Cloud Native & NAVER Opensource

NAVER PaaS 김성관

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NAVER

Cloud Native ?

Cloud native technologies empower organizations to build and run **scalable applications in modern, dynamic environments** such as public, private, and hybrid clouds.

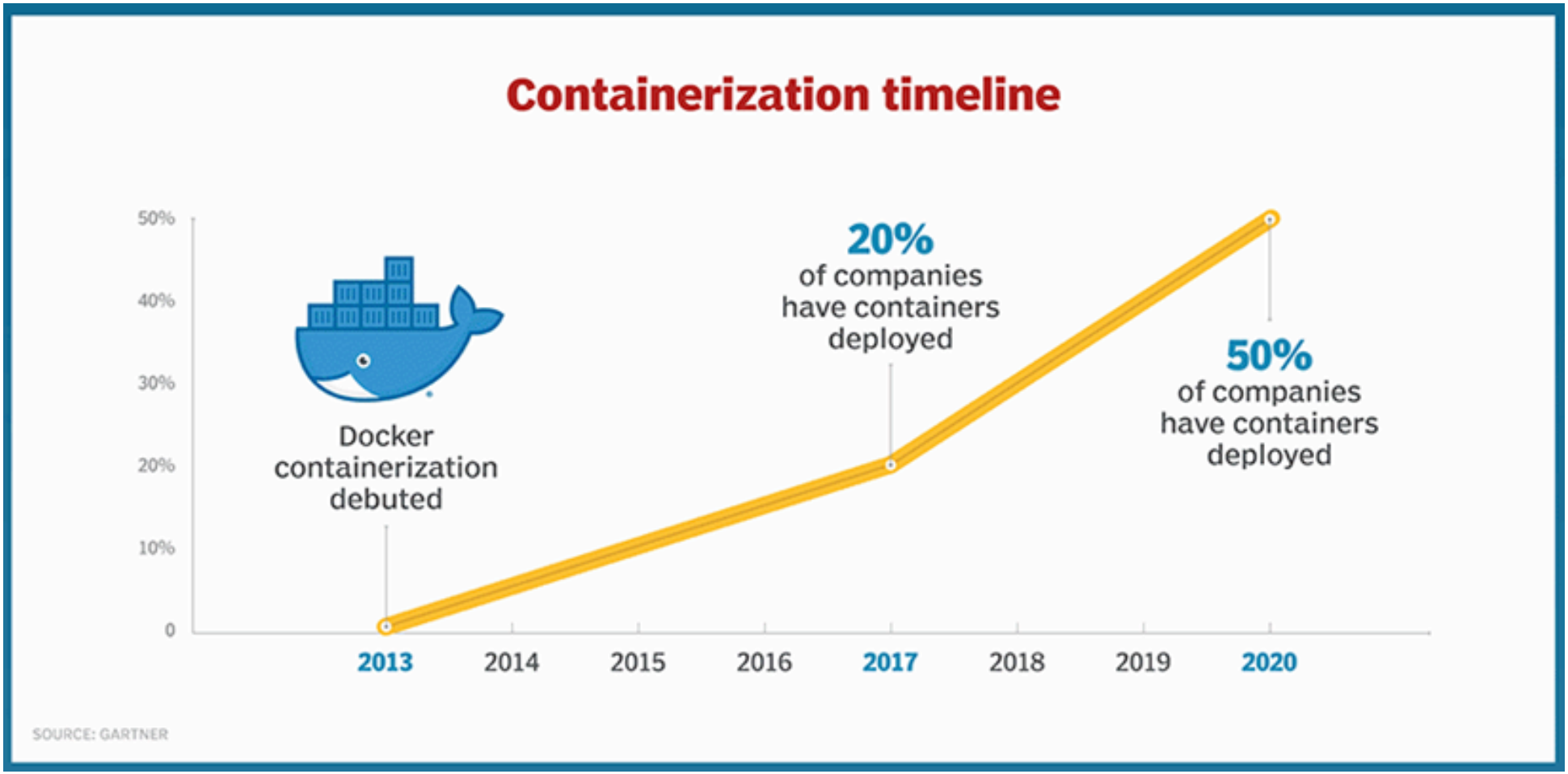
Containers, service meshes, microservices, immutable infrastructure, and declarative APIs exemplify this approach.

https://github.com/cncf/toc/blob/master/DEFINITION.md

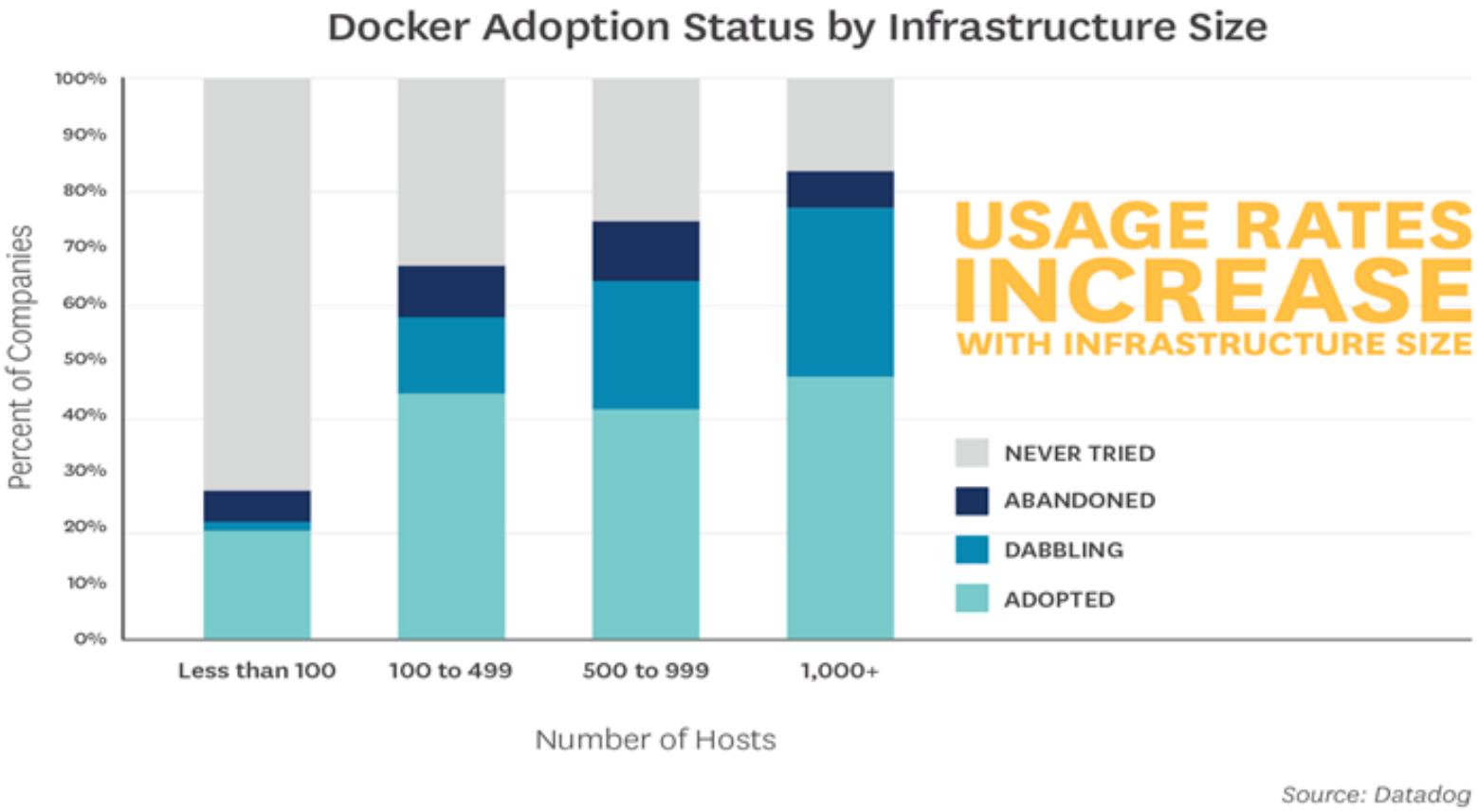
핵심 속성

- loosely coupled
  전체 시스템 컴포넌트 간 의존성 최소화
- resilient
  장애에 스스로 대응하고 회복
- observable
  시스템 노드 및 컨테이너의 monitoring 요소 관찰
- manageable
  쉽고 안정적인 관리

