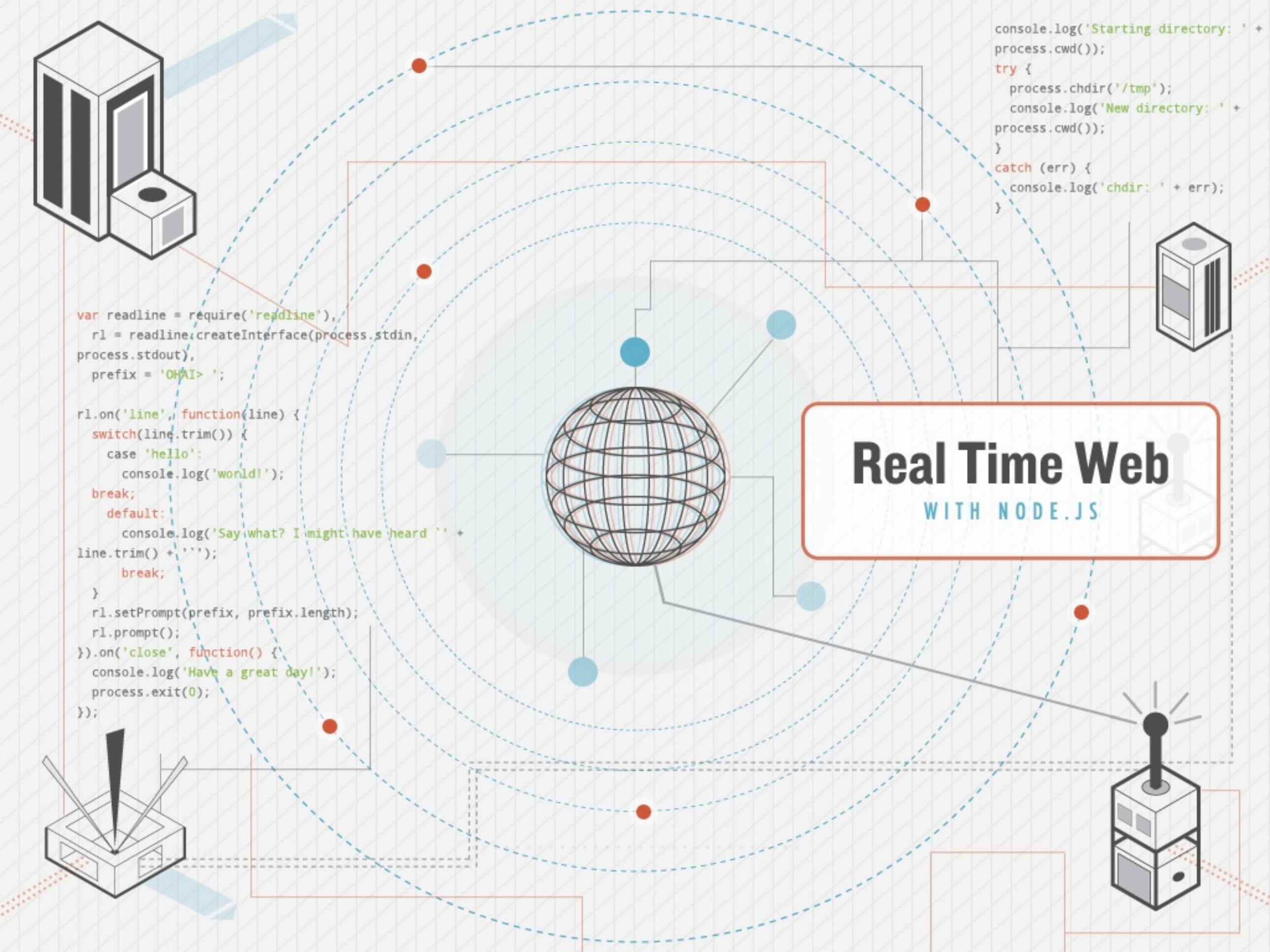

console.log('Starting directory: ' +
process.cwd());
try {
process.chdir('/tmp');
console.log('New directory: ' +
process.cwd());
}
catch (err) {
console.log('chdir: ' + err);
}
var readline = require('readline'),
rl = readline.createInterface(process.stdin,
process.stdout),
prefix = 'OHAI> ';
rl.on('line', function(line) {
switch(line.trim()) {
case 'hello':
console.log('world!');
break;
default:
console.log('Say what? I might have heard `' +
line.trim() + '`');
break;
}
rl.setPrompt(prefix, prefix.length);
rl.prompt();
}).on('close', function() {
console.log('Have a great day!');
process.exit(0);
});
Real Time Web
WITH NODE.JS

INTRO TO NODE.JS

- LEVEL ONE -

WHAT IS NODE.JS?

Allows you to build scalable network applications using JavaScript on the server-side.

Node.js

V8 JavaScript Runtime

It's fast because it's mostly C code

WHAT COULD YOU BUILD?

- Websocket Server *Like a chat server*
- Fast File Upload Client
- Ad Server
- Any Real-Time Data Apps

WHAT IS NODE.JS NOT?

- A Web Framework
- For Beginners *It's very low level*
- Multi-threaded

You can think of it as a single threaded server

OBJECTIVE: PRINT FILE CONTENTS

- Blocking Code

```
Read file from Filesystem, set equal to “contents”
Print contents
Do something else
```

- Non-Blocking Code

```
Read file from Filesystem
  whenever you’re complete, print the contents
Do Something else
```

This is a "Callback"

BLOCKING VS NON-BLOCKING

- Blocking Code

```
var contents = fs.readFileSync('/etc/hosts');
console.log(contents);
console.log('Doing something else');
```

Stop process until complete

- Non-Blocking Code

```
fs.readFile('/etc/hosts', function(err, contents) {
  console.log(contents);
});
console.log('Doing something else');
```

CALLBACK ALTERNATE SYNTAX

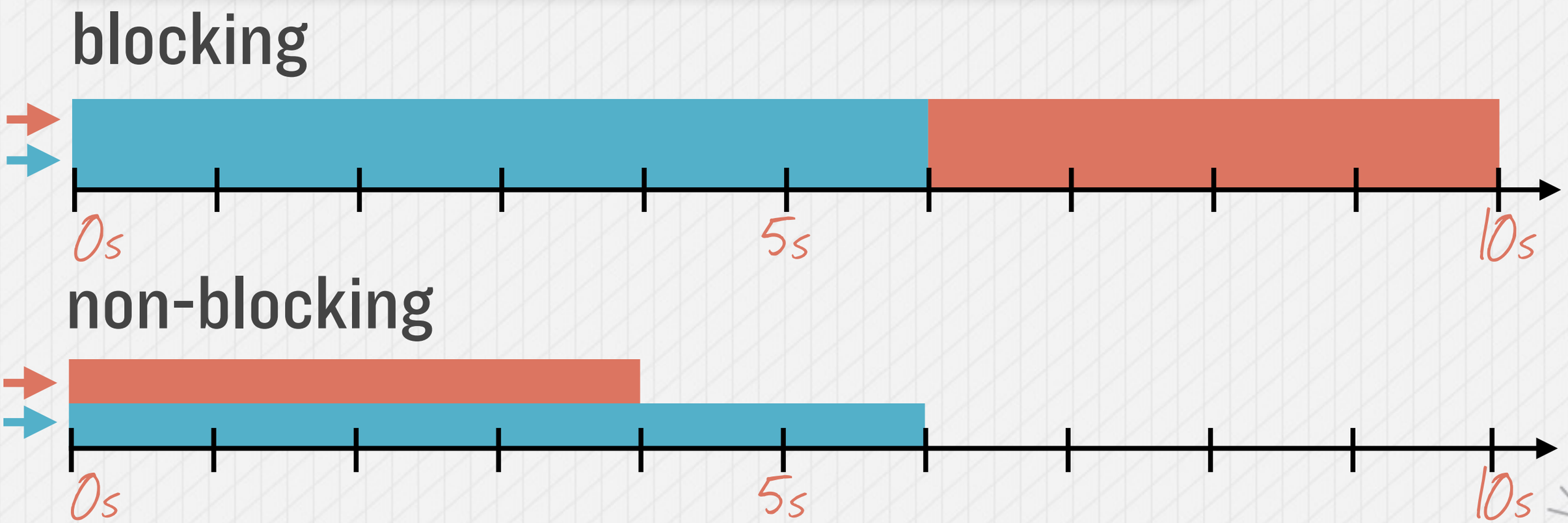
```
fs.readFile('/etc/hosts', function(err, contents) {
  console.log(contents);
});
```

Same as

```
var callback = function(err, contents) {
  console.log(contents);
}

fs.readFile('/etc/hosts', callback);
```

BLOCKING VS NON-BLOCKING

```
var callback = function(err, contents) {
  console.log(contents);
}

fs.readFile('/etc/hosts', callback);
fs.readFile('/etc/inetcfg', callback);
```



NODE.JS HELLO DOG

hello.js

```
var http = require('http');  How we require modules

http.createServer(function(request, response) {
  response.writeHead(200);   Status code in header
  response.write("Hello, this is dog.");  Response body
  response.end(); Close the connection
}).listen(8080, function(){  Listen for connections on this port
  console.log('Listening on port 8080...');
});
```

```
$ node hello.js   Run the server
```

---> Listening on port 8080...

```
$ curl http://localhost:8080
```

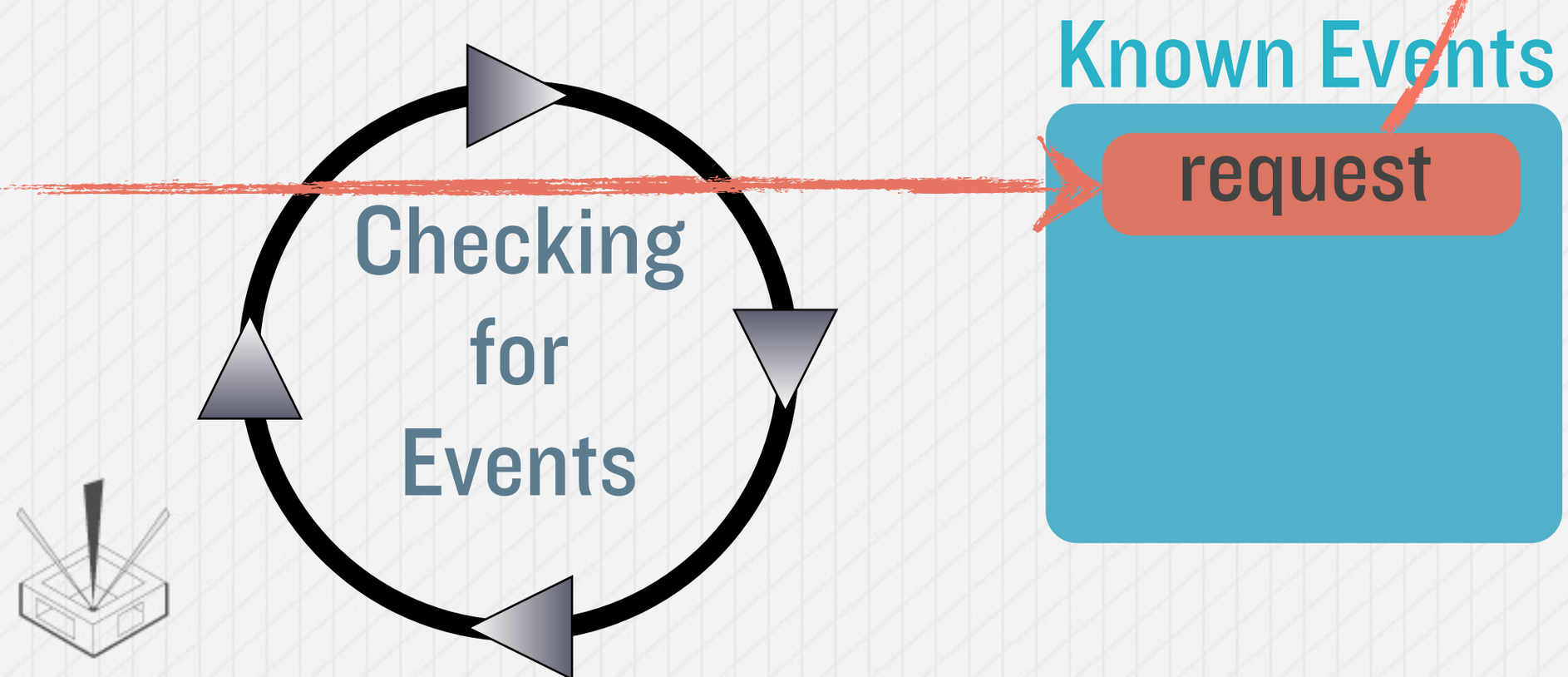
---> Hello, this is dog.

THE EVENT LOOP

```
var http = require('http');
http.createServer(function(request, response) {
  ...
}).listen(8080, function(){
  console.log('Listening on port 8080...');
});
```

Starts the Event Loop when finished

Run the Callback



WHY JAVASCRIPT?

"JavaScript has certain characteristics that make it very different than other dynamic languages, namely that it has no concept of threads. Its model of concurrency is completely based around events."

