

SWIMMING IN THE MICROSERVICES OCEAN

@LUCAMARASCHI
NODEJS/POST-MORTEM

THE MAGIC DUMP



PORTING MDB TO LINUX COMMON HEAP DUMP FORMAT

DISCLAIMER!

IT'S JUST MY OPINION!

I DON'T WORK FOR UBER

I HAVE A DREAM
AUTONOMOUS CLUSTER
WITH NO CONFIGURATION

FLOW DRIVEN DEVELOPMENT

ONCE UPON A TIME . . .



AND THEN JAVA CAME ACROSS...
WITH THE FAMOUS MONOLITH



GEBERIT



'DIVIDE ET IMPERA'

THEN MICROSERVICES



NodeCrunch

Welcome to NodeCrunch, the nearForm blog. This is where we share information of all kinds, from Node.js news to new tool releases to our latest thinking on developing company values. We love to chat, so do post your comments below.



WHY NODE.JS IS BECOMING THE GO-TO TECHNOLOGY IN THE ENTERPRISE

By: [Cian Ó Maidín](#)

 March 10, 2014  Feature articles, Node.js community Tagged Mail Online, node.js growth, PayPal, Voxer, WallMart, Yammer  65 Comments

Over the last 18 months the use of Node.js has grown at an exponential rate.

RECENT POSTS

[Microservices Day London \(live blog\)](#)

[Live stream from Microservices Day London](#)

[Node v6.0.0 released today \(April 26th\)](#)

