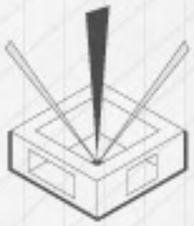
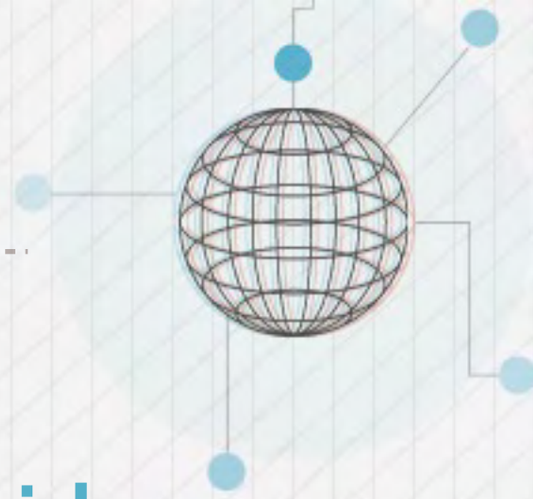
# INTRO TO NODE.JS

## - LEVEL ONE -



# WHAT IS NODE.JS?

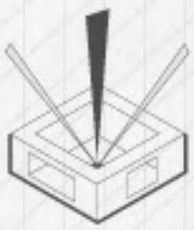


Allows you to build scalable network applications using JavaScript on the server-side.

Node.js

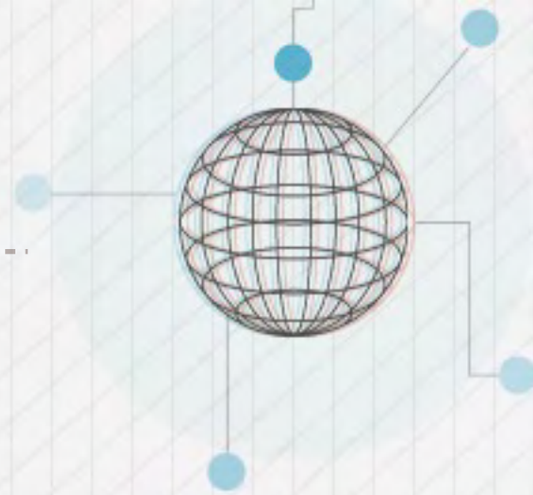
V8 JavaScript Runtime

*It's fast because it's mostly C code*

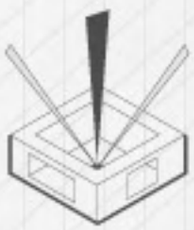




# WHAT COULD YOU BUILD?

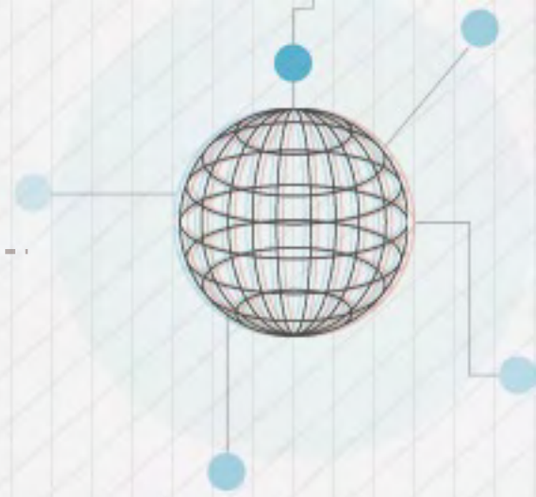


- Websocket Server *Like a chat server*
- Fast File Upload Client
- Ad Server
- Any Real-Time Data Apps



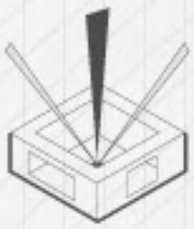


# WHAT IS NODE.JS NOT?



- 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

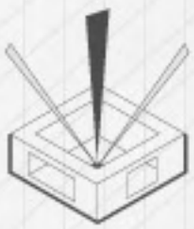
- Blocking Code

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

- Non-Blocking Code

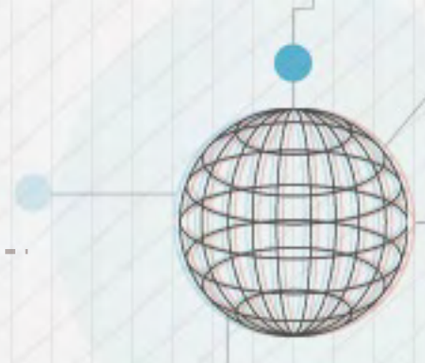
```
Read file from Filesystem
  whenever you’re complete, print the contents
Do Something else
```

*This is a “Callback”*





# BLOCKING VS NON-BLOCKING



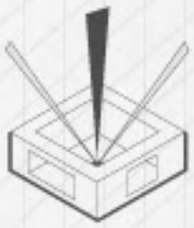
- Blocking Code

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

Stop process until complete

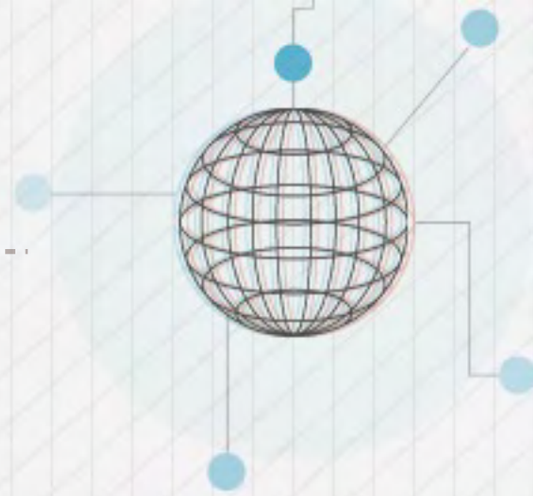
- Non-Blocking Code

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





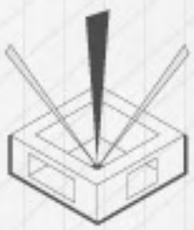
# CALLBACK ALTERNATE SYNTAX



```
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);
```

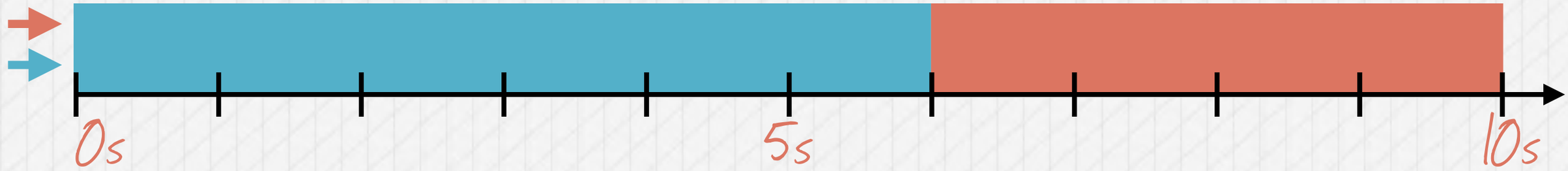




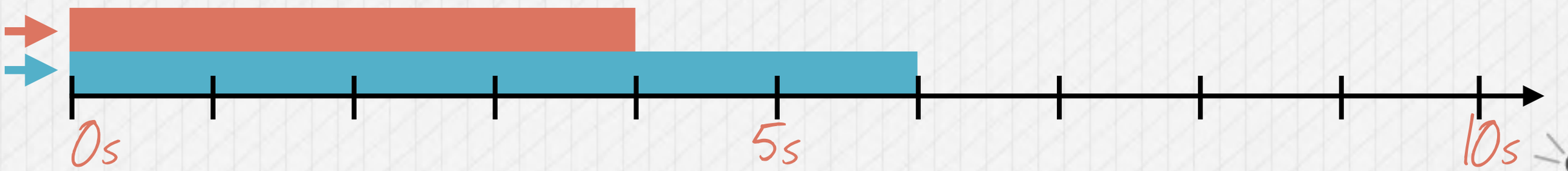
# BLOCKING VS NON-BLOCKING

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

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

blocking




non-blocking



# NODE.JS HELLO DOG

## hello.js

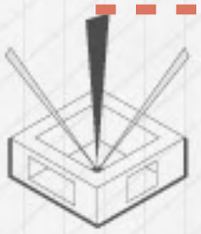
```
var http = require('http');  How we require modules

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
```

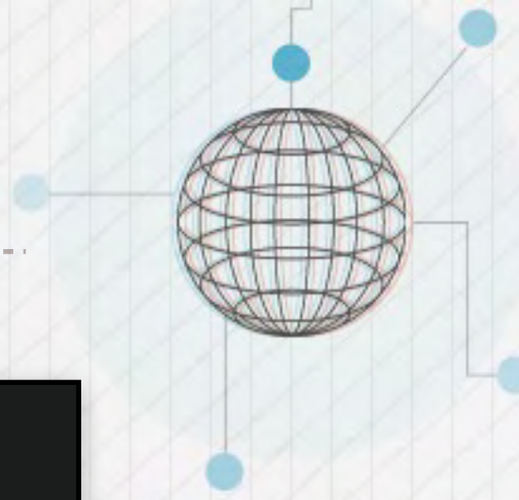
----> Listening on port 8080...

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

----> Hello, this is dog.



# THE EVENT LOOP



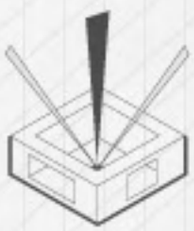
```
var http = require('http');
http.createServer(function(request, response) {
  ...
}).listen(8080, function(){
  console.log('Listening on port 8080...');
});
```

Starts the Event Loop when finished

Run the Callback


Known Events

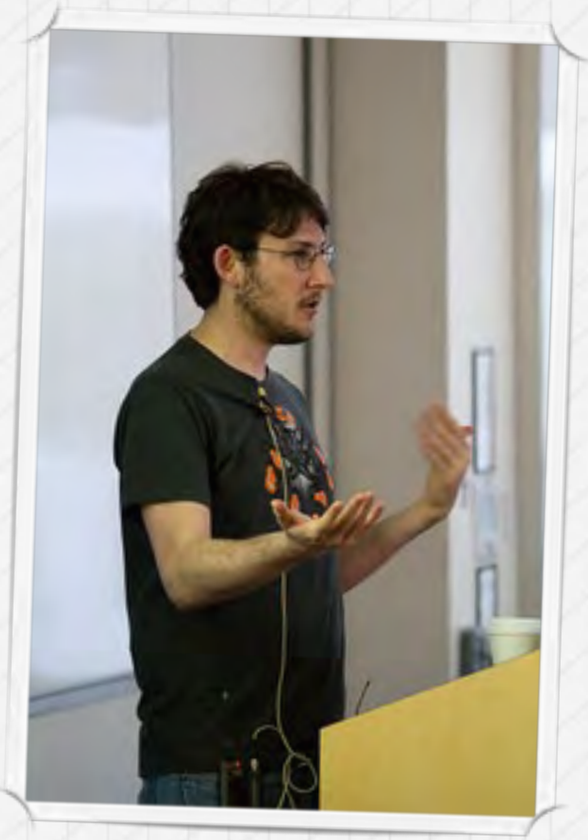
request



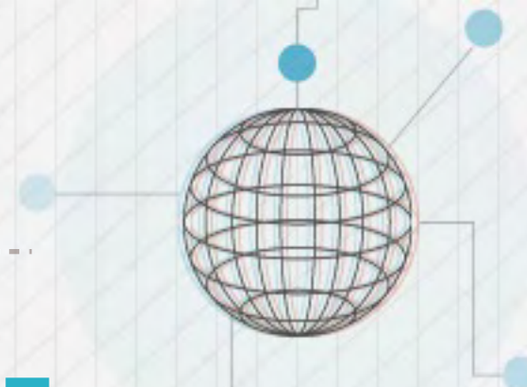
# WHY JAVASCRIPT?

"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



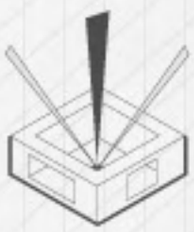
## Event Queue

- close
- request


## Known Events

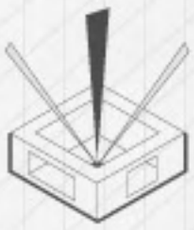
- request
- connection
- close

*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(){    Represent long running process
    response.write("Dog is done.");
    response.end();
  }, 5000);  5000ms = 5 seconds
}).listen(8080);
```



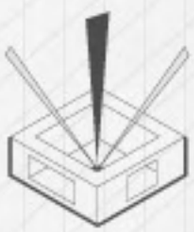


# TWO CALLBACKS HERE

