



如何实现ZABBIX对 DOCKER和K8S的监控

张世宏

开源社区专家

ZABBIX



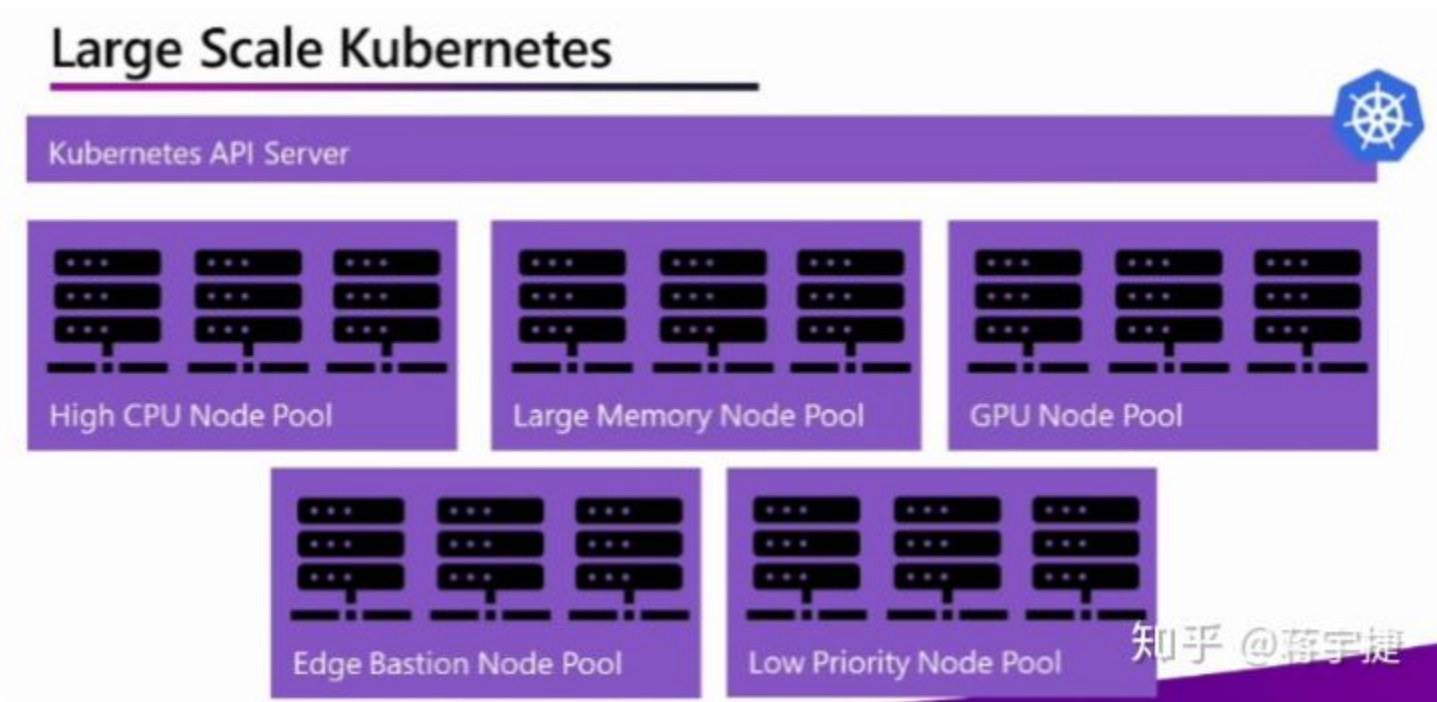
