

PKOS 5주차 스터디 발표

온프레미스 클러스터

구축 경험

주니어 데브옵스 엔지니어 김휘천

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기본적인 클러스터 환경

첫 직장에서의 2개월의 경험

Control-plane 3대 워커노드 5대의 클러스터환경

registry: Private Docker registry

CRI: Containerd

CNI: flannel

ingress: nginx-ingress-controller, Metallb

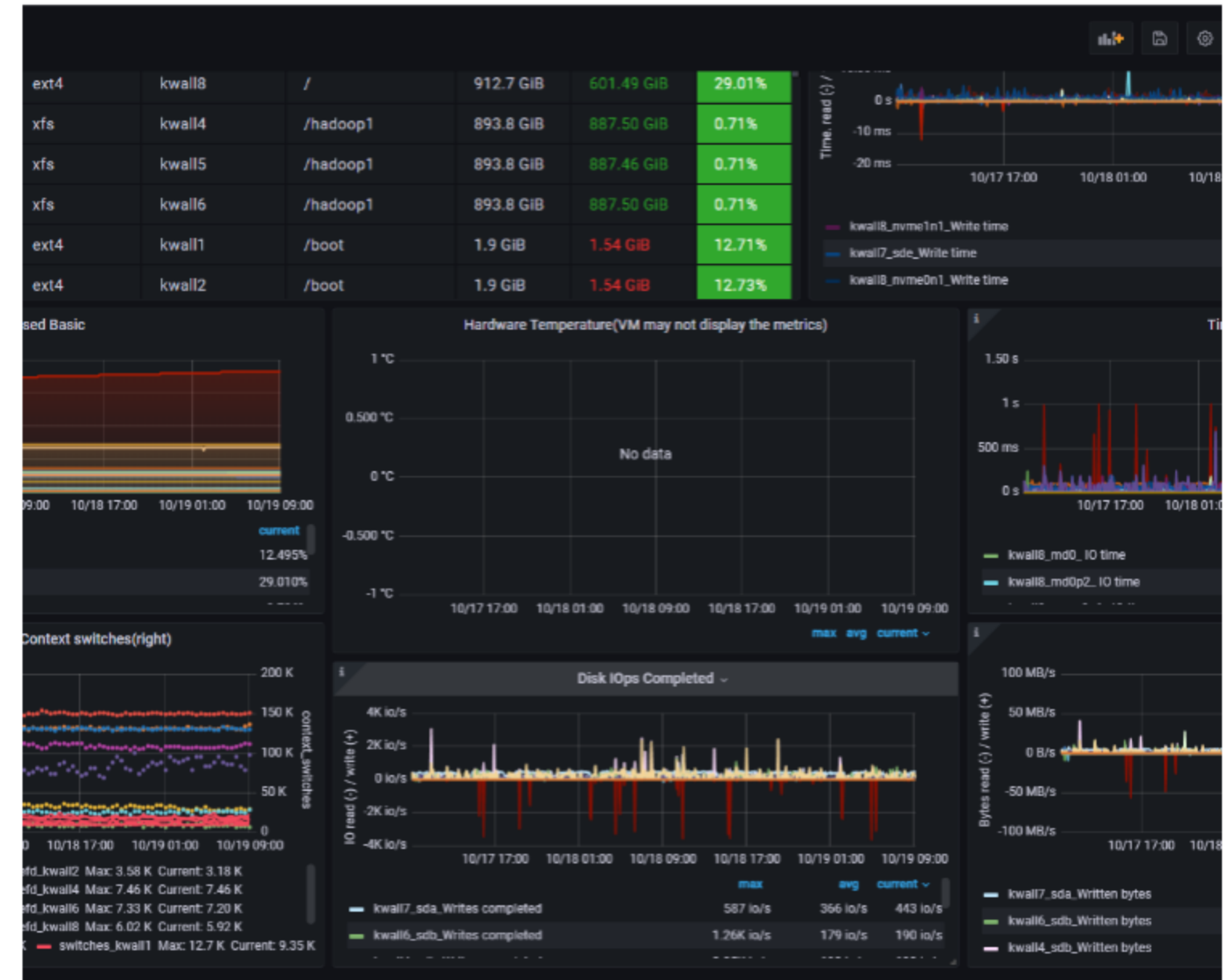
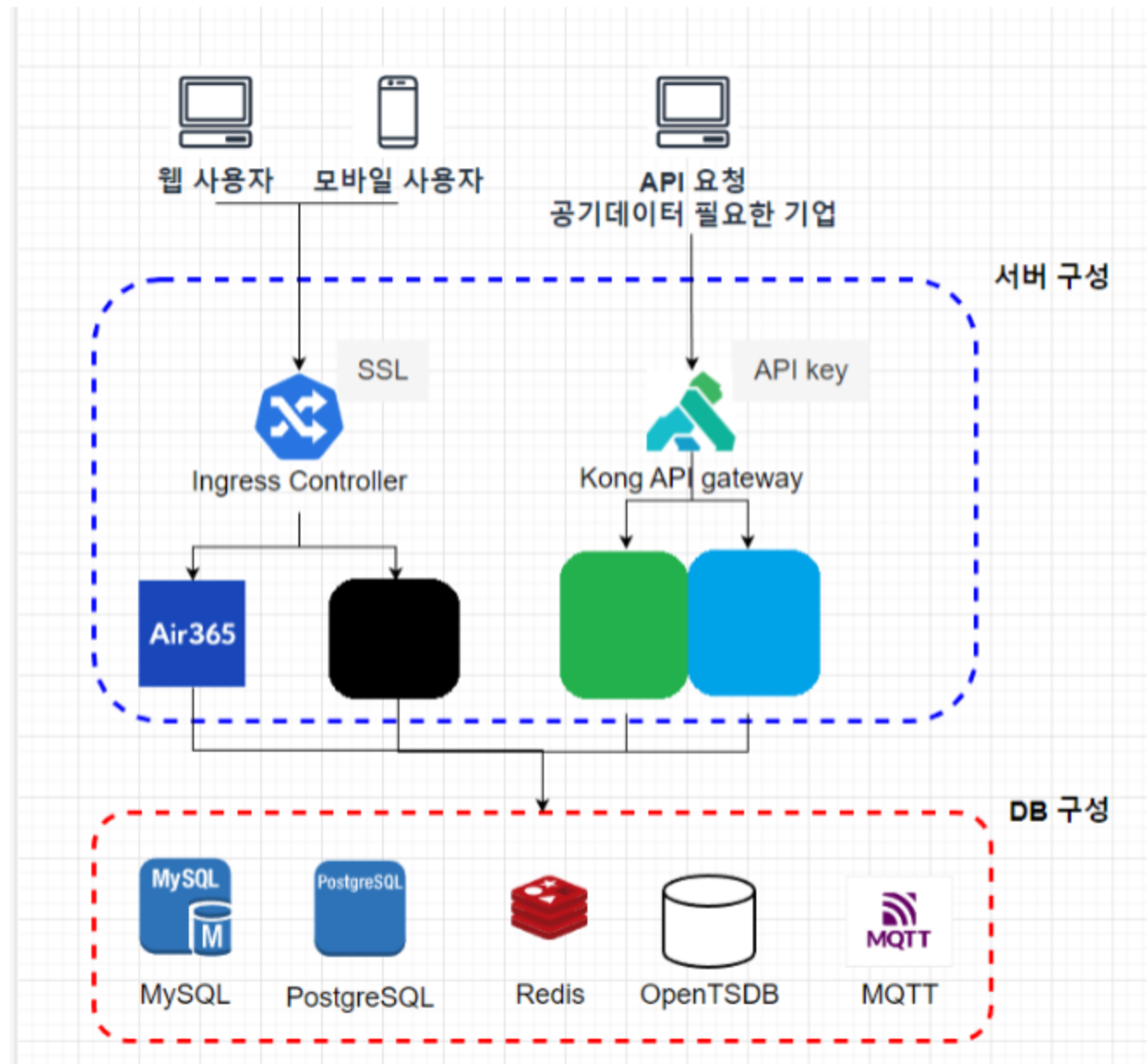
Monitoring: Grafana - Prometheus , ECK APM

