



链滴

Kubernetes 监控集群资源利用率 (Metrics-server+cAdvisor)

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来源网站: [链滴](#)

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了解Metrics之前先了解kubectl自带的一个top命令，它是显示资源利用率的，包括cpu，内存和存

```
Cluster Management Commands:
certificate  修改 certificate 资源.
cluster-info 显示集群信息
top         Display Resource (CPU/Memory/Storage) usage.
cordon     标记 node 为 unschedulable
uncordon   标记 node 为 schedulable
drain     Drain node in preparation for maintenance
taint     更新一个或者多个 node 上的 taints
```

通过kubectl top --help了解到top命令有两个子命令，支持pod和node这两个维度去查看。

```
[root@k8s-master ~]# kubectl top --help
Display Resource (CPU/Memory/Storage) usage.

The top command allows you to see the resource consumption for nodes or pods.

This command requires Metrics Server to be correctly configured and working on the server.

Available Commands:
node      Display Resource (CPU/Memory/Storage) usage of nodes
pod       Display Resource (CPU/Memory/Storage) usage of pods

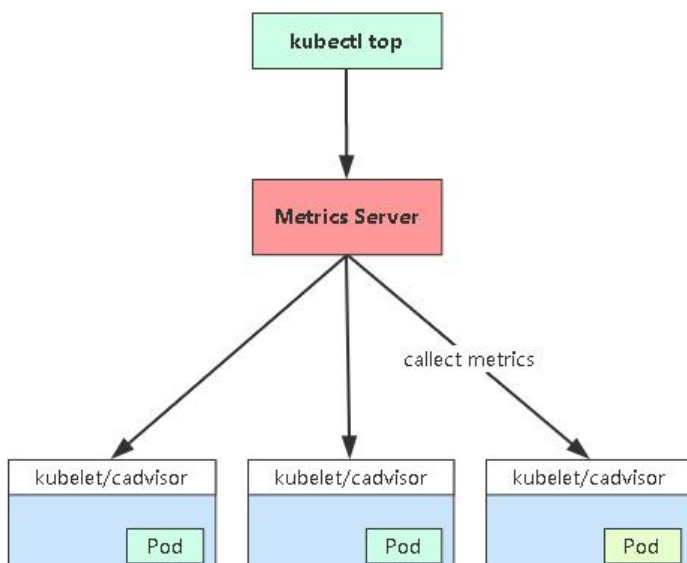
Usage:
kubectl top [flags] [options]

Use "kubectl <command> --help" for more information about a given command.
Use "kubectl options" for a list of global command-line options (applies to all commands).
```

当我们使用kubectl top node和kubectl top pod命令时报错：

```
[root@k8s-master ~]# kubectl top node
Error from server (NotFound): the server could not find the requested resource (get services http:heapster:)
[root@k8s-master ~]# kubectl top pod
Error from server (NotFound): the server could not find the requested resource (get services http:heapster:)
```

其实这个原因是top命令是需要调用一个资源的，该资源恰好提供了cpu或者内存的信息，而提供这资源的就是报错信息中所提到的heapster，这个heapster是一个k8s早期的监控组件，为top提供数据来源，之后这个组件被完全弃用，官方社区研发了一个新的组件来替换它，替代者就是Metrics-server 它的功能就是一个聚合器，Metrics-server并不直接采集cpu等监控数据，它是从cadvisor组件中去合响应的监控数据，cadvisor已经内置到k8s agent中了，所以我们只需要安装Metrics-server即可



部署方式

```
# 下载所需文件
git clone https://github.com/kubernetes-incubator/metrics-server
cd metrics-server/deploy/kubernetes
# 编辑替换源地址并添加参数
vi metrics-server-deployment.yaml

# 修改镜像地址并添加最后两行参数
...
  containers:
  - name: metrics-server
    image: lizhenliang/metrics-server-amd64:v0.3.1
    imagePullPolicy: IfNotPresent
    args:
      - --cert-dir=/tmp
      - --secure-port=4443
      - --kubelet-insecure-tls
      - --kubelet-preferred-address-types=InternalIP
  ...

# 应用所有 yaml文件
kubectl apply -f .
# 查看metrics-server状态
kubectl get pod -n kube-system
# 查看metrics-server是否注册到apiservice中
kubectl get apiservice
```

添加参数说明：

- `--kubelet-insecure-tls`：让metrics-server以非https安全方式连接kubectl
- `--kubelet-preferred-address-types`：让metrics-server不用主机名而使用节点实际的IP地址连接kubelet

若网络访问慢，也可直接下载本站压缩包，[点击下载](#)

```
wget https://leif.fun/downloads/kubernetes/metrics-server.zip
unzip metrics-server.zip
cd metrics-server
kubectl apply -f .
```

文件功能介绍：

- `metrics-server-deployment.yaml`：部署metrics服务
- `metrics-server-service.yaml`：暴露metrics服务
- `metrics-apiservice.yaml`：把metrics服务注册到k8s的api中
- 其他文件：授权访问

接下来就可以正常使用top命令查看资源状态了

```

[root@k8s-master metrics-server]# kubectl top node
NAME          CPU(cores)   CPU%   MEMORY(bytes)  MEMORY%
k8s-master   172m         8%     1036Mi         60%
k8s-node1    121m         6%     411Mi          23%
k8s-node2    100m         5%     412Mi          23%
[root@k8s-master metrics-server]# kubectl top pod -A
NAMESPACE     NAME                                               CPU(cores)   MEMORY(bytes)
kube-system   calico-kube-controllers-76d4774d89-pcdrn         1m           14Mi
kube-system   calico-node-472bs                                 28m          73Mi
kube-system   calico-node-54jjl                                 29m          61Mi
kube-system   calico-node-hpv7x                                 27m          61Mi
kube-system   coredns-7ff77c879f-cgfjw                         4m           12Mi
kube-system   coredns-7ff77c879f-pn8qk                         3m           12Mi
kube-system   etcd-k8s-master                                  21m          87Mi
kube-system   kube-apiserver-k8s-master                         44m         348Mi
kube-system   kube-controller-manager-k8s-master               15m          79Mi
kube-system   kube-proxy-grnpw                                  1m           30Mi
kube-system   kube-proxy-mshjk                                  1m           17Mi
kube-system   kube-proxy-nkkk4                                   1m           16Mi
kube-system   kube-scheduler-k8s-master                         5m           28Mi
kube-system   metrics-server-5667498b7d-7gjbm                  1m           13Mi
kubernetes-dashboard dashboard-metrics-scraper-694557449d-dvqpp         1m           11Mi
kubernetes-dashboard kubernetes-dashboard-5d8766c7cc-6q7rp            1m           15Mi

```

注意: 1000m=1c

总结

监控流程: `kubectl top -> apiserver -> metrics-server pod -> kubectl(cadvisor)`