react源码解析18事件系统

从一个bug说起

下面这个demo_13在react17和react16中有什么不同吗？代码也很简单，模拟一个modal框，点击显示出现，点击其他地方，相当于点击了mask，modal消失，因为react事件都是委托到上层，所以需要在handleClick阻止冒泡，这样点击显示的时候不会触发document上的事件回调，导致modal无法显示。但是在react16上发现这样做还是不行，需要调用e.nativeEvent.stopImmediatePropagation()才能实现，而react17上没什么影响

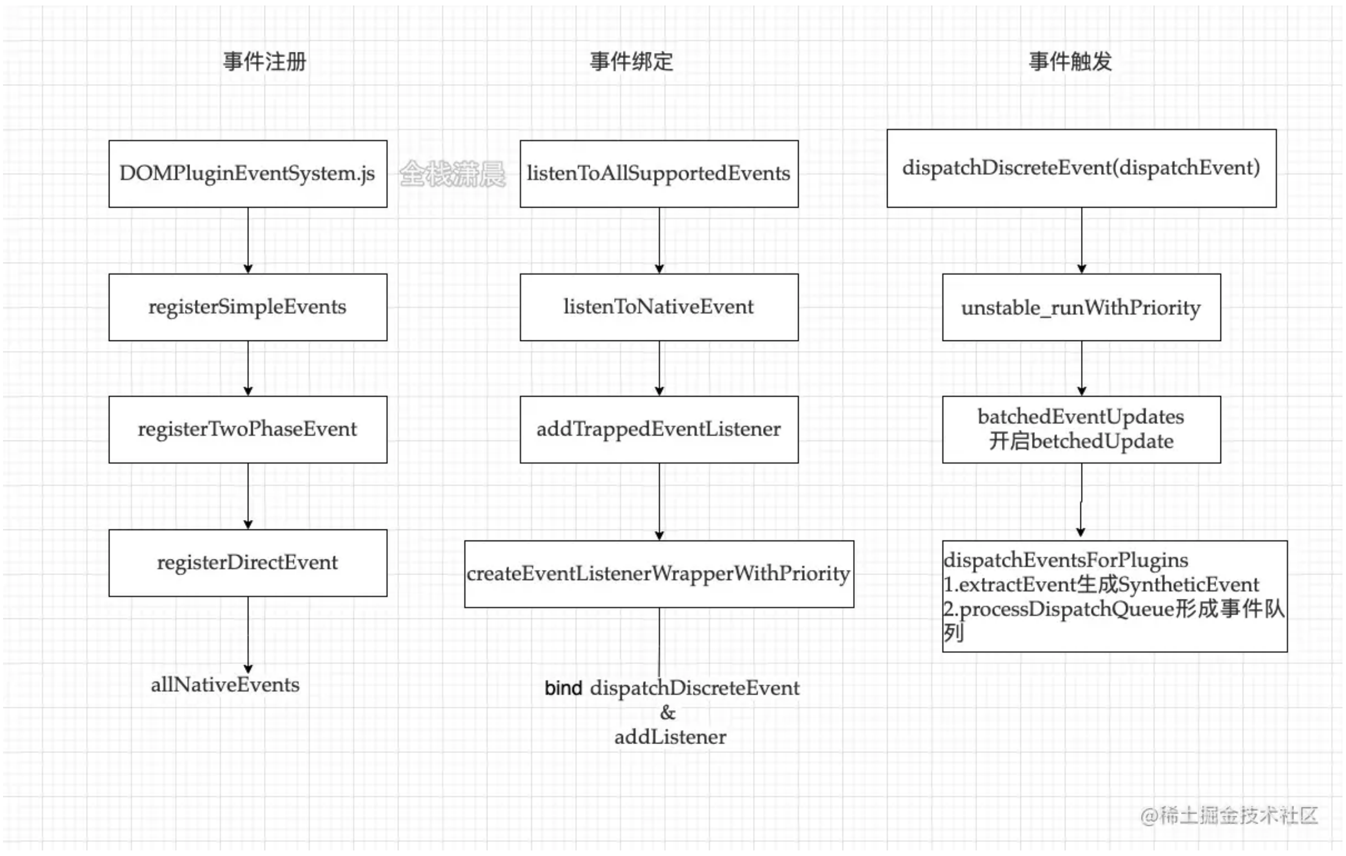
究其原因就是react16和17在委托事件的容器上做出了改变，react16的事件会冒泡的document上，而17则会冒泡到root容器上，也就是ReactDom.render的第二个参数

