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# RHINOCEROS ON THE LOOSE

APPLIED REAL-WORLD PROJECTS WITH  
JAVA AND JAVASCRIPT

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SOLUTIONS ARCHITECT, HAZELCAST

DEVNEXUS, ATLANTA, GA 2015

**“MAY YOU LIVE IN INTERESTING  
TIMES”**

**CHINESE CURSE**

# WHY YOU'RE HERE

★YOU'RE EXCITED ABOUT JDK8 FEATURES



# WHY YOU'RE HERE

- ★ YOU'RE EXCITED ABOUT JDK8 FEATURES
- ★ JAVASCRIPT ENTHUSIAST



*Bit of both.*

# WHY YOU'RE HERE

- ★ YOU'RE EXCITED ABOUT JDK8 FEATURES
- ★ JAVASCRIPT ENTHUSIAST
- ★ YOU NEED TO RUN JS AND JAVA SIDE-BY-SIDE

I NEED DIS



# WHO IS TALKING?

★SOLUTIONS ARCHITECT AND CONSULTANT



THE LEADING OPEN SOURCE IN-MEMORY DATA GRID

# WHO IS TALKING?

- ★ SOFTWARE ENGINEER AND CONSULTANT
- ★ CO-AUTHOR AND JUG CO-LEAD

# DO YOU EVEN JAVASCRIPT ?



*Building HTML5 Applications: From Desktop to Mobile*



# Enterprise Web Development

O'REILLY®

*Yakov Fain, Victor Rasputnis,  
Anatole Tartakovsky & Viktor Gamov*

# AVAILABLE IN STORES



[HTTP://ENTERPRISEWEBBOOK.COM](http://ENTERPRISEWEBBOOK.COM)

[HTTP://ENTERPRISEWEBBOOK.COM](http://ENTERPRISEWEBBOOK.COM)

