEW_ARCHITECTURE** in your project configuration.
3. Test for improved performance or inspect logs for references to Fabric.