javascript 复制代码

```javascript
export default class Demo13 extends React.Component {
  state = { show: false };
  componentDidMount() {
    document.addEventListener("click", () => {
      this.setState({ show: false });
    });
  }
  handleClick = (e) => {
    e.stopPropagation();//react17中生效
    // e.nativeEvent.stopImmediatePropagation(); //react16中生效 stopImmediatePropagation也阻止本级监
    this.setState({ show: true });
  };
  render() {
    return (
      <div>
        <button onClick={this.handleClick}>显示</button>
        {this.state.show && <div onClick={(e) => e.nativeEvent.stopImmediatePropagation()}>modal</di
      </div>
    );
  }
}
```

大家也可以看下demo_11、demo_12在react16、17触发顺序有何差异，同时demo项目中的event.html也模拟了react16、17的事件代理机制

事件系统架构图


事件注册
事件绑定
事件触发
DOMPluginEventSystem.js
全栈潇晨
listenToAllSupportedEvents
dispatchDiscreteEvent(dispatchEvent)
registerSimpleEvents
listenToNativeEvent
unstable_runWithPriority
registerTwoPhaseEvent
addTrappedEventListener
batchedEventUpdates 开启betchedUpdate
registerDirectEvent
createEventListenerWrapperWithPriority
dispatchEventsForPlugins 1.extractEvent生成SyntheticEvent 2.processDispatchQueue形成事件队列
allNativeEvents
bind dispatchDiscreteEvent & addListener
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我们以SimpleEvent为例看事件注册、绑定和触发的过程，看视频的调试过程

事件注册

1. DOMPluginEventSystem.js会调用SimpleEventPlugin插件的registerEvents方法注册事件，

javascript 复制代码

```javascript
//DOMPluginEventSystem.js
SimpleEventPlugin.registerEvents();
```

2. registerSimpleEvents

javascript 复制代码

```javascript
function registerSimpleEvents() {
  registerSimplePluginEventsAndSetTheirPriorities(discreteEventPairsForSimpleEventPlugin, DiscreteEv
  //...
}

function registerSimplePluginEventsAndSetTheirPriorities(eventTypes, priority) {
  for (var i = 0; i < eventTypes.length; i += 2) {
    var topEvent = eventTypes[i];
    var event = eventTypes[i + 1];
    var capitalizedEvent = event[0].toUpperCase() + event.slice(1);
```

```
      var reactName = 'on' + capitalizedEvent;
      eventPriorities.set(topEvent, priority);
      topLevelEventsToReactNames.set(topEvent, reactName);
      registerTwoPhaseEvent(reactName, [topEvent]);//注册捕获和冒泡两个阶段的事件
    }
  }
```

3. registerTwoPhaseEvent

javascript 复制代码

```javascript
function registerTwoPhaseEvent(registrationName, dependencies) {
  registerDirectEvent(registrationName, dependencies);
  registerDirectEvent(registrationName + 'Capture', dependencies);
}
```

4. registerDirectEvent

javascript 复制代码

```javascript
function registerDirectEvent(registrationName, dependencies) {
//...

  for (var i = 0; i < dependencies.length; i++) {
    allNativeEvents.add(dependencies[i]);//生成allNativeEvents对象
  }
}
```

事件绑定

1. listenToAllSupportedEvents

javascript 复制代码

```javascript
//由函数createRootImpl调用，也就是在创建根节点之后执行
function listenToAllSupportedEvents(rootContainerElement) {
    allNativeEvents.forEach(function (domEventName) {
      if (!nonDelegatedEvents.has(domEventName)) {
        listenToNativeEvent(domEventName, false, rootContainerElement, null);
      }

      listenToNativeEvent(domEventName, true, rootContainerElement, null);
    });
  }
}
```

相关参考视频讲解：进入学习

2. listenToNativeEvent

javascript 复制代码

```javascript
function listenToNativeEvent(domEventName, isCapturePhaseListener, rootContainerElement, targetEleme
//...

  if (!listenerSet.has(listenerSetKey)) {
    if (isCapturePhaseListener) {
      eventSystemFlags |= IS_CAPTURE_PHASE;
    }

    addTrappedEventListener(target, domEventName, eventSystemFlags, isCapturePhaseListener);
    listenerSet.add(listenerSetKey);
  }
}
```

