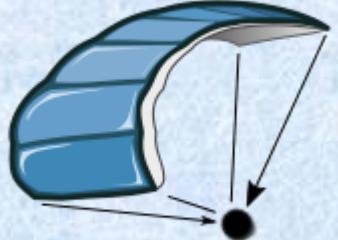


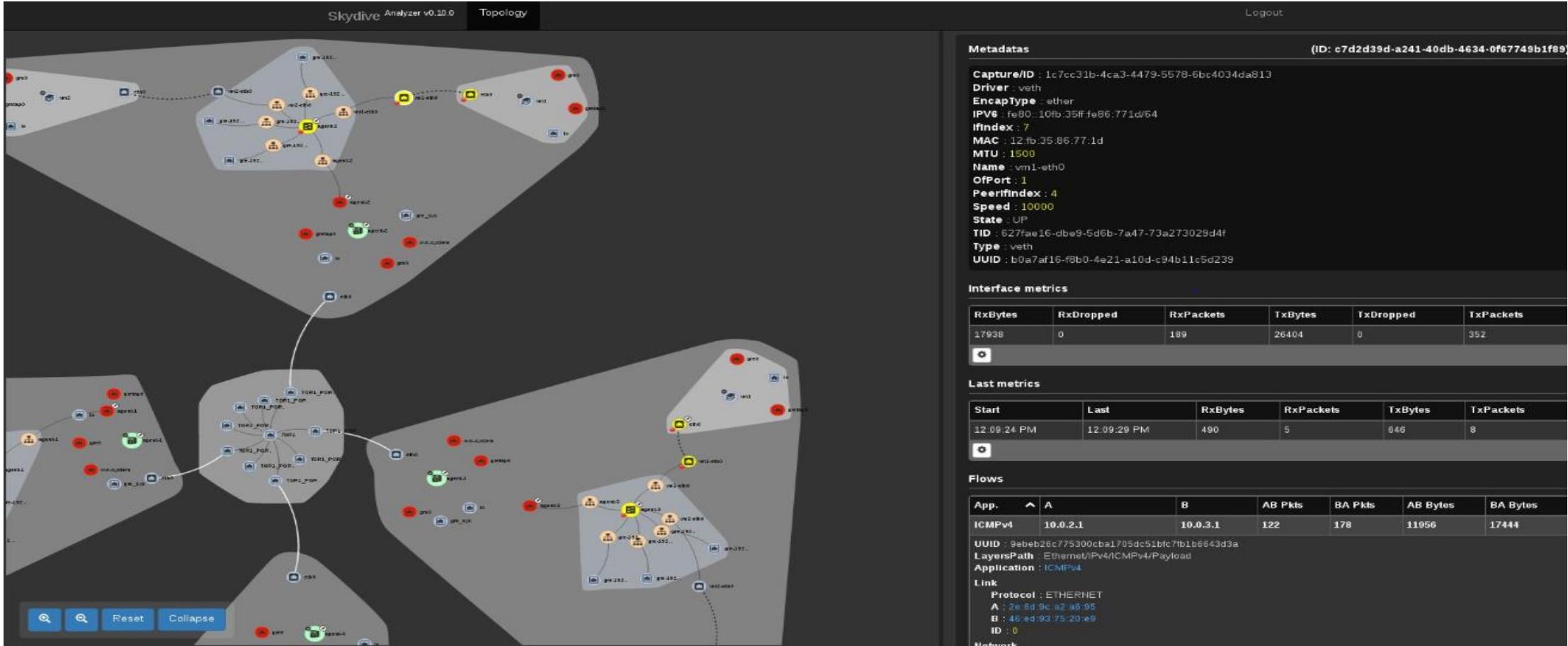
Things I (re)learnt during my 100 commits to **Skydive Project**

Aidan Shribman

IBM Research Labs Haifa



Skydive Project: open source (Apache 2.0) real-time network topology and protocol analyzer



Languages: Go (core), JS/D3 (visualization)

