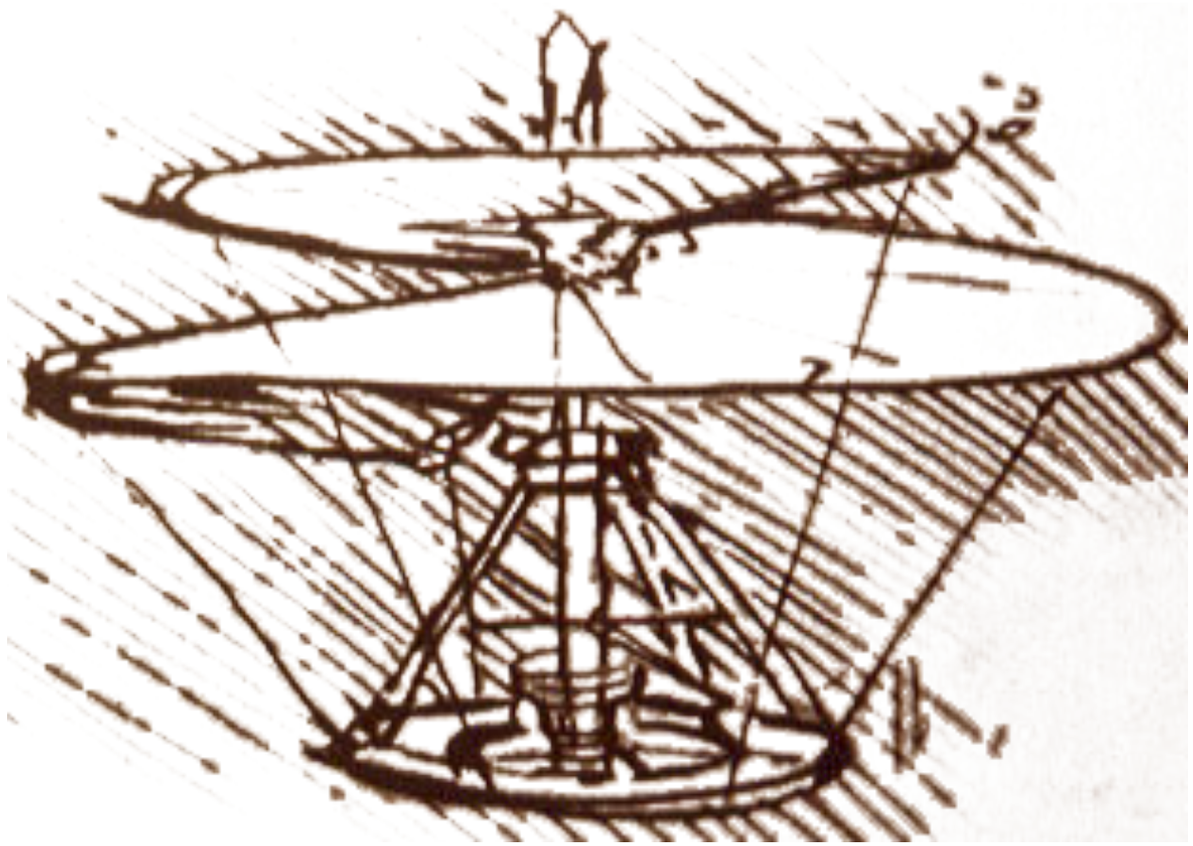
STUDIOS
ThoughtWorks®

# Future of the Java platform




Ola Bini
JRuby Core Developer
ThoughtWorks Studios

ola.bini@gmail.com
http://olabini.com/blog

STUDIOS
ThoughtWorks®

# About me

STUDIOS

ThoughtWorks®

# About me

Ola Bini

# About me

Ola Bini

Works for ThoughtWorks

# About me

Ola Bini

Works for ThoughtWorks

From Sweden - duh

STUDIOS
ThoughtWorks®

# About me

Ola Bini

Works for ThoughtWorks

From Sweden - duh

Involved with several languages on the JVM:

STUDIOS
ThoughtWorks®

# About me

Ola Bini

Works for ThoughtWorks

From Sweden - duh

Involved with several languages on the JVM:

Ioke

# About me

Ola Bini

Works for ThoughtWorks

From Sweden - duh

Involved with several languages on the JVM:

- Ioke
- JRuby

STUDIOS
ThoughtWorks®

# About me

Ola Bini

Works for ThoughtWorks

From Sweden - duh

Involved with several languages on the JVM:

- Ioke
- JRuby
- Jatha

# About me

Ola Bini

Works for ThoughtWorks

From Sweden - duh

Involved with several languages on the JVM:

