Canary Releases with Prometheus
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IT Infrastructure

- 9 data centers around the world
- 400+ unique services in production
- 1200+ service instances
- 4TB+ monthly traffic
- 50+ releases per day
Release problems

• Client traffic is unpredictable
• Providers availability is unpredictable
• Distributed teams
• Microservices
• Downtime is not allowed
Goals

• Detect problems faster than clients do
• Effective use of human resources
• Accelerate deployment
What we tried?

- Code review
- Writing tests
- Who made that release
- Canary Releases
Balancing strategies

- Fixed canary-instance
- Canary-instance chosen during deployment
Balancers

• HA Proxy
• Client Side Balancing
• Spring Cloud
What tool do we need?

- Scalability and availability
- Meet microservices
- Simple deployment
- Many clients and integrations
- Active community
Metrics

- Error count
- Latency
- Retry count
- Count of touched services
Version Analysis Strategies

- Analyze only canary-instance
- Compare canary-instance with other instances
- Compare canary-instance with itself for past time frame
Get metrics

GET /api/v1/query?query={query},
where {query}:

rate(logback_appender_total{
    level="error",
    instance=~"$instance"
}[5m] offset $offset_value)
How run?

• Choose service
• Choose time to compare
• Choose canary-instance
• Choose instance to compare
• Choose time frame
• Setup metrics
while (System.currentTimeMillis() < endCanaryTs) {
    def isOk = compare(srv, canary, time, base, offset, metrics)
    if (isOk) {
        sleep DEFAULT SLEEP
    } else {
        echo "Canary failed, need to revert"
        break
    }
}
Define metrics

```
metric(
    'compareName',
    'rate(metric{node=~"$instance"}[5m] offset $offset)',
    { baseValue, canaryValue ->
      if (canaryValue > baseValue * 1.3) return 'CRITICAL'
      if (canaryValue > baseValue * 1.1) return 'WARN'
      return 'OK'
    }
)
```
Start -> Disable balancer -> Deploy canary -> Enable balancer -> Verify canary -> Deploy all instances
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Examples: https://github.com/AndreyVMarkelov/spring-canary-examples