An open source real-time network topology and protocols analyzer

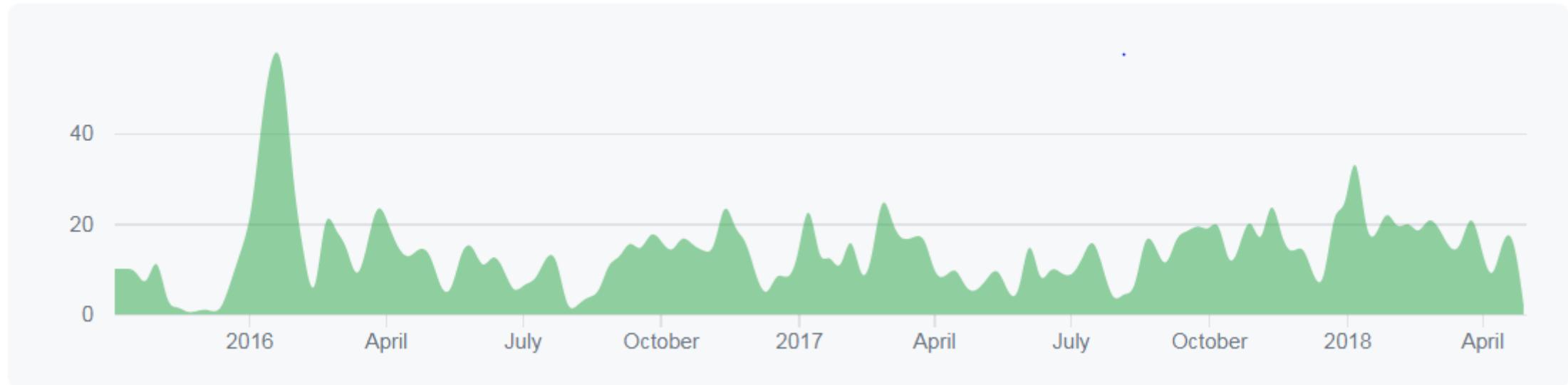
networking network-topology flow monitoring traffic-analysis traffic-monitoring metrics packet-sniffer packet-analyzer pcap ebpf

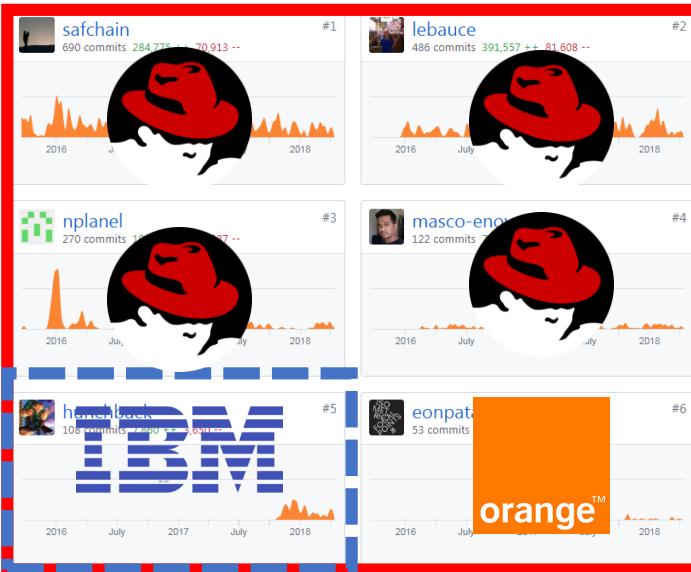
2,461 commits 4 branches 18 releases 30 contributors Apache-2.0

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

Lebaucé Merge pull request #1019 from nplanet/dont-run-in-virt	...	Latest commit 8574798 3 hours ago
agent	json: wrong json omitempty option in host cpu	4 days ago
alert	lock: introduce a deadlock helper	6 days ago
analyzer	lock: introduce a deadlock helper	6 days ago
api	flow : add TCP and IP high level metric	27 days ago
cmd	cleanup: remove unused variable	4 days ago
common	lock: introduce a deadlock helper	6 days ago
config	Merge pull request #955 from safchain/fix-ansible	6 days ago
contrib	CI : fix ansible CI slave deploy	4 days ago
devstack	config : more flow/topology backend fixes	15 days ago

Started: January 2016





Lesson 1: Your first contributions
should be trivial, freeing you to
focus on the contribution process

Updating documentation

devmode: check vagrant up on OS X hosts #12

[Open](#) hunchback wants to merge 1 commit into `skydive-project:master` from `hunchback:build-devmode-macos`

Conversation 1 Commits 1 Checks 0 Files changed 1

Changes from all commits ▾ Jump to... +10 -11 Diff settings ▾ Review changes ▾

21 documentation/build.md

22 @@ -42,25 +42,24 @@ testsuite is

42 available.