- Ioke
- JRuby
- Jatha

Member of the JSR292 expert group

# About me

Ola Bini

Works for ThoughtWorks

From Sweden - duh

Involved with several languages on the JVM:

- Ioke
- JRuby
- Jatha

Member of the JSR292 expert group

# About me

Ola Bini

Works for ThoughtWorks

From Sweden - duh

Involved with several languages on the JVM:

- Ioke
- JRuby
- Jatha

Member of the JSR292 expert group

STUDIOS
ThoughtWorks®

# Java as a platform

STUDIOS

ThoughtWorks®

# Java as a platform

## Other languages

STUDIOS
ThoughtWorks®

# Java as a platform

Other languages

Libraries

STUDIOS
ThoughtWorks®

# Java as a platform

Other languages

Libraries

Platform independence

STUDIOS
ThoughtWorks®

# Java as a platform

Other languages

Libraries

Platform independence

Higher level abstractions

# Java as a platform

Other languages

Libraries

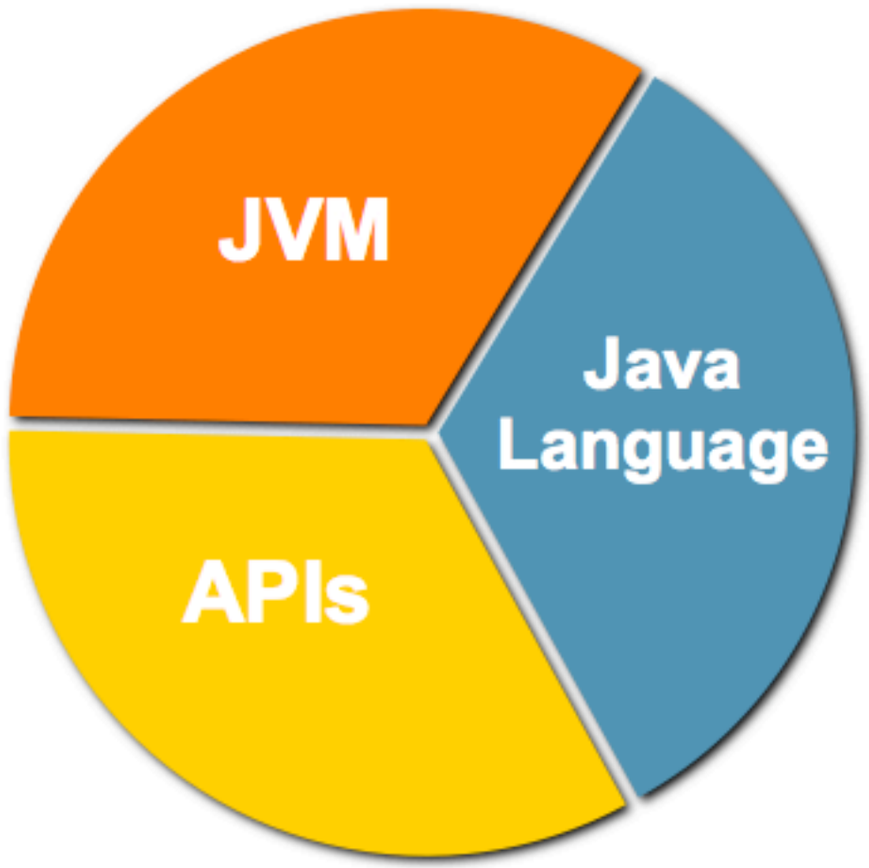
Platform independence

Higher level abstractions

Java the language as systems language?