동향

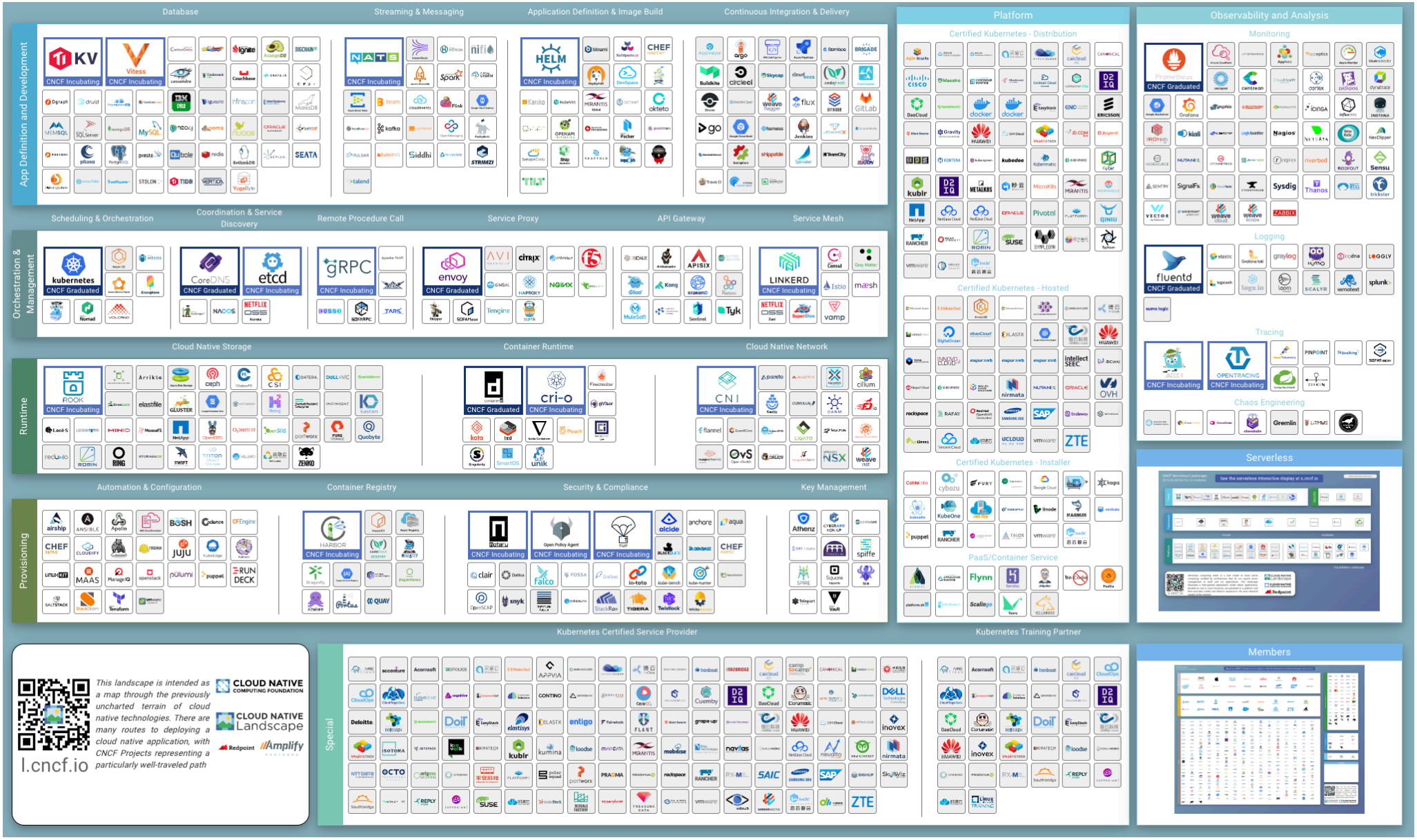

Containerization timeline
50%
40%
30%
20%
10%
0
Docker containerization debuted
20% of companies have containers deployed
50% of companies have containers deployed
2013
2014
2015
2016
2017
2018
2019
2020
SOURCE: GARTNER

동향



Source: Datadog

CNCF (Cloud Native Computing Foundation)

