

# Scala goes Native

by Denys Shabalin

EPFL

# Prologue

# Pascal

My first programming experience.

Verbose.

Low-level.

Can't immediately shoot yourself.

Seriously, it's really verbose.

## Prologue

# C

I can type code so much faster now.

Low-level.

Oh, my foot is right over there.

Wait, where is the other one.

## Prologue

# C#

You're a class, and you, and you...

Structs and pointers are still there.

First experience with modern IDEs.

Every single thing is documented.

# Python

Look mom, no types.

Productive to prototype.

Pain to maintain.

We don't need no threads.

Can go low-level with C API.

# Scala

Is it typed? It's typed.

Where did all the annotations go?

Is it fast? Yes, just wait for it.

Is it parallel? Oh, yes it is.

Chapter 1:

# The golden cage



It had four walls, food and water

It's fast. Once warmed up.

It's fast. If JIT likes your code.

It's fast. If you don't stress the GC.

It's fast...

# And it was safe

Perhaps too safe.

Can't escape the sandbox.

Escape hatches are for the masters.

They know better.

# Don't talk to strangers

Let's make talking to others hard.

As hard as possible.

No, even harder.

They will just stay here, it's safe.

Chapter 2:

# Daydreaming

# Immediate

Your code runs right away.

No warm-up.

No interpretation.

# Family values

It's nice not to allocate every thing.

Passing values around is cheap.

Stack is your friend.

# Forgetful

Memory, under your control.

Sometimes, you just know better.

GC heap is just an option.

You choose.

Talking to others is easy

Calling native code should be easy.

And not incur any overhead.



Chapter 3:

# Waking up



Chapter 4:

9 months later



Chapter 5:

