

基于PXE的物理机 Kubernetes集群管理方案

关于作者

- 工程师, 熟悉Python以及Go语言
- Docker早期用户, 容器架构实践者, 开源爱好者
- 曾在多次技术活动中分享容器相关经验
- 开源软件资讯站 Porter.io 作者
- 目前在经营 KubeUp.com , 致力于协助客户公司以 Kubernetes为基础结合众多开源组件进行底层架构, 打造基于容器技术的高效开发运维流程, 同时为企业使用 Kubernetes过程遇到的问题提供技术支持和服务



twitter: [@adieu](https://twitter.com/adieu)

您平常如何创建Kubernetes集群？

手动创建



自动创建



手动创建物理机集群

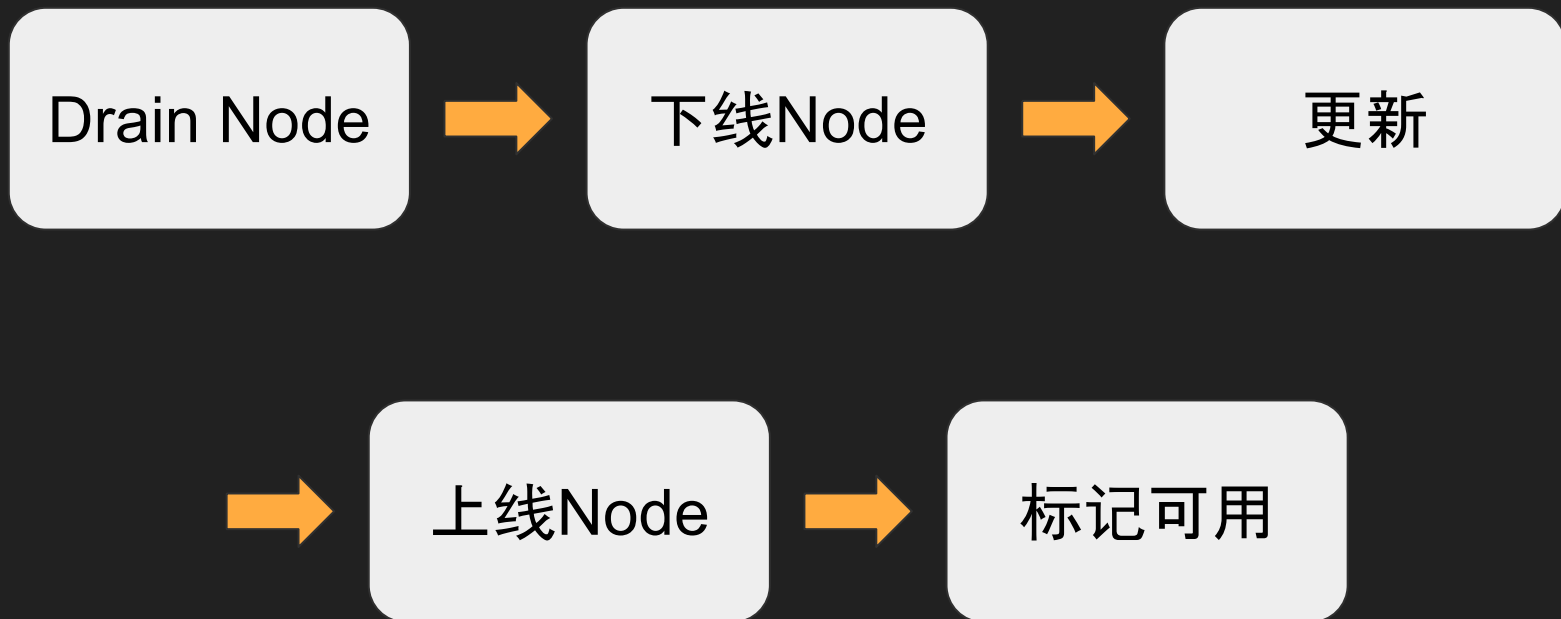


自动创建物理机集群

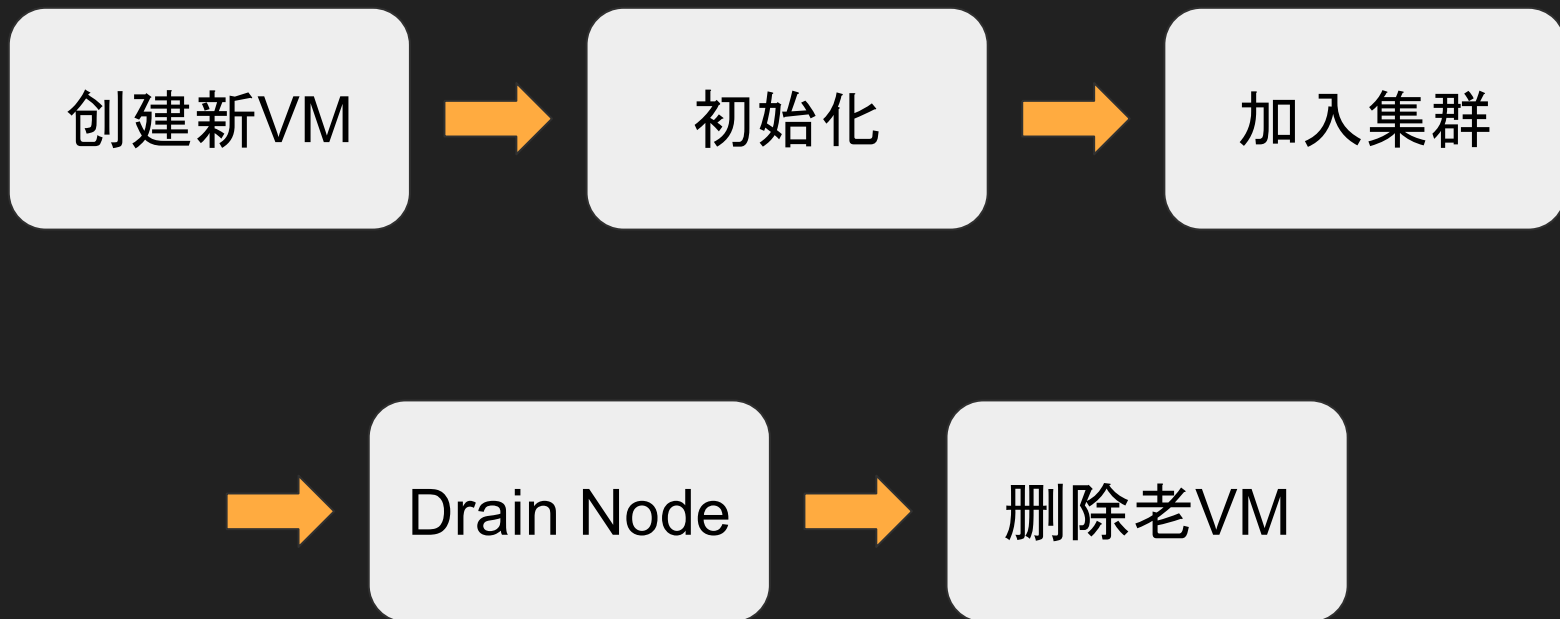


您平常如何升级Kubernetes集群？

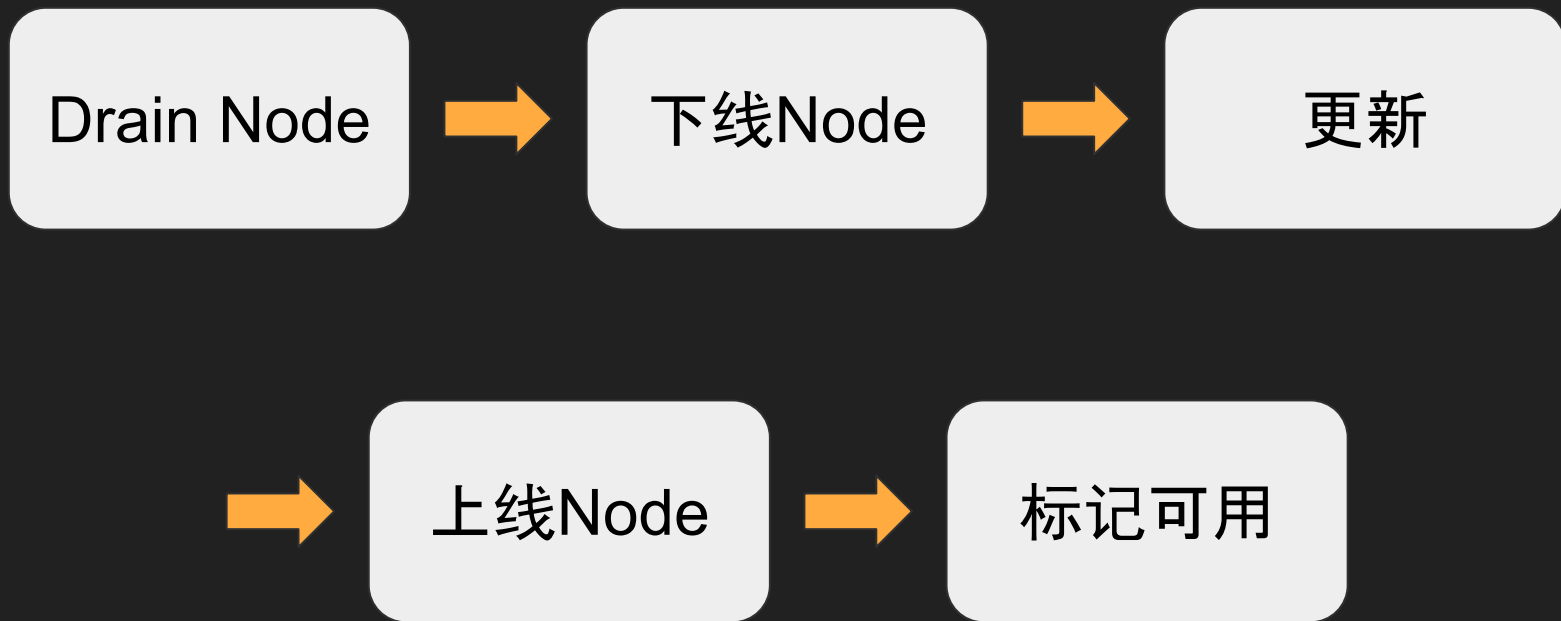
手动升级



手动升级



手动升级物理机集群



自动升级物理机集群



如何自动化运维物理机集群？

OpenStack



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From Boston to your browser, stream OpenStack Summit sessions

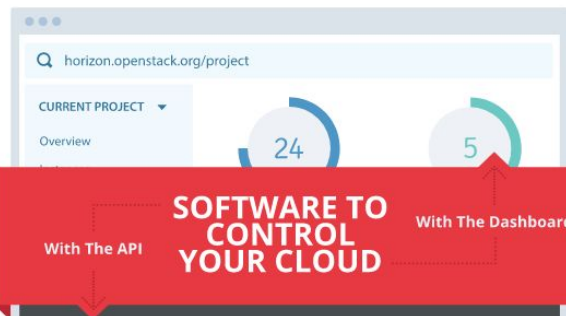