```
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

- Request comes in, triggers request event
  - Request Callback executes
    - setTimeout registered
      - Request comes in, triggers request event
        - Request Callback executes
        - setTimeout registered
      - triggers setTimeout event
      - setTimeout Callback executes
      - triggers setTimeout event
      - setTimeout Callback

request

timeout

0s

5s

10s

# WITH BLOCKING TIMELINE

Request comes in, triggers request event

Request Callback executes

setTimeout executed

Request comes in, waits for server

triggers setTimeout event

setTimeout Callback executed

Request comes in

Request Callback executes

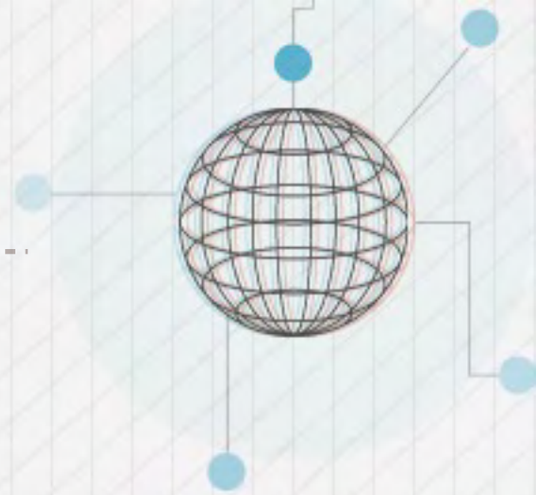
Wasted Time

0s

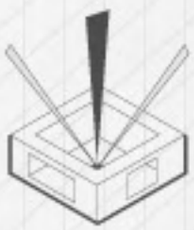
5s

10s

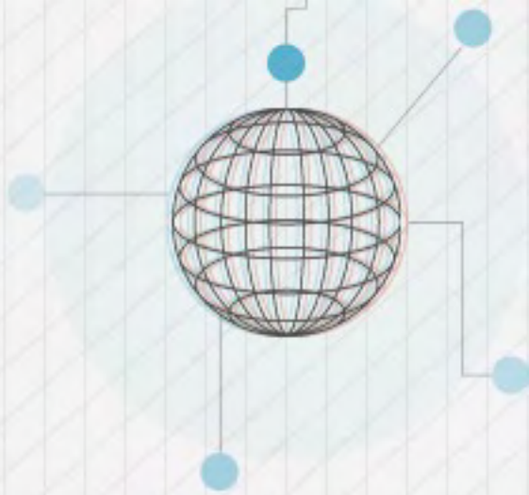
# TYPICAL BLOCKING THINGS



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

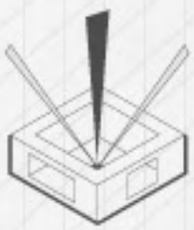






# EVENTS

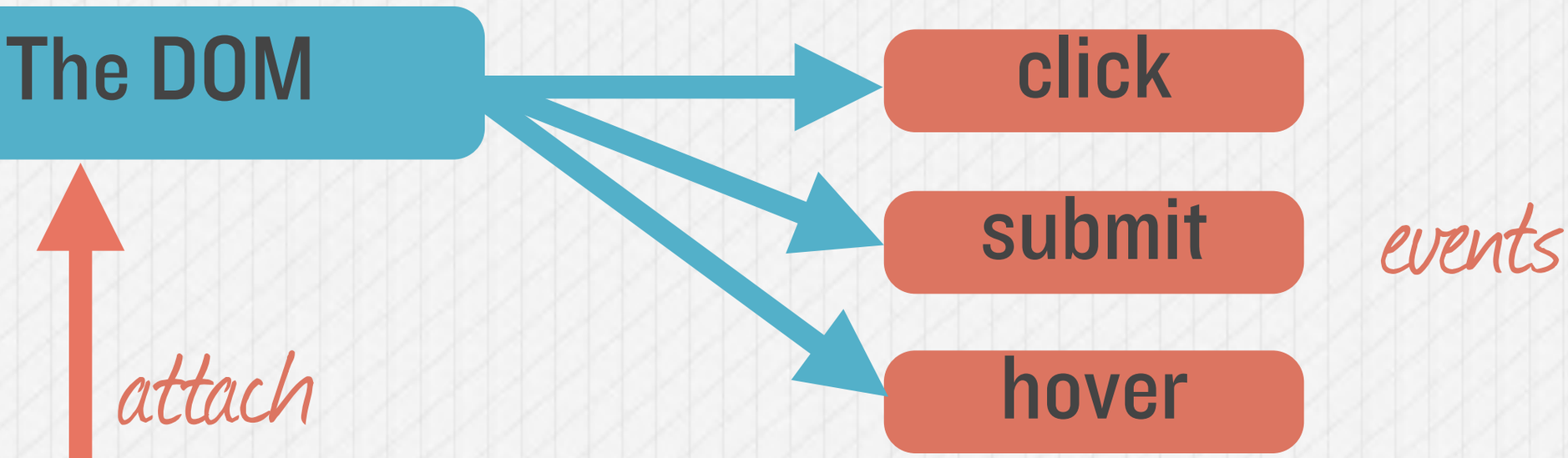
## - LEVEL TWO -



# EVENTS IN THE DOM

*The DOM triggers Events*

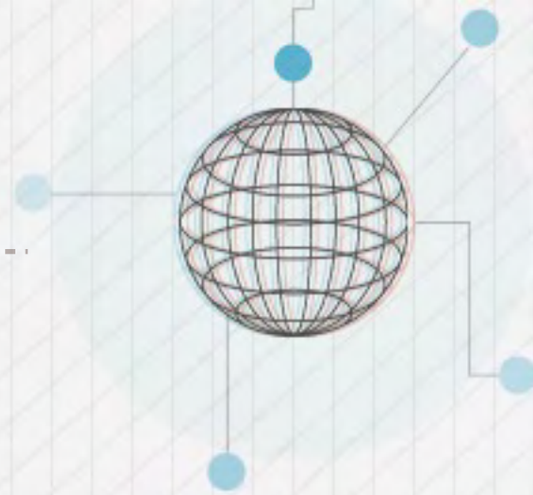
*you can listen for those events*



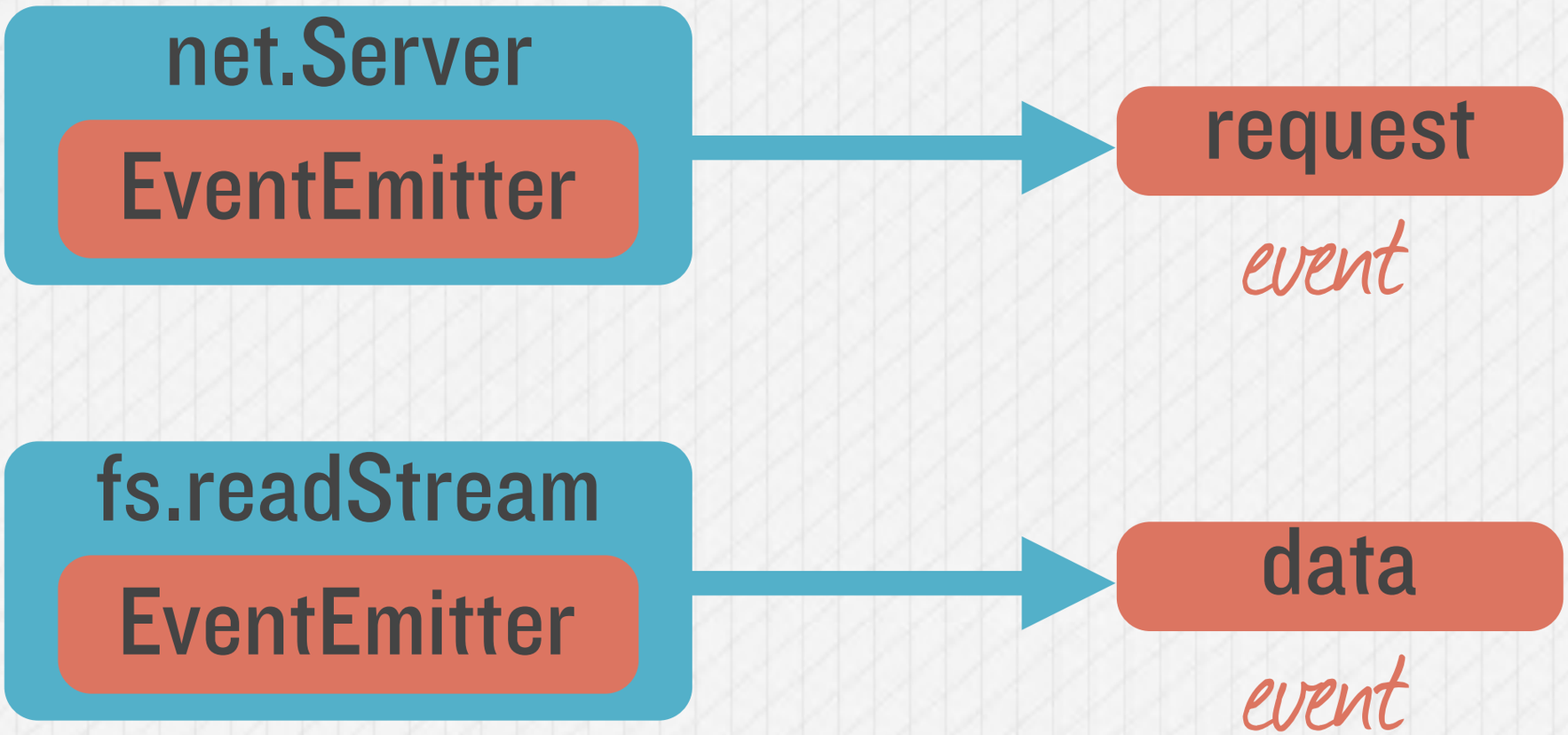

```
$("p").on("click", function(){ ... });
```

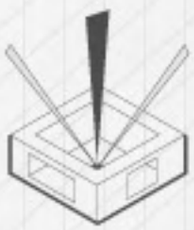
When ‘click’ event is triggered

# EVENTS IN NODE



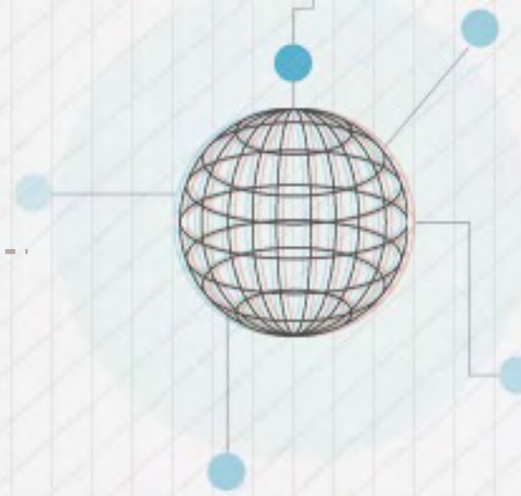
*Many objects in Node emit events*





# 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);
});
```

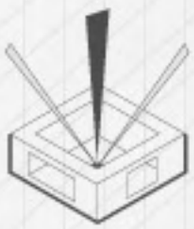
listen for error event

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

-> ERR: Spilled Milk

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

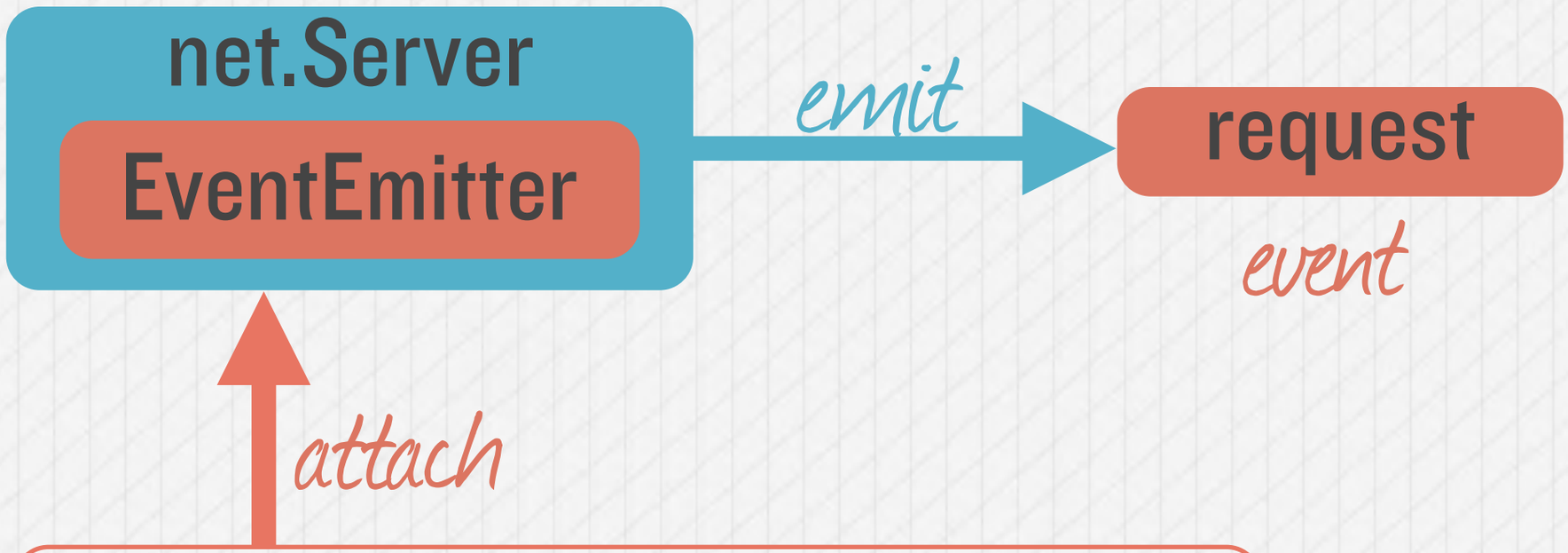
-> ERR: Eggs Cracked





# EVENTS IN NODE

*Many objects in Node emit events*




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

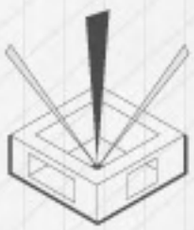
When ‘request’ event is emitted

# HTTP ECHO SERVER

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

But what is really going on here?

http://nodejs.org/api/



EVENTS

# 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.

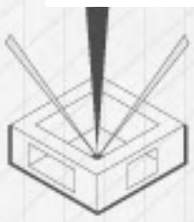
## Class: http.Server

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){ ... });
```

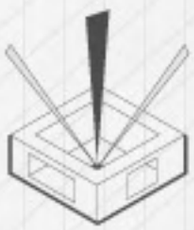
*This is how we add event listeners*

**Event: 'close'**

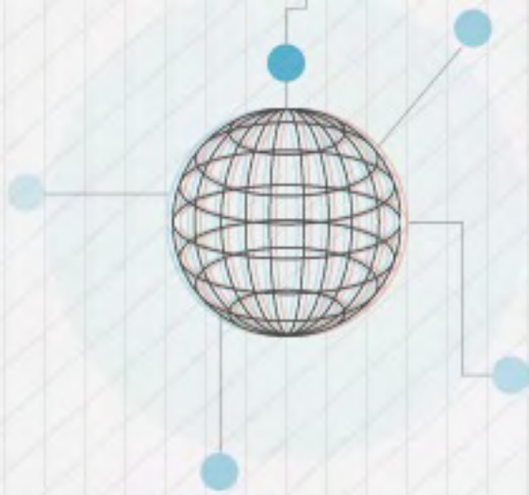
```
function () { }
```

Emitted when the server closes.

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

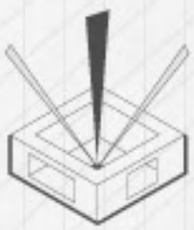




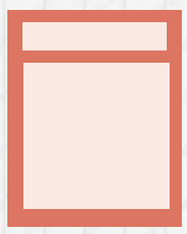


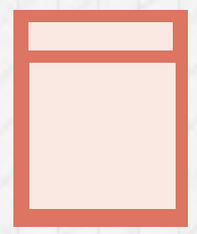
# STREAMS

## - LEVEL THREE -



# WHAT ARE STREAMS?

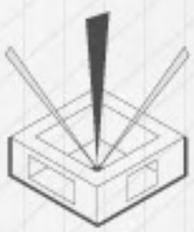




Start Processing Immediately

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*

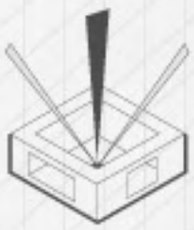
```
http.createServer(function(request, response) {
  response.writeHead(200);
  response.write("<p>Dog is running.</p>");
  setTimeout(function(){
    response.write("<p>Dog is done.</p>");
    response.end();
  }, 5000);
}).listen(8080);
```

*Our browser receives*

"Dog is running."

