dnode

remote execution in the kingdom of node.js

James Halliday (substack)

March 22, 2011

King Ryan

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- Thou shalt have only one thread.

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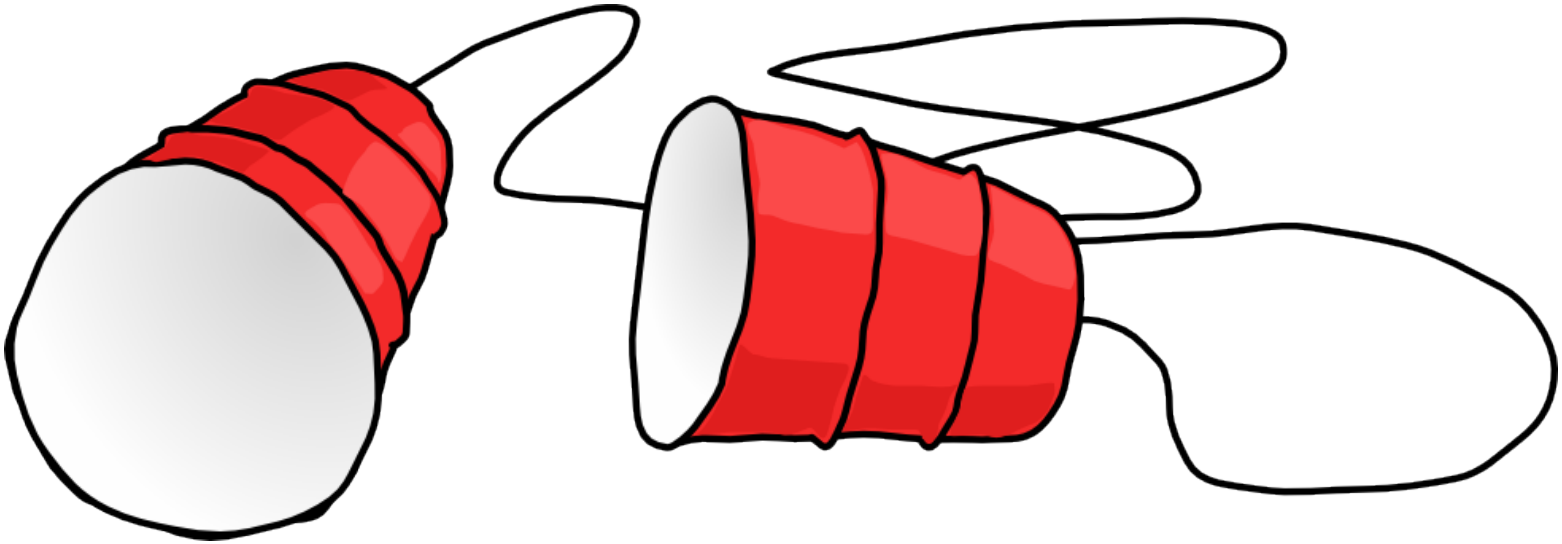
- Thou shalt have only one thread.
- Thy IO shalt be asynchronous.

call remote functions!



