

Making WallStreet talk with GO

Matthew Campbell

Who Am I

- New York / Bangkok
- Run GO Meetup in Bangkok
- bloomberg.com (Rails)
- gucci.com (Rails)
- Co founder ErrPlane (GO)
- Thomson Reuters Messenger (GO)



GOLANG **Bangkok** **2015**

#langfight

What is this talk about?

- Running GO with a 300k users in production for multiple years
- Monitoring Large scale GO Servers
- Remote teams and GO

Eikon Messenger

RC

Matthew Campbell

CONTACTS

Buddies 2 / 6

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dsfasdf 0 / 5

support 0 / 8

ターネット 0 / 4

Ungrouped 20 / 177

Alan Carino Thomson Reut...

ANUSORN ROCHANA-AR...

Arunee Sugreekate Thoms...

Arunee Sugreekate-Chukla...

Emmanuel Kimmerlin Thom...

Fernando Varela Thomson ...

Henry Sun Thomson Reuters

Jack Berglund Thomson R...

Maheshkumar Tallor Thom...

Nipon Chinathlmatmongkh...

Pathompong Puengrosth...

Pentipa Jaemjankasem Th...

Richard Morris Thomson R...

Ronakorn Leelawilas Thom...

Roy Yang Industrial Bank ...

Samankwan Yodkaew Tho...

Sathita Amnuayskul Thoms...

Sombat Wongsrisupphakul...

Tanakiat Srisaranyakul Tho...

CONVERSATIONS

Paul Guerra Thomson Reuters
P. Guerra: scratch that Wal gave me the...

Darshan Patil Thomson Reuters

Dina Vaghjiani Thomson Reuters
Me: thx

Arunee Sugreekate Thomson Reuters
Me: nice ! exciting

James Cannon Thomson Reuters

Wal-Hung Shum Thomson Reuters

Pathompong Puengrosth... Thomson Reuters
Me: respond to the thread with details

Suresh Rajendran Thomson Reuters
S. Rajendran: is it collab.thomsonreuter...

matthew.g.campbell.nitro.com@reua ...

Alan Hall Thomson Reuters
A. Hall: hi

Dominic Brown Thomson Reuters

mcampbell@hyperworks.nu

Adrian Dickinson Thomson Reuters
A. Dickinson: just a thought going forwa...

Matthew Campbell Rms

Ronakorn Leelawilas Thomson Reuters
Me: you have a good trip?

Rob Sutton Thomson Reuters

Nick Field Thomson Reuters
N. Field: after all the config probs there

Matthew Campbell Rms

Conversations may be recorded or monitored by the participants and their employers, and may be disclosed to governmental or other regulatory bodies in compliance with applicable laws.

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Type Here

Eikon Messenger

- 300k Traders / Fund Managers
- Federation with 20+ Bank/Financial Networks
- Strict compliance rules in 100+ countries
- Global usage, largest in SE Asia
- Downtime == Lost Trades == Upset customers

Protocols

- XMPP (Most XEPS)
- SIP (Microsoft SIP)
- BOSH (http xmpp)
- Chatrooms

Team

- 80% remote team
- Development
New York/Canada/Portugal/Germany/Bangkok
- Ops London
- QA Bangkok

Remote Dev

- Daily Google Hangouts
- Pivotal Tracker
- Github pull request, code reviews
- Xmpp Chatroom, all day multi time zone
- Email group

