

WebSockets, Realtime, and You

by Justin Shacklette

Realtime Comm

1. Polling
2. Long Polling (aka Comet, Hanging Get)
3. Server Sent Events
4. WebSockets
5. Custom Sockets

WebSockets

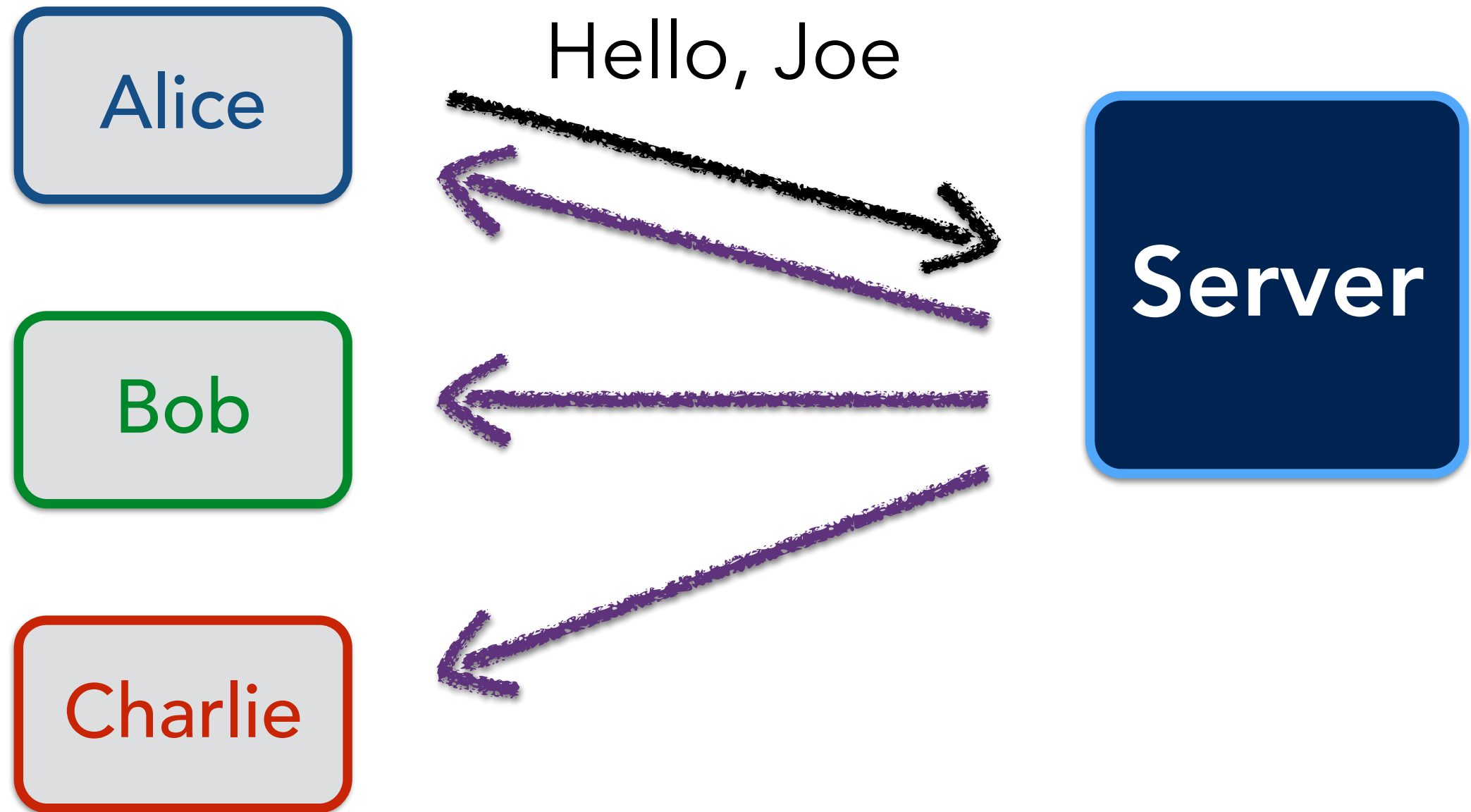
- bi-directional
- full-duplex
- low latency
- TCP-based (not HTTP)
- port 80 by default

WebSockets in my browser?

- How do you find out what HTML5 / CSS3 / Javascript features are available on which browser and version?

