

A PEOPLE'S HISTORY OF THE RUBY GARBAGE COLLECTOR

以毛泽东思想
宣传队

@nateberkopec



民团结如一人试看天下谁能

NO NO

speedshop

BEGINNER-FRIENDLY

**HOW DO WE REDUCE
GC PAUSES?**

**OBJECTSPACE
IS A LIST OF RVALUES**

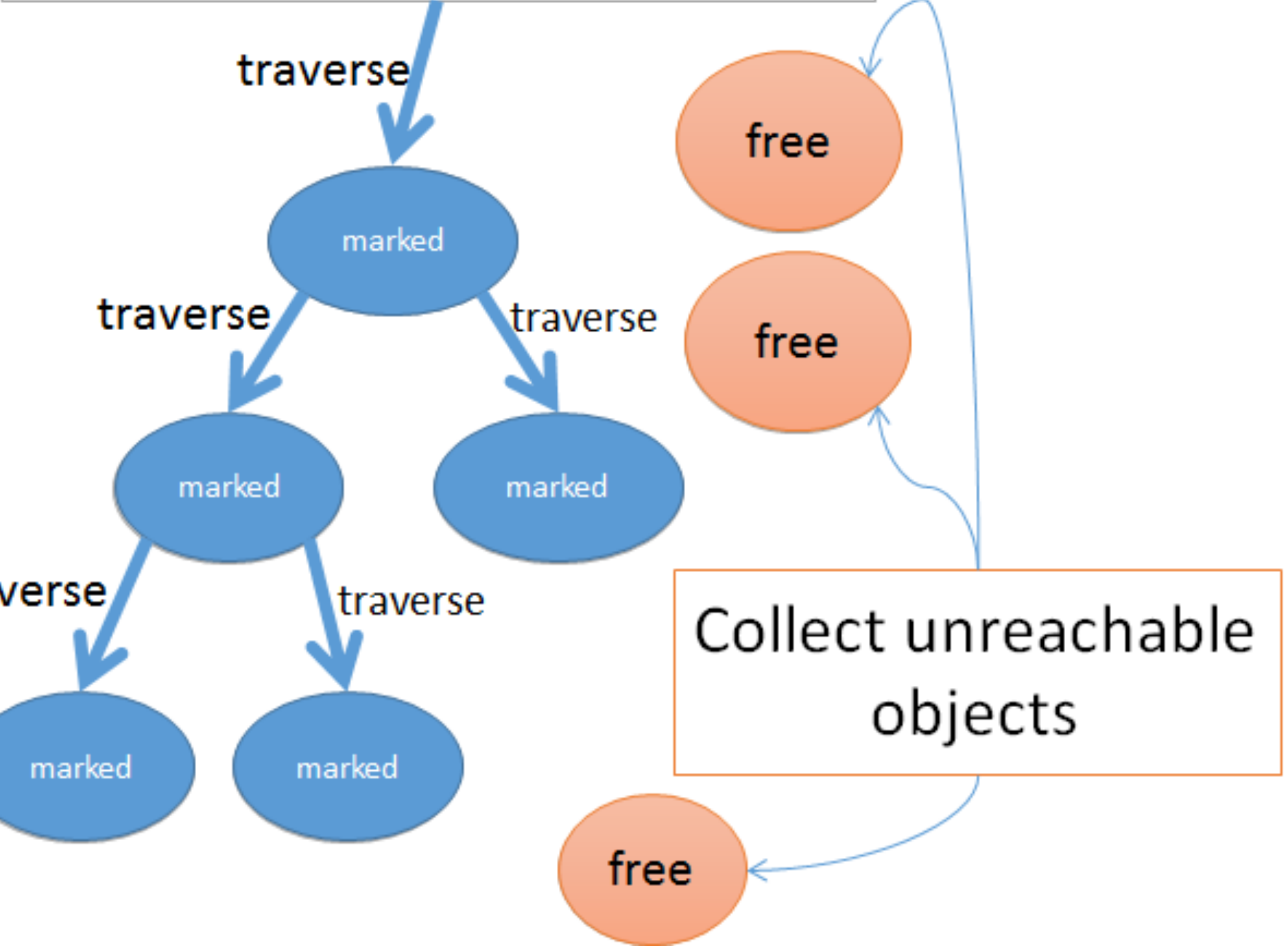
**irvalue - LIST OF
FLAGS, SOME
OBJECT INFO**

THE OBJECTSPACE IS
A LIST OF ~16KB PAGES OF ~400 RVALUES

WHAT TRIGGERS GC?

**RUN OUT OF OPEN
SLOTS FOR NEW
RVALUES OR HIT
OFF-OBJECTSPACE
("MALLOC")
LIMITS**

Root objects



FL_MARK FLAG

MARK -> SWEEP -> MARK -> SWEEP

**NO RUBY
CAN BE EXECUTED**

1.8 REEL COPY ON WRITE

A Phusion project

全世界人民团结起来,打倒美帝!打倒苏修!打倒各国反动派!

