

演讲主题：

Zabbix高级应用

--K8s集群监控



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ZABBIX 2019
Conference

- CactiFans
- Zabbix
- Microservice
- K8s
- Golang



老张监控技术

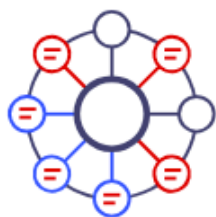
微信扫描二维码，关注我的公众号

<https://blog.cactifans.com/>

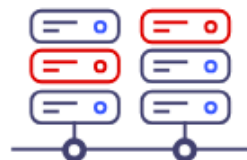
无边界监控

Monitor anything

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



Network
monitoring



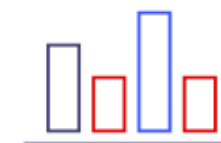
Server
monitoring



Cloud
monitoring

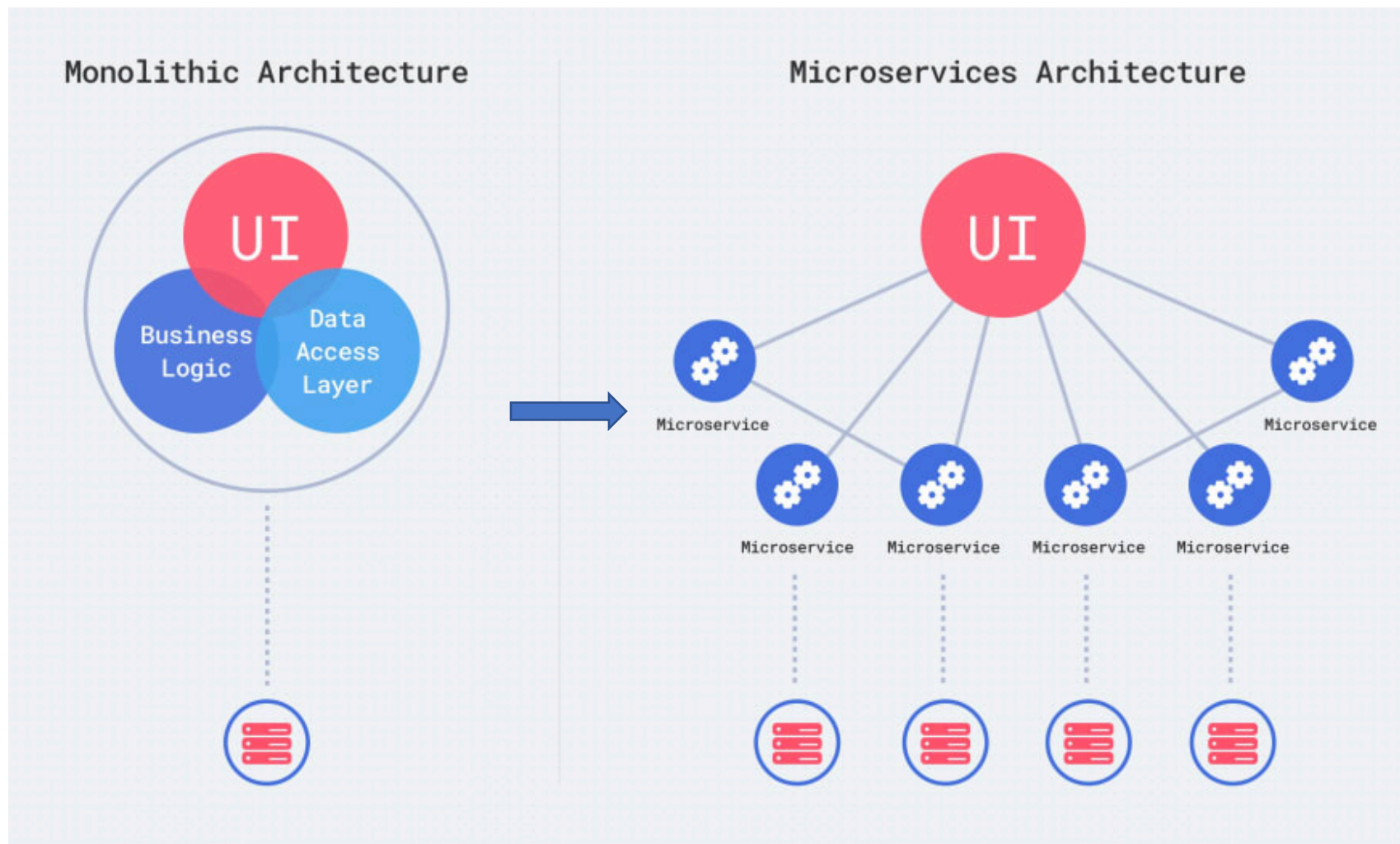


Services
monitoring

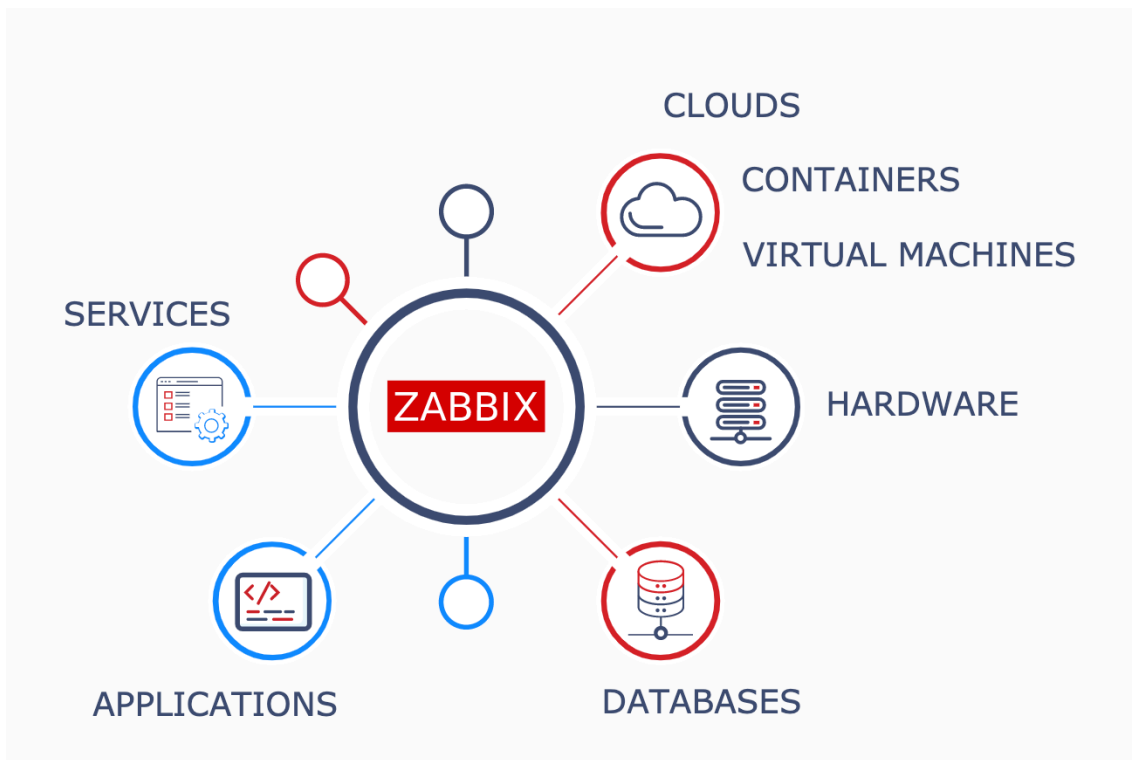


KPI / SLA
monitoring

应用架构发展趋势



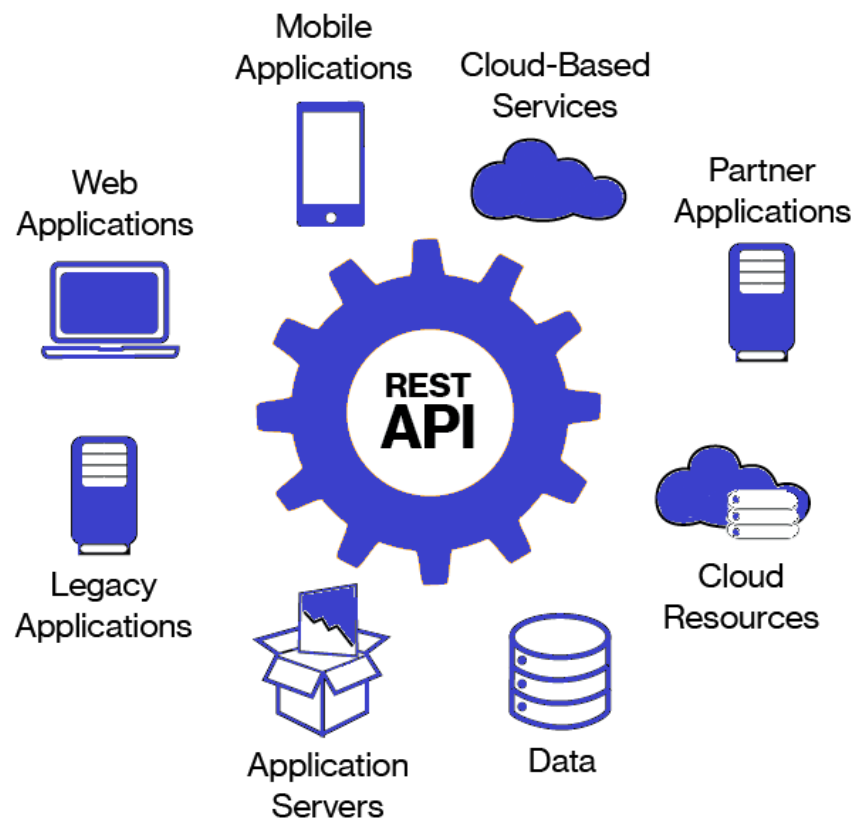
数据采集



The screenshot shows the ZABBIX Preprocessing configuration page. A dropdown menu is open, listing various agent types and check types. The page includes the following fields and options:

- Name: [Text input]
- Type: Zabbix agent, Zabbix agent (active), Simple check
- Key: [Text input]
- Host interface: [Text input]
- Type of information: [Text input]
- Units: [Text input]
- Update interval: [Text input]
- Custom intervals: [Text input]