I NEED DIS



# PART ONE

# PART ONE

# JAVASCRIPT FOR JAVA DEVELOPERS

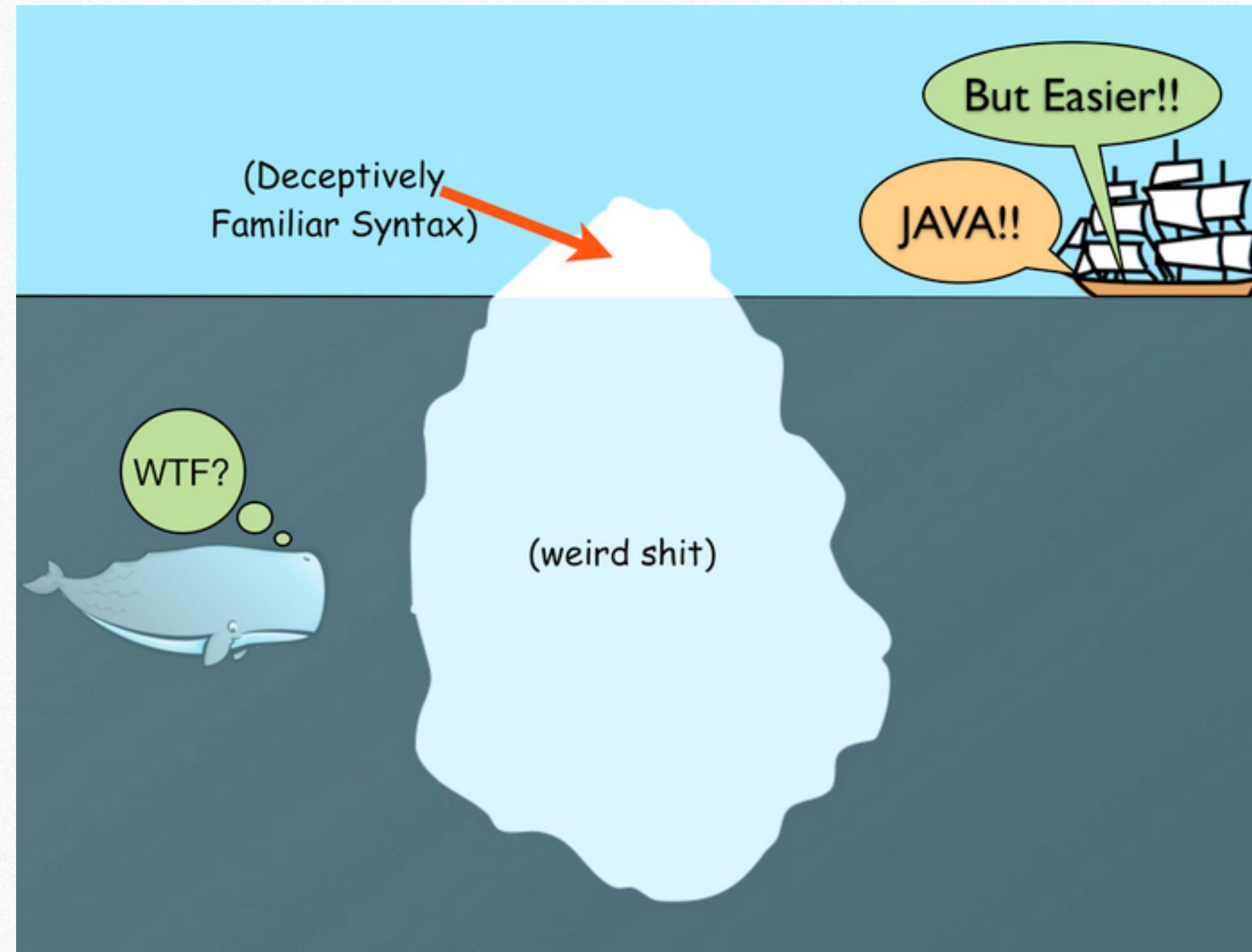
# NOT-SO-DISTANT PAST



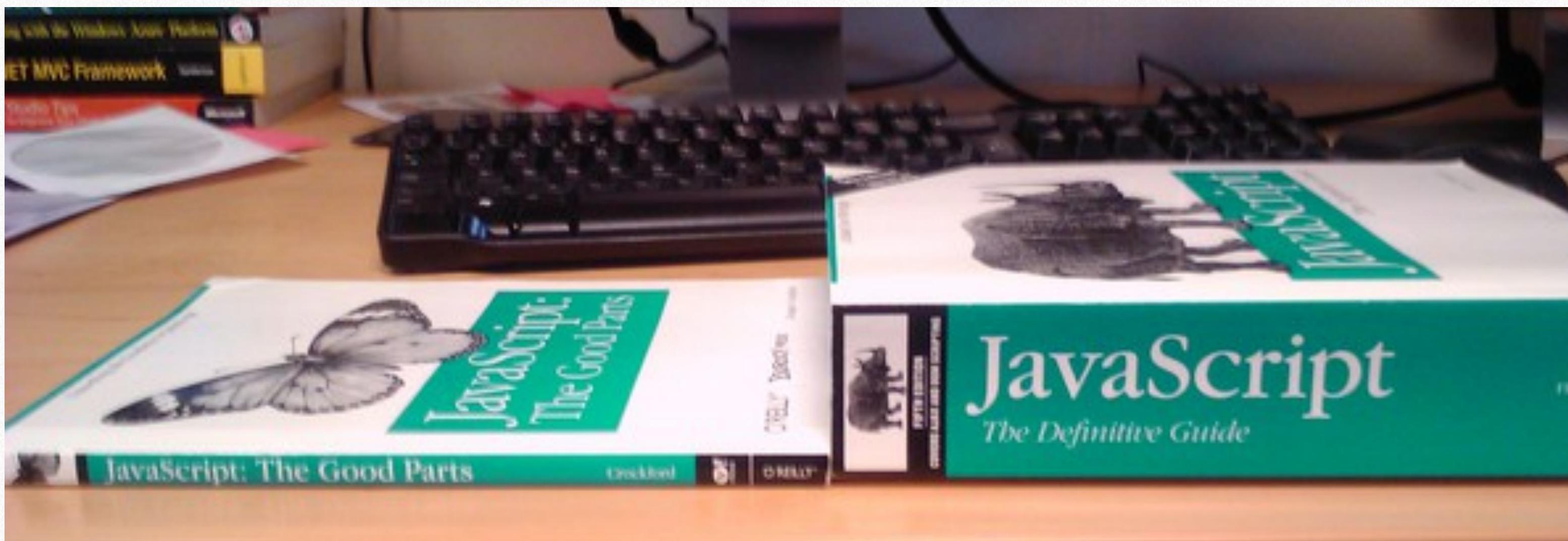
I DON'T CARE

JAVA DEVS ABOUT JAVASCRIPT

# EVERYBODY KNOWS HOW TO JAVASCRIPT



# MANY GOOD PARTS



# PRESENT



# JAVA DEVS ABOUT JAVASCRIPT

# OBJECTS

```
var obj = {};
```

```
var obj2 = {prop: 42};
```

```
// Store the data about Fox Mulder
var person = {
  lastName: "Fox",
  firstName: "Mulder",
  age: 53
};
```

# FUNCTIONS

```
// Declaring function
function calcTaxes(income, dependent){
    // do stuff
}

// Assigning function literal to a variable
var calcTaxes = function (income, dependent){
    // do stuff
};

// Invoking function
calcTaxes(5000, 2);
var myTaxes = calcTaxes(5000, 2);

// declaration and invocation at the same time
// IIFE - immediate invoked function expression
(function calcTaxes(income, dependent){
    // do stuff
})();
```

# ASSIGNING A FUNCTION TO OBJECT PROPERTY

```
person.doTaxes = function (income, dependent) {  
    // do stuff  
