

# Multitouch-Events in OS X

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# 2do

- Create and post Multitouch-Events in OS X
- Problem: NOT DOCUMENTED :-(  
Event delivering only roughly explained (some parts in Legacy-Documents)  
Never updated for Multitouch

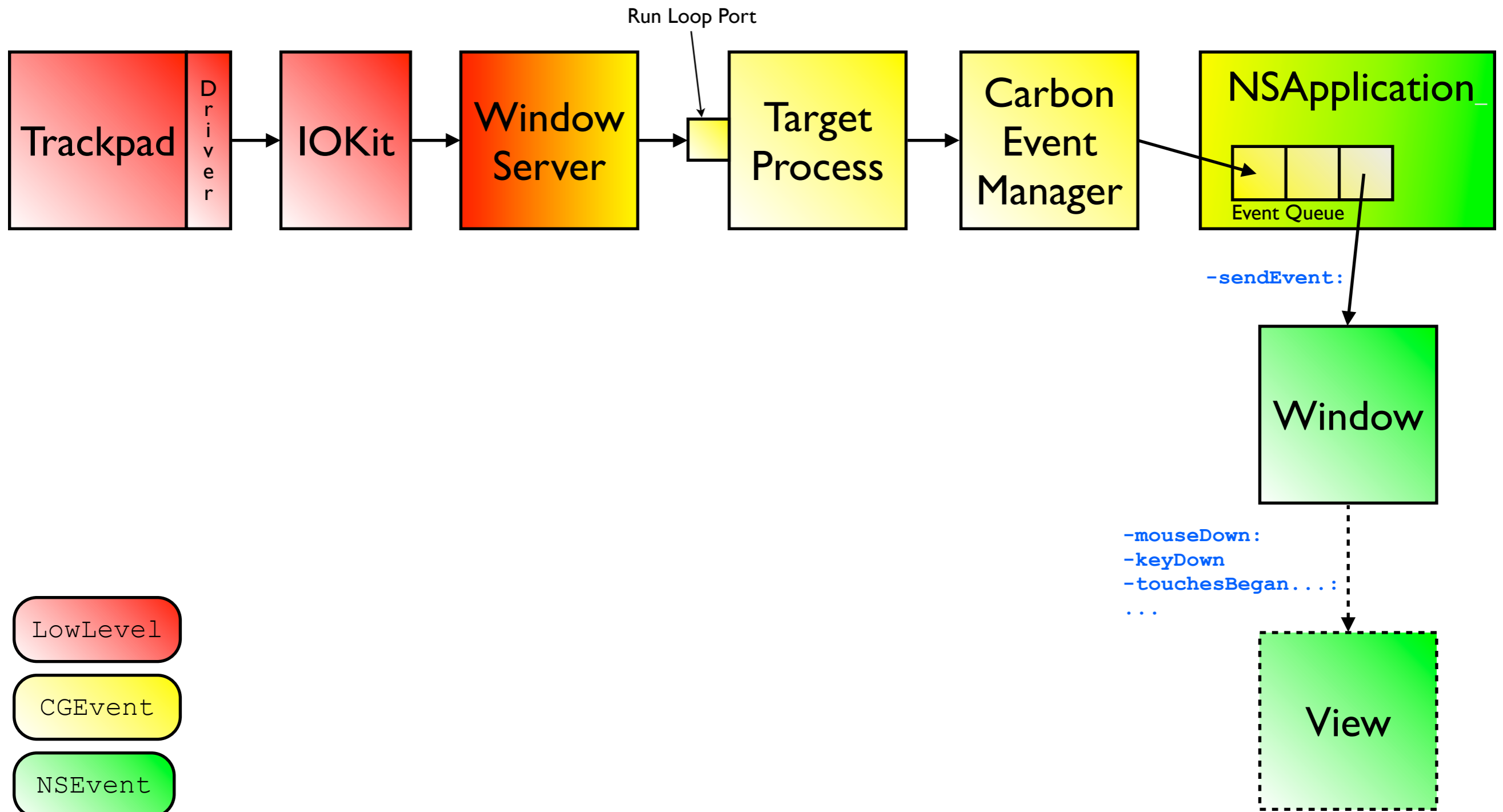


# How

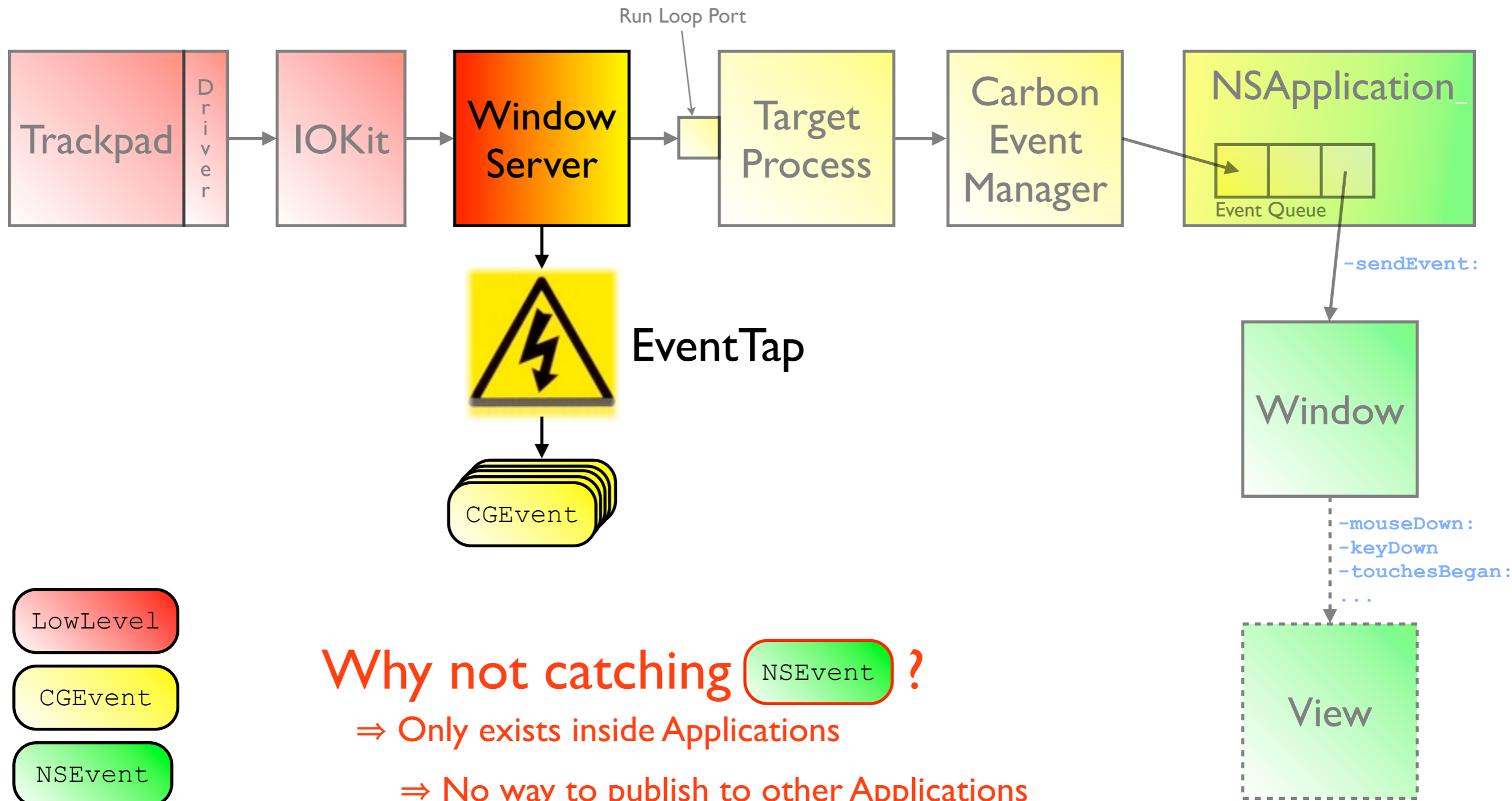
- Analyse event delivering in OS X
- Capture Multitouch-Events from trackpad
- Disassemble captured events and analyse the structure
- Create own events
- Post created events



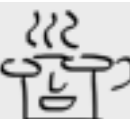
# How events are delivered



# How to catch events



- LowLevel
- CGEvent
- NSEvent



# How to catch events

```
// Specify event mask
CGEventMask eventMask =
    NSEventMaskGesture           |
    NSEventMaskMagnify          |
    NSEventMaskSwipe            |
    NSEventMaskRotate           |
    NSEventMaskBeginGesture     |
    NSEventMaskEndGesture;      // The use of these NSEvent-Flags for the mask is NOT officially supported

// Create event tap
CFMachPortRef eventTap = CGEventTapCreate(
    kCGHIDEventTap,             // Event tap is placed at the point where events enter the window server
    kCGHeadInsertEventTap,     // Event tap should be inserted before any pre-existing event tap
    kCGEventTapOptionDefault,  // Event tap is an active filter
    eventMask,                 // Event mask (as specified above)
    cgEventCallbackFunction,   // Callback-Function
    NULL);                    // User data

if(eventTap)
{
    // Create a run loop source
    CFRunLoopSourceRef runLoopSource = CFMachPortCreateRunLoopSource(kCFAllocatorDefault, eventTap, (CFIndex)0);

    // Add run loop source to current run loop
    CFRunLoopAddSource(CFRunLoopGetCurrent(), runLoopSource, kCFRunLoopCommonModes);

    // Enable event tap
    CGEventTapEnable(eventTap, true);
}

CGEventRef cgEventCallbackFunction(CGEventTapProxy proxy, CGEventType type, CGEventRef event, void* refcon);
```