관리 툴: Rancher 2.6.7 버전

01

클러스터 아키텍처

Air365 Platform 서비스



ECK, 프로메테우스와 그라파나

모니터링 환경

02

프로메테우스 오퍼레이터

오퍼레이터(Operator)는 사용자 정의 리소스를 사용하여 애플리케이션 및 해당 컴포넌트를 관리하는 쿠버네티스의 소프트웨어 익스텐션이다

출처

<https://velog.io/@kubernetes/Kubernetes-Operator-%EB%9E%80>

<https://kubernetes.io/ko/docs/concepts/extend-kubernetes/operator/>

```
kubectl apply -f prometheus-pv.yaml
```

```
1  apiVersion: v1
2  kind: PersistentVolume
3  metadata:
4    name: prometheus-pv-0
5    namespace: monitoring
6    labels:
7      type: local
8      app: prometheus
9  spec:
10   capacity:
11     storage: 100Gi
12   accessModes:
13     - ReadWriteOnce
14   persistentVolumeReclaimPolicy: Retain
15   storageClassName: local-storage
16   local:
17     path: /hadoop4/data/prometheus
18   nodeAffinity:
19     required:
20       nodeSelectorTerms:
21         - matchExpressions:
22           - key: kubernetes.io/hostname
23             operator: In
24             values:
25               - kwall16
26
```

요구사항

default값으로 apply 할 시 prometheus의
데이터 저장시간이 24시간이라 Grafana에서 노출되는
그래프의 시간이 24시간 전까지만 저장됨

vim kube-prometheus/manifests/prometheus-prometheus.yaml

```
retention: '10y'  
storage:  
  volumeClaimTemplate:  
    spec:  
      resources:  
        requests:  
          storage: 20Gi  
      storageClassName: local-storage
```