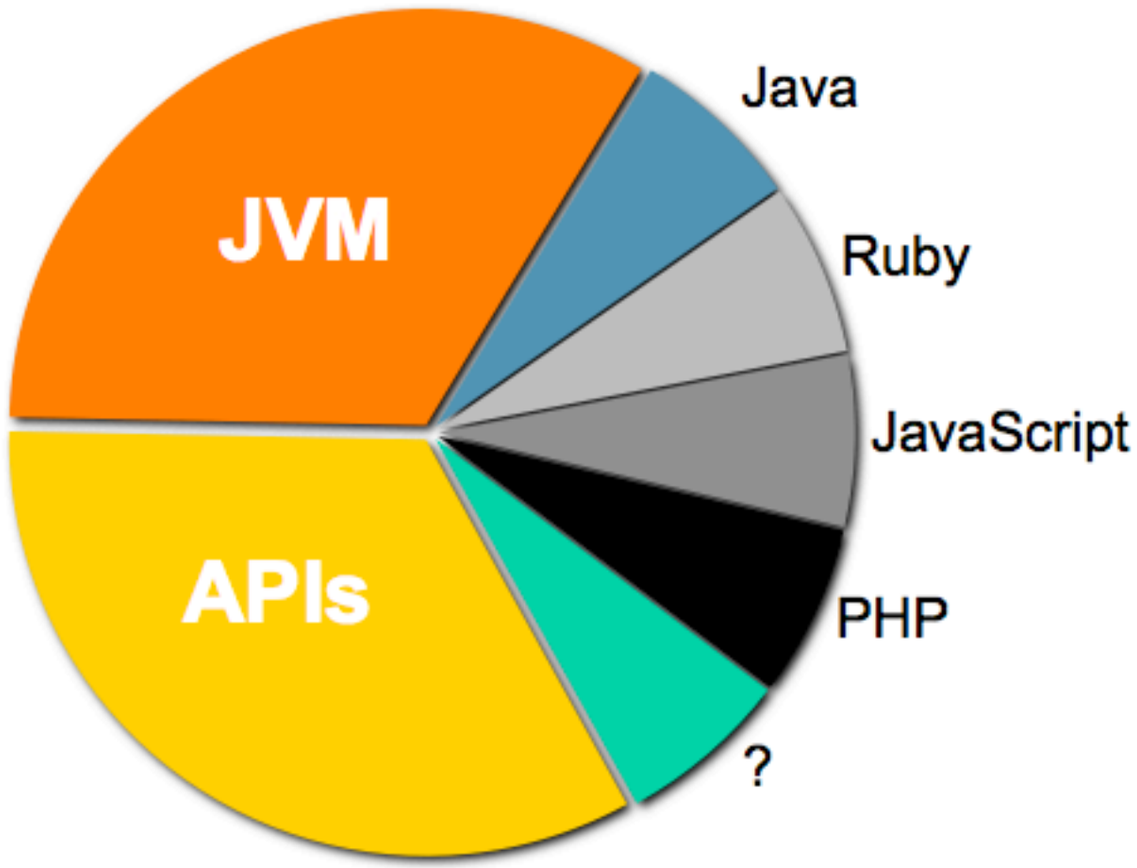
STUDIOS
ThoughtWorks®

# The Java platform?



STUDIOS
ThoughtWorks®

# The Java platform?



STUDIOS
ThoughtWorks®

# Other languages

Hecl
Jacl
Clojure
Ync/Javascript
JoyJ
v-language
CAL
Aardappel
Funnel
Mini
PLAN
Sixx
BDC Scheme
ABCL
Lili
Jatha
Bigloo
SISC
Lisp
PS3i

HotScheme
webLISP
Jaja
JScheme
Skij
Kawa
uts
JBasic
Mapyrus
CONVERT
HotTEA
COCOA
NetLogo
StarLogo
AJLogo
Turtle Tracks
rLogo
Yoyo
TermWare
XProlog

tuProlog
JLog
LL
javalog
SmallWorld
Bistro
Talks2
Obol
Groovy
Nice
Scala
Anvil
dSelf
Hojo
Correlate
MetaJ
Sather
Quercus
FScript
Sleep

WLShell
JudoScript
JRuby
Jickle
Rhino
BeanShell
Resin
Jython
Pnuts
Janino
Join Java
JMatch
iScript
Yassl
Yoix
W4F
PERCobol
Bex Script
Demeter/Java
CKI Prolog