Issues with GO

Missing Features

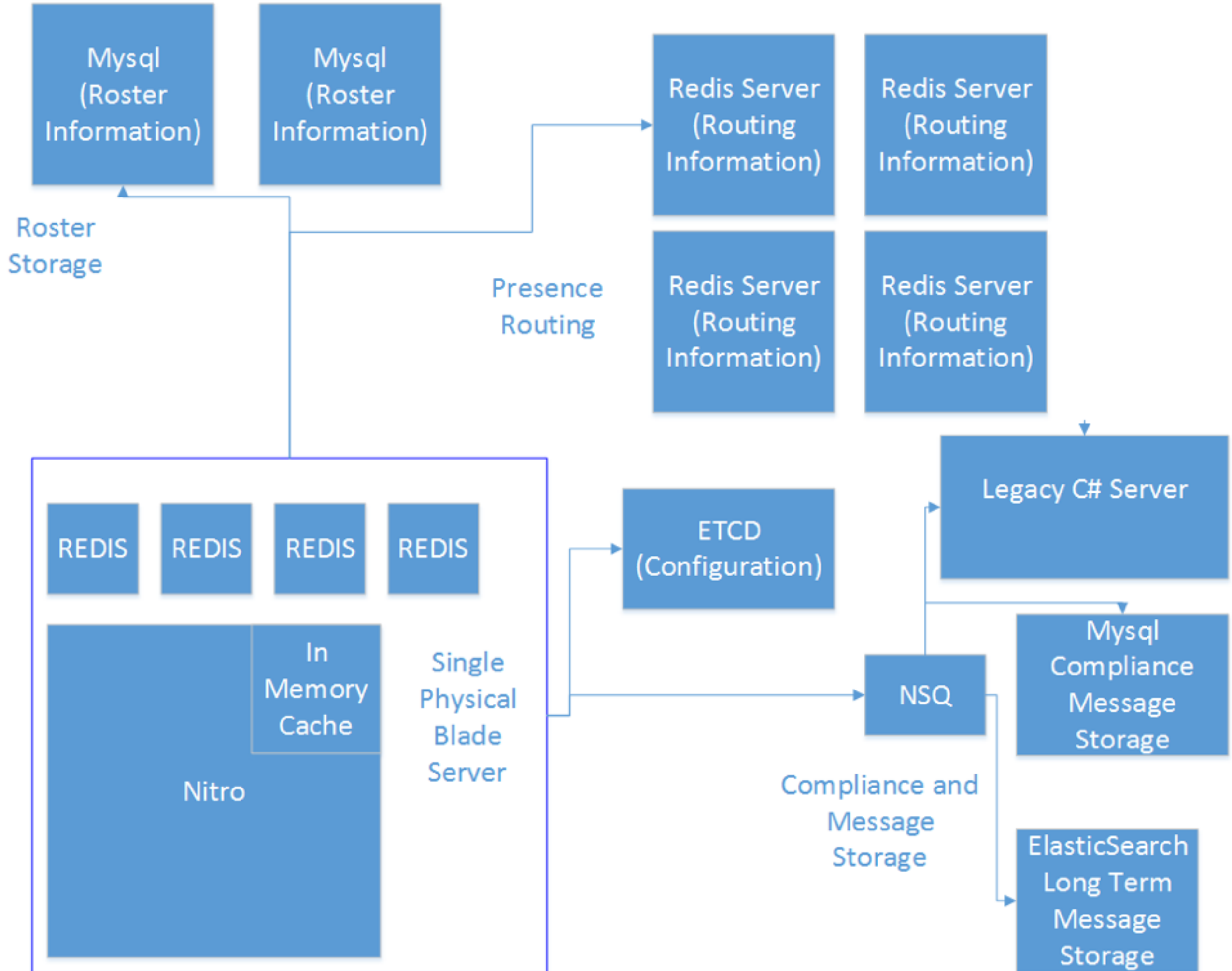
- Decent XML Dom Parser
- Regex with decent performance
- Serializing performance / allocations
- Better CGO integration