- Ryan Dahl

THE EVENT LOOP

Event Queue

close

request

Known Events

request

connection

close

Events processed one at a time

WITH LONG RUNNING PROCESS

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


http.createServer(function(request, response) {
  response.writeHead(200);
  response.write("Dog is running.");
  setTimeout(function(){
    response.write("Dog is done.");
    response.end();
  }, 5000);
}).listen(8080);
```

Represent long running process

5000ms = 5 seconds

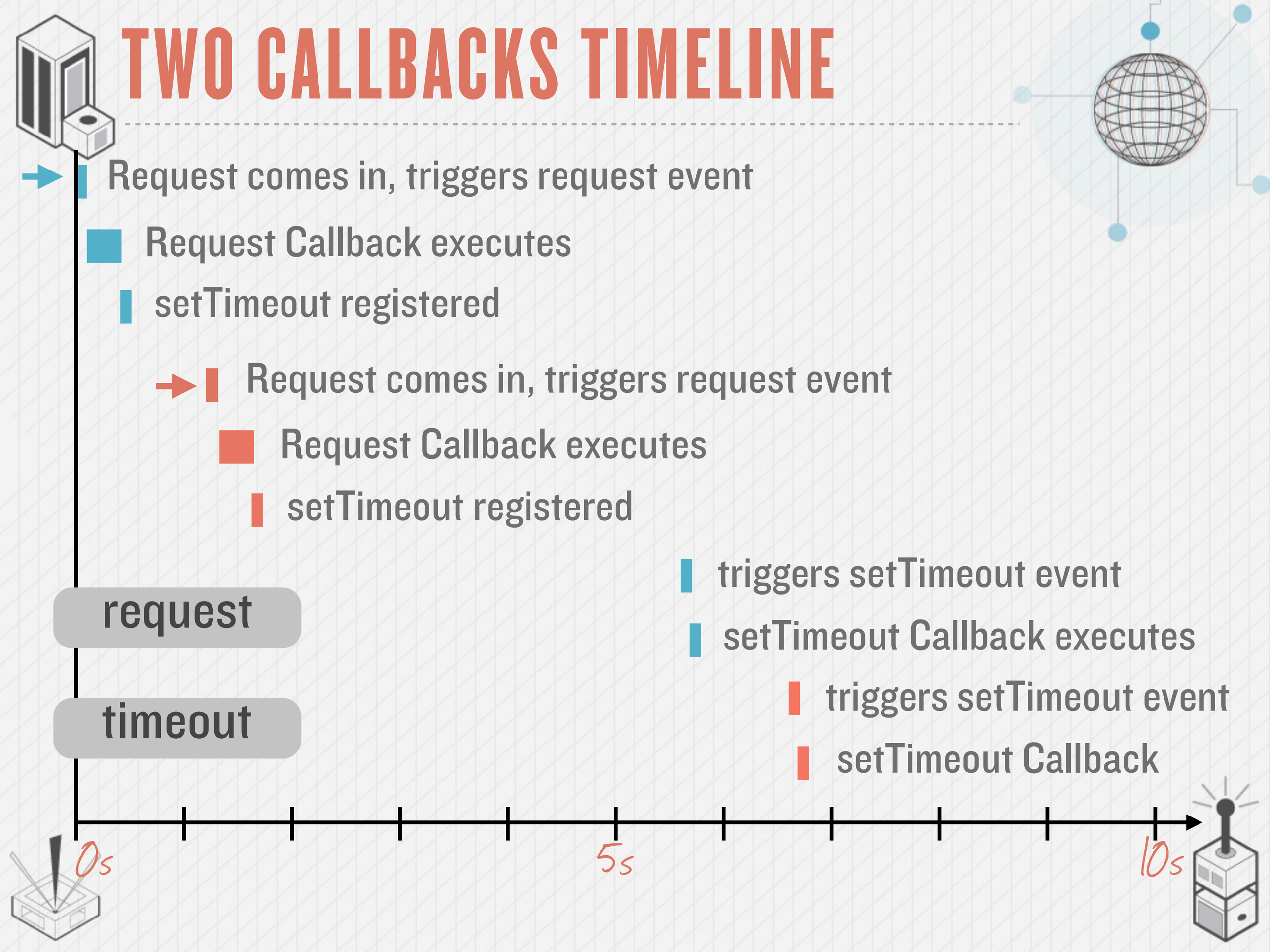
TWO CALLBACKS HERE

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


http.createServer(function(request, response) {
  response.writeHead(200);
  response.write("Dog is running.");
  setTimeout(function(){
    response.write("Dog is done.");
    response.end();
  }, 5000);
}).listen(8080);
```

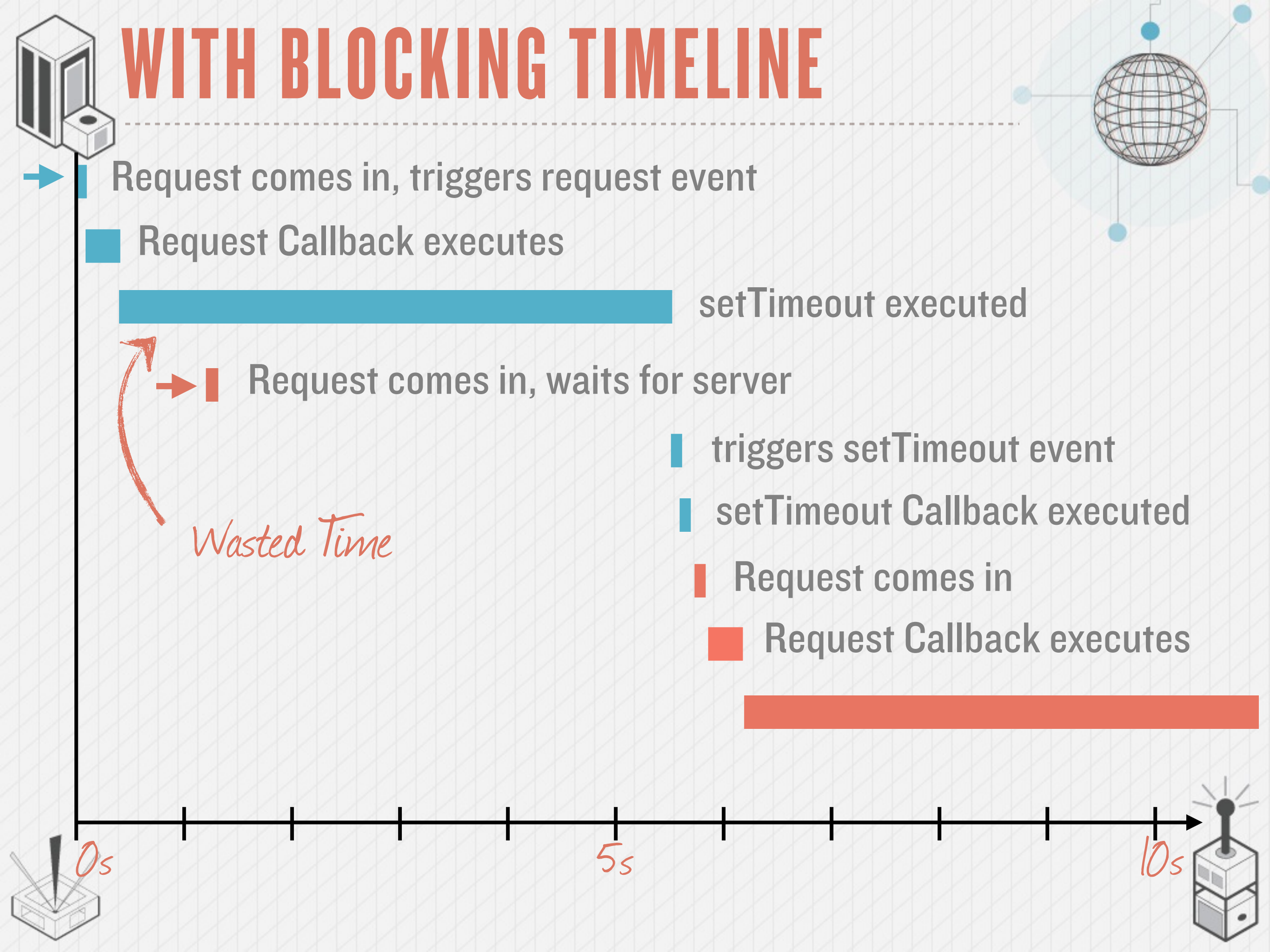
request

timeout

TWO CALLBACKS TIMELINE



WITH BLOCKING TIMELINE



TYPICAL BLOCKING THINGS

- Calls out to web services
- Reads/Writes on the Database
- Calls to extensions

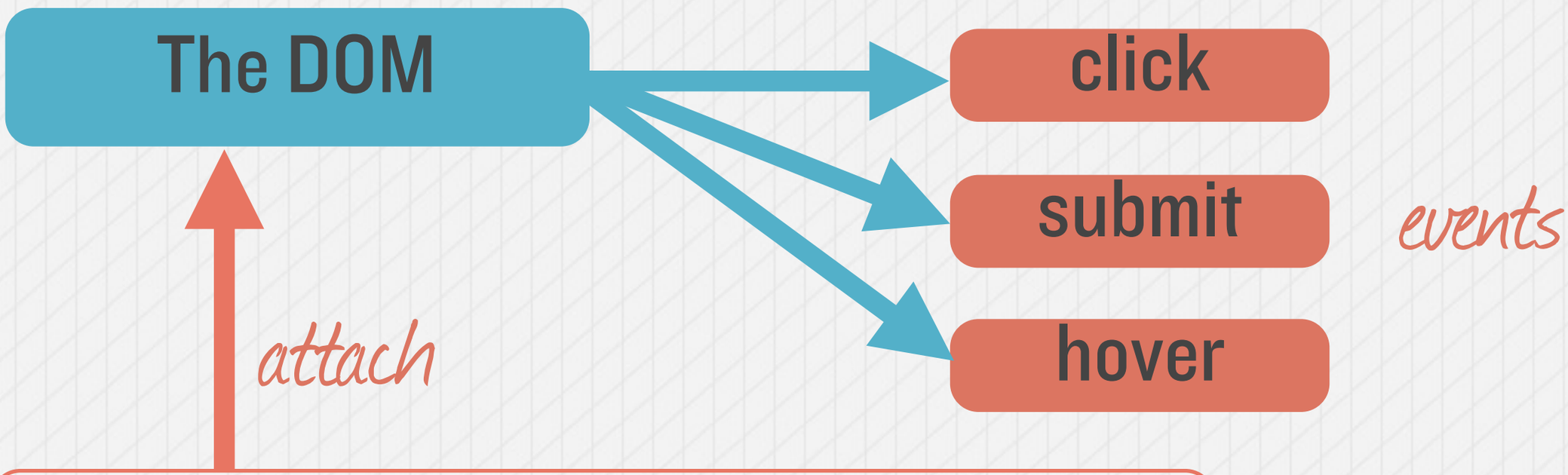
EVENTS

- LEVEL TWO -

EVENTS IN THE DOM

The DOM triggers Events

you can listen for those events

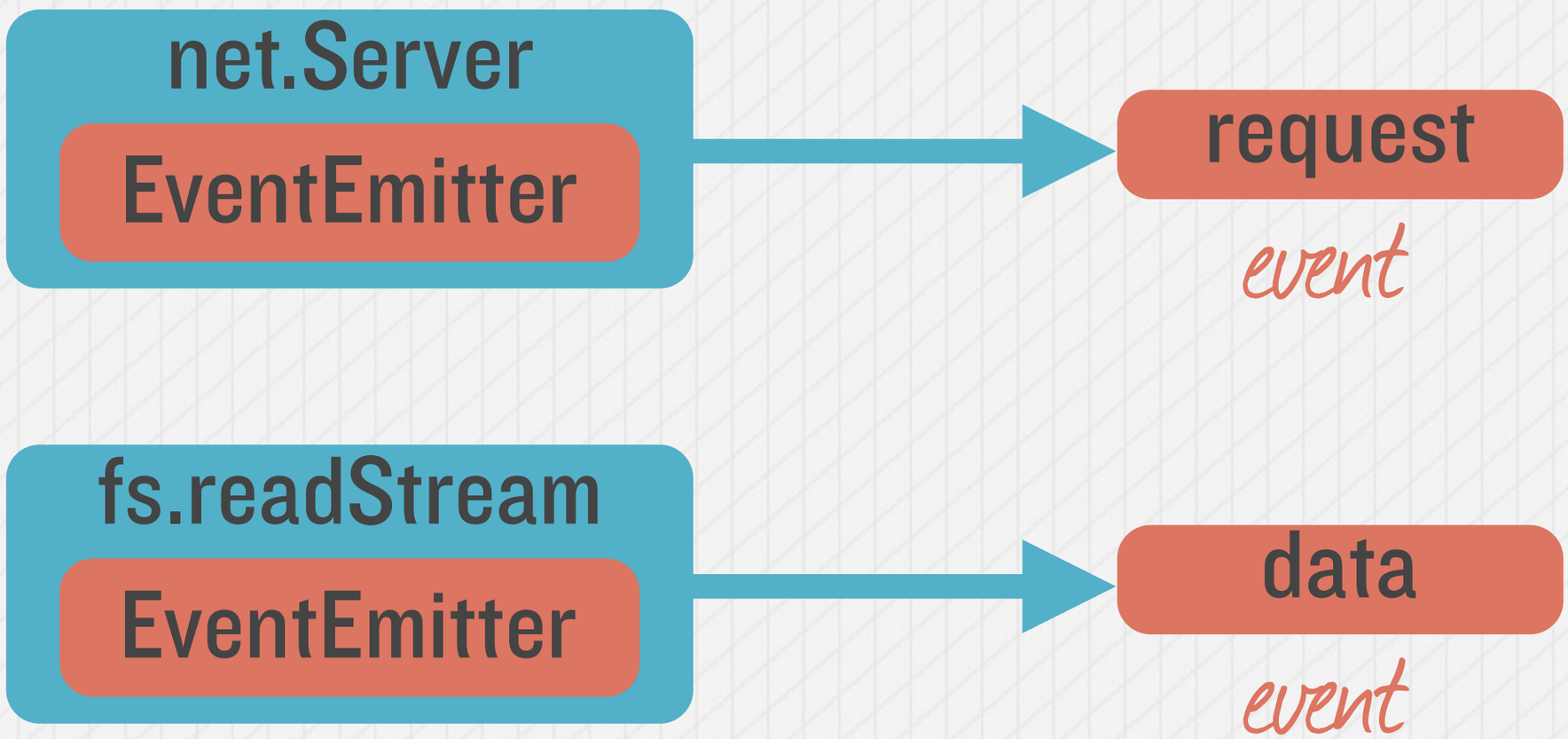



```
$("p").on("click", function(){ ... });
```