43

44

45 -*The image has been successfully tested on:*

46

47 -* vagrant v2.1.1

48 -* VirtualBox v5.2.10

49

50 -*First install the needed vagrant plugins:*

51

52 -{% highlight shell %}

53 -vagrant install plugin vagrant-openstack-provider

54 -vagrant install plugin vagrant-reload

42 available.

43

44

45 +*Supported platforms:*

46

47 +* Windows hosts

48 +* OS X hosts

49 +* Linux distributions

50

51 +*Install one of the following hypervisors:*

52

53 +* VirtualBox (v5.2.10 or v5.2.12)

54 +* libvirt

Fixing coding style

k8s: keep golint happy Browse files

master (#682) v0.16.0

 hunchback committed on Dec 20, 2017 1 parent f3b257a commit 90276614e565a74cf2999db1b2a63cd50d2a2a64

Showing 4 changed files with 19 additions and 15 deletions. Unified Split

22  topology/probes/k8s/k8s.go View

@@ -27,36 +27,40 @@ import ()
27)	27)
28	28
29 const (29 const (
30 - PodToContainerLink = "pod2container"	30 + podToContainerLink = "pod2container"
31 - PolicyToPodLink = "policy2pod"	31 + policyToPodLink = "policy2pod"
32)	32)
33	33
34 var (34 var (
35 - PodToContainerMetadata = graph.Metadata{"RelationType": PodToContainerLink}	35 + podToContainerMetadata = graph.Metadata{"RelationType": podToContainerLink}
36 - PolicyToPodMetadata = graph.Metadata{"RelationType": PolicyToPodLink}	36 + policyToPodMetadata = graph.Metadata{"RelationType": policyToPodLink}
37)	37)
38	38

Code refactoring

ci: reduced code duplication in cleanup.sh

master (#649) v0.16.0 v0.15.0

hunchback committed on Dec 2, 2017 1 parent e5f5247 commit 614623ac4f73f936906bfeeed9c895bbcd4f4

Showing 1 changed file with 34 additions and 54 deletions.

scripts/ci/cleanup.sh

View

@@ -3,48 +3,31 @@	DIR=/tmp/netcleanup CURDIR="\$(dirname "\$0")" function cleanup() { # cleanup old netns if [-e \$DIR/netns.init] && [-e \$DIR/netns.snapshot]; then grep -v -F -x -f \$DIR/{netns.init,netns.snapshot} while read NETNS; do ip netns del \$NETNS done rm -f \$DIR/netns.snapshot fi # cleanup old interfaces if [-e \$DIR/intf.init] && [-e \$DIR/intf.snapshot]; then grep -v -F -x -f \$DIR/{intf.init,intf.snapshot} while read INTF; do ip link del \$INTF done fi }	DIR=/tmp/netcleanup CURDIR="\$(dirname "\$0")" +function cleanup_items() { local label=\$1 local cmd="\$2" if [-e \$DIR/\$label.init] && [-e \$DIR/\$label.snapshot]; then grep -v -F -x -f \$DIR/{\$label.init,\$label.snapshot} while read i; do eval "\$cmd \$i" done fi }
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	
10	10	
11	11	
12		
13		
14		
15		
16		
17		
18		

Fixing platform support

epbf: fix build on old distos (using bcc package)

master (#658) v0.16.0

 hunchback committed on Dec 6, 2017 1 parent ac3fc59 commit 586ed2ae1fcda26ac99c759902e407f9ccb2c907

Showing 2 changed files with 3 additions and 1 deletion.

Unified Split

1 doc/content/getting-started/install.md

diff --git a/doc/content/getting-started/install.md b/doc/content/getting-started/install.md

@@ -21,6 +21,7 @@ Skydive relies on two main components:

21 * llvm	21 * llvm
22 * clang	22 * clang
23 * kernel-headers / linux-libc-dev	23 * kernel-headers / linux-libc-dev
24	24 +* bcc / bcc-devel
25 ## Install	25
26	26 ## Install
27	27

3 probe/ebpf/Makefile

diff --git a/probe/ebpf/Makefile b/probe/ebpf/Makefile

@@ -5,7 +5,8 @@ all: flow.o

View

Lesson 2: before embarking on a
long running task share your
plans with the community