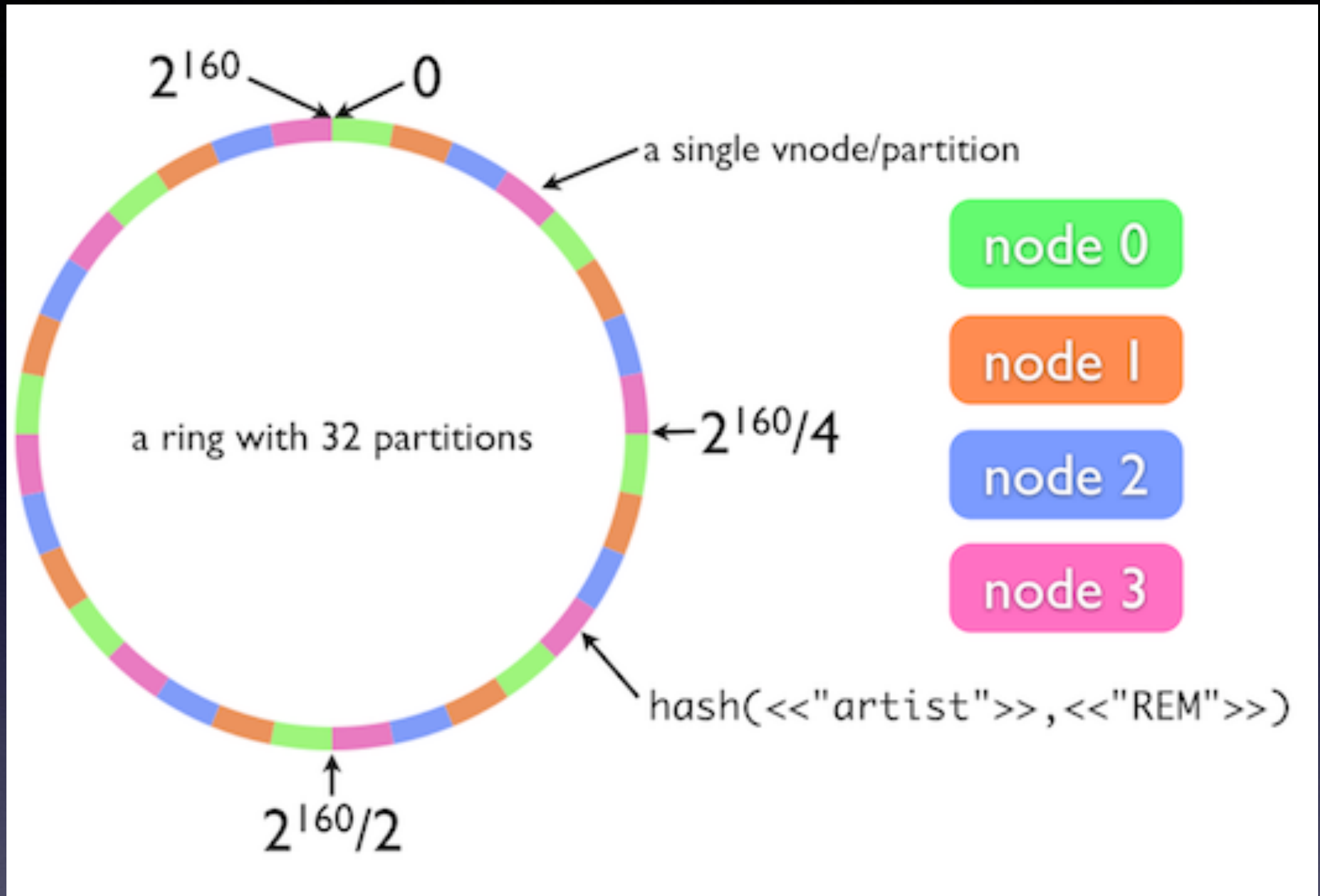
Garbage Collection

- Our single largest problem. Our app is latency sensitive.
- We have automated test suite to detect garbage collection problems
- Avoiding Heap allocations
- Managing Size of Heap

IO Latency

- Many Layers
- In process cache
- Local Redis instance on machine
- Mysql primary storage
- NSQ for delayed message queuing





Clustered Redis

source: paperplanes.de

CGO Issues

- Libxml2 (Gokogiri) , PCRE (Perl Regex)
- Issues with too many Pthreads
- 1.4 broke a lot of C libraries, with stack moving
- Broke GDB for a while
- Faster sometimes, sometimes significantly slower cause of thread dispatch