When ‘click’ event is triggered

EVENTS IN NODE

Many objects in Node emit events



CUSTOM EVENT EMITTERS

```
var EventEmitter = require('events').EventEmitter;
```

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

events

error | warn | info

```
logger.on('error', function(message){
  console.log('ERR: ' + message);
});
```

listen for error event

```
logger.emit('error', 'Spilled Milk');
```

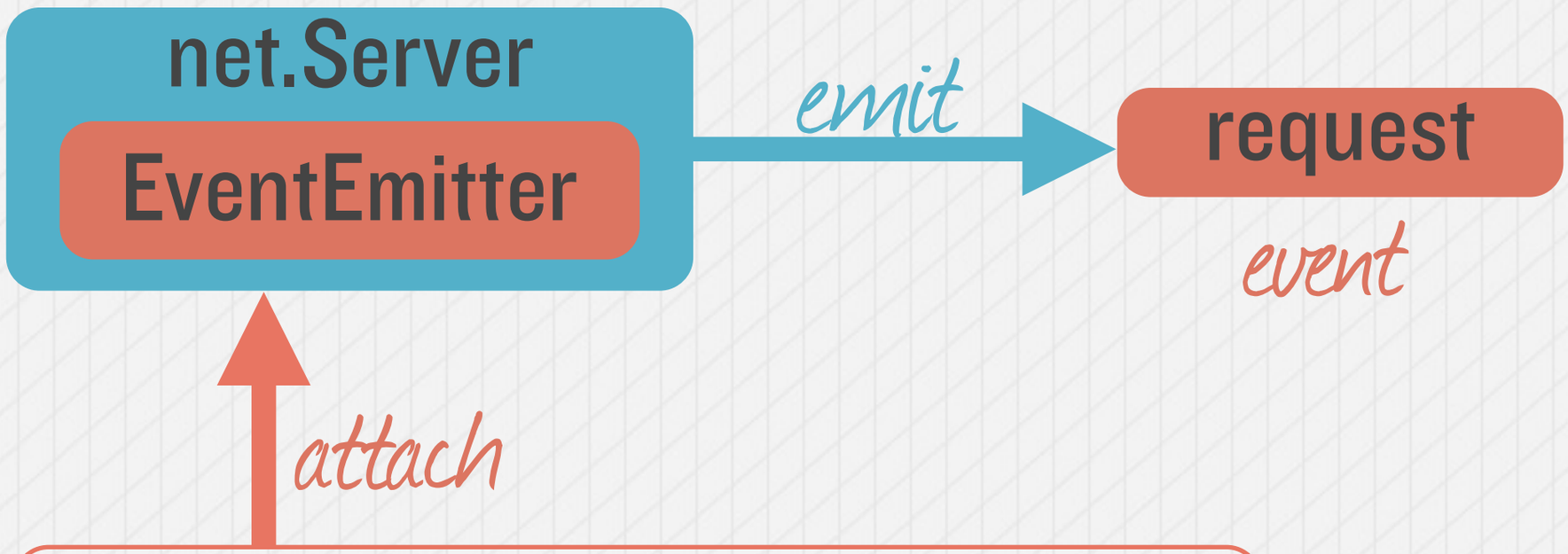
--> ERR: Spilled Milk

```
logger.emit('error', 'Eggs Cracked');
```

--> ERR: Eggs Cracked

EVENTS IN NODE

Many objects in Node emit events




```
function(request, response){ .. }
```

When ‘request’ event is emitted

HTTP ECHO SERVER

```
http.createServer(function(request, response){ ... });
```

But what is really going on here?

http://nodejs.org/api/

BREAKING IT DOWN

```
http.createServer(function(request, response){ ... });
```

http.createServer([requestListener])

Returns a new web server object.

The `requestListener` is a function which is automatically added to the `'request'` event.

Class: http.Server

This is an `EventEmitter` with the following events:

Event: 'request'

`function (request, response) { }`

Emitted each time there is a request.

ALTERNATE SYNTAX

```
http.createServer(function(request, response){ ... });
```

Same as

```
var server = http.createServer();
server.on('request', function(request, response){ ... });
```

This is how we add event listeners

Event: 'close'

`function () { }`

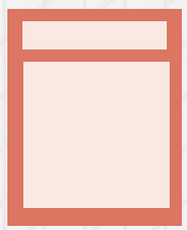
Emitted when the server closes.

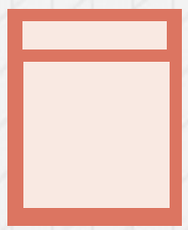
```
server.on('close', function(){ ... });
```

STREAMS

- LEVEL THREE -

WHAT ARE STREAMS?





Start Processing Immediately

Streams can be readable, writeable, or both

The API described here is for streams in Node version v0.10.x a.k.a. streams2

STREAMING RESPONSE

readable stream *writable stream*

```
http.createServer(function(request, response) {
  response.writeHead(200);
  response.write("<p>Dog is running.</p>");
  setTimeout(function(){
    response.write("<p>Dog is done.</p>");
    response.end();
  }, 5000);
}).listen(8080);
```

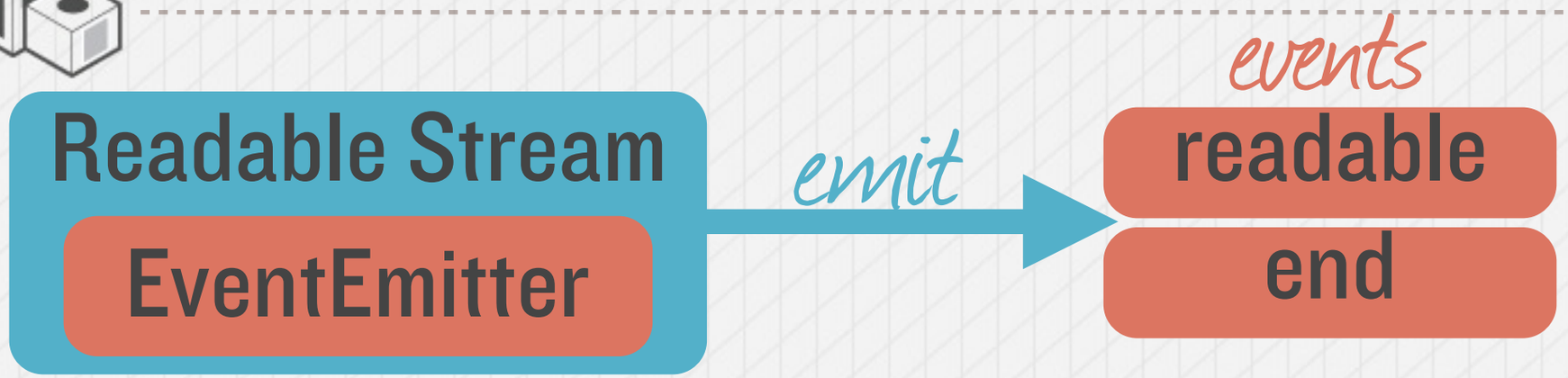
Our browser receives

"Dog is running."

(5 seconds later)

"Dog is done."

HOW TO READ FROM THE REQUEST?



Let's print what we receive from the request.

```
http.createServer(function(request, response) {
  response.writeHead(200);
  request.on('readable', function() {
    var chunk = null;
    while (null !== (chunk = request.read())) {
      console.log(chunk.toString());
    }
  });
  request.on('end', function() {
    response.end();
  });
}).listen(8080)
```

HOW TO READ FROM THE REQUEST?

```
http.createServer(function(request, response) {
  response.writeHead(200);
  request.on('readable', function() {
    var chunk = null;
    while (null !== (chunk = request.read())) {
      response.write(chunk);
    }
  });
  request.on('end', function() {
    response.end();
  });
}).listen(8080)
```

```
request.pipe(response);
```

LET'S CREATE AN ECHO SERVER!

```
http.createServer(function(request, response) {
  response.writeHead(200);
  request.pipe(response);
}).listen(8080)
```

```
$ curl -d 'hello' http://localhost:8080
```

----> `Hello` on client

Kinda like on the command line

```
cat 'bleh.txt' | grep 'something'
```

DOCUMENTATION http://nodejs.org/api/

Stability Scores

File System

```
Stability: 3 - Stable
```

File I/O is provided by simple wrappers around standard PO
`require('fs')`. All the methods have asynchronous and sy

The asynchronous form always take a completion callback as
completion callback depend on the method, but the first argu
operation was completed successfully, then the first argumen

When using the synchronous form any exceptions are immed
exceptions or allow them to bubble up.

Here is an example of the asynchronous version:

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

fs.unlink('/tmp/hello', function (err) {
```

Stream

```
Stability: 2 - Unstable
```

A stream is an abstract interface implemented by various objects in No
server is a stream, as is stdout. Streams are readable, writable, or both.

You can load the Stream base classes by doing `require('stream')`. T
Readable streams, Writable streams, Duplex streams, and Transform s

This document is split up into 3 sections. The first explains the parts of
use streams in your programs. If you never implement a streaming AP

The second section explains the parts of the API that you need to use i
yourself. The API is designed to make this easy for you to do.

The third section goes into more depth about how streams work, inclu
functions that you should probably not modify unless you definitely kn

API for Stream Consumers

STREAMS

READING AND WRITING A FILE

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

var file = fs.createReadStream("readme.md");
var newFile = fs.createWriteStream("readme_copy.md");

file.pipe(newFile);
```