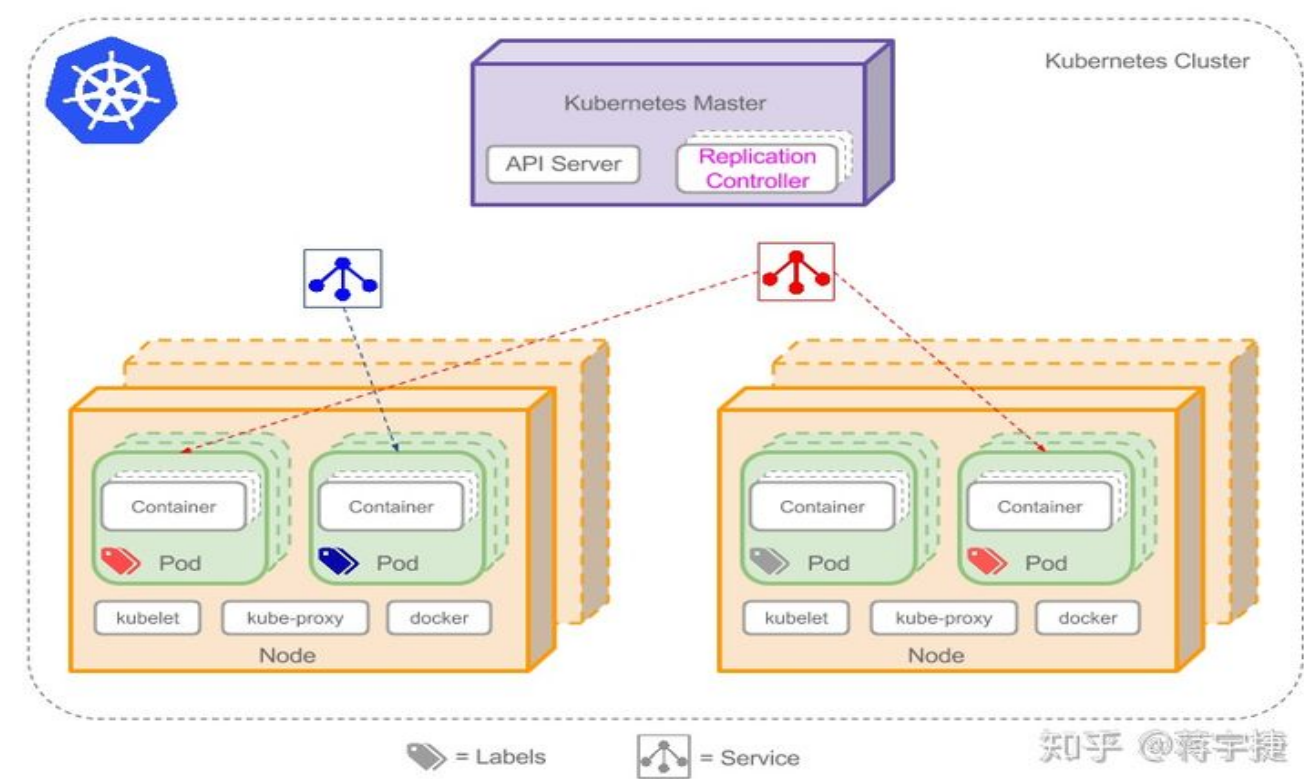
如何实现Zabbix对Docker和K8s的监控