- History storage period: [Text input] Storage period: 90d
- Trend storage period: Do not keep trends Storage period: 365d
- Show value: [Text input] As is
- New application: [Text input]

RESTful 接口



```
GET https://.../api
```

KEY	VALUE	DESCRIPTION
Key	Value	Description

```
Body Cookies Headers (5) Test Results Status
```

```
Pretty Raw Preview Visualize BETA JSON
```

```
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": "coredns-5644d7b6d9-rv295",
11        "namespace": "kube-system",
12        "selfLink": "/apis/metrics.k8s.io/v1beta1/namespaces/kube-system/pods/coredns-5644d7b6d9-rv295",
13        "creationTimestamp": "2019-11-06T02:40:21Z"
14      },
15      "timestamp": "2019-11-06T02:40:04Z",
16      "window": "30s",
17      "containers": [
18        {
19          "name": "coredns",
20          "usage": {
21            "cpu": "2274200n",
22            "memory": "11016Ki"
23          }
24        }
25      ]
26    },
27    {
28      "metadata": {
29        "name": "calico-node-2x4kk",
30        "namespace": "kube-system",
```

LLD – 低级别发现

低级发现提供了一种监控主机上变化实体，并自动创建监控指标，触发器和图形的方法。

例如

- 磁盘
- 网卡
- 端口
-

The screenshot displays the Zabbix web interface for configuring a discovery rule. The breadcrumb trail is: Monitoring > Inventory > Reports > Configuration > Administration > Hosts > Maintenance > Actions > Event correlation > Discovery > Services > Discovery rules. The current page is 'Discovery rules', and the specific rule being edited is 'Mounted filesystem discovery' under the 'Template OS Linux' template.

The configuration form includes the following fields and options:

- Name:** Mounted filesystem discovery
- Type:** Zabbix agent
- Key:** vfs.fs.discovery
- Update interval:** 1h
- Custom intervals:** A table with columns for Type, Interval, Period, and Action. The current entry is 'Flexible' with an interval of '50s' and a period of '1-7,00:00-24:00'. There are 'Add' and 'Remove' buttons for this entry.
- Keep lost resources period:** 30d
- Description:** Discovery of file systems of different types as defined in global regular expression "File systems for discovery".
- Enabled:**

At the bottom of the form are buttons for 'Update', 'Clone', 'Delete', and 'Cancel'.

