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如何实现ZABBIX对DOCKER和K8S的监控

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ZABBIX

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如何实现Zabbix对Docker和K8s的监控

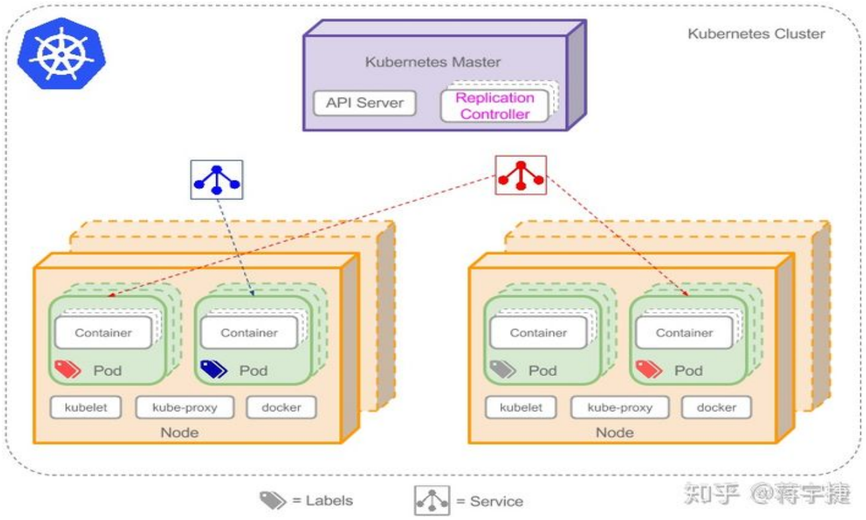
拥抱云原生时代

发展

单体应用
分布式
微服务
K8S
Service Mesh
互联网需求爆发
Docker诞生
容器编排需求
微服务进化

服务网格
声明式API
微服务
云原生
容器
不可变基础设施
知乎 @蒋宇捷

结构


Kubernetes Cluster
Kubernetes Master
API Server
Replication Controller
Container
Container
Pod
Pod
kubelet
kube-proxy
docker
Node
Container
Container
Pod
Pod
kubelet
kube-proxy
docker
Node
= Labels
= Service
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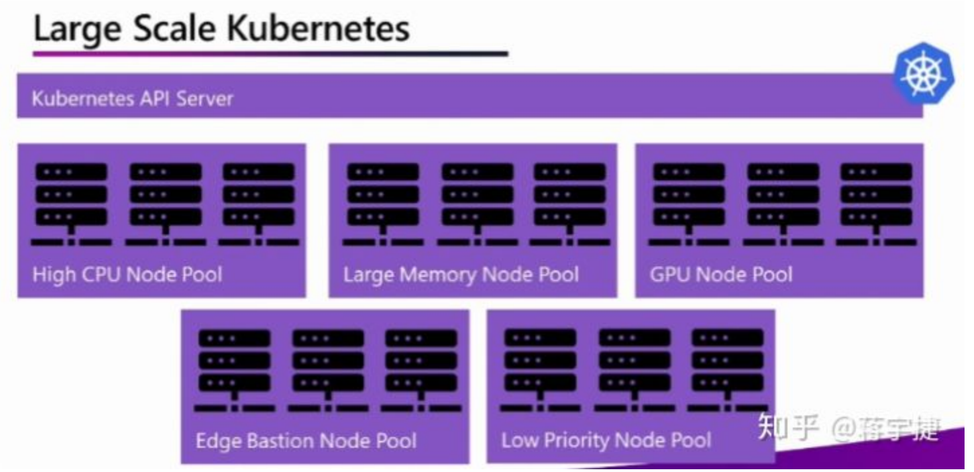
Large Scale Kubernetes
Kubernetes API Server
High CPU Node Pool
Large Memory Node Pool
GPU Node Pool
Edge Bastion Node Pool
Low Priority Node Pool
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如何实现Zabbix对Docker和K8s的监控