require filesystem module

http://gulpjs.com/

Build system built on top of Streams

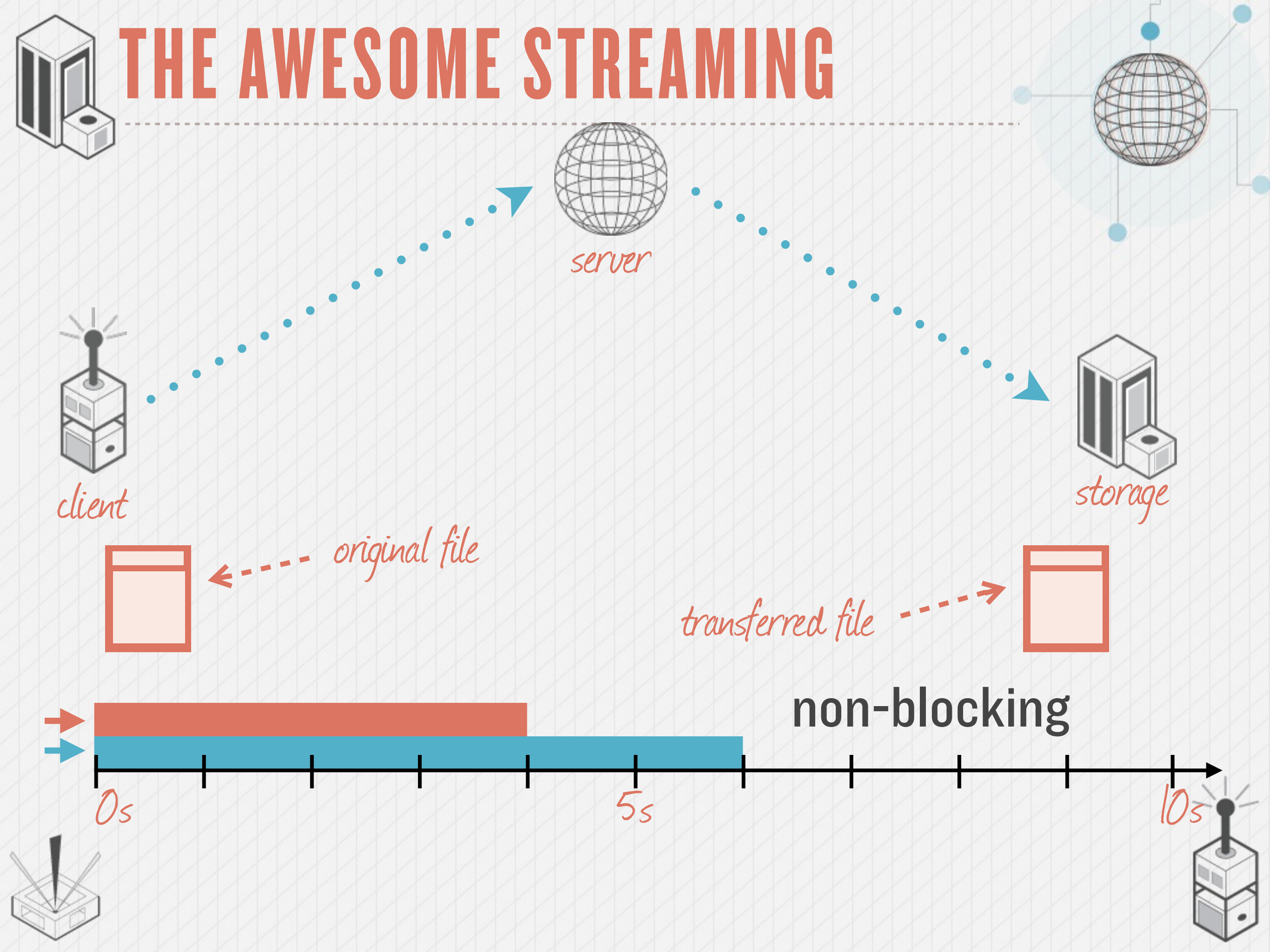
UPLOAD A FILE

```
var fs = require('fs');
var http = require('http');

http.createServer(function(request, response) {
  var newFile = fs.createWriteStream("readme_copy.md");
  request.pipe(newFile);

  request.on('end', function() {
    response.end('uploaded!');
  });
}).listen(8080);
```

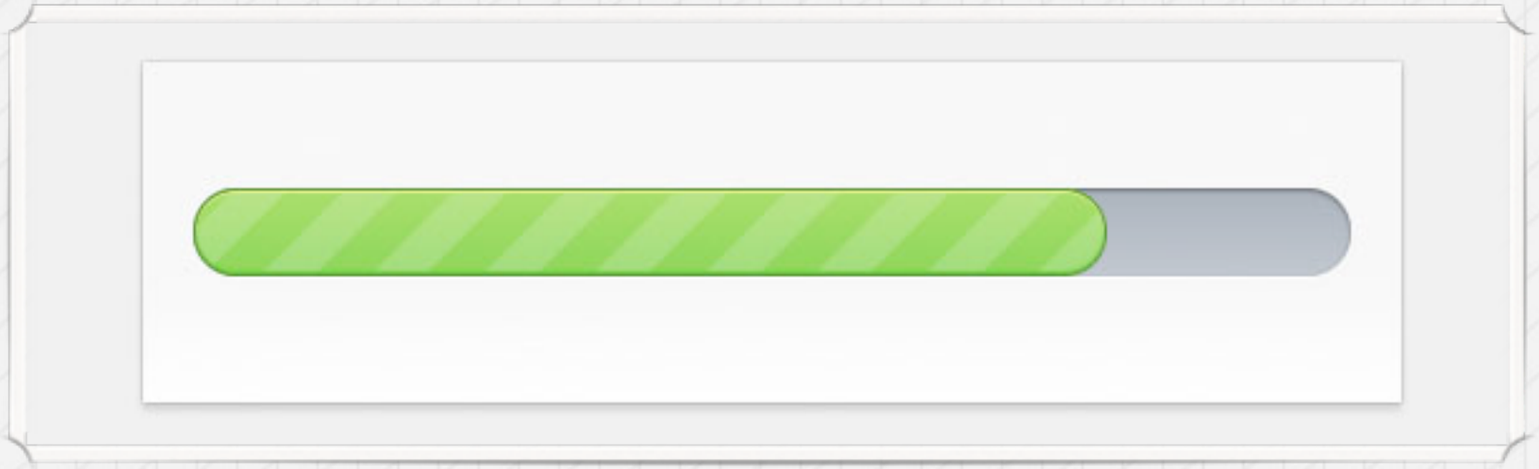
```
$ curl --upload-file readme.md http://localhost:8080
```

----> uploaded!

THE AWESOME STREAMING



FILE UPLOADING PROGRESS

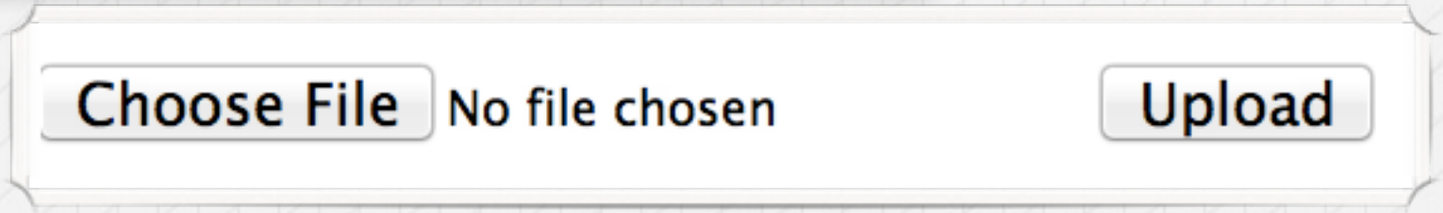


FILE UPLOADING PROGRESS

```
$ curl --upload-file file.jpg http://localhost:8080
```

Outputs:

```
progress: 3%
progress: 6%
progress: 9%
progress: 12%
progress: 13%
...
progress: 99%
progress: 100%
```



We're going to need:

- HTTP Server
- File System

REMEMBER THIS CODE?

```
var fs = require('fs');
var http = require('http');

http.createServer(function(request, response) {
  var newFile = fs.createWriteStream("readme_copy.md");
  request.pipe(newFile);

  request.on('end', function() {
    response.end('uploaded!');
  });
}).listen(8080);
```

REMEMBER THIS CODE?

```
http.createServer(function(request, response) {
  var newFile = fs.createWriteStream("readme_copy.md");
  var fileBytes = request.headers['content-length'];
  var uploadedBytes = 0;

  request.on('readable', function() {
    var chunk = null;
    while(null !== (chunk = request.read())){
      uploadedBytes += chunk.length;
      var progress = (uploadedBytes / fileBytes) * 100;
      response.write("progress: " + parseInt(progress, 10) + "%\n");
    }
  });

  request.pipe(newFile);
  ...
}).listen(8080);
```

SHOWING PROGRESS

MODULES

- LEVEL FOUR -

REQUIRING MODULES

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

→ http.js

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

→ fs.js

How does 'require' return the libraries?

How does it find these files?

LET'S CREATE OUR OWN MODULE

custom_hello.js

```
var hello = function() {
  console.log("hello!");
}

module.exports = hello;
```

custom_goodbye.js

```
exports.goodbye = function() {
  console.log("bye!");
}
```

app.js

exports defines what require returns

```
var hello = require('./custom_hello');
var gb = require('./custom_goodbye');
hello();
gb.goodbye();
```

```
require('./custom_goodbye').goodbye();
```

If we only need to call once

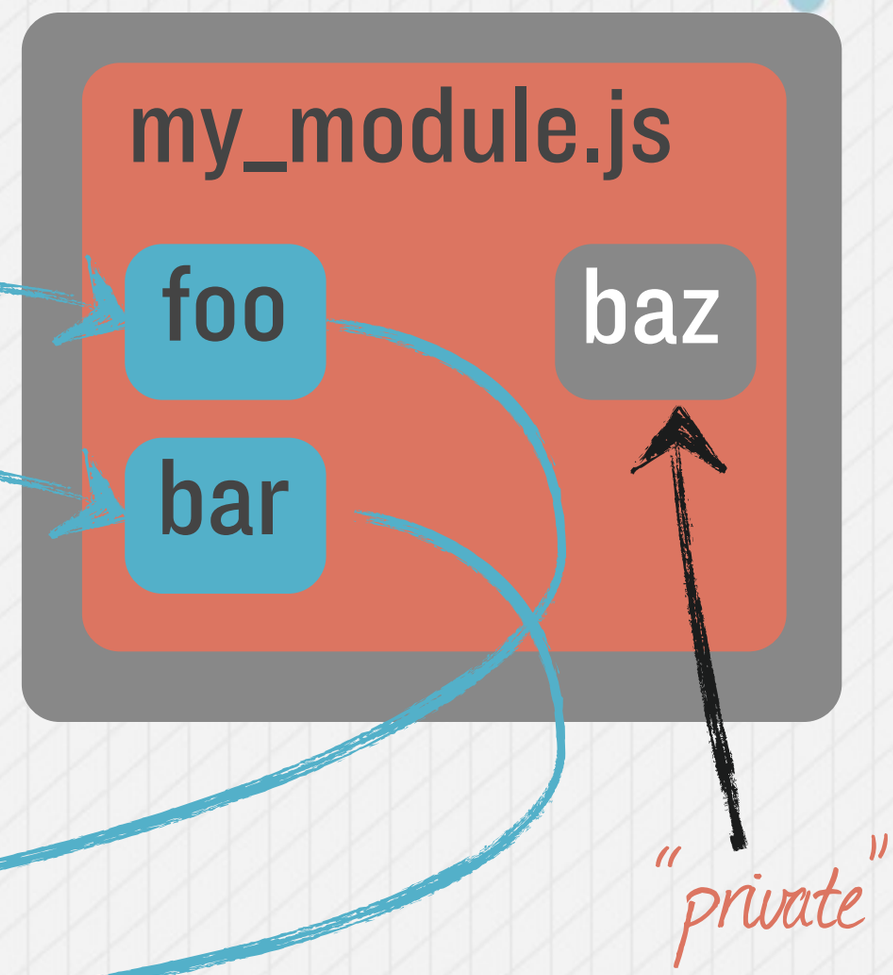
EXPORT MULTIPLE FUNCTIONS

my_module.js

```
var foo = function() { ... }
var bar = function() { ... }
var baz = function() { ... }

exports.foo = foo
exports.bar = bar
```

app.js

```
var myMod = require('./my_module');
myMod.foo();
myMod.bar();
```



MAKING HTTP REQUESTS

app.js

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

var message = "Here's looking at you, kid.";
var options = {
  host: 'localhost', port: 8080, path: '/', method: 'POST'
}

var request = http.request(options, function(response){
  response.on('data', function(data){
    console.log(data);  logs response body
  });
});
request.write(message);  begins request
request.end();  finishes request
```

ENCAPSULATING THE FUNCTION

app.js

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

var makeRequest = function(message) {
  var options = {
    host: 'localhost', port: 8080, path: '/', method: 'POST'
  }

  var request = http.request(options, function(response){
    response.on('data', function(data){
      console.log(data);
    });
  });
  request.write(message);
  request.end();
}

makeRequest("Here's looking at you, kid.");
```

CREATING & USING A MODULE

make_request.js

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

var makeRequest = function(message) {
   ...
}

module.exports = makeRequest;
```

app.js

```
var makeRequest = require('./make_request');

makeRequest("Here's looking at you, kid");
makeRequest("Hello, this is dog");
```

Where does require look for modules?

REQUIRE SEARCH

```
var make_request = require('./make_request')
var make_request = require('../make_request')
var make_request = require('/Users/eric/nodes/make_request')
```

look in same directory

look in parent directory

/Home/eric/my_app/app.js

Search in node_modules directories

