Prometheus

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简介

- 开源监控报警系统和时序列数据库
- SoundCloud开发
- **使用Go语言编写**
- Apache-2.0

项目开始于2012年，2016年成为继Kubernetes(k8s)之后，第二个加入Cloud Native Computing基金会的项目
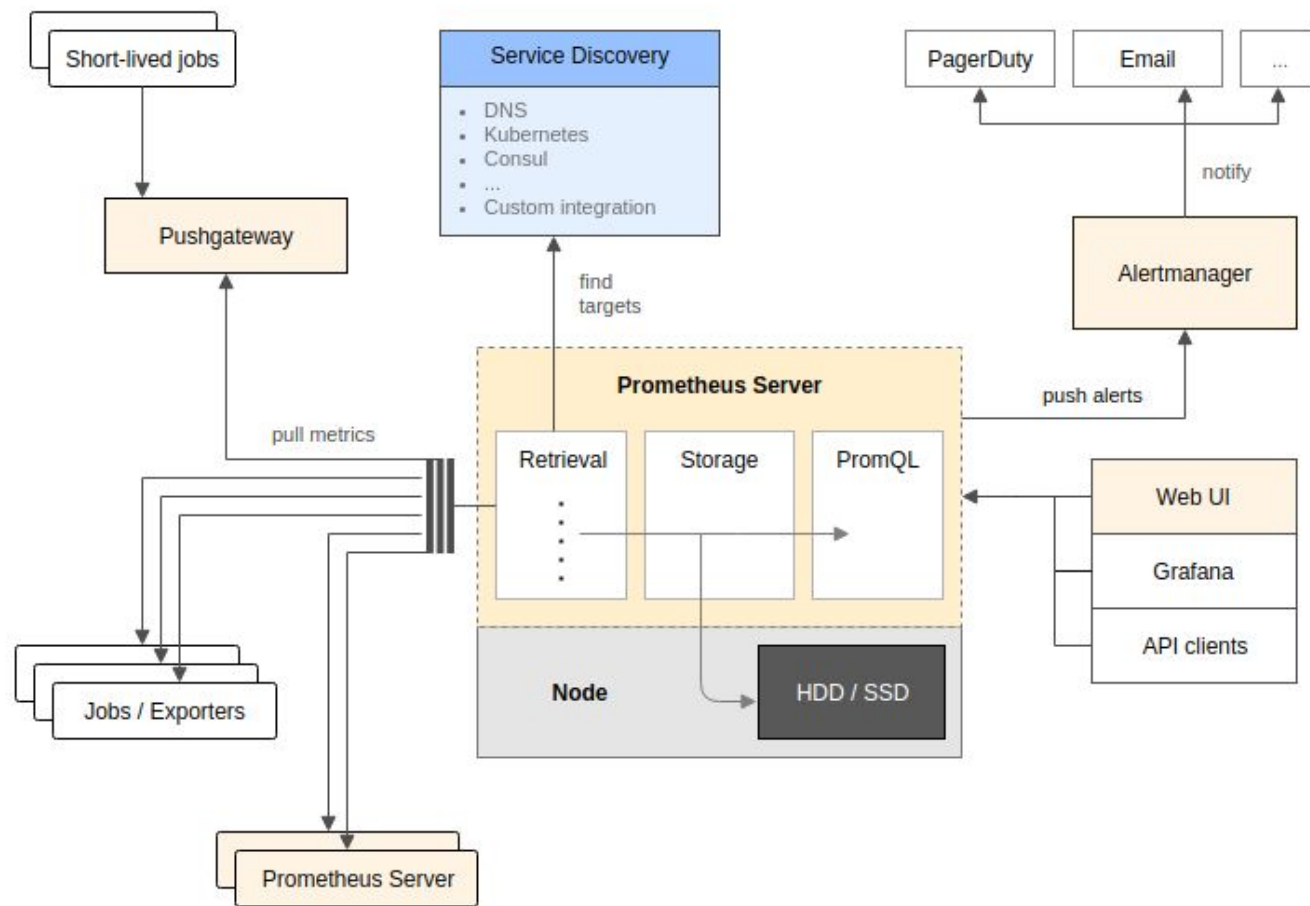
官网：https://prometheus.io/

特点

- 多维度的数据模型（由key/value与metric所定义的时间序列）
- 灵活的查询语言
- 不依赖于分布式存储，单个服务节点自治
- **基于HTTP协议，使用pull model采集时序数据**
- 支持通过独立网关的模式实现push模型
- 可通过服务发现或者静态配置的方式发现target
- 支持多种数据展现方式
- 支持分级、集群模式

