

minikube logs



a #sig-cluster-lifecycle project

🔥 Burning laps since 2016 🔥

Who dat?



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Today's Theme: Help Wanted!

We know minikube could be better. That's why we're here.

We could really use your help, and we are willing to hold your hand in order to turn you into a successful Kubernetes contributor.

The Origin Story

I recently read the Kalevala, which is a famous book of epic tales from the Finnish people, passed on verbally from generation to generation. One particular concept from it really hit home with me:

To control something, you must know it's origins.

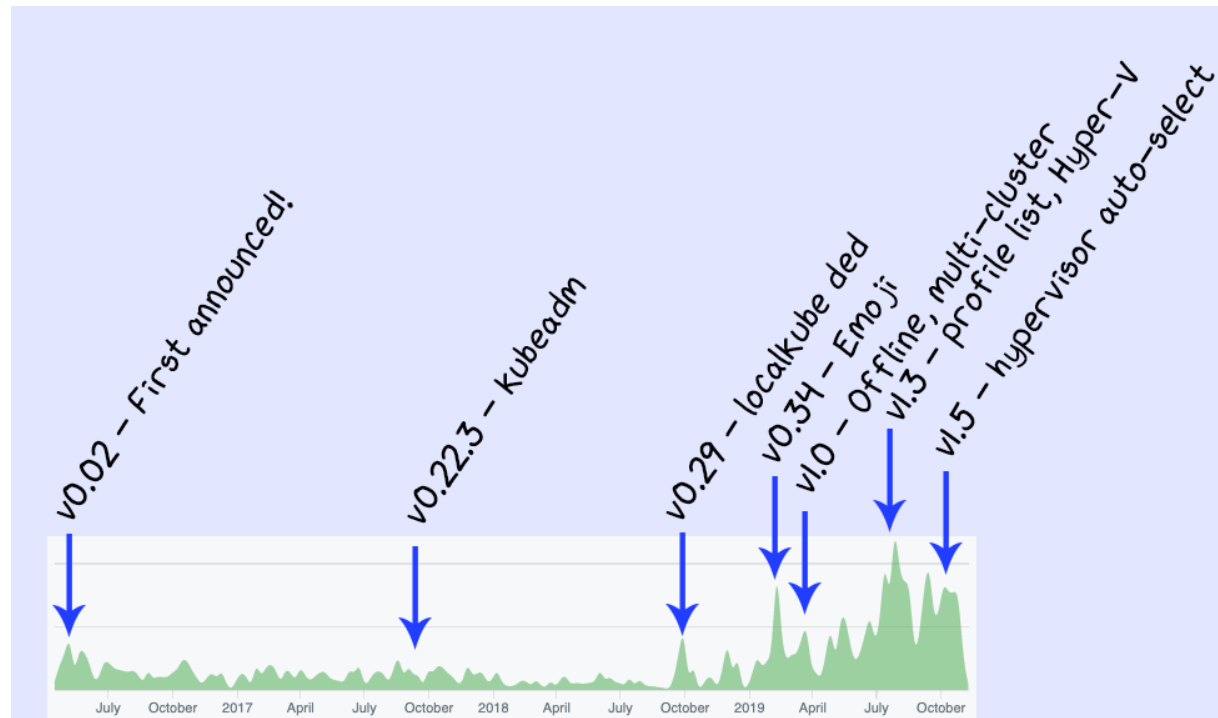
Chesterton's Fence

There exists in such a case a certain institution or law; let us say, for the sake of simplicity, a fence or gate erected across a road.

The more modern type of reformer goes gaily up to it and says, "I don't see the use of this; let us clear it away." To which the more intelligent type of reformer will do well to answer:

"If you don't see the use of it, I certainly won't let you clear it away. Go away and think. Then, when you can come back and tell me that you do see the use of it, I may allow you to destroy it."

minikube: the origin story



goal and principles

Make local Kubernetes simple, for day-to-day development and learning.

