JavaCro'17

NETFLIX | OSS

Anticipating the fallacies of distributed computing using the Netflix OSS

JavaCro'17

NETFLIX | OSS

tom.cools@infosupport.com
@TCoolsIT
https://github.com/TomCools


InfoSupport
Solid Innovator


citi
HSBC
BARCLAYS
STATE STREET


citi
HSBC
BARCLAYS
STATE STREET
M-PESA
PayPal

Payment Services Directive 2

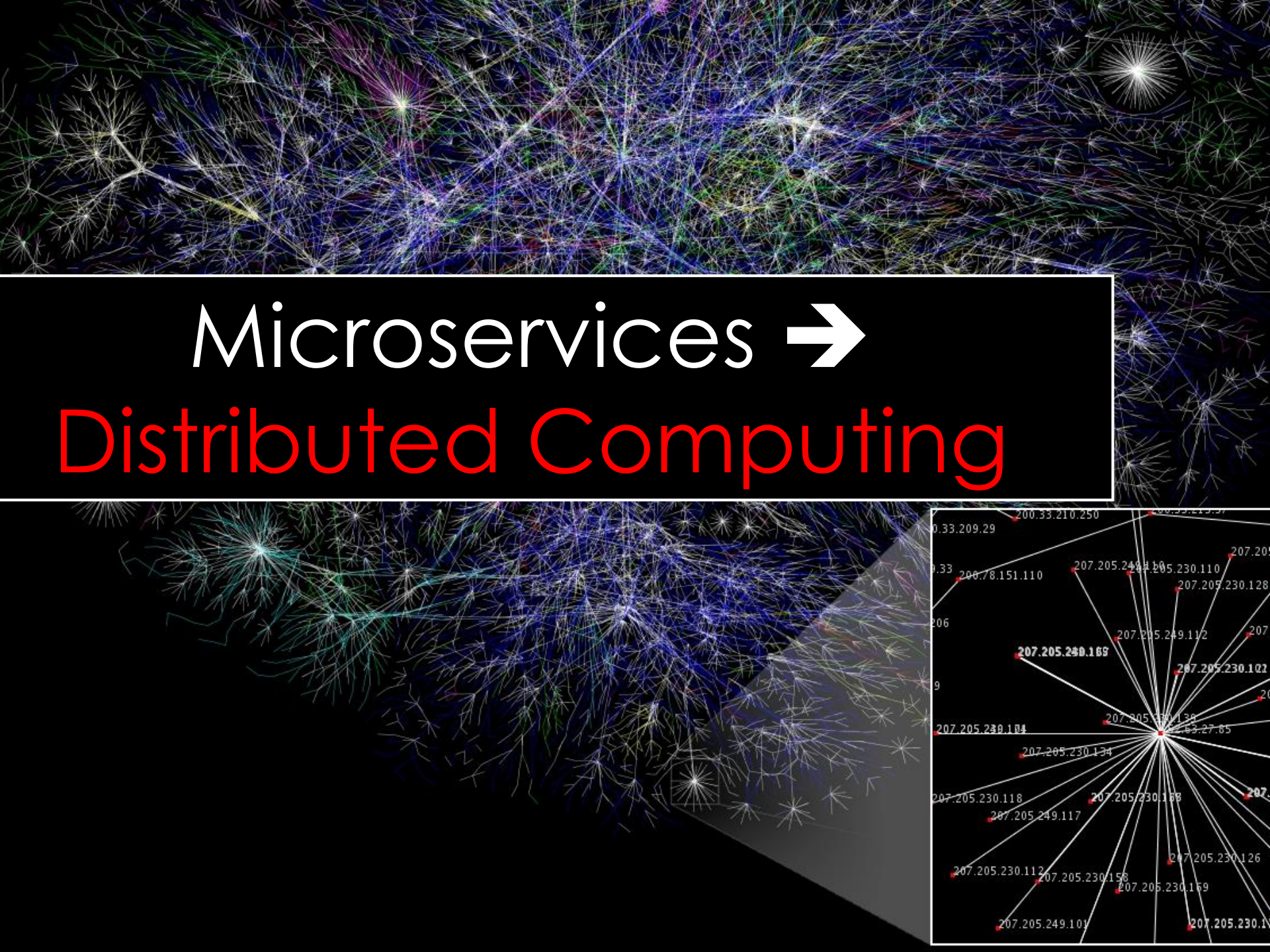
GAMES

"We need microservices"