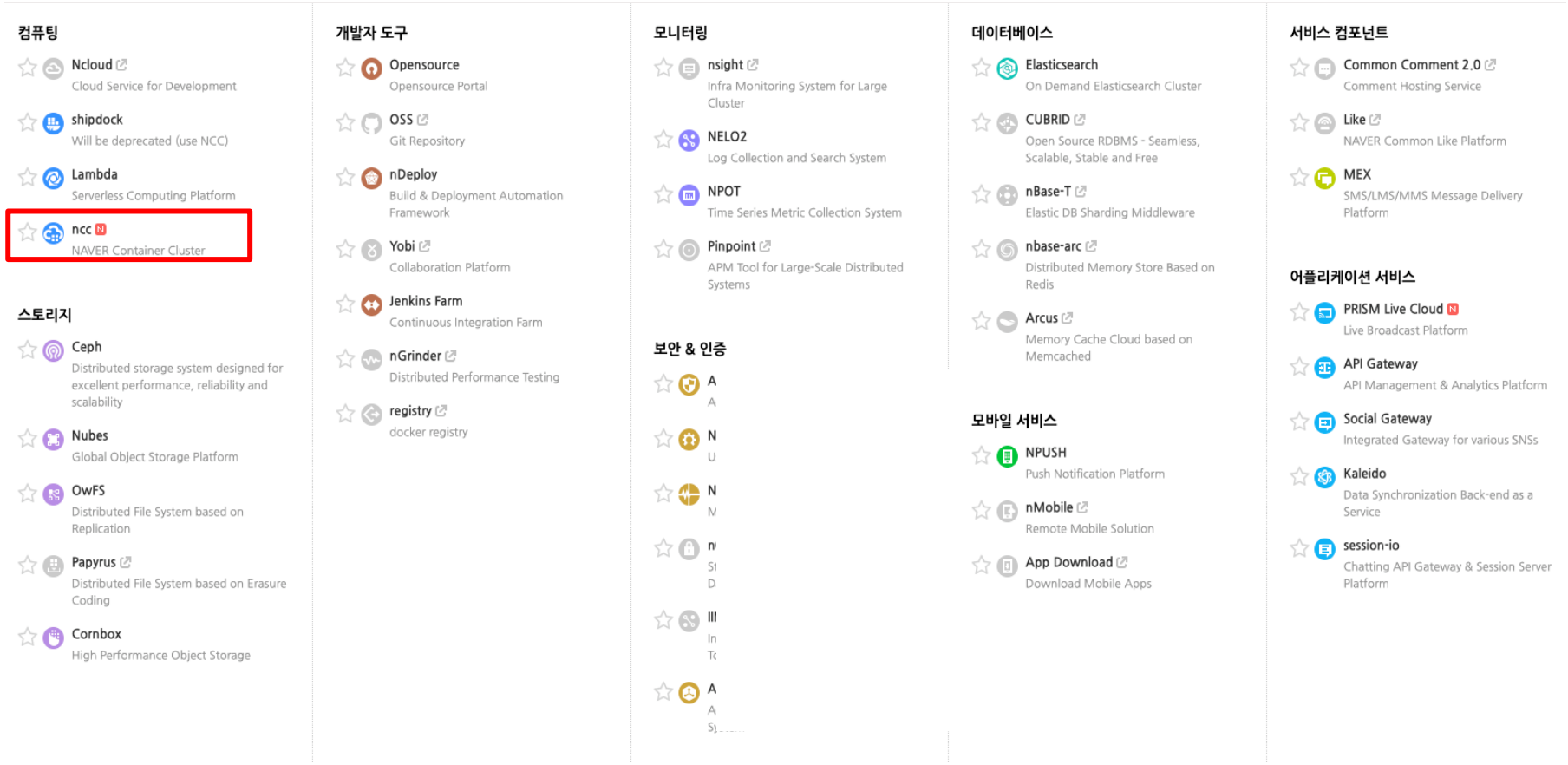


https://landscape.cncf.io

NAVER 에서의 Cloud Native

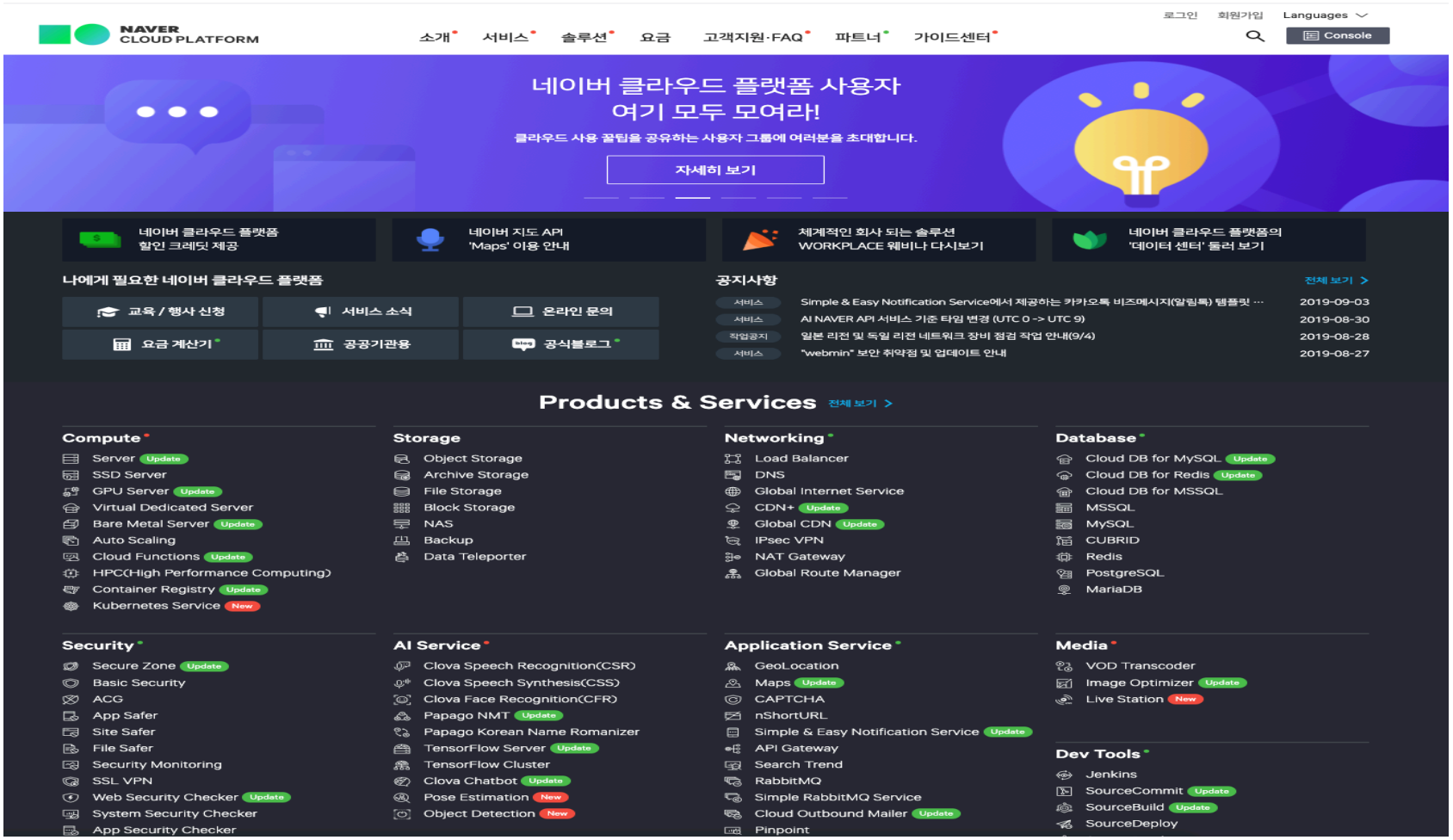
NAVER

Private and Public Cloud



- Private Cloud : NAVER 서비스 개발에 사용되는 PaaS & SaaS

Private and Public Cloud

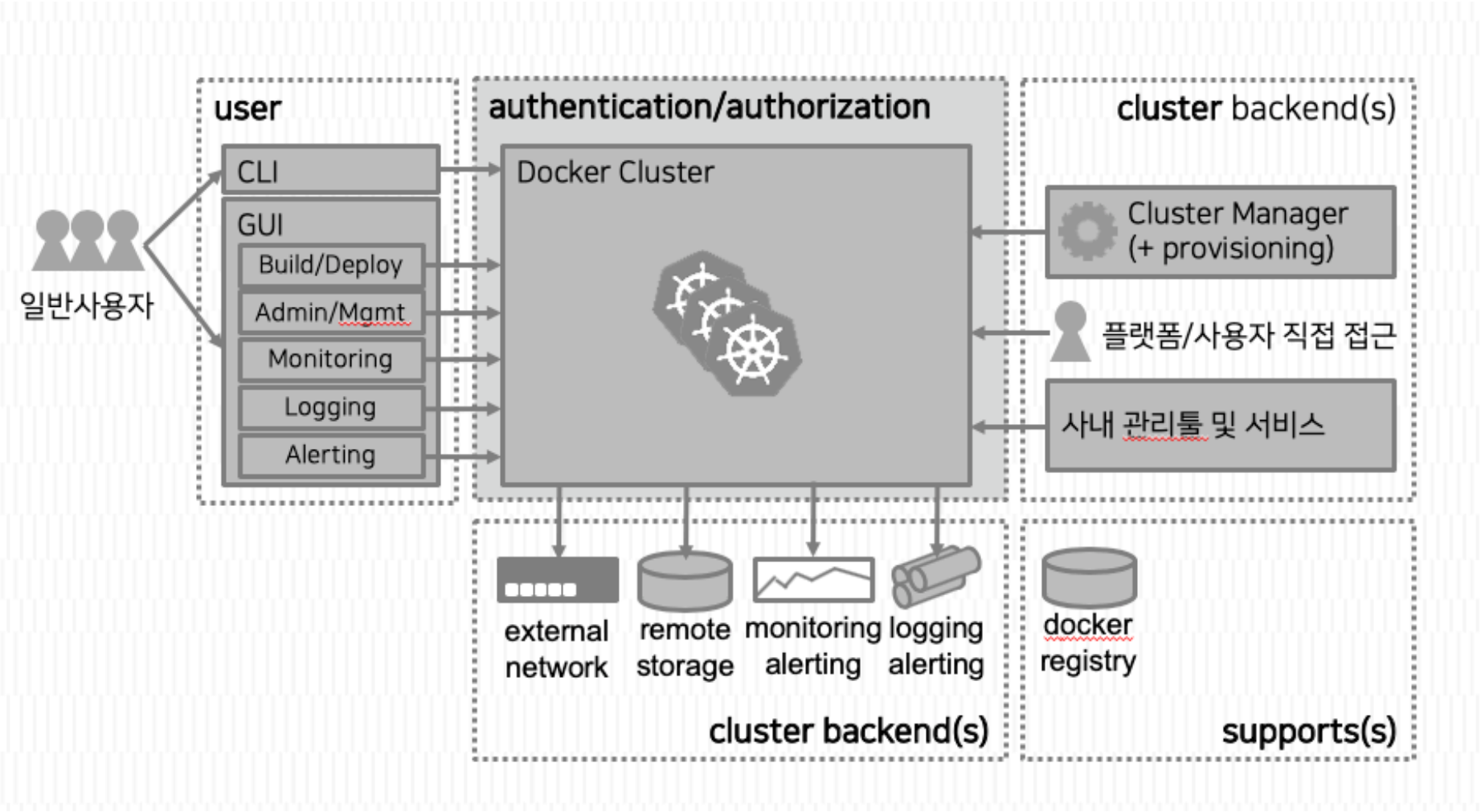


- Public Cloud : Naver Cloud Platform (https://www.ncloud.com)

NAVER Container Cluster

- CNCF의 오픈소스 최대한 활용
  - Kubernetes, Harbor, Ceph, Prometheus, Grafana, …
- 수년 간 기술 내재화 및 시행착오를 거쳐 2019년부터
  주요 서비스 및 플랫폼에 적용
- Stateless / Stateful 서비스 중
- Network, Remote Storage, ACL, Security, Monitoring …