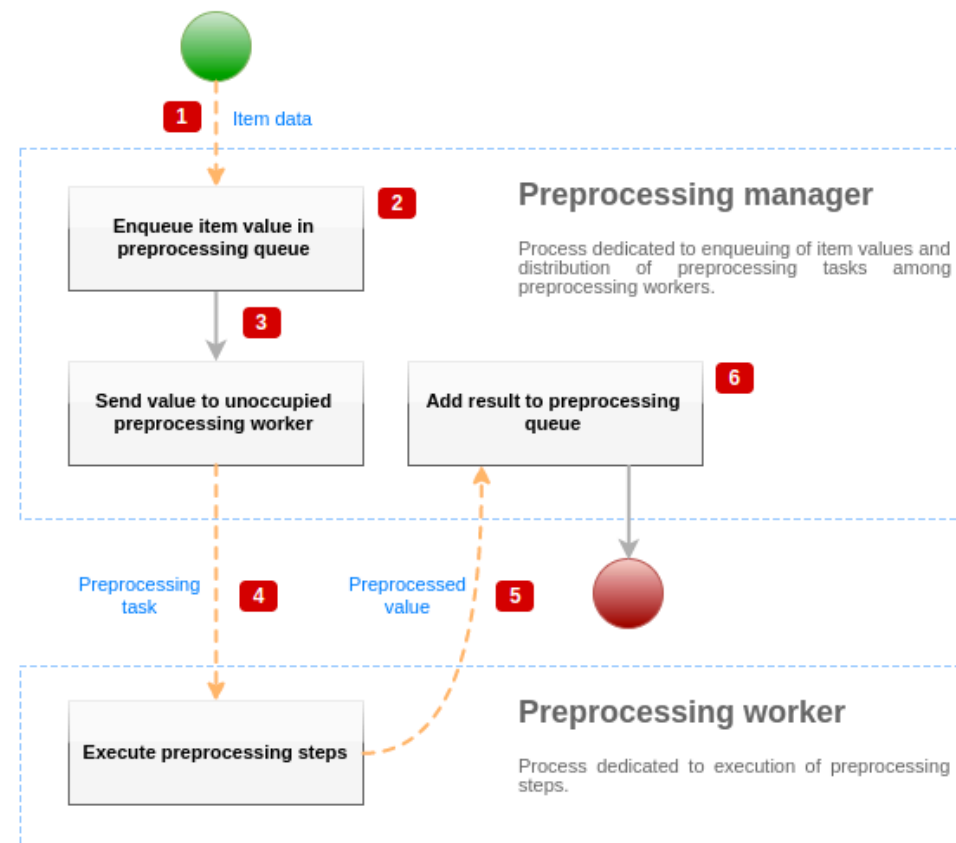
预处理

对采集器采集的原始数据通过管道进行处理，最终达到数据展现和存储的要求。

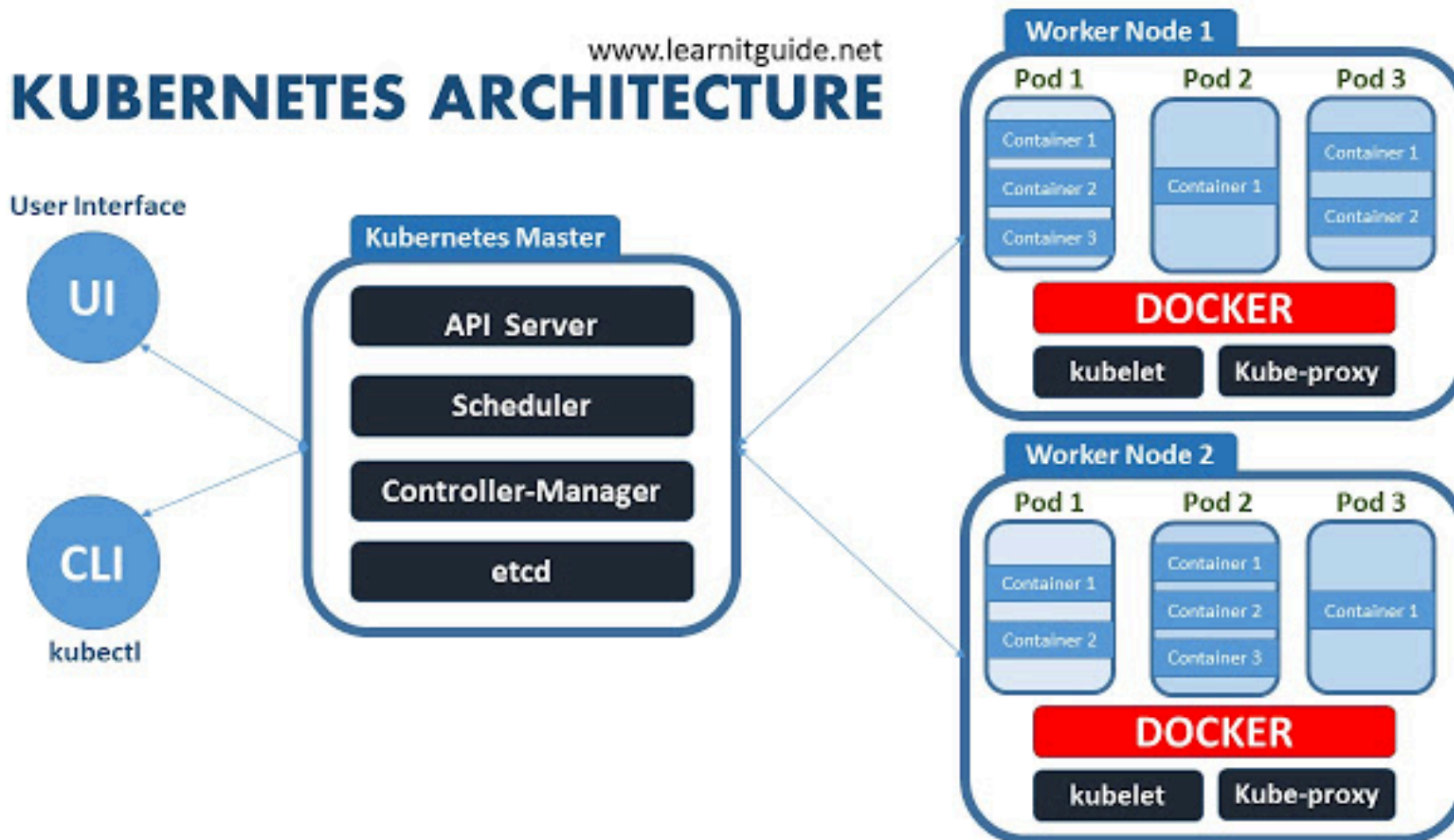
