
A MASTERPIECE


EVERYTHING YOU WANTED
TO KNOW
ABOUT
LOGGING

WHY, HELLO THERE

CHARLIE HERE

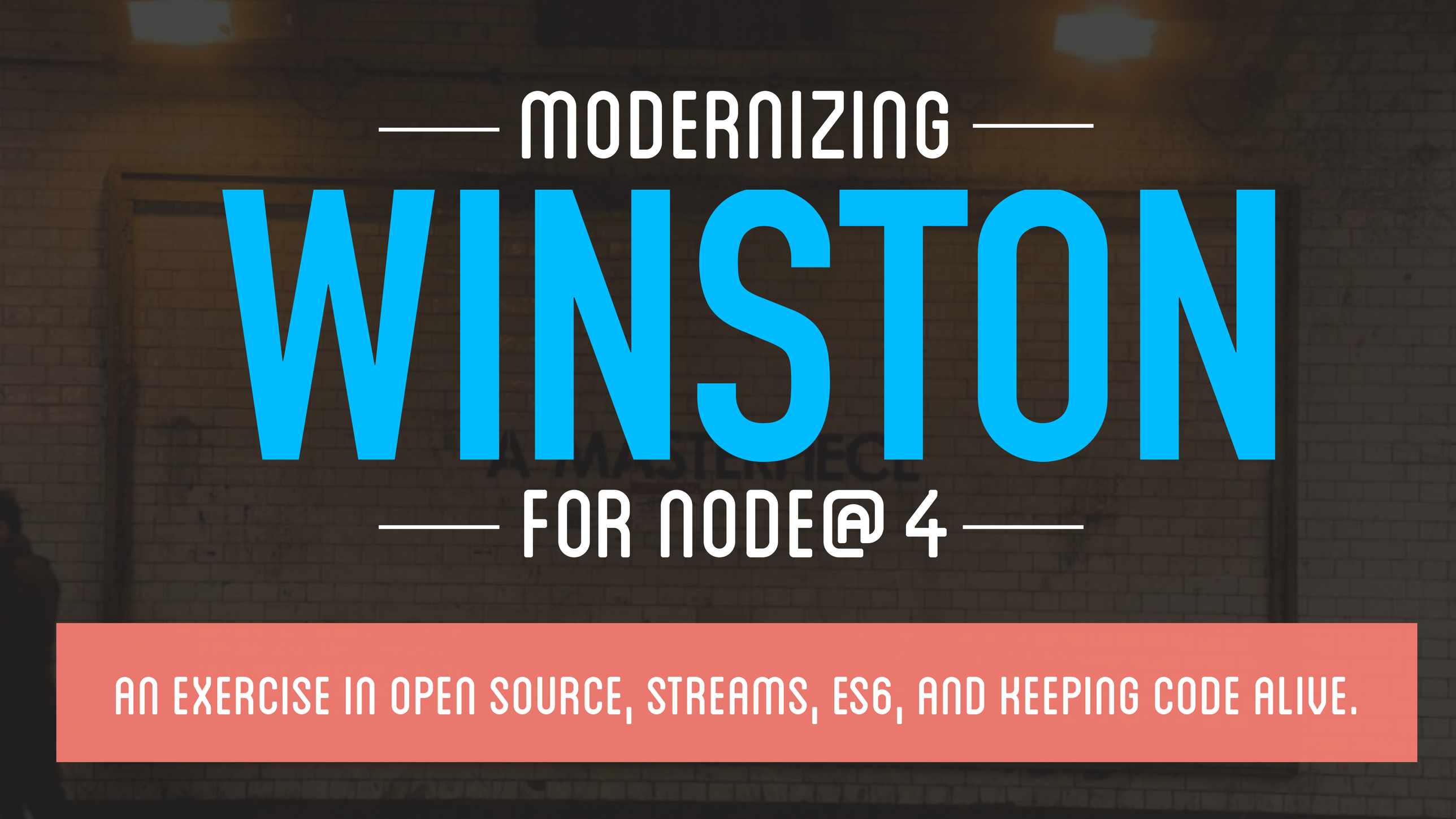
WELCOME TO LOGGING. I WILL BE YOUR GUIDE

SENIOR DIR. UX PLATFORM @

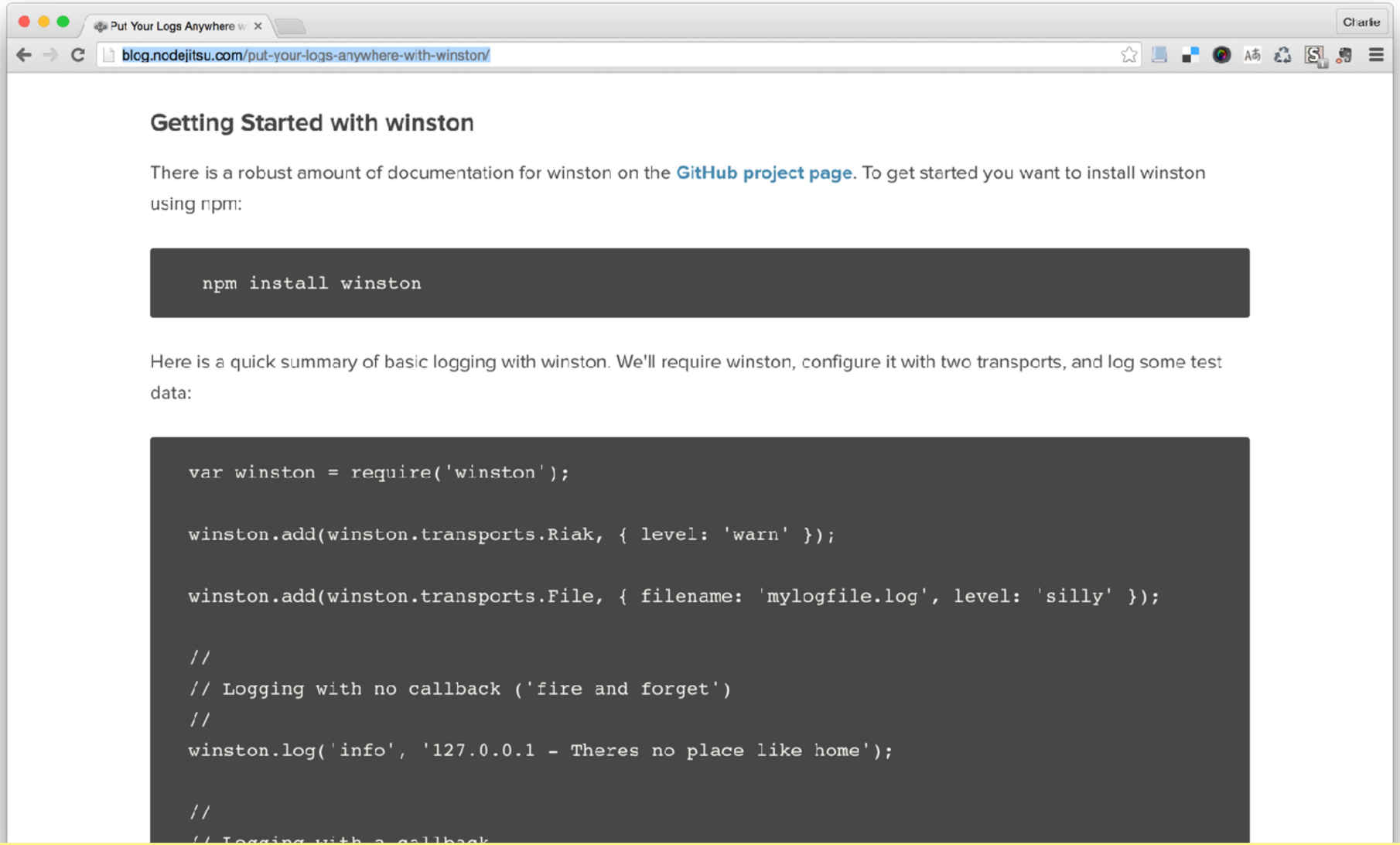
GODADDY

@INDEXZERO GITHUB TWITTER

WELCOME TO LOGGING. I WILL BE YOUR GUIDE


MODERNIZING
WINSTON
FOR NODE@4
AN EXERCISE IN OPEN SOURCE, STREAMS, ES6, AND KEEPING CODE ALIVE.


LOOKING FOR THE
TL;DR?



WINSTON IS FROM 2010

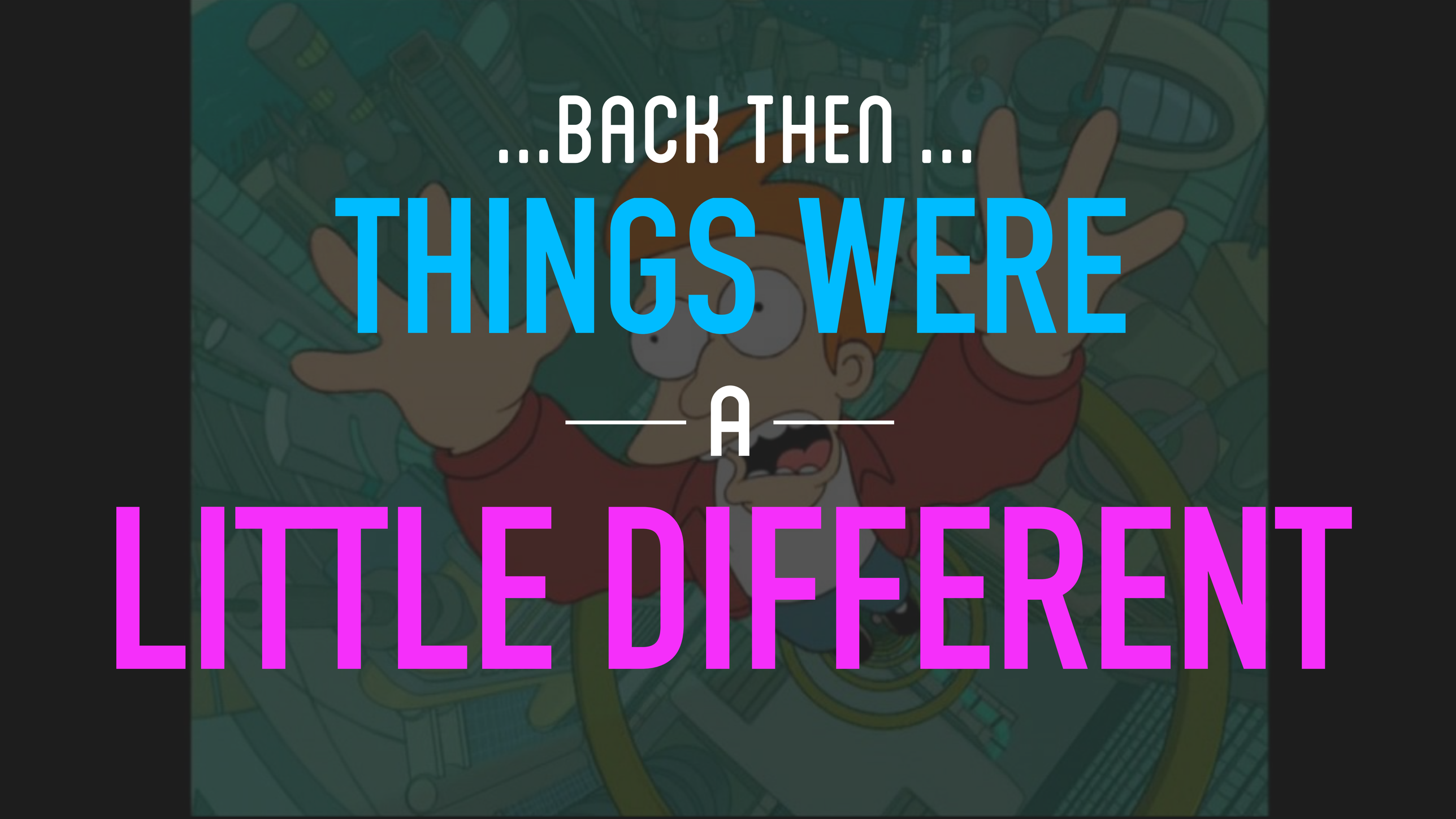
ACTUALLY

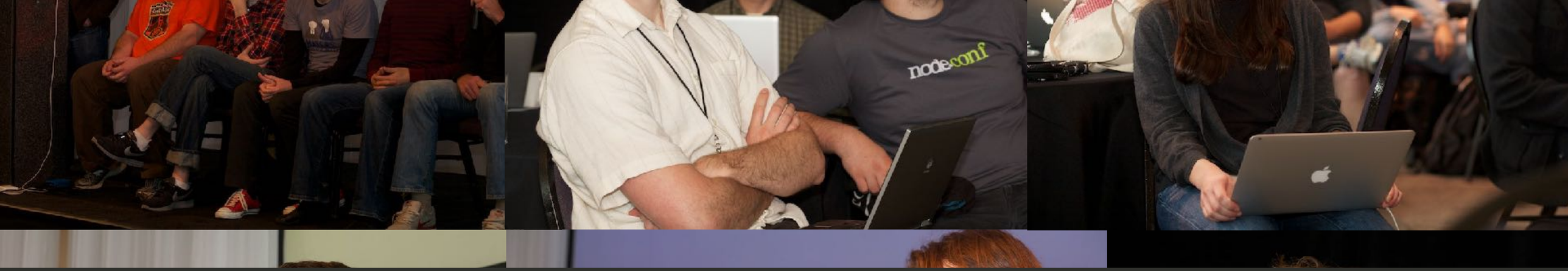
JANUARY, 17

2011

BUT STARTED IN 2010

...BACK THEN ...