HONG KONG BAPTIST UNIVERSITY

圖書館 LIBRARY

**FORKING
WEBSERVERS**

SHARED VS PRIVATE MEMORY

TOUCHING RVa1ue



1903

LAZY SWEEP

BY NARIHIRO NAKAMURA

封昌訓練師紅心 永也系越七土席

**DON'T SWEEP
'TIL YOU NEED IT
OBJECT ALLOCATION**

**SWEEP UNTIL
FREE OBJECT IS FOUND**

**DECREASE
WORST-CASE TIMES**

MARK -> SWEEP -> SWEEP -> SWEEP -> MARK



200

BITMAP MARKING

BY NARIHIRO NAKAMURA

**KEEP THE MARK BIT
SOMEWHERE ELSE!**

THE BITMAP
SMALLER, EFFICIENT

COPY ON WRITE FRIENDLY

WAY!

MARK -> SWEEP -> SWEEP -> SWEEP -> MARK



2011

GENERATIONAL GC - RGENGC
BY KOICHI SASADA

MARKED OBJECTS
ARE ALSO MARKED "OLD" (3 SURVIVALS)

MINOR/MAJOR GCS

PROBLEM:
KEEPING TRACK OF NEW OBJECTS

BLACK

GRAY

WHITE

THE WRITE-BARRIER

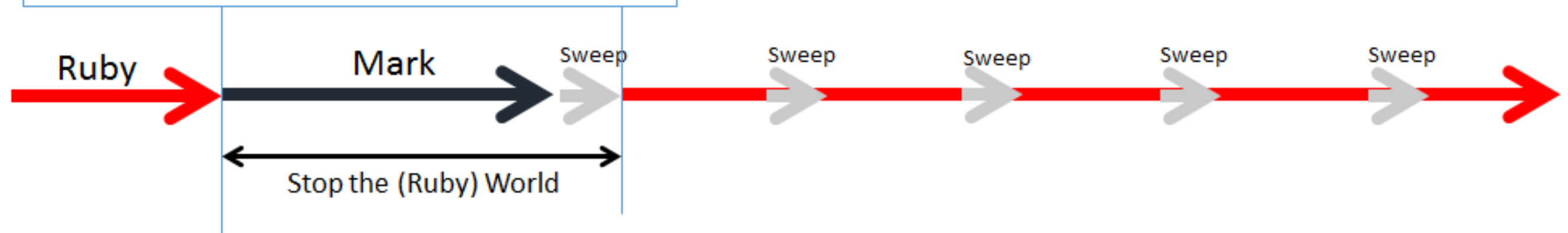
SUNNY/SHADY OBJECTS

WB PROTECTED/UNPROTECTED

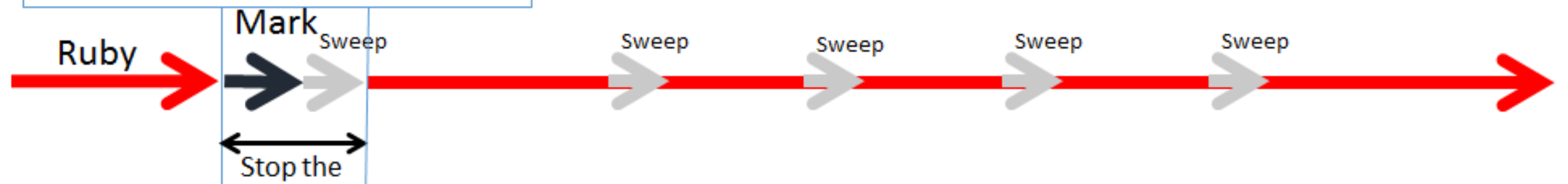
**SHADY/UNPROTECTED OBJECTS
ARE NEVER "OLD"**

REMEMBERED SET

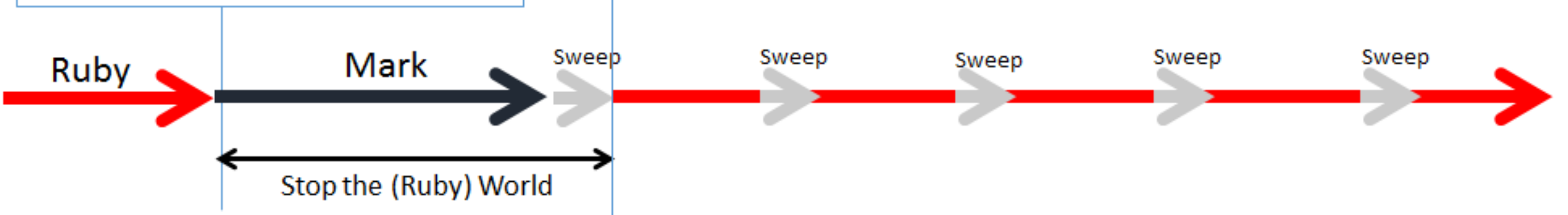
2.0.0 GC (M&S w/lazy sweep)



w/RGenGC (Minor GC)