与时俱进的ZABBIX

无边界监控

23 years
of experience

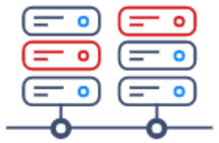
100%
Free and Open Source Software

300 000 +
installations worldwide

Monitor anything

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

Network monitoring



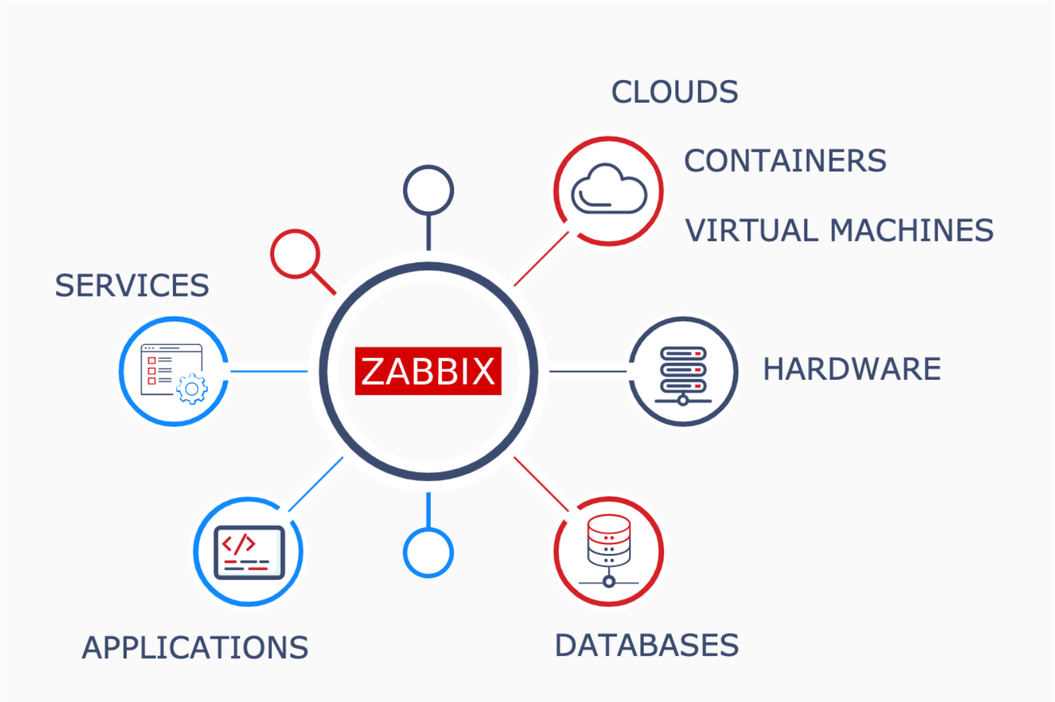
Server monitoring

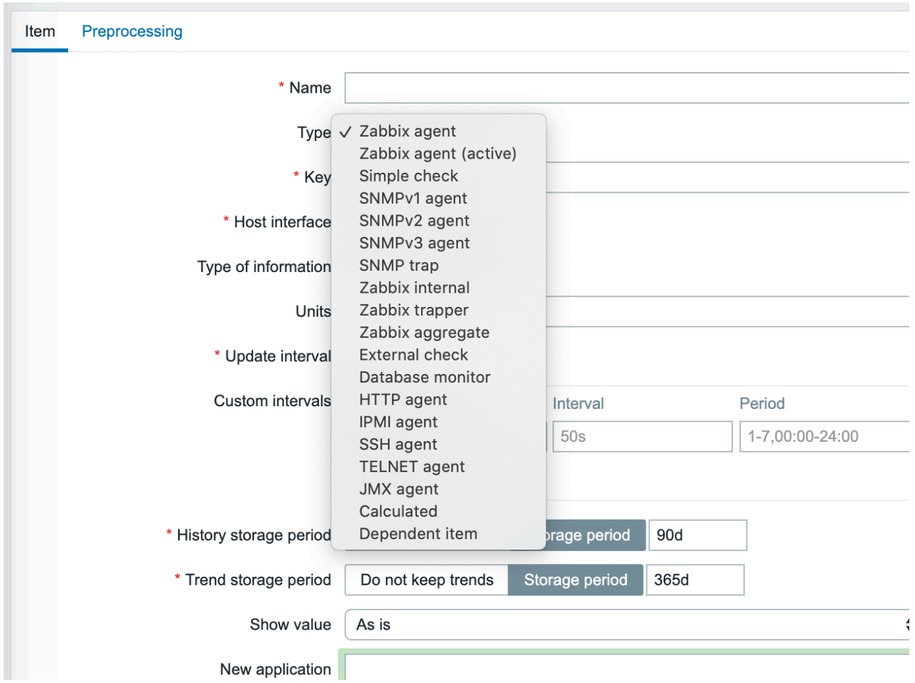
Cloud monitoring

Application monitoring

Services monitoring

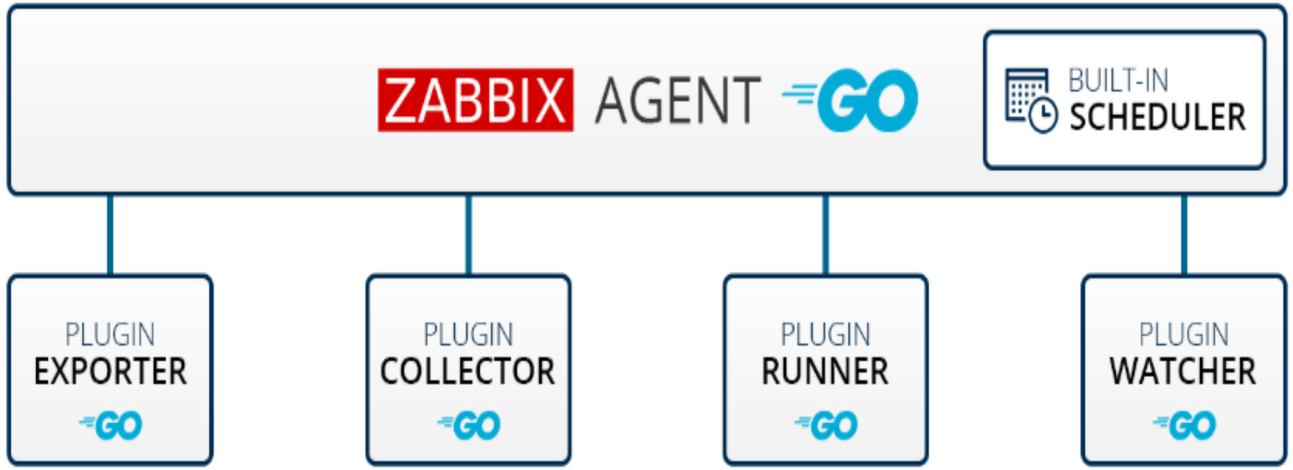
多样的数据采集


CLOUDS
CONTAINERS
VIRTUAL MACHINES
SERVICES
ZABBIX
HARDWARE
APPLICATIONS
DATABASES


Item
Preprocessing
* Name
Type
Zabbix agent
Zabbix agent (active)
* Key
Simple check
SNMPv1 agent
* Host interface
SNMPv2 agent
SNMPv3 agent
Type of information
SNMP trap
Zabbix internal
Units
Zabbix trapper
Zabbix aggregate
* Update interval
External check
Database monitor
Custom intervals
HTTP agent
Interval
Period
IPMI agent
50s
1-7,00:00-24:00
SSH agent
TELNET agent
JMX agent
Calculated
* History storage period
Dependent item
90d
* Trend storage period
Do not keep trends
Storage period
365d
Show value
As is
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



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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