CATEGORIES

culture

SUCCESS
MORE USERS

MORE USERS
≡ MORE COMPUTE POWER

**MORE 'RACKS'
MORE DISTRIBUTION**



Amazon
EC2



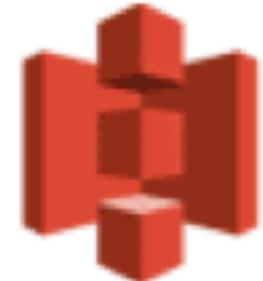
Amazon
RDS



AWS
Direct Connect



Amazon
EBS



Amazon
S3



Elastic Load
Balancing



Amazon
Route 53



Amazon
VPC



Elastic IP

ELASTICITY

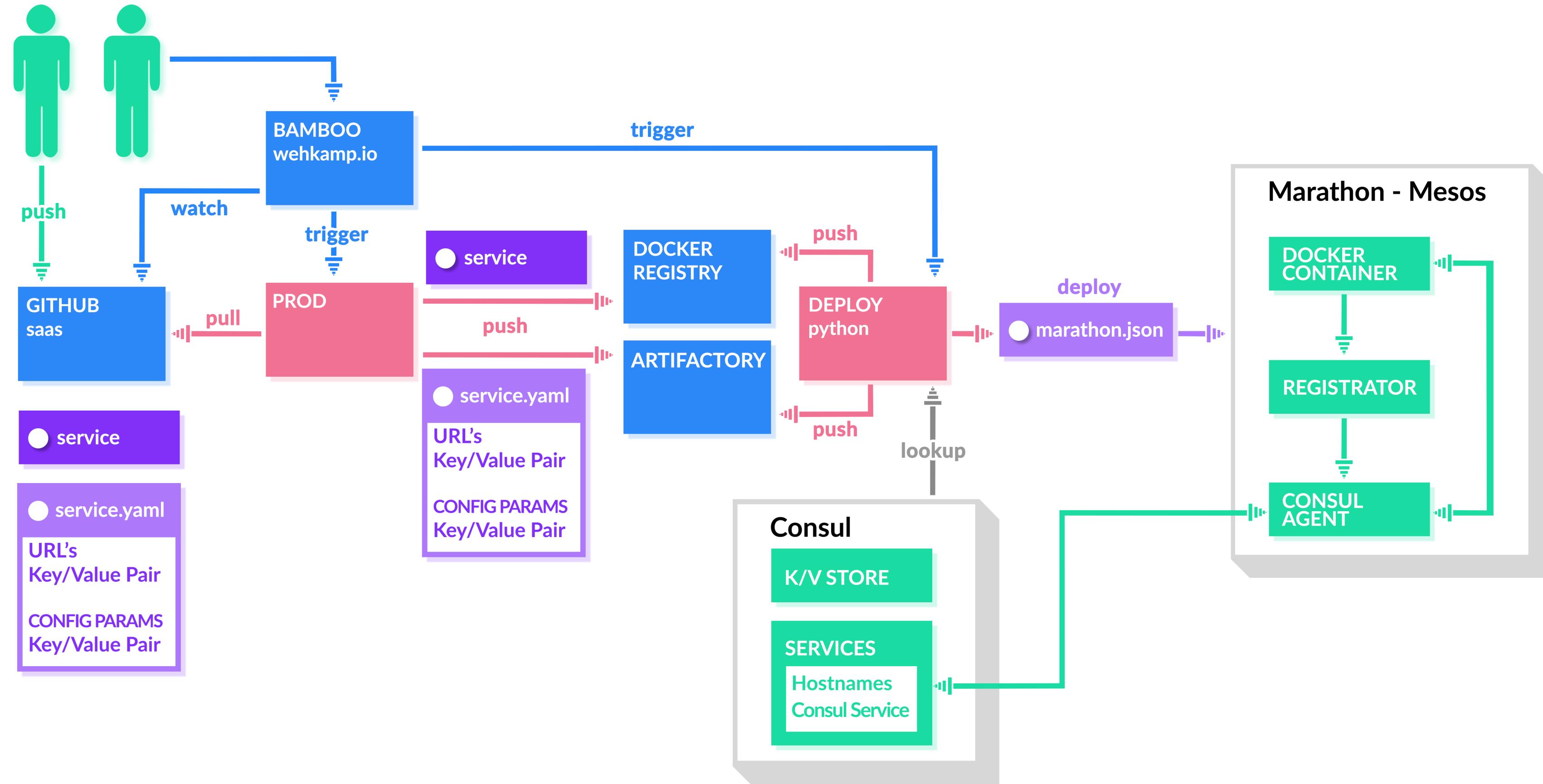
AWS ➡ ELB

DOCKER

DOES NOT SOLVE THE PROBLEM!

MORE 'CONTAINERS'
== SERVICE DISCOVERY

**NO RESILIENCE
NO FAULT TOLERANCE**



**FAILURES
ARE DETECTED BY HEARTBEATS**

**WELCOME IN
DEVOPS HELL!**

PROBLEM
STATE OF THE CLUSTER
MIGHT CHANGE ALL THE TIME

FINN



Tool

SWIM: Scalable Weakly-consistent Infection-style Process Group Membership Protocol

Abhinandan Das, Indranil Gupta, Ashish Motivala*
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Ithaca NY 14853 USA