BlueJeans Conferencing

The image shows the BlueJeans Conferencing interface. On the left, a large blue rectangular area displays the message "You are the first person in Skydive public meeting". Below this, a smaller text says "Add participants by sharing this link through email or chat." followed by a URL: <https://bluejeans.com/812434643>. To the right of the URL are two buttons: "COPY" and "EMAIL". On the far right, there is a vertical sidebar with various control icons and labels:

- Leave (red icon)
- Chat (speech bubble icon)
- Participants (person icon with a '1')
- Share Screen (monitor icon)
- Settings (gear icon)
- Switch Audio (audio icon)
- Audio OFF (speaker icon with a slash)
- Video OFF (video camera icon with a slash)
- Full Screen (square icon with arrows)



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[HELP CENTER](#)
+1 (855) 354-3955

Slack Channel

The screenshot shows the Slack interface for the **#skydive-k8s** channel. The sidebar on the left lists several channels, with **# skydive-k8s** highlighted in green. The main channel view displays the channel header, a message from **hunchback** setting the purpose to "Discuss K8s Development", and a message from **Eran Raichstein** inviting others by invitation from **hunchback**. A detailed development plan is shared by **hunchback**, listing four steps for testing k8s objects and improving UI.

#skydive-k8s

You created this channel on May 22nd. This is the very beginning of the **#skydive-k8s** channel. Purpose: Discuss K8s Development ([edit](#))

+ Add an app [Invite others to this channel](#)

Tuesday, May 22nd

hunchback 10:34 AM joined **#skydive-k8s**.

hunchback 10:34 AM set the channel purpose: Discuss K8s Development

Eran Raichstein 10:34 AM joined **#skydive-k8s** by invitation from **hunchback**, along with 5 others.

hunchback 10:36 AM Hi all, I wanted to discuss use this channel to help track and shape k8s support within skydive ... let me first give a few pointers.

hunchback 10:43 AM **High level development plan:**
(1) add missing k8s objects (statefulset, replicationcontroller, persistentvolume) each with a simple test which check only the creation of the node (so not testing of edges)
(2) add a set of test scenarios in which we test the creation of multiple objects and the edges between them (starting with scenarios such as: <https://kubernetes-v1-4.github.io/docs/hellonode/>) and gradually evolving into more complex scenarios
(3) addressing scale (although still only on a single minikube node)
(4) improving UI view of k8s only; such as adding pre-defined filters; launching-context, etc. connecting k8s object with L2 objects at UI level (this may require us to merge at UI level only nodes which represent the same object such as Docker contain getting info from both Docker probe and K8s probe)

+ Message **#skydive-k8s** @ 😊

GitHub Issues

skydive-project / skydive

Watch 69 Unstar 682 Fork 149

Code Issues 68 Pull requests 14 Projects 0 Wiki Insights

ES: Lock-less rollover for ES topology index #965

Open hunchback opened this issue on Apr 18 · 8 comments

hunchback commented on Apr 18 · edited Member + 

Current implementation

We block incoming updates to ES live topology index (all requests building up in golang chan, in memory), the existing live index becomes an archive index and a new live is created and is seeded with the live topology state (measurements by @safchain indicate that even for several 10k of nodes this operation would take only several seconds).

Issues with current implementation

- Writing to ES is blocked for several seconds: updates entering in this period are not reflected in topology map; a reboot of the system in this period will cause loss of this update events (as chan is only backed by memory)
- ~~the live map is duplicated again and again in every index in large slow changing environments this will~~

Assignees
No one assigned

Labels
None yet

Projects
None yet

Milestone
No milestone

Notifications

 Unsubscribe

Lesson 3: For most cases the
Pull-Request Workflow is best

Centralized Workflow (GitHub)

```
$ git clone github.com/skydive-project/skydive
```

```
$ git pull origin
```

```
$ git checkout origin/master
```