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AGNET2监控DOCKER

- cpu、内存使用
- 磁盘使用
- 镜像大小
- 容器状态

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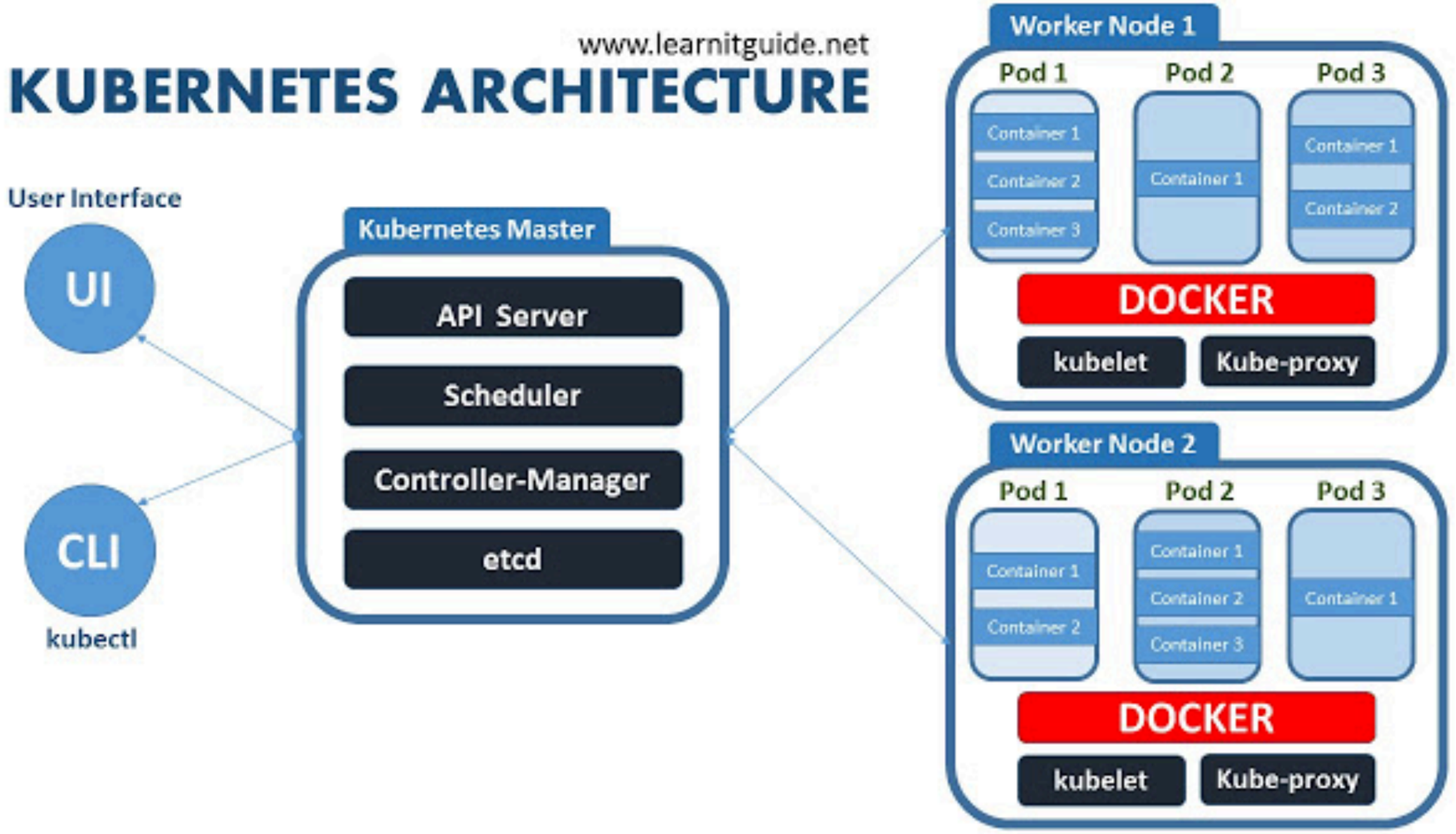
K8S监控

KUBERNETES 架构



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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


```
{
    "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"
```