(5 seconds later)

"Dog is done."



STREAMS

# HOW TO READ FROM THE REQUEST?

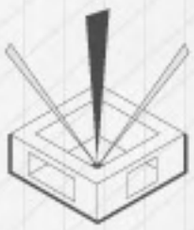

Let's print what we receive from the request.

```
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)
```

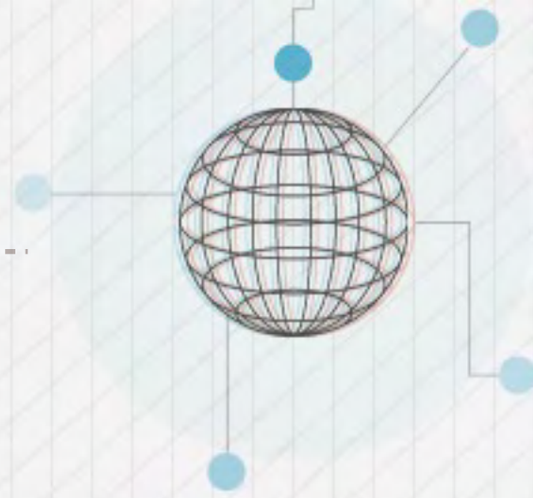
# HOW TO READ FROM THE REQUEST?

```
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!



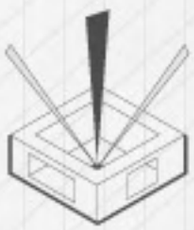
```
http.createServer(function(request, response) {
  response.writeHead(200);
  request.pipe(response);
}).listen(8080)
```

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

----> Hello *on client*

*Kinda like on the command line*

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



STREAMS

# 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 arg
operation was completed successfully, then the first argumen

When using the synchronous form any exceptions are imme
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 API

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

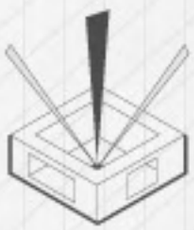
# READING AND WRITING A FILE

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

file.pipe(newFile);
```

*require filesystem module*

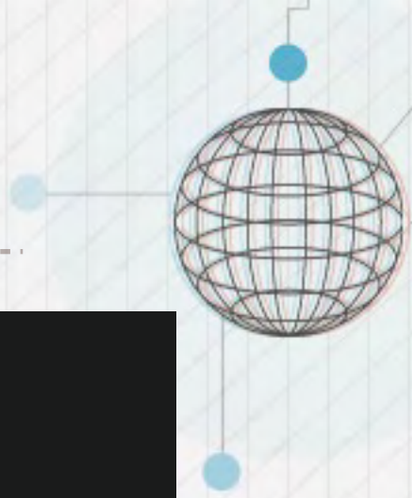

**http://gulpjs.com/**

*Build system built on top of Streams*



STREAMS

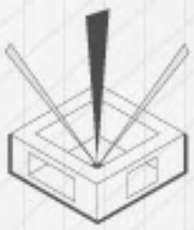
# UPLOAD A FILE



```
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!



STREAMS

# THE AWESOME STREAMING

server

client

storage

original file

transferred file

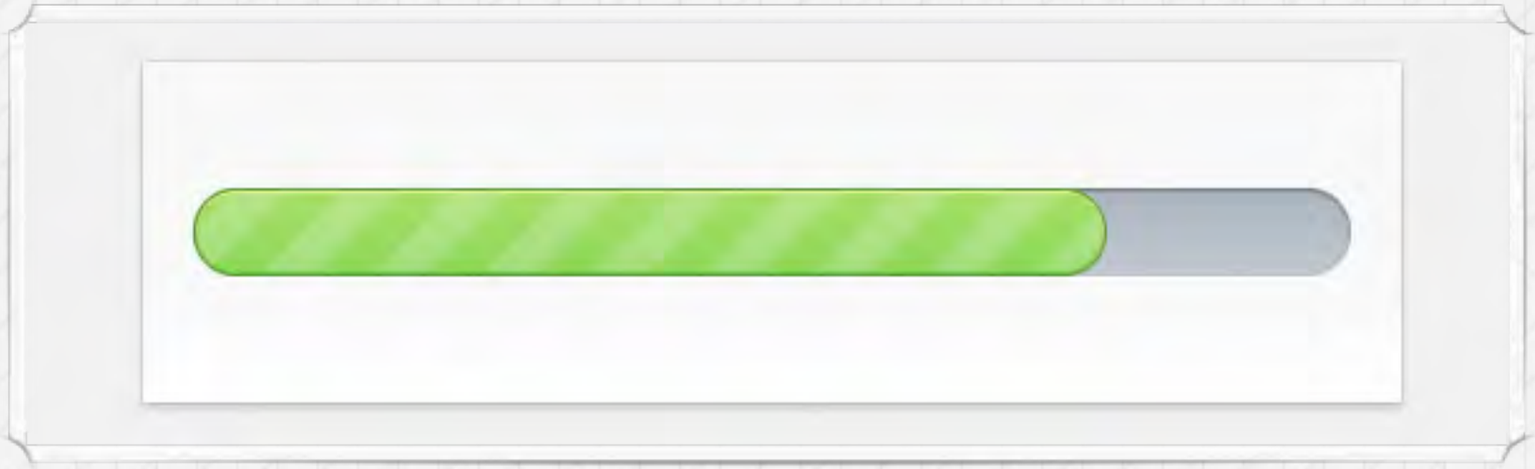
non-blocking

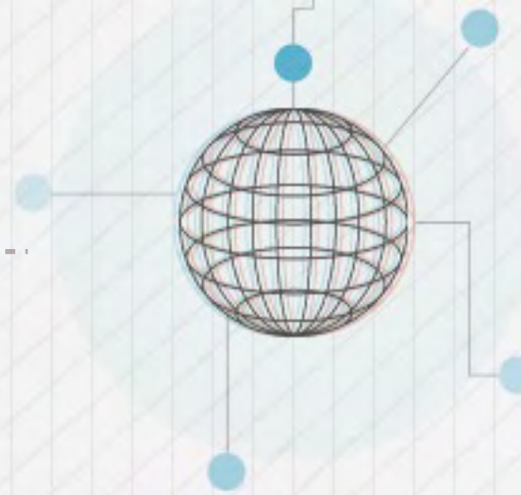
0s

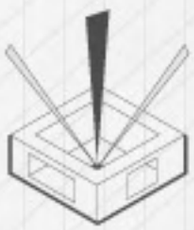
5s

10s

# FILE UPLOADING PROGRESS

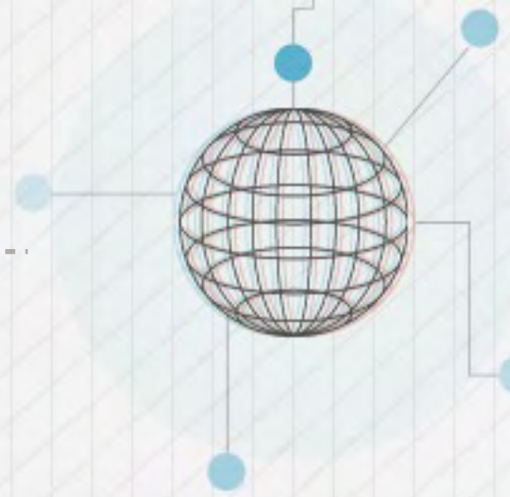






STREAMS

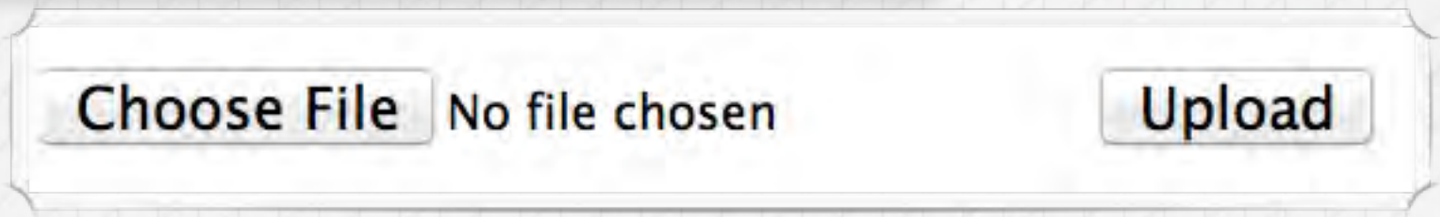
# FILE UPLOADING PROGRESS



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

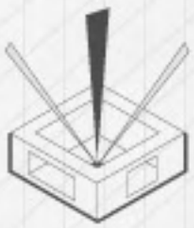
*Outputs:*

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



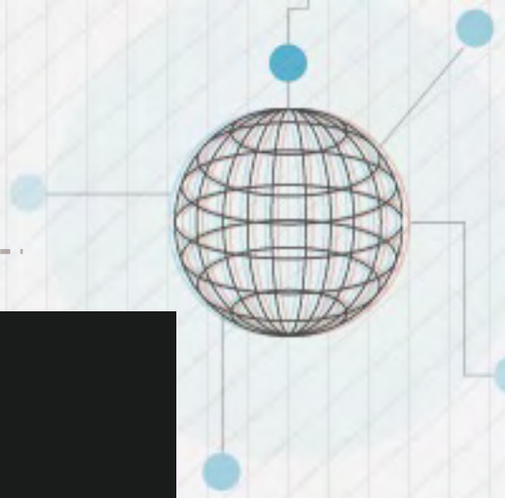

*We're going to need:*

- HTTP Server
- File System

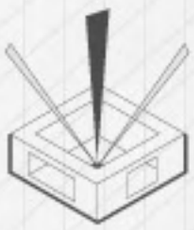


STREAMS

# REMEMBER THIS CODE?

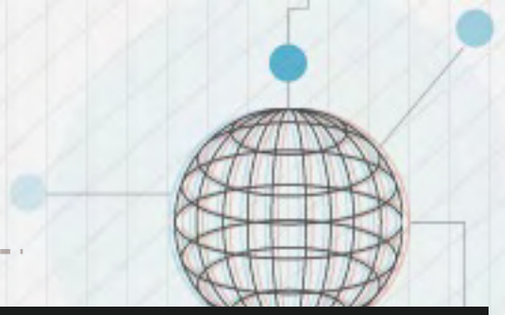


```
var fs = require('fs');
var http = require('http');

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

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



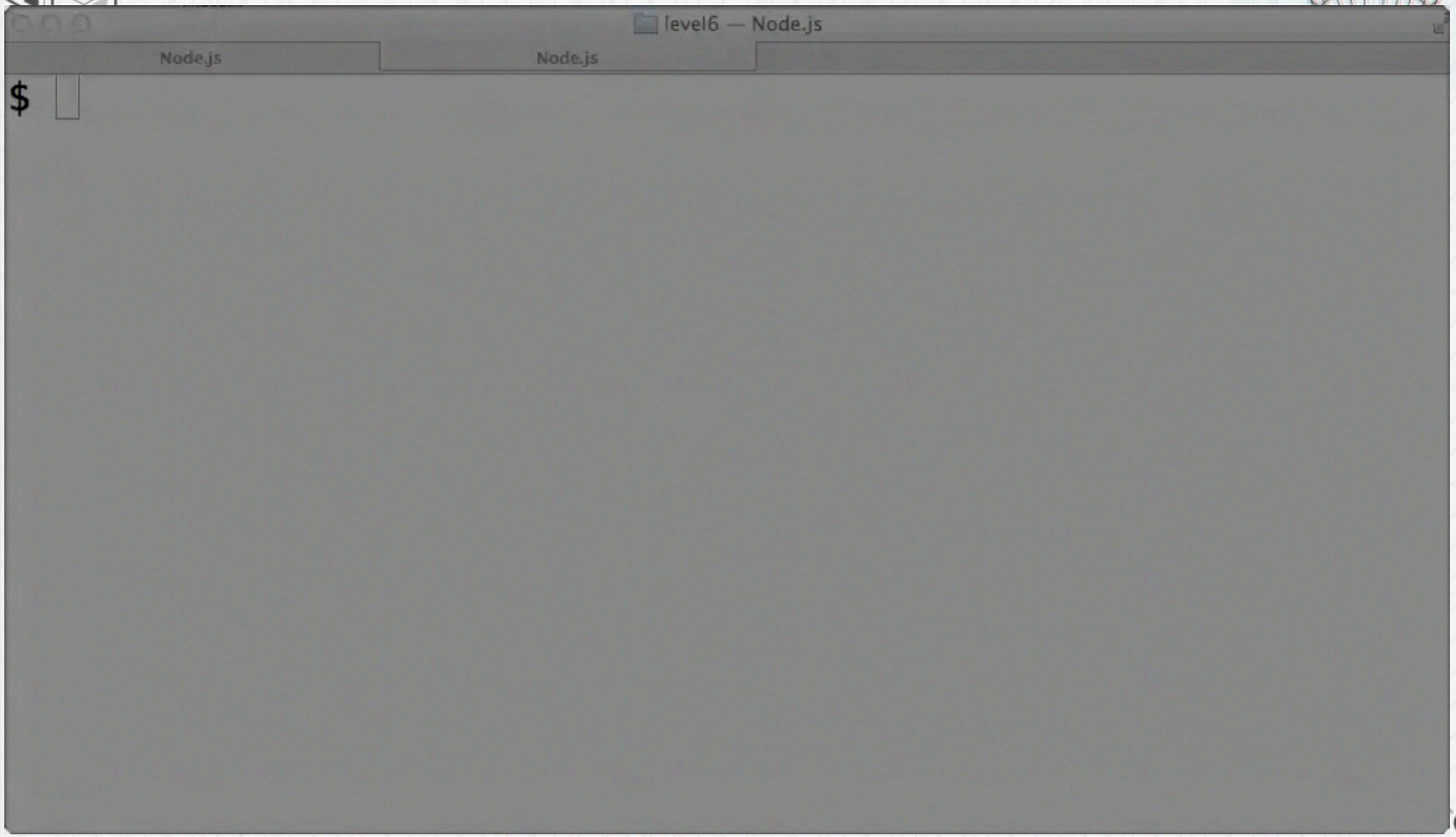
STREAMS

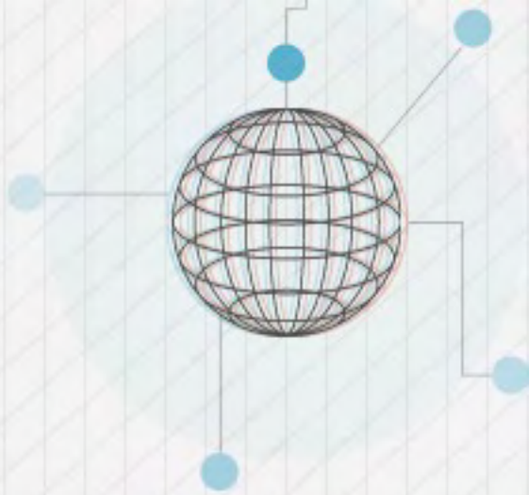
# REMEMBER THIS CODE?



```
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);
```