};
```

```
person.doTaxes(5000, 2);
```

# OBJECT METHODS IN LITERALS

```
var person2 = {  
    lastName: "Fox",  
    firstName: "Mulder",  
    age: 53,  
    doTaxes: function (income, dependent) {  
        // do stuff  
    }  
};
```

```
person2.doTaxes(5000, 2);
```

# CONSTRUCTOR FUNCTION

```
function Tax(income, dependents) {  
    // Do something here  
}  
  
// Creating 2 Tax objects  
var t1 = new Tax(50000, 3);  
var t2 = new Tax(68000, 1);
```



# PROTOTYPE

```
// Constructor function Person
function Person(name, title) {
    this.name = name;
    this.title = title;
    this.subordinates = [];
}

// Constructor function Employee
function FbiAgent(name, title) {
    this.name = name;
    this.title = title;
}

FbiAgent.prototype = new Person();

var emp = new FbiAgent("Dana Scully", "Special Agent");
```

```
print(3[3]);
```



YOU'VE GOT TO  
**BE KIDDING ME.**

Mykakes tumble

```
Number.prototype[3] = "DevNexus";
```

```
print(3[3]);
```



[WWW.DESTROYALLSOFTWARE.COM/TALKS/WAT](http://WWW.DESTROYALLSOFTWARE.COM/TALKS/WAT)