NETFLIX


June

Microservices ➔ Distributed Computing



The Eight Fallacies of Distributed Computing

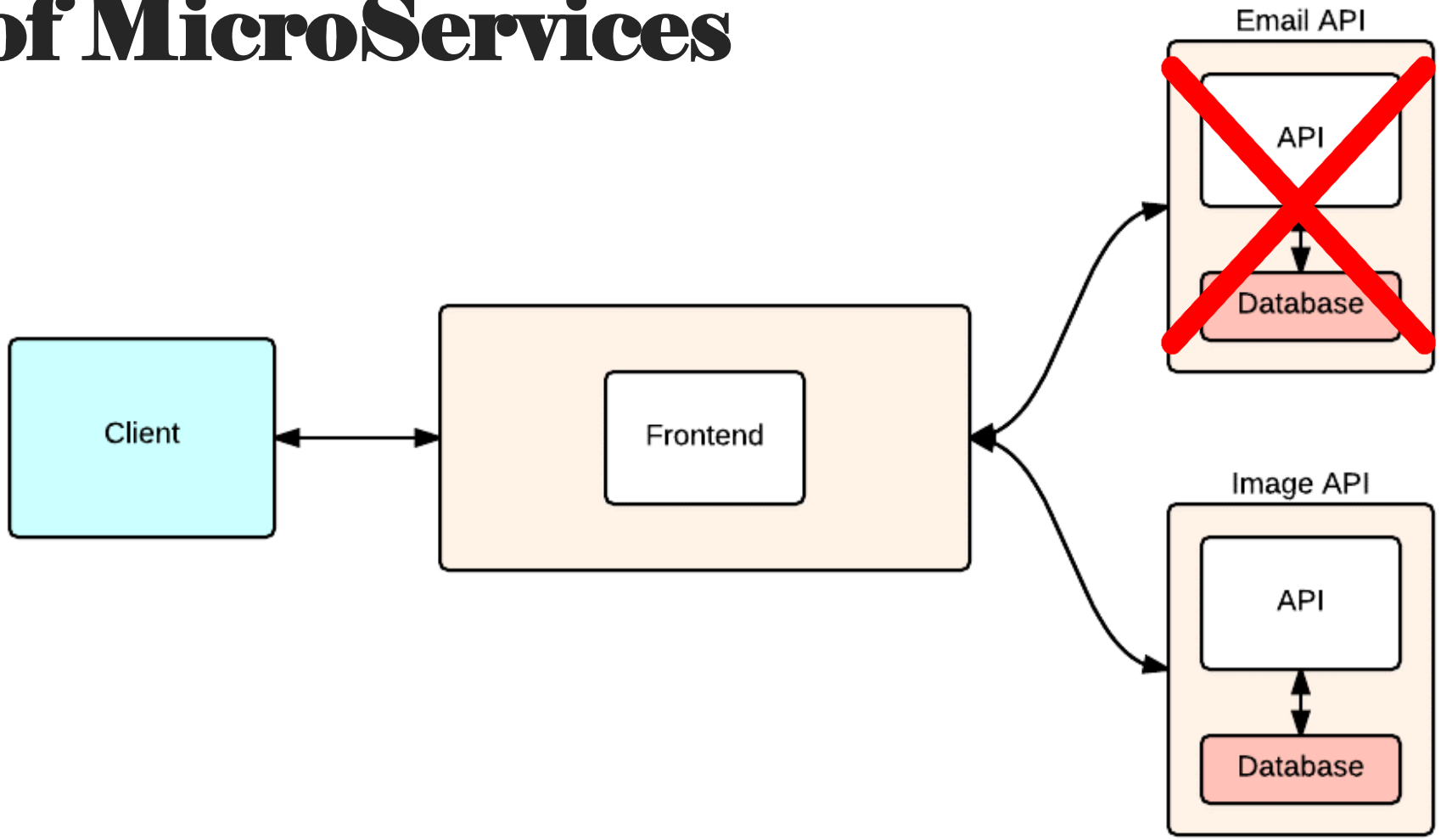
1. The network is reliable.
2. Latency is zero.
3. Bandwidth is infinite.
4. The network is secure.
5. Topology doesn't change.
6. There is one administrator.
7. Transport cost is zero.
8. The network is homogeneous.

Big Trouble & Painful Learning

Essentially everyone, when they first build a distributed application, makes the following eight assumptions. All prove to be false in the long run and all cause big trouble and painful learning experiences.