拥抱云原生时代

发展



结构





如何实现Zabbix对Docker和K8s的监控

与时俱进的ZABBIX

无边界监控


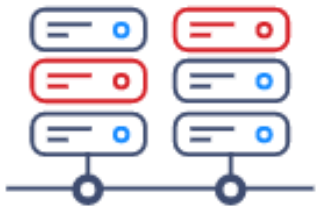



23 years
of experience

100%
Free and Open Source Software

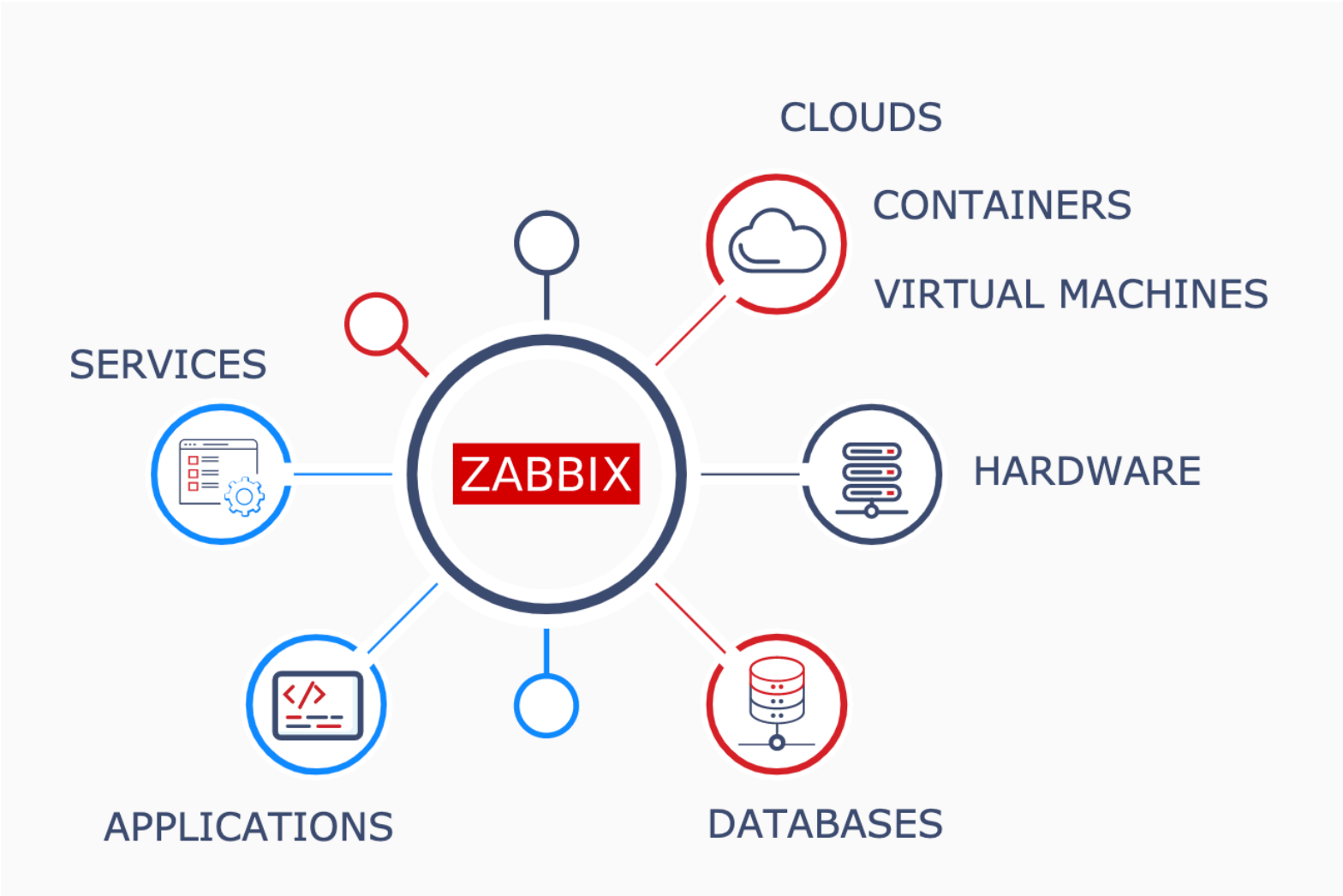
300 000 +
installations worldwide

Monitor anything

Solutions for any kind of IT infrastructure, services, applications, resources

				
Network monitoring	Server monitoring	Cloud monitoring	Application monitoring	Services monitoring

多样的数据采集



Item Preprocessing

* Name

Type ☒ Zabbix agent
☐ Zabbix agent (active)