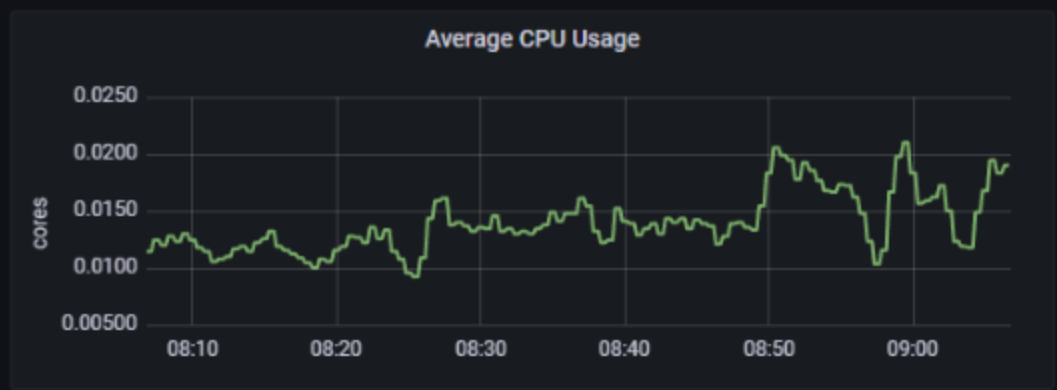
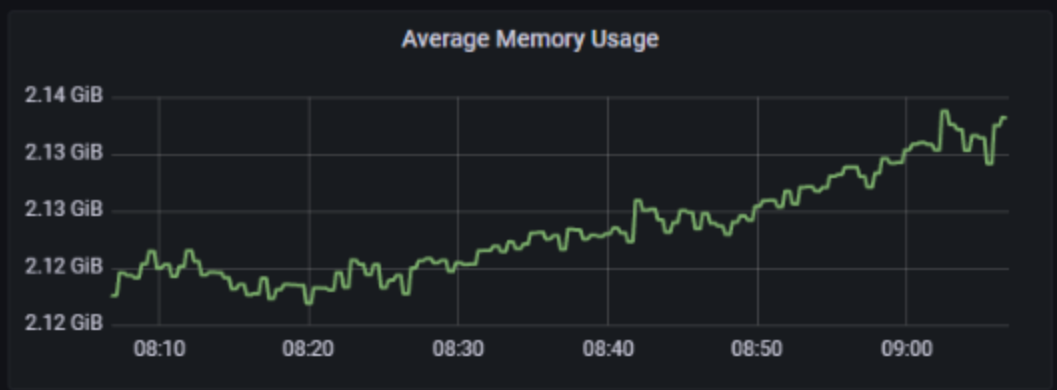
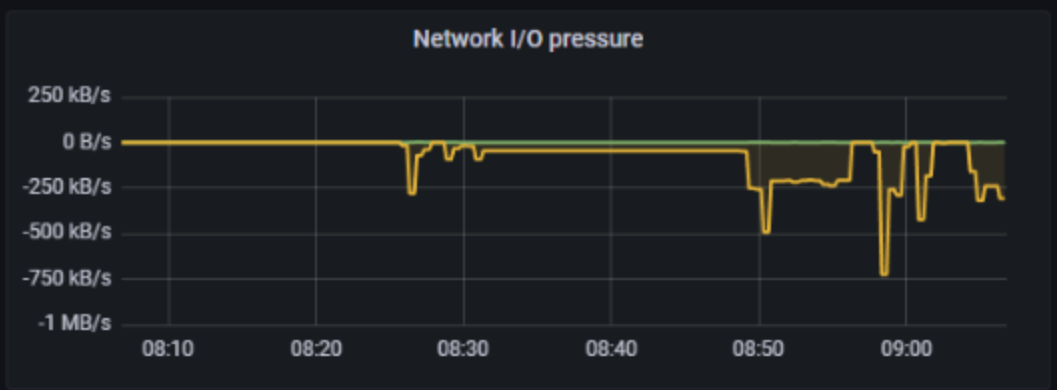