结构

组件

prometheus有两个最重要的组件,支撑其最基本的运行, 分别是Server, Job/Exporter

Job/Exporter

job -- 用来监控自定义的服务
exporter -- 用来监控某些通用的服务

server

job和exporter采集target的数据, 就由server来收集并储存
采用的是pull模型, 需要server主动去job或者exporter索取
提供一种叫做PromQL的语法做查询

数据展示

开发者可以使用多个可视化工具展示prometheus收集到的监控数据, 比如prometheus自带的web ui, 以及
grafana, 也提供了API供开发者调用这些数据

altermanager

支持多种方式告警, 比如 Email, slack

更多信息: https://github.com/lwhile/workDoc/tree/master/prometheus

如何使用

Prometheus入门: https://www.hi-linux.com/posts/25047.html

peometheus配置文件的抓取规则：

```
scrape_configs:
  - job_name: 'node resources'
    scrape_interval: 15s
    static_configs:
      - targets:
        - '192.168.1.2:9100'
    params:
      collect[]:
        - cpu
        - meminfo
        - diskstats
        - netdev
        - netstat
```

Enabled by default

Name	Description	OS
arp	Exposes ARP statistics from `/proc/net/arp` .	Linux
bcache	Exposes bcache statistics from `/sys/fs/bcache/` .	Linux
conntrack	Shows conntrack statistics (does nothing if no `/proc/sys/net/netfilter/` present).	Linux
cpu	Exposes CPU statistics	Darwin, Dragonfly, FreeBSD, Linux
diskstats	Exposes disk I/O statistics.	Darwin, Linux
edac	Exposes error detection and correction statistics.	Linux
entropy	Exposes available entropy.	Linux
exec	Exposes execution statistics.	Dragonfly, FreeBSD
filefd	Exposes file descriptor statistics from `/proc/sys/fs/file-nr` .	Linux
filesystem	Exposes filesystem statistics, such as disk space used.	Darwin, Dragonfly, FreeBSD, Linux, OpenBSD
hwmon	Expose hardware monitoring and sensor data from `/sys/class/hwmon/` .	Linux
infiniband	Exposes network statistics specific to InfiniBand and Intel OmniPath configurations.	Linux
ipvs	Exposes IPVS status from `/proc/net/ip_vs` and stats from `/proc/net/ip_vs_stats` .	Linux
loadavg	Exposes load average.	Darwin, Dragonfly, FreeBSD, Linux, NetBSD, OpenBSD, Solaris
mdadm	Exposes statistics about devices in `/proc/mdstat` (does nothing if no `/proc/mdstat` present).	Linux
meminfo	Exposes memory statistics.	Darwin, Dragonfly, FreeBSD, Linux
netdev	Exposes network interface statistics such as bytes transferred.	Darwin, Dragonfly, FreeBSD, Linux, OpenBSD
netstat	Exposes network statistics from `/proc/net/netstat` . This is the same information as `netstat -s` .	Linux
sockstat	Exposes various statistics from `/proc/net/sockstat` .	Linux
stat	Exposes various statistics from `/proc/stat` . This includes boot time, forks and interrupts.	Linux

https://github.com/prometheus/node_exporter

rules

rules分为两种：recoding与alter

recoding 举例：
```
groups:
  - name: example
    rules:
    - record: job:http_inprogress_requests:sum
      expr: sum(http_inprogress_requests) by (job)
```

rules(cont.)

另一种语法

```
ALERT HighMemoryLoad
    IF ( sum(node_memory_MemTotal) - sum(node_memory_MemFree + node_memory_Buffers + node_memory_Cached) )
        /
      sum(node_memory_MemTotal)
       * 100 > 85
    FOR 60m
    LABELS { severity = "warning" }
    ANNOTATIONS {
        summary = "Host {{ $labels.instance }} high memory loads",
        description = "{{ $value }}% memory loads in {{ $labels.instance }}",
    }
```

如何使用

```
$ls
prometheus*  promtool*
$./promtool update rules alter.rules
生成`alter.rules.yml`, 在prometheus的配置文件里面添加:
    rule_files:
      - "alter.rules.yml"
```

rules(cont.)

rules参考

https://gitlab.com/gitlab-com/runbooks/tree/master/alerts

https://github.com/infinityworks/prometheus-example-queries

服务

prometheus: http://bj-ha-1.ha.suse.asia:9090

被监控的机器: http://bj-ha-1.ha.suse.asia:9090/targets

alter规则: http://bj-ha-1.ha.suse.asia:9090/alerts

数据可视化服务grafana: http://bj-ha-1.ha.suse.asia/
    username: admin
    password: admin

We adapt. You succeed.