- Inclusive and community-driven
 - User-friendly
 - Support all Kubernetes features
 - Cross-platform
 - Reliable
 - High Performance
 - Developer Focused
-

minikube architecture

Somewhere between the origin story and the minikube principles lies reality:

INSERT code-flow.png

The Matrix

	Continuously Tested	Supported	May require work	Planned			
k8s	1.17	1.16	1.15	1.14	1.13	1.12	1.11
runtime	Docker	CRI-O	containerd	gvisor	kata		
bootstrapper	kubeadm kic						
Drivers	VirtualBox	KVM2	HyperKit	HyperV	none		
	Parallels	VMware	Docker	Podman	Firecracker		
OS	Linux	MacOS	Windows	FreeBSD			
Architecture		amd64	arm64	s390x			

minikube vs prod

Minor differences

:

- The master allows jobs to be scheduled
 - Nodes can't resolve Kubernetes DNS records (pods can though!)
 - More likely to OOM because default memory size is 2GB (`--memory`)
 - Defaults to Docker runtime, to allow direct image pushes
-

minikube vs others

minikube is what we recommend when you're willing to pay some overhead for a more high-fidelity cluster.

-- [Tilt's guide to cluster selection](#)

Pros

- The most full-featured local Kubernetes
- Easily run different Kubernetes versions, container runtimes, and controllers
- Build images in-cluster with `minikube docker-env`
- Developer-focused: LoadBalancer, addons, dashboard.
- Always supports the most recent Kubernetes release + 5 older releases

minikube vs others, Cont.

Cons

- High overhead - you'll want to shut minikube down when not in use
 - Running within a VM makes Kubernetes performance slower
 - Hypervisors can be difficult to configure
-

minikube in 2019

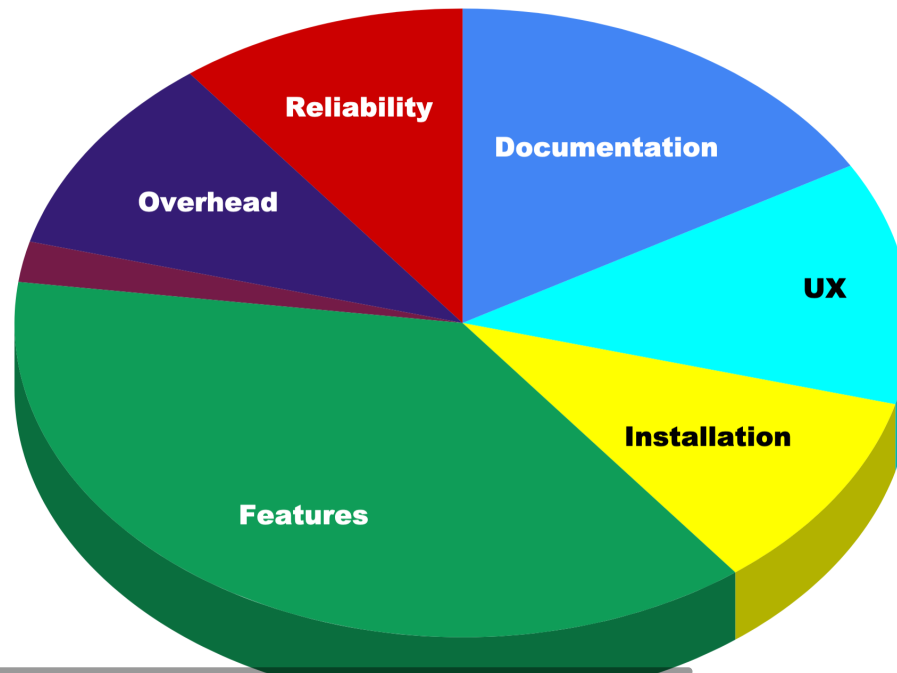
Driver auto-selection, languages, addons, multiple profiles, network fault detection

```
bash ~  
Darwin tstromberg-macbookpro.roam.corp.google.com 18.7.0 x86_64  
21:00 up 14:47, 2 users, load averages: 2.23 2.31 2.64  
~/s/demoit ➤ minikube-deep
```