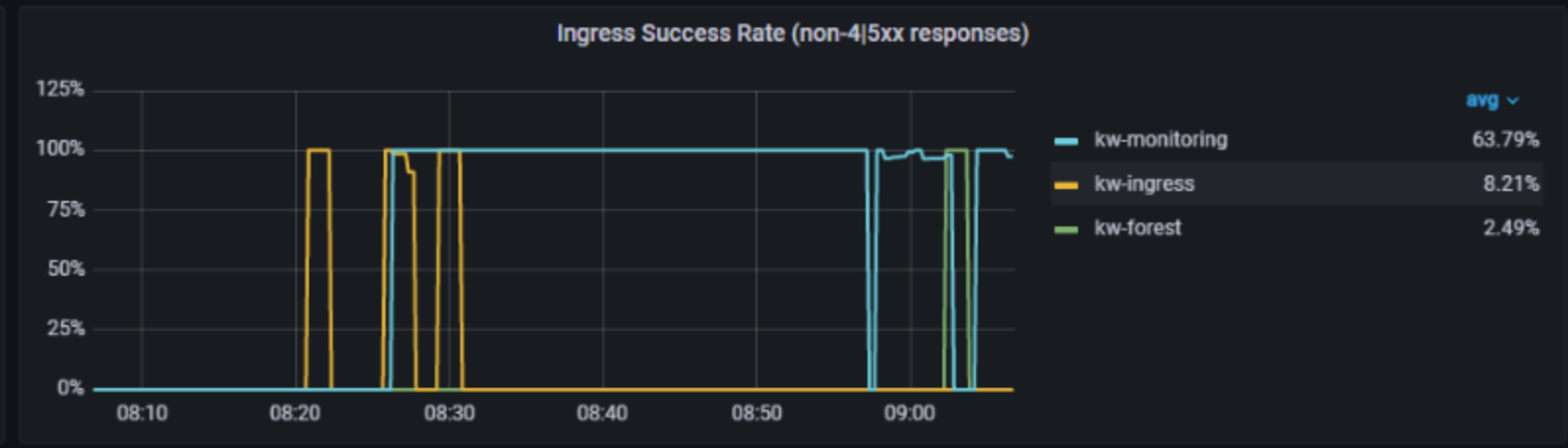
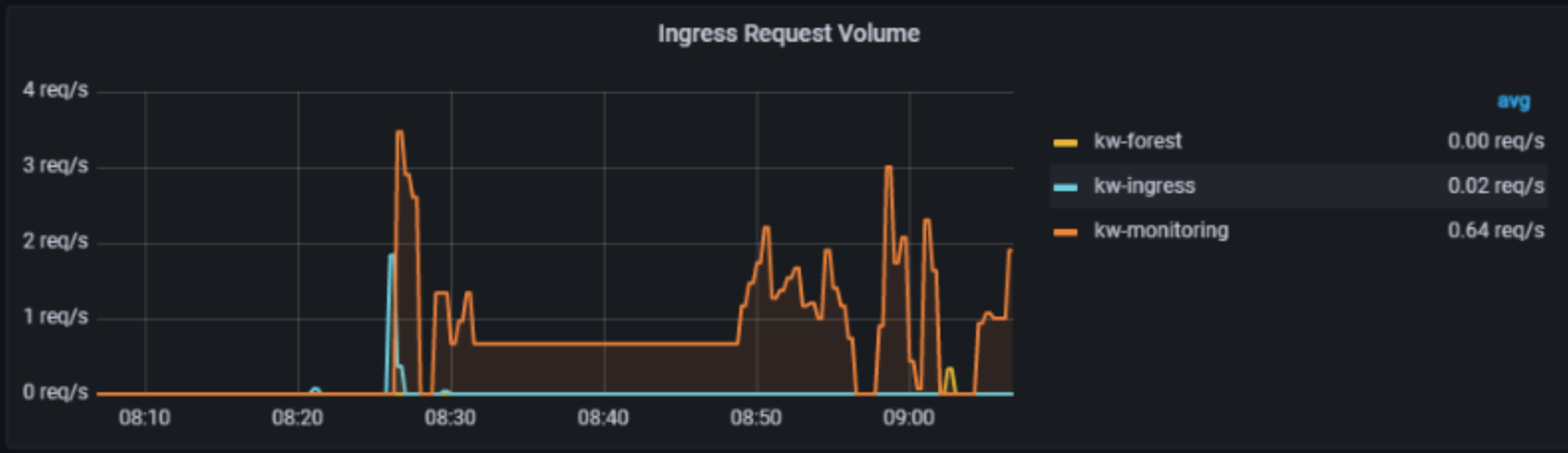
spec.retention