* Key

* Host interface

Type of information

Units

* Update interval

Custom intervals

Interval Period

* History storage period

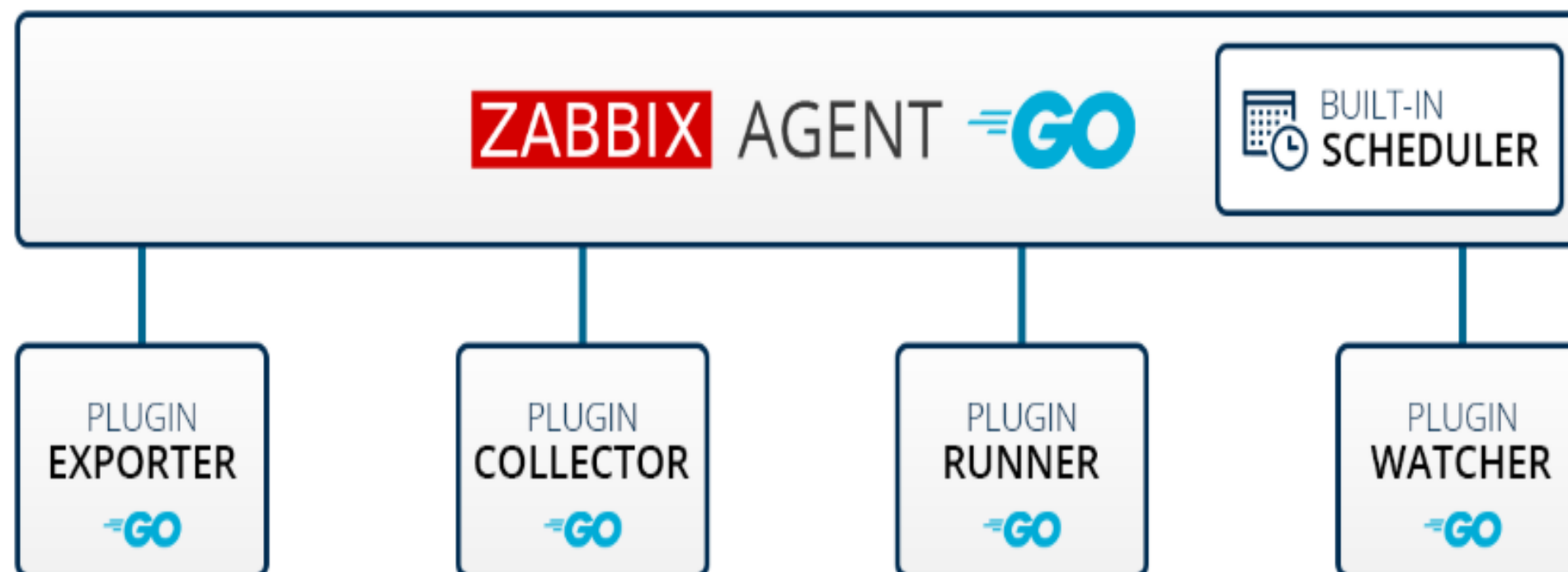
* Trend storage period

Show value

New application

全新的AGNET2

- ✓ 灵活方便的插件模式
- ✓ 支持灵活的采集周期调度
- ✓ 更高效的数据采集及传输
- ✓ 可完全替换先有的 agent





如何实现Zabbix对Docker和K8s的监控

DOCKER监控

传统AGENT

Agent

+

zabbix_module_docker

<https://github.com/monitoringartist/zabbix-docker-monitoring>

Zabbix plugin

✓ zabbix_module_docker.so

Template

- ✓ Zabbix-Template-App-Docker.xml - standard (recommended) template
- ✓ Zabbix-Template-App-Docker-active.xml - standard template with active checks

AGNET2监控DOCKER



- ✓ cpu、内存使用
- ✓ 磁盘使用
- ✓ 镜像大小
- ✓ 容器状态



如何实现Zabbix对Docker和K8s的监控

K8S监控

KUBERNETES 架构

KUBERNETES ARCHITECTURE

www.learnitguide.net

User Interface



kubectl

Kubernetes Master

API Server

Scheduler

Controller-Manager

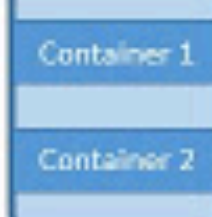
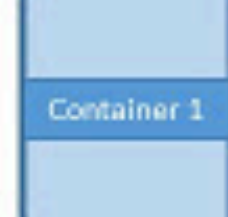
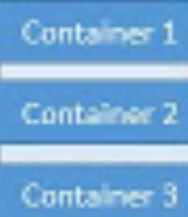
etcd