Browse through use cases, demos and announcements from the OpenStack Summit Boston this week.

[Watch now >](#)

Open source software for creating private and public clouds.

OpenStack software controls large pools of compute, storage, and networking resources throughout a datacenter, managed through a [dashboard](#) or via the [OpenStack API](#). OpenStack works with [popular enterprise and open source technologies](#) making it ideal for heterogeneous infrastructure.

[Hundreds of the world's largest brands](#) rely on OpenStack to run their businesses every day, reducing costs and helping them move faster.



将OpenStack运行在Kubernetes之上

openstack / openstack-helm

Watch 20 Unstar 33 Fork 17

Code Pull requests 0 Projects 0 Insights

Helm charts for deploying OpenStack on Kubernetes <http://openstack.org>

798 commits 1 branch 1 release 34 contributors

Branch: master New pull request Create new file

Jenkins committed with openstack-gerrit Merge "Fix ceph instructions in multinode guide."

- barbican Refactor start scripts, to support graceful termination
- bootstrap Remove executable flag from Chart.yaml
- ceph Remove executable flag from Chart.yaml
- cinder Merge "Refactor start scripts, to support graceful termination"
- doc/source Fix ceph instructions in multinode guide.
- etcd Update deployment for kubernetes 1.6
- glance Helm Test: Glance
- heat Refactor start scripts, to support graceful termination
- helm-toolkit Helm Test: Framework & Keystone
- horizon Refactor start scripts, to support graceful termination
- ingress Update deployment for kubernetes 1.6