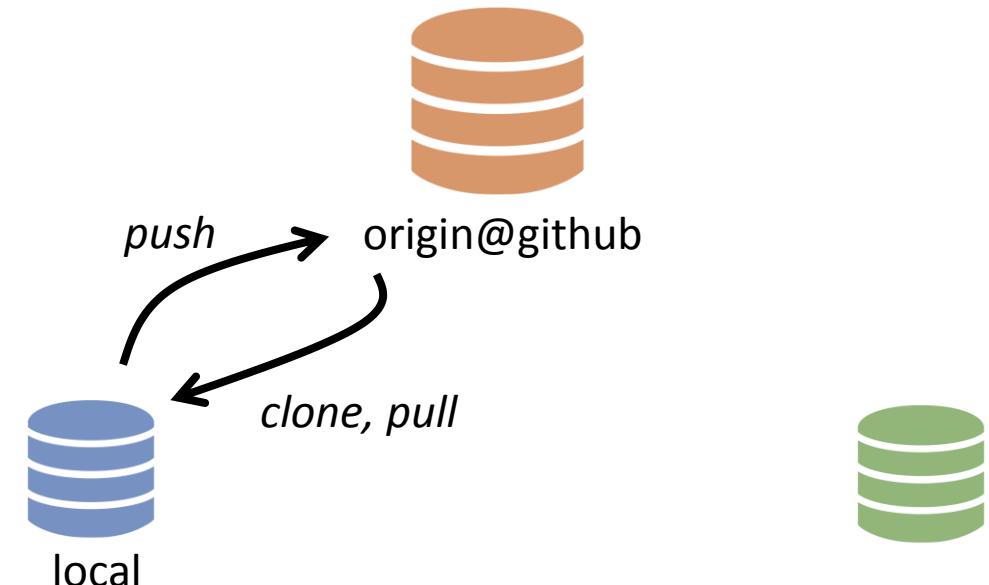
```
... make changes ...
```

```
$ git commit -a
```

```
$ git fetch origin
```

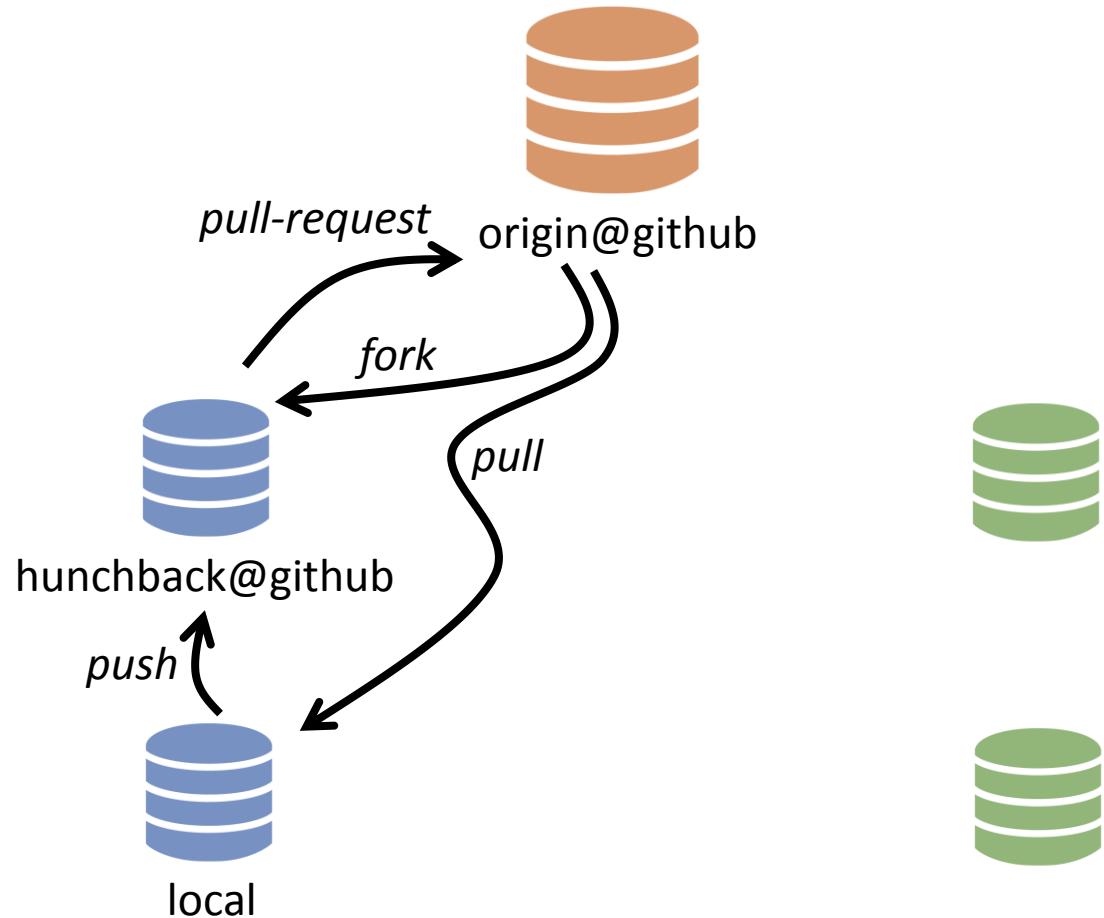
```
$ git rebase origin/master
```

```
$ git push origin master
```