```
var make_request = require('make_request')
```

- /Home/eric/my_app/node_modules/make_request.js
- /Home/eric/node_modules/make_request.js
- /Home/node_modules/make_request.js
- /node_modules/make_request.js

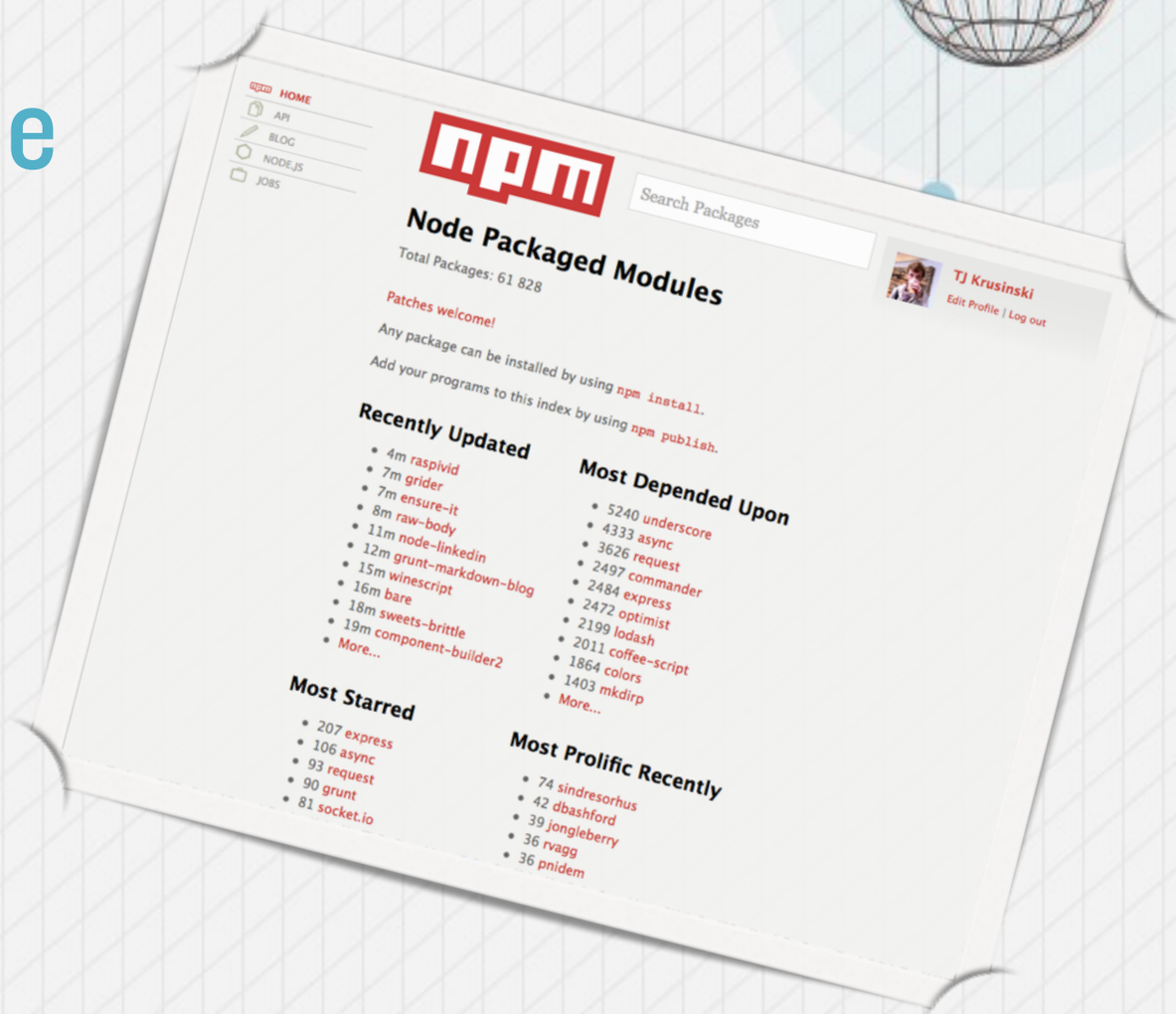
However, all packages are directories

NPM: THE USERLAND SEA

Package manager for node

- Comes with node
- Module Repository
- Dependency Management
- Easily publish modules

http://npmjs.org



INSTALLING A NPM MODULE

In /Home/my_app

```
$ npm install request
```

Installs into local node_modules directory

Home / my_app / node_modules / reques

In /Home/my_app/app.js

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

Loads from local node_modules directory

LOCAL VS GLOBAL

Install modules with executables globally

```
$ npm install coffee-script -g
```

global

```
$ coffee app.coffee
```

Global npm modules can't be required

```
var coffee = require('coffee-script');
```

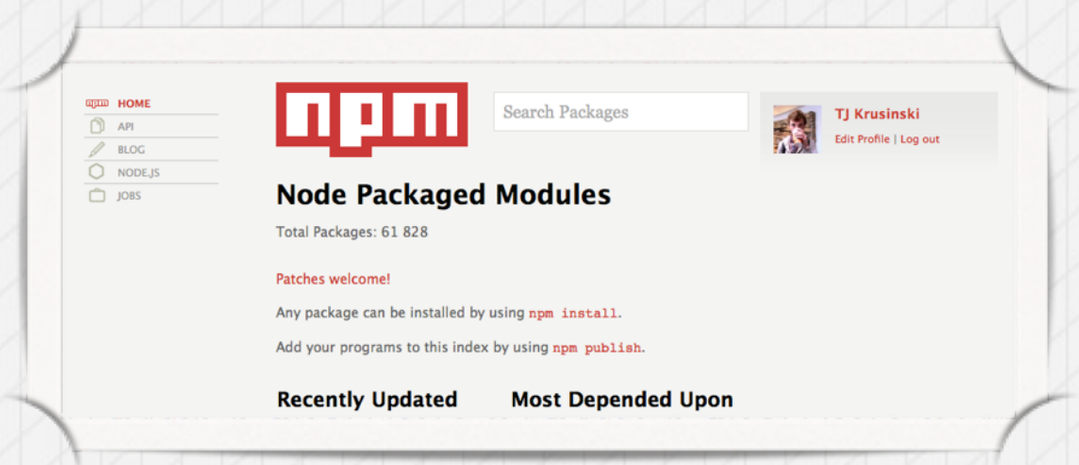
```
$ npm install coffee-script
```

Install them locally

```
var coffee = require('coffee-script');
```

FINDING MODULES

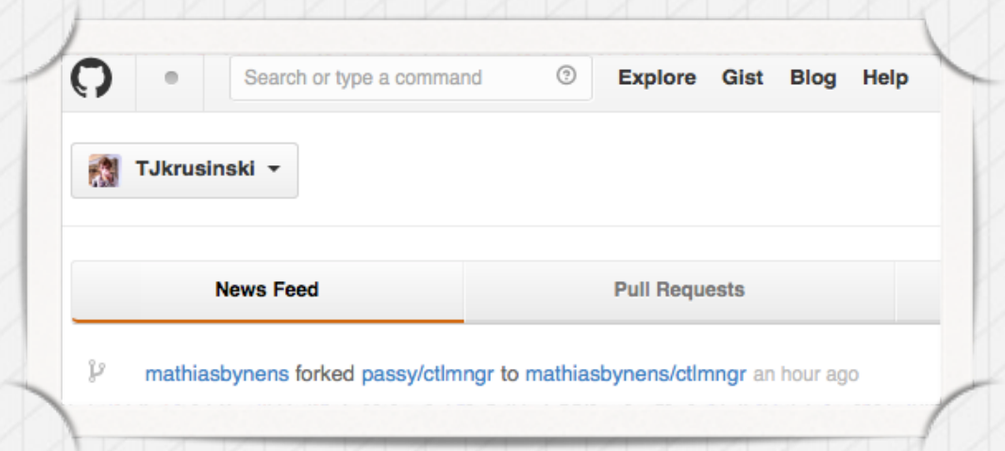
npm registry



npm command line

```
$ npm search request
```

github search



DEFINING YOUR DEPENDENCIES

my_app/package.json

```
{
  "name": "My App",
  "version": "1",
  "dependencies": {
    "connect": "1.8.7"
  }
}
```

version number

```
$ npm install
```

Installs into the node_modules directory

my_app / node_modules / connect

DEPENDENCIES

my_app/package.json

```
"dependencies": {
  "connect": "1.8.7"
}
```

Installs sub-dependencies

my_app / node_modules / connect

connect / node_modules / qs

connect / node_modules / mime

connect / node_modules / formidable

SEMANTIC VERSIONING

Major	Minor	Patch
1	8	7

```
"connect": "1.8.7"
```

Ranges

```
"connect": "~1"
```

--> `>=1.0.0 <2.0.0` Dangerous

```
"connect": "~1.8"
```

--> `>=1.8.0 <1.9.0` API could change

```
"connect": "~1.8.7"
```

--> `>=1.8.7 <1.9.0` Considered safe

http://semver.org/

EXPRESS

- LEVEL FIVE -

EXPRESS

"Sinatra inspired web development framework for Node.js -- insanely fast, flexible, and simple"

- Easy route URLs to callbacks
- Middleware (from Connect)
- Environment based configuration
- Redirection helpers
- File Uploads

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

```
$ npm install --save express
```

Installs the module and adds to package.json

```
var app = express();
```

root route

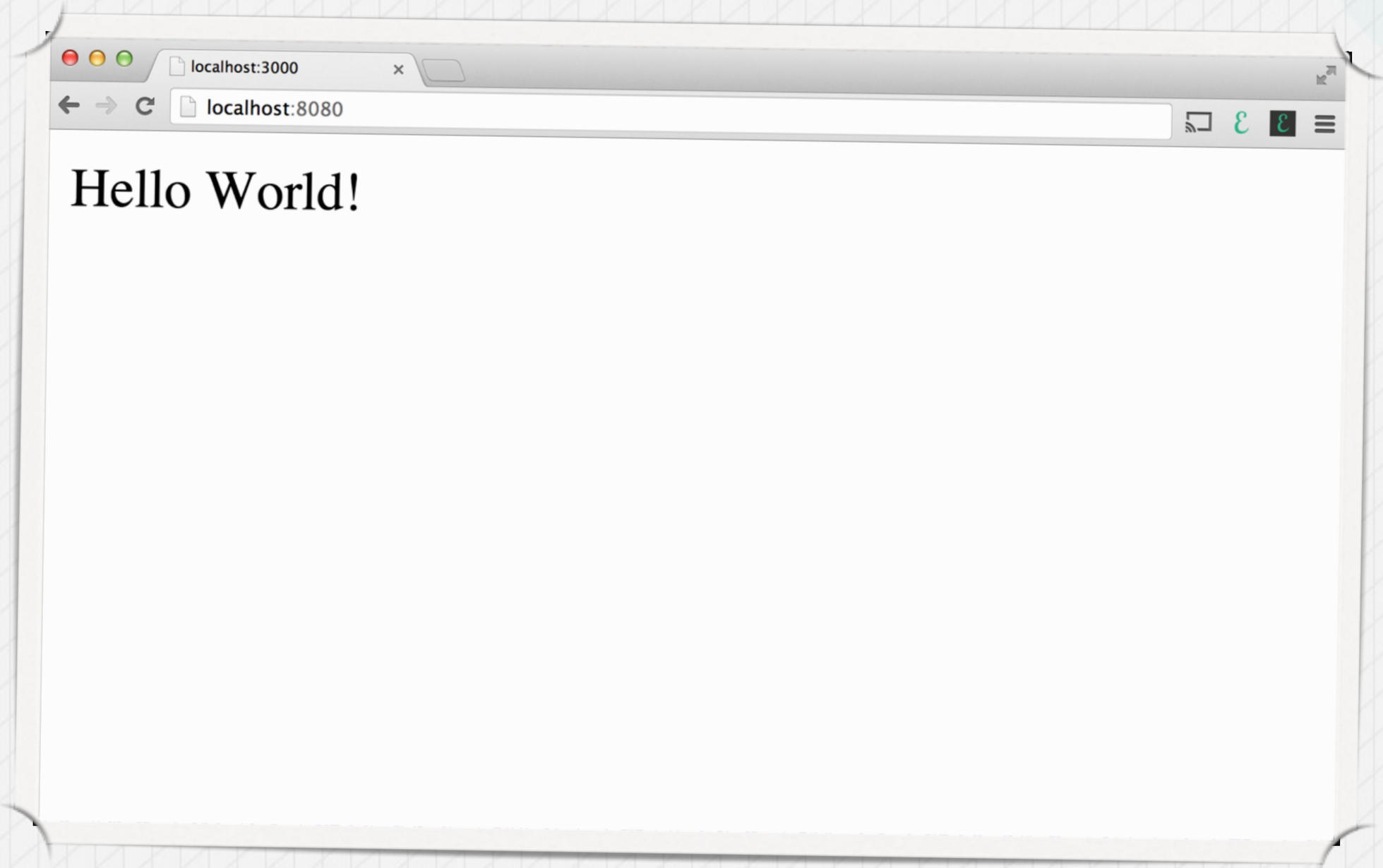
```
app.get('/', function(request, response) {
  response.sendFile(__dirname + "/index.html");
});
```

current directory

```
app.listen(8080);
```

```
$ curl http://localhost:8080/
> 200 OK
```

INTRODUCING EXPRESS



EXPRESS ROUTES

app.js

```
var request = require('request');
var url = require('url');

app.get('/tweets/:username', function(req, response) {

  var username = req.params.username;

  options = {
    protocol: "http:",
    host: 'api.twitter.com',
    pathname: '/1/statuses/user_timeline.json',
    query: { screen_name: username, count: 10}
  }

  var twitterUrl = url.format(options);
  request(twitterUrl).pipe(response);
});
```

route definition

get the last 10 tweets for screen_name

pipe the request to response

EXPRESS ROUTES

level4 — Node.js

Node.js | Node.js

```
$
```

EXPRESS + HTML

Tweets

localhost:8080/tweets/codeschool

Tweets for @codeschool

- @seandevineinc let us know how it goes, and good luck
- @larzconwell Nope, we didn't give those away. The one David has comes from http://t.co/XrvybxnS ^OL
- We just released a new Code TV screencast for enrolled members. Part of 1 of @markkendall's jQuery Mobile series. http://t.co/FstmuYEM
- ^vc
- We also have stickers..
- Are you at Railsconf? Come by the beginner track room.. we're giving away free Rails for Zombies T-shirts (while they last) #railsconf
- We themed out our Code School store. Check it out http://t.co/VOZCgorM ^vc
- Have you gotten your Code School & Zombies t-shirts yet? Check out our $19 sale this week... http://t.co/b7JUMfxy ^vc

my_app/package.json