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Abstract

Scalable distributed group communication requires

1. Introduction

As you swim lazily through the milieu,

SCALABLE
WEAKLY CONSISTENT
INFECTION STYLE
MEMBERSHIP PROTOCOL

WEAKLY CONSISTENT
VS. STRONGLY CONSISTENT

FAILURE DETECTION OVER THE CLUSTER

INFORMATION DISSEMINATION

EQUALLY DISTRIBUTION
OF THE WORKLOAD

DESIGNED FOR
DISTRIBUTED SYSTEMS

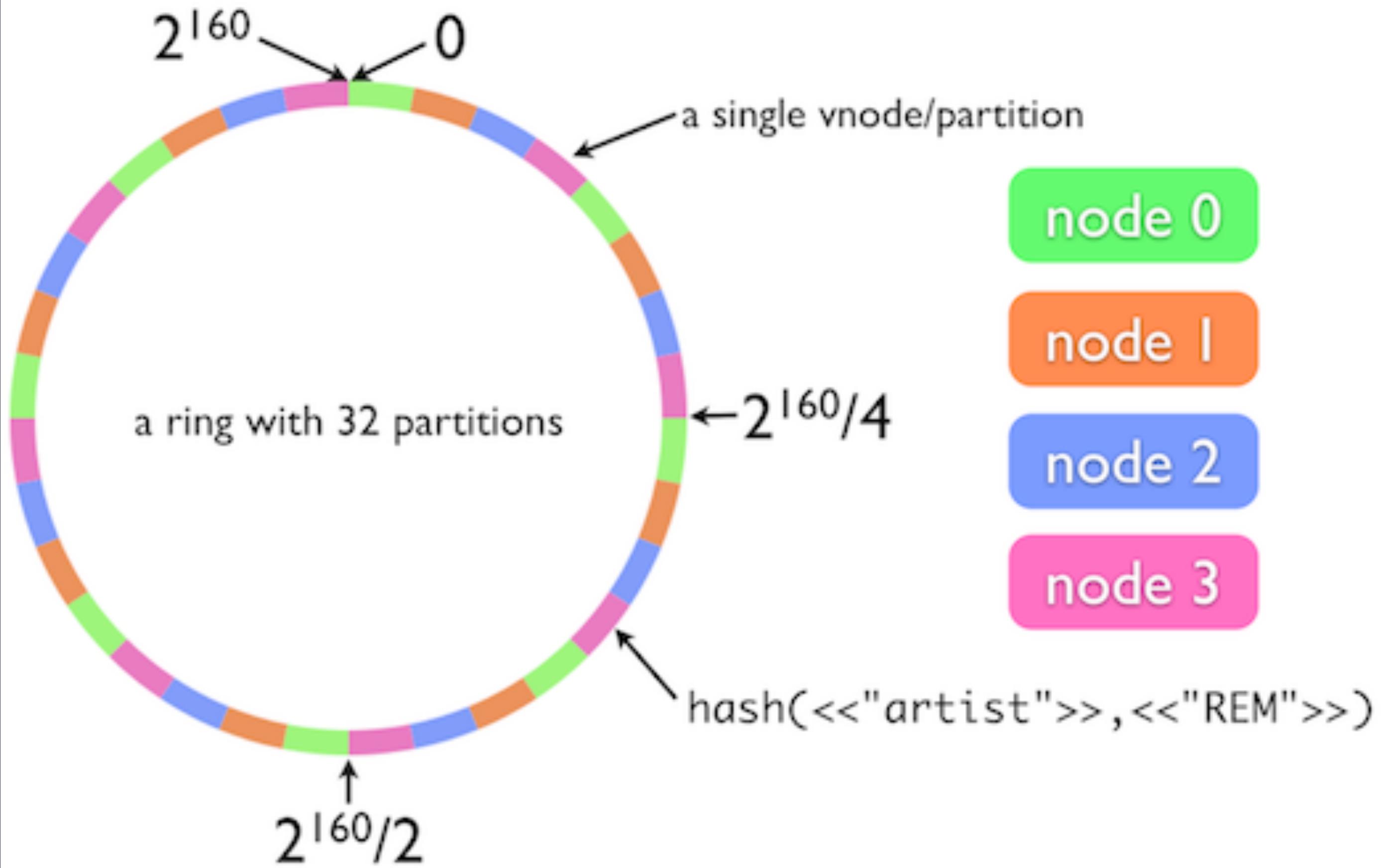


ReactionGIFS.me

ADD A NODE TO THE CLUSTER

HOW TO REBALANCE THE TOPOLOGY?

CONSISTENT HASHRING



WHY?
WHAT?