Worker Node 1

Pod 1

Pod 2

Pod 3



DOCKER

kubelet

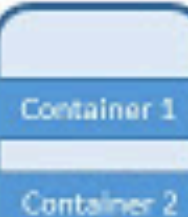
Kube-proxy

Worker Node 2

Pod 1

Pod 2

Pod 3



DOCKER

kubelet

Kube-proxy

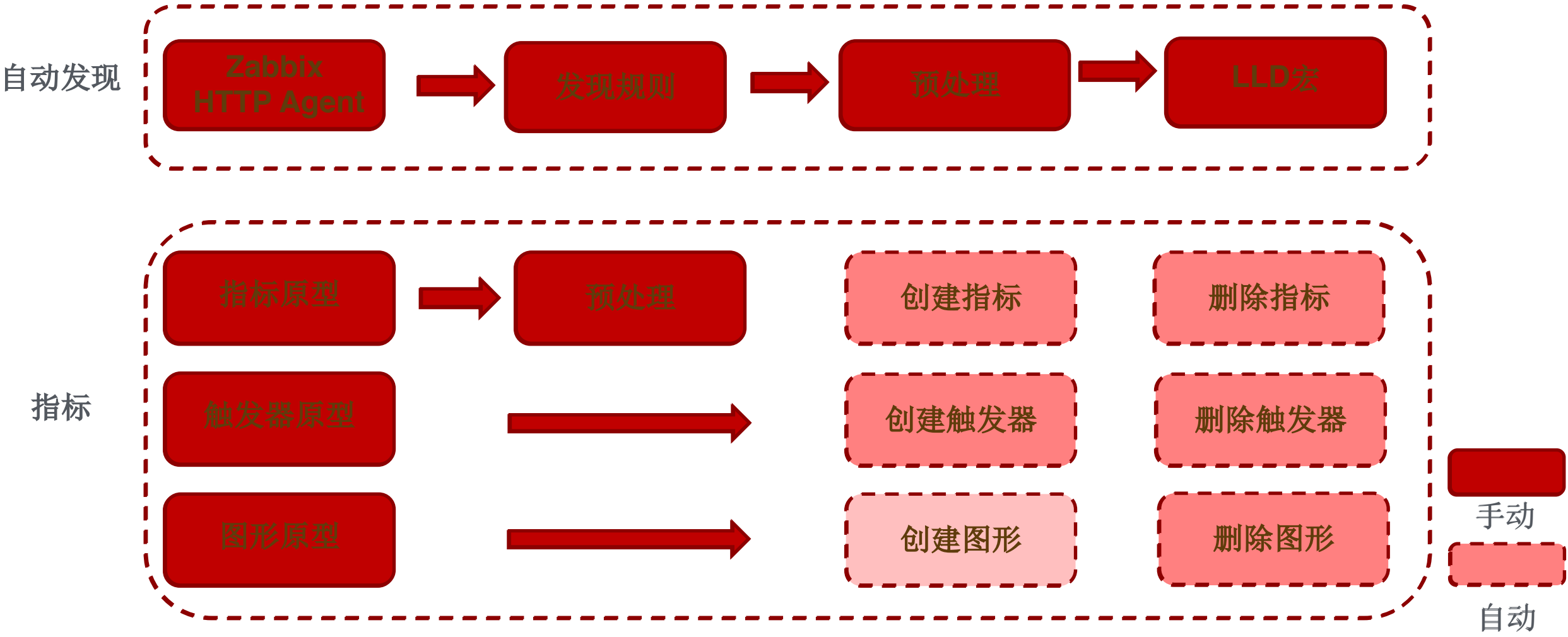
KUBERNETES METRICS SERVER API

Nodes https://K8S_API_SERVER:6443/apis/metrics.k8s.io/v1beta1/nodes

Pods https://K8S_API_SERVER:6443/apis/metrics.k8s.io/v1beta1/pods

```
1 {
2   "kind": "PodMetricsList",
3   "apiVersion": "metrics.k8s.io/v1beta1",
4   "metadata": {
5     "selfLink": "/apis/metrics.k8s.io/v1beta1/pods"
6   },
7   "items": [
8     {
9       "metadata": {
10        "name": "kube-proxy-rdj8q",
11        "namespace": "kube-system",
12        "selfLink": "/apis/metrics.k8s.io/v1beta1/namespaces/kube-system/pods/kube-proxy-rdj8q",
13        "creationTimestamp": "2019-11-06T04:09:51Z"
14      },
15      "timestamp": "2019-11-06T04:09:01Z",
16      "window": "30s",
17      "containers": [
18        {
19          "name": "kube-proxy",
20          "usage": {
21            "cpu": "5127129n",
22            "memory": "19088Ki"
23          }
24        }
25      ]
26    },
27    {
28      "metadata": {
29        "name": "metrics-server-849fb4fdd4-f4t6n",
30        "namespace": "kube-system",
31        "selfLink": "/apis/metrics.k8s.io/v1beta1/namespaces/kube-system/pods/metrics-server-849fb4fdd4-f4t6n",
32        "creationTimestamp": "2019-11-06T04:09:51Z"
```

实现



MASTER ITEM

Items

[All templates](#) / [Kubernets Nodes](#) [Applications 2](#) **Items 2** [Triggers](#) [Graphs](#) [Screens](#) [Discovery rules 2](#) [Web scenarios](#)

Item

Preprocessing

* Name

k8s pods master

Type

HTTP agent

* Key

k8s.pods.master

Select

* URL