<http://caniuse.com>

Chat Room



Chat - Javascript

```
var conn = new WebSocket('ws://www.example.com:7006/chat/');

conn.onopen = function(evt) {
    console.log('Connected!');
};

conn.onclose = function(evt) {
    console.log('Disconnected!');
    conn = null;
};

conn.onerror = function(evt) {
    console.log('Error!');
    conn = null;
};

conn.onmessage = function(evt) {
    $('#msg').append('<p>' + evt.data + '</p>');
}
```

Chat - Objective-C

```
-(void)webSocketDidOpen:(SRWebSocket *)ws {
    NSLog(@"websocket open");
}

-(void)webSocket:(SRWebSocket *)ws didCloseWithCode... {
    NSLog(@"websocket close: %ld %@", (long)code, reason);
}

-(void)webSocket:(SRWebSocket *)ws didFailWithError... {
    NSLog(@"websocket err: %@", error);
}

-(void)webSocket:(SRWebSocket *)ws didReceiveMessage... {
    NSLog(@"websocket msg: %@", message);
    [self.messages addObject:(NSString *)message];
}
```

Sub-Protocol



Alice|Hello, Joe

Sub-Protocol

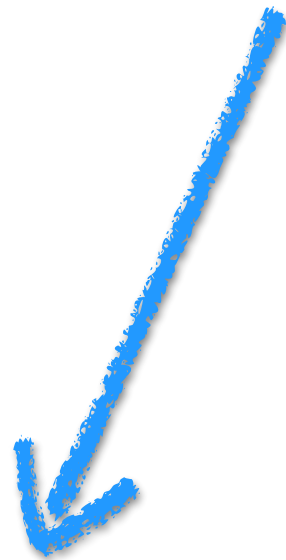
Name



Alice|Hello, Joe

Sub-Protocol

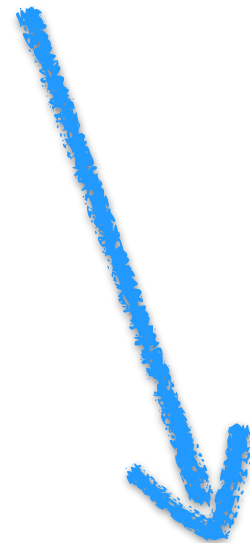
Separator



Alice|Hello, Joe

Sub-Protocol

Message



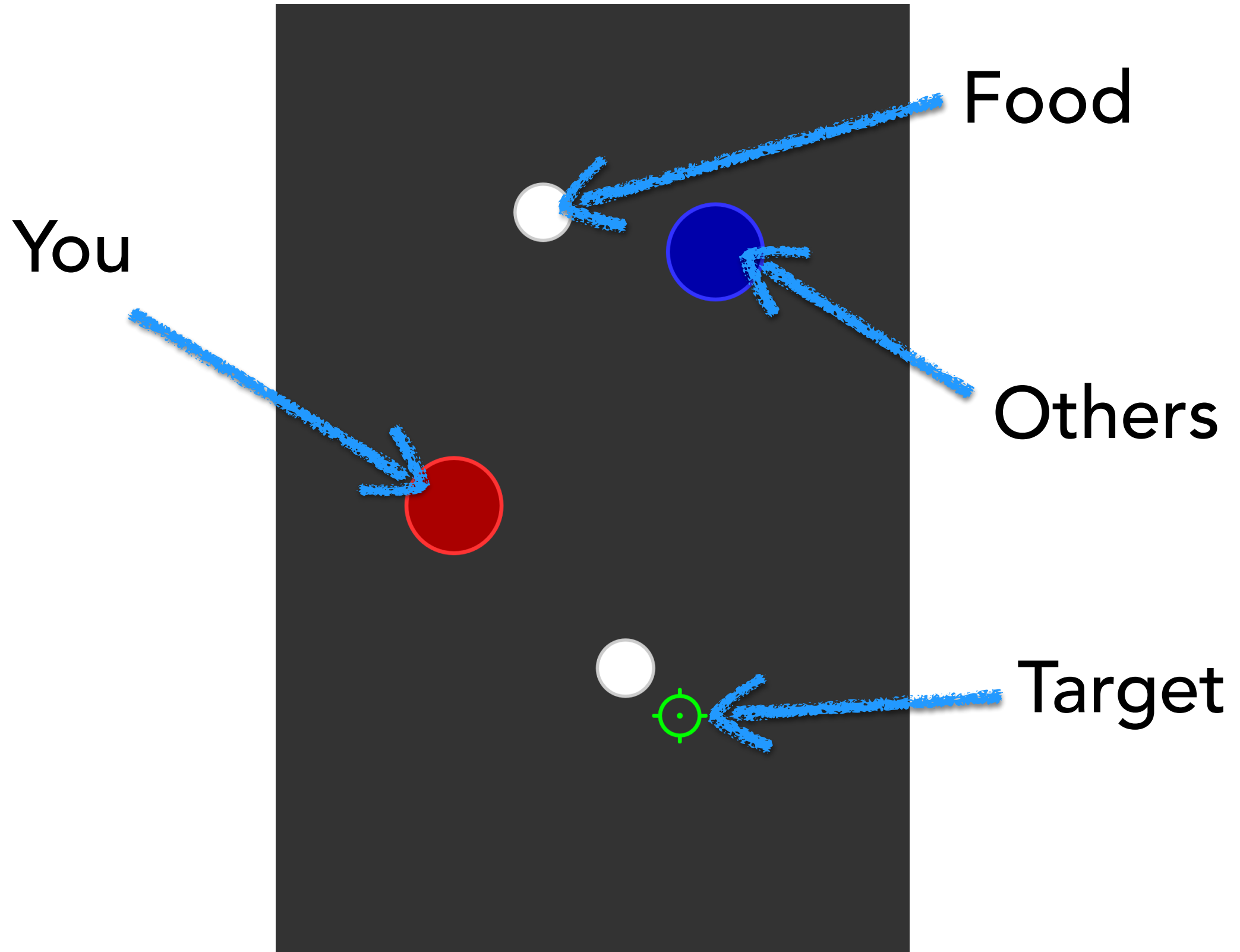
Alice|Hello, Joe

Chat Demo

Feed

- simple SpriteKit-based game
- realtime multiplayer
- works, but missing some stuff...
 - lobby/matchmaking
 - end game
 - error handling

Gameplay



Sub-Protocol

onJoin



(you)



WELCOME|id x y

(everyone else)



OTHER|id x y

(everyone)



START|timestamp

Sub-Protocol

EAT|id



(everyone)



YUM|id

(everyone)



END|id:score ...

(everyone)



FOOD|id x y v_x v_y

Sub-Protocol

POS|x y



(everyone else)



OTHER|id x y

Create EAT

```
-(void)update:(CFAbsoluteTime)currentTime {
    ...