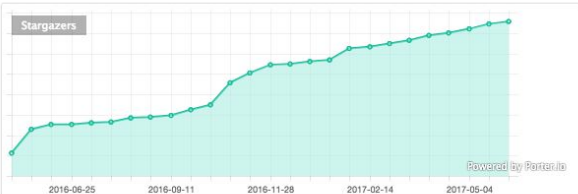
stackanetes / stackanetes

Watch 30 Star 185 Fork 42

Code Issues 4 Pull requests 7 Projects 0 Insights

Deploy and manage OpenStack on Kubernetes

556 commits 6 branches 3 releases 14 contributors Apache-2.0



News 1

OpenStack on Kubernetes Oct 26 2016

Branch: master New pull request Create new file Upload files Find file Clone or download

PiotrProkop committed on GitHub Merge pull request #153 from Quentin-M/mem_usage Latest commit 6ecb457 on Mar 14

- cinder Rename deployment.replicas by deployment.control_replicas 6 months ago
- elasticsearch Remove privileged=true and uid=0 on most services. 8 months ago
- etcd Changing label from rabbit to stackanetes 8 months ago
- glance Enforce 'replicas: 1' on glance-api when local storage is used 5 months ago

PXE拯救世界



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The Free Encyclopedia

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Preboot Execution Environment

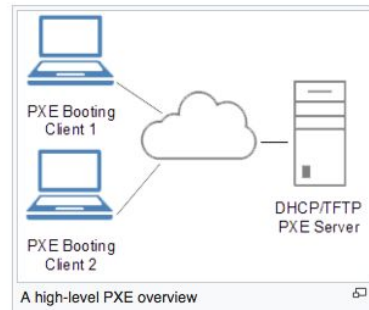
From Wikipedia, the free encyclopedia

In [computing](#), the **Preboot eXecution Environment** (**PXE**, sometimes pronounced as *pixie*^[1]) specification describes a standardized [client-server](#) environment that [boots](#) a software assembly, retrieved from a network, on PXE-enabled clients. On the client side it requires only a PXE-capable [network interface controller](#) (NIC), and uses a small set of industry-standard network protocols such as [DHCP](#) and [TFTP](#).

The concept behind the PXE originated in the early days of protocols like [BOOTP](#)/[DHCP](#)/[TFTP](#), and as of 2015 it forms part of the [Unified Extensible Firmware Interface](#) (UEFI) standard. In modern data centers, PXE is the most frequent choice^[2] for [operating system](#) booting, installation and deployment.

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Overview [edit]

Since the beginning of computer networks, there has been a persistent need for [client](#) systems which can boot appropriate software images, with appropriate configuration parameters, both

Matchbox

 This repository
Pull requests
Issues
Marketplace
Gist

[coresos / matchbox](#)


Watch 59
Star 358
Fork 111

Code
Issues 39
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Insights

Network boot and provision Container Linux clusters (e.g. etcd3, self-hosted Kubernetes, and more)

811 commits
6 branches
9 releases
32 contributors
Apache-2.0

Branch: master

 dghubble committed on GitHub Merge pull request #564 from coresos/remove-cmdline ...			Latest commit 50a3d11 13 hours ago
Documentation	Doc/deployment.md: Cp local config to correct location	5 days ago	
cmd	cmd/matchbox: fix -address parsing when built with Go 1.8	3 months ago	
contrib	*: Update docs references to v0.6.1	13 days ago	
examples	examples/terraform: Configure whether to install CL from cache	7 days ago	
matchbox	matchbox: Remove Profile cmdline map field	2 days ago	
scripts	CHANGES.md: Prepare for a v0.6.1 docs point release	13 days ago	
tests/smoke	examples/terraform: Configure whether to install CL from cache	7 days ago	
vendor	glide.yaml: Update and vendor the crypto openpgp package	13 days ago	
.dockerignore	Update dockerignore to slim the build context	5 months ago	
.gitignore	contrib/rpm: Fixing the source URL format	28 days ago	

CoreOS

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container linux

A container-focused OS that's designed for painless management in large clusters

[Overview](#)[Documentation](#)[Release Notes](#)

CoreOS Container Linux 1437.0.0 Documentation

[1437.0.0 \(latest\)](#) ▾


These docs should cover the entire lifecycle of your Container Linux machines. Anyone can submit changes to [these docs via GitHub](#). For more in-depth support, jumping into [#coreos on IRC](#), [emailing the dev list](#) or [filing a bug](#) are recommended.






Running Container Linux

Container Linux runs on most cloud providers, virtualization platforms and bare metal servers. Running a local VM on your laptop is a great dev environment. Following the [Quick Start guide](#) is the fastest way to get set up.