...BACK THEN ...
THINGS WERE
A
LITTLE DIFFERENT



node.conf

NEVER BEEN ONE OF THESE

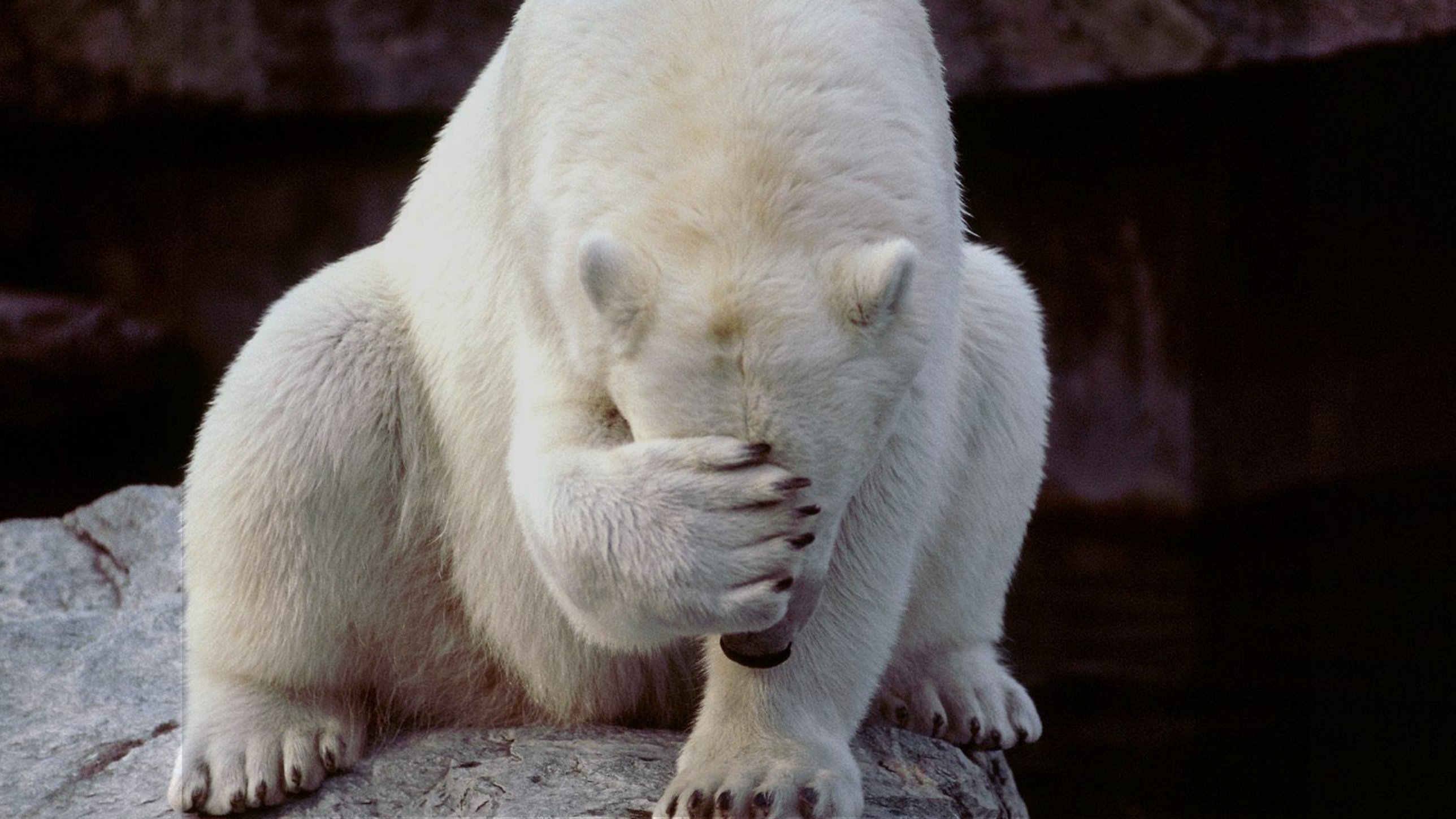
2011 BE LIKE. . .

NO STREAMS API

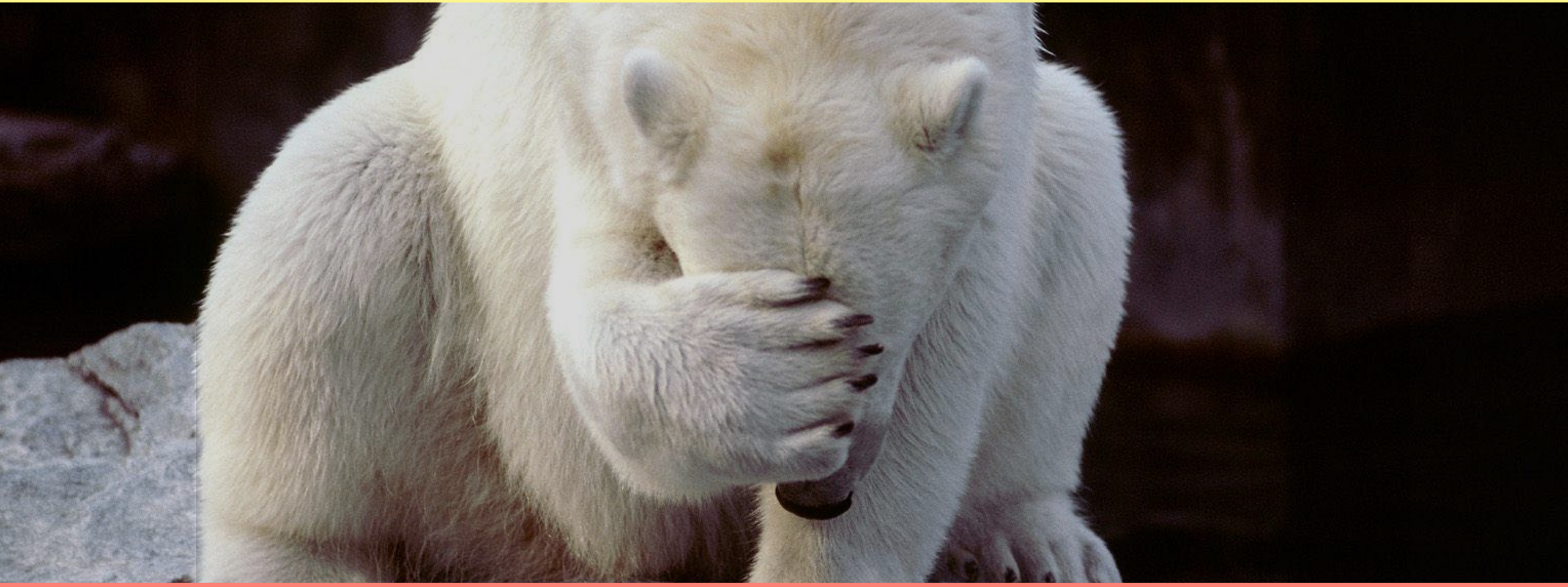
2011 BE LIKE...

ES5 IS STILL NEW

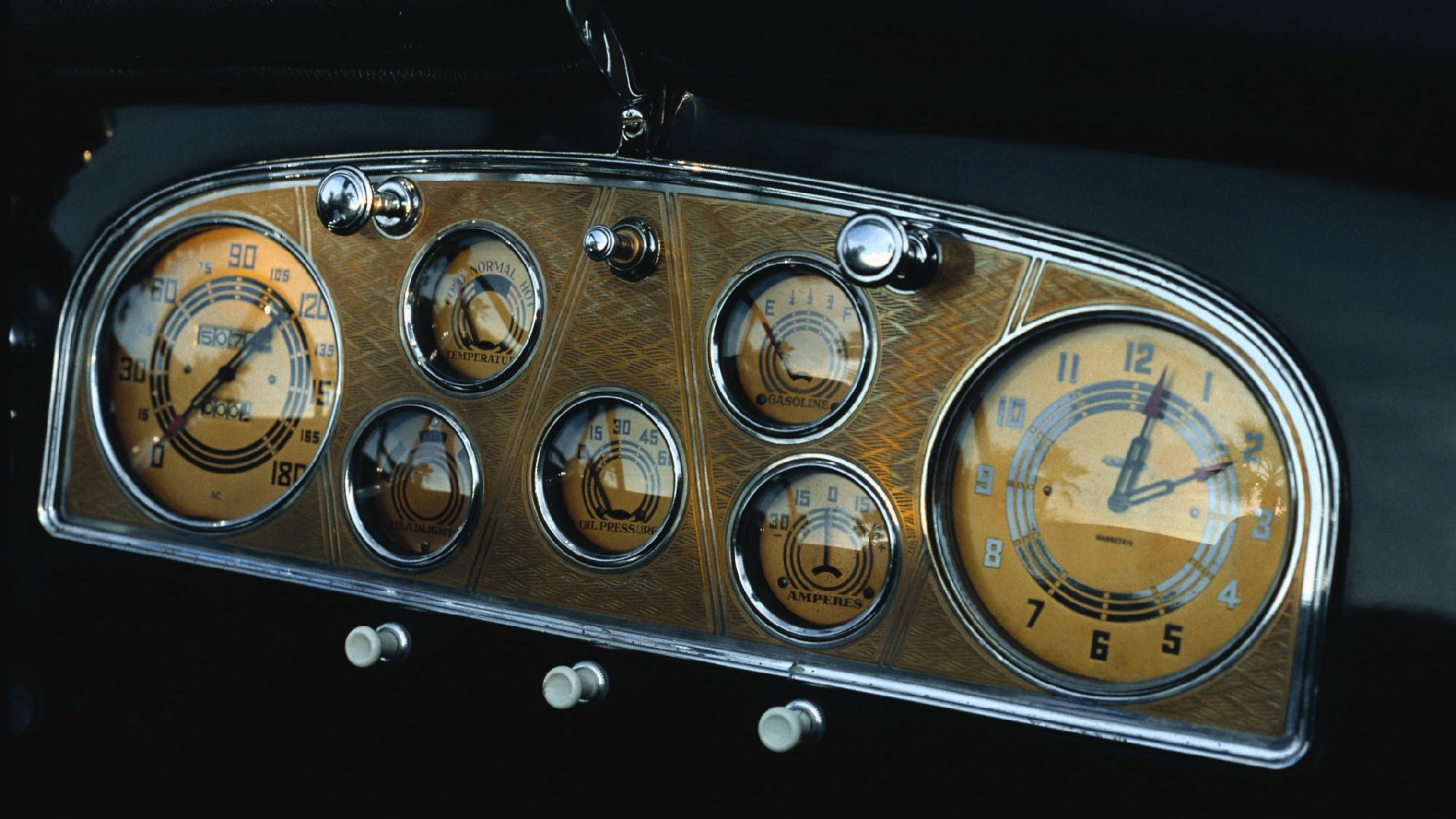
2011 BE LIKE...



LIMITED CODE COVERAGE TOOLS



2011 BE LIKE. . .

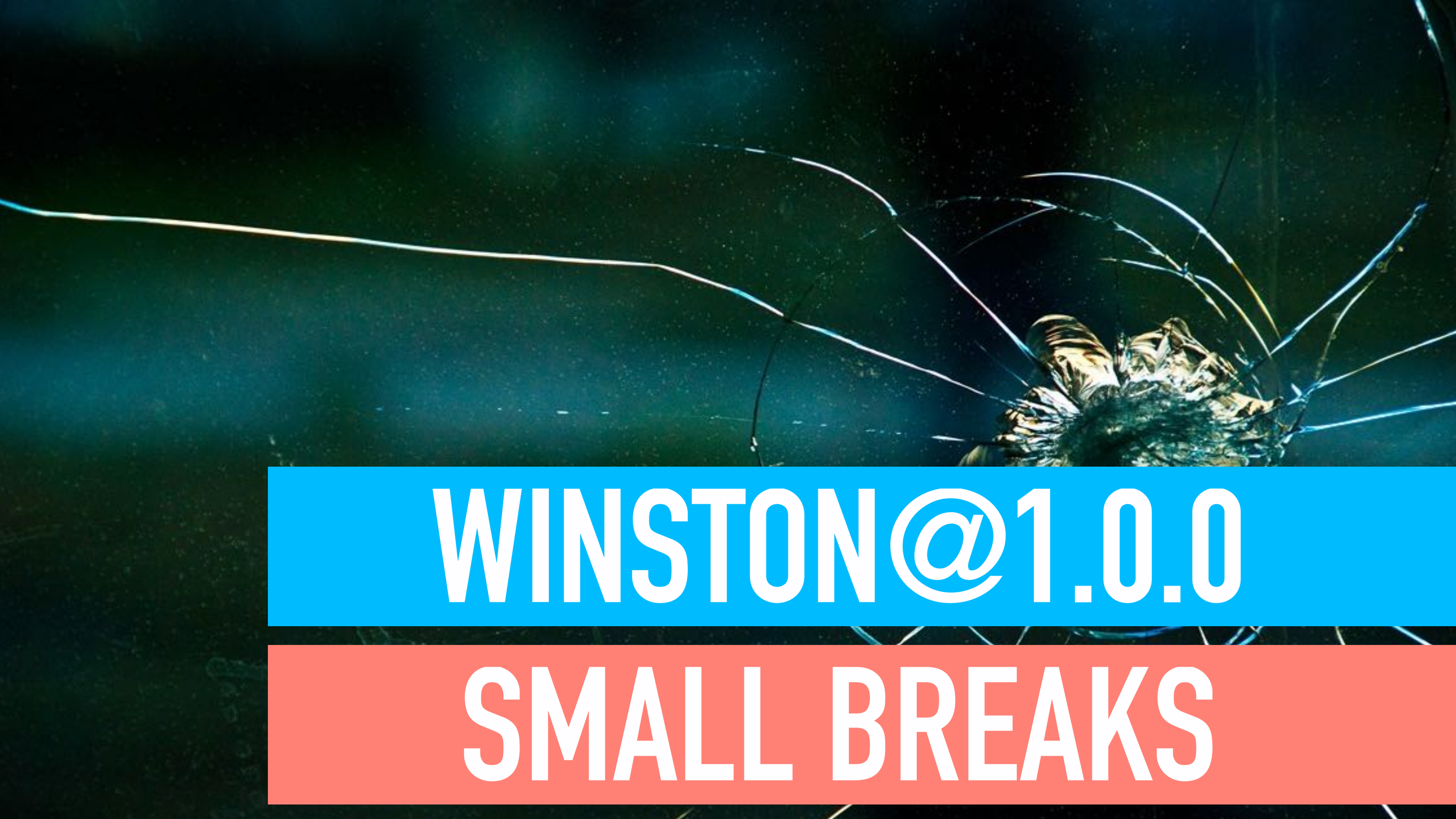

90
75
105
60
120
135
30
15
165
0
180
COLD NORMAL HOT
TEMPERATURE
E
F
GASOLINE
15 30 45
OIL PRESSURE
15 0 15
30
AMPERES
12
1
2
3
4
5
6
7
8
9
10
11