STUDIOS
ThoughtWorks®

# Other languages: Clojure

STUDIOS
ThoughtWorks®

# Other languages: Clojure

Lisp dialect - code as data

STUDIOS
ThoughtWorks®

# Other languages: Clojure

Lisp dialect - code as data

Designed for the JVM

STUDIOS
ThoughtWorks®

# Other languages: Clojure

Lisp dialect - code as data

Designed for the JVM

Powerful macros

STUDIOS
ThoughtWorks®

# Other languages: Clojure

Lisp dialect - code as data

Designed for the JVM

Powerful macros

Good interoperability with Java

STUDIOS
ThoughtWorks®

# Other languages: Clojure

Lisp dialect - code as data

Designed for the JVM

Powerful macros

Good interoperability with Java

Functional programming language

STUDIOS
ThoughtWorks®

# Other languages: Clojure

Lisp dialect - code as data

Designed for the JVM

Powerful macros

Good interoperability with Java

Functional programming language

Concurrency

STUDIOS
ThoughtWorks®

# Other languages: Groovy

STUDIOS
ThoughtWorks®

# Other languages: Groovy

Dynamic, strongly typed

STUDIOS
ThoughtWorks®

# Other languages: Groovy

Dynamic, strongly typed

Object oriented

STUDIOS
ThoughtWorks®

# Other languages: Groovy

Dynamic, strongly typed

Object oriented

Designed for the JVM

STUDIOS
ThoughtWorks®

# Other languages: Groovy

Dynamic, strongly typed

Object oriented

Designed for the JVM

Inspired by Python, Ruby and Smalltalk

STUDIOS
ThoughtWorks®

# Other languages: Groovy

Dynamic, strongly typed

Object oriented

Designed for the JVM

Inspired by Python, Ruby and Smalltalk

Good integration with Java

STUDIOS
ThoughtWorks®

# Other languages: Scala

STUDIOS

ThoughtWorks®

# Other languages: Scala

Multiparadigm language

STUDIOS
ThoughtWorks®

# Other languages: Scala

Multiparadigm language

Object orientedness

STUDIOS
ThoughtWorks®

# Other languages: Scala

- Multiparadigm language
  - Object orientedness
  - Functional programming

STUDIOS
ThoughtWorks®

# Other languages: Scala

- Multiparadigm language
  - Object orientedness
  - Functional programming
- Designed for the JVM

STUDIOS
ThoughtWorks®

# Other languages: Scala

- Multiparadigm language
  - Object orientedness
  - Functional programming
- Designed for the JVM

Concurrency: Immutability and actors

STUDIOS
ThoughtWorks®

# Other languages: Scala

Multiparadigm language

- Object orientedness
- Functional programming

Designed for the JVM

Concurrency: Immutability and actors

Includes many advanced language features

STUDIOS
ThoughtWorks®

# Other languages: Scala

- Multiparadigm language
  - Object orientedness
  - Functional programming
- Designed for the JVM
- Concurrency: Immutability and actors
- Includes many advanced language features
  - Pattern matching, closures, parametric polymorphism

STUDIOS
ThoughtWorks®

# Other languages: Scala

- Multiparadigm language
  - Object orientedness
  - Functional programming
- Designed for the JVM
- Concurrency: Immutability and actors
- Includes many advanced language features
  - Pattern matching, closures, parametric polymorphism
  - Sequence comprehensions, mixins, infix or postfix statements

STUDIOS

ThoughtWorks®

# The Java Virtual Machine

STUDIOS
ThoughtWorks®

# The Java Virtual Machine

The JVM is a great virtual machine

STUDIOS
ThoughtWorks®

# The Java Virtual Machine

The JVM is a great virtual machine

Flexible online code loading (with safe bytecodes)

STUDIOS

ThoughtWorks®

# The Java Virtual Machine

The JVM is a great virtual machine

Flexible online code loading (with safe bytecodes)

GC & object structure

STUDIOS ThoughtWorks®

# The Java Virtual Machine

The JVM is a great virtual machine

Flexible online code loading (with safe bytecodes)

GC & object structure

- Mature and provies lots of algorithms and parameters

STUDIOS
ThoughtWorks®

# The Java Virtual Machine

The JVM is a great virtual machine

Flexible online code loading (with safe bytecodes)

GC & object structure

- Mature and provies lots of algorithms and parameters

Reflective access to classes and objects

# The Java Virtual Machine

The JVM is a great virtual machine

Flexible online code loading (with safe bytecodes)

GC & object structure

- Mature and provies lots of algorithms and parameters

Reflective access to classes and objects

Tools (JMM, JVMTI, dtrace)

STUDIOS
ThoughtWorks®

# The Java Virtual Machine

The JVM is a great virtual machine

Flexible online code loading (with safe bytecodes)

GC & object structure

- Mature and provies lots of algorithms and parameters

Reflective access to classes and objects

Tools (JMM, JVMTI, dtrace)

Good libraries and a useful language to write more

STUDIOS

ThoughtWorks®

# The Java Virtual Machine

STUDIOS

ThoughtWorks®

# The Java Virtual Machine

Optimizing Just-In-Time compiler

STUDIOS

ThoughtWorks®

# The Java Virtual Machine

Optimizing Just-In-Time compiler

Clever performance techniques

STUDIOS
ThoughtWorks®

# The Java Virtual Machine

- Optimizing Just-In-Time compiler
- Clever performance techniques
  - Type inference

STUDIOS ThoughtWorks®

# The Java Virtual Machine

- Optimizing Just-In-Time compiler
- Clever performance techniques
  - Type inference
  - Customization

STUDIOS
ThoughtWorks®

# The Java Virtual Machine

- Optimizing Just-In-Time compiler
- Clever performance techniques
  - Type inference
  - Customization
  - Profiling