# Community

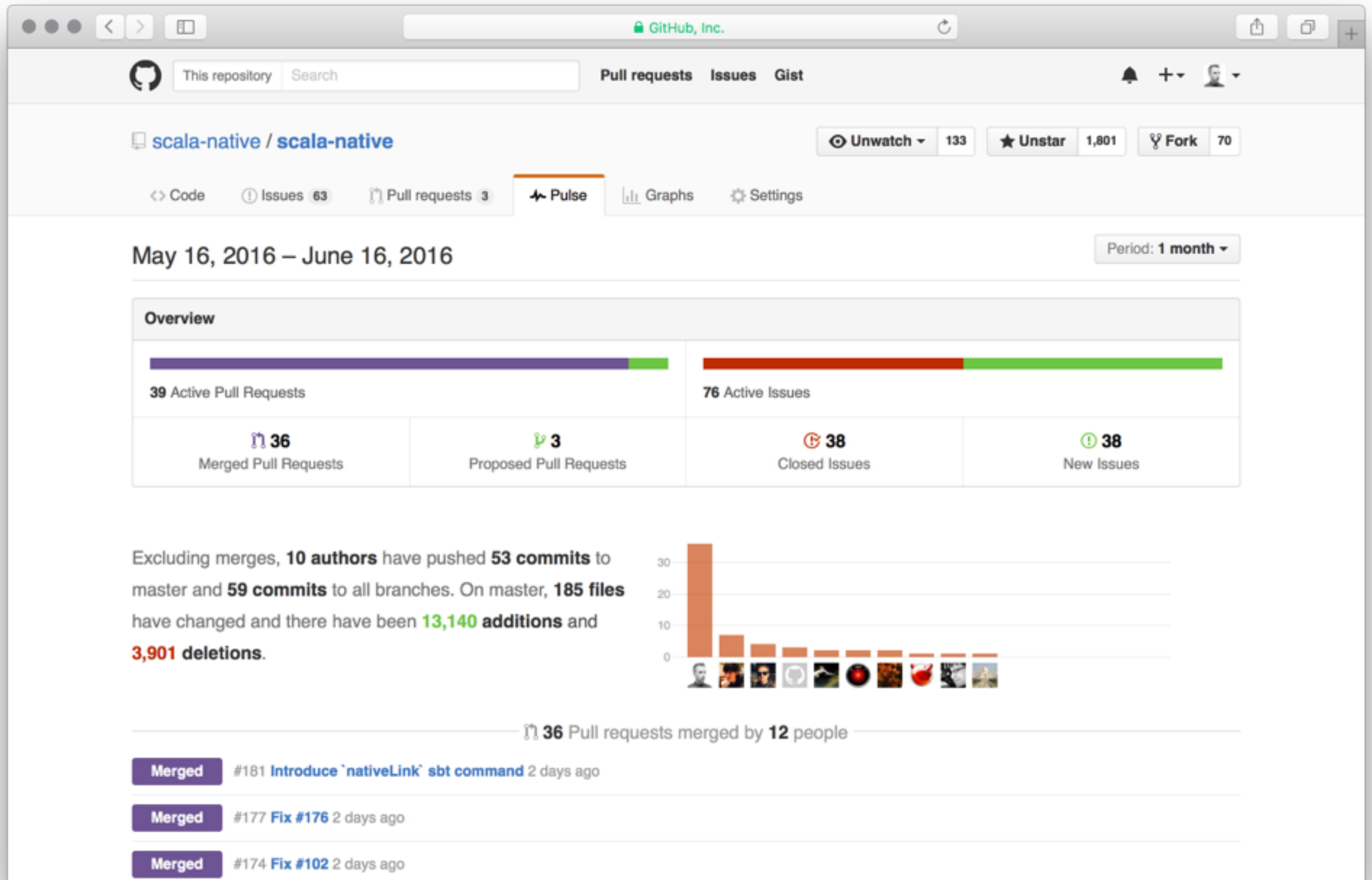
# Team effort

- @densh
- @sjrd

# Team effort

- @densh
- @sjrd
- @t-hiroyoshi
- @lukeindykiewicz
- @kmizu
- @andreaTP
- @TimothyKlim
- @Milyardo
- @dant3
- @phdoerfler
- @felixmulder
- @alexdupre
- @tuxdna
- @Jentsch

# Chapter 5: Community





# Chapter 5: Community

The screenshot shows a GitHub pull request page for the repository `scala-native / scala-native`. The pull request is titled "Add FreeBSD support #118" and is in a "Merged" state. It was merged by `densh` 26 days ago, merging 1 commit from `alexdupre:freebsd` into `scala-native:master`. The pull request has 3 pull requests, 63 issues, and 70 forks. The pull request description is "Enhance multi-platform support." and it has a commit hash of `f37f5ea`. The pull request has 3 thumbs up and 12 thumbs down. The pull request has 3 participants: `alexdupre`, `densh`, and `alexdupre`. The pull request has 3 participants: `alexdupre`, `densh`, and `alexdupre`. The pull request has 3 participants: `alexdupre`, `densh`, and `alexdupre`.

**Pull request details:**

- Title:** Add FreeBSD support #118
- Status:** Merged
- Author:** alexdupre
- Merged by:** densh
- Merge date:** 26 days ago
- Commits:** 1
- Files changed:** 5
- Score:** +22 -12

**Comments:**

- alexdupre** commented 27 days ago: Such changes should help also to use scala-native on other platforms. (3 thumbs up)
- densh** commented on an outdated diff 27 days ago: Please squash the sbtplugin changes, sign Scala CLA and it's a LGTM! (Scala Native member)
- alexdupre** commented 26 days ago: Done!