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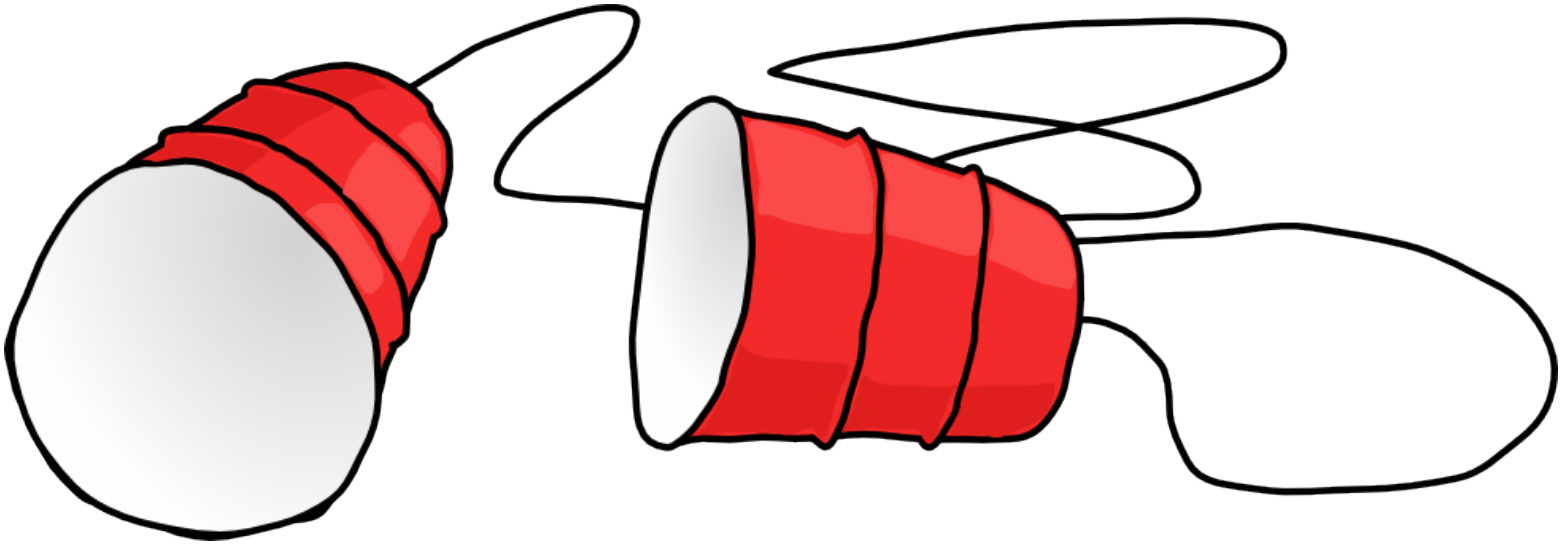

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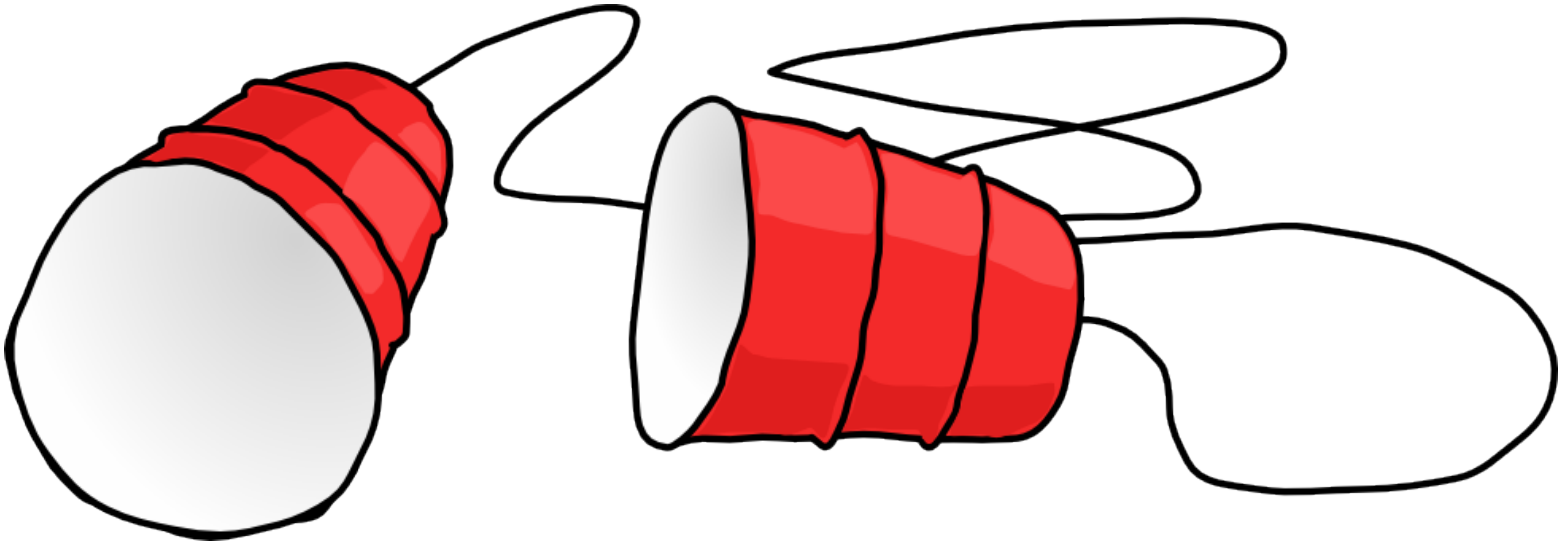