Peter Deutsch

Fault tolerance promise of MicroServices



Allowing resilience != Assuring resilience


End
Demo

Requirements

Async Execution

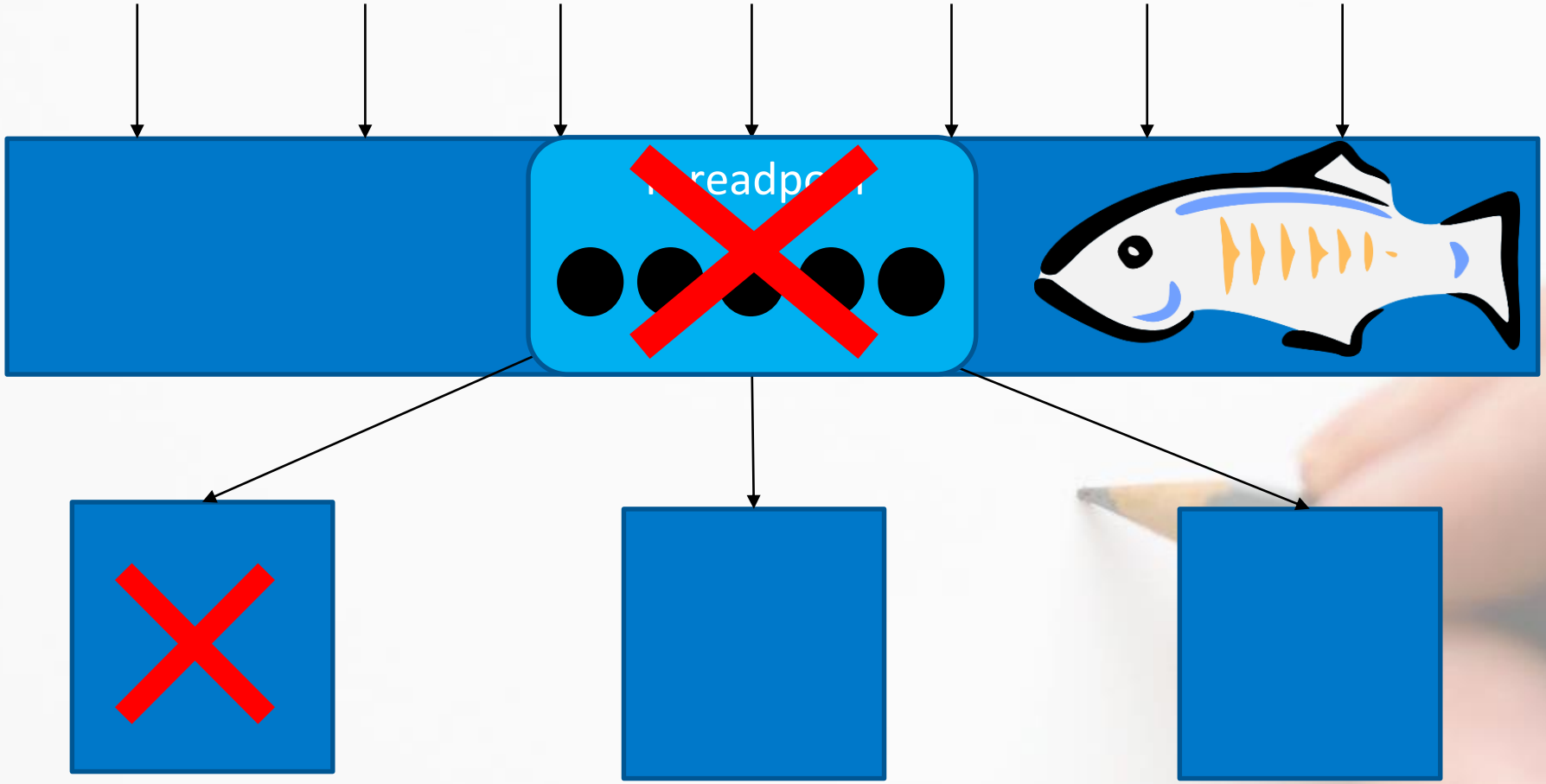
Multi-Threaded Support

SLA Call limitations

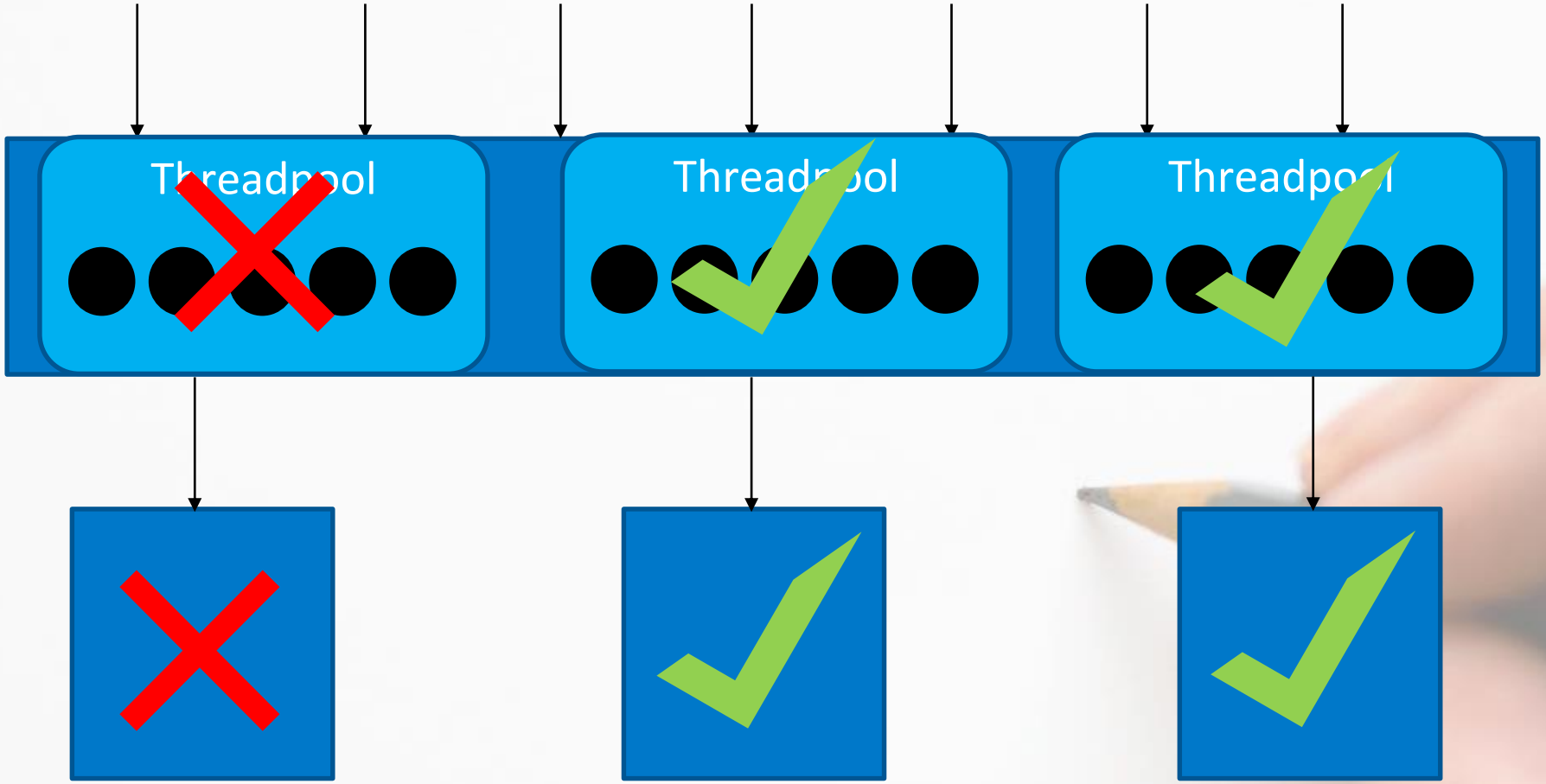
Fallback Mechanism

Request De-duplication

Problem: Thread Starvation

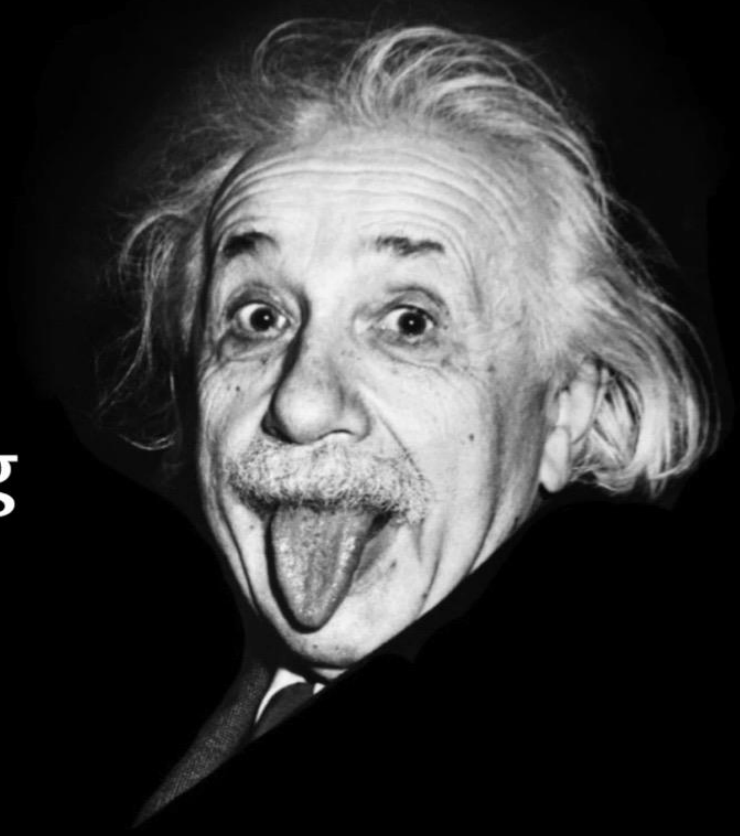


Solution: Bulkhead Pattern



"Insanity is doing the same thing over and over again and expecting different results"

Albert Einstein




If You're Going to Fail
Fail Fast


hager
hager
hager


RECEIPT
VALID
INVALID
?

NETFLIX

The Netflix Tech Blog

Wednesday, October 28, 2015

Evolution of Open Source at Netflix

When we started our Netflix Open Source (aka NetflixOSS) Program several years ago, we didn't know how it would turn out. We did not know whether our OSS contributions would be used, improved, or ignored; whether we'd have a community of companies and developers sending us feedback; and whether middle-tier vendors would integrate our solutions into theirs. The reasons for starting the OSS Programs were shared previously here.