Archon

 This repository

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Cluster operation the Kubernetes way [Edit](#)

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[go](#)
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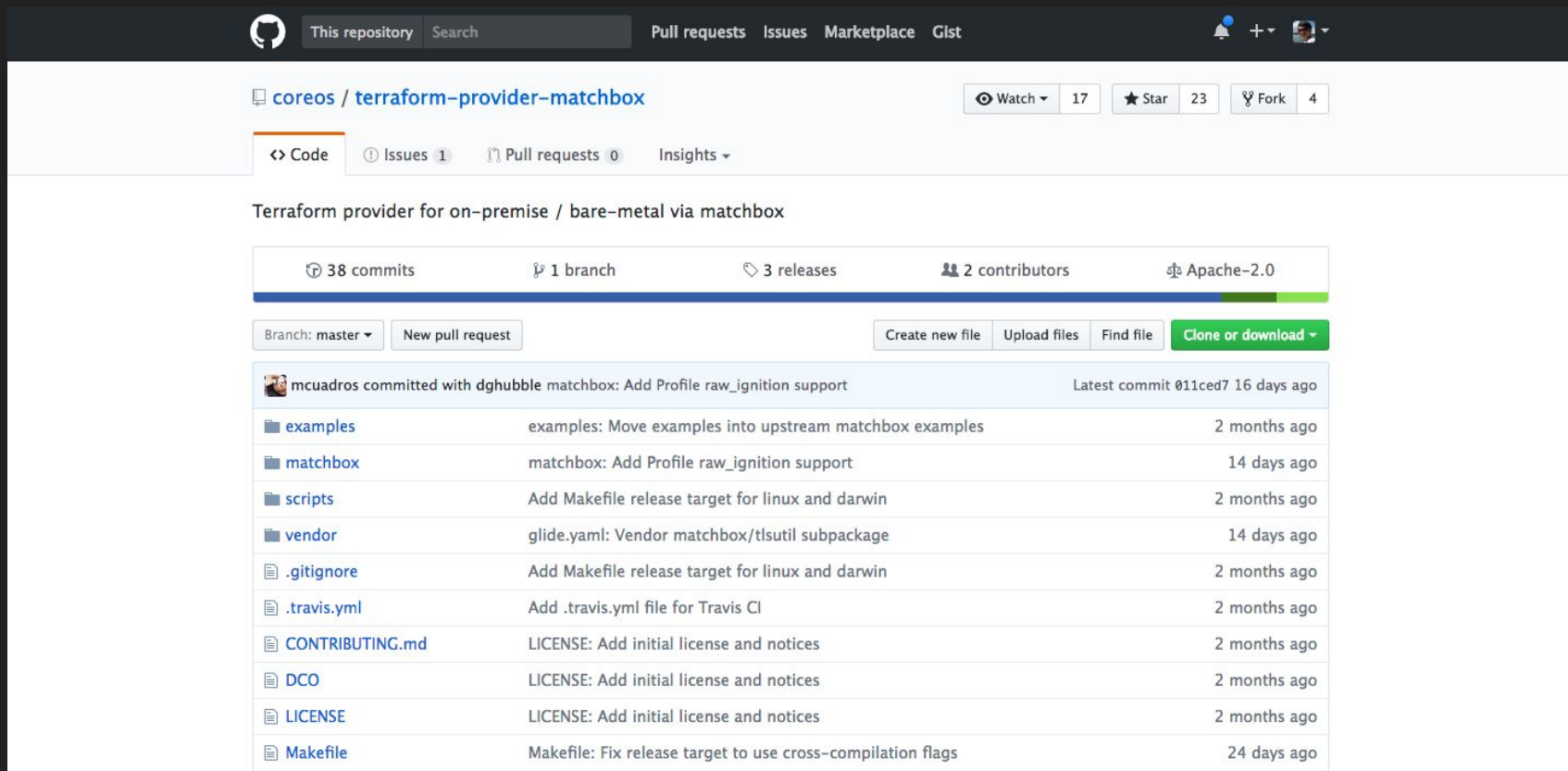
111 commits
2 branches
6 releases
2 contributors
Apache-2.0

Branch: [master](#) [New pull request](#)