{\$K8S_API_SERVER}/apis/metrics.k8s.io/v1beta1/pods

Parse

Query fields

Name

Value

name

⇒

value

Remove

Add

Request type

GET

Timeout

3s

Request body type

Raw data

JSON data

XML data

Request body

Headers

Name

Value

Authorization

⇒

Bearer eyJhbGciOiJSUzI1NiIsImtpZCI6

Remove

Add

Required status codes

200

Follow redirects

☒

模版宏

{\$K8S_API_SERVER}

历史记录保存期

不保留

Headers

Token

LLD

Discovery rules

All templates /

Kubernetes Nodes

Discovery list /

K8s pods discovery

Item prototypes 2

Trigger prototypes

Graph prototypes

Host prototypes

Discovery rule

Preprocessing

LLD macros

Filters

* Name

K8s pods discovery

Type

Dependent item

* Key

k8s.pods.discovery

* Master item

Kubernetes Nodes: k8s pods master

Select

* Keep lost resources period

1d

Description

Enabled

☒

Update

Clone

Delete

Cancel

指标类型

Dependent Item

历史记录保存期

k8s.pods[nginx-deployment-fdc64d445-dfsdm,cpu]	1w	30d	Dependent item	k8s-pods	Not supported	<div><div></div><div></div></div>
k8s.pods[nginx-deployment-fdc64d445-dfsdm,memory]						
k8s.pods[nginx-deployment-fdc64d445-dfsdm,memory]						

The item is not discovered anymore and will be deleted in 23h 23m 47s (on 2019-11-30 at 21:35).

PREPROCESSING

Discovery rules

All templates / Kubernetes Nodes / Discovery list / K8s pods discovery / Item prototypes 2 / Trigger prototypes / Graph prototypes / Host prototypes

Discovery rule

Preprocessing

LLD macros

Filters

Preprocessing steps

Name

Parameters

1: JSONPath

\$.items[.].metadata

Add

Update

Clone

Delete

Cancel

Discovery rules

All templates / Kubernetes Nodes / Discovery list / K8s pods discovery / Item prototypes 2 / Trigger prototypes / Graph prototypes / Host prototypes