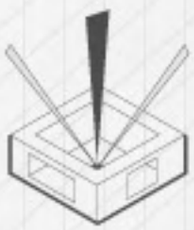
# SHOWING PROGRESS



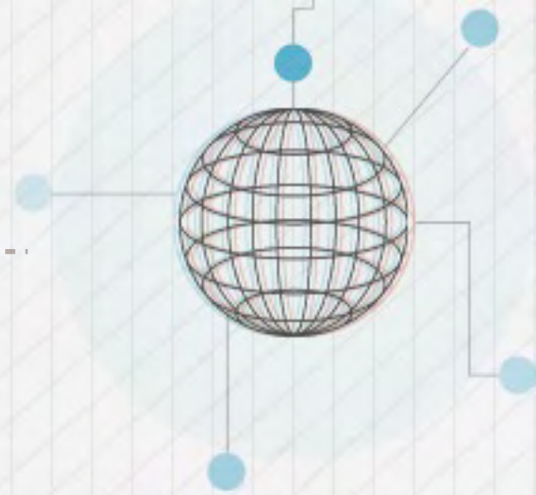


# MODULES

## - LEVEL FOUR -



# REQUIRING MODULES



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

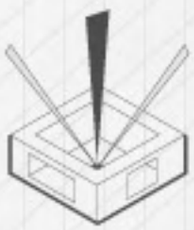
--------> http.js

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

--------> fs.js

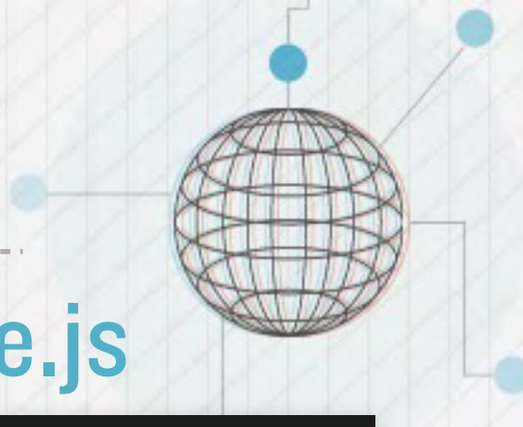
How does ‘require’ return the libraries?

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();
```

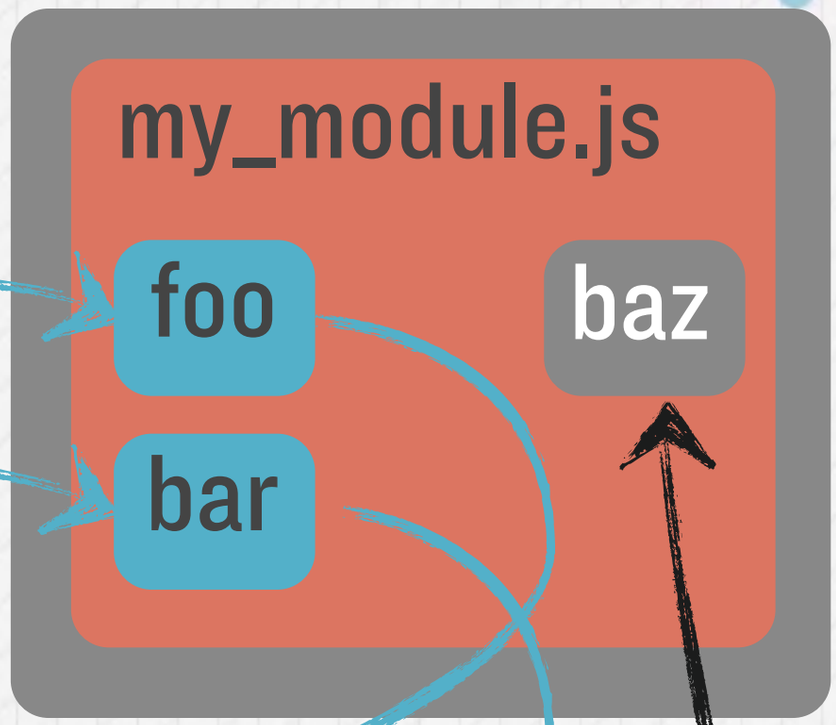
*If we only need to call once*



# EXPORT MULTIPLE FUNCTIONS

## my_module.js

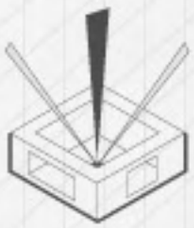
```
var foo = function() { ... }
var bar = function() { ... }
var baz = function() { ... }

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




## app.js

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

"private"





# MAKING HTTP REQUESTS

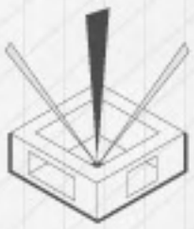
app.js

```
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);
  });
});
request.write(message);
request.end();
```

logs response body

begins request

finishes request



MODULES

# 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

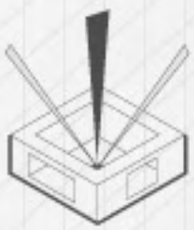
make_request.js

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

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

module.exports = makeRequest;
```

app.js

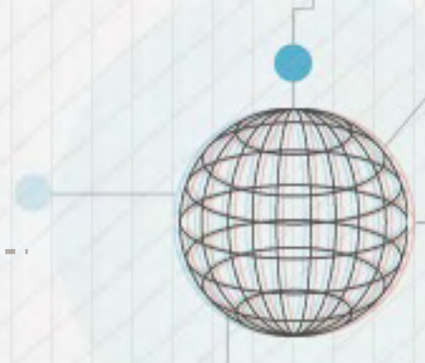
```
var makeRequest = require('./make_request');

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

## Where does require look for modules?



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

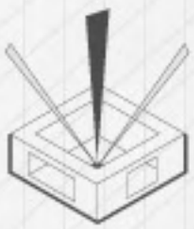
look in parent directory

## /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



MODULES

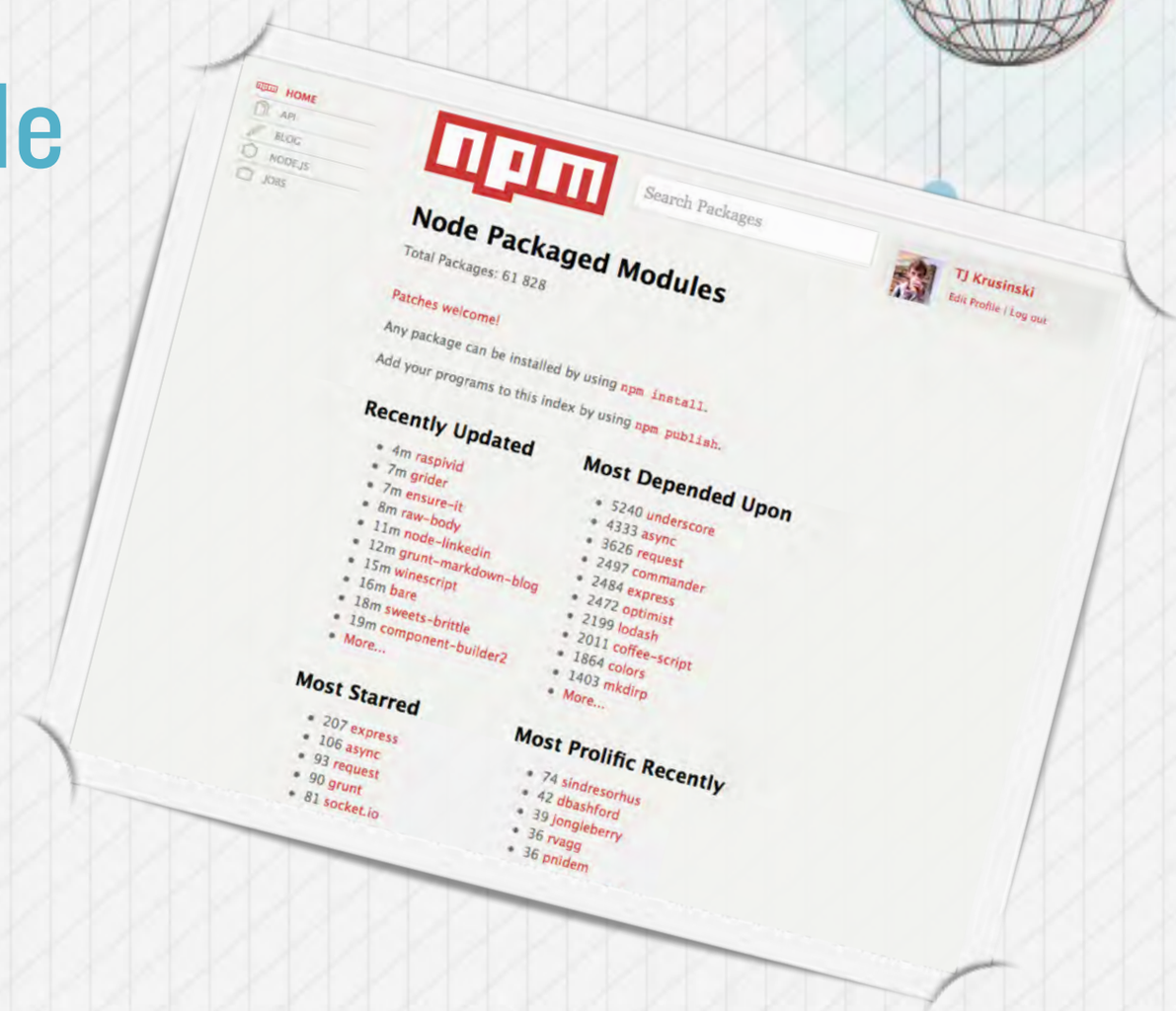
However, all packages are directories

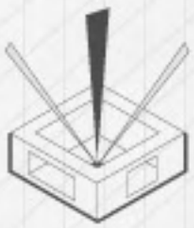
# NPM: THE USERLAND SEA

## Package manager for node

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

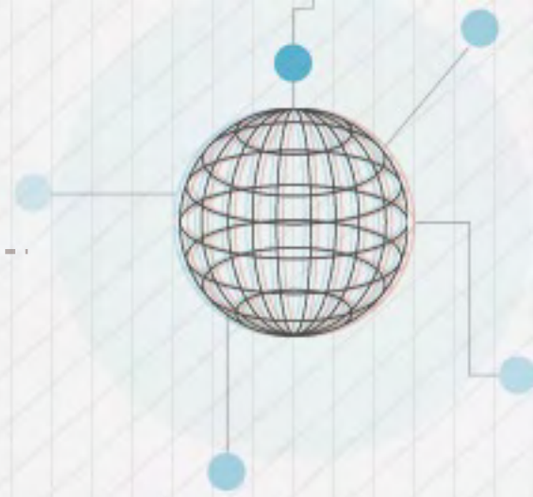
http://npmjs.org



MODULES

# INSTALLING A NPM MODULE



## In /Home/my_app

```
$ npm install request
```

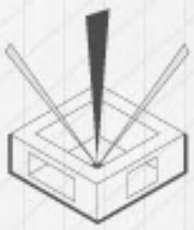
## Installs into local node_modules directory

Home / my_app / node_modules / reques

## In /Home/my_app/app.js

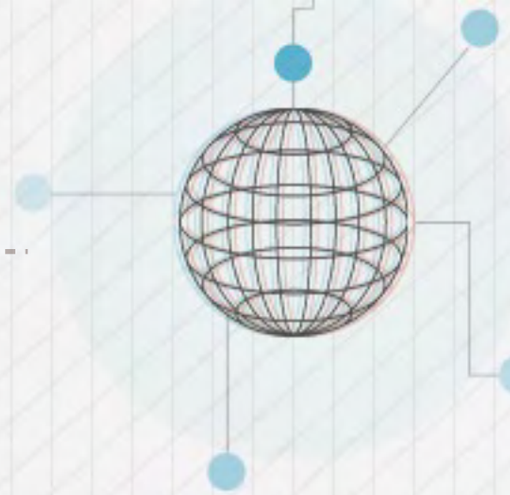
```
var request = require('request');
```

## Loads from local node_modules directory





# LOCAL VS GLOBAL



## Install modules with executables globally

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

*global*

```
$ coffee app.coffee
```

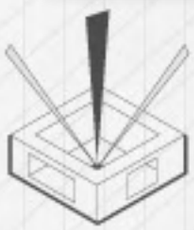
## Global npm modules can't be required

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

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

*Install them locally*

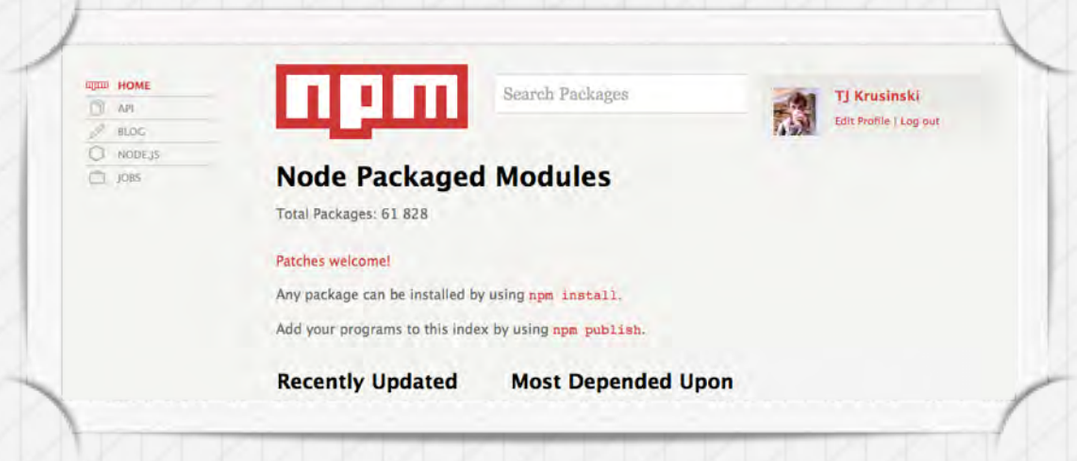
```
var coffee = require('coffee-script');
```