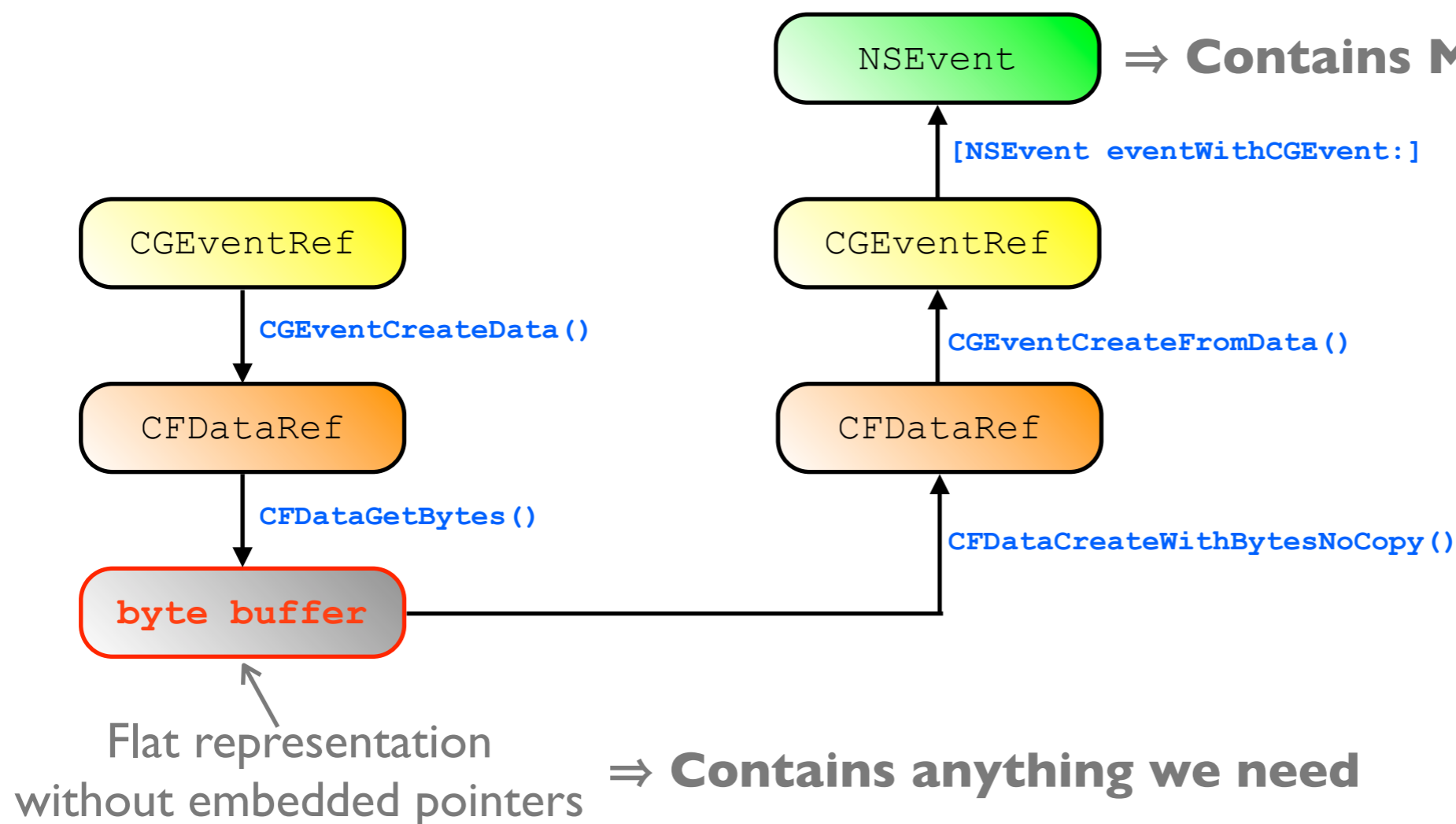


# How to analyse events

*Undocumented Fields!*

```
1. typedef uint32_t CGEventField;  
int64_t CGEventGetIntegerValueField(CGEventRef event, CGEventField field);  
double CGEventGetDoubleValueField(CGEventRef event, CGEventField field);
```

2. **NSEvent** ⇒ **Contains Multitouch data**



# Status

- ✓ Analyse event delivering in OS X
- ✓ Capture Multitouch-Events from trackpad
  - Disassemble captured events and analyse the structure
- ➡ Create own events
- ➡ Post created events



# How?

- Disassemble captured events and analyse the structure  
⇒ Analyse raw data (byte buffer)



# References

- Quartz Event Services Reference
- Carbon Event Manager Reference (Legacy Document)
- Cocoa Event-Handling Guide
- A lot of Headers ...



**Thank you!**