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Commit	Message	Time
 ledzep2	committed with adieu fix #7	Latest commit 2838f51 20 days ago
cmd/archon-controller	use k8s 1.6	3 months ago
docs	Add aliyun example.	4 months ago
example	aliyun centos example and code	25 days ago
pkg	fix #7	15 days ago
vendor	aliyun centos example and code	25 days ago
.gitignore	initial commit	6 months ago
Dockerfile	update docker base image. add --test-run option	3 months ago
LICENSE	minor fixes of docs	5 months ago
Makefile	update docker base image. add --test-run option	3 months ago

terraform-provider-matchbox



This screenshot shows the GitHub repository page for `terraform-provider-matchbox`. The repository is owned by `coreos`. The page displays the repository name, navigation links for Pull requests, Issues, Marketplace, and Gist, and user interaction buttons for Watch (17), Star (23), and Fork (4). The repository description is "Terraform provider for on-premise / bare-metal via matchbox". It shows 38 commits, 1 branch, 3 releases, 2 contributors, and an Apache-2.0 license. A list of recent commits is shown, including updates to examples, matchbox, scripts, vendor, .gitignore, .travis.yml, CONTRIBUTING.md, DCO, LICENSE, and Makefile.

coreos / terraform-provider-matchbox

Watch 17 Star 23 Fork 4

Code Issues 1 Pull requests 0 Insights

Terraform provider for on-premise / bare-metal via matchbox

38 commits 1 branch 3 releases 2 contributors Apache-2.0

Branch: master New pull request Create new file Upload files Find file Clone or download

mcuadros committed with dghubble matchbox: Add Profile raw_ignition support Latest commit 011ced7 16 days ago

examples	examples: Move examples into upstream matchbox examples	2 months ago
matchbox	matchbox: Add Profile raw_ignition support	14 days ago
scripts	Add Makefile release target for linux and darwin	2 months ago
vendor	glide.yaml: Vendor matchbox/tlsutil subpackage	14 days ago
.gitignore	Add Makefile release target for linux and darwin	2 months ago
.travis.yml	Add .travis.yml file for Travis CI	2 months ago
CONTRIBUTING.md	LICENSE: Add initial license and notices	2 months ago
DCO	LICENSE: Add initial license and notices	2 months ago
LICENSE	LICENSE: Add initial license and notices	2 months ago
Makefile	Makefile: Fix release target to use cross-compilation flags	24 days ago

Sextant

GitHub repository interface for `k8sp / sextant`.

Navigation: Pull requests, Issues, Marketplace, Gist

Repository stats: Watch 28, Star 61, Fork 25

Navigation: Code, Issues (33), Pull requests (1), Projects (1), Wiki, Insights

Repository description: Fully automatic installation of CoreOS+Kubernetes clusters

Repository stats: 985 commits, 8 branches, 3 releases, 14 contributors, Apache-2.0 license

Branch: develop

Actions: New pull request, Create new file, Upload files, Find file, Clone or download

Commit	Message	Time
typhoonzero	Merge pull request #536 from k8sp/fix_image_name	Latest commit 239ff7a on May 3
doc	Add Install CentOS design	7 months ago
docker	fix 519	3 months ago
golang	fix download kernel logits.	2 months ago
install-ceph	Merge branch 'test_cc_centos' of https://github.com/k8sp/sextant into...	6 months ago
logo	add logo	7 months ago
scripts	fix image save name and README	a month ago
testdata	Add testdata/example.yaml and test check_prerequisites	8 months ago
vm-cluster	Remove docker version	5 months ago
.gitignore	put build ops in docker	8 months ago
.travis.yml	Add .travis.yml	11 months ago
LICENSE.txt	Rephrase copyright holders. Taking https://github.com/tensorflow/tens...	9 months ago

Demo

进一步改进计划

- 基于IPMI(Intelligent Platform Management Interface)实现远程控制物理机启动顺序以及重启物理机
- 与DCIM(Data Center Infrastructure Management)系统集成, 从它同步物理机基础数据, 将物理机加入被管理列表
- 全套方案完全开源, 欢迎感兴趣的朋友一起来完善

总结

- 在物理机集群环境中，缺少有效的远程控制手段，传统运维方法中手动比例较高
- PXE可以用来自动化安装和配置物理机操作系统
- 辅以配套的管理工具，可以实现从配置定义到配置下发一整套的物理机自动化运维方案
- 使用场景很关键，需要有一定的集群规模才能平衡引入新系统带来的管理负担的增加

Q & A