Following GO Libraries

- For the first year, we tracked all GO dependencies
- We often time found bugs in upstream libraries with our automated integration suite
- Over time this got to risky, and we chose to freeze our GO Libraries

Tracking GO Lang

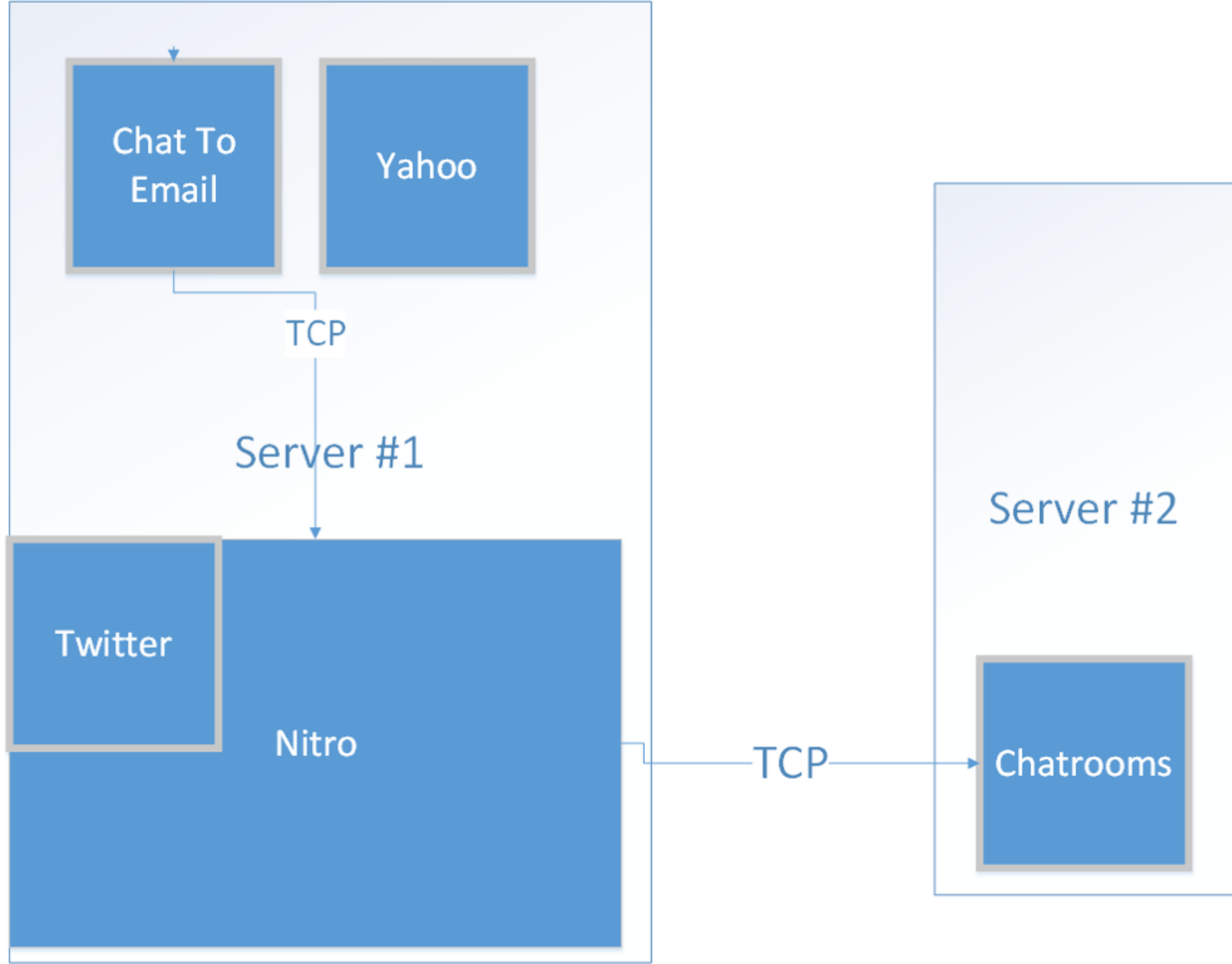
- PAINLESS !
- We track Go Lang official releases, within 2 weeks of each release we have gone to production using the new compiler
- We have had a few integration tests break during upgrades
- Only production code that broke, was in CGO ;(