# FINDING MODULES

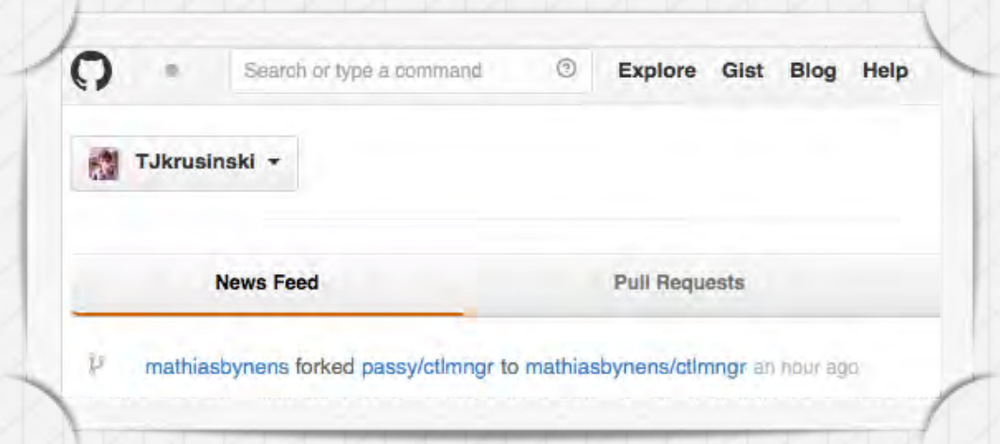
## npm registry



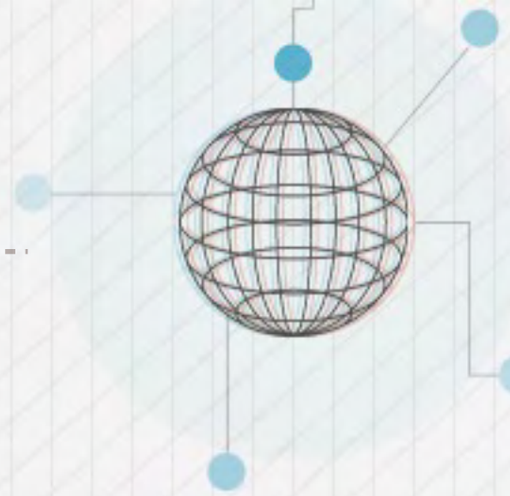

## npm command line

```
$ npm search request
```

## github search



# DEFINING YOUR DEPENDENCIES



## my_app/package.json

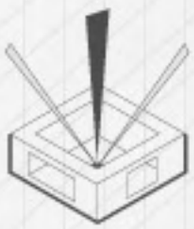
```
{
  "name": "My App",
  "version": "1",
  "dependencies": {
    "connect": "1.8.7"
  }
}
```

version number

```
$ npm install
```

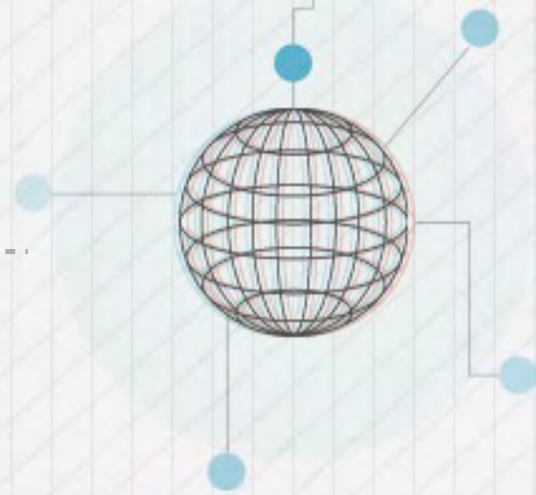
## Installs into the node_modules directory

my_app / node_modules / connect





# DEPENDENCIES



## my_app/package.json

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

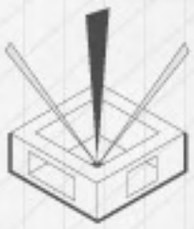
## Installs sub-dependencies

my_app / node_modules / connect

connect / node_modules / qs

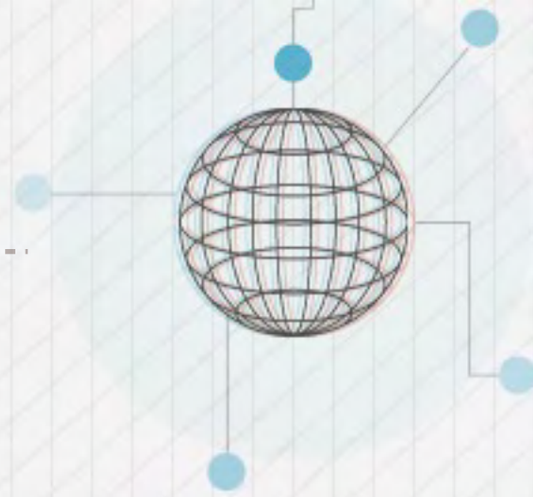
connect / node_modules / mime

connect / node_modules / formidable



MODULES

# SEMANTIC VERSIONING



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

Major Minor Patch

1 . 8 . 7

## Ranges

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

--> `>=1.0.0 <2.0.0` Dangerous

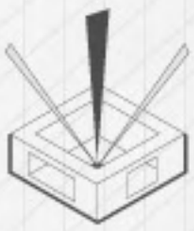
```
"connect": "~1.8"
```

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

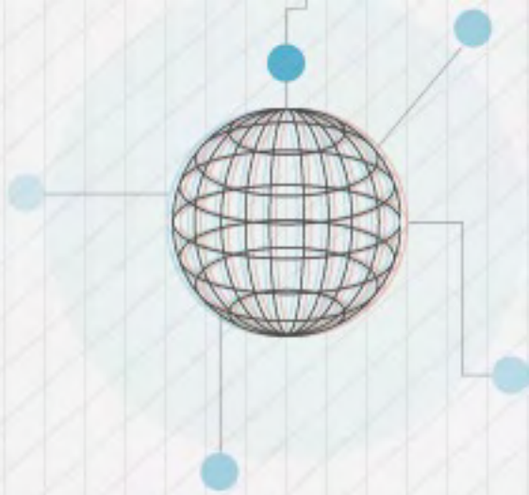
```
"connect": "~1.8.7"
```

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

**http://semver.org/**

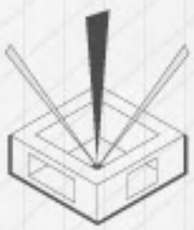




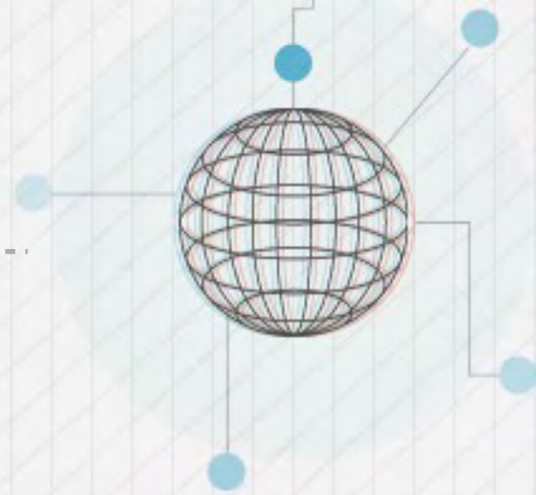


# EXPRESS

## - LEVEL FIVE -

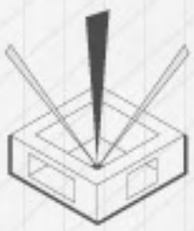


# EXPRESS



"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();
```

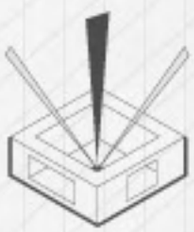
root route

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

current directory

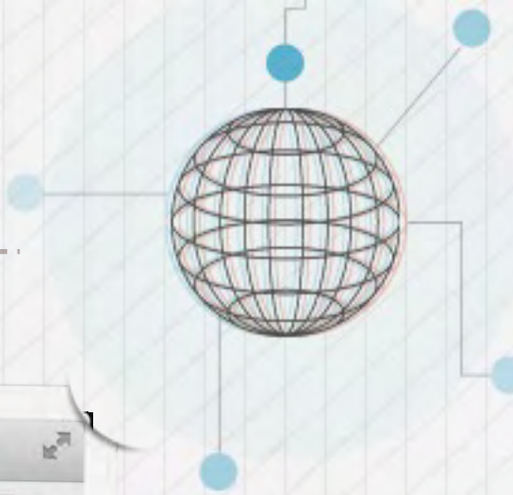
```
app.listen(8080);
```

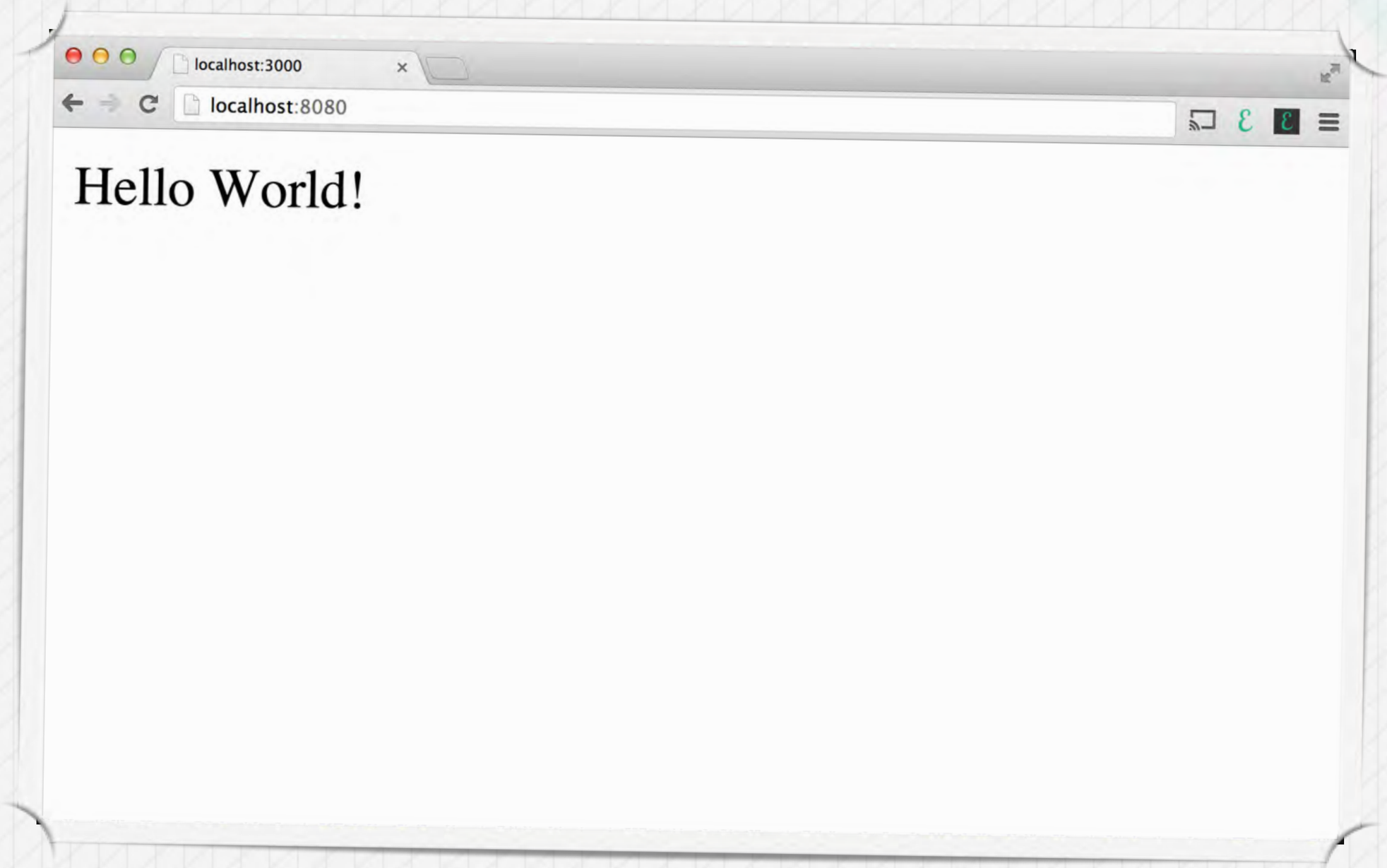
```
$ curl http://localhost:8080/
> 200 OK
```

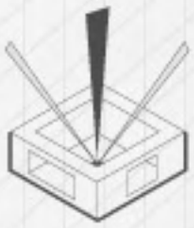


EXPRESS

# INTRODUCING EXPRESS







# EXPRESS ROUTES

app.js

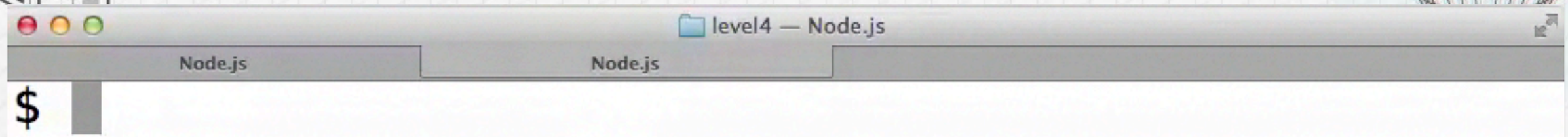
```
var request = require('request');
var url = require('url');

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

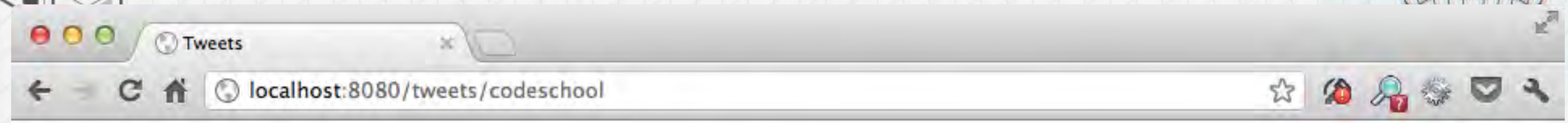
get the last 10 tweets for screen_name

pipe the request to response

# EXPRESS ROUTES



# EXPRESS + HTML




# 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

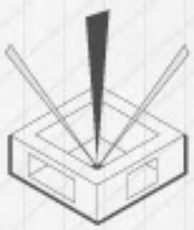
```
"dependencies": {
  "express": "4.9.6",
  "ejs": "1.0.0"
}
```