Discovery rule

Preprocessing

LLD macros

Filters

LLD macros

LLD macro

JSONPath

{#K8S_NAMESPACE}

\$.namespace

Remove

{#K8S_POD_NAME}

\$.name

Remove

Add

Update

Clone

Delete

Cancel

```
{
  "kind": "PodMetricsList",
  "apiVersion": "metrics.k8s.io/v1beta1",
  "metadata": {
    "selfLink": "/apis/metrics.k8s.io/v1beta1/pods"
  },
  "items": [
    {
      "metadata": {
        "name": "kube-proxy-rdj8q",
        "namespace": "kube-system",
        "selfLink": "/apis/metrics.k8s.io/v1beta1/namespaces/kube-system/pods/kube-proxy-rdj8q",
        "creationTimestamp": "2019-11-06T04:09:51Z"
      },
      "timestamp": "2019-11-06T04:09:01Z",
      "window": "30s",
      "containers": [
        {
          "name": "kube-proxy",
          "usage": {
            "cpu": "5127129n",
            "memory": "19088Ki"
          }
        }
      ]
    }
  ]
},
{
  "metadata": {
    "name": "metrics-server-849fb4fdd4-f4t6n",
    "namespace": "kube-system",
    "selfLink": "/apis/metrics.k8s.io/v1beta1/namespaces/kube-system/pods/metrics-server-849fb4fdd4-f4t6n",
    "creationTimestamp": "2019-11-06T04:09:51Z"
  },
  "timestamp": "2019-11-06T04:09:10Z",
  "window": "30s",
  "containers": [
    {
      "name": "metrics-server",
      "usage": {
        "cpu": "661076n",
        "memory": "16960Ki"
      }
    }
  ]
}
],
}
```

{#K8S_NAMESPACE}

{#K8S_POD_NAME}

ITEM PROTOTYPES

All templates / Kubernetes Nodes

Discovery list / K8s pods discovery

Item prototypes 2

Trigger prototypes

Graph prototypes

Host prototypes

Item prototype

Preprocessing

* Name

k8s {#K8S_POD_NAME} ON {#K8S_NAMESPACE} cpu

Type

Dependent item

* Key

k8s.pods[{#K8S_POD_NAME},cpu]

Select

* Master item

Kubernetes Nodes: k8s pods master

Select

Select prototype

Type of information

Numeric (unsigned)

Units

!m

* History storage period

Do not keep history

Storage period

1w

* Trend storage period

Do not keep trends

Storage period

30d

Show value

As is

show value mappings

New application

Applications

-None-

k8s-nodes

k8s-pods

类型

Dependent item

单位

!m

JSON PATH

<https://www.zabbix.com/documentation/4.2/manual/appendix/items/jsonpath>

`$.items[?(@.metadata.name=='#K8S_POD_NAME')].containers[:].usage.cpu.first()`

`$.items[?(@.metadata.name=='#K8S_POD_NAME')].containers[:].usage.memory.first()`

Item prototype

Preprocessing

Preprocessing steps	Name	Parameters
1:	JSONPath	<code>\$.items[?(@.metadata.name=='#K8S_POD_NAME')].containers[:].usage.c</code>
2:	Right trim	<code>n</code>
3:	Custom multiplier	<code>0.000001</code>

Add

Update

Clone

Delete

Cancel

```
{
  "kind": "PodMetricsList",
  "apiVersion": "metrics.k8s.io/v1beta1",
  "metadata": {
    "selfLink": "/apis/metrics.k8s.io/v1beta1/pods"
  },
  "items": [
    {
      "metadata": {
        "name": "kube-proxy-rdj8q",
        "namespace": "kube-system",
        "selfLink": "/apis/metrics.k8s.io/v1beta1/namespaces/kube-system/pods/kube-proxy-rdj8q",
        "creationTimestamp": "2019-11-06T04:09:51Z"
      },
      "timestamp": "2019-11-06T04:09:01Z",
      "window": "30s",
      "containers": [
        {
          "name": "kube-proxy",
          "usage": {
            "cpu": "5127129n",
            "memory": "19088Kl"
          }
        }
      ]
    }
  ]
},
```