spec.storage 값 추가

코드 주소

<https://github.com/prometheus-operator/kube-prometheus.git>

Namespace All Controller Class All Controller All Ingress All Config Reloads



Ingress Percentile Response Times and Transfer Rates

Ingress	P50 Latency	P90 Latency	P99 Latency	IN	OUT
kw-monitoring	522 milliseconds	5 seconds	9 seconds	782.77 B/s	206.88 kB/s
kw-ingress	NaN	NaN	NaN	0.00 B/s	0.00 B/s
kw-forest	NaN	NaN	NaN	0.00 B/s	0.00 B/s

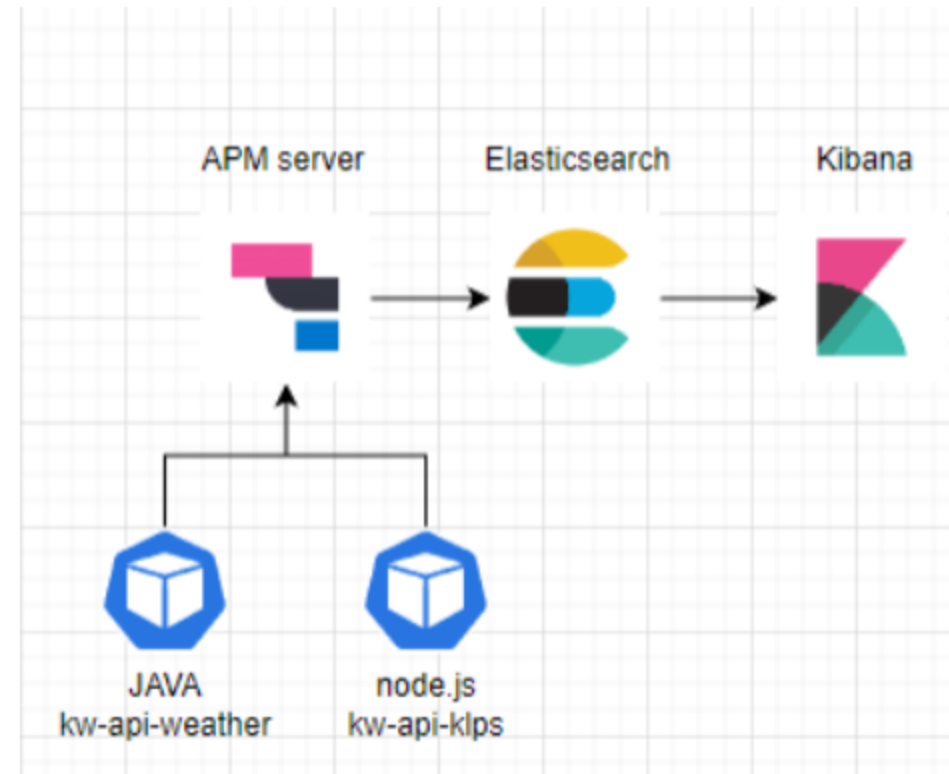
- ⚙️
- 🛡️
- 🚗
- ?











ECK APM 기능

Elasticsearch agent

컨테이너에서 처리하기

JAVA spring과 nodejs 서버의 다른 build 방식



Name	Environment	Transaction type	Latency (avg.)
 test	test	request	9.6 ms 
 kw-weather-api	production		0 ms 
 kweather	test-java		0 ms 
 kw-api-klps	production		0 ms 
 node-transaction	test		0 ms 

ECK APM 기능

Java image build

```
1 FROM openjdk:18-jdk-alpine
2
3 #imagefile
4 ARG JAR_FILE=kweather-0.0.1-SNAPSHOT.jar
5 COPY ${JAR_FILE} kw-all-api.jar
6 COPY elastic-apm-agent-1.34.0.jar apm-agent.jar
7 #환경변수
8 ENV ELASTIC_APM_SERVICE_NAME=kw-weather-api
9 ENV ELASTIC_APM_SERVER_URL=http://10.244.3.35:8200
0 ENV ELASTIC_APM_APPLICATION_PACKAGES=com.example
1 ENV ELASTIC_APM_ENVIRONMENT=production
2 #commandline
3 ENTRYPOINT ["java", "-javaagent:/apm-agent.jar" "-jar", "-Dspring.profiles.active=prod", "kw-all-api.jar"]
4
```

Observability

- Overview
- Alerts
- Services
- Groups
- Team
- Alerts
- Categories

Infrastructure

- Inventory
- Metrics Explorer

APM

- Services
- Dependencies
- Service Map

Time

- Monitors
- SSL Certificates

User Experience

- Dashboard

Throughput



Transactions

Name	Latency (avg.)	Throughput	Failed transaction rate	Impact
CbkoController#getRecentData	188 ms	1.1 tpm	12%	High
BuoyController#getRecentData	108 ms	1.1 tpm	100%	High
ForecastController#getStations	152 ms	0.3 tpm	0%	Medium
ResourceHttpRequestHandler	42 ms	0.4 tpm	0%	Low
ShkoController#getStations	24 ms	0.7 tpm	0%	Low