NOT ALL
THAT BAD THO

BACK TO THE FUTURE

BACK TO THE FUTURE

BY 2015 THINGS WERE MOVING ALONG…



WINSTON@1.0.0

SMALL BREAKS

WINSTON@2.0.0

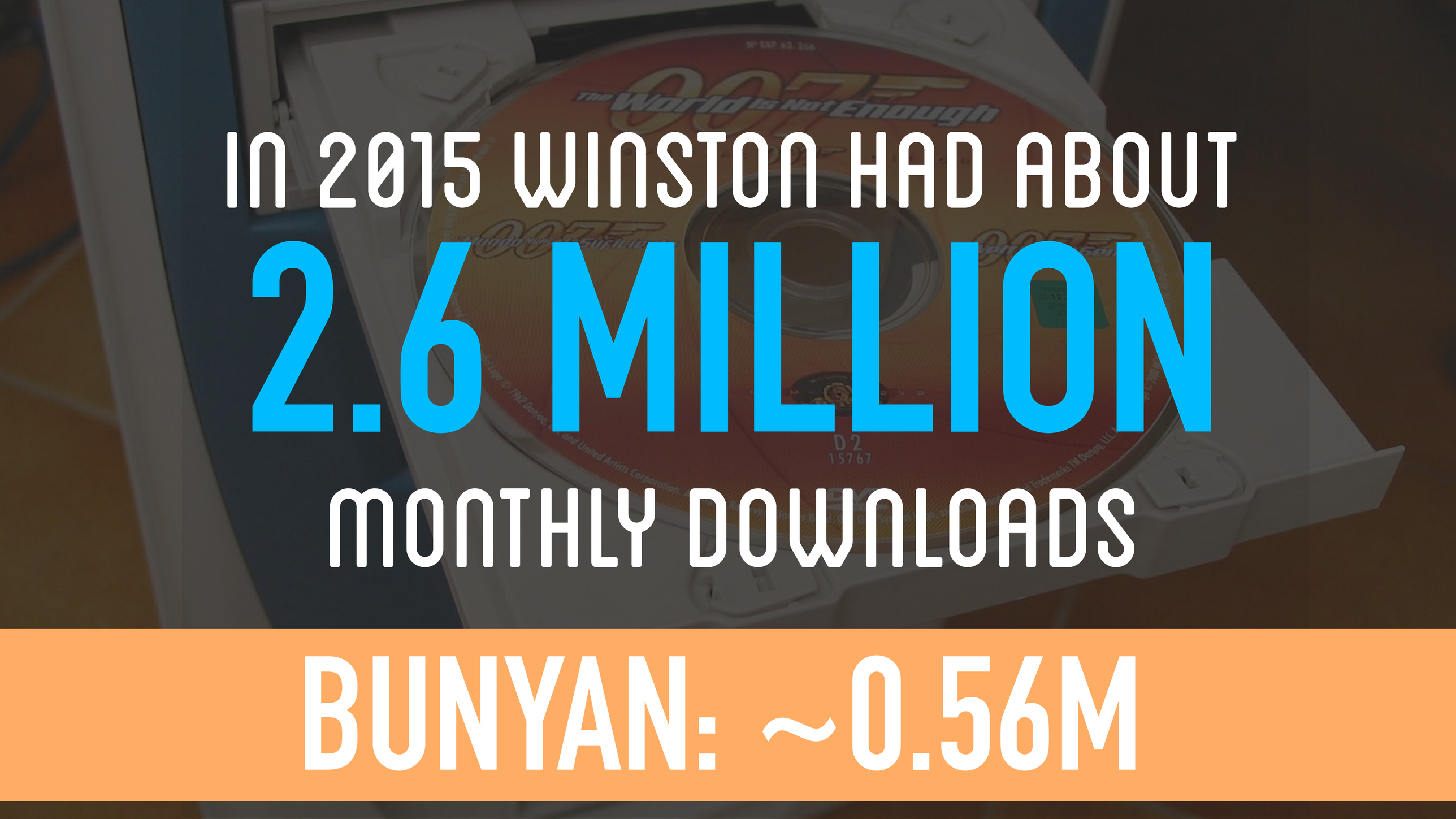
BIGGER BREAKS


WINSTON@3.0.0
BREAK TO NEW APIS

OPEN SOURCE

OPEN SOURCE

IT CAN BE DONE!

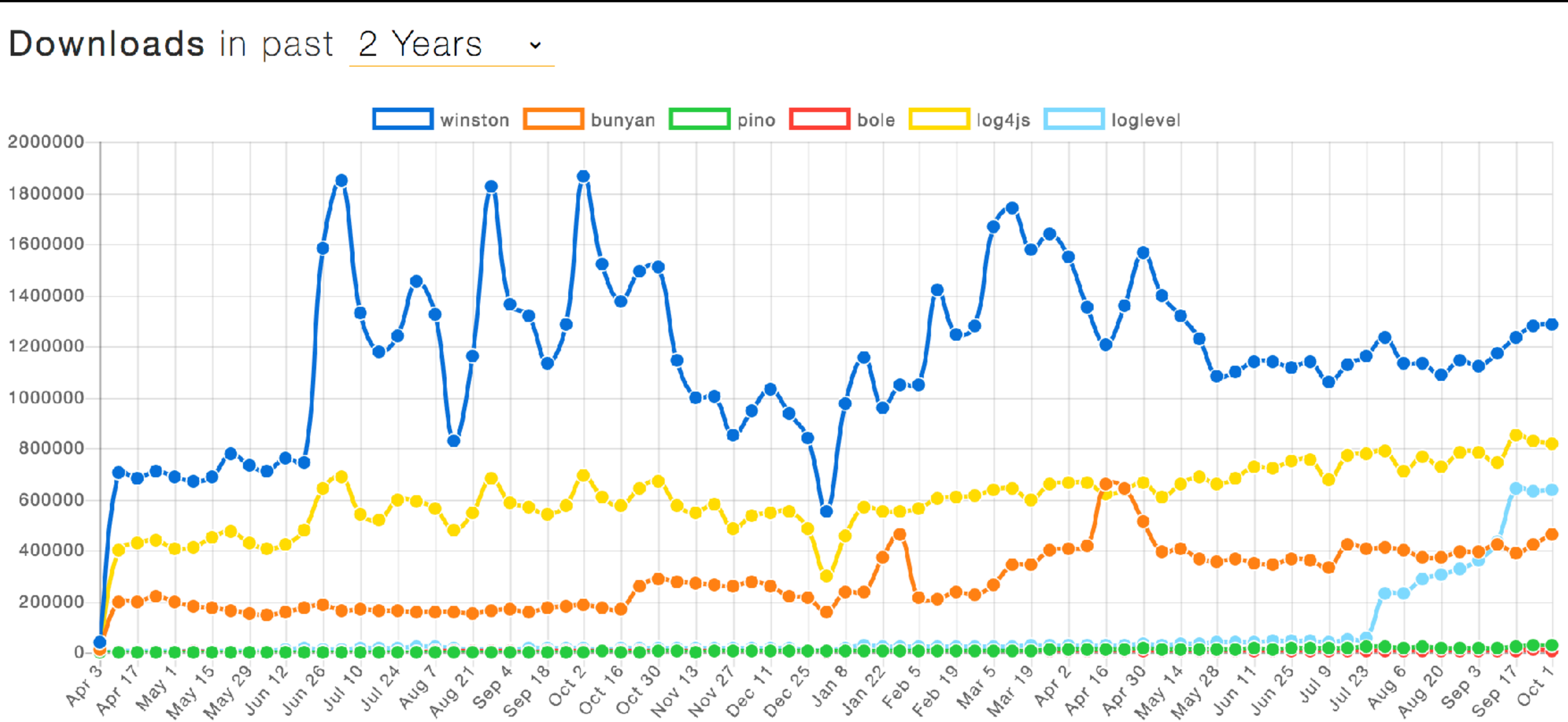

IN 2015 WINSTON HAD ABOUT
2.6 MILLION
MONTHLY DOWNLOADS
BUNYAN: ~0.56M

Open Source is what happens when you're busy making other plans

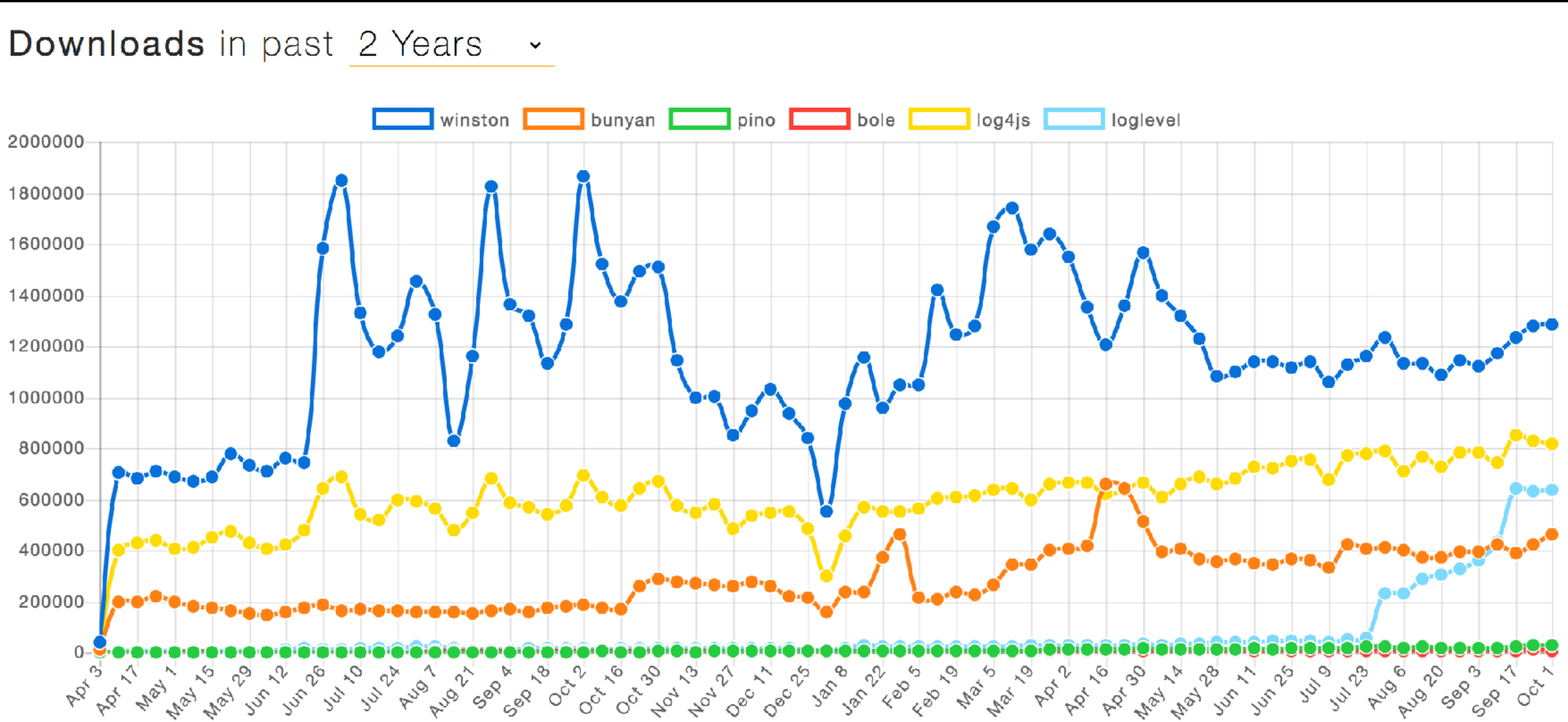
– IF JOHN LENNON WROTE SOFTWARE


FAST FORWARD
TO 2017

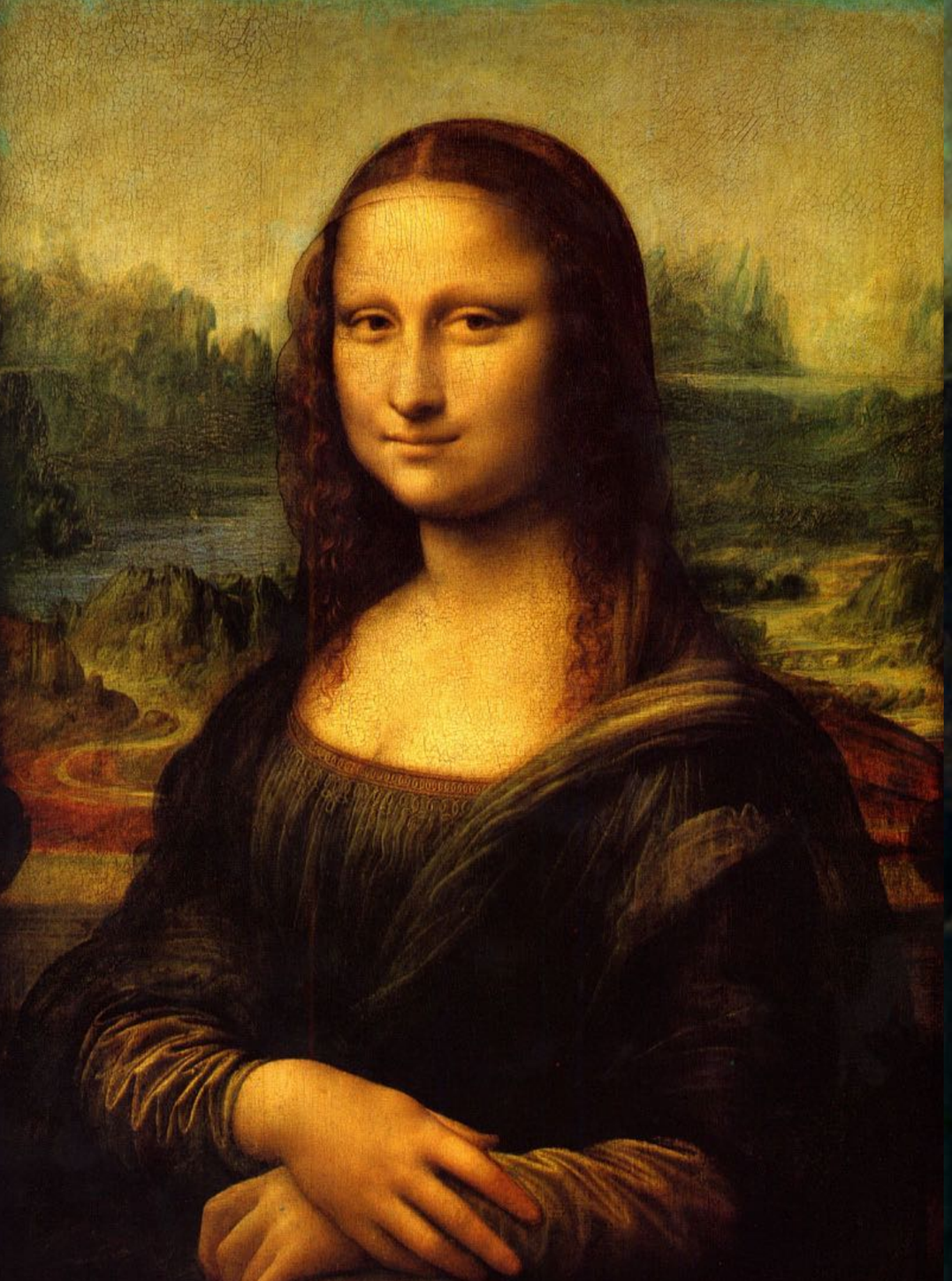
2017 download comparison



winston continues to “win”




BUT JUST
WHY EXACTLY?