PARTITIONING

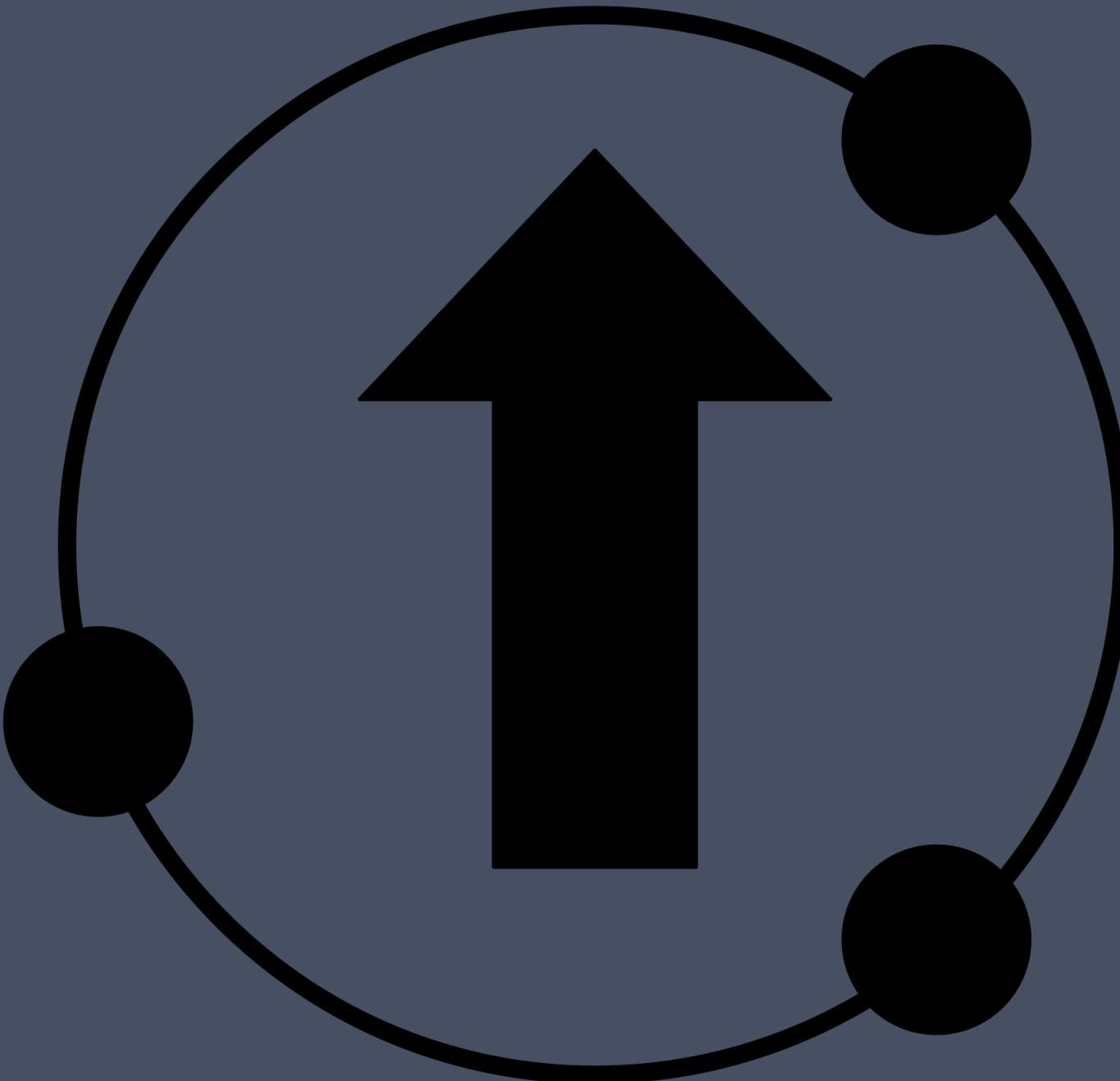
PREDICTABLE
ELASTICITY

REPLICATION

DISTRIBUTE STATE

EDGES ARE
NOT STATELESS





Uprising

application-level