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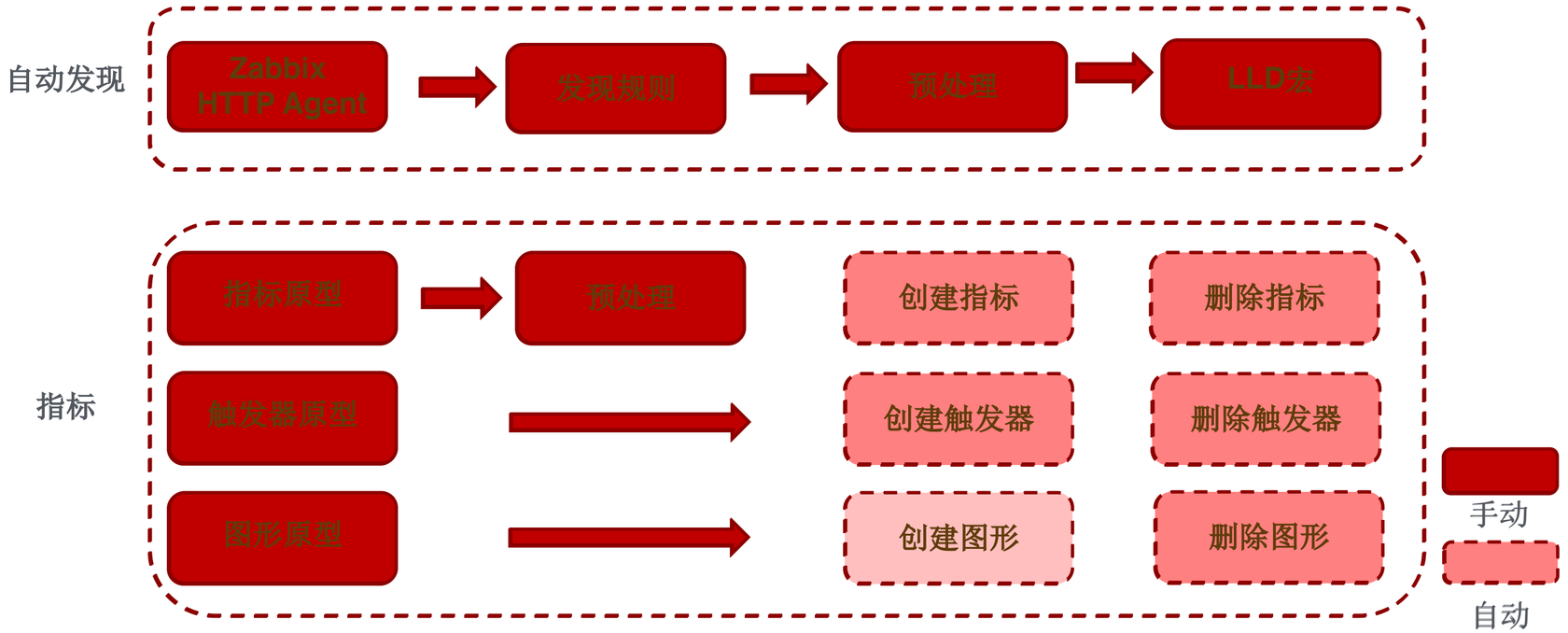
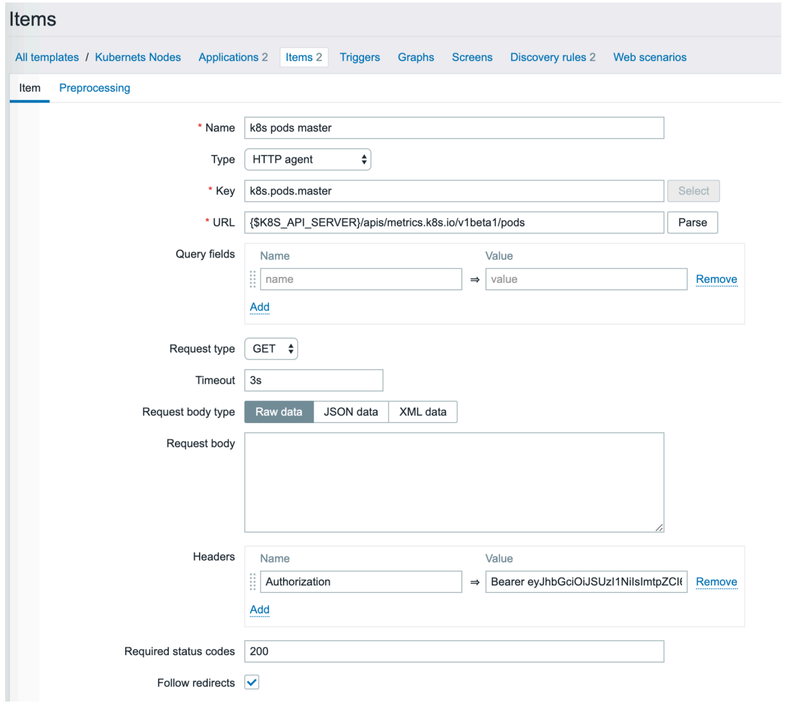
实现