NAVER Container Cluster



NAVER open source

NAVER

Opensource 전략

- **최대한 활용**

  네이버의 거의 모든 서비스에 오픈소스 사용

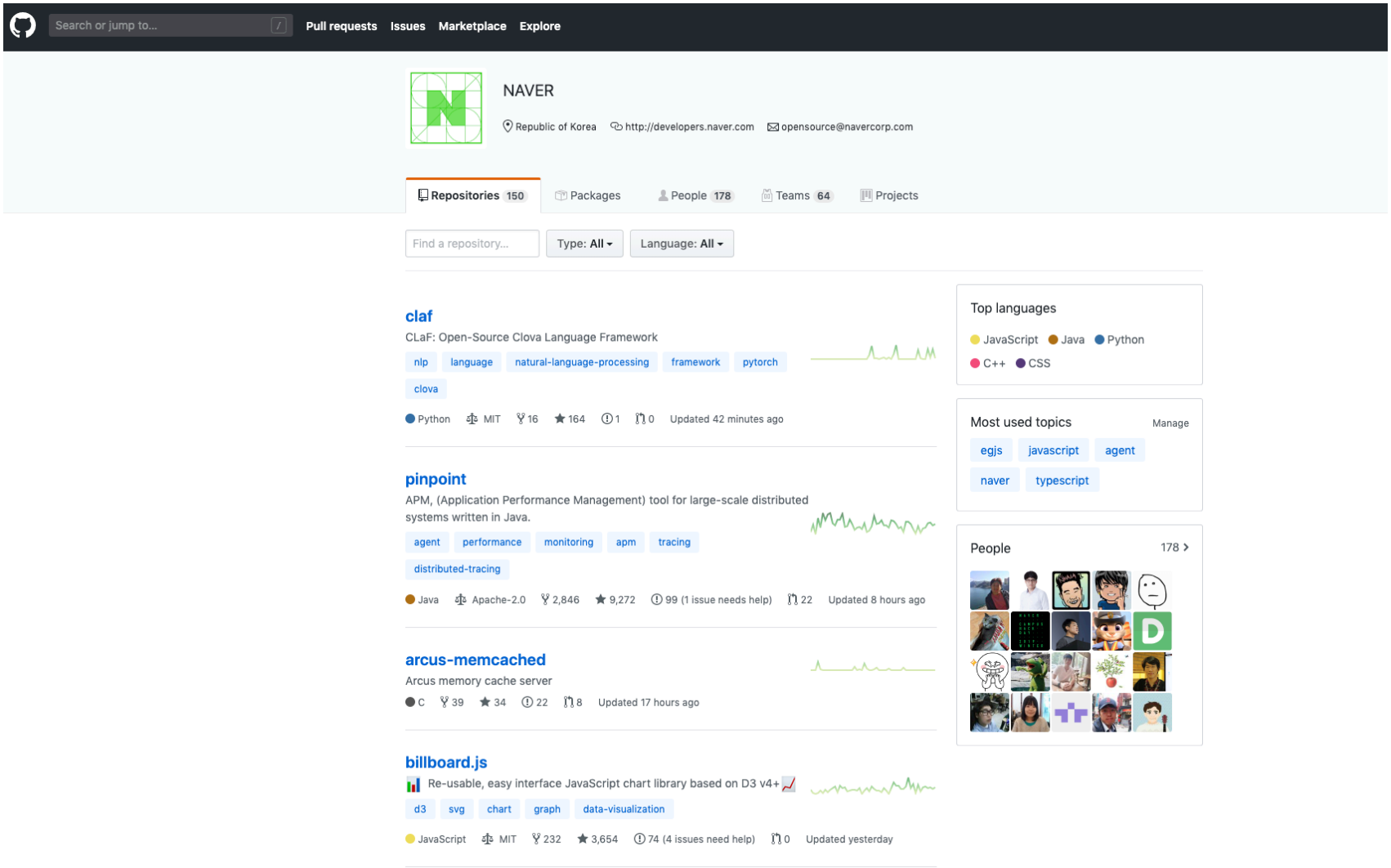
- **개선이 필요한 경우**

  - 과거 : fork & 자체 개선 , 미공개
  - 현재 : upstream contribution & committer 양성

- **오픈소스 공개**

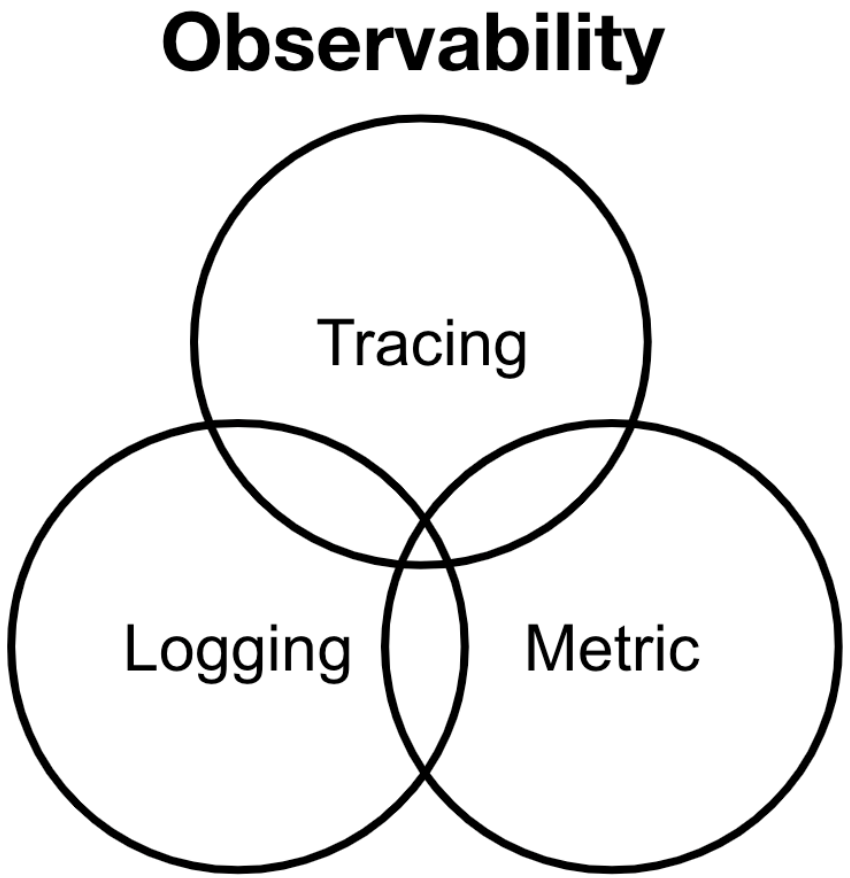
  - https://github.com/naver

Naver Open source



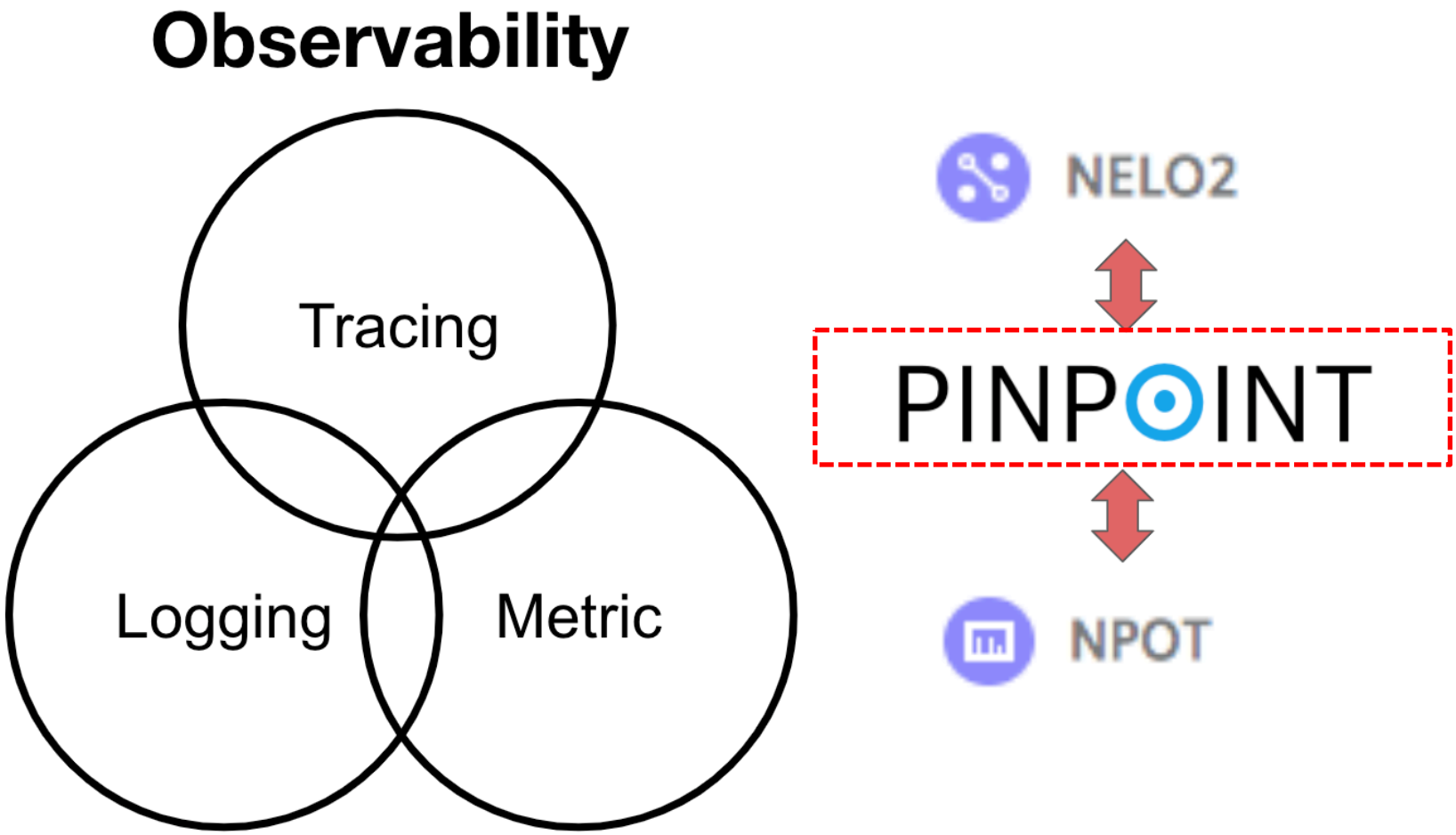
Naver Open source

Cloud Native 에서의 Observability



- MSA/EDA 기반의 서비스
- 난이도 , 중요도 Up

NAVER의 Observability



Open source Pinpoint

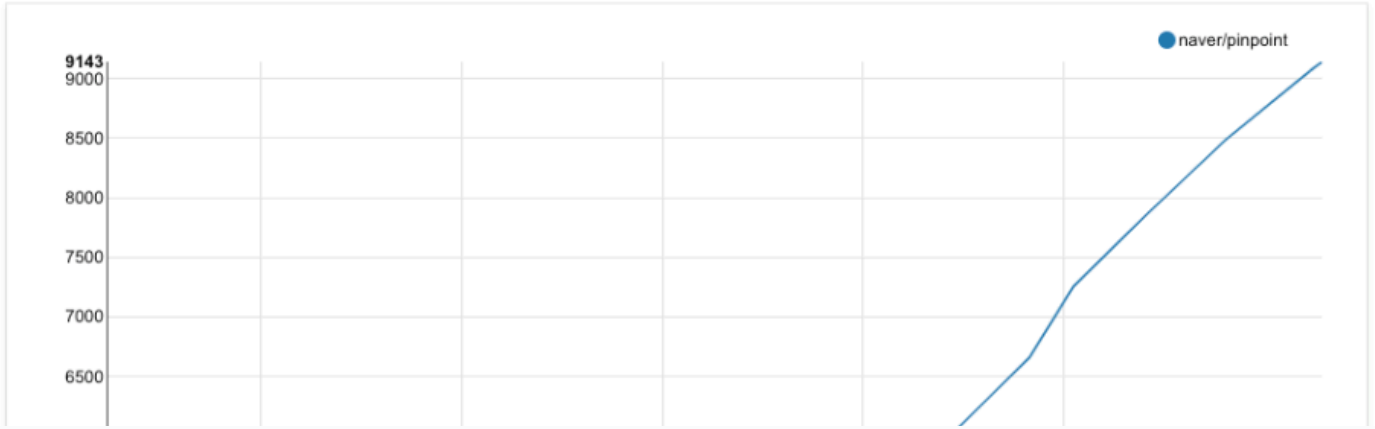
- 네이버의 대표적인 오픈소스 APM

PINPOINT

Bird Eye View
Finding Slow Transactions
Distributed Tracing
DevOps
Scalable
Minimum Overload

- github : https://github.com/naver/pinpoint/
- home : https://naver.github.io/pinpoint/
- demo : http://125.209.240.10:10123/#/main