STUDIOS
ThoughtWorks®

# The Java Virtual Machine

- Optimizing Just-In-Time compiler
- Clever performance techniques
  - Type inference
  - Customization
  - Profiling
  - Deoptimizing

STUDIOS
ThoughtWorks®

# The Java Virtual Machine

- Optimizing Just-In-Time compiler
- Clever performance techniques
  - Type inference
  - Customization
  - Profiling
  - Deoptimizing
  - Fast/slow paths

STUDIOS
ThoughtWorks®

# The Java Virtual Machine

- Optimizing Just-In-Time compiler
- Clever performance techniques
  - Type inference
  - Customization
  - Profiling
  - Deoptimizing
  - Fast/slow paths
- The JVM is mature

STUDIOS

ThoughtWorks®

# Needs of higher level languages

STUDIOS

ThoughtWorks®

# Needs of higher level languages

Very late binding (runtime linking, typing, code gen)

STUDIOS

ThoughtWorks®

# Needs of higher level languages

Very late binding (runtime linking, typing, code gen)

Automatic storage management (GC)

STUDIOS

ThoughtWorks®

# Needs of higher level languages

Very late binding (runtime linking, typing, code gen)

Automatic storage management (GC)

Environmental queries (reflection, stack walking)

STUDIOS

ThoughtWorks®

# Needs of higher level languages

Very late binding (runtime linking, typing, code gen)

Automatic storage management (GC)

Environmental queries (reflection, stack walking)

Exotic primitives (tail calls, bignums, call/cc)

STUDIOS

ThoughtWorks®

# Needs of higher level languages

Very late binding (runtime linking, typing, code gen)

Automatic storage management (GC)

Environmental queries (reflection, stack walking)

Exotic primitives (tail calls, bignums, call/cc)

Code management integrated with execution

STUDIOS

ThoughtWorks®

# Needs of higher level languages

Very late binding (runtime linking, typing, code gen)

Automatic storage management (GC)

Environmental queries (reflection, stack walking)

Exotic primitives (tail calls, bignums, call/cc)

Code management integrated with execution

Robust handling of incorrect inputs

STUDIOS
ThoughtWorks®

# Needs of higher level languages

Very late binding (runtime linking, typing, code gen)

Automatic storage management (GC)

Environmental queries (reflection, stack walking)

Exotic primitives (tail calls, bignums, call/cc)

Code management integrated with execution

Robust handling of incorrect inputs

Helpful runtime support libraries (regexps, math)

STUDIOS

ThoughtWorks®

# Needs of higher level languages

Very late binding (runtime linking, typing, code gen)

Automatic storage management (GC)

Environmental queries (reflection, stack walking)

Exotic primitives (tail calls, bignums, call/cc)

Code management integrated with execution

Robust handling of incorrect inputs

Helpful runtime support libraries (regexps, math)

A compiler that understands it all

STUDIOS

ThoughtWorks®

# Needs of higher level languages

Very late binding (runtime linking, typing, code gen)

Automatic storage management (GC)

Environmental queries (reflection, stack walking)

Exotic primitives (tail calls, bignums, call/cc)

Code management integrated with execution

Robust handling of incorrect inputs

Helpful runtime support libraries (regexps, math)