DONE

▼	Zabbix监控主机	k8s-pods (27 Items)									
<input type="checkbox"/>		k8s pods master k8s.pods.master	1m	0	HTTP agent						
<input type="checkbox"/>		k8s metrics-server-849fb4fdd4-f4t6n ON kube-sy... k8s.pods[metrics-server-849fb4fdd4-f4t6n,memory]	1w	30d	Dependent item	2019-11-06 12:40:16	16.56 MB				Graph
<input type="checkbox"/>		k8s metrics-server-849fb4fdd4-f4t6n ON kube-sy... k8s.pods[metrics-server-849fb4fdd4-f4t6n,cpu]	1w	30d	Dependent item	2019-11-06 12:40:16	0 m	-1 m			Graph
<input type="checkbox"/>		k8s kube-scheduler-k8s-master ON kube-system ... k8s.pods[kube-scheduler-k8s-master,memory]	1w	30d	Dependent item	2019-11-06 12:40:16	15.64 MB				Graph
<input type="checkbox"/>		k8s kube-scheduler-k8s-master ON kube-system ... k8s.pods[kube-scheduler-k8s-master,cpu]	1w	30d	Dependent item	2019-11-06 12:40:16	1 m				Graph
<input type="checkbox"/>		k8s kube-proxy-rdj8q ON kube-system memory k8s.pods[kube-proxy-rdj8q,memory]	1w	30d	Dependent item	2019-11-06 12:40:16	18.74 MB	-16.06 KB			Graph
<input type="checkbox"/>		k8s kube-proxy-rdj8q ON kube-system cpu k8s.pods[kube-proxy-rdj8q,cpu]	1w	30d	Dependent item	2019-11-06 12:40:16	0 m	-5 m			Graph
<input type="checkbox"/>		k8s kube-proxy-hn7bq ON kube-system memory k8s.pods[kube-proxy-hn7bq,memory]	1w	30d	Dependent item	2019-11-06 12:40:16	18.57 MB	+40.16 KB			Graph
<input type="checkbox"/>		k8s kube-proxy-hn7bq ON kube-system cpu k8s.pods[kube-proxy-hn7bq,cpu]	1w	30d	Dependent item	2019-11-06 12:40:16	0 m				Graph
<input type="checkbox"/>		k8s kube-proxy-4zlzd ON kube-system memory k8s.pods[kube-proxy-4zlzd,memory]	1w	30d	Dependent item	2019-11-06 12:40:16	18.75 MB	-40.16 KB			Graph
<input type="checkbox"/>		k8s kube-proxy-4zlzd ON kube-system cpu k8s.pods[kube-proxy-4zlzd,cpu]	1w	30d	Dependent item	2019-11-06 12:40:16	4 m				Graph
<input type="checkbox"/>		k8s kube-controller-manager-k8s-master ON kub... k8s.pods[kube-controller-manager-k8s-master,me...	1w	30d	Dependent item	2019-11-06 12:40:16	36.02 MB				Graph
<input type="checkbox"/>		k8s kube-controller-manager-k8s-master ON kub... k8s.pods[kube-controller-manager-k8s-master,cpu]	1w	30d	Dependent item	2019-11-06 12:40:16	14 m				Graph
<input type="checkbox"/>		k8s kube-apiserver-k8s-master ON kube-system ... k8s.pods[kube-apiserver-k8s-master,memory]	1w	30d	Dependent item	2019-11-06 12:40:16	241.8 MB				Graph
<input type="checkbox"/>		k8s kube-apiserver-k8s-master ON kube-system ... k8s.pods[kube-apiserver-k8s-master,cpu]	1w	30d	Dependent item	2019-11-06 12:40:16	33 m	-3 m			Graph

PLAN

- ✓ K8s Event
- ✓ Appliaction Moniting

ZABBIX

FORUM

SHENZHEN 2021

Q&A

ZABBIX



THANK YOU!

ZABBIX

ZABBIX

FORUM

SHENZHEN 2021

本次深圳大会照片 <https://live.aiyaopai.com/live/52886185>

往期大会演讲视频 <https://space.bilibili.com/476625813>



微信交流群：17502189550



公众号干货：Zabbix开源社区