# PART TWO

## PART TWO

NASHORN: JSR-233 AND BEYOND

# JAVASCRIPT IS EVERYWHERE

- ★ V8 AND NODEJS
- ★ RHINO WAS HERE FOR YEARS
- ★ HERE COMES NASHORN

# WHAT IS NASHORN?

# WHAT IS NASHORN?

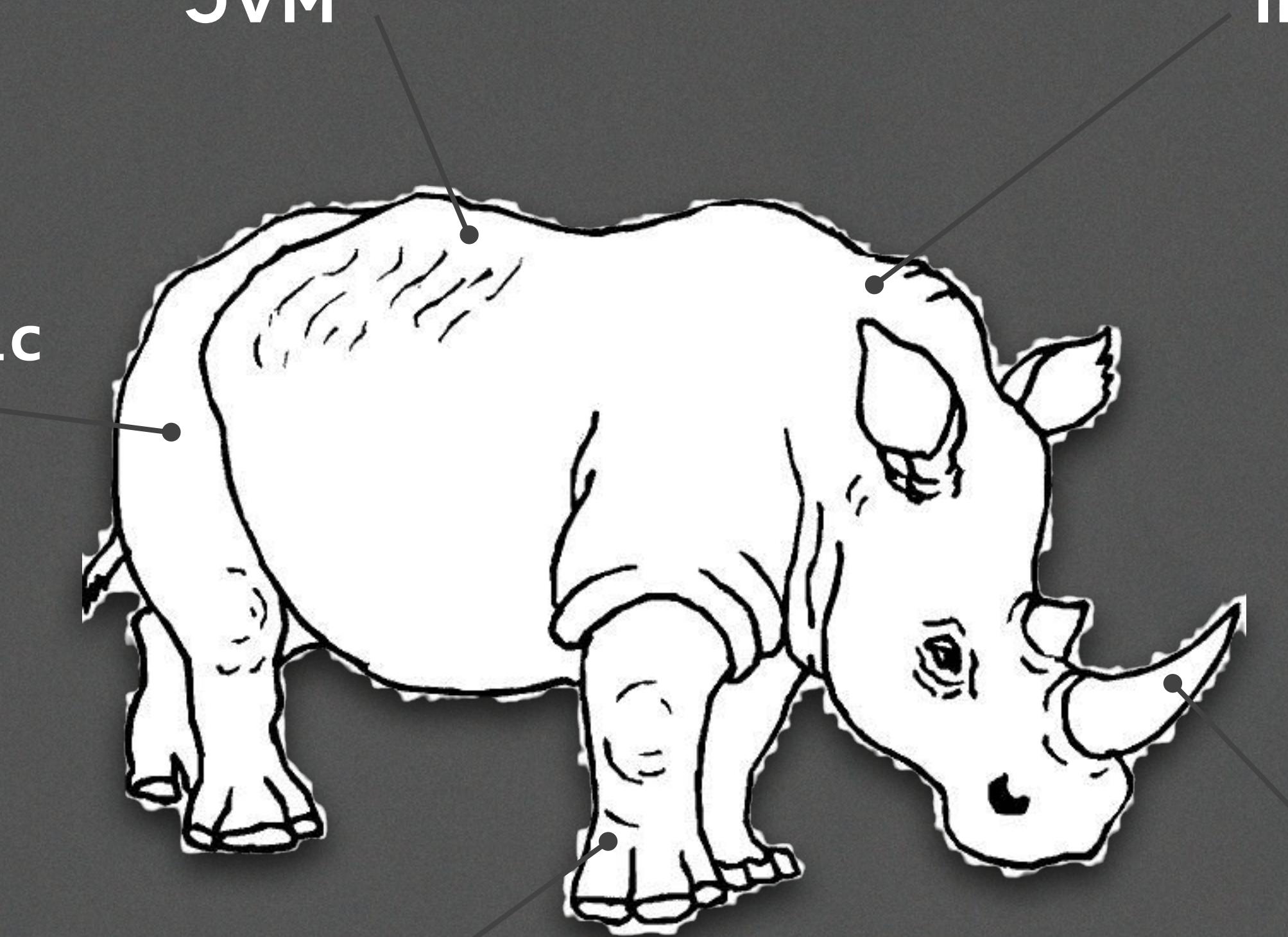
JAVASCRIPT ENGINE FOR  
JVM

100% PURE JAVA  
IMPLEMENTATION

ULTIMATE `invokedynamic`  
CONSUMER

100% COMPILED TO  
BYTECODE,  
NO INTERPRETER

100% ECMASCIPT 5.1  
COMPLIANT



# HOW TO USE NASHORN?

- ★ THE ONLY API IS JSR-223: `javax.scripting.*`
- ★ JAVA FROM JAVASCRIPT AND VICE VERSA
- ★ CREATE AND MANIPULATE JAVA/JAVASCRIPT OBJECTS
- ★ EXTEND JAVA CLASSES
- ★ IMPLEMENT JAVA INTERFACES

```
ScriptEngineManager factory = new ScriptEngineManager();
ScriptEngine engine = factory.getEngineByName("nashorn");

engine.eval("Number.prototype[3] = "DevNexus"; print(3[3]);")
```