Links

- Netflix US & Canada Blog
- Netflix America Latina Blog
- Netflix Brasil Blog
- Netflix Benelux Blog
- Netflix DACH Blog
- Netflix France Blog

NETFLIX | OSS

POWERED BY

JAX 2015 Award

Industry Awards!

Netflix is honored to receive the Jury's choice award for Innovation at JAX 2015 conference.

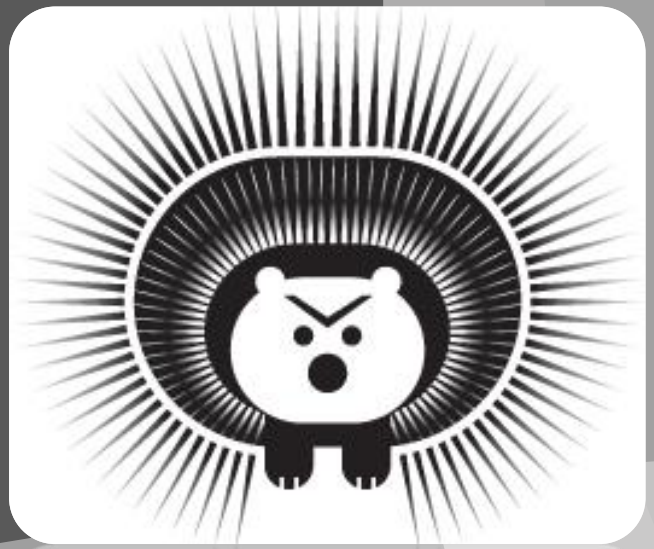
We would like to thank all of those who contribute to the Netflix open source community including our Netflix developers, all external contributors, and our active user base.

Netflix Open Source won the JAX Special Jury Award. Jury member Neal Ford was quoted as saying "that architecture is cool again, that it can be used as a business differentiator, and when done right it is a huge advantage. Netflix showed the power of internalizing DevOps into their architecture; all architectures will do this in the future.