sharding for Node.js



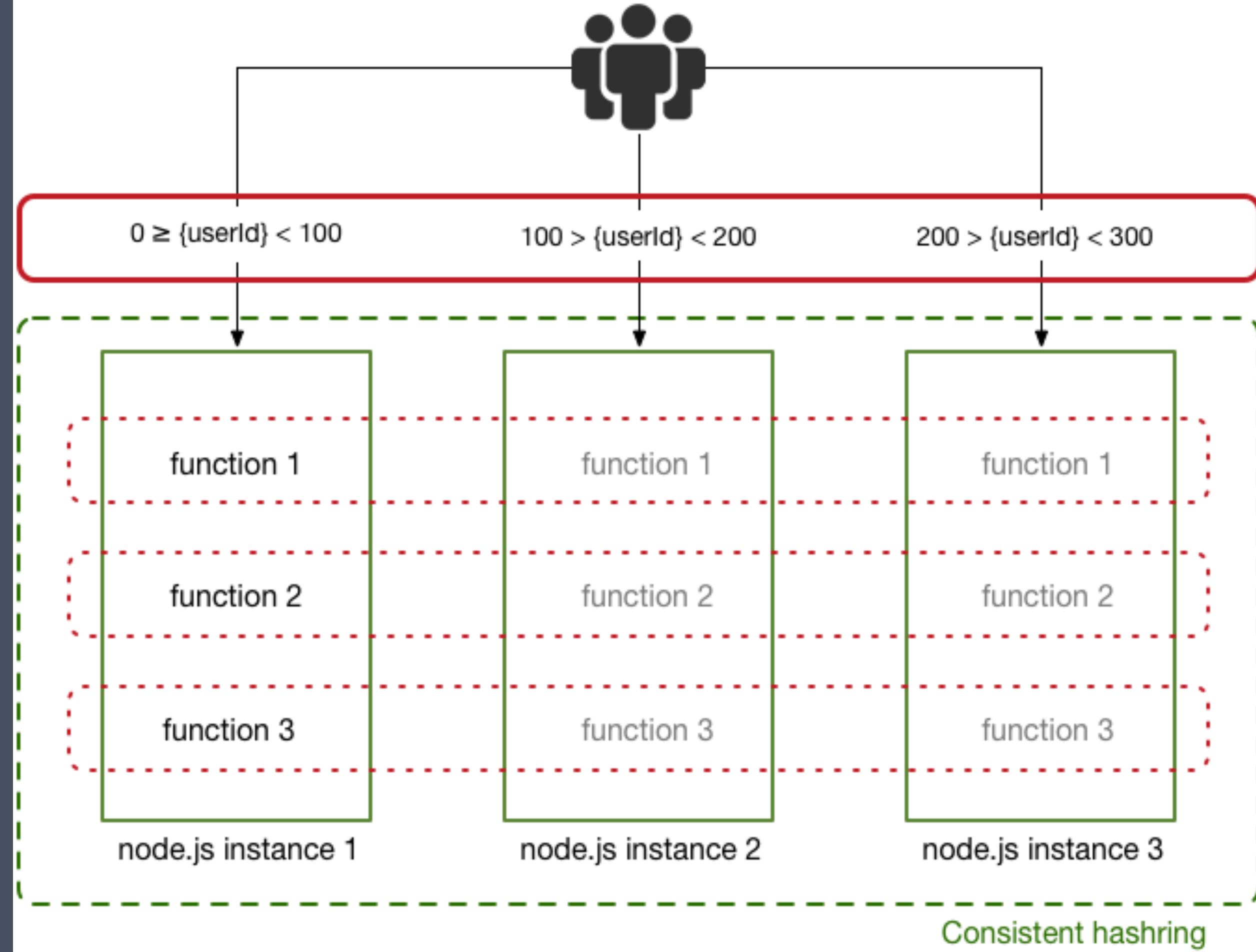
ringpop

Scalable, fault-tolerant application-layer sharding

[FORK ME ON GITHUB](#)