Open source Pinpoint

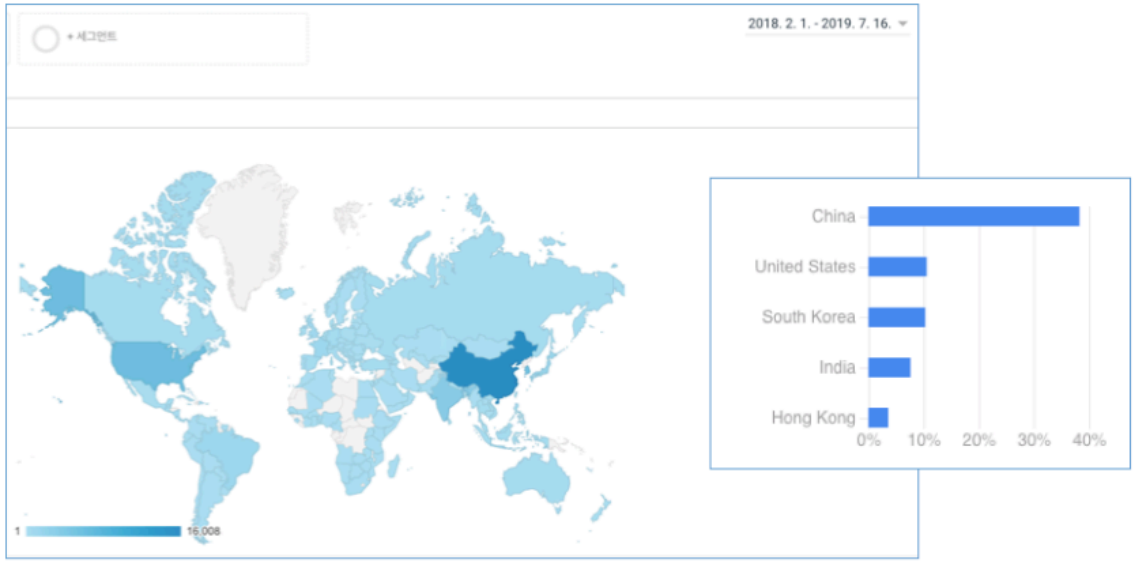


naver / pinpoint

Unwatch 790 | Unstar 9,272 | Fork 2,846

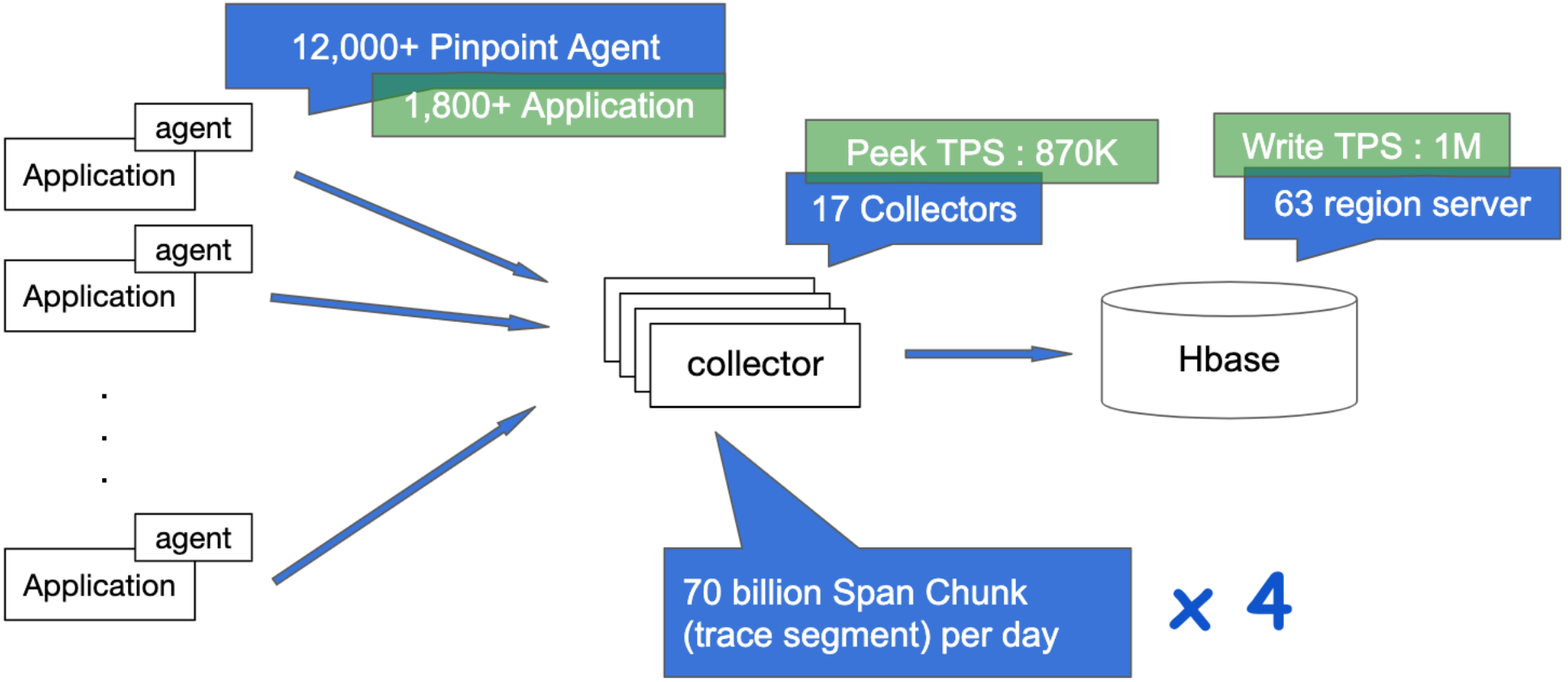
Code | Issues 99 | Pull requests 22 | Wiki | Security | Insights | Settings

Open source Pinpoint

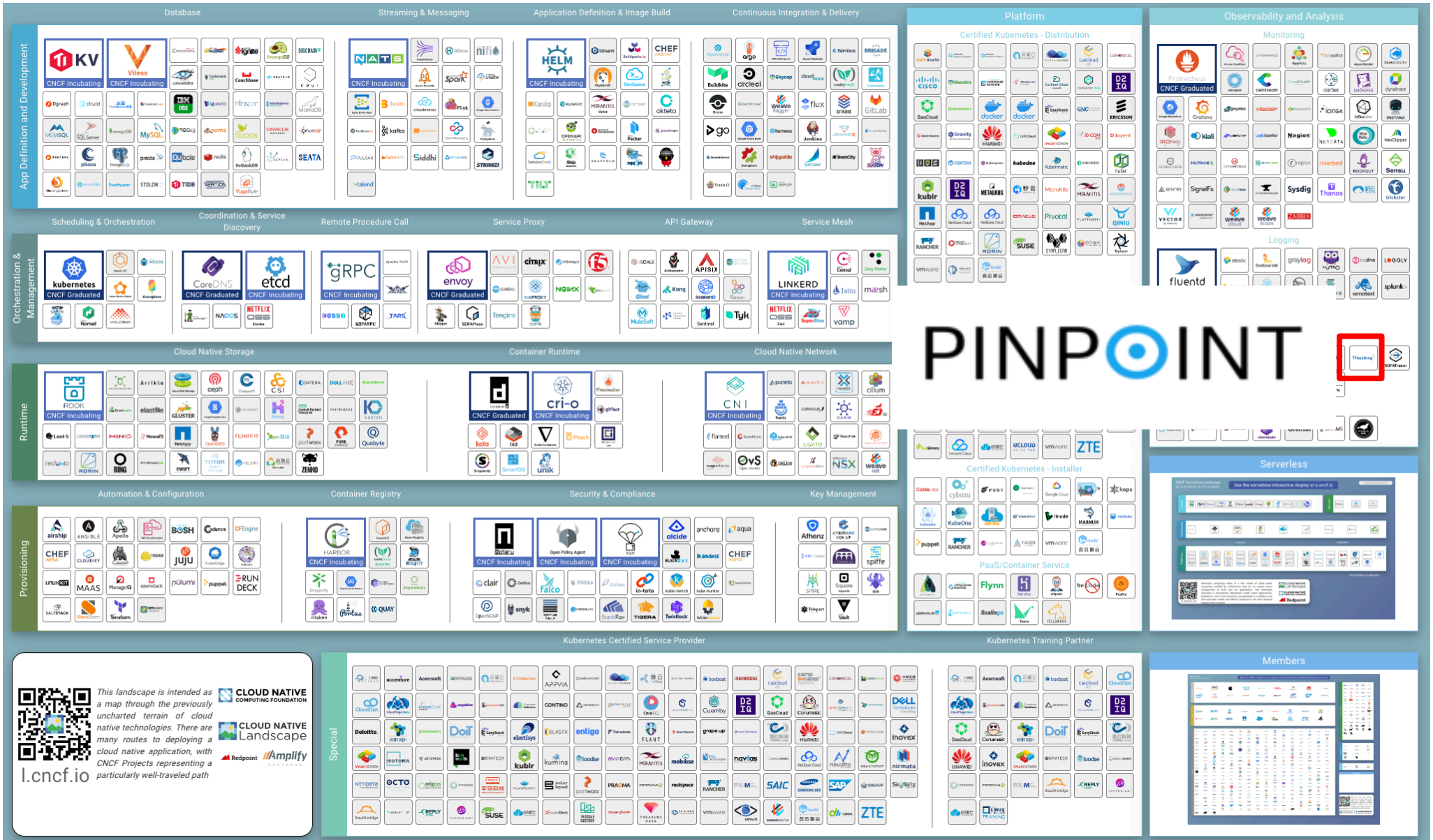


- Most of Top 10 IT companies in China
- Global enterprises in Korea
- Various IT companies in USA
- Companies in Financial Industry

Opensource Pinpoint



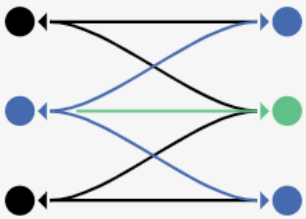
Pinpoint & CNCF



Pinpoint & Istio

Istio

Connect, secure, control, and observe services.