**Labels:** None yet

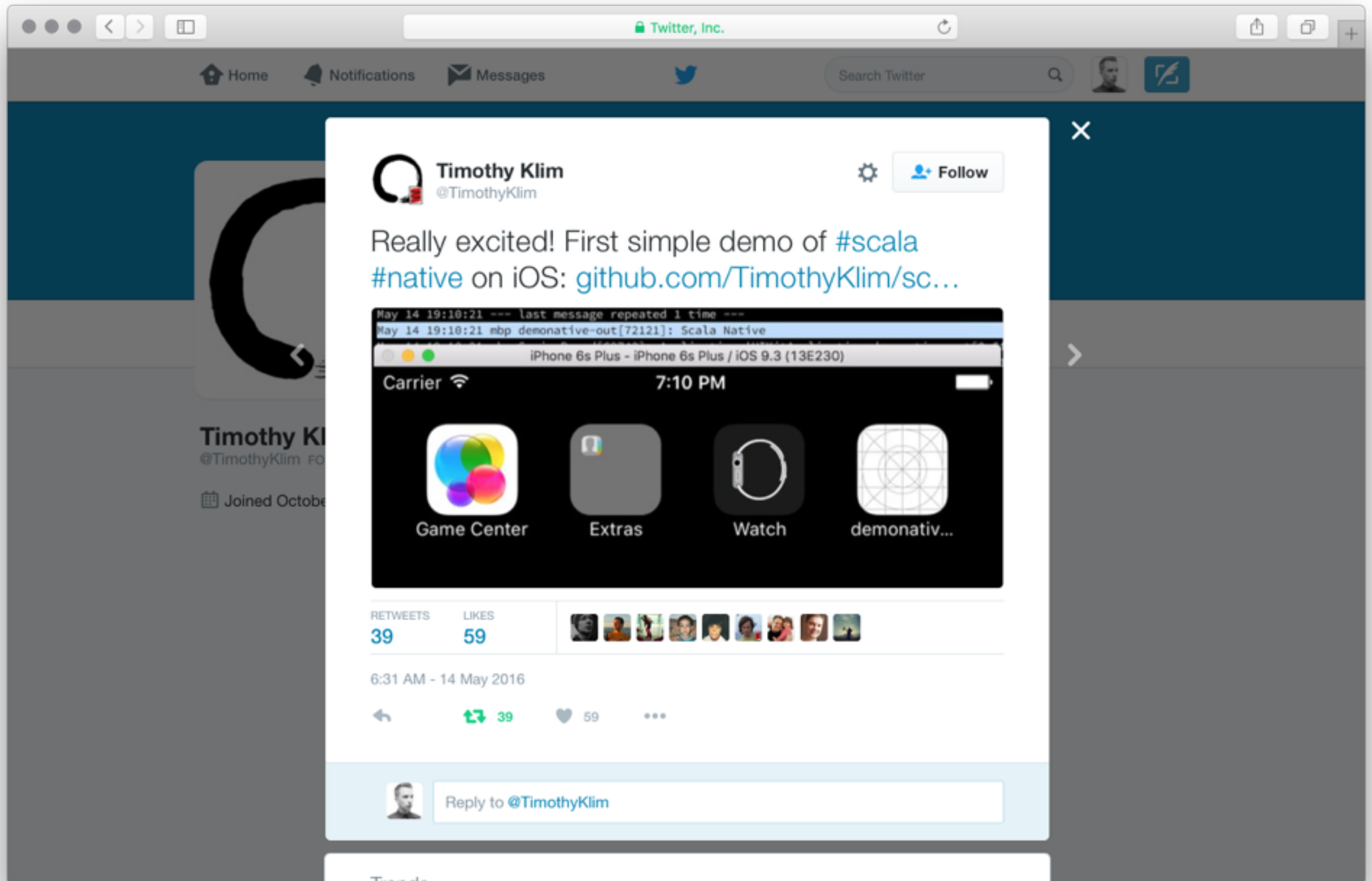
**Milestone:** No milestone

**Assignees:** No one—assign yourself

**Participants:** 3 participants (alexdupre, densh, alexdupre)

**Notifications:** You're receiving notifications because you modified the open/close state. (Unsubscribe)

## Chapter 5: Community



# Chapter 5: Community

The screenshot shows a web browser window displaying the GitHub repository page for 'frgomes / poc-scala-native'. The browser's address bar shows 'GitHub, Inc.' and the repository URL. The repository page includes a header with the repository name, a 'Watch' button with 2 subscribers, a 'Star' button with 6 stars, and a 'Fork' button with 0 forks. Below the header is a navigation bar with tabs for 'Code', 'Issues' (0), 'Pull requests' (0), 'Wiki', 'Pulse', and 'Graphs'. The main content area starts with a description: 'Proof of concept on Scala Native <http://scala-native.org/>'. Below this is a summary bar showing '31 commits', '1 branch', '0 releases', and '1 contributor'. A secondary bar contains buttons for 'Branch: master', 'New pull request', 'Create new file', 'Upload files', 'Find file', and a green 'Clone or download' button. The commit history section shows a list of recent commits by 'frgomes', including updates to the FAQ, README.md, and build.sbt files. The 'README.md' section is partially visible at the bottom, showing an 'Overview' heading and introductory text about the project's purpose as a template for Scala Native projects.

frgomes / poc-scala-native

Watch 2 Star 6 Fork 0

Code Issues 0 Pull requests 0 Wiki Pulse Graphs

Proof of concept on Scala Native <http://scala-native.org/>

31 commits 1 branch 0 releases 1 contributor

Branch: master New pull request Create new file Upload files Find file Clone or download

frgomes Update FAQ in regards to generation of executable files. Latest commit 35c0e90 2 days ago

example/src/main/scala	updates.	22 days ago