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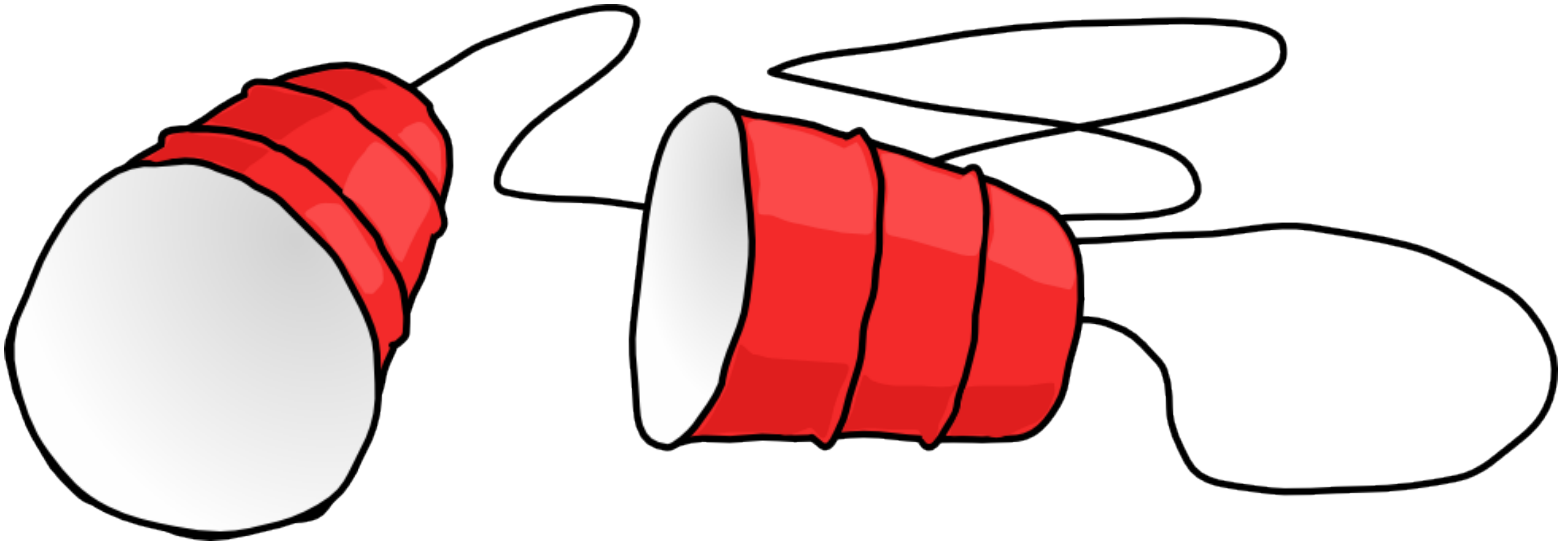

If only there were an easier way to expose backend code that complied with the King's wishes.
Well there are lots of these actually. Most of them suck.

At a glance

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At a glance

dnode gets out of your way

- fundamentally asynchronous
  - no return values
- symmetric
  - both sides can call the other's methods
- abstract
  - use it on the browser or the server
- simple yet powerful semantics
  - generalized callback wrapping
  - no implicit return callbacks

Zing example server!

```
var dnode = require('dnode');

var server = dnode({
    zing : function (n, cb) { cb(n * 100) }
});
server.listen(5000);
```

Zing example client!

```
var dnode = require('dnode');

dnode.connect(5000, function (remote) {
    remote.zing(66, function (n) {
        console.log('n = ' + n);
    });
});
```

Zing example client!

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var dnode = require('dnode');