CONSIDER THE API

SHAKESPEARE'S "LOGGING"

Autolycus 1st dress | Clown 2nd dress | Florizel 1st dress | Perdita. 2nd dress | Old Shepherd 2nd dress | Bithynian Boor

Plate 16.

COSTUMES IN SHAKSPEARE'S PLAY OF

THE WINTER'S TALE

Vienna: M. Trentsensky
Theat. Cost. 208

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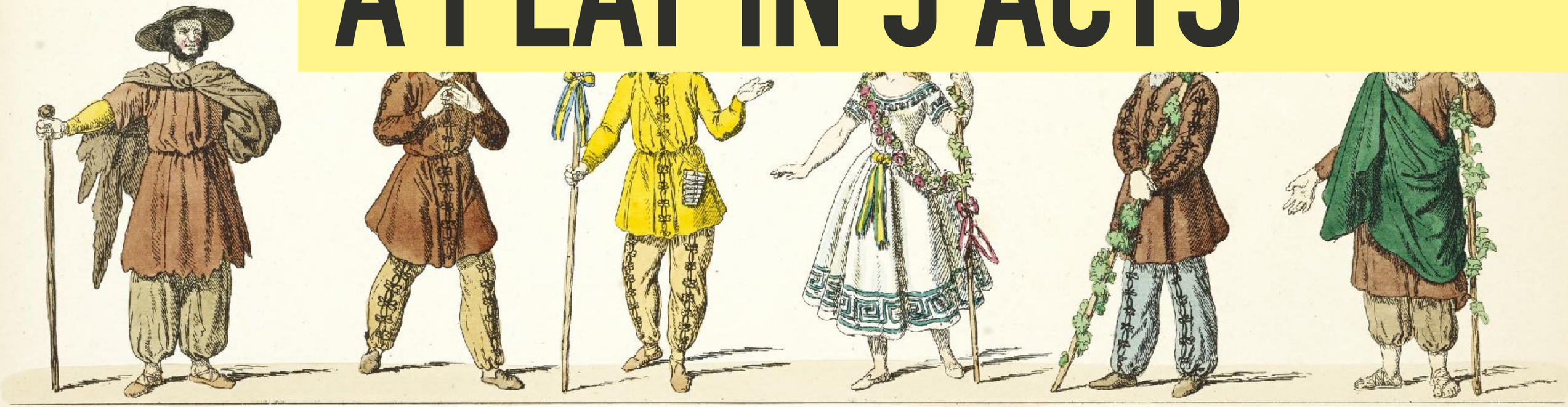
London Joseph, Myers & Co

SHAKESPEARE'S "LOGGING"

A PLAY IN 5 ACTS



Autolycus 1st dress | Clown 2nd dress | Florizel 1st dress | Perdita. 2nd dress | Old Shepherd 2nd dress | Bithynian Boor

Plate 16.

Vienna: M. Trentsensky
Theat. Cost. 208

COSTUMES IN SHAKSPEARE'S PLAY OF
THE WINTER'S TALE

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ACT ONE

Levels


ACT ONE
Levels
WHERE IN RFC5424
EMERGES VICTORIOUS IN THE END. ALWAYS.

```
const syslog = {
  emerg: 0,
  alert: 1,
  crit: 2,
  error: 3,
  warning: 4,
  notice: 5,
  info: 6,
  debug: 7
}
```

```
const npm = {
  error: 0,
  warn: 1,
  http: 2,
  info: 3,
  verbose: 4,
  debug: 5,
  silly: 6
}
```

ACT TWO

Log Shipping

ACT TWO

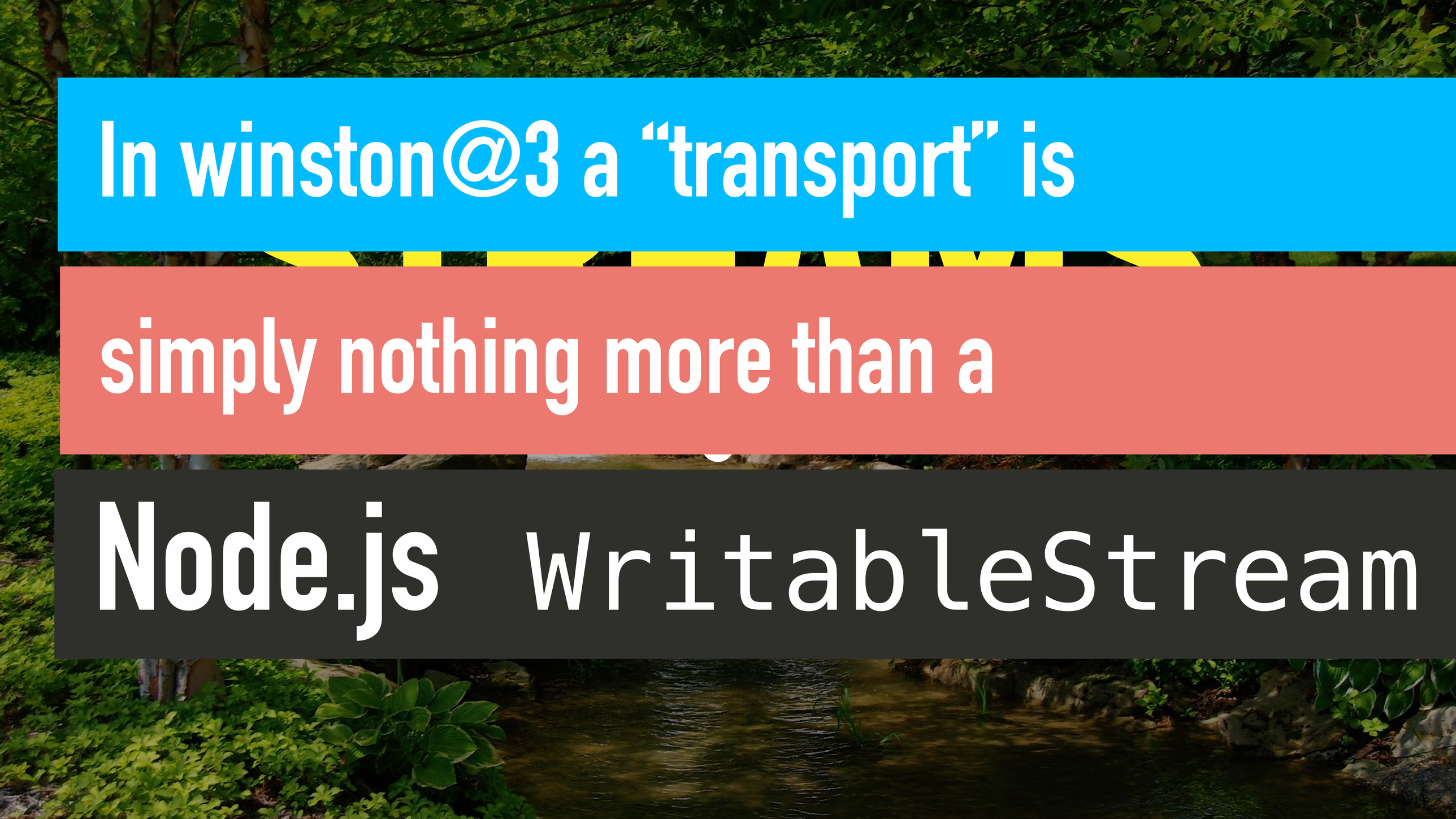
Log Shipping

WINSTON TRANSPORTS

BUNYAN STREAMS

LOG4JS-NODE APPENDERS


STREAMS
ALL THE THINGS


In winston@3 a “transport” is
simply nothing more than a
Node.js WritableStream

ACT THREE

Querying & Streaming

ACT THREE

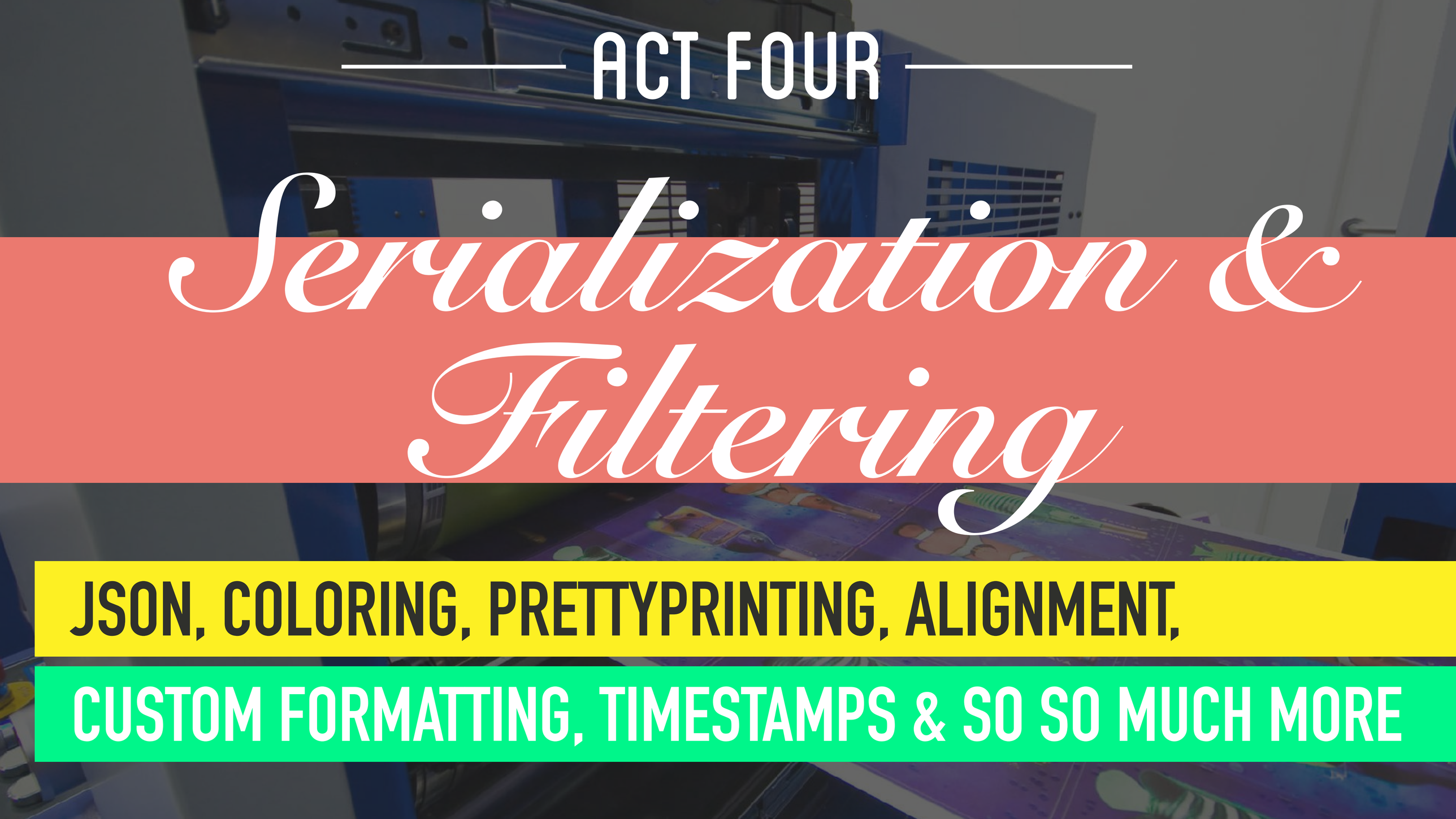
Querying & Streaming

KIBANA. OR SOME SASS YOU PAY FOR.

BESPOKE ENDS TRAGICALLY — USUALLY.