[HTTPS://BLOGS.ORACLE.COM/NASHORN/ENTRY/IMPROVING\\_NASHORN\\_STARTUP\\_TIME\\_USING](HTTPS://BLOGS.ORACLE.COM/NASHORN/ENTRY/IMPROVING_NASHORN_STARTUP_TIME_USING)

```
String[] options =  
    new String[] {  
        "--persistent-code-cache",  
        "--class-cache-size=50",  
        "-no-java"; *}
```

```
NashornScriptEngineFactory factory = new NashornScriptEngineFactory();  
NashornScriptEngine engine =  
    (NashornScriptEngine) factory.getScriptEngine(options);
```

```
engine.eval("Number.prototype[3] = 'DevNexus'; print(3[3]);");
```

\* jjs -xhelp

## PARAMETER OVERLOADING

```
var System = Java.type('java.lang.System');
System.out.println(10);                                // 10
System.out["println"](11.0);                            // 11.0
System.out["println(double)"](12);                      // 12.0
```

## WHEREIS

```
print(__FILE__, __LINE__, __DIR__);
```

## LOAD SCRIPTS

```
//load('http://cdnjs.cloudflare.com/ajax/libs/underscore.js/1.6.0/underscore-min.js');
load('./lib/underscore-min.js');

var odds = _.filter([1, 2, 3, 4, 5, 6], function (num) {
  return num % 2 == 1;
});

print(odds); // 1, 3, 5
```

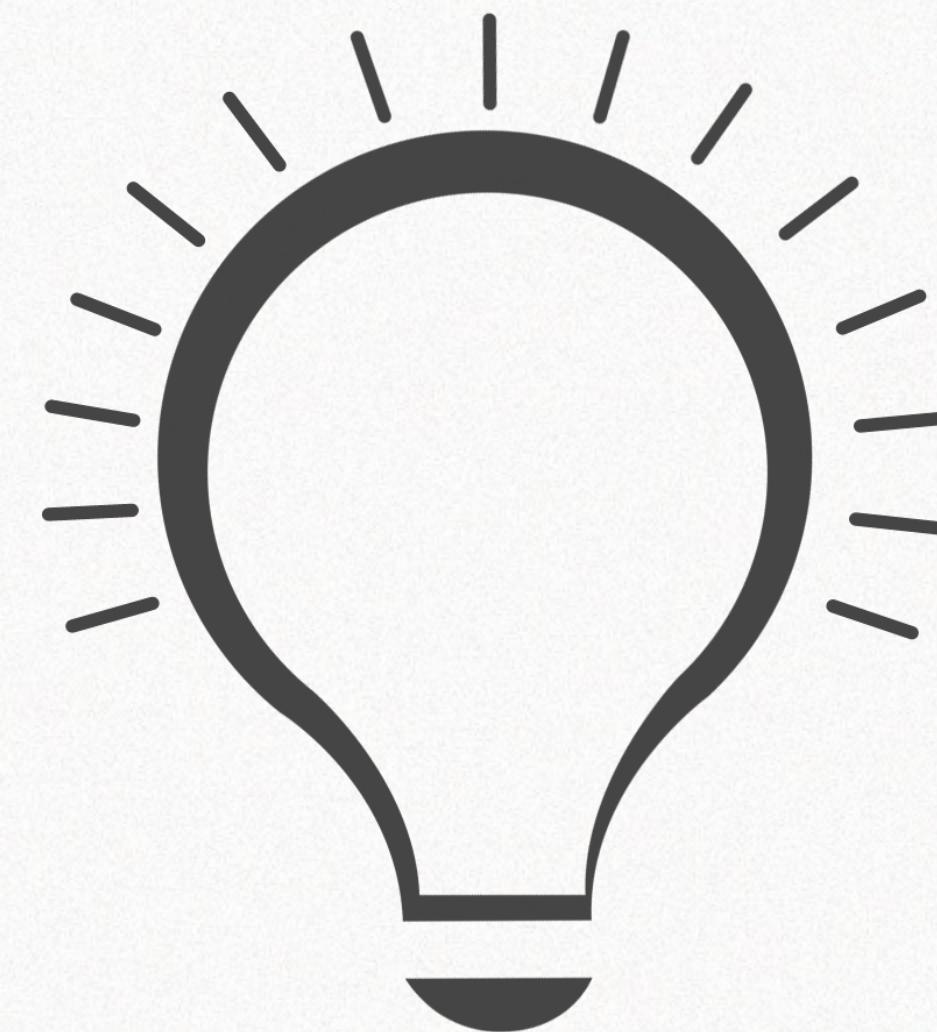
## JAVA BEANS

```
var Date = Java.type('java.util.Date');
var date = new Date();
date.year += 1900;
print(date.year); // 2014
```