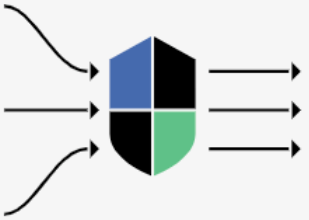


Connect

Intelligently control the flow of traffic and API calls between services, conduct a range of tests, and upgrade gradually with red/black deployments.

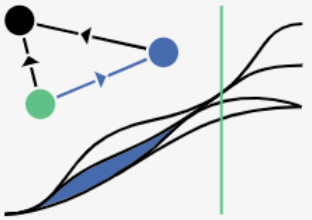
Secure

Automatically secure your services through managed authentication, authorization, and encryption of communication between services.



Control

Apply policies and ensure that they're enforced, and that resources are fairly distributed among consumers.

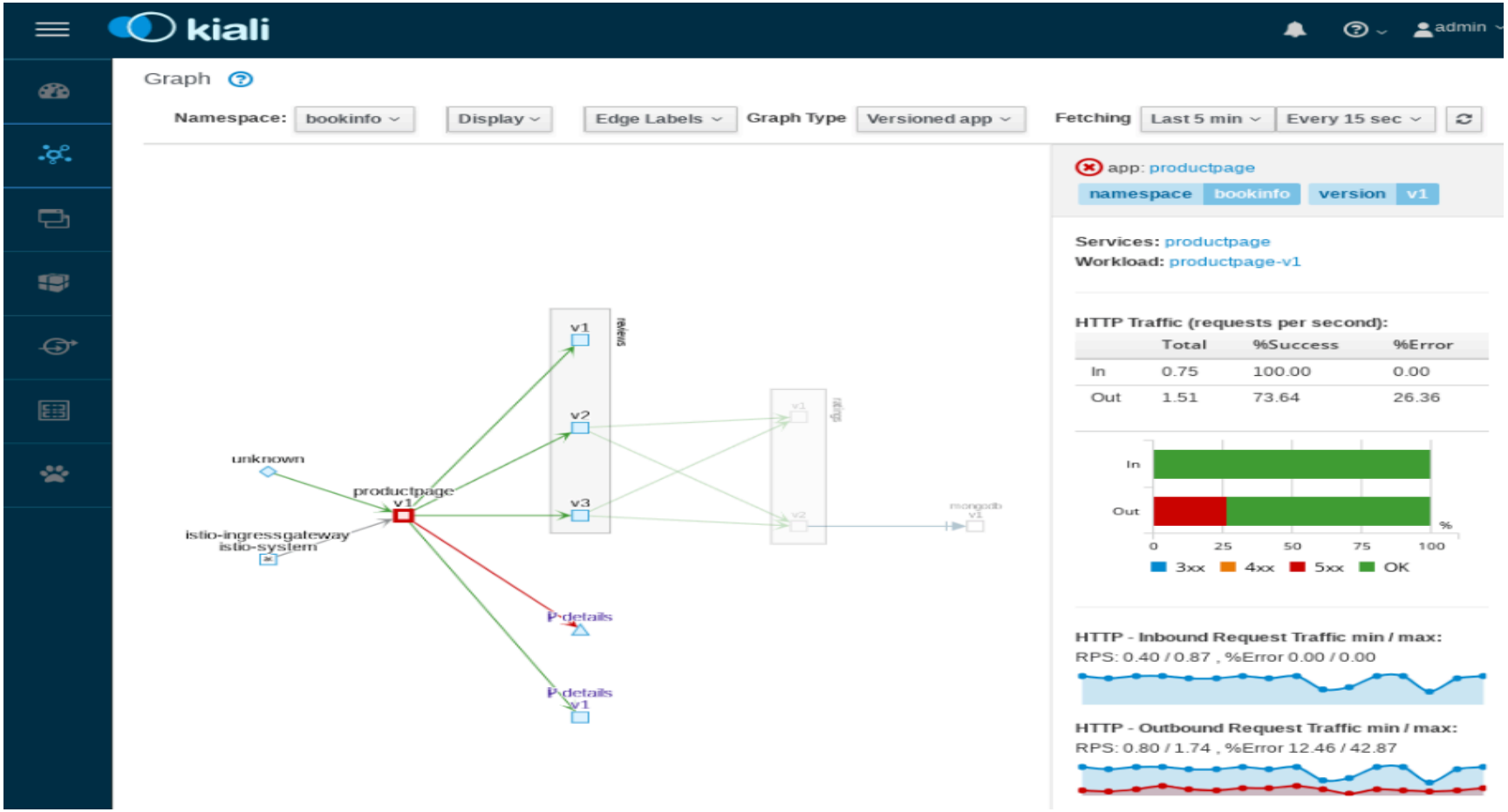


Observe

See what's happening with rich automatic tracing, monitoring, and logging of all your services.

Pinpoint & Istio

- Istio의 default tool 보다 더 좋은 tool을 쓰고 싶다.



Pinpoint + Istio

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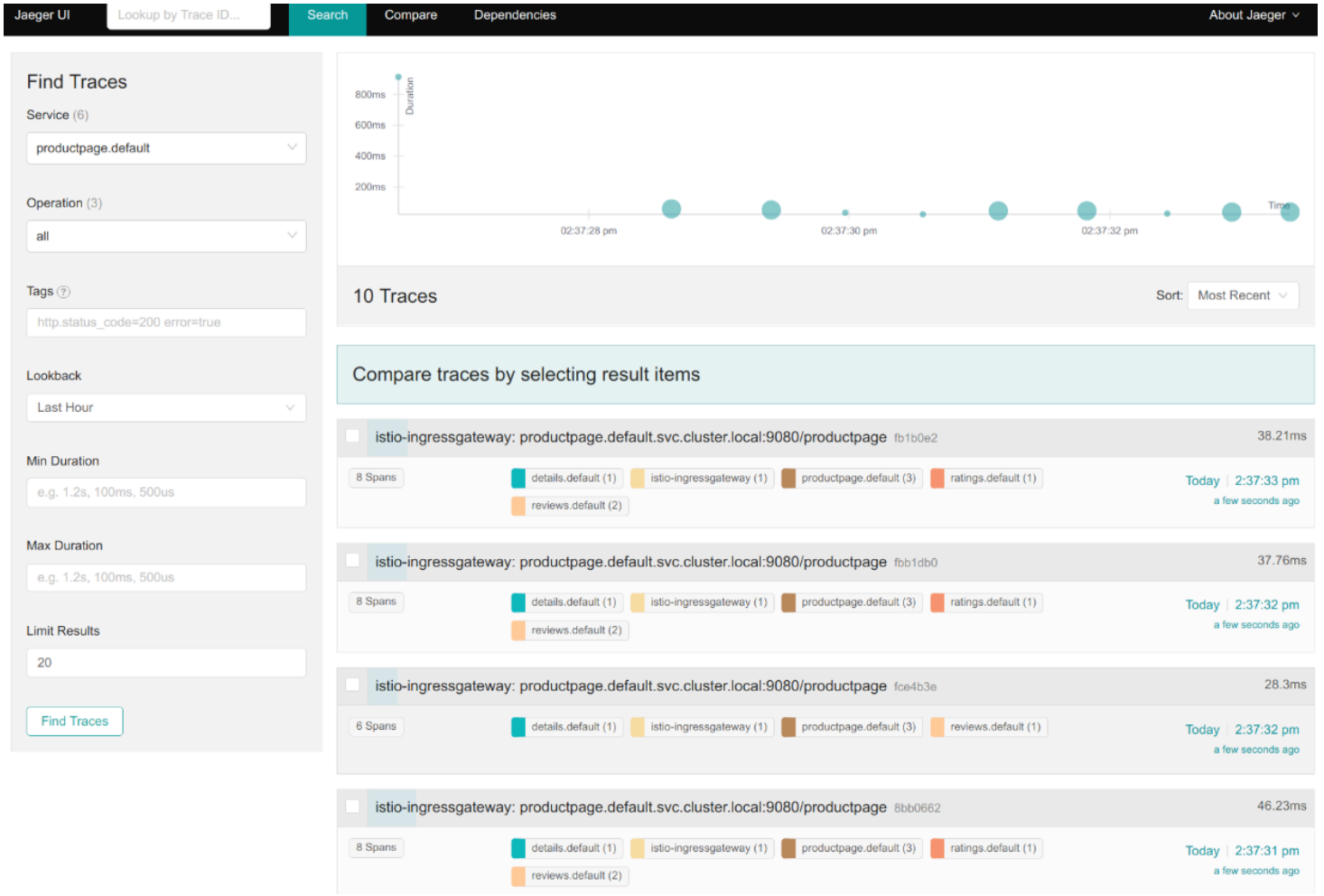