dnode.connect(5000, function (remote) {
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});
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```
code $ node zing_server.js &
[1] 21671
code $ node zing_client.js
n = 6600
^C
```

Fuck yeah callbacks

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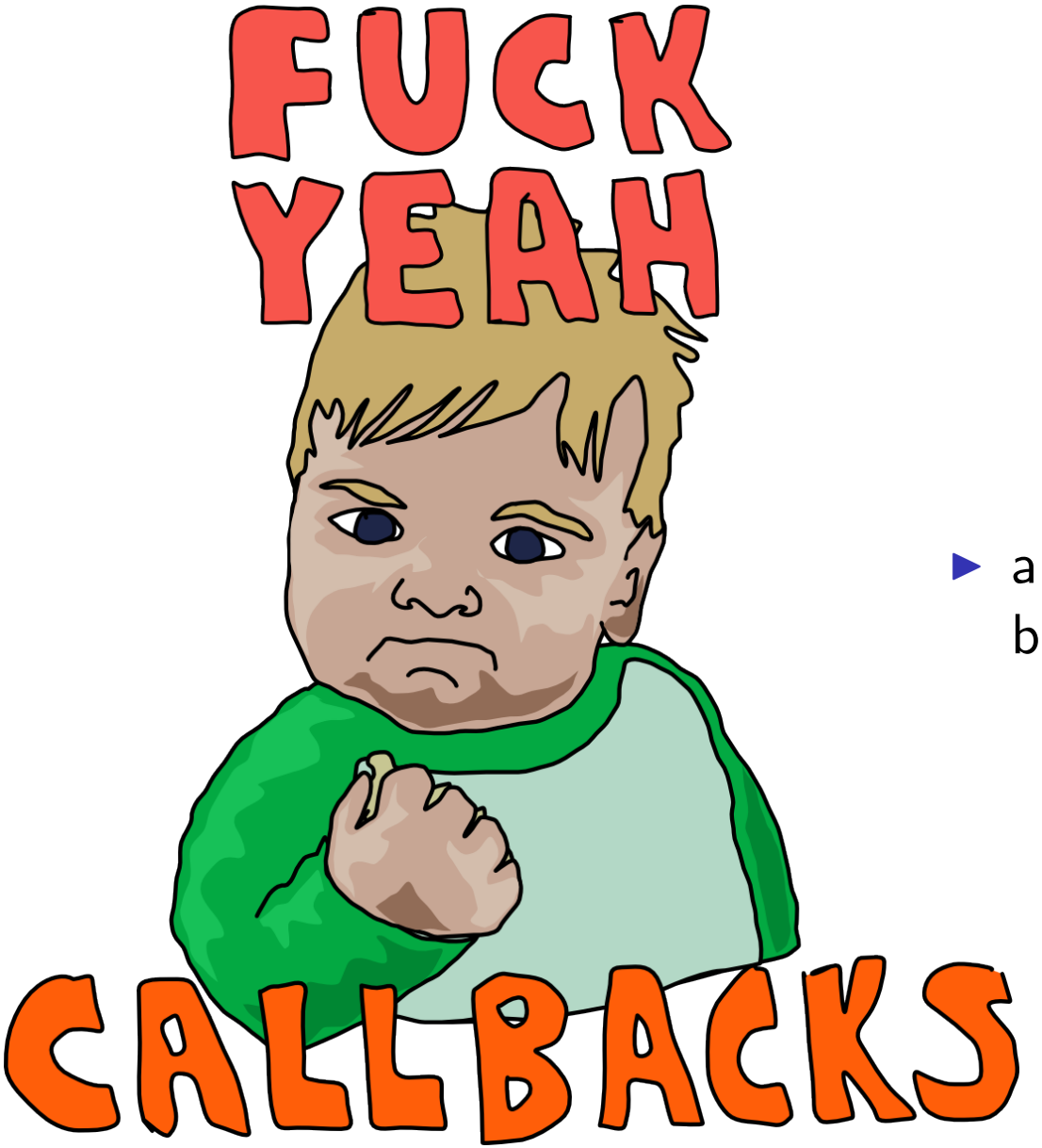


- and now let's do that in the browser

Retrofitting the server

```
var express = require('express');
var app = express.createServer();
app.use(express.static(__dirname));
app.listen(8080);