自动发现
Zabbix
HTTP Agent
发现规则
预处理
LLD宏
指标
指标原型
预处理
触发器原型
图形原型
创建指标
删除指标
创建触发器
删除触发器
创建图形
删除图形
手动
自动

指标生命周期

MASTER ITEM



模版宏	**{$K8S_API_SERVER}**
历史记录保存期	**不保留**
Headers	**Token**

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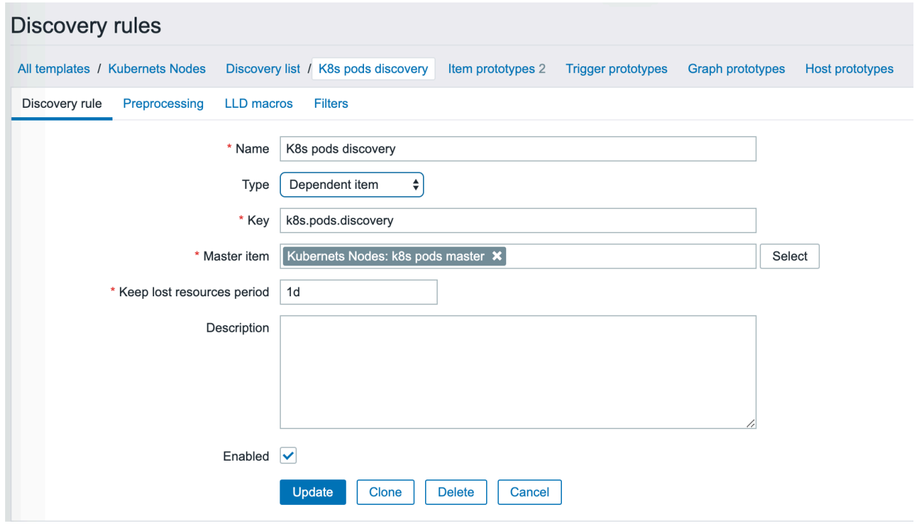
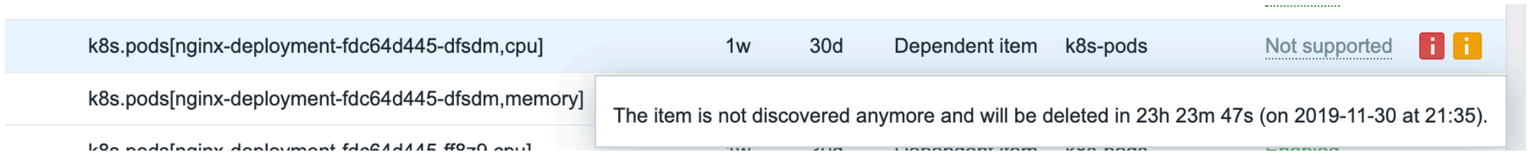
LLD