project	Attempting to make symbols visible to the linker.	26 days ago
.gitignore	Update README.md according to latest Scala Native updates.	2 days ago
.hgignore	Add .hgignore	21 days ago
README.md	Update FAQ in regards to generation of executable files.	2 days ago
build.sbt	Update FAQ in regards to generation of executable files.	2 days ago

README.md

## Overview

This project intends to serve as a template for projects employing [Scala Native](#).

For an introduction for the completely newbie on the subject, please find the FAQ down below.

# Chapter 5: Community

The screenshot shows a GitHub pull request interface. At the top, the browser address bar displays 'GitHub, Inc.'. The GitHub navigation bar includes the repository name 'scala-native / scala-native', a search bar, and links for 'Pull requests', 'Issues', and 'Gist'. On the right, there are buttons for 'Unwatch' (133), 'Unstar' (1,801), and 'Fork' (70). Below the navigation bar, the pull request title is 'Implement java.lang.String #140', with an 'Edit' button. A red 'Closed' label is present. The description states: 't-hiroyoshi wants to merge 1 commit into scala-native:master from t-hiroyoshi:java-string'. Below this, there are tabs for 'Conversation' (76), 'Commits' (1), and 'Files changed' (2). A progress bar shows '+796 -34' with a green bar. The main content area shows a comment by 't-hiroyoshi' from 14 days ago, stating 'target #20'. Below this, there are five comments by 'densh' from 14 days ago, each with a 'Show 1 comment' link. On the right side, there are sections for 'Labels' (None yet), 'Milestone' (No milestone), 'Assignees' (No one—assign yourself), '3 participants' (with three avatars), and 'Notifications' (with an 'Unsubscribe' button and a note: 'You're receiving notifications because you modified the open/close state.').

Chapter 6:

# Under the hood

# Based on LLVM?

Yes.

# Can it optimise tail calls?

Yes, even the mutual ones.