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

Installs the module and adds to package.json

/Home/eric/my_app/views

default directory



EXPRESS

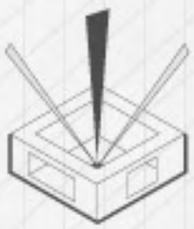
# EXPRESS TEMPLATES

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

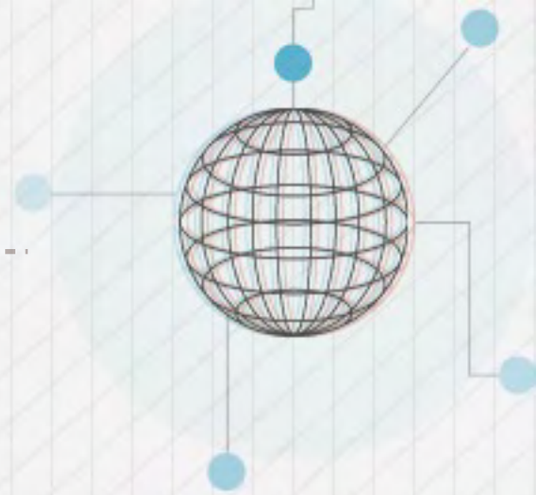
```
<h1>Tweets for @<%= name %></h1>
<ul>
  <% tweets.forEach(function(tweet){ %>
    <li><%= tweet.text %></li>
  <% }); %>
</ul>
```

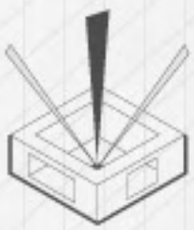




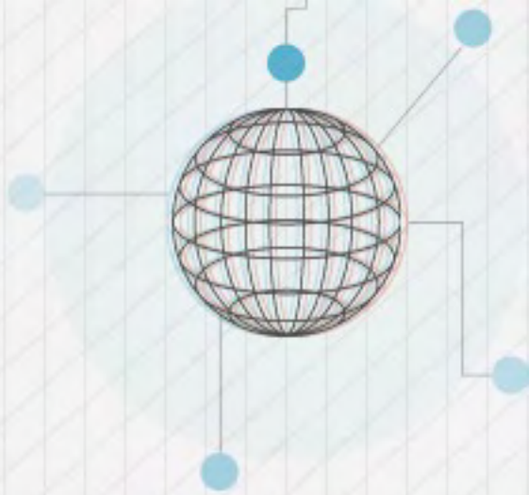
# EXPRESS TEMPLATES

# TEMPLATE LAYOUTS



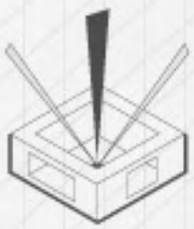


EXPRESS



# SOCKET.IO

## - LEVEL SIX -



# CHATTR

## Hello from Chattr

ERIC

DERRICK

CONNECTED TO CHATTR

***Eric*** *joined the room*

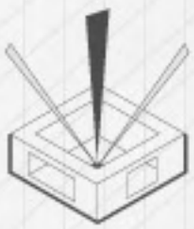
**Derrick**
Hey buddy!

**Eric**
I'm having a great time over here?

***Derrick*** *joined the room*

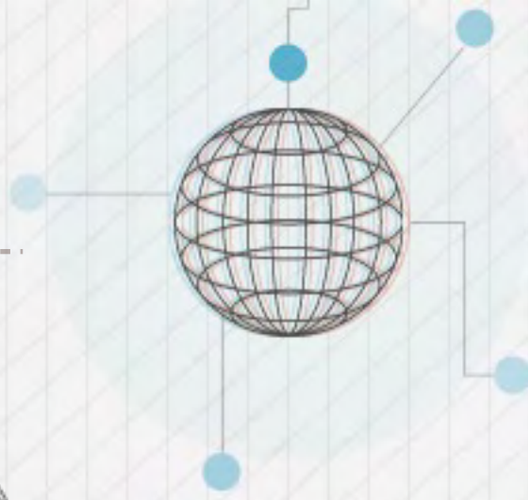
Type your message

SEND



SOCKET.IO

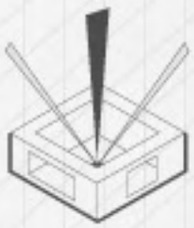
# WEBSOCKETS



browser

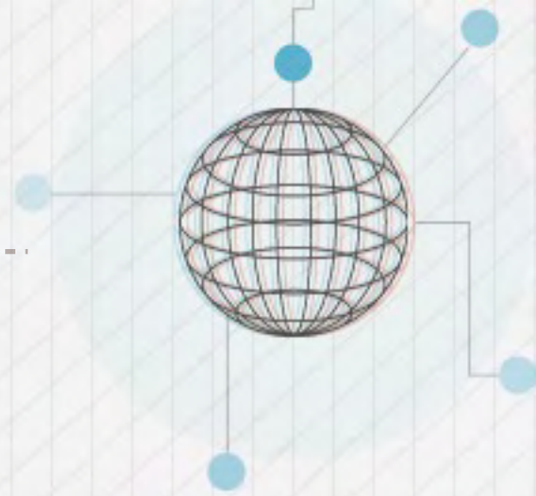
traditional server

Traditional request/response cycle



SOCKET.IO

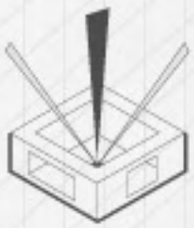
# WEBSOCKETS



browser

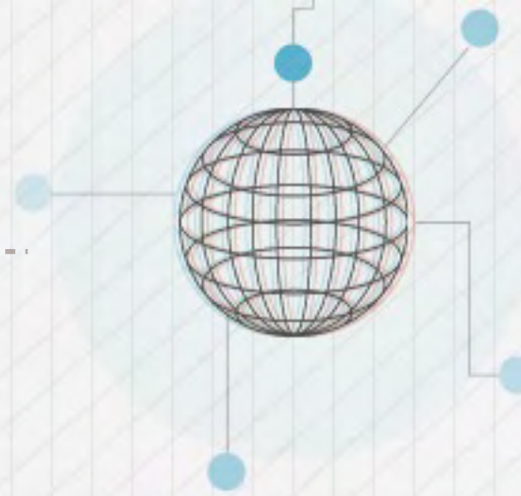
socket.io

Using duplexed websocket connection



SOCKET.IO

# SOCKET.IO FOR WEBSOCKETS



## Abstracts websockets with fallbacks

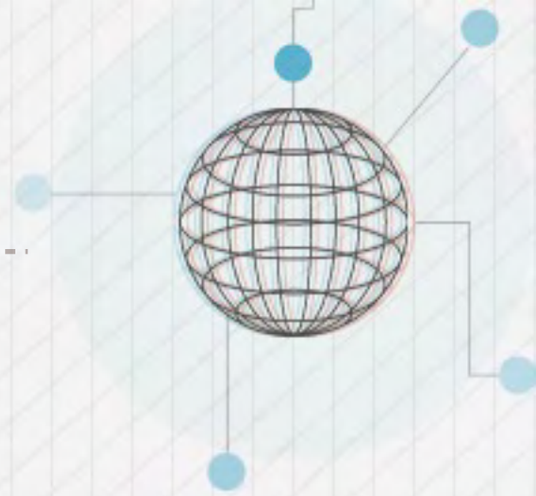
```
$ npm install --save socket.io
```

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);
```



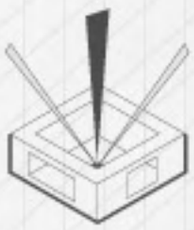
# SOCKET.IO FOR WEBSOCKETS



## 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

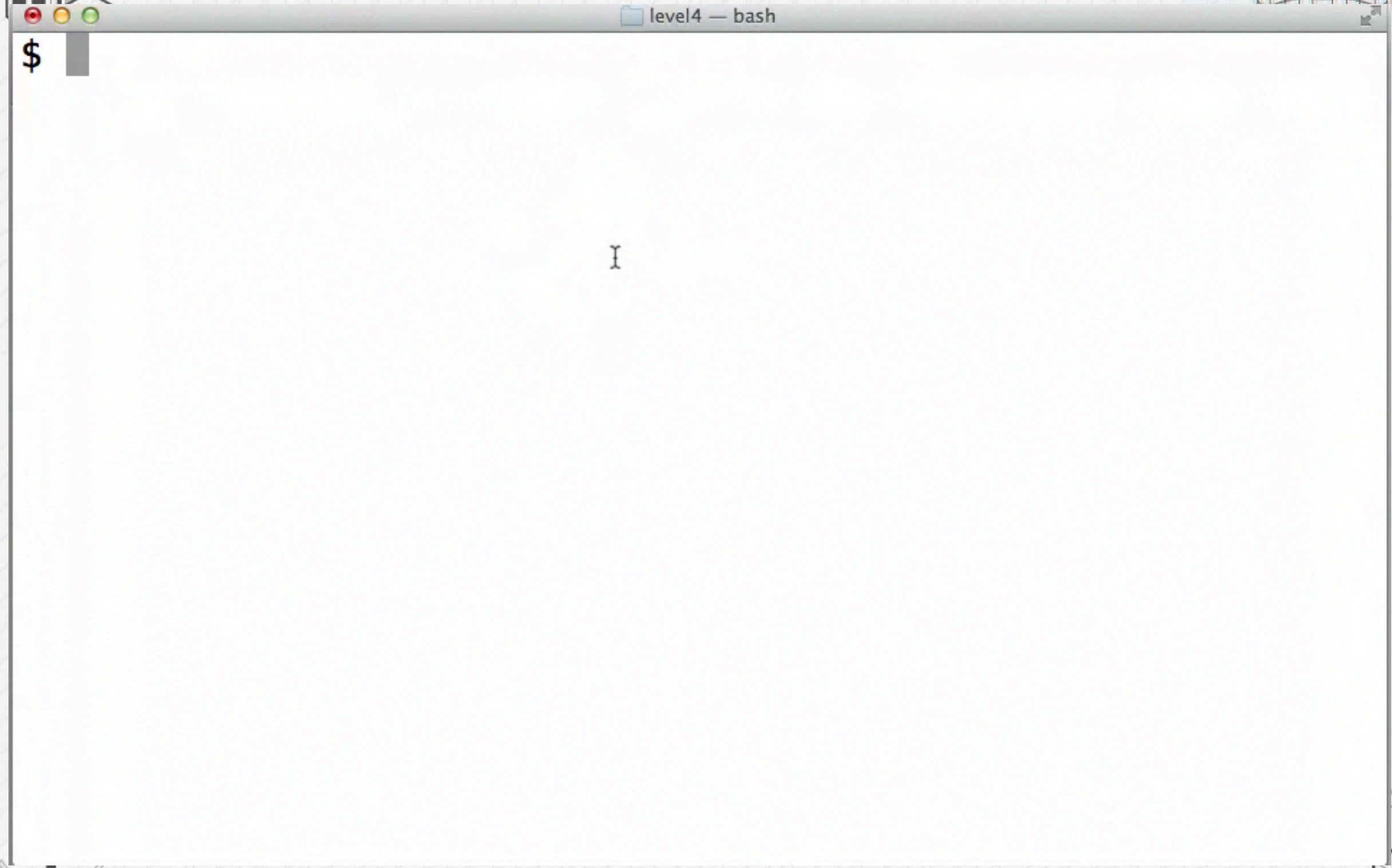
```
io.on('connection', function(client) {
   client.on('messages', function (data) {
      console.log(data);
   });
});
```

*listen for 'messages' events*

index.html

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

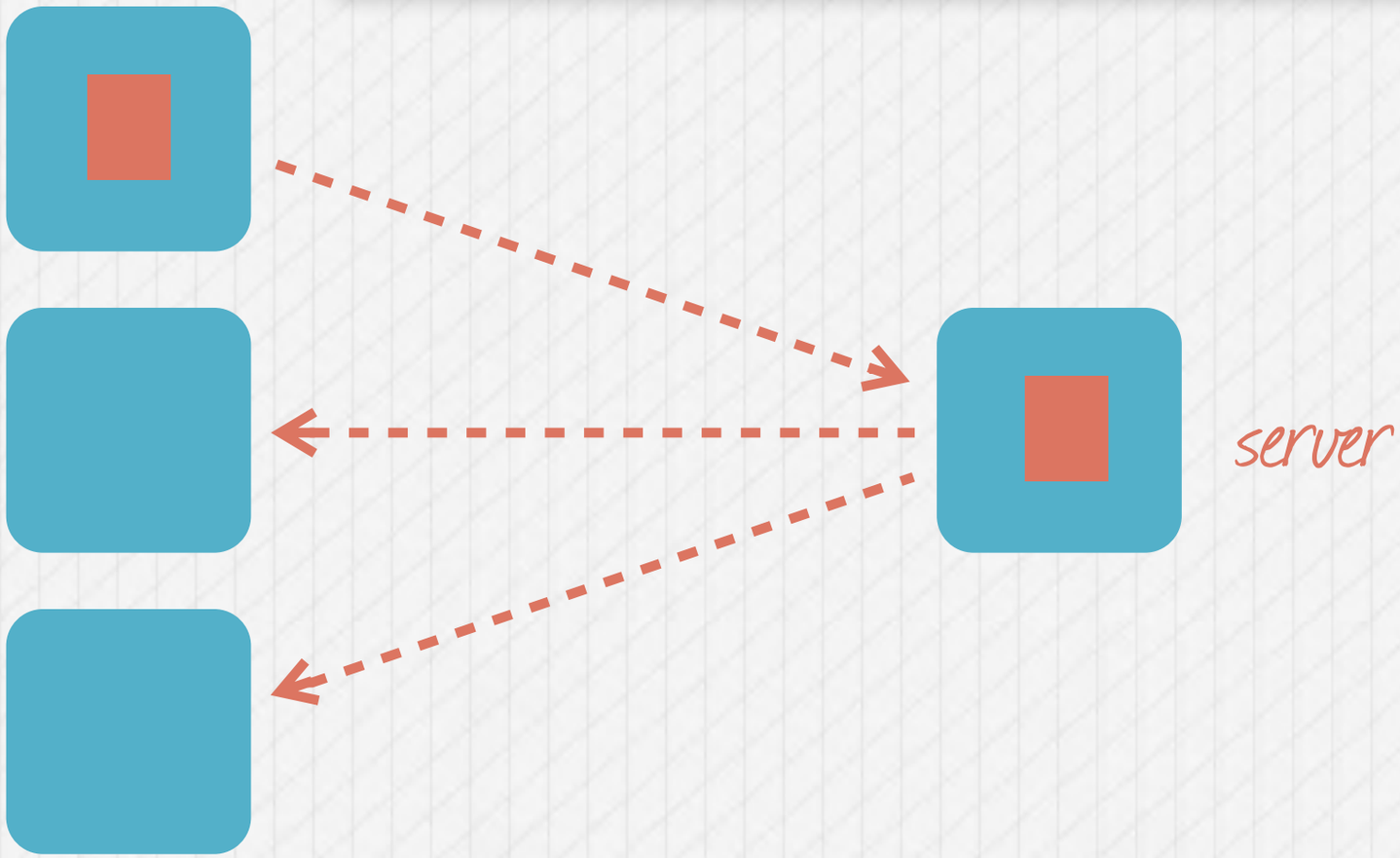
# CHATTR HELLO WORLD



# BROADCASTING MESSAGES

app.js

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



# BROADCASTING MESSAGES

app.js

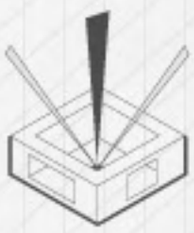
```
io.on('connection', function(client) {
  client.on('messages', function (data) {
    client.broadcast.emit("messages", data);
  });
});
```

*broadcast message to all other clients connected*

index.html

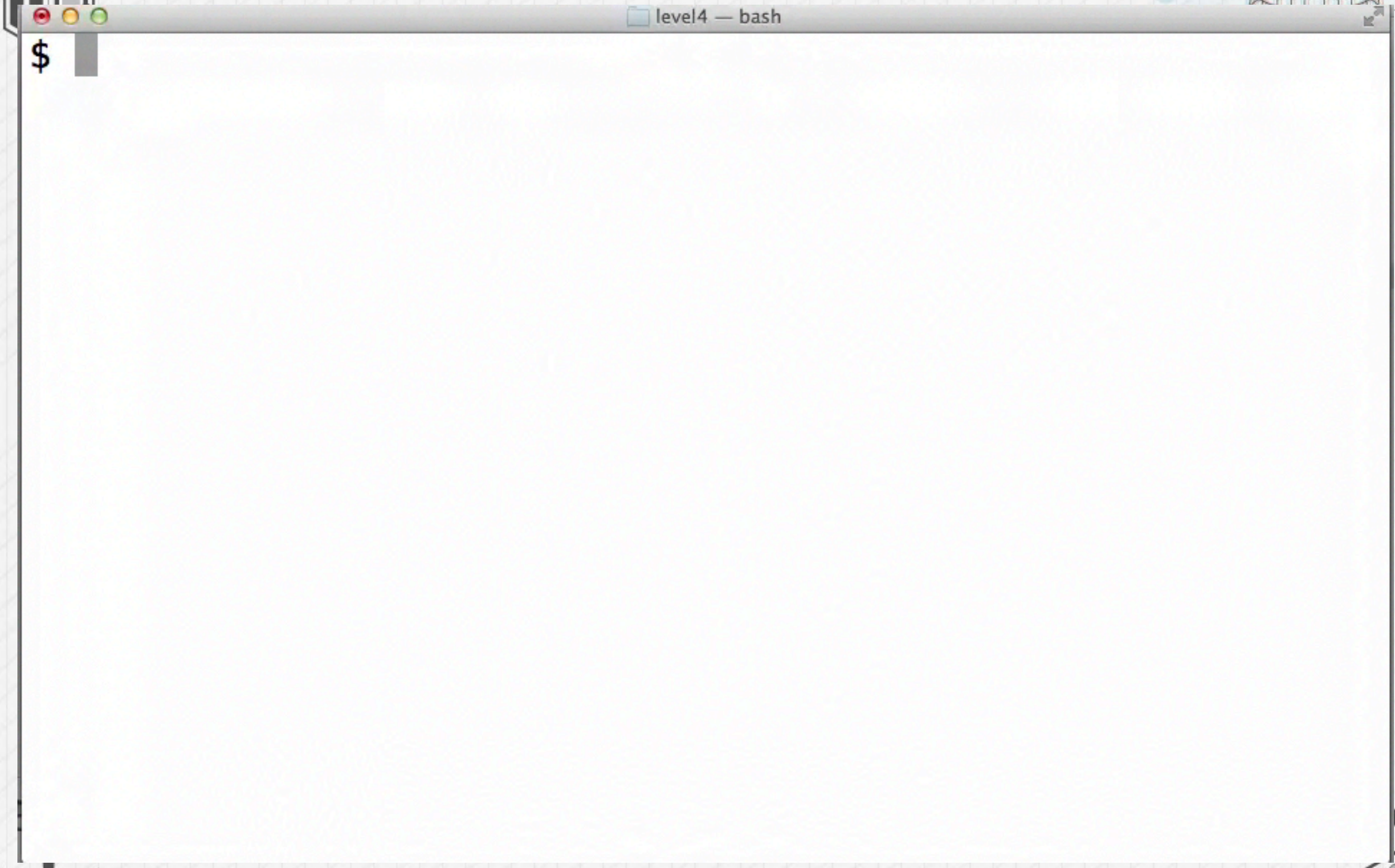
```
<script>
  ...
  socket.on('messages', function(data) { insertMessage(data) });
</script>
```

*insert message into the chat*



SOCKET.IO

# BROADCASTING MESSAGES



# SAVING DATA ON THE SOCKET

app.js

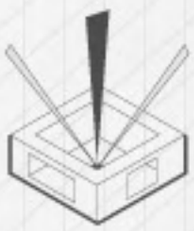
```
io.on('connection', function(client) {
  client.on('join', function(name) {
    client.nickname = name;
  });
});
```

*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);

  });
});
```