APPLICATION-LEVEL SHARDING

DISTRIBUTION IN AN EVENTUAL CONSISTENT UNIVERSE





hyperbahn

Service discovery and routing for large-scale microservice operations

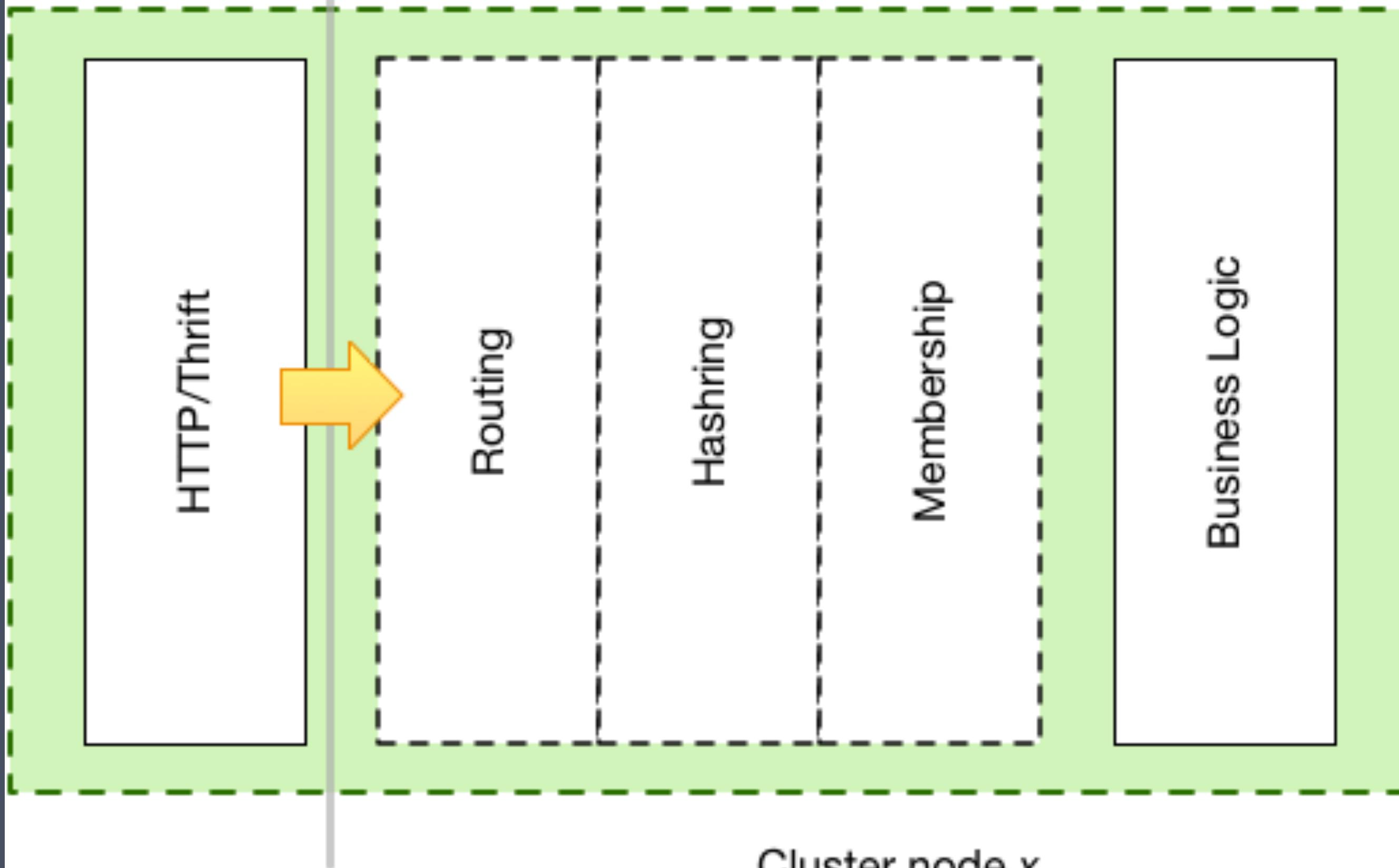
[FORK ME ON GITHUB](#)

HYPERBAHN ENABLES SERVICE DISCOVERY AND ROUTING FOR LARGE-SCALE SYSTEMS COMPRISED OF MANY MICROSERVICES. DISTRIBUTED, FAULT TOLERANT, AND HIGHLY AVAILABLE, IT LETS ONE SERVICE FIND AND COMMUNICATE WITH OTHERS SIMPLY AND RELIABLY WITHOUT HAVING TO KNOW WHERE THOSE SERVICES RUN.

- UBER'S DOCUMENTATION!

FRONT-END

APPLICATION



Cluster node x

HIT UP

AND THE LATENCY

DON'T USE IT!
FOR IN-NETWORK COMMUNICATION!



tchannel

Network multiplexing and framing protocol for RPC

 [FORK ME ON GITHUB](#)

TCHANNEL IS A NETWORKING FRAMING PROTOCOL USED FOR
GENERAL RPC, SUPPORTING OUT-OF-ORDER RESPONSES AT
EXTREMELY HIGH PERFORMANCE WHERE INTERMEDIARIES CAN
MAKE A FORWARDING DECISION QUICKLY

- @MATT SWEENEY

WHY RPC?

**ARE FUNCTIONS!
RUNNING ON A CLUSTER!**

AWS LAMBDA

KILLS THE
~~DEVELOPMENT WORKFLOW~~

ABSTRACT THE DEVELOPMENT
DISTRIBUTION COMPLEXITY

**'SERVERLESS'
IS THE NEW HIPSTER!**

'FUNCTIONAL'
IS THE NEW HIPSTER!

**'DISTRIBUTED FUNCTIONS'
ARE THE FUTURE :-)**

CRAZY!P