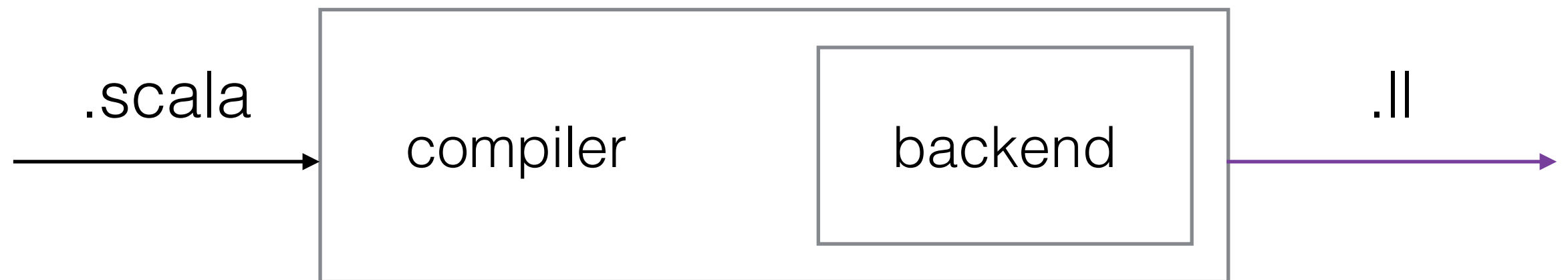
# Same language?

Yes, mostly.

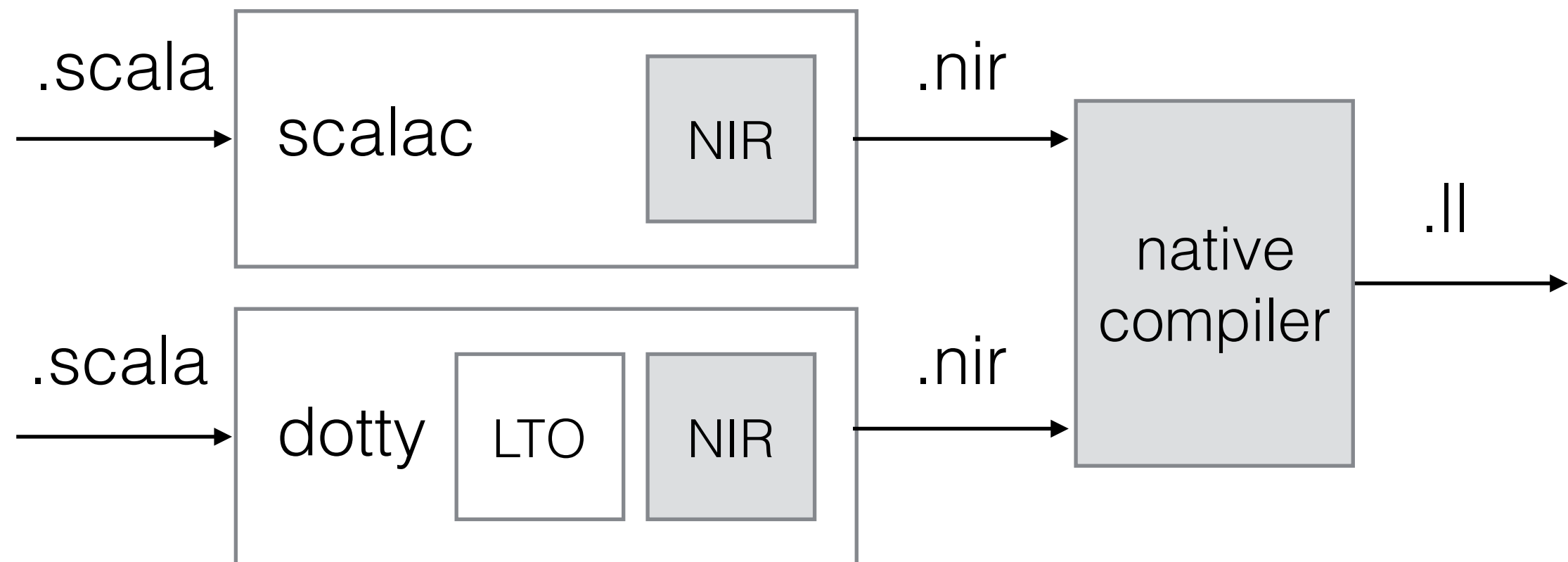
With extra low-level primitives,  
and better native interoperability.