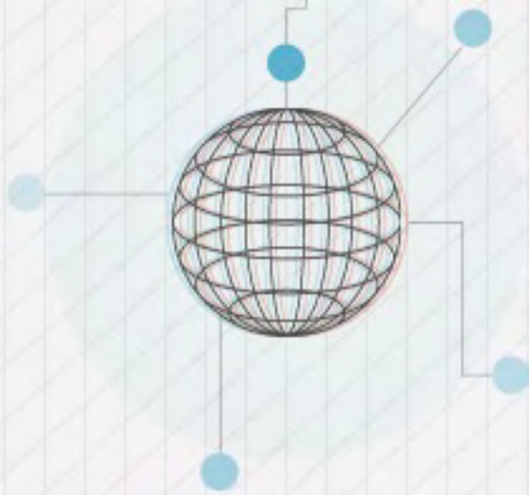
set the nickname associated with this client

get the nickname of this client before broadcasting message

broadcast with the name and message

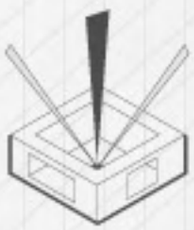
send the same message back to our client



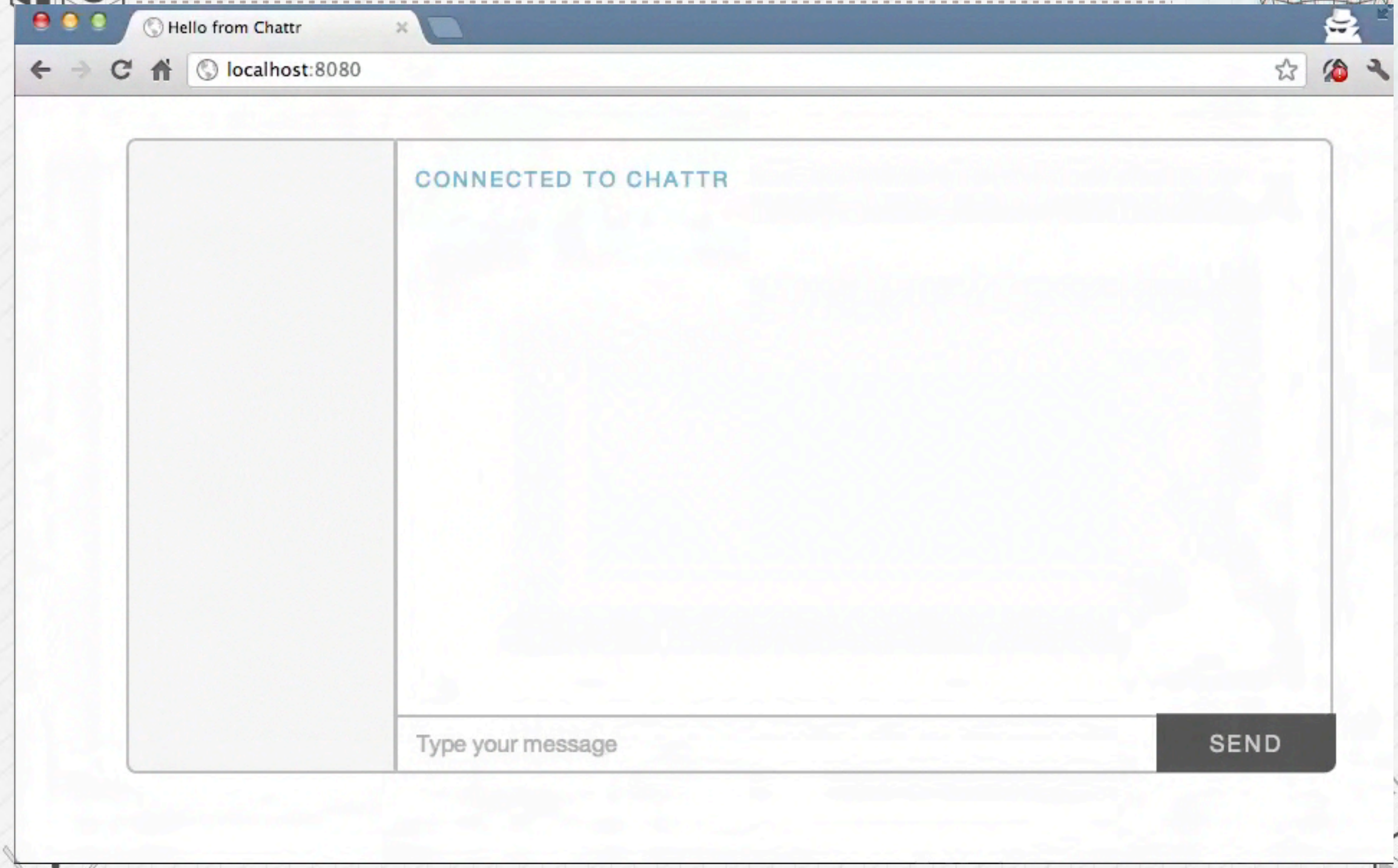


# PERSISTING DATA

## - LEVEL SEVEN -



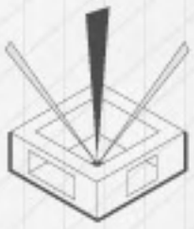
# RECENT MESSAGES



# 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);
  });
});
```



PERSISTING DATA

# STORING MESSAGES

app.js

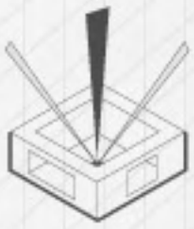
```
var messages = [];  store messages in array

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

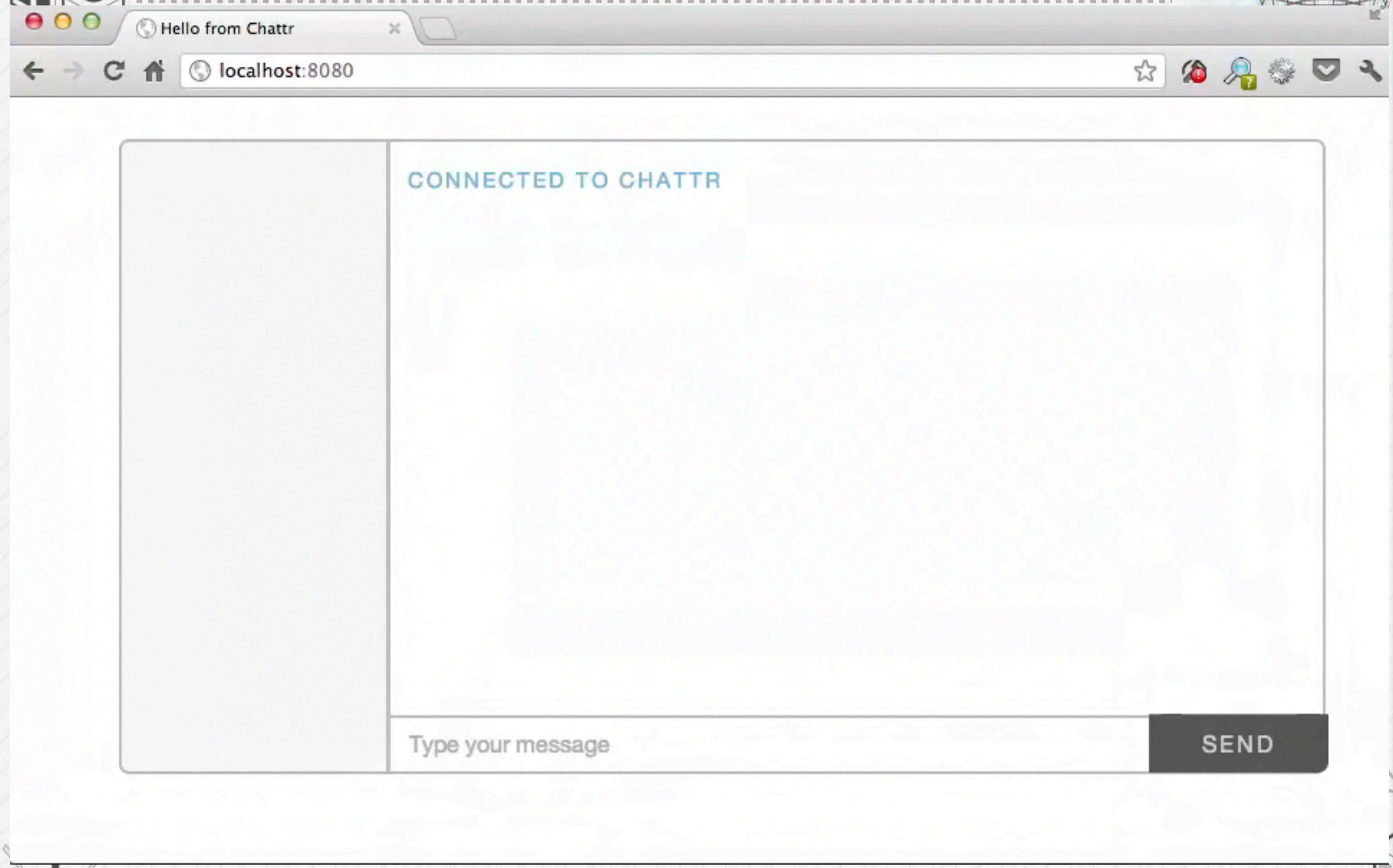
```
io.sockets.on('connection', function(client) {
  ...
  client.on('join', function(name) {
    messages.forEach(function(message) {
      client.emit("messages", message.name + ": " + message.data);
    });
  });
});
```

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



PERSISTING DATA

# RECENT MESSAGES

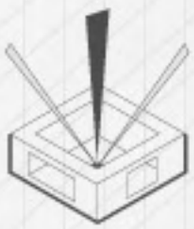


# PERSISTING STORES

- MongoDB
- CouchDB
- PostgreSQL
- Memcached
- Riak

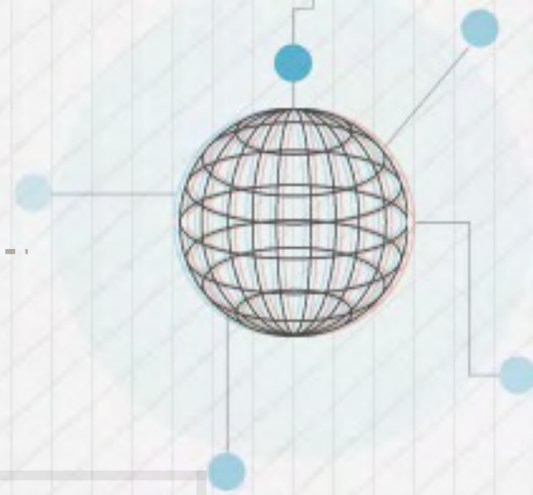
All non-blocking!