ACT FOUR

Serialization & Filtering



ACT FOUR

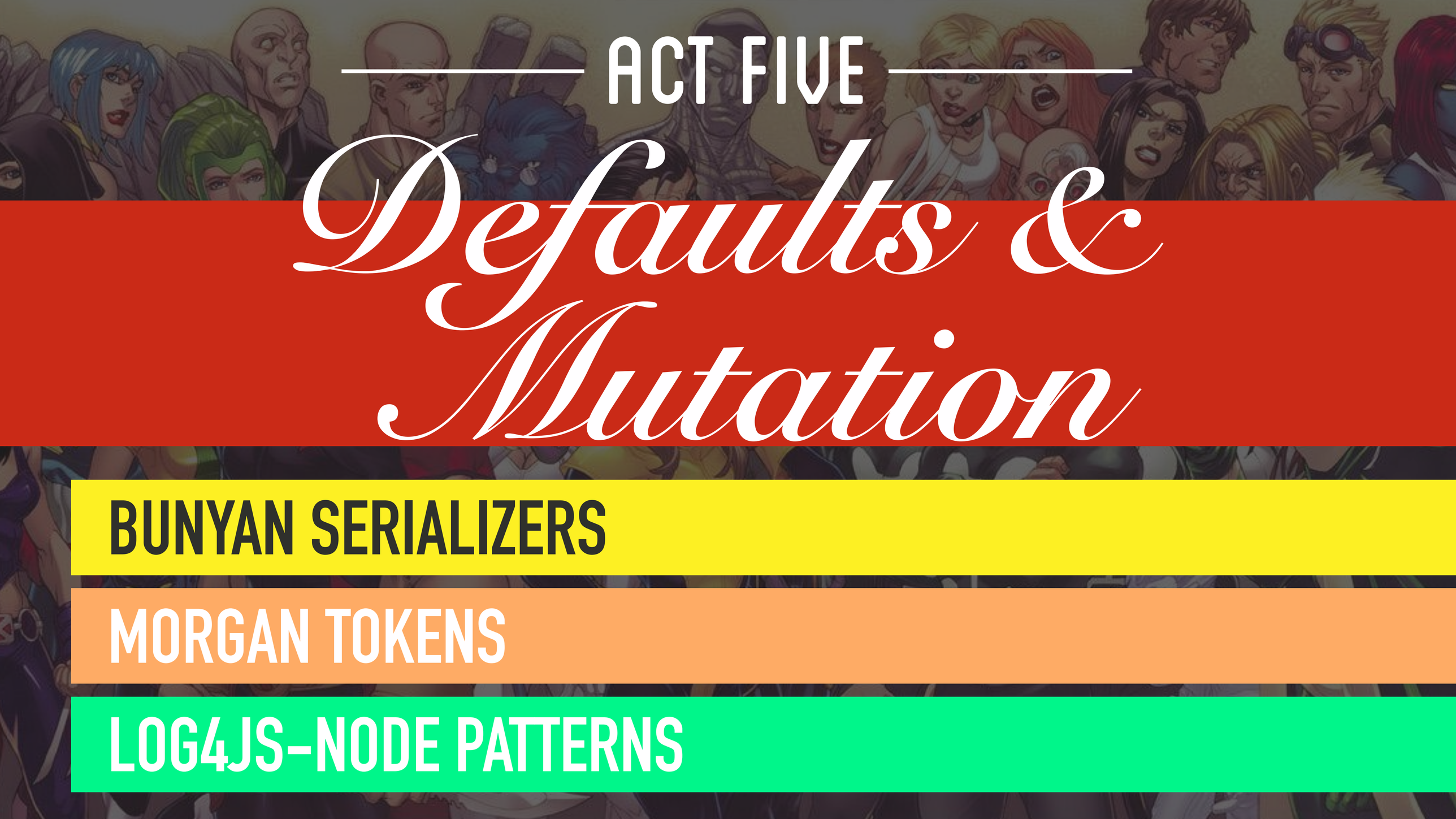
Serialization & Filtering

JSON, COLORING, PRETTYPRINTING, ALIGNMENT,

CUSTOM FORMATTING, TIMESTAMPS & SO SO MUCH MORE

ACT FIVE

Defaults & Mutation


ACT FIVE
Defaults & Mutation
BUNYAN SERIALIZERS
MORGAN TOKENS
LOG4JS-NODE PATTERNS

OPTIONS HELL IS


OPTIONS HELL IS
AT LEAST THE
FIFTH CIRCLE
OF
PROGRAMMING HELL

COMMON.LOG

```
//
// ### function log (options)
// #### @options {Object} All information about the log serialization.
// Generic logging function for returning timestamped strings
// with the following options:
//
//    {
//      level:     'level to add to serialized message',
//      message:   'message to serialize',
//      meta:      'additional logging metadata to serialize',
//      colorize:  false, // Colorizes output (only if `.json` is false)
//      align:     false  // Align message level.
//      timestamp: true   // Adds a timestamp to the serialized message
//      label:     'label to prepend the message'
//    }
//
exports.log = function (options) {
  var timestampFn = typeof options.timestamp === 'function'
        ? options.timestamp
        : exports.timestamp,
      timestamp   = options.timestamp ? timestampFn() : null,
      showLevel   = options.showLevel === undefined ? true : options.showLevel,
      meta        = options.meta !== null && options.meta !== undefined && !(options.meta instanceof Error)
        ? exports.clone(options.meta)
        : options.meta || null,
      output;
```

```
//
// ### function log (options)
// #### @options {Object} All information about the log serialization.
// Generic logging function for returning timestamped strings
// with the following options:
//
//    {
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//      colorize:  false, // Colorizes output (only if `.json` is false)
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exports.log = function (options) {
  var timestampFn = typeof options.timestamp === 'function'
        ? options.timestamp
        : exports.timestamp,
      timestamp   = options.timestamp ? timestampFn() : null,
      showLevel   = options.showLevel === undefined ? true : options.showLevel,
      meta        = options.meta !== null && options.meta !== undefined && !(options.meta instanceof Error)
        ? exports.clone(options.meta)
        : options.meta || null,
      output;
```
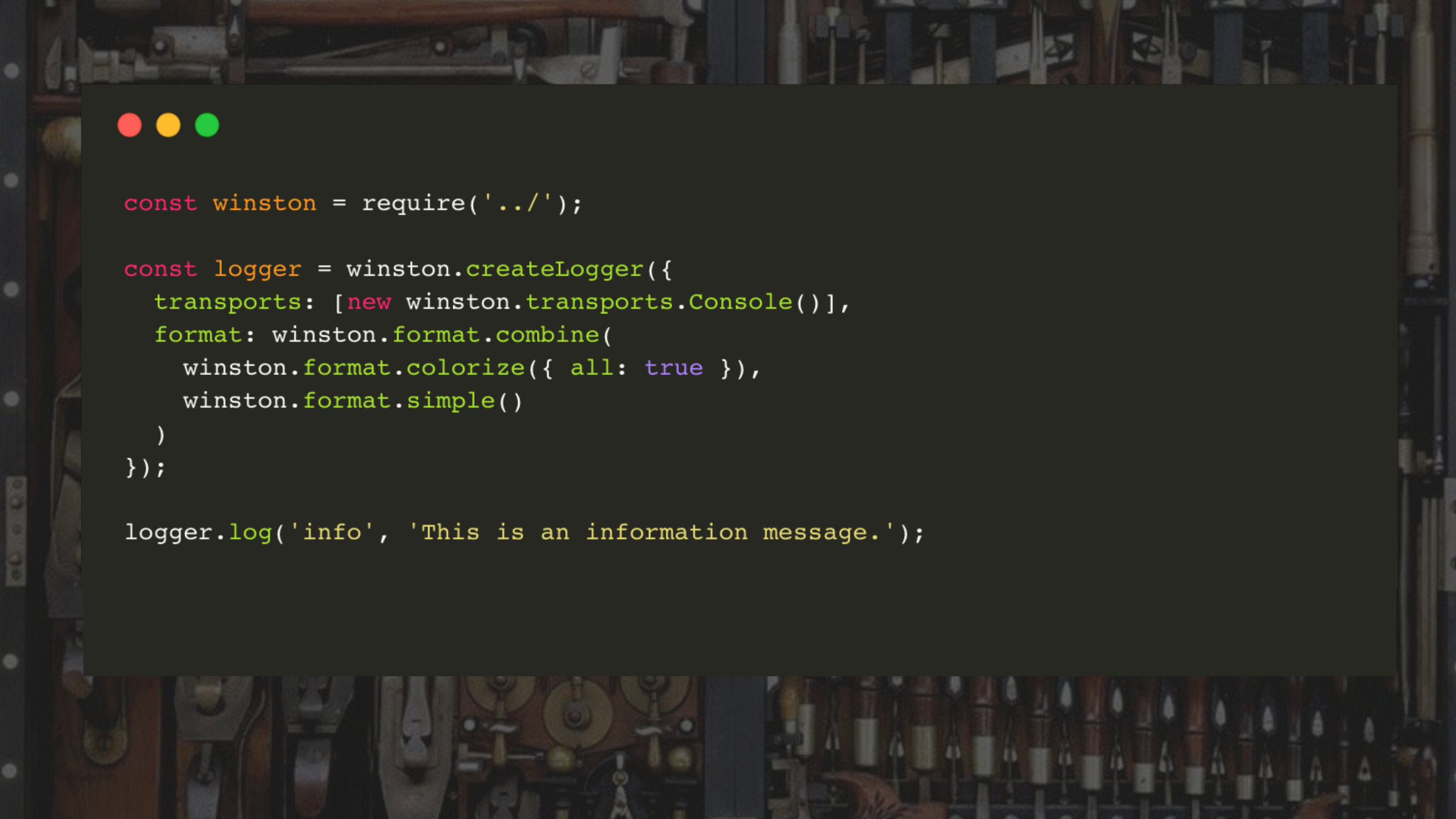

```
/* from: lib/winston2/transports/console.js */

var output = common.log({
  colorize:     this.colorize,
  json:         this.json,
  level:        level,
  message:      msg,
  meta:         meta,
  stringify:    this.stringify,
  timestamp:    this.timestamp,
  showLevel:    this.showLevel,
  prettyPrint: this.prettyPrint,
  raw:          this.raw,
  label:        this.label,
  logstash:     this.logstash,
  depth:        this.depth,
  formatter:    this.formatter,
  align:        this.align,
  humanReadableUnhandledException: this.humanReadableUnhandledException
});

if (this.stderrLevels[level]) {
  process.stderr.write(output + this.eol);
} else {
  process.stdout.write(output + this.eol);
}
```

THIS IS OPTIONS HELL

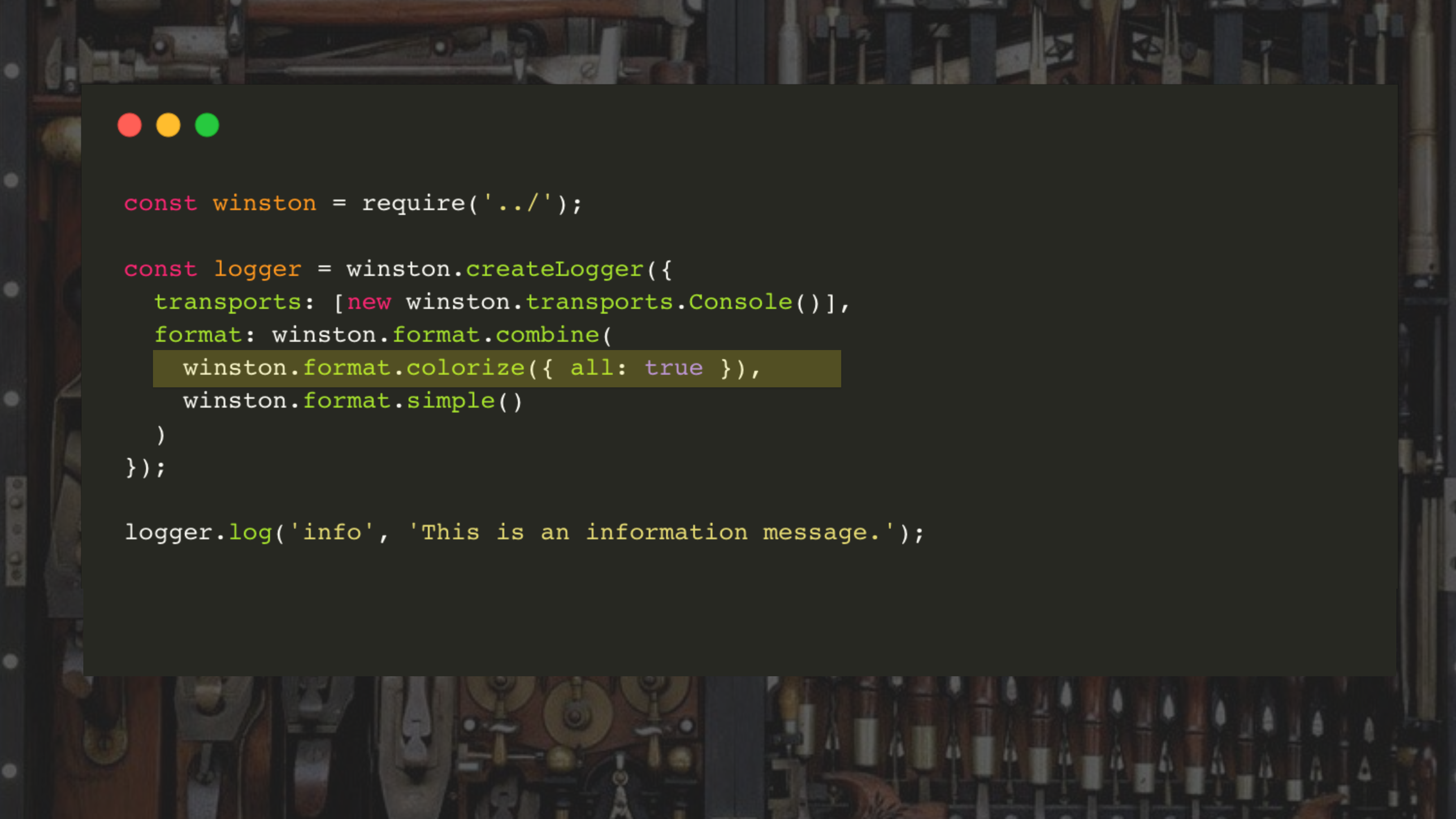
```
var output = common.log({
  colorize:     this.colorize,
  json:         this.json,
  level:        level,
  message:      msg,
  meta:         meta,
  stringify:    this.stringify,
  timestamp:    this.timestamp,
  showLevel:    this.showLevel,
  prettyPrint: this.prettyPrint,
  raw:          this.raw,
  label:        this.label,
  logstash:     this.logstash,
  depth:        this.depth,
  formatter:    this.formatter,
  align:        this.align,
  humanReadableUnhandledException: this.humanReadableUnhandledException
});
```

```
if (this.stderrLevels[level]) {
  process.stderr.write(output + this.eol);
} else {
  process.stdout.write(output + this.eol);
}
```


INTRODUCE
FORMATS



```
const winston = require('../');

const logger = winston.createLogger({
  transports: [new winston.transports.Console()],
  format: winston.format.combine(
    winston.format.colorize({ all: true }),
    winston.format.simple()
  )
});

logger.log('info', 'This is an information message.');
```