例如

SNMP采集交换机内存 15MB

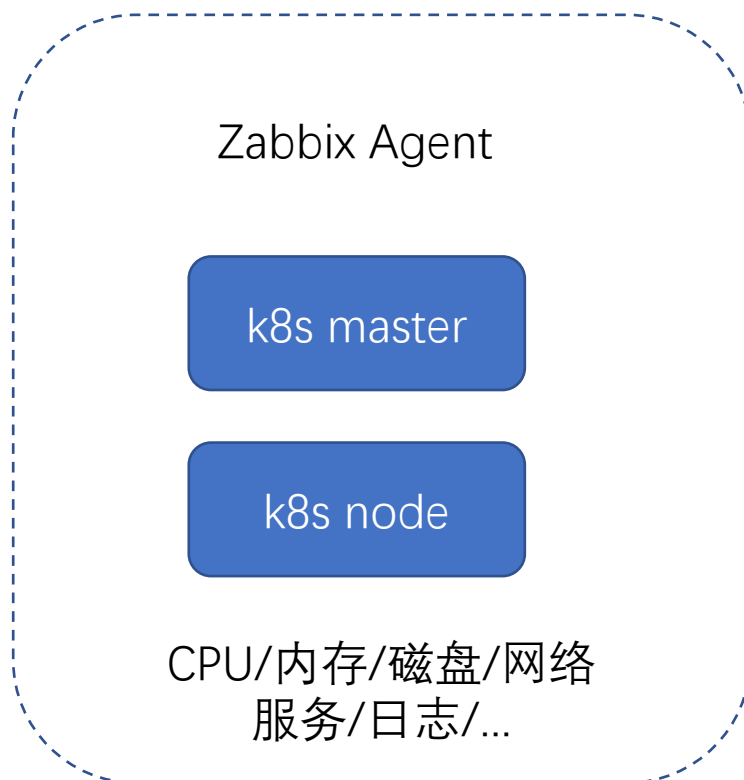
string? 图形? 触发器?