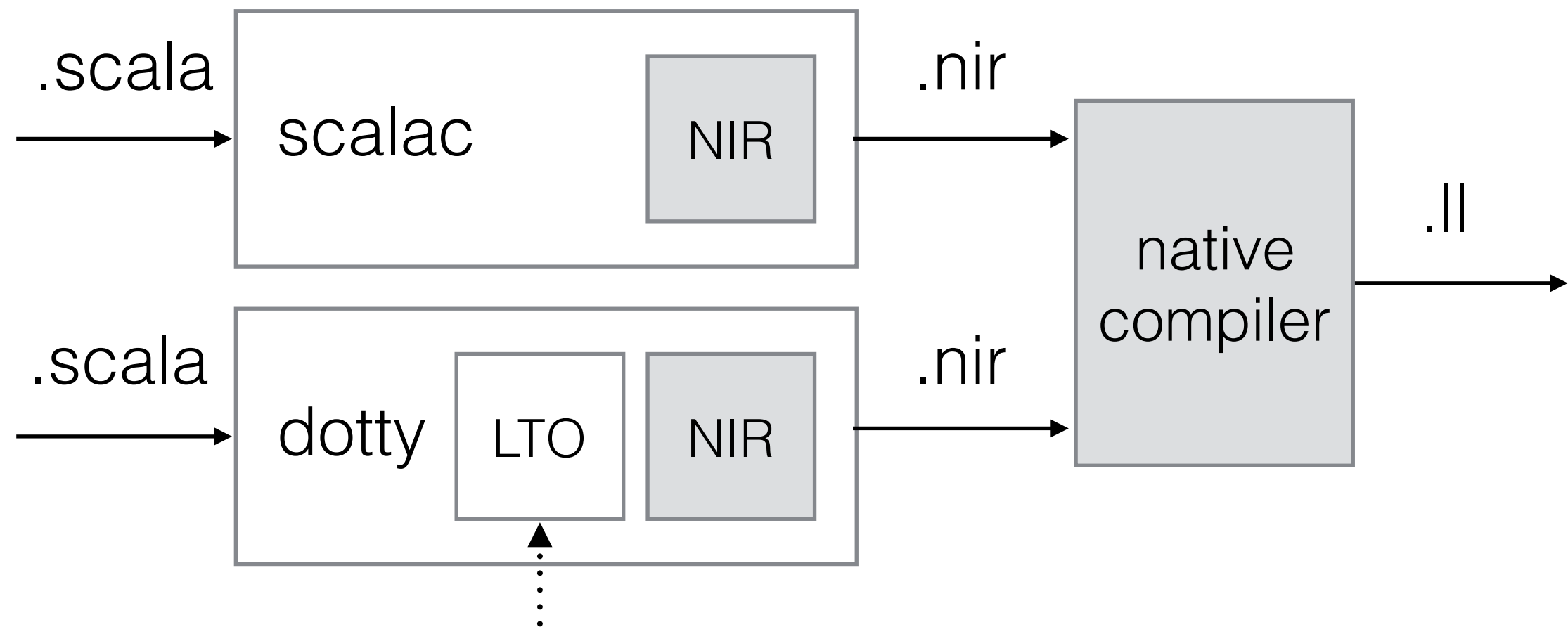
# Just a backend? Not quite.



# Which front-end? *All of them.*



# Which front-end? *All of them.*



[github.com/dotty-linker](https://github.com/dotty-linker) by @darkdimius

# Garbage-collected?

Yes.

First release will use Boehm GC.

Can only get better from there.

# Hardware support?

Developed on 64-bit Intel.

People expressed interest in

{ARM, Intel} x {32-bit, 64-bit}.

# Libraries?

```
import java.lang._ , reflect._
```

```
import java.util._
```

```
import java.io._
```

```
import java.nio._
```

```
import java.net._
```

# When?

First developer preview (i.e. 0.1) to appear in the near future. Monthly updates in 0.x series afterwards.

# When?

Follow us on twitter  
to be the first to know.

[http://twitter.com/scala\\_native](http://twitter.com/scala_native)



The end