Continuous Delivery

- Jenkins
- Integration level tests, that fire up a cluster of our servers, and validates user level interactions at protocol level. Including federating with several open source messaging servers
- Unit tests for functional areas

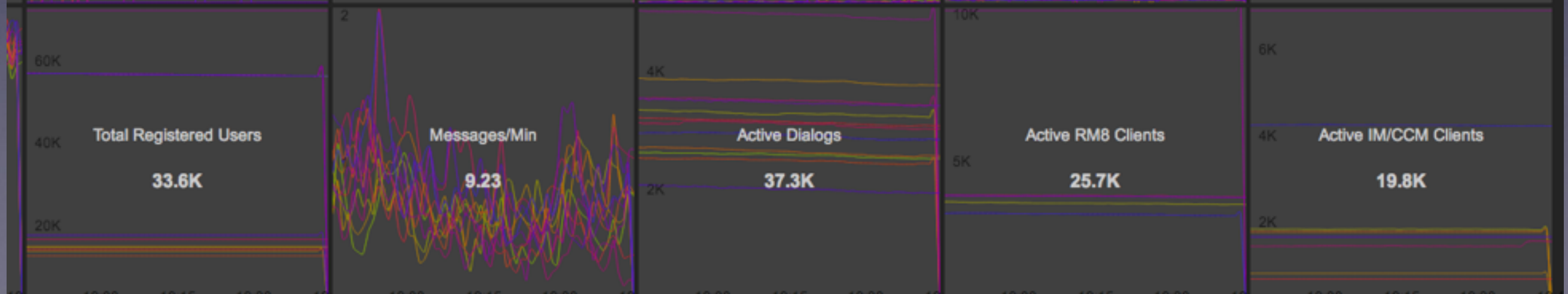
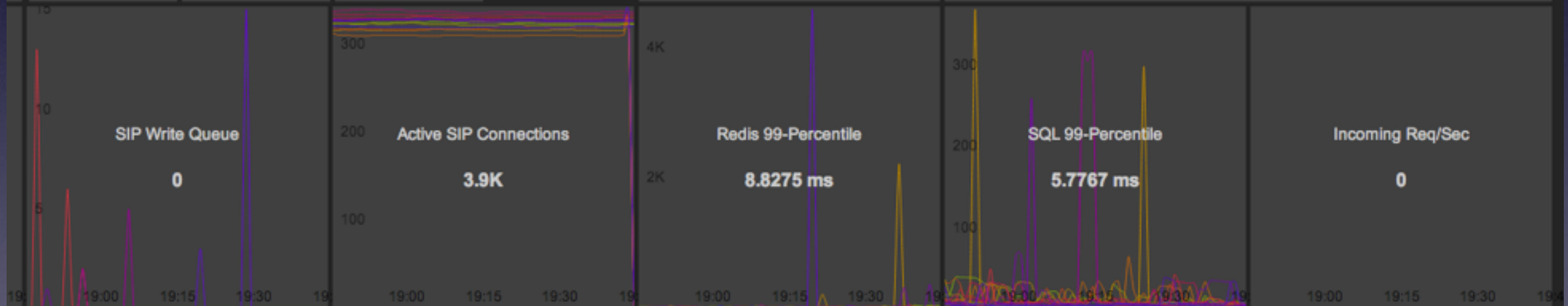
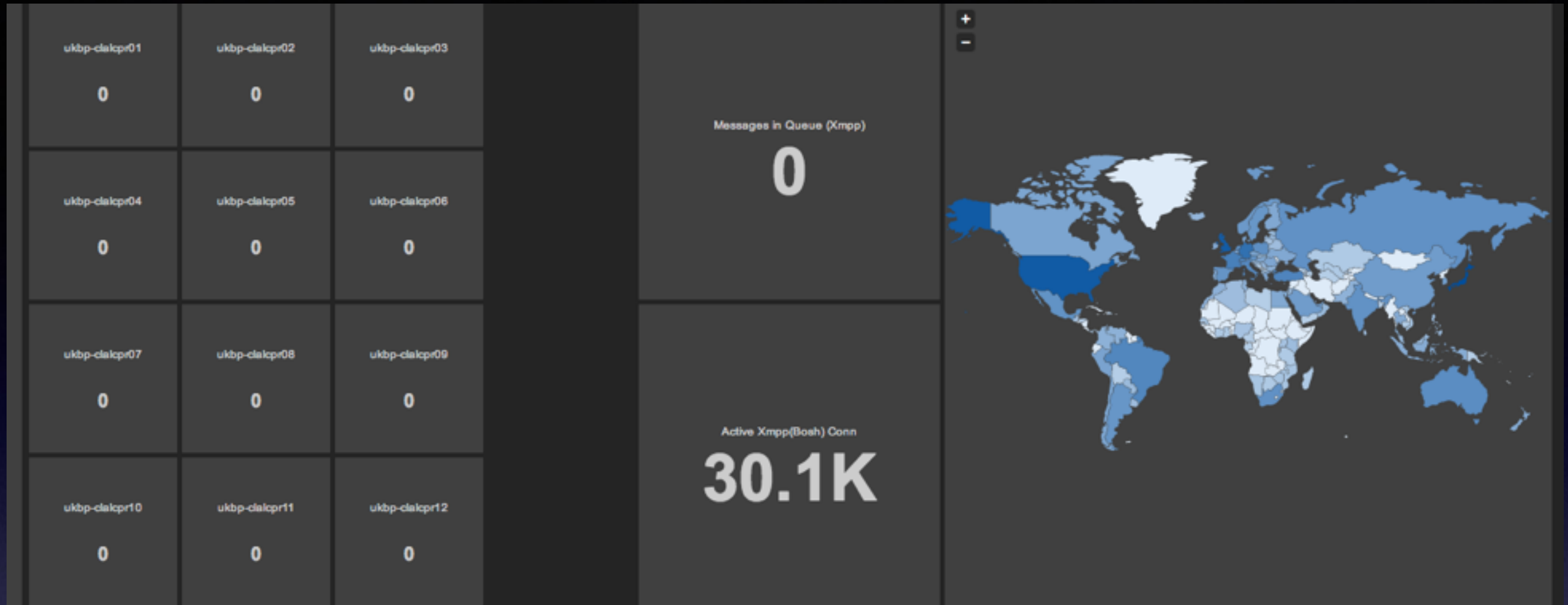
Plugin Architecture