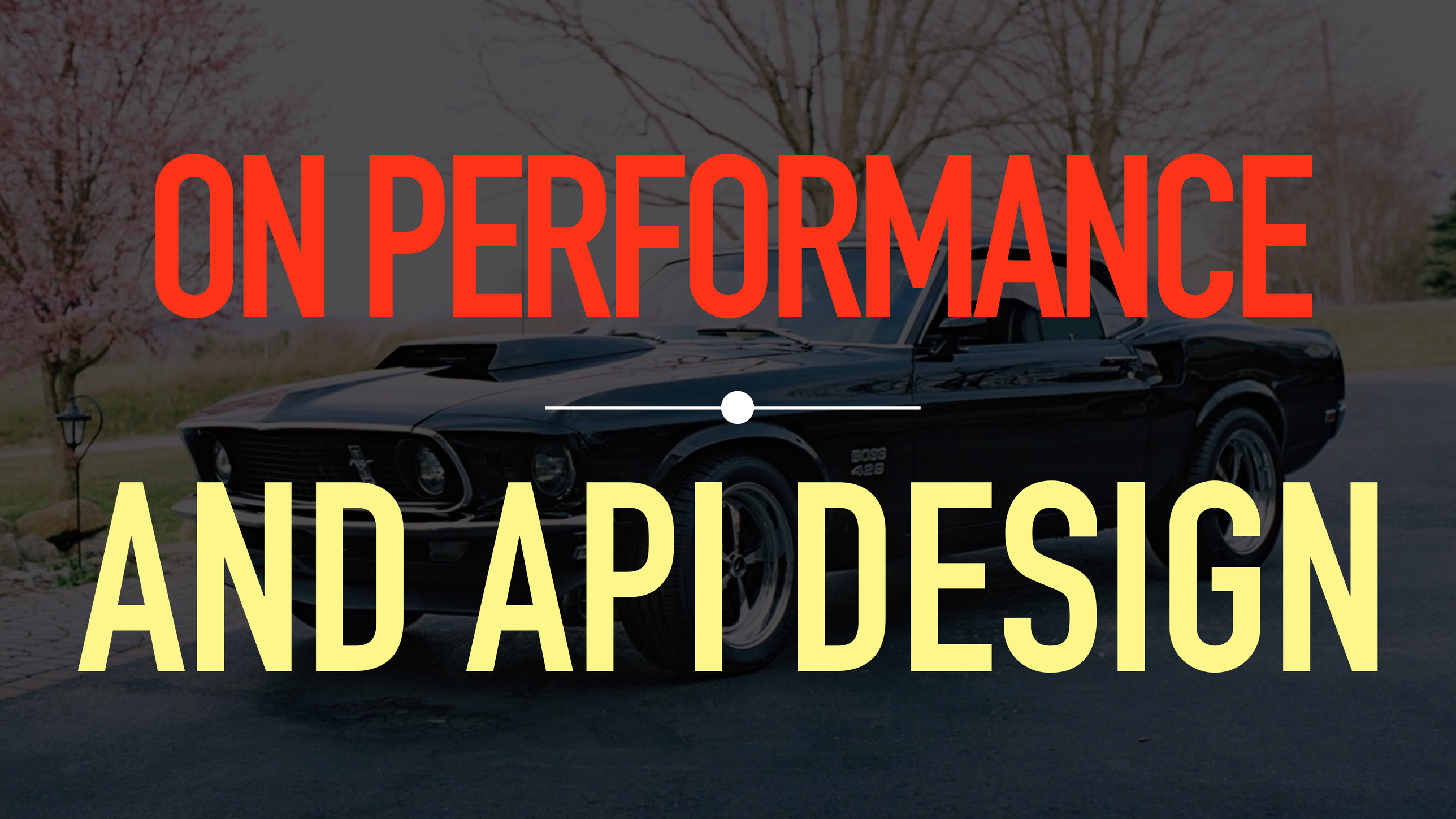
```
const winston = require('../');

const logger = winston.createLogger({
  transports: [new winston.transports.Console()],
  format: winston.format.combine(
    winston.format.colorize({ all: true }),
    winston.format.simple()
  )
});

logger.log('info', 'This is an information message.');
```

```
/* from: lib/winston2/transports/console.js */

var output = common.log({
  colorize:    this.colorize,
  json:        this.json,
  level:       level,
  message:     msg,
  meta:        meta,
  stringify:   this.stringify,
  timestamp:   this.timestamp,
  showLevel:   this.showLevel,
  prettyPrint: this.prettyPrint,
  raw:         this.raw,
  label:       this.label,
  logstash:    this.logstash,
  depth:       this.depth,
  formatter:   this.formatter,
  align:       this.align,
  humanReadableUnhandledException: this.humanReadableUnhandledException
});

if (this.stderrLevels[level]) {
  process.stderr.write(output + this.eol);
} else {
  process.stdout.write(output + this.eol);
}
```

```
/* from: lib/winston3/transports/console.js */

if (this.stderrLevels[info[LEVEL]]) {
  process.stderr.write(info[MESSAGE] + this.eol);
  if (callback) { callback(); }
  return;
}

process.stdout.write(info[MESSAGE] + this.eol);
if (callback) { callback(); }
```

A LA CARTE. PAY FOR WHAT YOU USE.

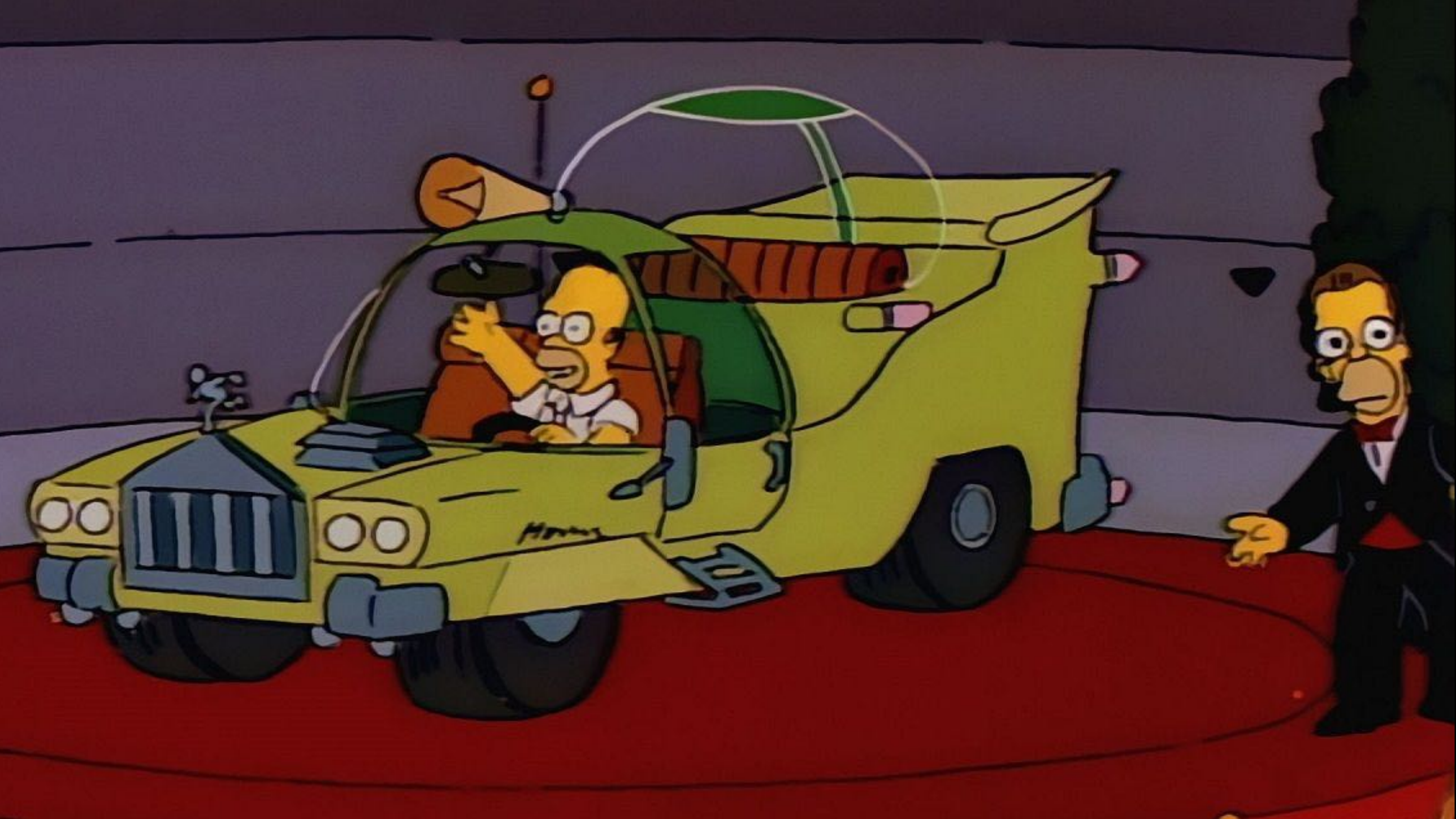

BOSS
429


ON PERFORMANCE
AND API DESIGN


GTO

IT TURNS OUT


IT TURNS OUT
PERFORMANCE
IS SIMPLY
NOT EVERYTHING




DEVELOPERS
WANT
THE
THE HOMER CAR

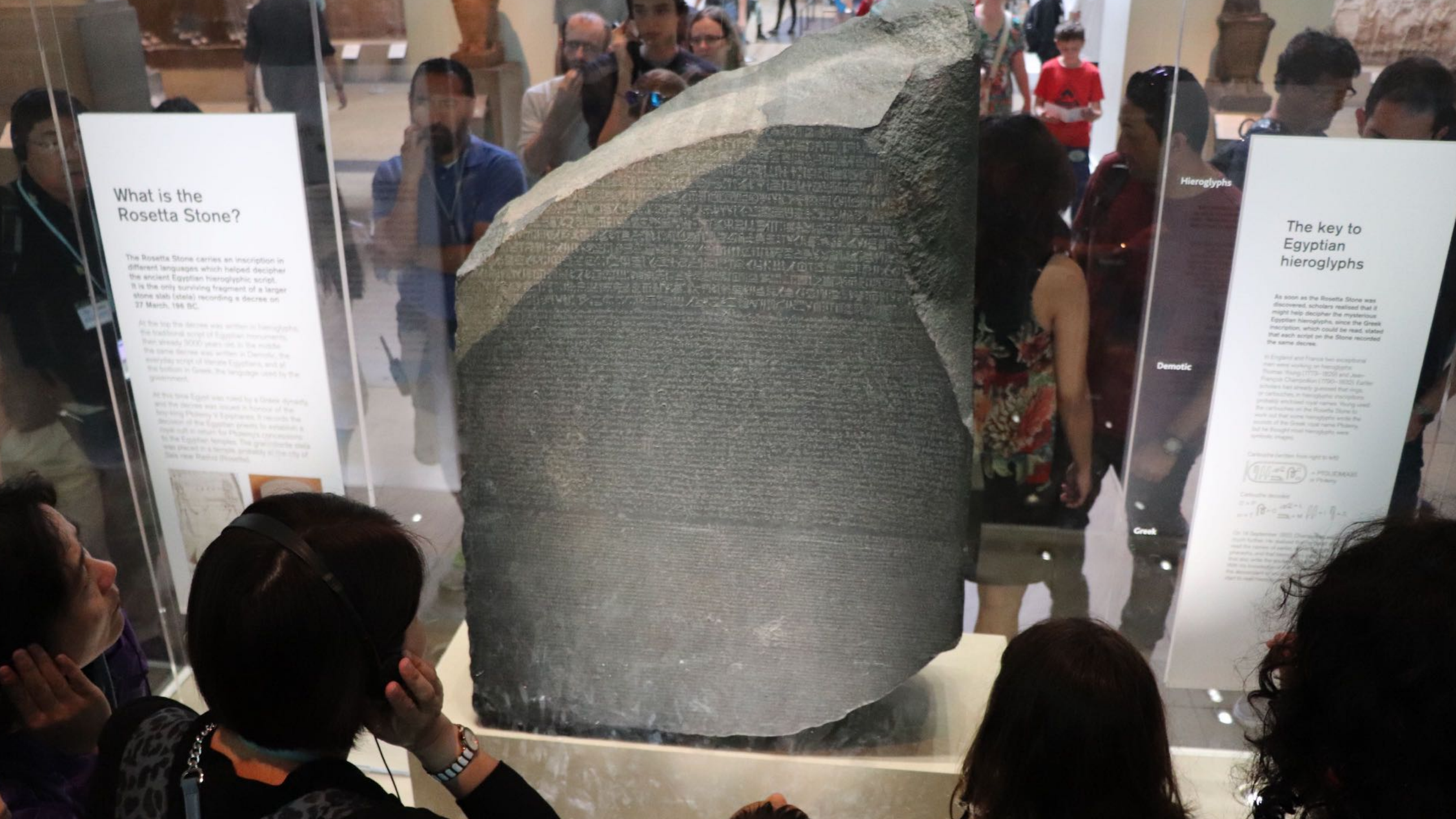

DEFINE
YOUR OWN
FORMATS

```
/* winston.formats.colorize */

/*
 * function transform (info, opts)
 * Attempts to colorize the { level, message } of the given
 * `logform` info object.
 */
Colorizer.prototype.transform = function transform(info, opts) {
  var level = info.level;

  if (opts.level || opts.all || !opts.message) {
    info.level = this.colorize(level);
  }

  if (opts.all || opts.message) {
    info.message = this.colorize(level, info.message);
  }

  return info;
};
```

```
const { inspect } = require('util');
const { format } = require('winston');
const MESSAGE = Symbol.for('message');

/*
 * function prettyPrint (info)
 * Returns a new instance of the prettyPrint Format that "prettyPrint"
 * serializes `info` objects. This was previously exposed as
 * { prettyPrint: true } to transports in `winston < 3.0.0`.
 */
module.exports = format(function (info, opts) {
  info[MESSAGE] = inspect(info, false, opts.depth || null, opts.colorize);
  return info;
});
```

```
const { format } = require('winston');
const MESSAGE = Symbol.for('message');

/*
 * function json (info)
 * Returns a new instance of the JSON format that turns a log `info`
 * object into pure JSON. This was previously exposed as { json: true }
 * to transports in `winston < 3.0.0`.
 */
module.exports = format(function (info, opts) {
  info[MESSAGE] = JSON.stringify(info, opts.replacer || replacer, opts.space);
  return info;
});

/*
 * function replacer (key, value)
 * Handles proper stringification of Buffer output.
 */
function replacer(key, value) {
  return value instanceof Buffer
    ? value.toString('base64')
    : value;
```