# SHIT JUST GOT REAL

# JAVASCRIPT ON JVM USE CASES



## 1 SHELL SCRIPTING

[HTTPS://DOCS.ORACLE.COM/JAVASE/8/DOCS/TECHNOTES/GUIDES/SCRIPTING/NASHORN/SHELL.HTML](https://docs.oracle.com/javase/8/docs/technotes/guides/scripting/nashorn/shell.html)

## 2 EXTEND APP FUNCTIONALITY ON RUNTIME

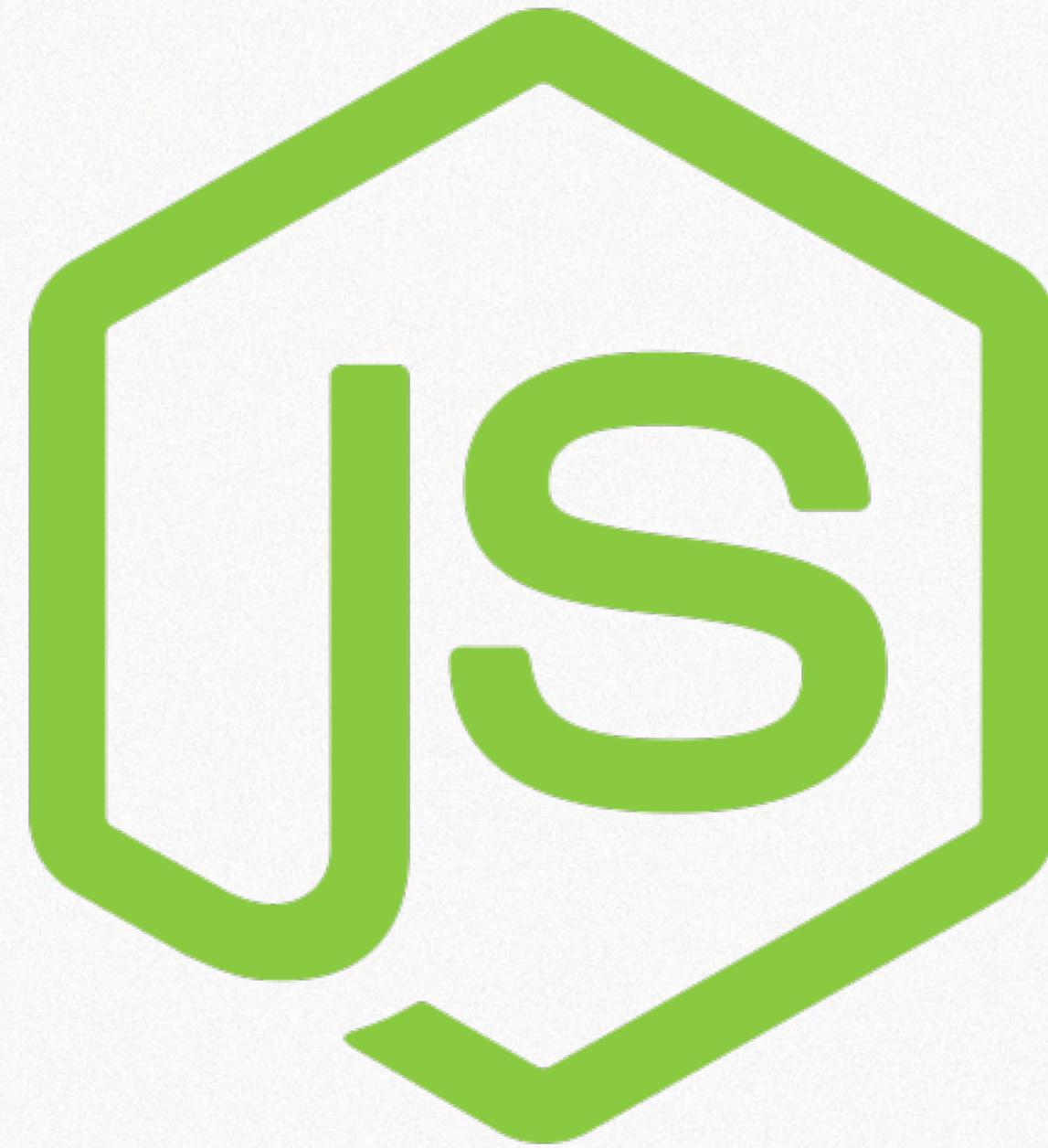
## 3 PROVIDE EXTENSION POINTS FOR APPLICATION