    for (SKSpriteNode *food in _foods) {
        if (DIST2(food.position, _red.position) < _D2) {
            //red eats food!
            NSInteger id = [food.userData[@"id"] integerValue];
            NSString *msg = [NSString
                stringWithFormat:@"EAT|%ld", (long)id];
            [self.webSocket send:msg];

            [_foods removeObject:food];
            [food runAction:_eatAction];
            break;
        }
    }
}
```

Handle EAT

```
public synchronized void onEatFood(int id, int foodId) {  
    if (foods.contains(foodId)) {  
        foods.remove(foodId);  
        sendAll("YUM|" + foodId);  
  
        int score = getPlayer(id).incrScore();  
  
        if (score >= SCORE_MAX) {  
            // max score reached, so player won!  
            doEnd();  
        }  
    }  
}
```

Handle YUM

```
if ([msg hasPrefix:@"YUM|"]) {
    //remove food: YUM|<foodId>
    NSString *data = [msg substringFromIndex:4];
    NSInteger foodId = [data integerValue];

    for (SKSpriteNode *food in _foods) {
        if (foodId == [food.userData[@"id"] integerValue]) {
            [_foods removeObject:food];
            [food runAction:_eatAction];
            break;
        }
    }
}
```

Feed Demo

Get the Code

[http://github.com/saturnboy/
websockets_and_you](http://github.com/saturnboy/websockets_and_you)

Links

- W3C WebSocket API

<http://dev.w3.org/html5/websockets/>

- SocketRocket

<https://github.com/square/SocketRocket>

- Jetty WebSockets Server API

<http://www.eclipse.org/jetty/documentation/current/jetty-websocket-server-api.html>

- Quake 3 Networking Model

<http://fabiansanglard.net/quake3/network.php>

Questions?



github.com/saturnboy

`justin@saturnboy.com`