Pinpoint + Istio

- DEMO

요약

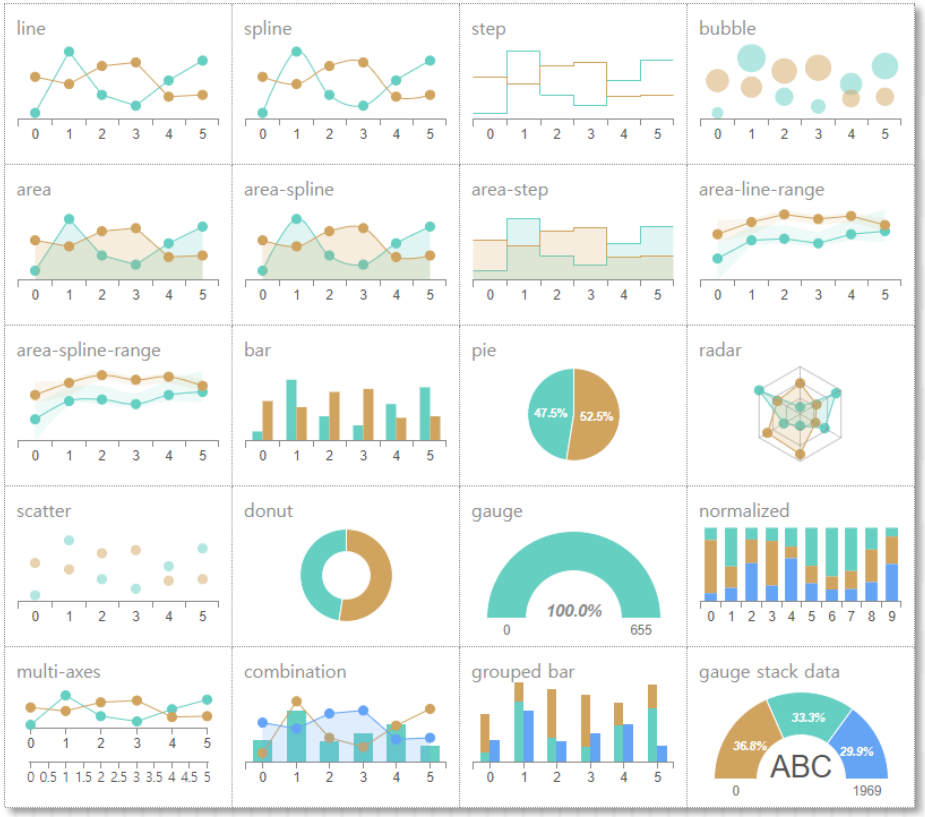
- Cloud Native로의 전환은 피할 수 없고,
- NAVER도 Cloud Native 적용에 속도를 내고 있으며,
- NAVER는 오픈소스를 최대한 활용하고 기여하며
- 특히 Observability 개선에 많은 노력을 하고 있음

Appendix

- billboard.js
- Apache Openwhisk contribution

billboard.js

https://github.com/naver/billboard.js



2017년 6월 공개한 재사용과 자유로운 커스터마이징 가능한 쉬운 인터페이스를 제공하는 벡터 기반 차트 라이브러리

주요 특징:

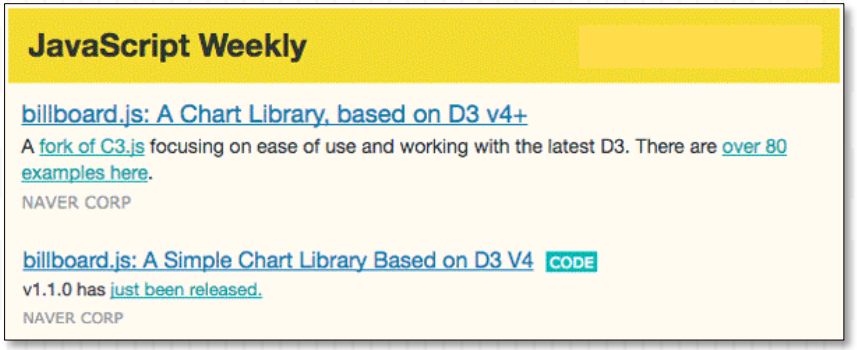
- 15개 유형의 차트 지원
- 270 여개의 옵션을 통한 다양한 기능 조합 설정
- 200 여개의 풍부한 예제 제공
- 네이버의 다양한 서비스에 적용
  DataLab, 스마트스토어 통계(BizAdvisor) 등

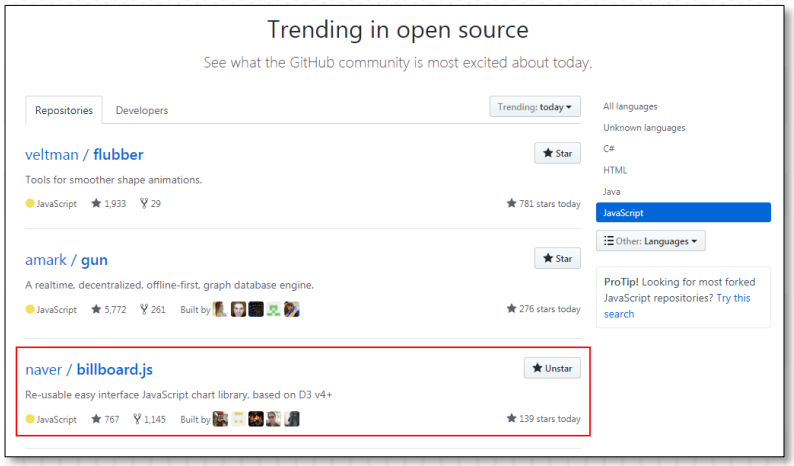
Global Recognition

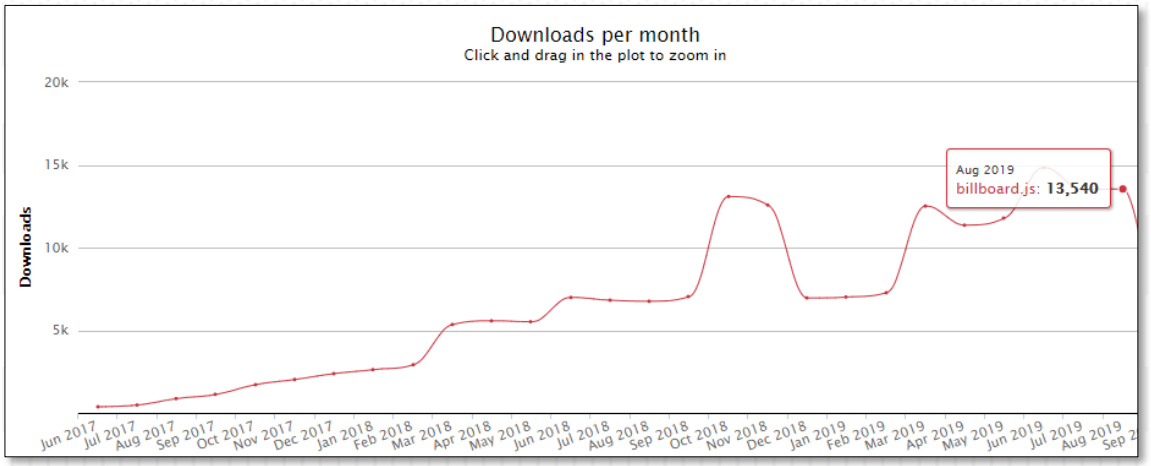
2019.9월 기준, GitHub starts **3.6K**
첫 릴리스 직후, GitHub Trending - JavaScript 언어 부문 3위 Rank

일간 전세계적으로 **600**건의 다운로드 발생 (월간 13K+)
https://npm-stat.com/charts.html?package=billboard.js

JavaScript 대표 기술 메일링 매체 "JavScript Weekly" 소개
JavaScript Weekly Issues: #338, #353, #416, #428



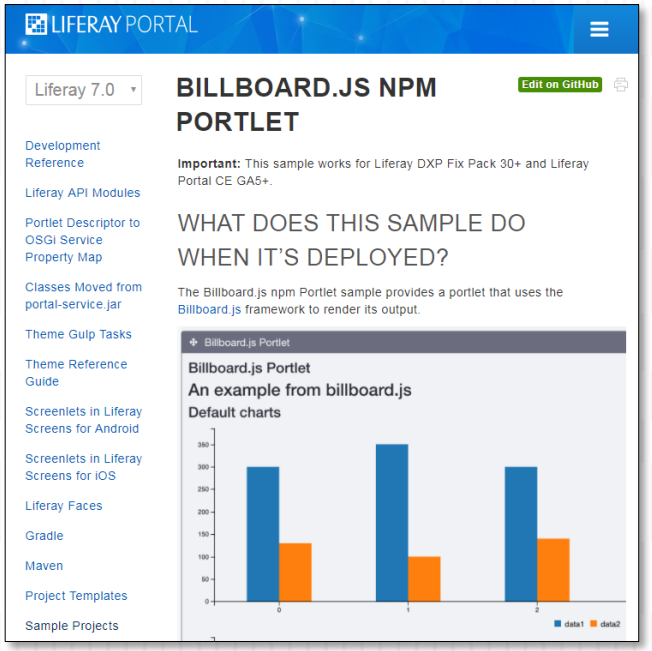




Global Reference

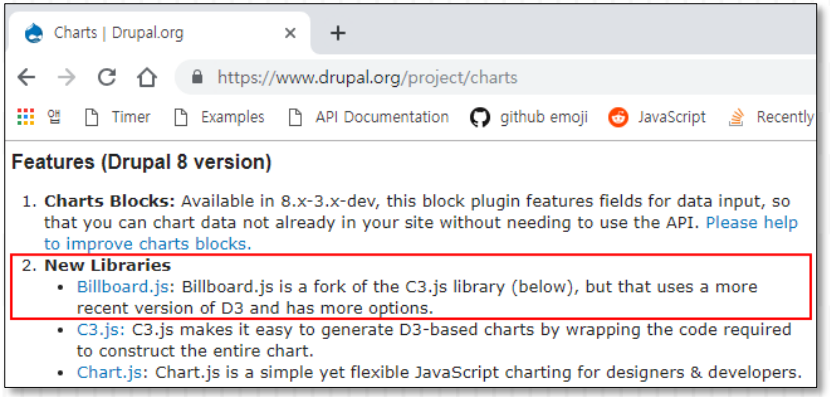
커뮤니티 주도적 12개의 third-party 앱
https://github.com/naver/billboard.js/wiki/Third-party-applications