3. addTrappedEventListener

javascript 复制代码

```javascript
function addTrappedEventListener(targetContainer, domEventName, eventSystemFlags, isCapturePhaseList
  //创建具有优先级的监听函数
  var listener = createEventListenerWrapperWithPriority(targetContainer, domEventName, eventSystemFl
  //...
  targetContainer =  targetContainer;
  var unsubscribeListener;

  if (isCapturePhaseListener) {//节点上添加事件
    if (isPassiveListener !== undefined) {
      unsubscribeListener = addEventCaptureListenerWithPassiveFlag(targetContainer, domEventName, li
    } else {
      unsubscribeListener = addEventCaptureListener(targetContainer, domEventName, listener);
    }
  } else {
    if (isPassiveListener !== undefined) {
      unsubscribeListener = addEventBubbleListenerWithPassiveFlag(targetContainer, domEventName, lis
    } else {
      unsubscribeListener = addEventBubbleListener(targetContainer, domEventName, listener);
    }
  }
}
```

4. createEventListenerWrapperWithPriority

javascript 复制代码

```javascript
function createEventListenerWrapperWithPriority(targetContainer, domEventName, eventSystemFlags) {
  var eventPriority = getEventPriorityForPluginSystem(domEventName);
  var listenerWrapper;
  switch (eventPriority) {
    case DiscreteEvent:
      listenerWrapper = dispatchDiscreteEvent;
      break;

    case UserBlockingEvent:
      listenerWrapper = dispatchUserBlockingUpdate;
      break;

    case ContinuousEvent:
    default:
      listenerWrapper = dispatchEvent;
      break;
  }
    //绑定dispatchDiscreteEvent
  return listenerWrapper.bind(null, domEventName, eventSystemFlags, targetContainer);
}
```

事件触发

1. dispatchDiscreteEvent(dispatchEvent)

javascript 复制代码

```
function dispatchDiscreteEvent(domEventName, eventSystemFlags, container, nativeEvent) {
  {
    flushDiscreteUpdatesIfNeeded(nativeEvent.timeStamp);
  }

  discreteUpdates(dispatchEvent, domEventName, eventSystemFlags, container, nativeEvent);
}
```

2. unstable_runWithPriority

javascript 复制代码

```
function unstable_runWithPriority(priorityLevel, eventHandler) {//eventHandler就是dispatchEvent函数
  switch (priorityLevel) {
    case ImmediatePriority:
    case UserBlockingPriority:
    case NormalPriority:
    case LowPriority:
    case IdlePriority:
      break;

    default:
      priorityLevel = NormalPriority;
  }
  var previousPriorityLevel = currentPriorityLevel;
  currentPriorityLevel = priorityLevel;

  try {
    return eventHandler();
  } finally {
    currentPriorityLevel = previousPriorityLevel;
  }
}
```

3. batchedEventUpdates

javascript 复制代码

```
function batchedEventUpdates(fn, a, b) {
  if (isBatchingEventUpdates) {
    return fn(a, b);
  }

  isBatchingEventUpdates = true;

  try {
    return batchedEventUpdatesImpl(fn, a, b);
    //fn参数即:
    //function () {
    //    return dispatchEventsForPlugins(domEventName, eventSystemFlags, nativeEvent,
      //}
    function () {
    return dispatchEventsForPlugins(domEventName, eventSystemFlags, nativeEvent, ancestorInst);
  }
  } finally {
    isBatchingEventUpdates = false;
    finishEventHandler();
  }
}
```

4. dispatchEventsForPlugins

javascript 复制代码

```
function dispatchEventsForPlugins(domEventName, eventSystemFlags, nativeEvent, targetInst, targetCor
  var nativeEventTarget = getEventTarget(nativeEvent);
  var dispatchQueue = [];
  //extractEvent生成SyntheticEvent
  extractEvents(dispatchQueue, domEventName, targetInst, nativeEvent, nativeEventTarget, eventSysten
  //processDispatchQueue执行形成事件队列
  processDispatchQueue(dispatchQueue, eventSystemFlags);
}
```