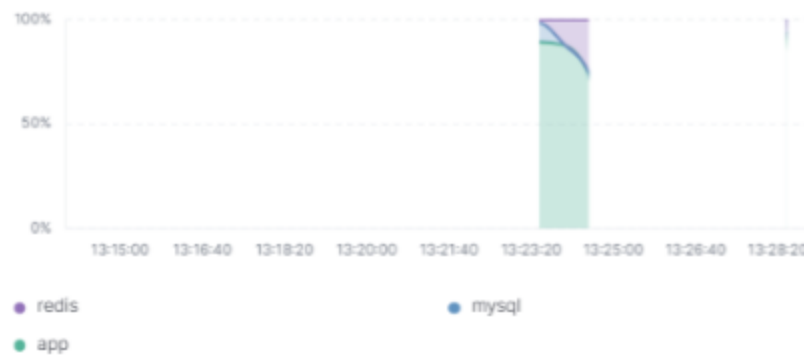
Errors

Type	Name	Last seen	Occurrences
org.springframework.dao.DataIntegrityViolationE...	could not execute query; SQL [select vbko60enti...	an hour ago	17 occ.
org.apache.catalina.connector.ClientAbortExcep...	java.io.IOException: Broken pipe	an hour ago	1 occ.
org.apache.catalina.connector.ClientAbortExcep...	java.io.IOException: Broken pipe	an hour ago	1 occ.

Failed transaction rate



Time spent by span type



Dependencies

Dependency	Latency (avg.)	Throughput	Failed transaction rate	Impact
mysql/weather	11 ms	2.1 tpm	0%	High
redis	13 ms	1.2 tpm	0%	Medium

ECK APM 기능

nodejs image build

You, 18분 전 | 1 author (You)

```
require("elastic-apm-node").start({
  // Override service name from package.json
  // Allowed characters: a-z, A-Z, 0-9, -, _, and space
  serviceName: "node-transaction",

  // Use if APM Server requires a token
  //secretToken: '',

  // Use if APM Server uses API keys for authentication
  //apiKey: '',

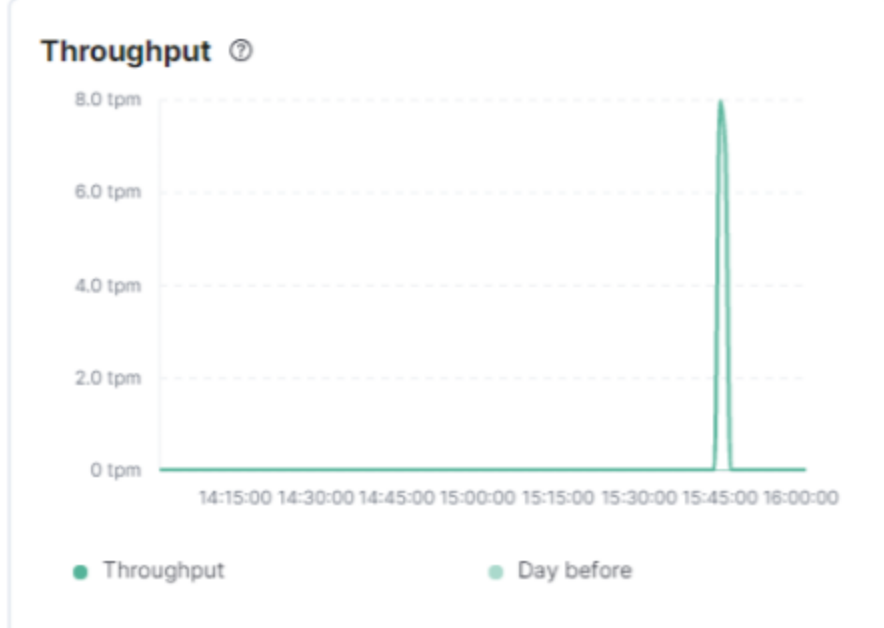
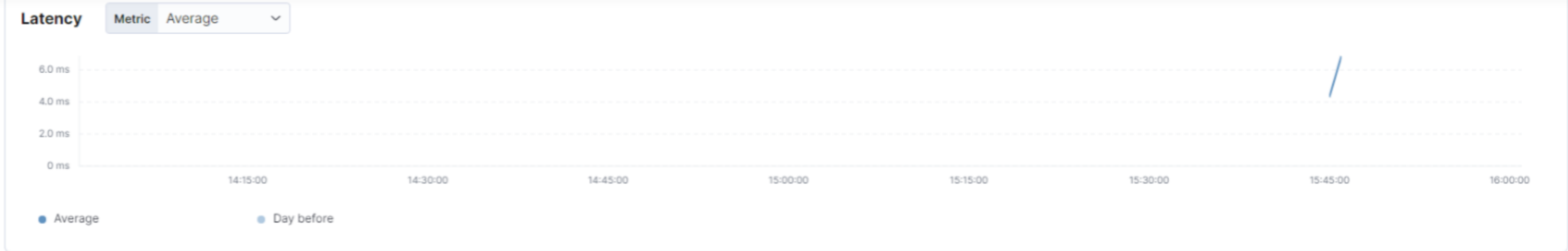
  // Set custom APM Server URL (default: http://localhost:8200)
  serverUrl: ████████████████████,

  // Set the service environment
  environment: "test",
});
const express = require("express");
const http = require("http");
const app = express();
const os = require("os");
const fs = require("fs");
require("dotenv").config();
```

