CALLBACKS & EVENT EMITTERS

Can we talk about this later?

WHAT IS A CALLBACK?

We’re about to learn about a coding pattern that will save us from callback hell - Promises. But first, let’s talk a bit more about callbacks.

WHAT IS A CALLBACK?

Technically: a function passed to another function

two flavors…

- **Blocking**
- **Non-blocking**

BLOCKING CALLBACKS

think: ***portable code***

predicates

e.g. `arr.filter(function predicate (elem) {…});`

comparators

e.g. `arr.sort(function comparator (elemA, elemB) {…});`

iterators

e.g. `arr.map(function iterator (elem) {…});`

NON-BLOCKING CALLBACKS

think: ***control flow***

event handlers

e.g. `button.on('click', function handler (data) {…});`

middleware

e.g. `app.use(function middleware (…, next) {…});`

vanilla async callback

e.g. `fs.readFile('file.txt', function callback (err, data) {…});`

“At some point in the future, execute this function”

EVENT EMITTERS

- A code pattern of deferring certain functions to execute only in response to certain “events”
- Exactly like adding an event listener to a DOM event!
- Also exactly like Express middleware!
- Not restricted to events that are emitted by the environment - we listen for and emit any events we choose by writing our own event emitter

```
var userTweets = new EventEmitter();

// Elsewhere in the program . . .
userTweets.on('newTweet', function (tweet) {
    console.log(tweet);
});

// Elsewhere in the program . . .
userTweets.emit('newTweet', {
    text: 'Check out this fruit I ate'
});
```

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EVENT EMITTERS

- Objects that can “emit” specific events with a payload to any amount of registered listeners
- An instance of the “observer/observable” a.k.a “pub/sub” pattern
- Feels at-home in an *event*-driven environment

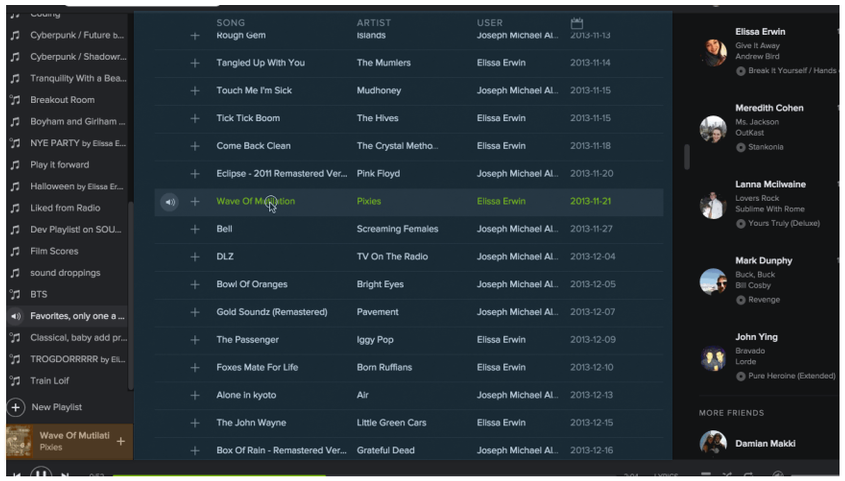
PRACTICAL USES

- Connect two decoupled parts of an application

```
var currentTrack = new EventEmitter();
```

```
currentTrack.emit('changeTrack', newTrack);
```

```
currentTrack.on('changeTrack', function (newTrack) {
    // Display new track!
});
```



PRACTICAL USES

- **Represent multiple asynchronous events on a single entity.**

```
var upload = uploadFile();

upload.on('error', function (e) {
   e.message; // World exploded!
});

upload.on('progress', function (percentage) {
   setProgressOnBar(percentage);
});

upload.on('complete', function (fileUrl, totalUploadTime) {

});
```

ALL OVER NODE

- server.on(‘request’)
- request.on(‘data’) / request.on(‘end’)
- process.stdin.on(‘data’)
- db.on(‘connection’)
- Streams