NETFLIX | OSS

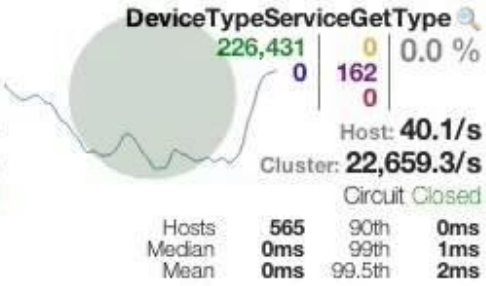
Netflix Hystrix

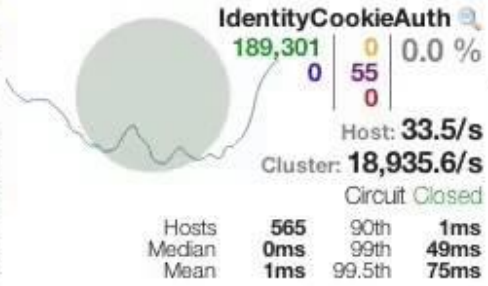
Latency and Fault Tolerance Library

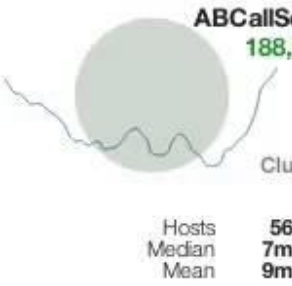


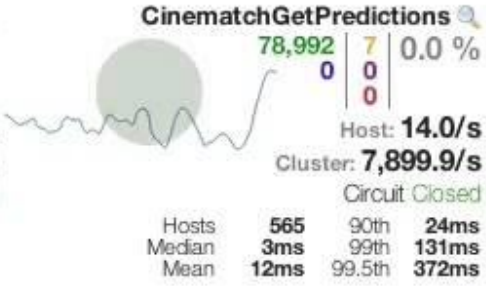

End
Demo

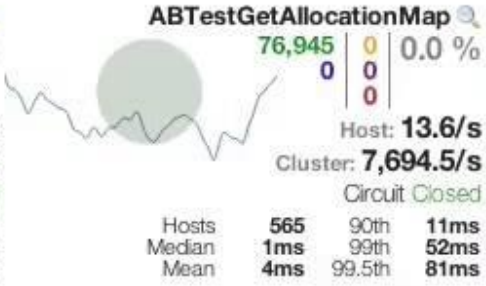
Sort: Error then Volume | Alphabetical | Volume | Error | Mean | Median | 90 | 99 | 99.5 Success | Latent | Short-Circuited | Timeout | Rejected | F