A compiler that understands it all

STUDIOS

ThoughtWorks®

# What's missing?

STUDIOS
ThoughtWorks®

# What's missing?

Dynamic invocation

STUDIOS
ThoughtWorks®

# What's missing?

Dynamic invocation

Lightweight method objects

STUDIOS
ThoughtWorks®

# What's missing?

Dynamic invocation

Lightweight method objects

Lightweight bytecode loading

STUDIOS
ThoughtWorks®

# What's missing?

Dynamic invocation

Lightweight method objects

Lightweight bytecode loading

Continuations and stack introspection

STUDIOS
ThoughtWorks®

# What's missing?

Dynamic invocation

Lightweight method objects

Lightweight bytecode loading

Continuations and stack introspection

Tail calls and tail recursion

STUDIOS
ThoughtWorks®

# What's missing?

Dynamic invocation

Lightweight method objects

Lightweight bytecode loading

Continuations and stack introspection

Tail calls and tail recursion

Tuples and value-oriented types

STUDIOS
ThoughtWorks®

# What's missing?

Dynamic invocation

Lightweight method objects

Lightweight bytecode loading

Continuations and stack introspection

Tail calls and tail recursion

Tuples and value-oriented types

Immediate wrapper types

STUDIOS
ThoughtWorks®

# What's missing?

Dynamic invocation

Lightweight method objects

Lightweight bytecode loading

Continuations and stack introspection

Tail calls and tail recursion

Tuples and value-oriented types

Immediate wrapper types

STUDIOS
ThoughtWorks®

# Dynamic invocation

STUDIOS
ThoughtWorks®

# Dynamic invocation

Non-Java call site in the bytecodes

STUDIOS
ThoughtWorks®

# Dynamic invocation

Non-Java call site in the bytecodes

Language-specific handler

STUDIOS
ThoughtWorks®

# Dynamic invocation

Non-Java call site in the bytecodes

Language-specific handler

Determines linking at runtime

STUDIOS
ThoughtWorks®

# Dynamic invocation

Non-Java call site in the bytecodes

Language-specific handler

Determines linking at runtime

Works in a reflective style

STUDIOS
ThoughtWorks®

# Dynamic invocation

Non-Java call site in the bytecodes

Language-specific handler

Determines linking at runtime

Works in a reflective style

Installs direct (non-reflective) methods

STUDIOS
ThoughtWorks®

# Dynamic invocation

Non-Java call site in the bytecodes

Language-specific handler

Determines linking at runtime

Works in a reflective style

Installs direct (non-reflective) methods

Stateful: can be updated or revoked over time

STUDIOS
ThoughtWorks®

# Dynamic invocation

Non-Java call site in the bytecodes

Language-specific handler

Determines linking at runtime

Works in a reflective style

Installs direct (non-reflective) methods

Stateful: can be updated or revoked over time

Any dynamic language will benefit greatly

STUDIOS

ThoughtWorks®

# Symbolic freedom

STUDIOS
ThoughtWorks®

# Symbolic freedom

Allow any identifier as name

STUDIOS
ThoughtWorks®

# Symbolic freedom

Allow any identifier as name

JVM identifiers originally based on the Java language

STUDIOS
ThoughtWorks®

# Symbolic freedom

Allow any identifier as name

JVM identifiers originally based on the Java language

No real reason for this

STUDIOS
ThoughtWorks®

# Symbolic freedom

Allow any identifier as name

JVM identifiers originally based on the Java language

No real reason for this

Support for Ruby style names

STUDIOS
ThoughtWorks®

# Symbolic freedom

Allow any identifier as name

JVM identifiers originally based on the Java language

No real reason for this

Support for Ruby style names

```
empty?
```

STUDIOS
ThoughtWorks®

# Symbolic freedom

Allow any identifier as name

JVM identifiers originally based on the Java language

No real reason for this

Support for Ruby style names

```
empty?
value=
```

# Symbolic freedom

Allow any identifier as name

JVM identifiers originally based on the Java language

No real reason for this

Support for Ruby style names

```
empty?
value=
clear!
```

# Symbolic freedom

Allow any identifier as name

JVM identifiers originally based on the Java language

No real reason for this

Support for Ruby style names

- empty?
- value=
- clear!

Canonical name mangling

STUDIOS

ThoughtWorks®

# Closures

# Closures

Several closure proposals right now

STUDIOS
ThoughtWorks®

# Closures

Several closure proposals right now

All of them will benefit from the previous ideas

STUDIOS
ThoughtWorks®

# Closures

Several closure proposals right now

All of them will benefit from the previous ideas

But it isn't required

STUDIOS
ThoughtWorks®

# Closures

Several closure proposals right now

All of them will benefit from the previous ideas

But it isn't required

Most of the machinery for closures is already in place

STUDIOS
ThoughtWorks®

# Closures

Several closure proposals right now

All of them will benefit from the previous ideas

But it isn't required

Most of the machinery for closures is already in place

It's just a question of deciding ...

STUDIOS

ThoughtWorks®

# The DaVinci machine

STUDIOS

ThoughtWorks®

# The DaVinci machine

Evolutionary adaptation of the present JVM

STUDIOS
ThoughtWorks®

# The DaVinci machine

Evolutionary adaptation of the present JVM

Open-ended experiment

STUDIOS
ThoughtWorks®

# The DaVinci machine

Evolutionary adaptation of the present JVM

Open-ended experiment

Wild ideas are considered, but must prove useful

STUDIOS
ThoughtWorks®

# The DaVinci machine

Evolutionary adaptation of the present JVM

Open-ended experiment

- Wild ideas are considered, but must prove useful
- While incubating, features are disabled by default

STUDIOS
ThoughtWorks®

# The DaVinci machine

Evolutionary adaptation of the present JVM

Open-ended experiment

- Wild ideas are considered, but must prove useful
- While incubating, features are disabled by default