```
"dependencies": {
  "express": "4.9.6",
  "ejs": "1.0.0"
}
```

```
$ npm install --save ejs
```

Installs the module and adds to package.json

/Home/eric/my_app/views

default directory

EXPRESS TEMPLATES

app.js

```
app.get('/tweets/:username', function(req, response) {
  ...
  request(url, function(err, res, body) {
    var tweets = JSON.parse(body);
    response.locals = {tweets: tweets, name: username};
    response.render('tweets.ejs');
  });
});
```

views/tweets.ejs

```
<h1>Tweets for @<%= name %></h1>
<ul>
  <% tweets.forEach(function(tweet){ %>
    <li><%= tweet.text %></li>
  <% }); %>
</ul>
```

EXPRESS TEMPLATES

level4 — Node.js

```
$
```

TEMPLATE LAYOUTS

SOCKET.IO

- LEVEL SIX -

CHATTR

Hello from Chattr

ERIC

DERRICK

CONNECTED TO CHATTR

Eric *joined the room*

Derrick
Hey buddy!

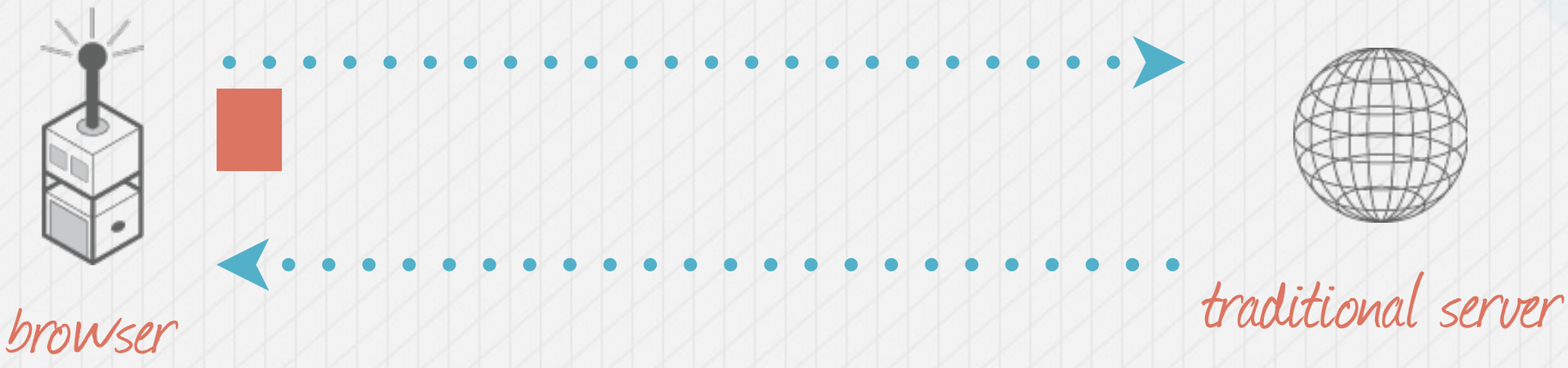
Eric
I'm having a great time over here?

Derrick *joined the room*

Type your message

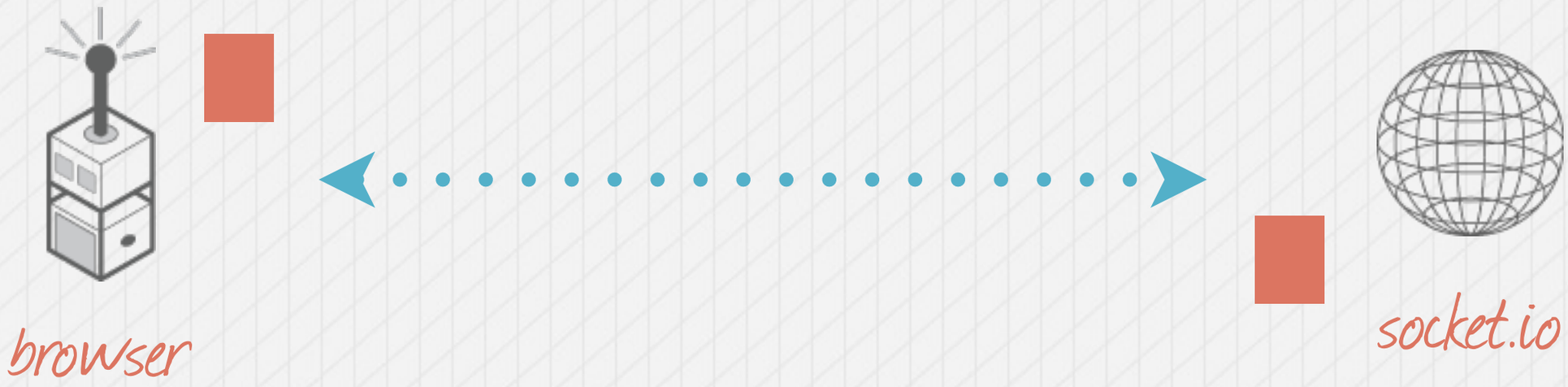
SEND

WEBSOCKETS



Traditional request/response cycle

WEBSOCKETS



Using duplexed websocket connection

SOCKET.IO FOR WEBSOCKETS

Abstracts websockets with fallbacks

```
$ npm install --save socket.io
```

app.js

```
var express = require('express');
var app = express();
var server = require('http').createServer(app);
var io = require('socket.io')(server);

io.on('connection', function(client) {
  console.log('Client connected...');
});

app.get('/', function (req, res) {
  res.sendFile(__dirname + '/index.html');
});

server.listen(8080);
```

SOCKET.IO FOR WEBSOCKETS

socket.io client connects to the server

index.html

```
<script src="/socket.io/socket.io.js"></script>
<script>
  var socket = io.connect('http://localhost:8080');
</script>
```

SENDING MESSAGES TO CLIENT

app.js

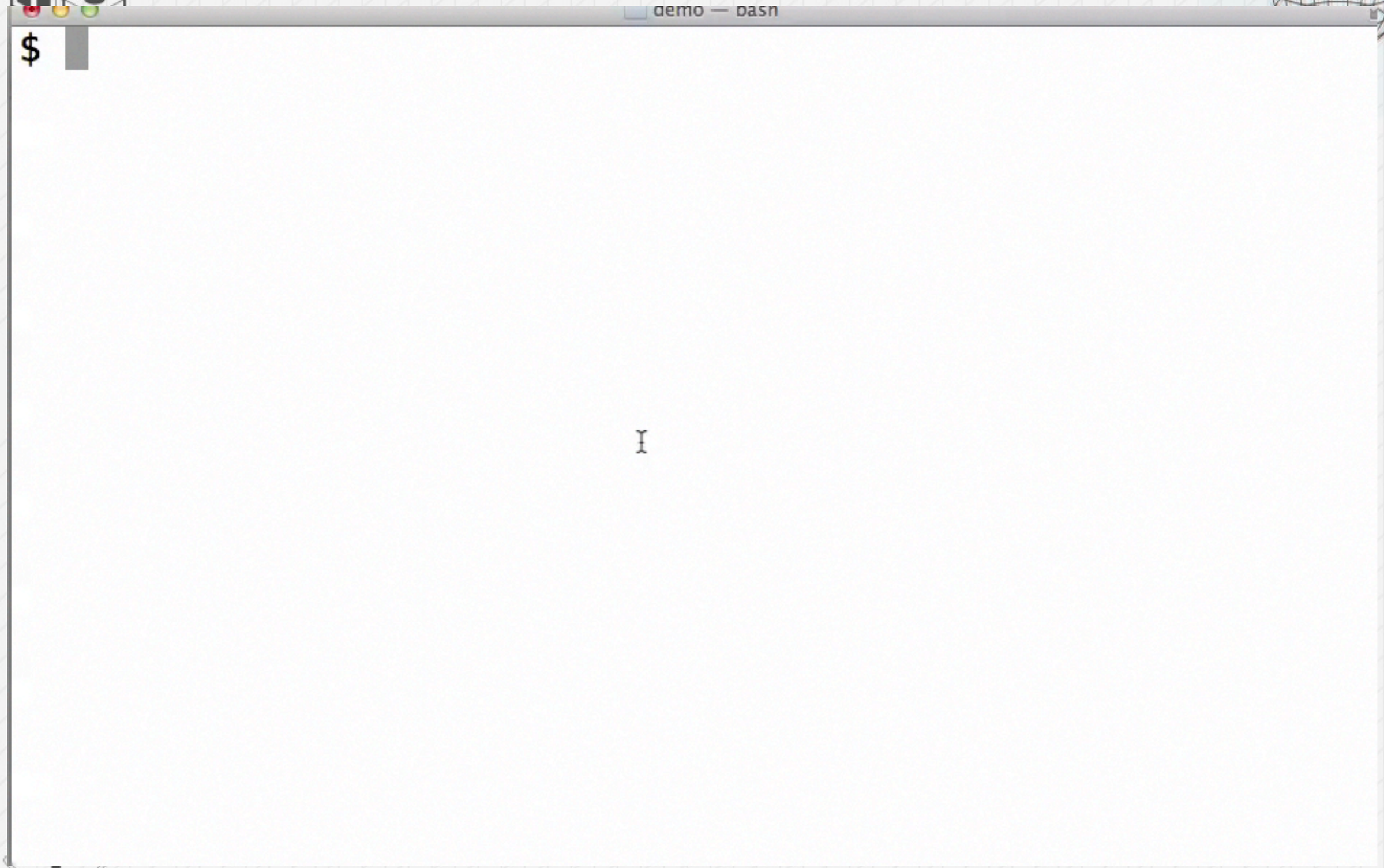
```
io.on('connection', function(client) {
  console.log('Client connected...');

    emit the 'messages' event on the client
  client.emit('messages', { hello: 'world' });
});
```

index.html

```
<script src="/socket.io/socket.io.js'></script>
<script>
  var socket = io.connect('http://localhost:8080');
  socket.on('messages', function (data) {
    alert(data.hello);
  });
</script>
```

listen for 'messages' events

CHATTR HELLO WORLD



SENDING MESSAGES TO SERVER

app.js

```
io.on('connection', function(client) {
  client.on('messages', function (data) {
    console.log(data);
  });
});
```

listen for 'messages' events

index.html

```
<script>
  var socket = io.connect('http://localhost:8080');
  $('#chat_form').submit(function(e){
    var message = $('#chat_input').val();
    socket.emit('messages', message);
  });
</script>
```

emit the 'messages' event on the server

CHATTR HELLO WORLD

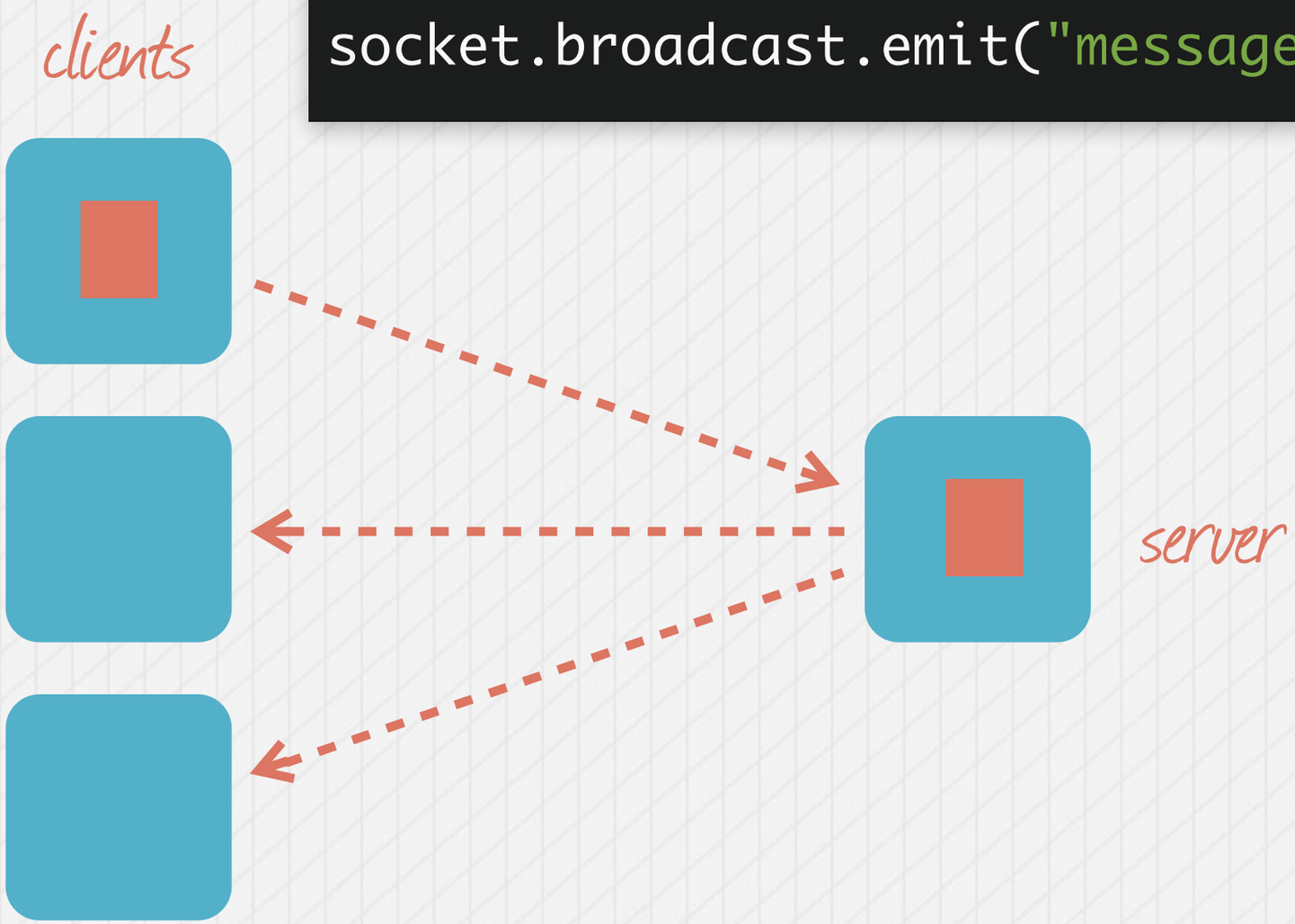
level4 — bash