## 4 WEB-CONTENT GENERATION

# PART THREE

# PART THREE

# JAVA AND NODE.JS



# NODE.JS



Search Packages

## Node Packaged Modules

Total Packages: 97 562

23 454 122 downloads in the last day

131 728 461 downloads in the last week

533 148 592 downloads in the last month

**WHAT IF RUN**



**NODE APP ON  
JVM ?**

memegenerator.net

# AVATAR.JS FTW!



**YOU CAN DO IT!**

[HTTPS://AVATAR-JS.JAVA.NET](https://AVATAR-JS.JAVA.NET)

# DEMO



**TAKE FIRST AVAILABLE EXPRESS DEMO FROM  
INTERNET WHAT COULD GO WRONG**

[HTTPS://GITHUB.COM/HACKSPARROW/NINJA-STORE](https://github.com/hacksparrow/ninja-store)

```
import com.oracle.avatar.js.Server;

import java.io.File;
import java.lang.reflect.Field;

public class Main {

    static {
        try {
            final Field sysPathsField = ClassLoader.class.getDeclaredField("sys_paths");
            sysPathsField.setAccessible(true);
            sysPathsField.set(null, null);
            System.setProperty("java.library.path",
                new File(Main.class.getResource("/libavatar-js.dylib")).getPath()
                    .getParentFile().getCanonicalPath());
            System.loadLibrary("avatar-js");
        } catch (Throwable t) {
            throw new RuntimeException(t);
        }
    }

    public static void main(String[] args) throws Throwable {
        Server.main(Main.class.getResource("/app.js").getPath());
    }
}
```



# NASHORN IN «WILD LIFE»

★ VERT.X

★ AVATAR 2.0

★ NODYN.IO

# VERTX.IO

## ★ POLYGLOT PLATFORM

- ★ DEVELOP WITH JAVA, JAVASCRIPT, JRUBY, GROOVY, JYTHON, CLOJURE,
- ★ SCALA, PHP, CEYLON

## ★ INTEGRATION WITH NASHORN

- ★ [HTTPS://GITHUB.COM/VERT-X/MOD-LANG-NASHORN](https://github.com/vert-x/mod-lang-nashorn)

## ★ EVENT BUS (DOWN TO THE BROWSER)

## ★ DISTRIBUTED DATA (IN V.3)

## ★ OPEN SOURCE: EPL / APACHE

# AVATAR 2.0

- ★ POLYGLOT PLATFORM (SORT OF)
- ★ INTEGRATION WITH NASHORN
- ★ NODE API
- ★ MODEL-STORE API
- ★ EVENT BUS
- ★ DISTRIBUTED DATA
- ★ NOT OPEN YET

# AVATAR 2.0



R.I.P 2013 – 2015

[HTTPS://BLOGS.ORACLE.COM/THEAQUARIUM/ENTRY/PROJECT\\_AVATAR\\_UPDATE](https://blogs.oracle.com/theaquarium/entry/project_avatar_update)

# NODYN

- ★ NODE API FOR JAVA PLATFORM
- ★ USES DYNJS – ALTERNATIVE JAVASCRIPT ENGINE
- ★ WILL BE INTEGRATED WITH VERTX

P.S. NODE ❤ JAVA

# DEMO

gA

# SHOW ME THE CODE

[HTTPS://GITHUB.COM/GAMUSSA/JAVA-SCRIPTING-EXPERIMENTS](https://github.com/gamussa/java-scripting-experiments)

**THANKS**  
FOR YOUR ATTENTION