Kubernetes 架构



Kubernetes 监控



Kubernetes Metrics Server 安装

<https://github.com/kubernetes-sigs/metrics-server>

- ①

```
# Kubernetes 1.7
$ kubectl create -f deploy/1.7/
# Kubernetes > 1.8
$ kubectl create -f deploy/1.8+/
```
- ②

```
#edit metric-server deployment to add the flags
# args:
# - --kubelet-insecure-tls
# - --kubelet-preferred-address-types=InternalIP,ExternalIP,Hostname
$ kubectl edit deploy -n kube-system metrics-server
```
- ③ Token

Kubernetes Metrics Server API

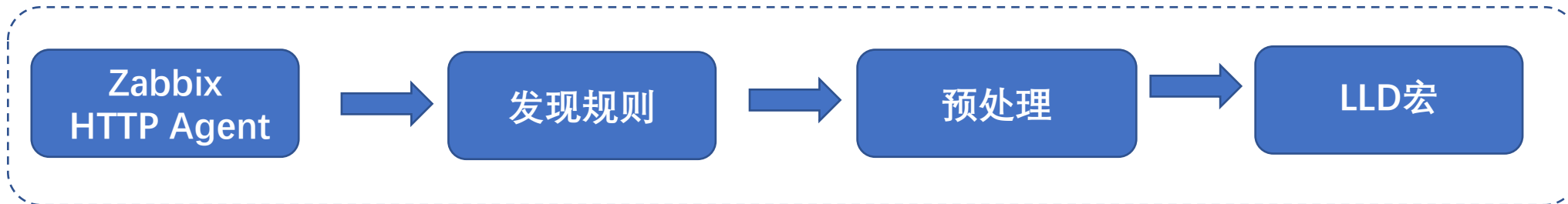
Nodes https://K8S_API_SERVER:6443/apis/metrics.k8s.io/v1beta1/nodes