- Plugins are processes
- Go doesn't support dynamic linking
- Plugins talk to main process via TCP
- Plugins can be run in process, but still use tcp, to simulate exact same properties



Metrics

- Annotate everything
- Us GO-Metrics
- Graphite / InfluxDb



Single Points of Failure

- Mysql Multimaster
- Redis Master / Slave
- Sentinel for Mysql Failover
- Custom scripts + ETCD for Mysql Failover

Packaging

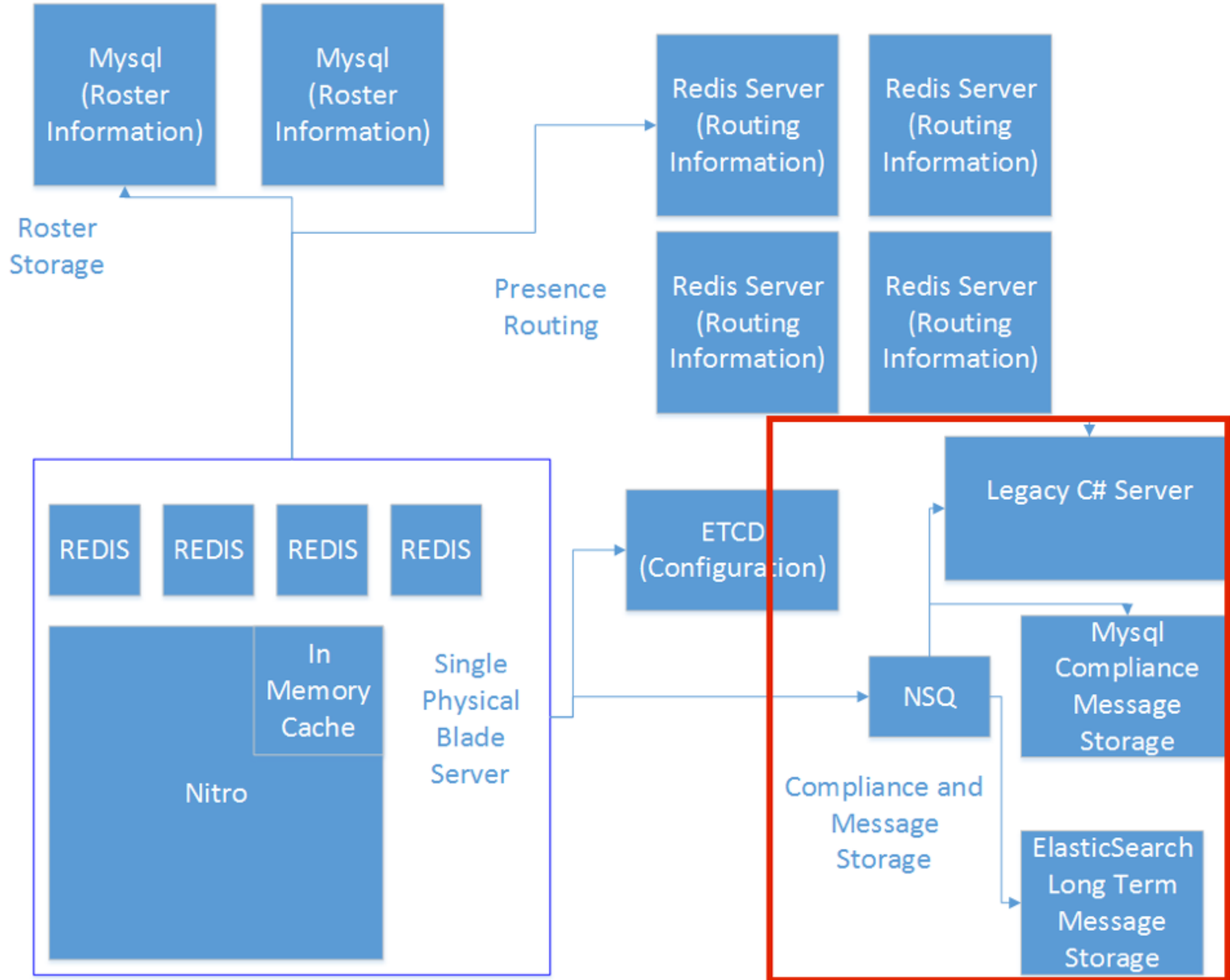
- RPMs
- FPM Ruby Gem
- Single binary + Configs

Managing Config

- ETCD vs Zookeeper
- Push
- Pull

Compliance

- NSQ
- Elastic Search
- Mysql
- C# process



Upgrades

- In place upgrades
- Spawn a new process
- Pass file handles for TCP via a Named Pipe
- New process kills parent

What's Next

- Multiple live datacenters, currently Hot/Cold
- Removal of all CGO Code
- Using GO Generate for config classes

Q & A

Contact

- Feel Free to email me any further questions
- We're Hiring!
- mcampbell@hyperworks.nu