Eventual convergence

STUDIOS
ThoughtWorks®

# The DaVinci machine

Evolutionary adaptation of the present JVM

Open-ended experiment

- Wild ideas are considered, but must prove useful
- While incubating, features are disabled by default

Eventual convergence

Prototype JVM extensions to run non-Java languages efficiently

STUDIOS
ThoughtWorks®

# The DaVinci machine

Evolutionary adaptation of the present JVM

Open-ended experiment

- Wild ideas are considered, but must prove useful
- While incubating, features are disabled by default

Eventual convergence

Prototype JVM extensions to run non-Java languages efficiently

First class architectural support (no hack or side-cars)

STUDIOS
ThoughtWorks®

# The DaVinci machine

Evolutionary adaptation of the present JVM

Open-ended experiment

- Wild ideas are considered, but must prove useful
- While incubating, features are disabled by default

Eventual convergence

Prototype JVM extensions to run non-Java languages efficiently

First class architectural support (no hack or side-cars)

New languages to co-exist gracefully with Java

STUDIOS

ThoughtWorks®

# The DaVinci machine

STUDIOS
ThoughtWorks®

# The DaVinci machine

Most of the features mentioned above have or will be implemented here

STUDIOS
ThoughtWorks®

# The DaVinci machine

Most of the features mentioned above have or will be implemented here

Will eventually decide what makes it in Java 7

STUDIOS
ThoughtWorks®

# The DaVinci machine

Most of the features mentioned above have or will be implemented here

Will eventually decide what makes it in Java 7

Why?

STUDIOS
ThoughtWorks®

# The DaVinci machine

Most of the features mentioned above have or will be implemented here

Will eventually decide what makes it in Java 7

Why?

Language implementers know what they want

STUDIOS
ThoughtWorks®

# The DaVinci machine

Most of the features mentioned above have or will be implemented here

Will eventually decide what makes it in Java 7

Why?

Language implementers know what they want

and how to simulate it at 100x slowdown

STUDIOS
ThoughtWorks®

# The DaVinci machine

Most of the features mentioned above have or will be implemented here

Will eventually decide what makes it in Java 7

Why?

Language implementers know what they want

and how to simulate it at 100x slowdown

VM implementers know what VMs can do

STUDIOS
ThoughtWorks®

# The DaVinci machine

Most of the features mentioned above have or will be implemented here

Will eventually decide what makes it in Java 7

Why?

Language implementers know what they want

and how to simulate it at 100x slowdown

VM implementers know what VMs can do

Let's bring them together

# JSR 292

STUDIOS

ThoughtWorks®

STUDIOS

ThoughtWorks®

# JSR 292

Supporting dynamically type languages

STUDIOS

ThoughtWorks®

# JSR 292

Supporting dynamically type languages

Main features

STUDIOS
ThoughtWorks®

# JSR 292

Supporting dynamically type languages

Main features

invoke_dynamic

STUDIOS
ThoughtWorks®

# JSR 292

Supporting dynamically type languages

Main features

- invoke_dynamic
- Method handles

STUDIOS
ThoughtWorks®

# JSR 292

Supporting dynamically type languages

Main features

- invoke_dynamic
- Method handles
- Hotswapping

STUDIOS
ThoughtWorks®

# JSR 292

Supporting dynamically type languages

Main features

- invoke_dynamic
- Method handles
- Hotswapping

Representatives from JRuby, Groovy, Jython, among others

STUDIOS
ThoughtWorks®

# JSR 292

Supporting dynamically type languages

Main features

- invoke_dynamic
- Method handles
- Hotswapping

Representatives from JRuby, Groovy, Jython, among others

Focus on VM support

STUDIOS
ThoughtWorks®

# The JVM languages group

STUDIOS

ThoughtWorks®

# The JVM languages group

Focus on library level support for languages running on the JVM

STUDIOS
ThoughtWorks®

# The JVM languages group

Focus on library level support for languages running on the JVM

Discussions about current pain points

STUDIOS
ThoughtWorks®

# The JVM languages group

Focus on library level support for languages running on the JVM

Discussions about current pain points

Meta-object protocol

STUDIOS

ThoughtWorks®

# The JVM languages group

Focus on library level support for languages running on the JVM

Discussions about current pain points

Meta-object protocol

Java method overload resolution at runtime

STUDIOS
ThoughtWorks®

# The JVM languages group

Focus on library level support for languages running on the JVM

Discussions about current pain points

Meta-object protocol

Java method overload resolution at runtime

Representatives from Java, JRuby, Jython, Groovy, Pnuts, Ioke, Scala, Clojure, Nice, Ng, and many more