NOT AS
EASY AS
IT LOOKS


What is the Rosetta Stone?
The Rosetta Stone carries an inscription in different languages which helped decipher the ancient Egyptian hieroglyphic script. It is the only surviving fragment of a larger stone slab (stela) recording a decree on 27 March, 196 BC.
At the top the decree was written in hieroglyphs, the traditional script of Egyptian monuments, then already 3000 years old. In the middle the same decree was written in Demotic, the everyday script of literate Egyptians, and at the bottom in Greek, the language used by the government.
At this time Egypt was ruled by a Greek dynasty and the decree was issued in honour of the boy-king Ptolemy V Epiphanes. It records the decision of the Egyptian priests to establish a royal cult in return for Ptolemy's concessions to the Egyptian temples. The granodiorite stela was placed in a temple, probably in the city of Sais near Rashid (Rosetta).
Hieroglyphs
Demotic
Greek
The key to Egyptian hieroglyphs
As soon as the Rosetta Stone was discovered, scholars realised that it might help decipher the mysterious Egyptian hieroglyphs, since the Greek inscription, which could be read, stated that each script on the Stone recorded the same decree.
In England and France two exceptional men were working on hieroglyphs: Thomas Young (1773–1829) and Jean-François Champollion (1790–1832). Earlier scholars had already guessed that rings, or cartouches, in hieroglyphic inscriptions probably enclosed royal names. Young used the cartouches on the Rosetta Stone to work out that some hieroglyphs spelled the sounds of the Greek royal name Ptolemy, but he thought most hieroglyphs were symbolic images.
Cartouche (written from right to left)
= PTOLEMAIOS in Ptolemy
Cartouche decoded

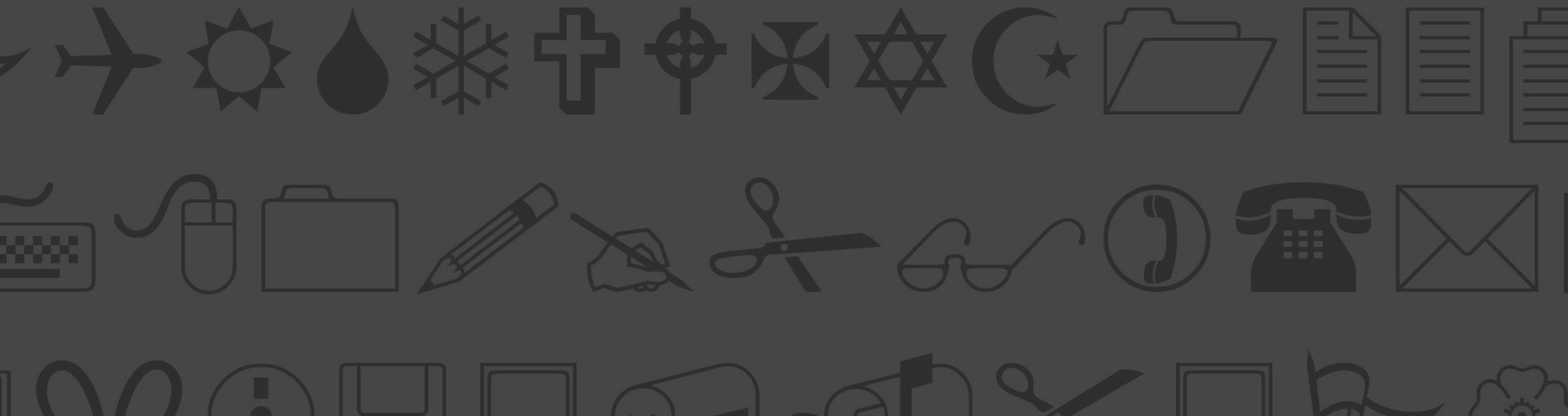

What is the Rosetta Stone?
Hieroglyphs
Demotic
Greek
The key to Egyptian hieroglyphs

ES6 SYMBOLS


SYMBOLS!
ES6 SYMBOLS
EVERYWHERE

ES6 SYMBOLS

```
const LEVEL = Symbol.for('level');      // Treated as immutable for priorities
const MESSAGE = Symbol.for('message'); // Final serialized output
```



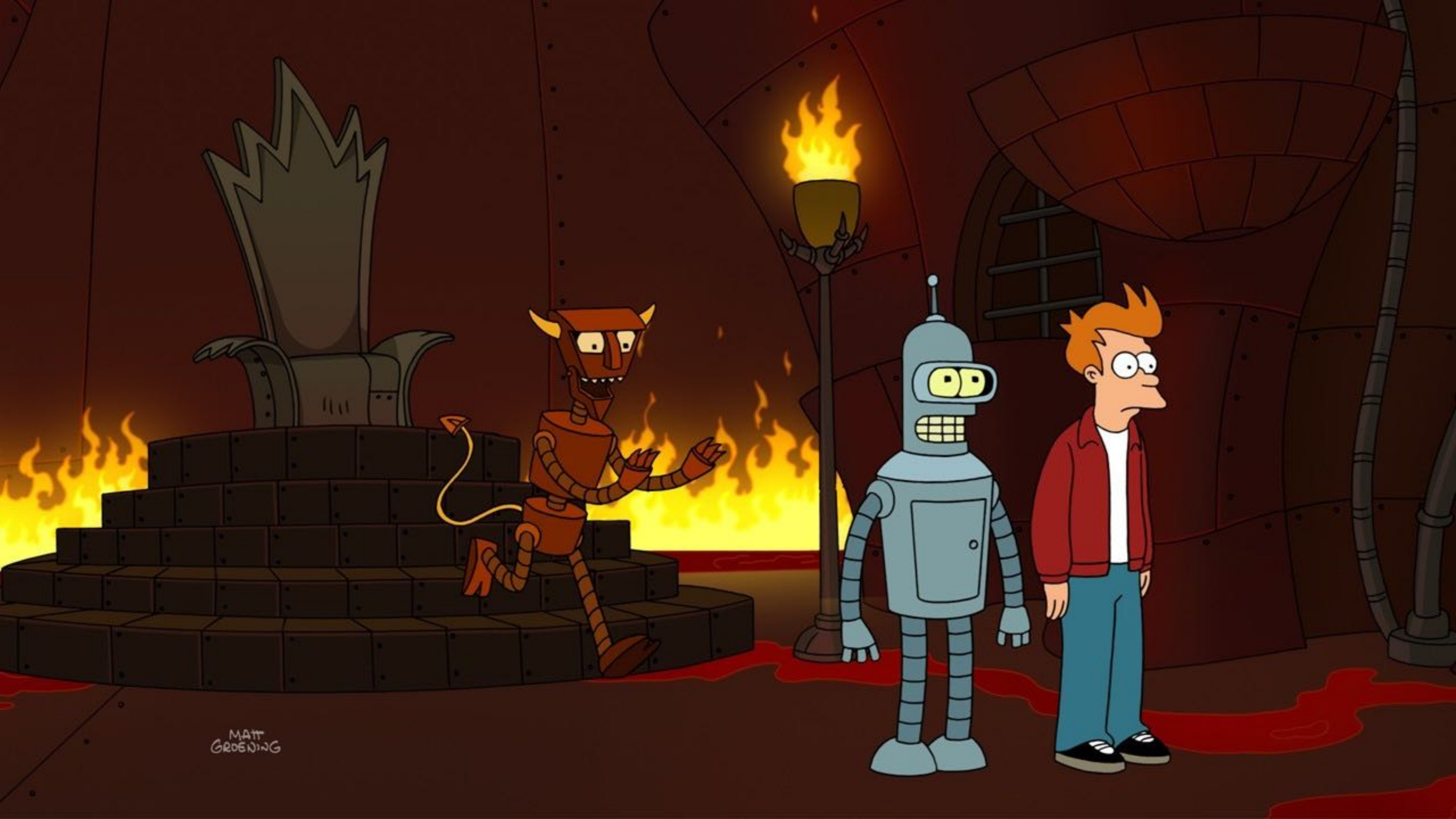
ES6 SYMBOLS

```
const LEVEL = Symbol.for('level');      // Treated as immutable for priorities
const MESSAGE = Symbol.for('message'); // Final serialized output
```