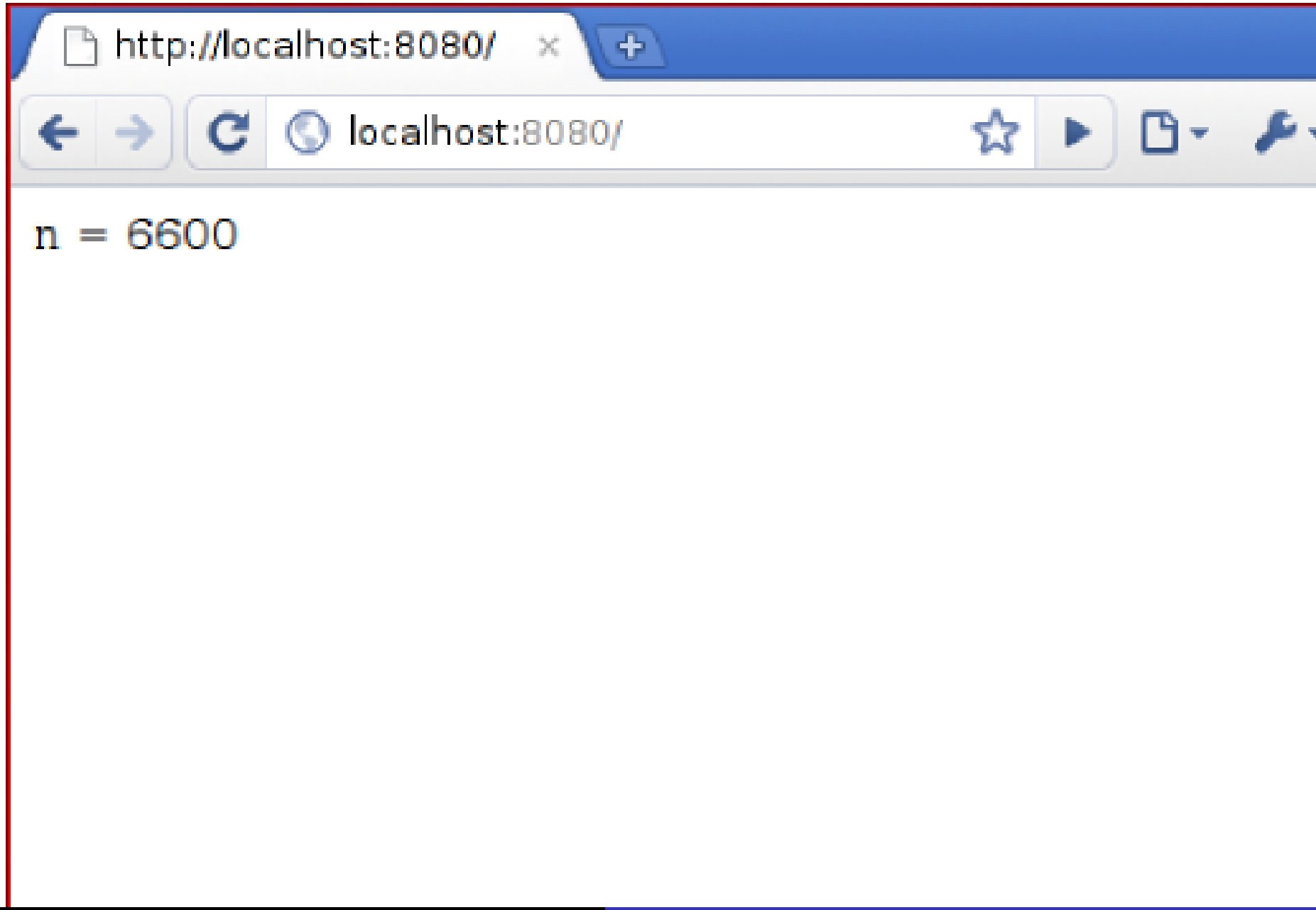
var dnode = require('dnode');

var server = dnode({
    zing : function (n, cb) { cb(n * 100) }
});
server.listen(app);
```

Browser code

```
<html>
<head>
  <script type="text/javascript" src="/dnode.js">
  </script>
  <script type="text/javascript">
    DNode.connect(function (remote) {
      remote.zing(66, function (n) {
        document.getElementById("res").innerHTML
          = 'n = ' + n;
      });
    });
  </script>
</head>
<body>
  <div id="res"></div>
</body>
</html>
```

It works in the browser! Huzzah!



How it doesn't work

dnode DOESN'T use these

- eval()
- Function.prototype.toString()
- <script> tag injection

How it does work

When a function gets called...

- a recursive walk pulls out all the functions from the arguments
- function paths and IDs sent alongside
- handles cycles too

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```
{
    "method" : "zing",
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    "callbacks" : { "0" : ["1"] }
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```
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    "method" : "zing",
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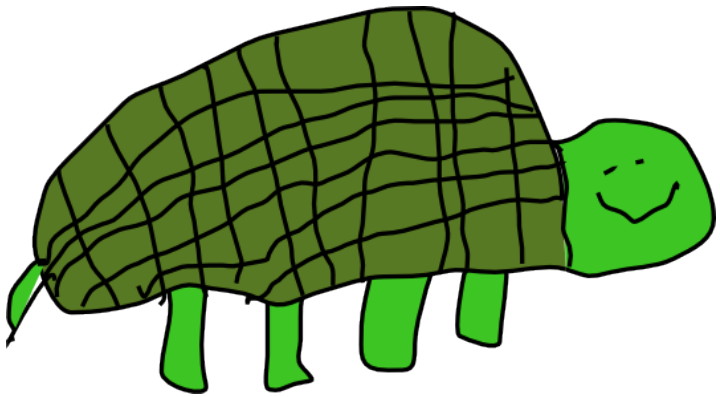
}
```

This transformation is recursive!