# Java 7

STUDIOS

ThoughtWorks®

STUDIOS

ThoughtWorks®

# Java 7

Probably early 2010

STUDIOS
ThoughtWorks®

# Java 7

Probably early 2010

Provisional:

STUDIOS

ThoughtWorks®

# Java 7

Probably early 2010

Provisional:

Modularization

STUDIOS

ThoughtWorks®

# Java 7

Probably early 2010

Provisional:

- Modularization
- JSR 292 - Dynamic languages

# Java 7

Probably early 2010

Provisional:

- Modularization
- JSR 292 - Dynamic languages
- JSR 203 - Better I/O support, asynch I/O, revamped file system API

# Java 7

Probably early 2010

Provisional:

- Modularization
- JSR 292 - Dynamic languages
- JSR 203 - Better I/O support, asynch I/O, revamped file system API
- Safe rethrow

STUDIOS
ThoughtWorks®

# Java 7

Probably early 2010

Provisional:

- Modularization
- JSR 292 - Dynamic languages
- JSR 203 - Better I/O support, asynch I/O, revamped file system API
- Safe rethrow
- Null dereferencing

STUDIOS ThoughtWorks®

# Java 7

Probably early 2010

Provisional:

- Modularization
- JSR 292 - Dynamic languages
- JSR 203 - Better I/O support, asynch I/O, revamped file system API
- Safe rethrow
- Null dereferencing
- Better type inferencing for generics

# Java 7

Probably early 2010

Provisional:

- Modularization
- JSR 292 - Dynamic languages
- JSR 203 - Better I/O support, asynch I/O, revamped file system API
- Safe rethrow
- Null dereferencing
- Better type inferencing for generics
- Multi catch

# Java 7

Probably early 2010

Provisional:

- Modularization
- JSR 292 - Dynamic languages
- JSR 203 - Better I/O support, asynch I/O, revamped file system API
- Safe rethrow
- Null dereferencing
- Better type inferencing for generics
- Multi catch
- Better Swing

ThoughtWorks STUDIOS

# Java 7

Probably early 2010

Provisional:

- Modularization
- JSR 292 - Dynamic languages
- JSR 203 - Better I/O support, asynch I/O, revamped file system API
- Safe rethrow
- Null dereferencing
- Better type inferencing for generics
- Multi catch
- Better Swing
- 6u10 features - Java Kernel, Quickstarter, new plugin

ThoughtWorks STUDIOS

# Java 7

Probably early 2010

Provisional:

- Modularization
- JSR 292 - Dynamic languages
- JSR 203 - Better I/O support, asynch I/O, revamped file system API
- Safe rethrow
- Null dereferencing
- Better type inferencing for generics
- Multi catch
- Better Swing
- 6u10 features - Java Kernel, Quickstarter, new plugin

# Not in Java 7

STUDIOS
ThoughtWorks®

STUDIOS

ThoughtWorks®

# Not in Java 7

Closures

STUDIOS
ThoughtWorks®

# Not in Java 7

Closures

Reified generics

STUDIOS

ThoughtWorks®

# Not in Java 7

Closures

Reified generics

1st class propertiers

STUDIOS
ThoughtWorks®

# Not in Java 7

Closures

Reified generics

1st class propertiers

Operator overloading

STUDIOS

ThoughtWorks®

# Not in Java 7

Closures

Reified generics

1st class propertiers

Operator overloading

BigDecimal syntax

STUDIOS

ThoughtWorks®

# Not in Java 7

Closures

Reified generics

1st class propertiers

Operator overloading

BigDecimal syntax

JSR 295 - Beans binding

STUDIOS

ThoughtWorks®

# Not in Java 7

Closures

Reified generics

1st class propertiers

Operator overloading

BigDecimal syntax

JSR 295 - Beans binding

STUDIOS

ThoughtWorks®

# After?

STUDIOS
ThoughtWorks®

# After?

Look to C# - more advanced language features

STUDIOS
ThoughtWorks®

# After?

Look to C# - more advanced language features

But not as much backwards compatibility

STUDIOS
ThoughtWorks®

# After?

Look to C# - more advanced language features

But not as much backwards compatibility

JavaFX

STUDIOS
ThoughtWorks®

# After?

- Look to C# - more advanced language features
  - But not as much backwards compatibility
- JavaFX
- Java as a platform

STUDIOS
ThoughtWorks®

# After?

- Look to C# - more advanced language features
  - But not as much backwards compatibility
- JavaFX
- Java as a platform

Q and A