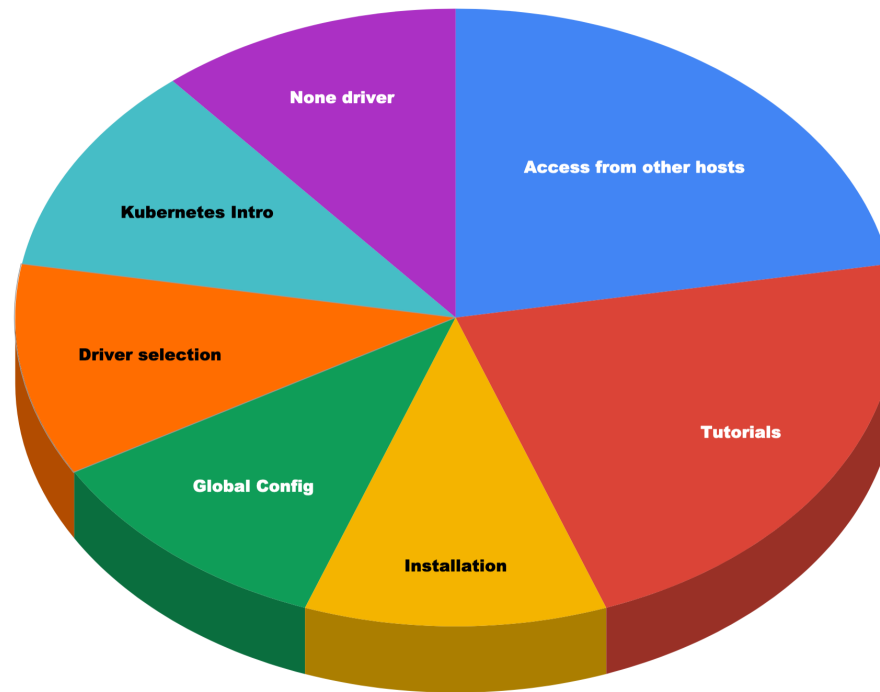
```
code ~ src  
cmd/start.go x pkg/hyperkit.go pkg/docker.go pkg/kubeadm.go ...  
1 /*  
2 Copyright 2016 The Kubernetes Authors All rights reserved.  
3  
4 Licensed under the Apache License, Version 2.0 (the "License")  
5 you may not use this file except in compliance with the License  
6 You may obtain a copy of the License at  
7  
8     http://www.apache.org/licenses/LICENSE-2.0  
9  
10 Unless required by applicable law or agreed to in writing, software  
11 distributed under the License is distributed on an "AS IS" BASIS  
12 WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.  
13 See the License for the specific language governing permissions and  
14 limitations under the License.  
15 */  
16  
17 package cmd
```

What users want to see changed

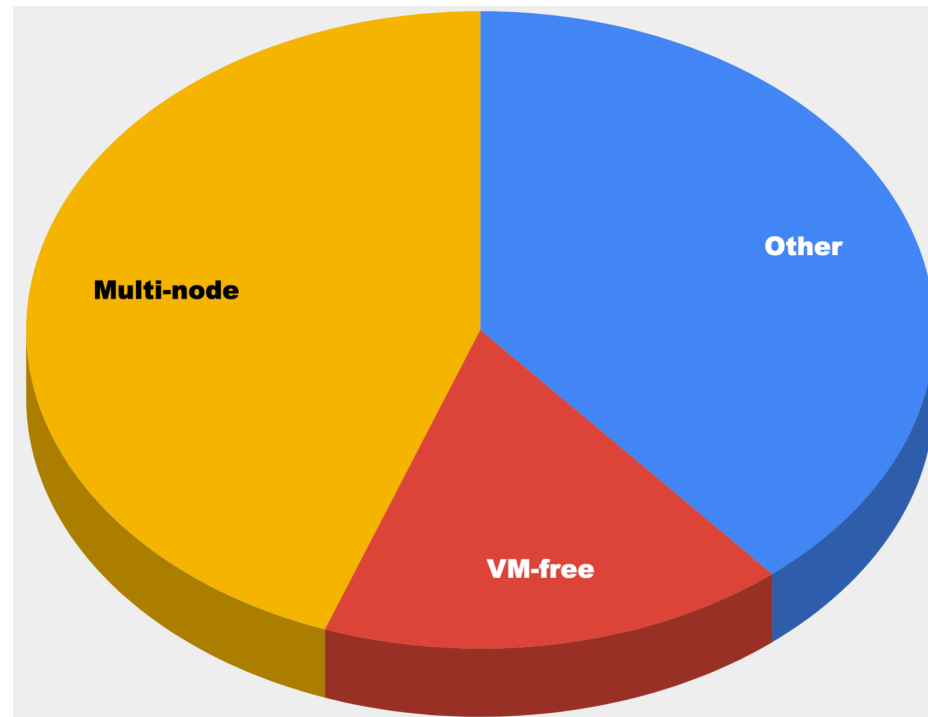
Surveys are critical for user understanding.