Redis is a key-value store

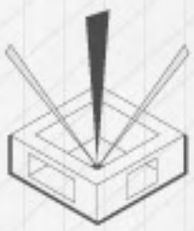




# REDIS DATA STRUCTURES

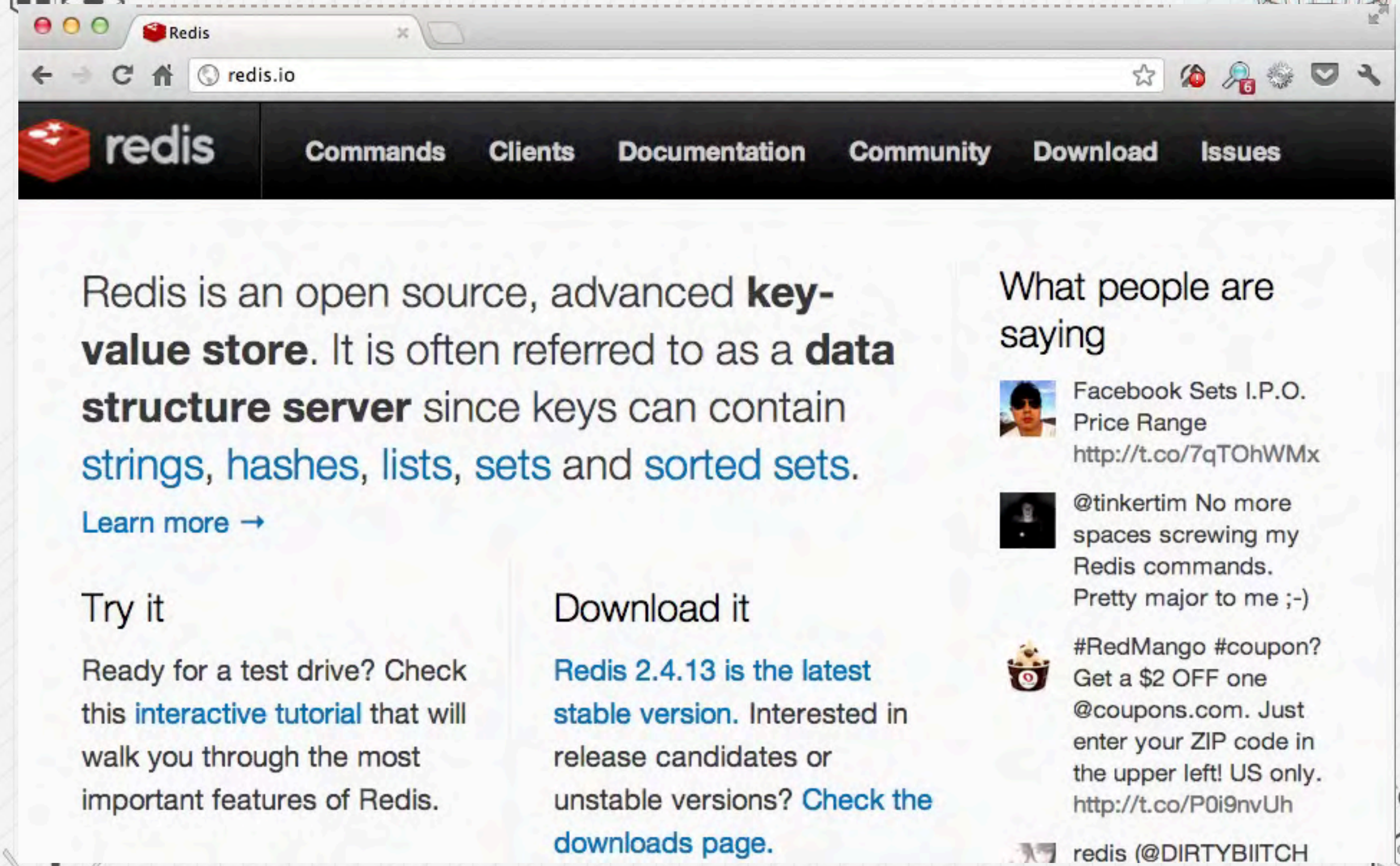


| data structure | commands |
|---|---|
| Strings | *SET, GET, APPEND, DECR, INCR...* |
| Hashes | *HSET, HGET, HDEL, HGETALL...* |
| Lists | *LPUSH, LREM, LTRIM, RPOP, LINSERT...* |
| Sets | *SADD, SREM, SMOVE, SMEMBERS...* |
| Sorted Sets | *ZADD, ZREM, ZSCORE, ZRANK...* |



PERSISTING DATA

# REDIS COMMAND DOCUMENTATION



# NODE REDIS

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

mranney / node_redis

Watch 176 | Star 3,102 | Fork 422

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

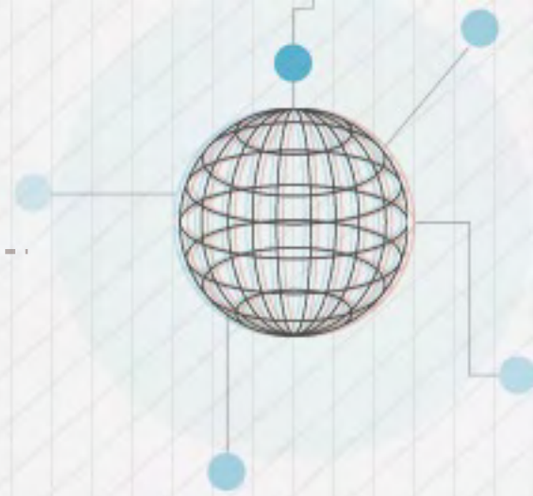
git@github.com:mran

You can clone with HTTPS, SSH, or Subversion.

Clone in Desktop

Download ZIP

# REDIS



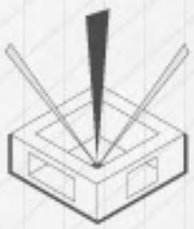
```
$ npm install redis --save
```

```
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



PERSISTING DATA

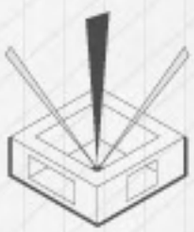
# REDIS LISTS: PUSHING

## 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);
});
```

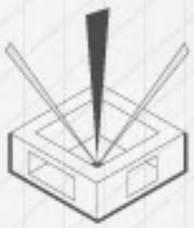
*trim keeps first two strings and removes the rest*

## Retrieving from list

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

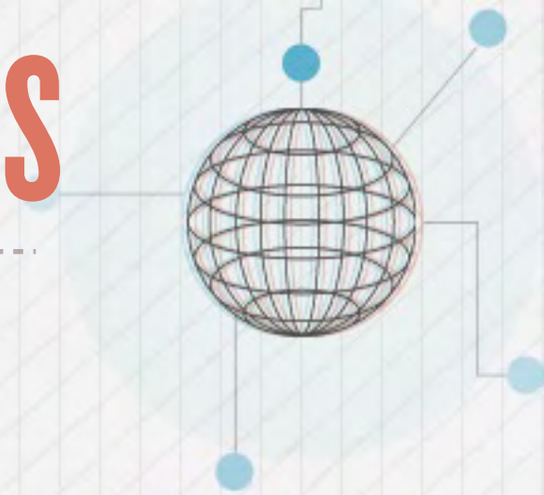
*replies with all strings in list*

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





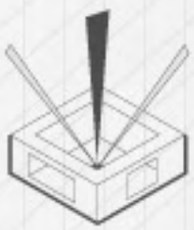
# CONVERTING MESSAGES TO REDIS



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



PERSISTING DATA

# CONVERTING STOREMESSAGE

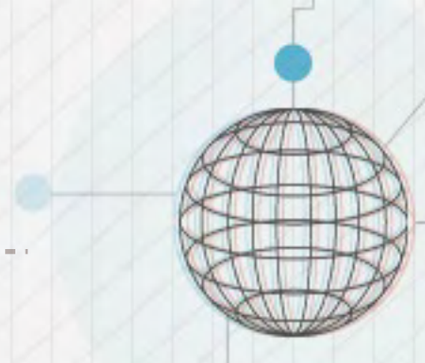
app.js

```
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

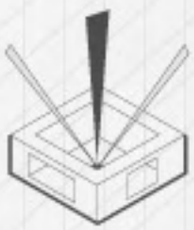
keeps newest 10 items

# OUTPUT FROM LIST



app.js

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

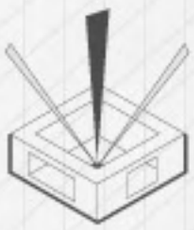


PERSISTING DATA

# OUTPUT FROM LIST

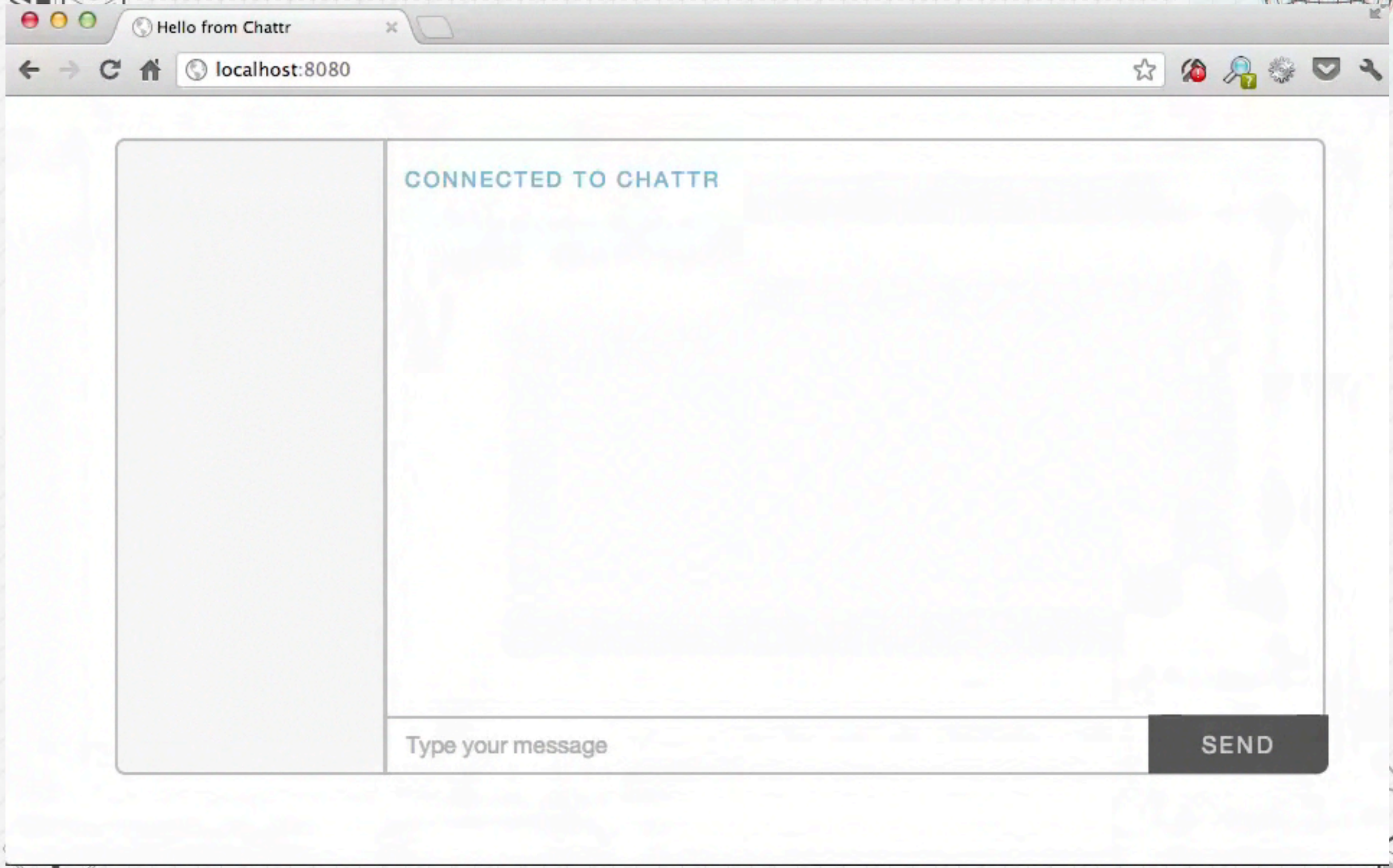
app.js

```
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);
    });
  });
});
```



## PERSISTING DATA

# IN ACTION


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

# CURRENT CHATTER LIST

## Sets are lists of unique data


### add & remove members of the names set

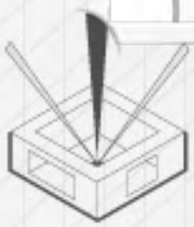
```
client.sadd("names", "Dog");
client.sadd("names", "Spider");
client.sadd("names", "Gregg");
```

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

### reply with all members of set

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

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





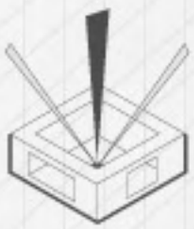
# ADDING CHATTERS

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);
});
```



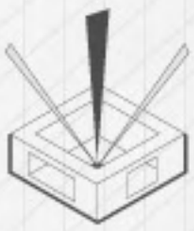
PERSISTING DATA

# 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*



PERSISTING DATA

# REMOVING CHATTERS

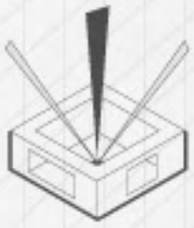
*remove chatter when they disconnect from server*

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();
});
```



PERSISTING DATA

# WELCOME TO CHATTR