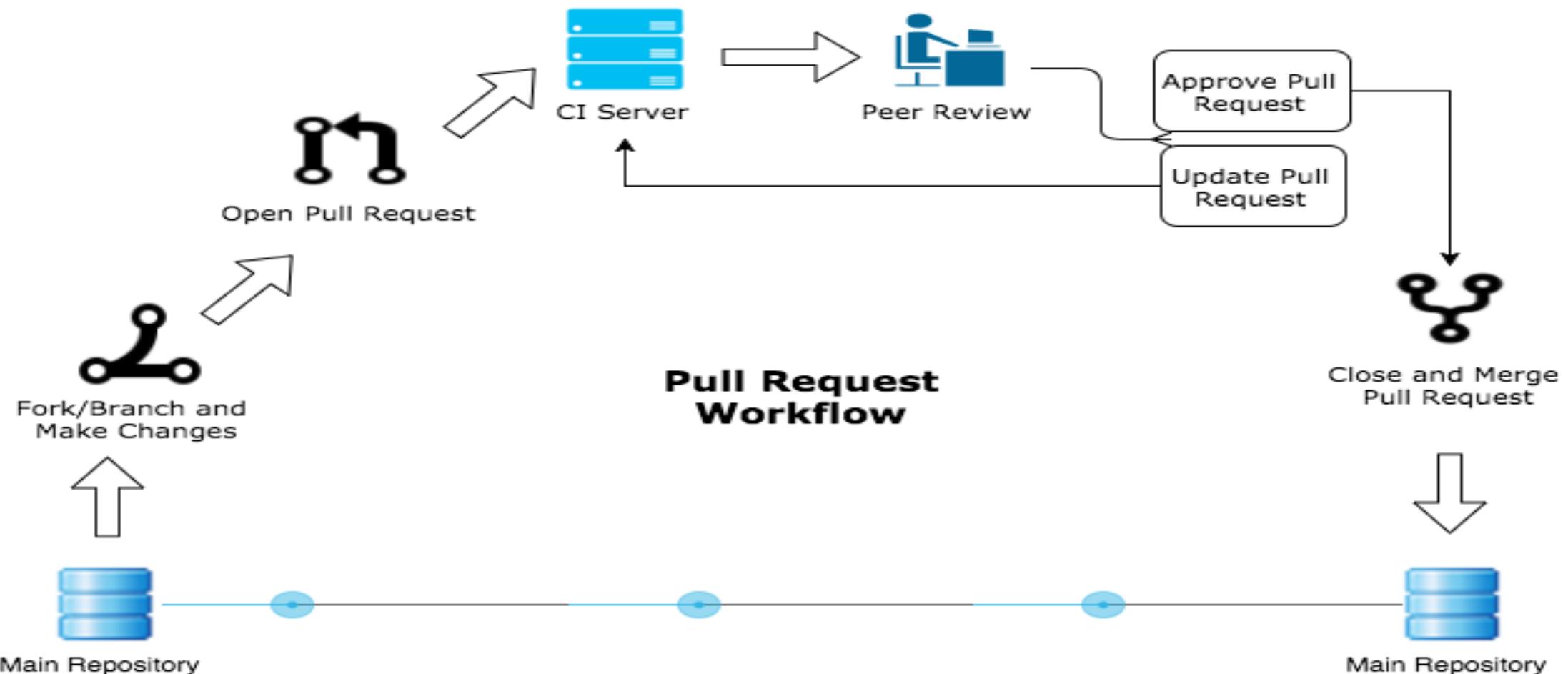


Pull-Request Workflow

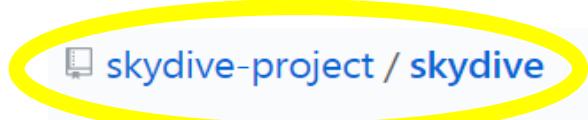
```
$ git clone github.com/skydive-project/skydive
[github] fork (contribotr)
$ git fetch origin
$ git checkout origin/master
$ git checkout -b feature-a
... make changes ...
$ git commit -a
$ git fetch origin
$ git rebase origin/master
$ git push origin feature-a
[github] open pull-request (contributor)
[github] run ci tests (owner)
[github] review/approve (contributor/reviewer)
[github] merge/close (owner)
```