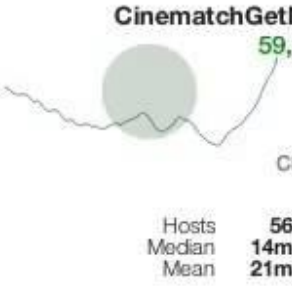


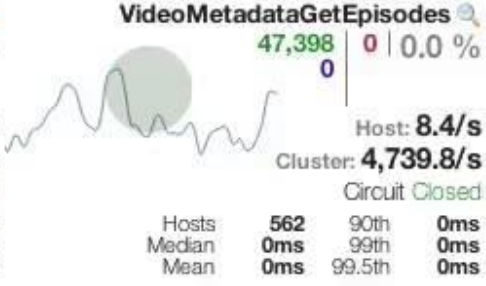


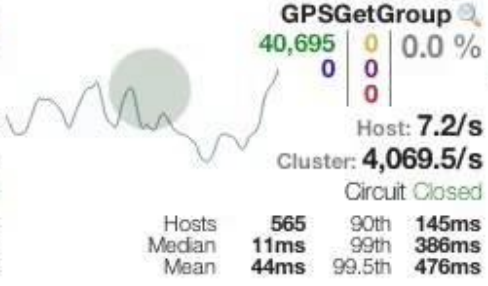


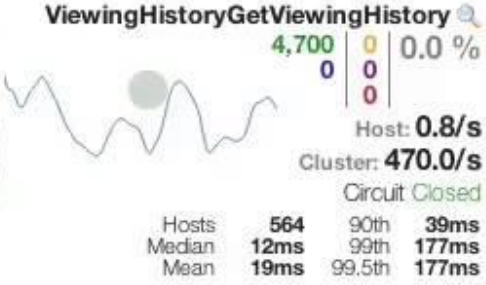


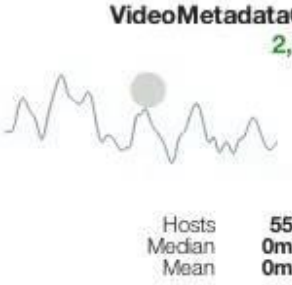


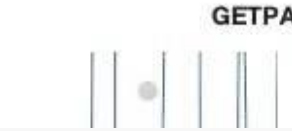


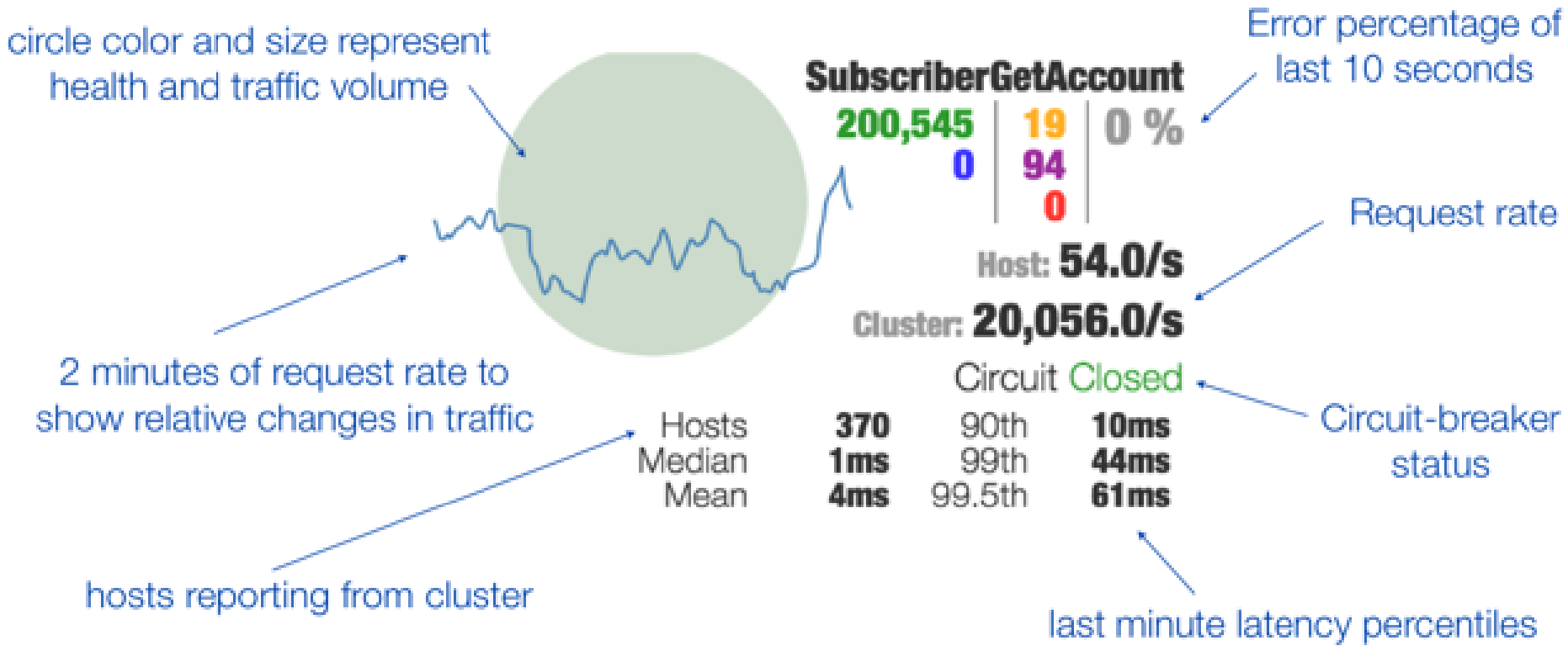












Rolling 10 second counters
with 1 second granularity

Successes	200,545	19	Thread timeouts
Short-circuited (rejected)	0	94	Thread-pool Rejections
		0	Failures/Exceptions

宋宮遺石

龍亭一帶原是宋朝皇宮遺址，明為周王府花園之煤山，清代在此建萬壽宮時，將煤山埋砌在龍亭殿基下面。一九七四年八月維修大殿時，發現基座下煤山上的宋宮遺石，遂從山峰上搬取兩塊立於大殿兩側山峰之方位。此石應為宋花石綱之遺物，是宋、元、明、清以來開封歷史滄桑巨變的見証者，以供遊人觀瞻。

戊寅仲夏古汴許安衆書丹

NETFLIX | OSS

Netflix Archaius

Configuration Management Library

Configuration Management with Archaius

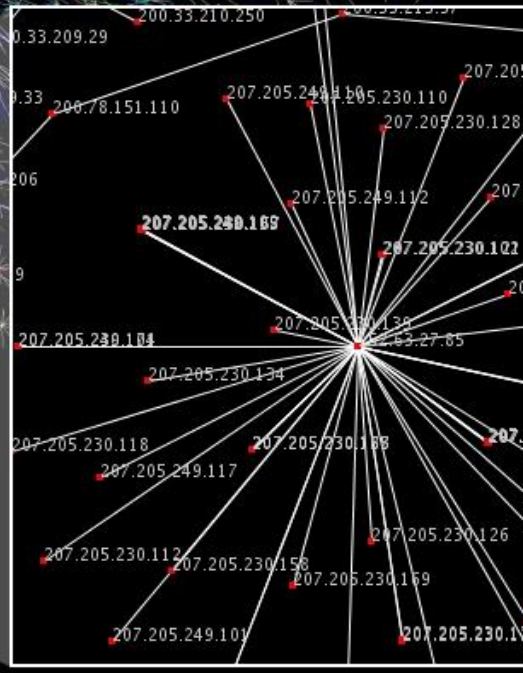
- Dynamic, Typed Properties
- Polling Framework
- Callback Mechanism
- JMX MBean for access through Jconsole

Most Netflix Libraries use Archaius

Connection Mechanisms


End
Demo

Where is *SERVICE*?!