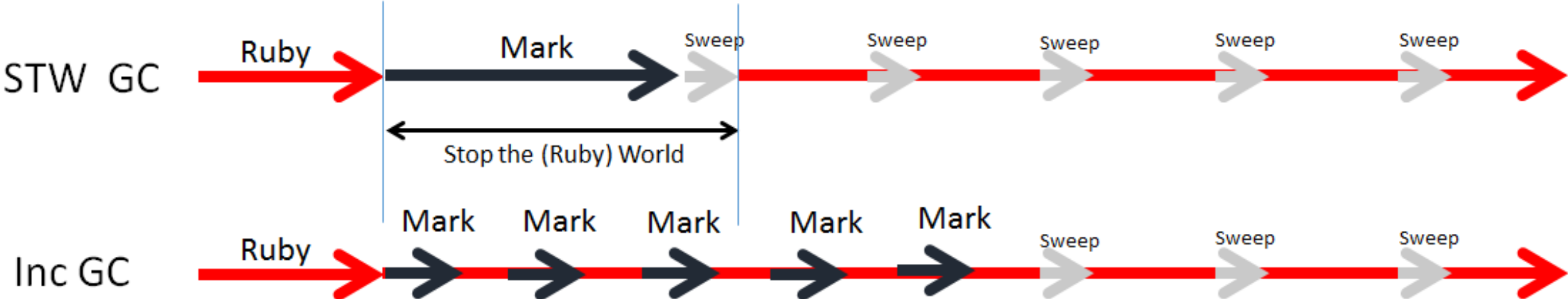
w/RGenGC (Major GC)



The background is a grayscale Soviet war poster. It features a large, bold number '2.2' in the center. Behind the number, there are faint, stylized illustrations of Soviet aircraft in flight. At the top, there is a banner with the Russian text 'БОЛЬШЕ ОРУЖИЯ!' (More Weapons!). On the left side, there is a portrait of a man, likely a Soviet leader, and some other faint text and graphics. The overall style is that of a mid-20th-century propaganda poster.

2.2

INCREMENTAL GC
BY KOICHI SASADA



"INTERLEAVE" MAJOR GC

TOTAL GC TIME REMAINS SAME

OOBGGC

NOT REALLY REQUIRED

**BLACK OBJECTS CAN
NOW REFER TO WHITE**

WRITE BARRIER
TRACKS NEW OBJECTS

GC.STAT

SYMBOL GC

A high-contrast, black and white graphic background featuring a stylized illustration of a woman's face in profile, looking upwards. She has long, wavy hair. The background is filled with various elements: a large, bold number '23' in the upper left, a smaller number '10' in the center, and the words 'NEW WRITE BARRIER' at the bottom. There are also some faint, stylized text elements in the background, including 'куче!' (kuchy!) and 'мать мур' (mat' mur).

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**NEW WRITE
BARRIER**

**“WE CAN ASSUME
NEW OBJECTS
REFERRED FROM
OLD OBJECTS ARE
MAYBE LONG-
LIVED OLD
OBJECTS”**

DIDN'T WORK?

A Soviet propaganda poster featuring a large portrait of a man in a space helmet with 'СССР' (USSR) on it, set against a background of stars and a rocket. At the bottom, a crowd of people is cheering with their arms raised. The text '2044' is prominently displayed in the center.

2044

**MORE LITTLE
CHANGES**

FREE SLOT CONTROL



THE FUTURE COMPACTING GC



JRUBY/TRUFFLE ALREADY DO THIS



AARON'S WORK

OLD/NEW PAGES
IMPROVE COW PERFORMANCE

GUILDS

MORE READING

PAT SHAUGHNESSY

KOICHI SASADA

SAM SAFFRON

**350+ PAGES, 18+
HOURS OF VIDEO
RAILSSPEED.COM**

What HTTP/2 Means for Ruby Developers

by Nate Berkopec (@nateberkopec)



34 points on reddit



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Summary: Full HTTP/2 support for Ruby web frameworks is a long way off - but that doesn't mean you can't benefit from HTTP/2 today! (*2112 words/11 minutes*)

HTTP/2 is coming! No, wait, HTTP/2 is here! [After publication in Q1 of 2015](#), HTTP/2 is now an "official thing" in Web-land. As of writing (December 2015), [caniuse.com estimates about 70% of browsers globally can now support HTTP/2](#). So, I can use HTTP/2 in my Ruby application *today*, right? After all, Google says that [some pages can load up to 50% faster just by adding HTTP/2/SPDY support](#), it's magical web-speed pixie dust! Let's get it going!



Okay, way too much magical pixie dust.

SPEEDSHOP.CO

THANKS!

SLIDES AND NOTES ON TWITTER

@NATEBERKOPEC

SPEEDSHOP.CO & RAILSSPEED.COM

Tell me your problems!