Documentation



Features



Y U FAIL?

Issues that came up more than once last week (~30 issues)

- None driver - incompatibility with host (6x)
- Great Firewall of China (3x)
- Incompatible nested virtualization(2x)
- None driver - incomplete cleanup (2x)
- VirtualBox/Hyper-V conflict (2x)
- Kubernetes Services confusion (2x)
- KVM/libvirt networking (2x)
- VPN or firewall blocking access (2x)
- Obsolete or incompatible Kubernetes flags (2x)

Honorable mention: resource exhaustion

Multi-node: Prototype

```
bash ~  
Darwin tstromberg-macbookpro.roam.corp.google.com 18.7.0 x86_64  
21:00 up 14:47, 2 users, load averages: 2.23 2.31 2.64  
~/s/demoit ➤ minikube-deep
```

```
code ~ src  
cmd/start.go x pkg/hyperkit.go pkg/docker.go pkg/kubeadm.go ...  
1 /*  
2 Copyright 2016 The Kubernetes Authors All rights reserved.  
3  
4 Licensed under the Apache License, Version 2.0 (the "License")  
5 you may not use this file except in compliance with the License  
6 You may obtain a copy of the License at  
7  
8     http://www.apache.org/licenses/LICENSE-2.0  
9  
10 Unless required by applicable law or agreed to in writing, software  
11 distributed under the License is distributed on an "AS IS" BASIS,  
12 WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.  
13 See the License for the specific language governing permissions and  
14 limitations under the License.  
15 */  
16  
17 package cmd  
18  
19 import (  
20     "encoding/json"  
21     "fmt"  
22     "math"
```

Docker deployment: Prototype

```
bash ~  
Darwin tstromberg-macbookpro.roam.corp.google.com 18.7.0 x86_64  
21:00 up 14:47, 2 users, load averages: 2.23 2.31 2.64  
~/s/demoit ➤ minikube-deep ⌵ ^&1 |less;
```

```
code ~ src  
cmd/start.go x pkg/hyperkit.go pkg/docker.go pkg/kubeadm.go ...  
97 apiServerName = "apiserver-name"  
98 apiServerPort = "apiserver-port"  
99 dnsDomain = "dns-domain"  
100 serviceCIDR = "service-cluster-ip-range"  
101 imageRepository = "image-repository"  
102 imageMirrorCountry = "image-mirror-country"  
103 mountString = "mount-string"  
104 disableDriverMounts = "disable-driver-mounts"  
105 addons = "addons"  
106 cacheImages = "cache-images"  
107 uuid = "uuid"  
108 vpnkitSock = "hyperkit-vpnkit-sock"  
109 vsockPorts = "hyperkit-vssock-ports"  
110 embedCerts = "embed-certs"  
111 noVTXCheck = "no-vtx-check"  
112 downloadOnly = "download-only"  
113 dnsProxy = "dns-proxy"  
114 hostDNSResolver = "host-dns-resolver"  
115 waitUntilHealthy = "wait"  
116 force = "force"  
117 interactive = "interactive"  
118 waitTimeout = "wait-timeout"
```

Menu Bar UI Prototype

Look up! Why do we care about a MenuBar UI?

- Switch between Kubernetes contexts
- Stop/start (and eventually suspend)
- Resource alerts
- Deployment failure notifications
- Background daemon for time synchronization

minikube 2020

- Multi-node
- Container Deployments (Docker, Podman)
- MenuBar UI with resource alerts
- Automatic installation of hypervisor dependencies
- Integration with leading CNI providers
- 3rd party addon market with 50+ apps
- Less than 25% CPU overhead on a single core
- Startup latency under 30s
- Kernel-assisted mounts (CIFS, NFS) by default
- Suspend and Resume
- post-libmachine exploration
- Newbie-friendly documentation!

HELP WANTED!

A very friendly and patient group of contributors who want to help people learn Kubernetes. Many Kubernetes org members got their start by contributing to minikube.

ART: HELP WANTED

- *#minikube on Slack*
- *mailing list*
- *bi-weekly office-hours*
- *<https://minikube.sigs.k8s.io/>*