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

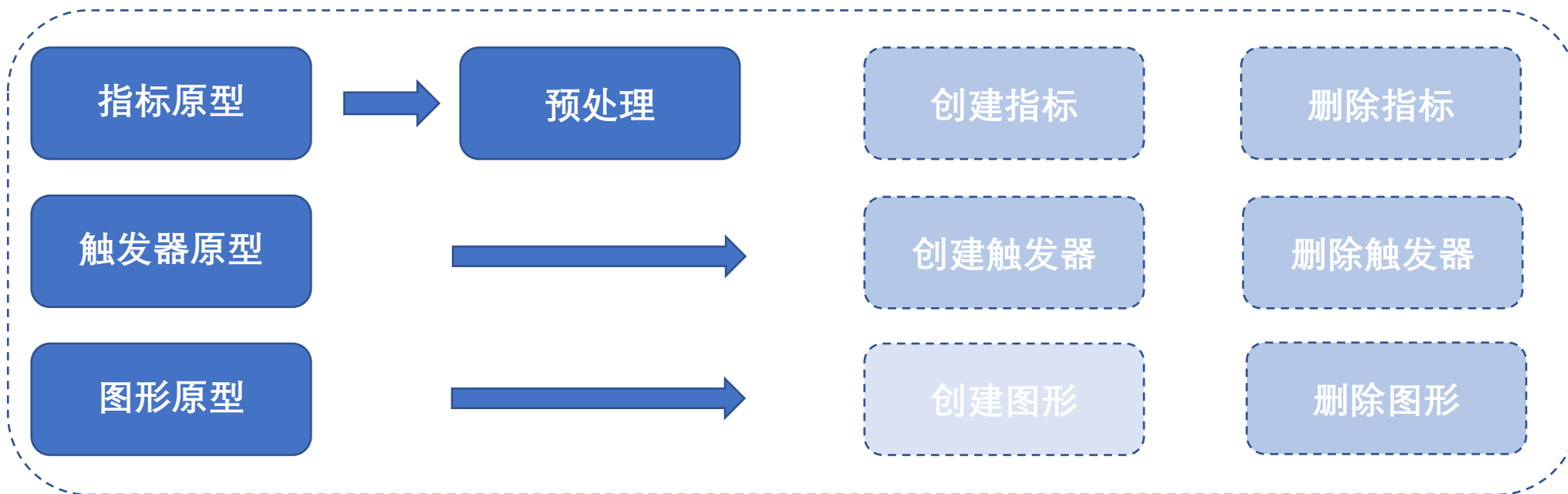
```
1  {
2  |   "kind": "PodMetricsList",
3  |   "apiVersion": "metrics.k8s.io/v1beta1",
4  |   "metadata": {
5  |     |   "selfLink": "/apis/metrics.k8s.io/v1beta1/pods"
6  |     |   },
7  |   "items": [
8  |     |   {
9  |     |     |   "metadata": {
10 |     |     |     |   "name": "kube-proxy-rdj8q",
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

自动发现



指标



指标生命周期

主监控指标

Items

All templates / Kubernetes Nodes Applications 2 Items 2 Triggers Graphs Screens Discovery rules 2 Web scenarios

Item Preprocessing

* Name

Type

* Key

* URL

Query fields

Name	Value
<input type="text" value="name"/>	<input type="text" value="value"/>

[Add](#) [Remove](#)

Request type

Timeout

Request body type Raw data JSON data XML data

Request body

Headers

Name	Value
<input type="text" value="Authorization"/>	<input type="text" value="Bearer eyJhbGciOiJIUzI1NiIsImtpZCI6I"/>

[Add](#) [Remove](#)

Required status codes

Follow redirects

模版宏

{K8S_API_SERVER}

历史记录保存期

不保留

Headers

Token

发现规则

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:

Type:

* Key:

* Master item:

* Keep lost resources period:

Description:

Enabled:

指标类型

Dependent Item

历史记录保存期

1d

k8s.pods[nginx-deployment-fdc64d445-dfsdm,cpu]	1w	30d	Dependent item	k8s-pods	Not supported		
The item is not discovered anymore and will be deleted in 23h 23m 47s (on 2019-11-30 at 21:35).							
k8s.pods[nginx-deployment-fdc64d445-dfsdm,memory]							
k8s.pods[nginx-deployment-fdc64d445-dfsdm]							

预处理-LLD宏

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

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

Update Clone Delete Cancel

```

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

指标原型

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

Item prototype Preprocessing

* Name

Type

* Key

* Master item

Type of information

Units

* History storage period

* Trend storage period

Show value [show value mappings](#)