```
$
```

BROADCASTING MESSAGES

app.js

```
socket.broadcast.emit("message", 'Hello');
```



BROADCASTING MESSAGES

app.js

```
io.on('connection', function(client) {
  client.on('messages', function (data) {
    client.broadcast.emit("messages", data);
  });
});
```

broadcast message to all other clients connected

index.html

```
<script>
  ...
  socket.on('messages', function(data) { insertMessage(data) });
</script>
```

insert message into the chat

BROADCASTING MESSAGES

level4 — bash

```
$
```

SAVING DATA ON THE SOCKET

app.js

```
io.on('connection', function(client) {
  client.on('join', function(name) {
    client.nickname = name;
  });
});
```

set the nickname associated with this client

index.html

```
<script>
  var server = io.connect('http://localhost:8080');
  server.on('connect', function(data) {
    $('#status').html('Connected to chattr');
    nickname = prompt("What is your nickname?");


    server.emit('join', nickname);
  });
</script>
```

notify the server of the users nickname

SAVING DATA ON THE CLIENT

app.js

```
io.on('connection', function(client) {
  client.on('join', function(name) {
    client.nickname = name;
  });

  client.on('messages', function(data){

    var nickname = client.nickname;

    client.broadcast.emit("message", nickname + ": " + message);

    client.emit("messages", nickname +  ": " + message);

  });
});
```

set the nickname associated with this client

get the nickname of this client before broadcasting message

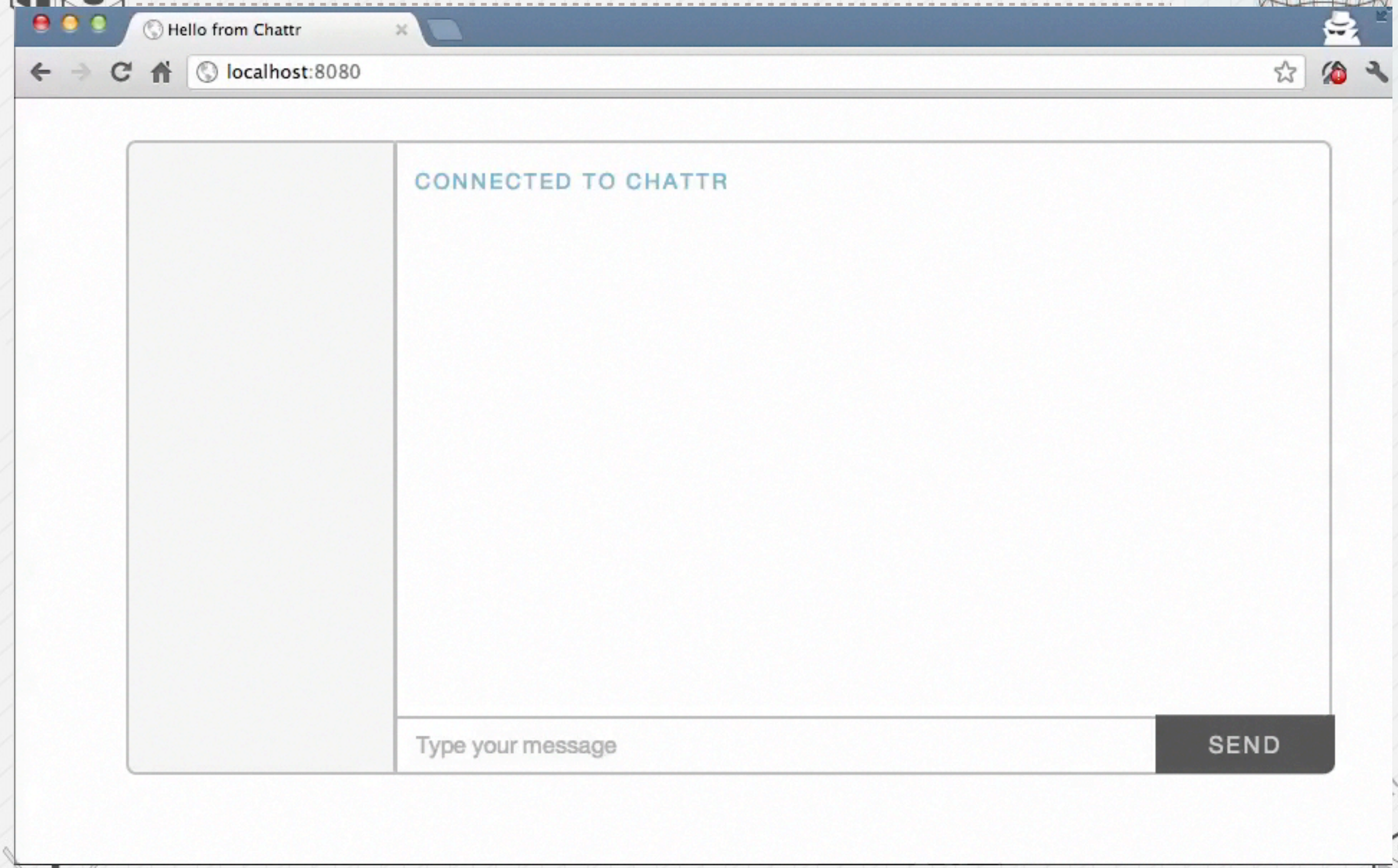
broadcast with the name and message

send the same message back to our client

PERSISTING DATA

- LEVEL SEVEN -

RECENT MESSAGES



RECENT MESSAGES

app.js

```
io.sockets.on('connection', function(client) {
  client.on('join', function(name) {
    client.nickname = name;
    client.broadcast.emit("chat", name + " joined the chat");
  });
  client.on("messages", function(message){
    client.broadcast.emit("messages", client.nickname +
      ": " + message);
    client.emit("messages", client.nickname +
      ": " + message);
  });
});
```

STORING MESSAGES

app.js

```
var messages = [];  store messages in array

var storeMessage = function(name, data){
  messages.push({name: name, data: data}); add message to end of array
  if (messages.length > 10) {
    messages.shift();   if more than 10 messages long,
                          remove the first one
  }
}

io.sockets.on('connection', function(client) {
  client.on("messages", function(message){
    client.broadcast.emit("messages", client.nickname +
      ": " + message);
    client.emit("messages", client.nickname + ": " + message);
    storeMessage(client.nickname, message);
  });                                  when client sends a message
});                                      call storeMessage
```

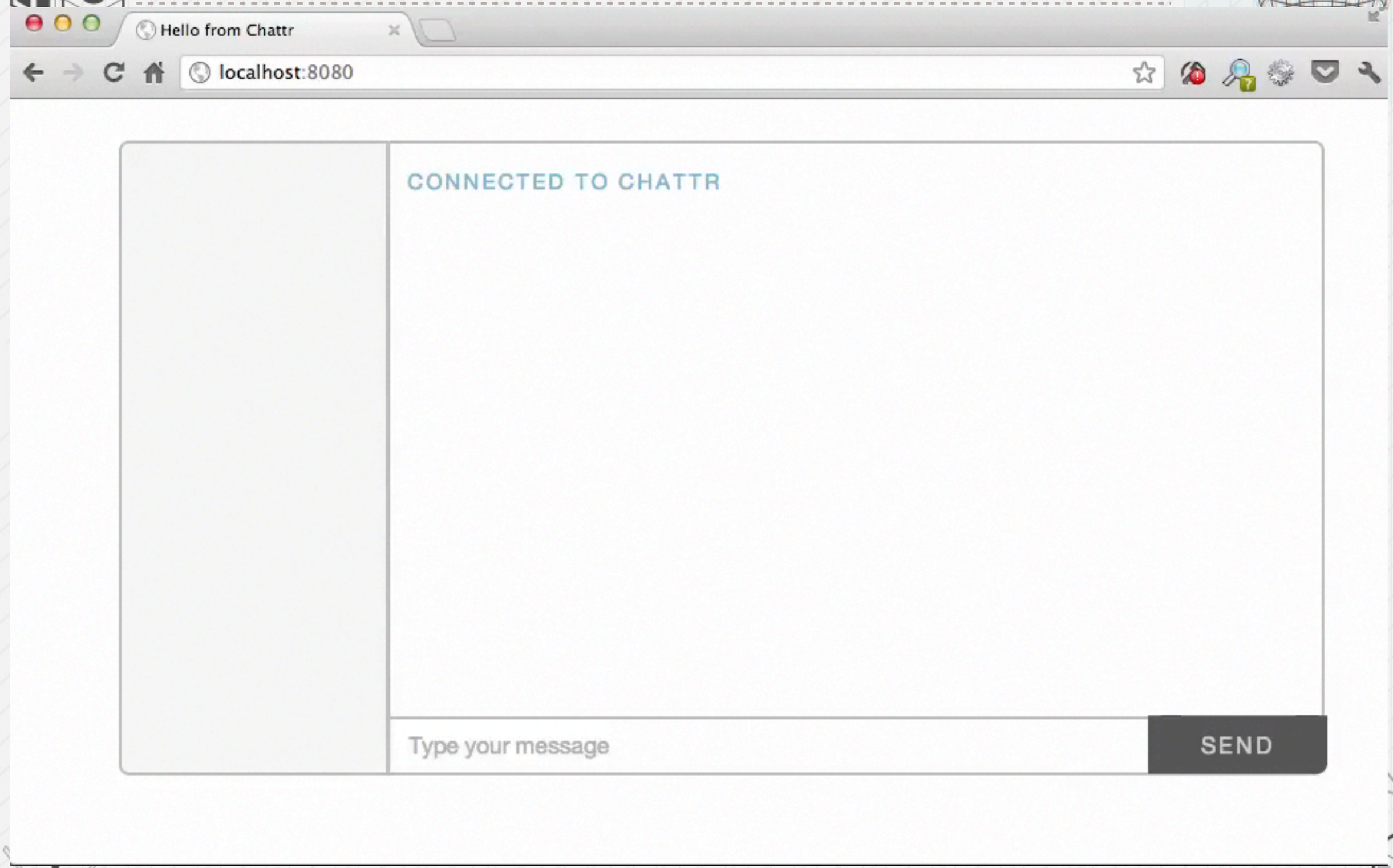
EMITTING MESSAGES

app.js