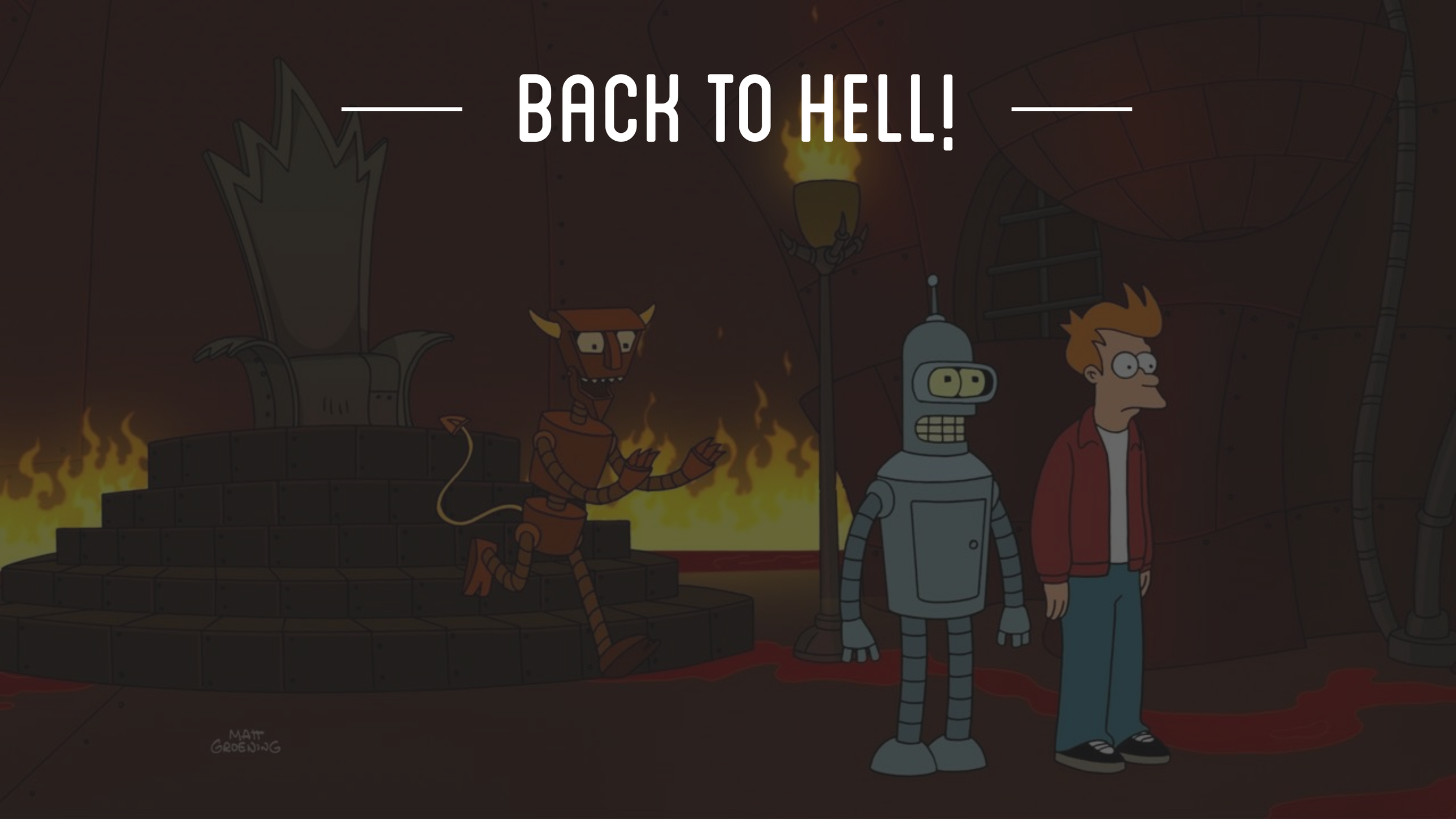
LESS MEMORY OVERHEAD

NON-ENUMERABLE / SEMI-PRIVATE

WILL NOT APPEAR IN DEFAULT JSON.STRINGIFY

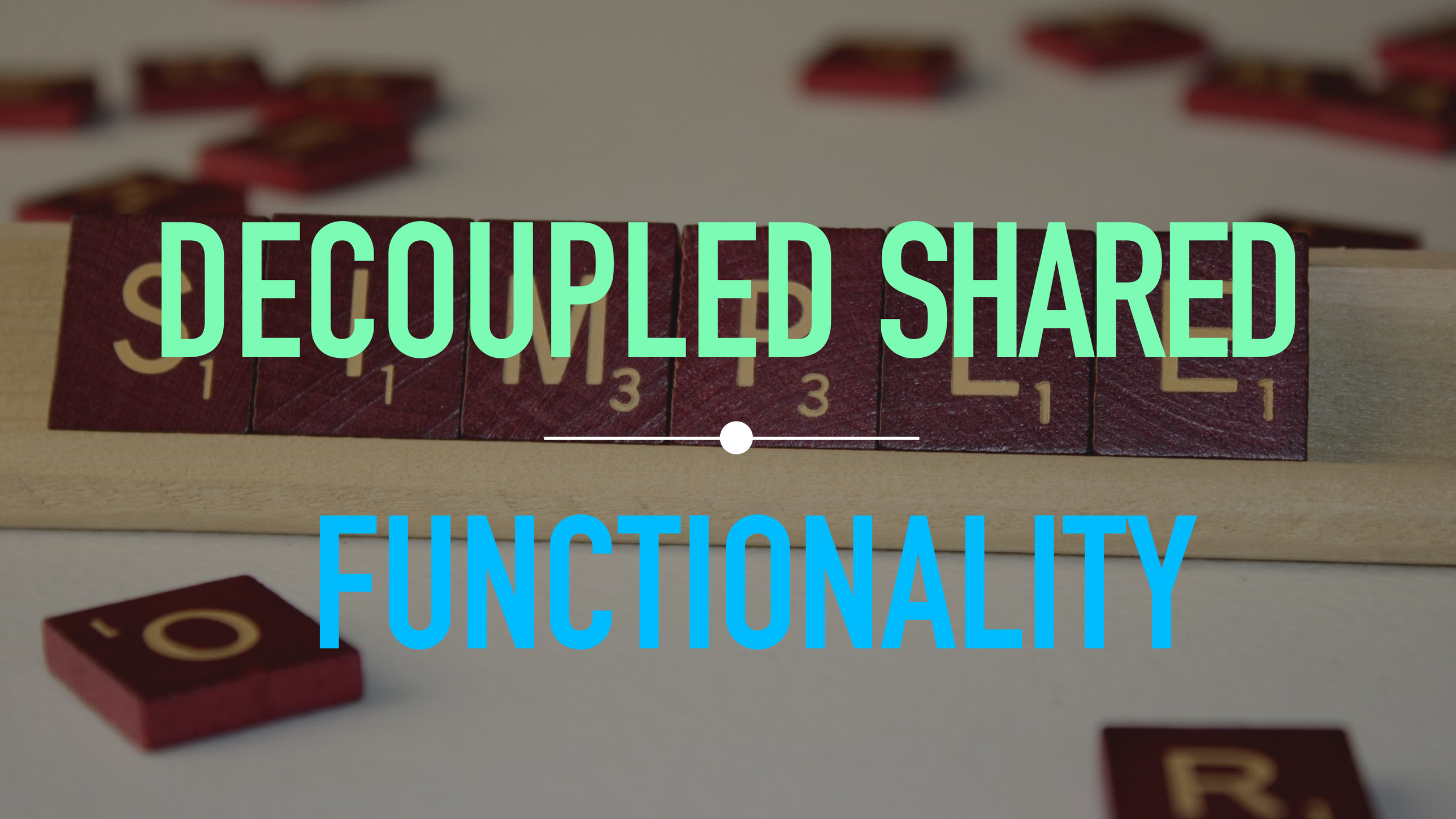

MATT
GROENING

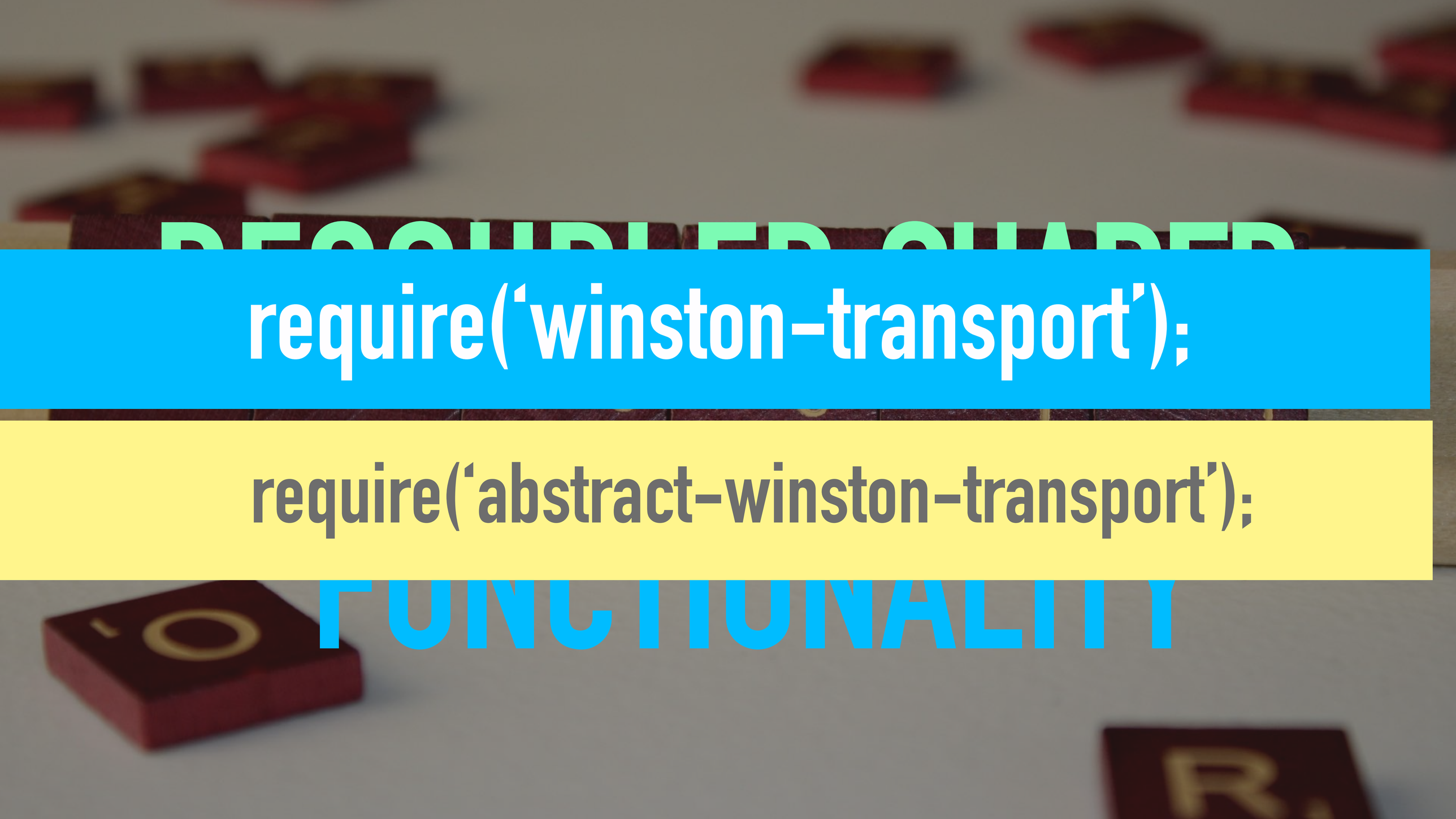
BACK TO HELL!

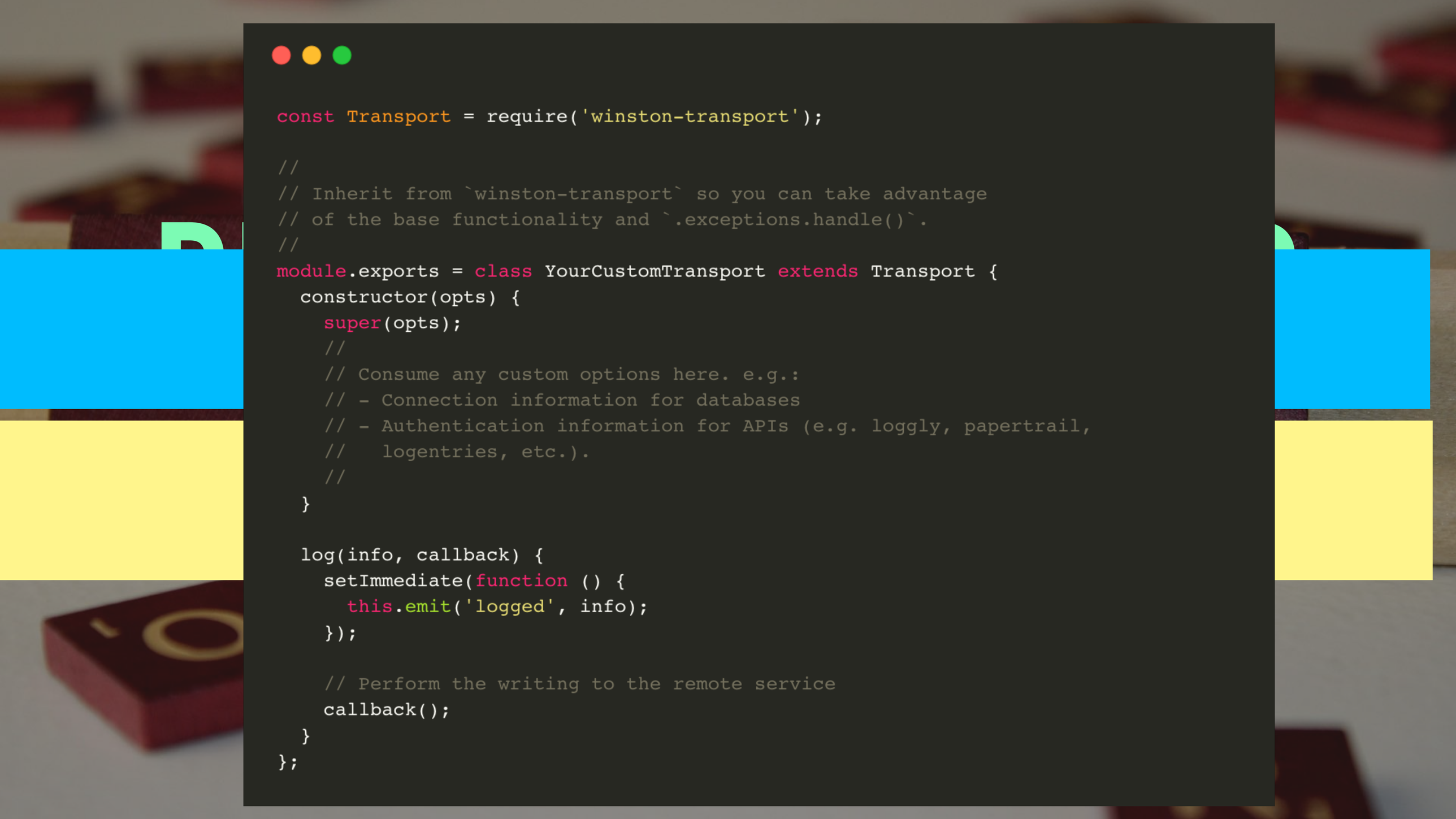



BACK TO HELL!
COUPLING IS
THE NINTH CIRCLE
OF
PROGRAMMING HELL


SIMPLE


DECOUPLED SHARED
FUNCTIONALITY


require('winston-transport');
require('abstract-winston-transport');



```
const Transport = require('winston-transport');

//
// Inherit from `winston-transport` so you can take advantage
// of the base functionality and `.exceptions.handle()`.
//
module.exports = class YourCustomTransport extends Transport {
  constructor(opts) {
    super(opts);
    //
    // Consume any custom options here. e.g.:
    // - Connection information for databases
    // - Authentication information for APIs (e.g. loggly, papertrail,
    //   logentries, etc.).
    //
  }

  log(info, callback) {
    setImmediate(function () {
      this.emit('logged', info);
    });

    // Perform the writing to the remote service
    callback();
  }
};
```


/**
* winston.format and winston.addColors are
* a part of logform. All of winston's formatting
* is decoupled from winston itself.
*/
const { format, levels } = require('logform');
winston.format = format;
winston.addColors = levels;
require('logform')


BACKWARDS
COMPATABILITY

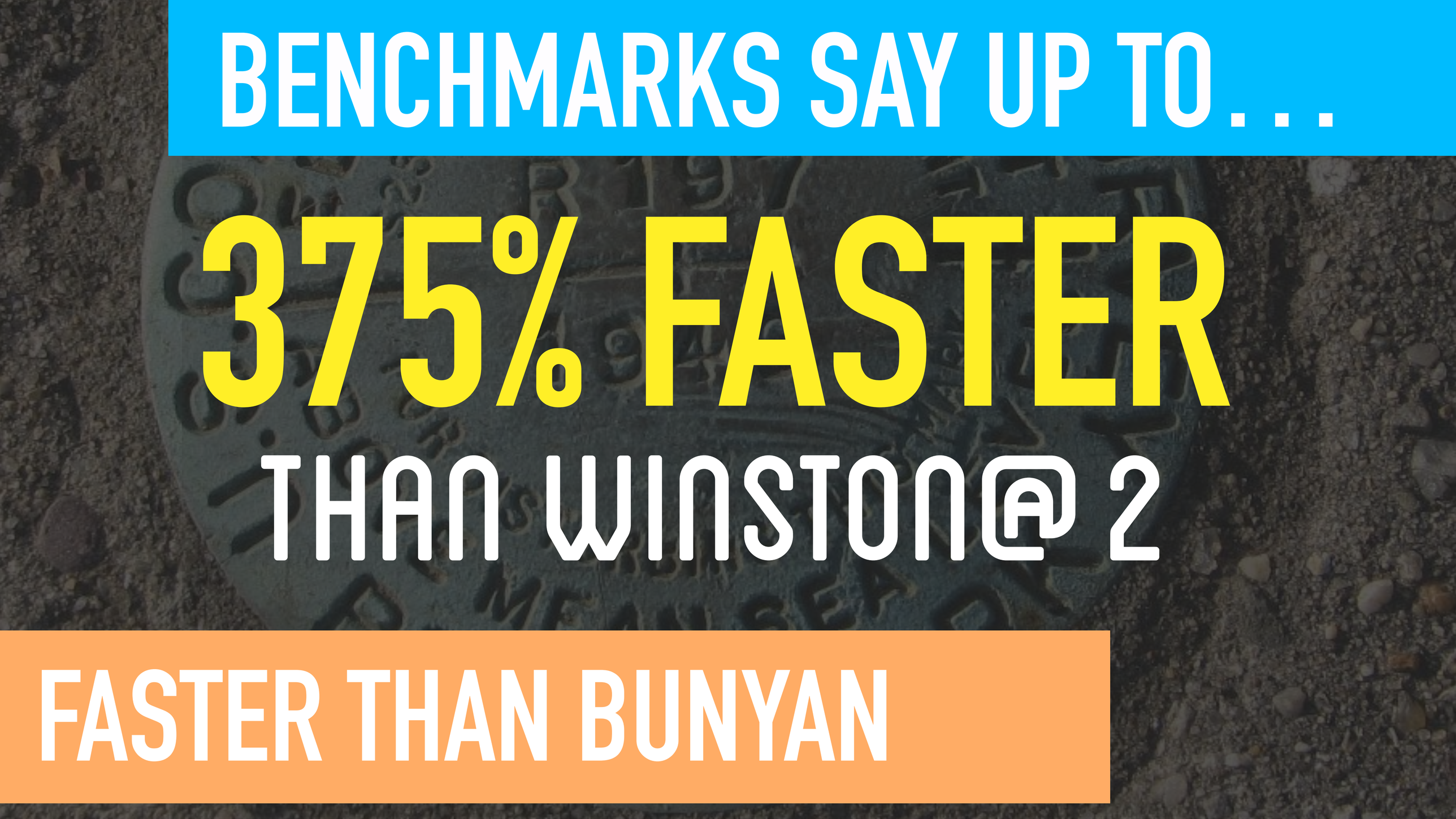
require('winston-compat'):

common.log

winston.transports.Transport

Old vows-based test macros

BENCHMARKS SAY UP TO . . .


BENCHMARKS SAY UP TO...
375% FASTER
THAN WINSTON@ 2
FASTER THAN BUNYAN


ACTIVELY SEEKING
NEW MAINTAINERS


ACTIVELY SEEKING
NEW MAINTAINERS
YES! THAT MEANS YOU!
SHOULD JOIN WINSTON

npm install winston@next