글로벌 사용 레퍼런스
https://github.com/naver/billboard.js/wiki/Who's-using-billboard.js



Liferay Portal

유명 기업용 엔터프라이즈 포털 도구인 Liferay에 포함
https://portal.liferay.dev/docs/7-0/reference/-/knowledge_base/r/billboard-js-npm-portlet



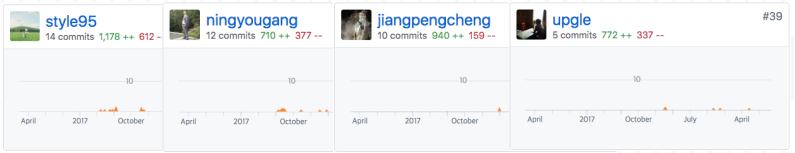
Drupal™

유명 CMS 오픈소수 솔루션인 Drupal v8의 차트 모듈
https://www.drupal.org/project/charts

Apache OpenWhisk Contribution

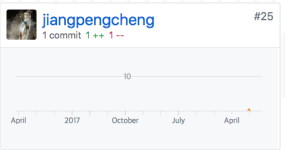
주요 컨트리뷰션 현황 - 커밋

openwhisk

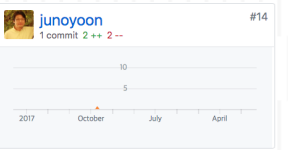


openwhisk-cli

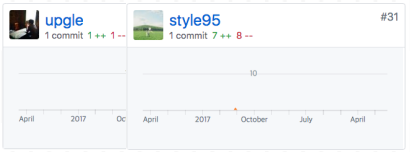
openwhisk-client-js



serverless-openwhisk



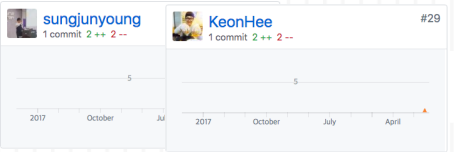
openwhisk-runtime-java



openwhisk-apigateway

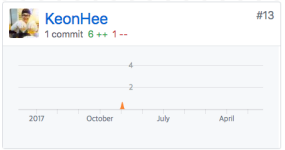
openwhisk-catalog

openwhisk-wskdeploy



openwhisk-client-go

openwhisk-package-alarms



10개 repo참여, 55개 커밋 머지 완료

현재 9개 추가 Pull requests 리뷰 중

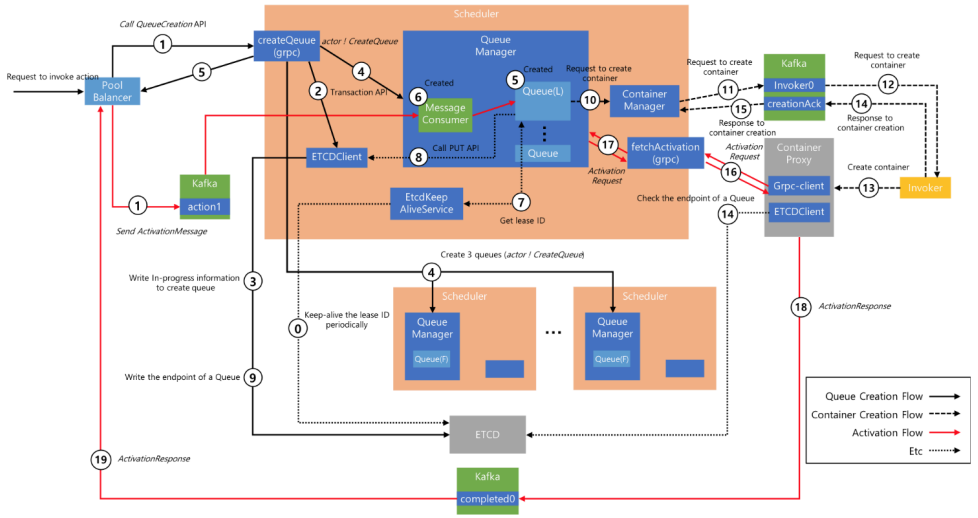
Committer/PMC member 1명

주요 컨트리뷰션 현황 - Proposal

4) Akka-cluster

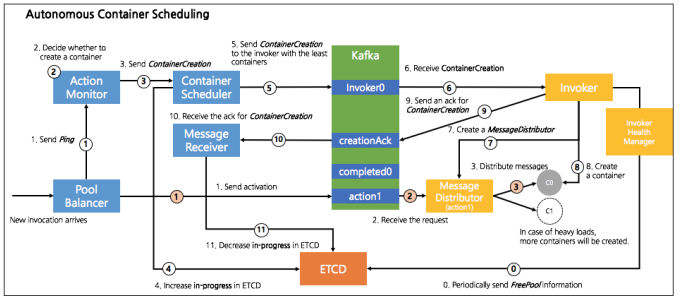
Akka-cluster is used for schedulers to communicate with each other.

Akka-grpc is required to define a grpc message, there are some advantages in akka-cluster when it is being used for simple inter-cluster communication.



The following diagram depicts the basic flow of ***container creation*** and ***activation invocation***.

Each path is separately handled. So there are only 3 steps in the **activation path**.



Following sections describe more details about each part in ACS.

1. Segregation of container creation and activation processing

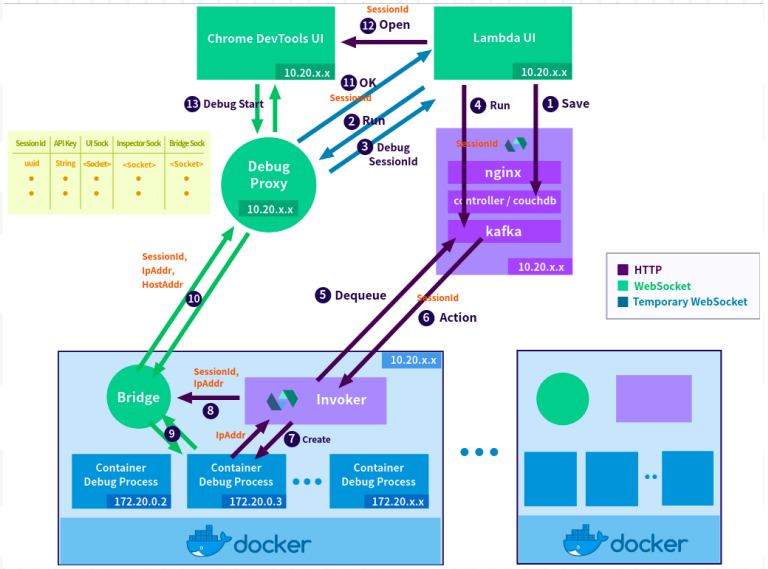
Activation lives in the world of 1~2 figures of ms.

On the other hand, container operations take about 3~4 figures of ms.

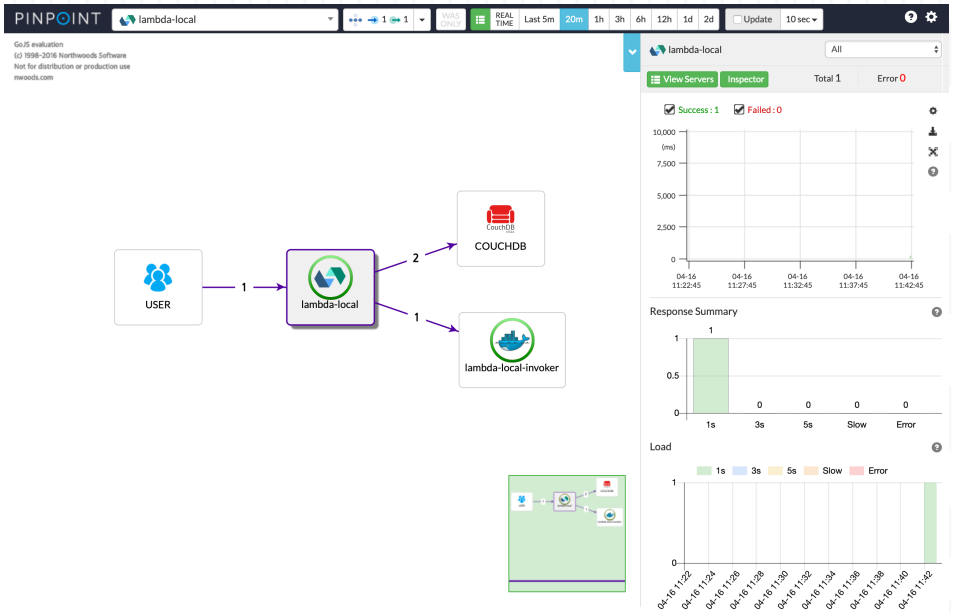
Since container operations are much slower than action invocation, if we process them at the same time, activation is delayed by container operations.

총 3건의 신규 아키텍처 및 컴포넌트 제안 https://cwiki.apache.org/confluence/display/OPENWHISK/System+Architecture

자체 개발 현황 - 추가 기능 개발



Chrome Devtools 기반 디버깅 기능 구현



Pinpoint 플러그인 개발 및 Tracing 기능 확보

기존 오픈소스 대비 추가 경쟁력 확보