```
io.sockets.on('connection', function(client) {
  ...
  client.on('join', function(name) {
    messages.forEach(function(message) {
      client.emit("messages", message.name + ": " + message.data);
    });
  });
});
```

iterate through messages array and emit a message on the connecting client for each one

RECENT MESSAGES



PERSISTING STORES

- MongoDB
- CouchDB
- PostgreSQL
- Memcached
- Riak

All non-blocking!

redis

Redis is a key-value store

REDIS DATA STRUCTURES

data structure	*commands*
Strings	*SET, GET, APPEND, DECR, INCR...*
Hashes	*HSET, HGET, HDEL, HGETALL...*
Lists	*LPUSH, LREM, LTRIM, RPOP, LINSERT...*
Sets	*SADD, SREM, SMOVE, SMEMBERS...*
Sorted Sets	*ZADD, ZREM, ZSCORE, ZRANK...*

REDIS COMMAND DOCUMENTATION

Redis

redis.io

redis

Commands Clients Documentation Community Download Issues

Redis is an open source, advanced **key-value store**. It is often referred to as a **data structure server** since keys can contain strings, hashes, lists, sets and sorted sets.

Learn more →

Try it

Ready for a test drive? Check this interactive tutorial that will walk you through the most important features of Redis.

Download it

Redis 2.4.13 is the latest stable version. Interested in release candidates or unstable versions? Check the downloads page.

What people are saying

Facebook Sets I.P.O. Price Range http://t.co/7qTOhWMx

@tinkertim No more spaces screwing my Redis commands. Pretty major to me ;-)

#RedMango #coupon? Get a $2 OFF one @coupons.com. Just enter your ZIP code in the upper left! US only. http://t.co/P0i9nvUh

redis (@DIRTYBIITCH

NODE REDIS

This repository | Search or type a command | Explore | Gist | Blog | Help | TJkrusinski

mranney / node_redis

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redis client for node

509 commits | 3 branches | 36 releases | 63 contributors

branch: master | node_redis /

If there's an error in SELECT and there's no callback, emit the error.

bengl authored 12 days ago | latest commit 4672479b91

benches	rename tests to benches for clarity	2 years ago
examples	EVAL: allow parameters as an array. Close #368.	a year ago
lib	Regenerate commands.js to match redis 2.8.0. Adds support for 'config…	3 months ago
.gitignore	Issue #439 (and others): Stop assuming all "message" or "pmessage" re…	5 months ago
README.md	README for unix domain socket connection.	5 months ago
changelog.md	Update changelog for 0.10.1	13 days ago
diff_multi_bench_output.js	Adding percentage outputs to diff_multi_bench_output.js	a year ago
generate_commands.js	node 0.6 fixes	2 years ago
index.js	If there's an error in SELECT and there's no callback, emit the error.	12 days ago

Code
Issues 136
Pull Requests 35
Wiki
Pulse
Graphs
Network

SSH clone URL
git@github.com:mran

You can clone with HTTPS, SSH, or Subversion.

Clone in Desktop
Download ZIP

REDIS

```
$ npm install redis --save
```

```
var redis = require('redis');
var client = redis.createClient();

client.set("message1", "hello, yes this is dog");
client.set("message2", "hello, no this is spider");
```

key

value

```
client.get("message1", function(err, reply){
  console.log(reply); ----> "hello, yes this is dog"
});
```

commands are non-blocking

REDIS LISTS: PUSHING

Add a string to the "messages" list

```
var message = "Hello, this is dog";
client.lpush("messages", message, function(err, reply){
  console.log(reply);
});
```

→ "1" *replies with list length*

Add another string to "messages"

```
var message = "Hello, no this is spider";
client.lpush("messages", message, function(err, reply){
  console.log(reply);
});
```

→ "2"

REDIS LISTS: RETRIEVING

Using LPUSH & LTRIM

```
var message = "Hello, this is dog";
client.lpush("messages", message, function(err, reply){
  client.ltrim("messages", 0, 1);
});
```

trim keeps first two strings and removes the rest

Retrieving from list

```
client.lrange("messages", 0, -1, function(err, messages){
  console.log(messages);
})
```

replies with all strings in list

```
["Hello, no this is spider", "Oh sorry, wrong number"]
```

CONVERTING MESSAGES TO REDIS

app.js

```
var storeMessage = function(name, data){
  messages.push({name: name, data: data});

  if (messages.length > 10) {
    messages.shift();
  }
}
```

Let's use the List data-structure

CONVERTING STOREMESSAGE

app.js

```
var redisClient = redis.createClient();

var storeMessage = function(name, data){
  var message = JSON.stringify({name: name, data: data});

  redisClient.lpush("messages", message, function(err, response) {
    redisClient.ltrim("messages", 0, 9);
  });
}
```

need to turn object into string to store in redis

keeps newest 10 items

OUTPUT FROM LIST

app.js

```
client.on('join', function(name) {
  messages.forEach(function(message) {
    client.emit("messages", message.name + ": " + message.data);
  });
});
```

OUTPUT FROM LIST

app.js

```
client.on('join', function(name) {
  redisClient.lrange("messages", 0, -1, function(err, messages){
    messages = messages.reverse();
```

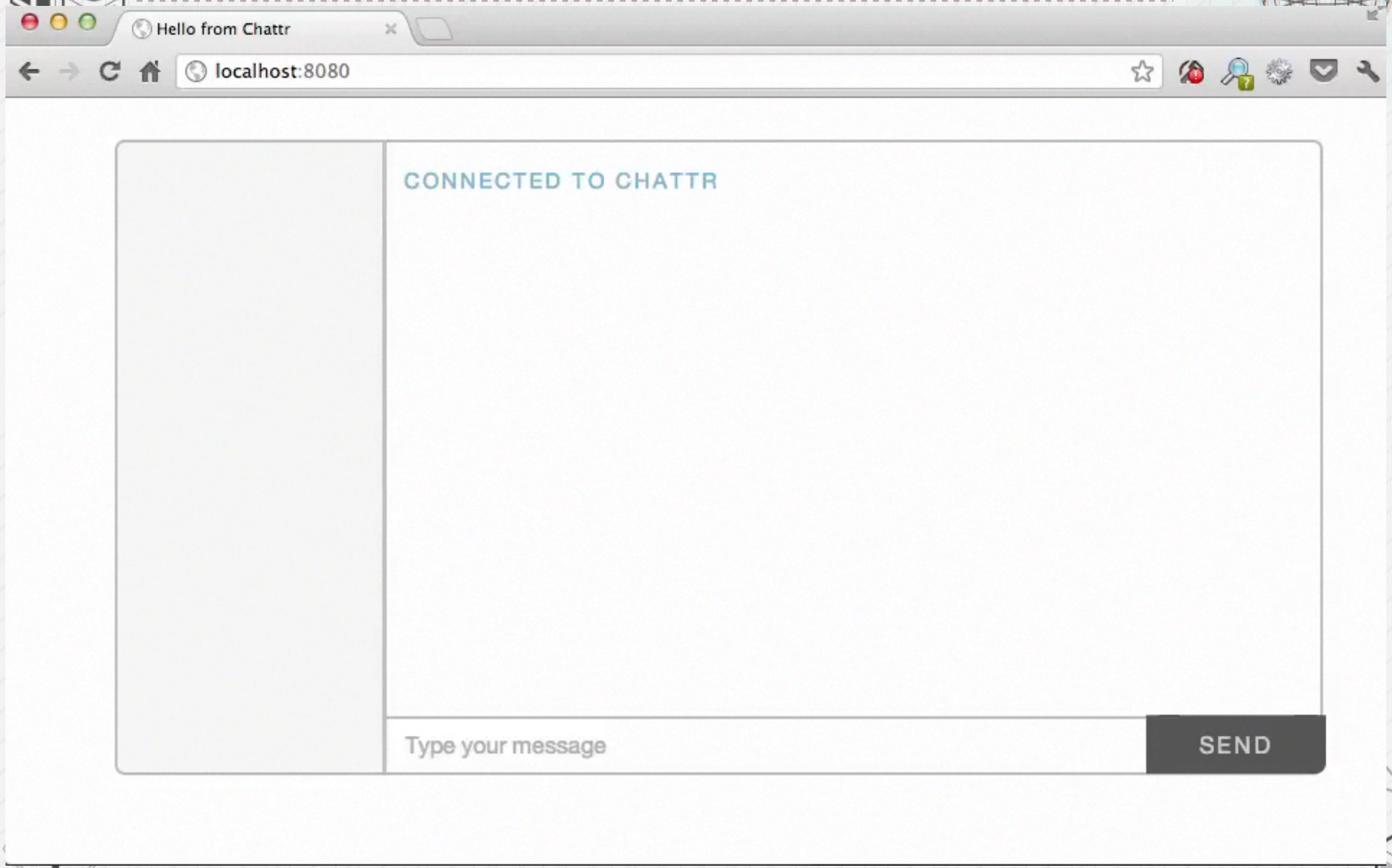
reverse so they are emitted in correct order

```
    messages.forEach(function(message) {
      message = JSON.parse(message);
```

parse into JSON object

```
      client.emit("messages", message.name + ": " + message.data);
    });
  });
});
```

IN ACTION


Hello from Chattr
localhost:8080
CONNECTED TO CHATTR
Type your message
SEND

CURRENT CHATTER LIST

Sets are lists of unique data

DOG

SPIDER

GREGG

add & remove members of the names set

```
client.sadd("names", "Dog");
client.sadd("names", "Spider");
client.sadd("names", "Gregg");
```

```
client.srem("names", "Spider");
```

reply with all members of set

```
client.smembers("names", function(err, names){
  console.log(names);
});
```

```
["Dog", "Gregg"]
```

ADDING CHATTERS

app.js

```
client.on('join', function(name){

  notify other clients a chatter has joined
  client.broadcast.emit("add chatter", name);

  redisClient.sadd("chatters", name);
});          add name to chatters set
```

index.html

```
socket.on('add chatter', function(name) {
  var chatter = $('<li>'+name+'</li>').data('name', name);
  $('#chatters').append(chatter);
});
```

ADDING CHATTERS (CONT)

app.js

```
client.on('join', function(name){
  client.broadcast.emit("add chatter", name);

  redisClient.smembers('names', function(err, names) {
    names.forEach(function(name){
      client.emit('add chatter', name);
    });
  });

  redisClient.sadd("chatters", name);
});
```

emit all the currently logged in chatters to the newly connected client

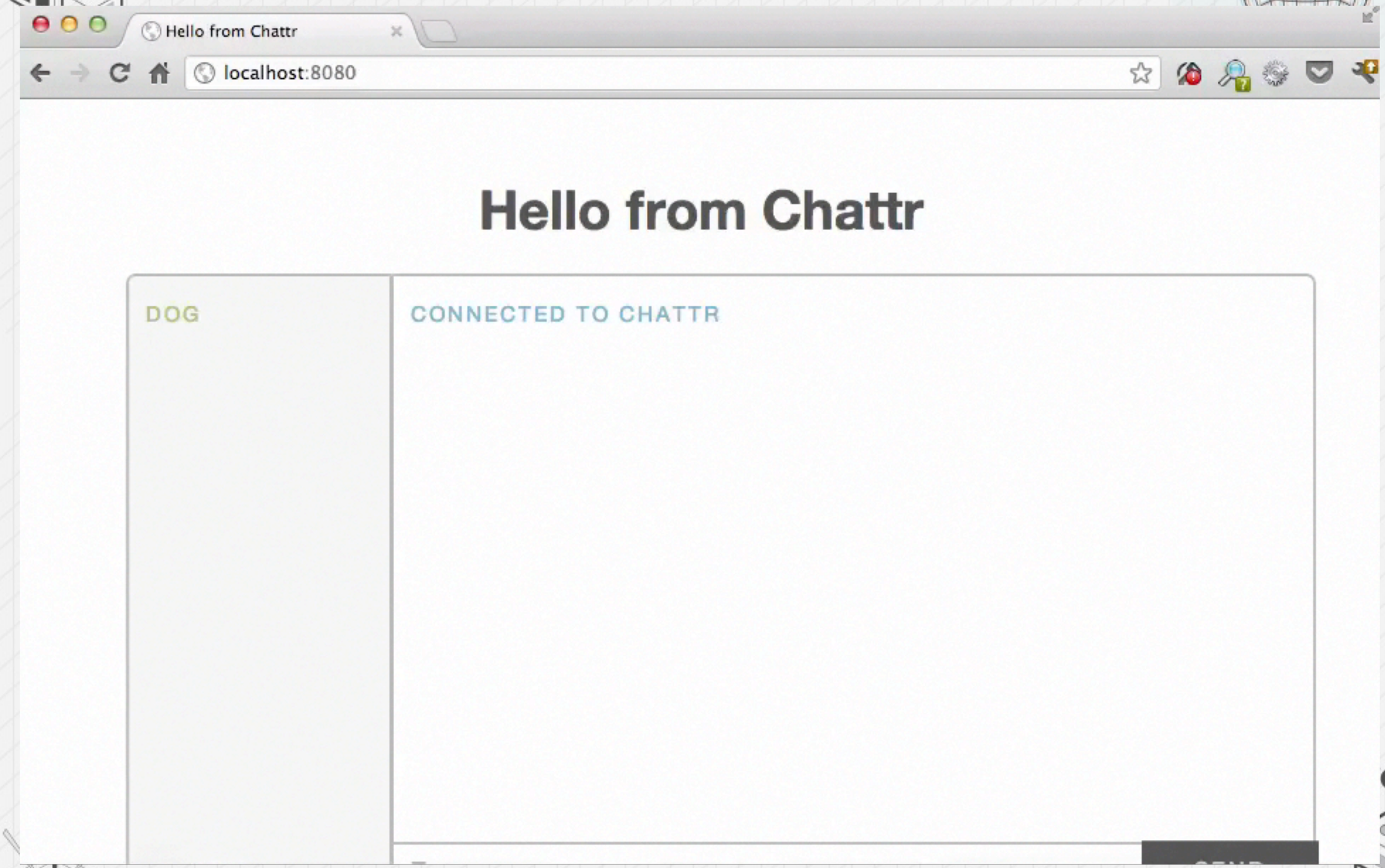
REMOVING CHATTERS

remove chatter when they disconnect from server

app.js

```
client.on('disconnect', function(name){
  client.broadcast.emit("remove chatter", client.nickname);
  redisClient.srem("chatters", client.nickname;);
});
```

index.html

```
server.on('remove chatter', function(name) {
  $('#chatters li[data-name='+ name + ']').remove();
});
```

WELCOME TO CHATTR