New application

Applications

类型

Dependent item

单位

!m

JSONPath 处理函数

<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": "19088Ki"
          }
        }
      ]
    }
  ]
},
```

指标预处理测试

All templates / Kubernetes Nodes / Discovery list / K8s pods discovery / **Item prototypes 2** / Trigger prototypes / Graph prototypes / Host prototypes 1

Item prototype Preprocessing

Preprocessing steps	Name	Parameters	Custom on fail	Actions
1:	JSONPath	\$.items[?(@.metadata.name=='{#K8S_POD_NAME}')].containers[:].usage.c	<input type="checkbox"/>	Test Remove
2:	Right trim			
3:	Custom multiplier			

[Add](#) [Update](#) [Clone](#)

Test item preprocessing

Value: { Time: now

Previous value: Prev. time:

End of line sequence:

Macros: {#K8S_POD_NAME} ⇒ kube-apiserver-k8s-master

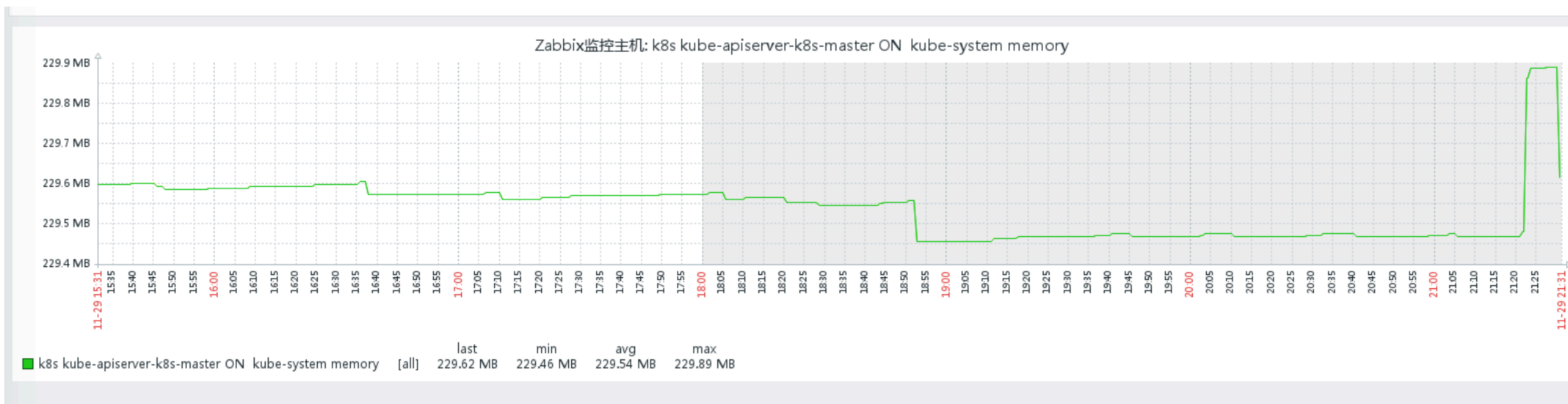
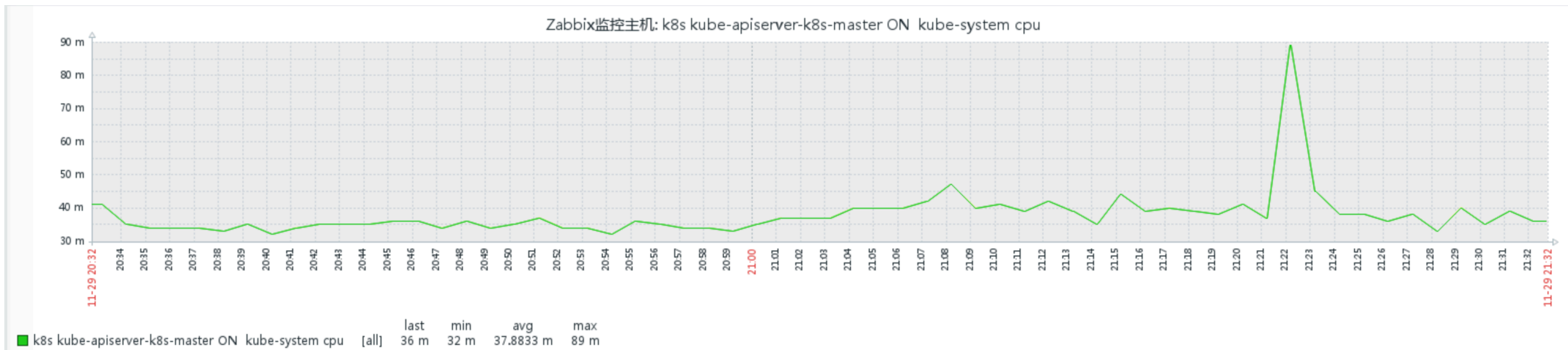
Preprocessing steps	Name	Result
1:	JSONPath	44212119n
2:	Right trim	44212119
3:	Custom multiplier	44

Result: Result converted to Numeric (unsigned) 44

[Test](#) [Cancel](#)

最终效果

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-849fb4 added4-f416n ON kube-sy... k8s.pods[metrics-server-849fb4 added4-f416n,memory]	1w	30d	Dependent item	2019-11-06 12:40:16	16.56 MB		Graph
<input type="checkbox"/>	k8s metrics-server-849fb4 added4-f416n ON kube-sy... k8s.pods[metrics-server-849fb4 added4-f416n,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-4z1zd ON kube-system memory k8s.pods[kube-proxy-4z1zd,memory]	1w	30d	Dependent item	2019-11-06 12:40:16	18.75 MB	-40.16 KB	Graph
<input type="checkbox"/>	k8s kube-proxy-4z1zd ON kube-system cpu k8s.pods[kube-proxy-4z1zd,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



总结

- 规划&标准
- 造轮子&生命周期

加入组织

扫码入群



关注公众号



关注微博



联系我们



021-6978-6188



china@zabbix.com



www.zabbix.com/cn
www.grandage.cn



Zabbix开源社区



Thank You!

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