NETFLIX | OSS

Netflix Eureka

Service Registry

Service Discovery Using Eureka

Eureka is a REST based service

Clusterable

Metadata per Instance

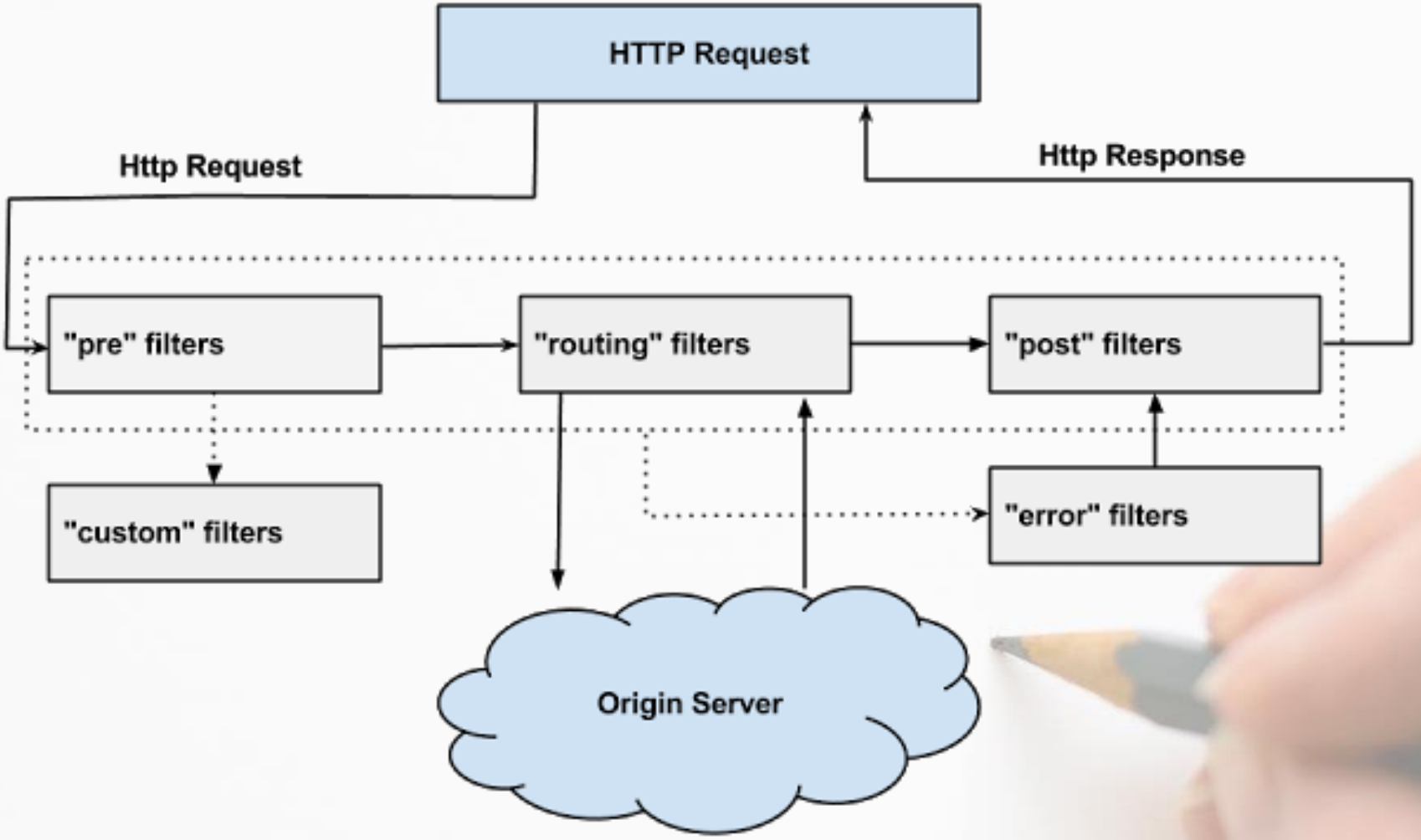
Healthchecks

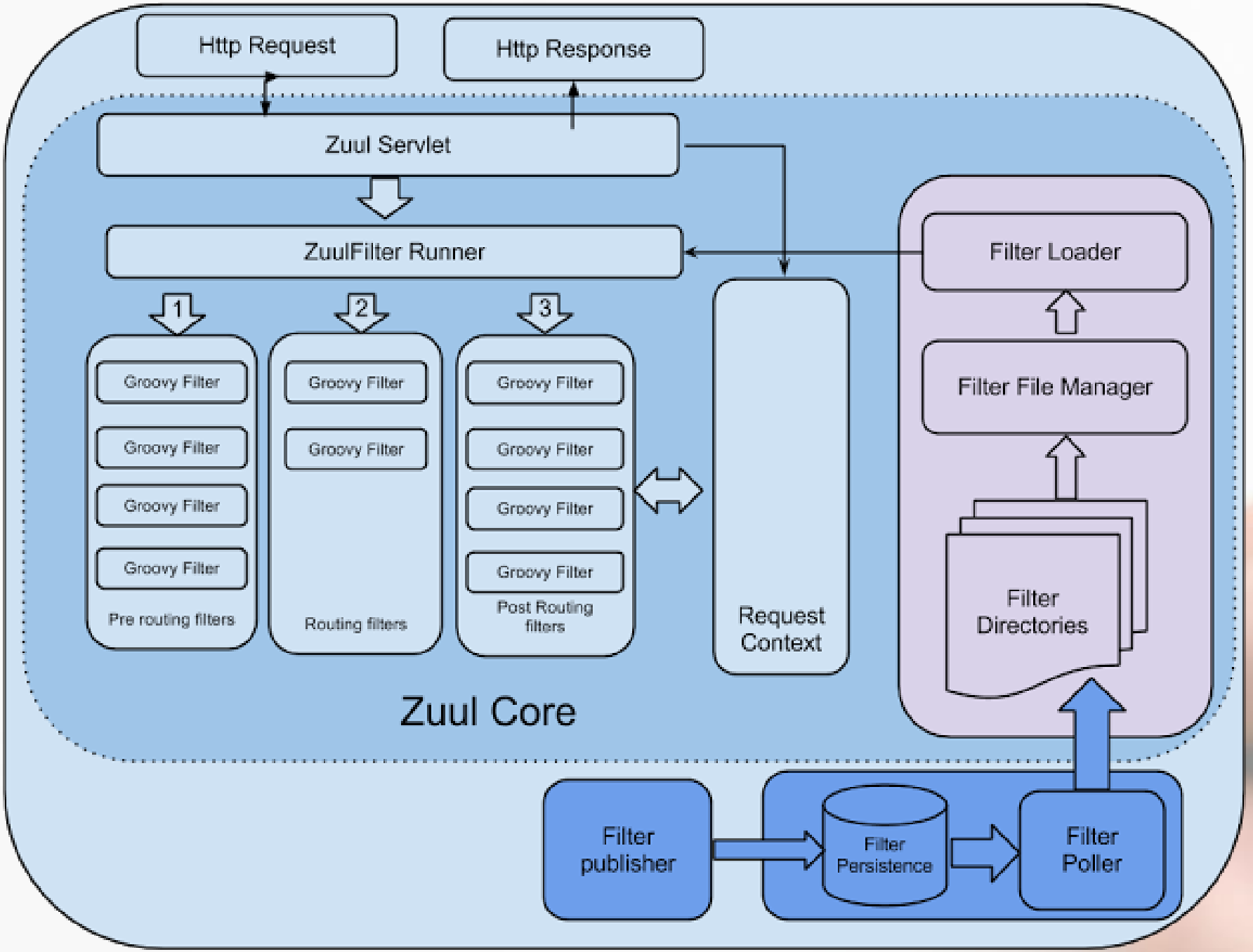

End
Demo

NETFLIX | OSS

Netflix Zuul

Gateway Service


HTTP Request
Http Request
Http Response
"pre" filters
"routing" filters
"post" filters
"custom" filters
"error" filters
Origin Server