You, 18분 전 • Uncommitted changes

Observability

- Overview
- Alerts
- Dashboards
- Apps
- Streams
- Alerts
- Categories
- Infrastructure
- Inventory
- Metrics Explorer
- APM
- Services
- Traces
- Dependencies
- Service Map
- Uptime
- Monitors
- SSL Certificates
- User Experience
- Dashboard

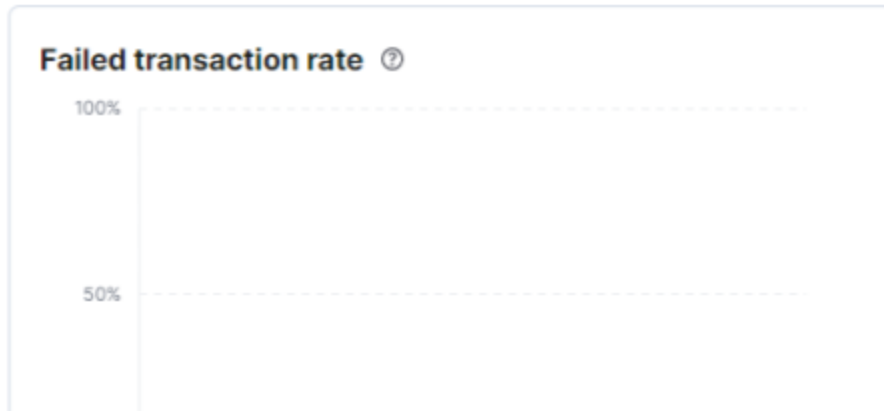


Transactions

[View transactions](#)

Name	Latency (avg.)	Throughput	Failed transaction rate	Impact
POST /node1test1	6.9 ms	< 0.1 tpm	0%	<div style="width: 100%;"></div>
GET /node1	4.3 ms	< 0.1 tpm	0%	<div style="width: 100%;"></div>

< 1 >



Errors

[View errors](#)

Type	Name	Last seen	Occurrences
No errors found			

PROJECT.3

PHP 컨테이너 컨테이너 한대로 운영하기

03

PHP image build

구글링 사례로는 nginx+php 이미지
파일이 대중적이었고 리소스를 많이
잡아먹는다고 판단하고 진행함

Ubuntu 이미지를 받아

Custom으로 진행하여

nginx php 처리가 된 걸

Deployment로 마이그레

이션 작업을 맡았음

```
FROM php:8.1-ubuntu
##레포지토리에 있는 이미지는 kwall1:35000/kw-forest-php:0
CMD service php8.1-fpm start && nginx -g "daemon off;"
```

```
containers:
  - name: forest-php
    image: kwall1:35000/php:test
    ports:
      - containerPort: 80
    volumeMounts:
      - name: nginx-php
        mountPath: /home/m_forest/www
  volumes:
    - name: nginx-php
      hostPath:
        path: /home/hduser/m_forest/www
  affinity:
    nodeAffinity:
      requiredDuringSchedulingIgnoredDuringExecution:
        nodeSelectorTerms:
          - matchExpressions:
              - key: kubernetes.io/hostname
                operator: In
                values:
                  - kwall15
      preferredDuringSchedulingIgnoredDuringExecution:
        - weight: 30
          preference:
            matchExpressions:
              - key: kubernetes.io/hostname
                operator: In
                values:
                  - kwall15
```

**마지막까지
다들 파이팅!**

PKOS StudyGroup