指标类型 **Dependent Item**

历史记录保存期



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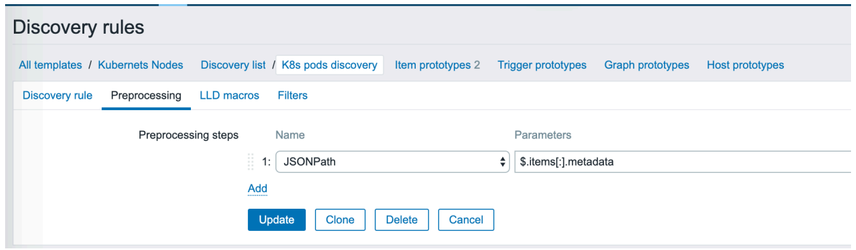
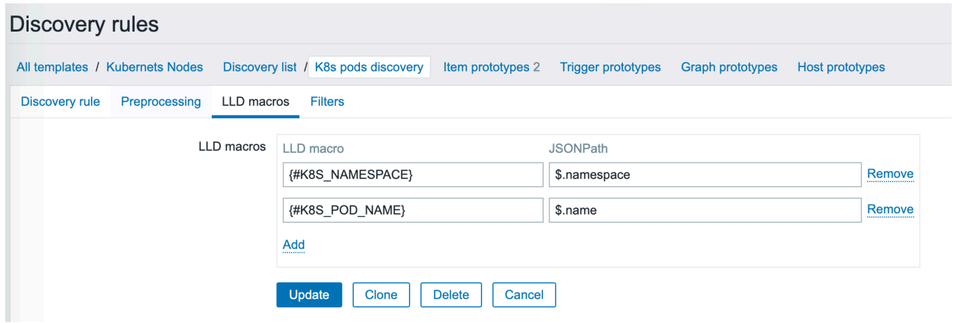
PREPROCESSING






```
{
  "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/ku
        "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/me
        "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}

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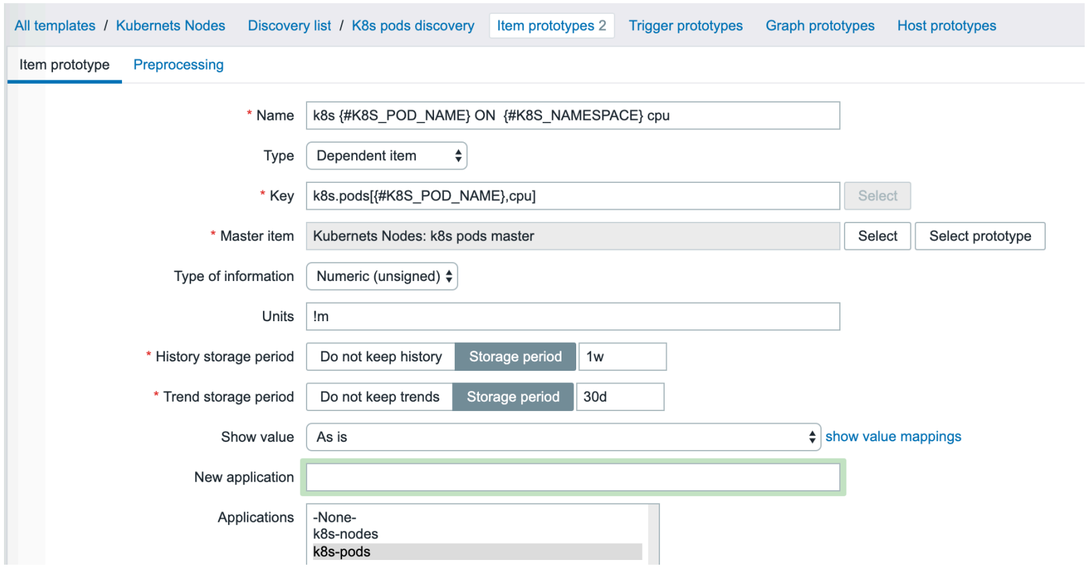
ITEM PROTOTYPES



类型 **Dependent item**

单位 **!m**

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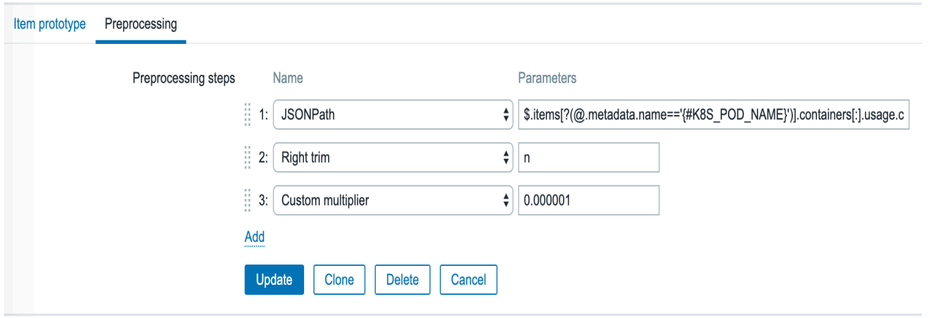
JSON PATH

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()




```
{
  "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"
          }
        }
      ]
    },
```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DONE

Zabbix监控主机	**k8s-pods** (27 Items)								
	k8s pods master k8s.pods.master	1m	0		HTTP agent				
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	k8s kube-apiserver-k8s-master ON kube-system …		1w	30d	Dependent item	2019-11-06 12:40:16	33 m	-3 m	Graph

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PLAN

- K8s Event
- Appliaction Moniting

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Q&A

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THANK YOU!

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