Http Request
Http Response
Zuul Servlet
ZuulFilter Runner
1
2
3
Groovy Filter
Groovy Filter
Groovy Filter
Groovy Filter
Pre routing filters
Groovy Filter
Groovy Filter
Routing filters
Groovy Filter
Groovy Filter
Groovy Filter
Groovy Filter
Post Routing filters
Request Context
Filter Loader
Filter File Manager
Filter Directories
Zuul Core
Filter publisher
Filter Persistence
Filter Poller

Zuul and Friends

NETFLIX | OSS

Hystrix for Metrics

Eureka for Instance Discovery

Ribbon for Routing

Archaius for real-time configuration

Astyanax for filter persistence in Cassandra

NETFLIX | OSS

“Boot”-strap your Netflix OSS


KETTAL

Spring Cloud Netflix

Spring Cloud Netflix provides Netflix OSS integrations for Spring Boot apps through autoconfiguration and binding to the Spring Environment and other Spring programming model idioms. With a few simple annotations you can quickly enable and configure the common patterns inside your application and build large distributed systems with battle-tested Netflix components. The patterns provided include Service Discovery (Eureka), Circuit Breaker (Hystrix), Intelligent Routing (Zuul) and Client Side Load Balancing (Ribbon)..

QUICK START

NETFLIX | OSS

Conclusion


PROGRESS
PROGRESS
OIL AND GAS
OIL AND GAS
PARTNERSHIP
PARTNERSHIP

The Eight Fallacies of Distributed Computing

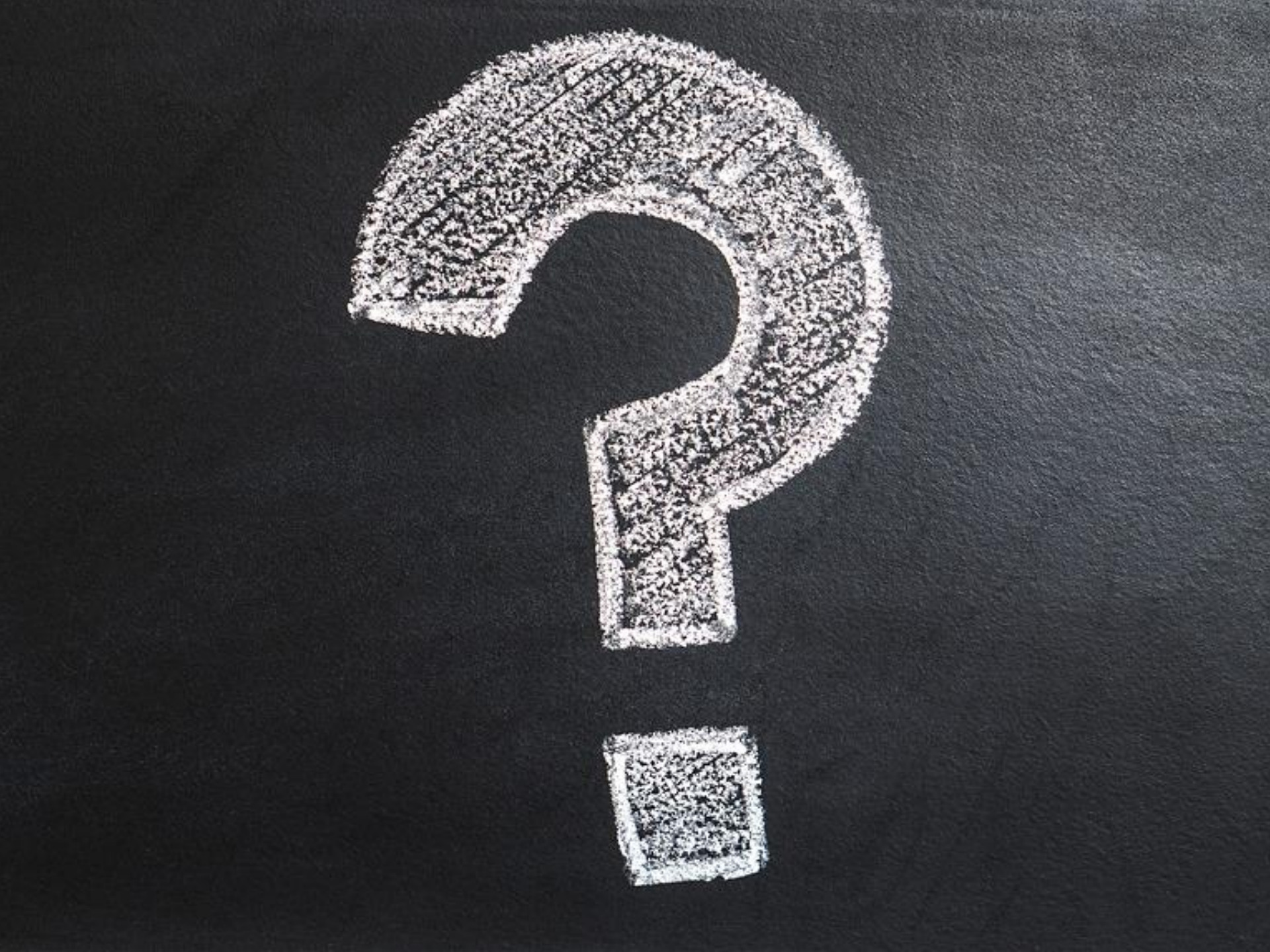
1. The network is reliable.
2. Latency is zero.
3. Bandwidth is infinite.
4. The network is secure.
5. Topology doesn't change.
6. There is one administrator.
7. Transport cost is zero.
8. The network is homogeneous.

Big Trouble & Painful Learning

Essentially everyone, when they first build a distributed application, makes the following eight assumptions. All prove to be false in the long run and all cause big trouble and painful learning experiences.

Peter Deutsch


OPEN



tom.cools@infosupport.com
https://github.com/TomCools