It's callbacks all the way down!

```
remote.turtles(function (f) {
    f(function (g) {
        g(function (h) {
            h("It's callbacks all the way down");
        });
    });
});
```



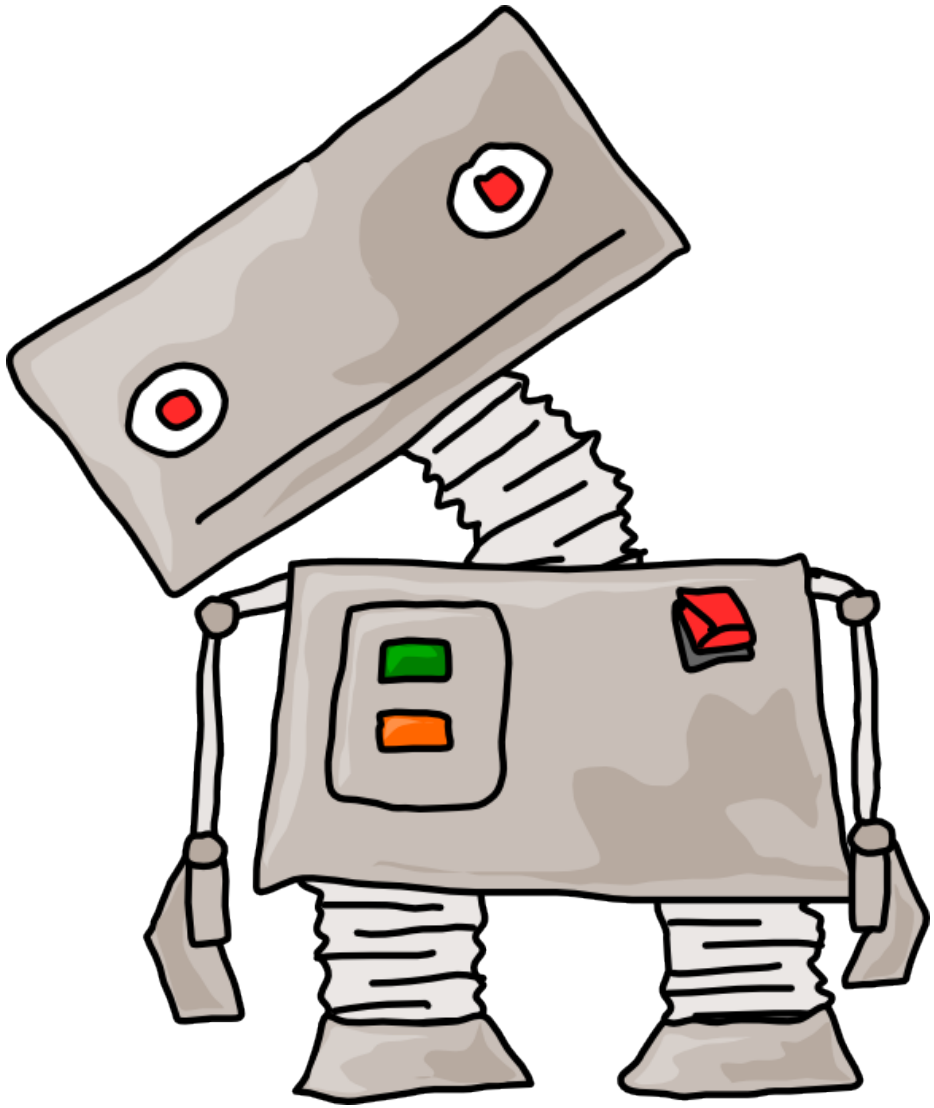
OOP javascript style

```
remote.meta(function (cb) {
    cb({
        foo : function (x, f) {
            f(2 * x + 1);
        },
        bar : function (x, f) {
            f(3 * x - 2);
        },
        baz : 5,
    });
});
```

Good news for you!

No need to write your own

- method dispatcher
- state machine
- serialization protocol



Git it!

github.com/substack/dnode

github.com/substack/dnode-slides

substack.net