Pull-Request Workflow



Origin

 skydive-project / skydive

Watch 67 Unstar 664 Fork 148

Code Issues 67 Pull requests 20 Projects 0 Wiki Insights

An open source real-time network topology and protocols analyzer

networking network-topology flow monitoring traffic-analysis traffic-monitoring metrics packet-sniffer packet-analyzer pcap ebpf

2,457 commits 4 branches 18 releases 30 contributors Apache-2.0

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

File	Commit Message	Time
agent	json: wrong json omitempty option in host cpu	3 days ago
alert	lock: introduce a deadlock helper	5 days ago
analyzer	lock: introduce a deadlock helper	5 days ago
api	flow : add TCP and IP high level metric	26 days ago
cmd	cleanup: remove unused variable	3 days ago

Fork

 hunchback / skydive
forked from skydive-project/skydive

Unwatch ▾ 1 Star 0 Fork 148

Code Pull requests 0 Projects 0 Wiki Insights Settings

An open source real-time network topology and protocols analyzer Edit

Add topics

1,772 commits 78 branches 14 releases 26 contributors Apache-2.0

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

This branch is 1 commit ahead, 686 commits behind skydive-project:master. Pull request Compare

 hunchback tests: removed duplication in test.functionals.run Latest commit 3cab2d9 on Nov 29, 2017

agent	websocket: split endpoints for replication, agents, publishers and li...	6 months ago
alert	alert: fix race when marshalling result	6 months ago
analyzer	graph: add persistence policy	6 months ago
api	api: do not panic on response write	6 months ago
cmd	Merge pull request #533 from lebauce/client-query	6 months ago

Branch and make changes

hunchback / [skydive](#)
forked from [skydive-project/skydive](#)

Unwatch ▾ 1 Star 0 Fork 149

[Code](#) Pull requests 0 Projects 0 Wiki Insights Settings

An open source real-time network topology and protocols analyzer [Edit](#)

Add topics

2,388 commits 87 branches 14 releases 26 contributors Apache-2.0

Branch: k8s-probes-def... ▾ New pull request Create new file Upload files Find file Clone or download ▾

This branch is 190 commits behind skydive-project:master. [Pull request](#) [Compare](#)

 hunchback k8s: generate defaults when k8s.probes is empty Latest commit 399d22d on Apr 29

 agent http : improve performance by serializing websocket data via protobuf 2 months ago

 alert http : improve performance by serializing websocket data via protobuf 2 months ago

 analyzer config: relocate graph.backend and analyzer.storage a month ago

 api flow : add TCP and IP high level metric 2 months ago

Open a Pull-Request

skydive-project / skydive

Watch ▾ 67

Code Issues 67 Pull requests 20 Projects 0 Wiki Insights

k8s: generate defaults when k8s.probes is empty #982

Merged safchain merged 1 commit into skydive-project:master from hunchback:k8s-probes-default 11 days ago

Conversation 7 Commits 1 Checks 0 Files changed 8

hunchback commented 15 days ago • edited

Contributor + 🧑

to test try:

(1)

```
analyzer:  
  probes:  
    - k8s  
k8s:  
  probes:  
    # empty
```

Run CI Tests

 **Some checks were not successful**

2 failing and 5 successful checks

  skydive-functional-tests-backend-elasticsearch [Details](#)

  skydive-functional-tests-backend-orientdb [Details](#)

  skydive-compile-tests [Details](#)

  skydive-go-fmt [Details](#)

  skydive-scale-tests [Details](#)

 **This branch has no conflicts with the base branch**

Only those with [write access](#) to this repository can merge pull requests.

Review/Approve Pull-Request

  nplanet reviewed 18 days ago [View changes](#)

`tests/helm_test.go`

```
35 +     relName    = "skydive"
36 +
37 +
38 +func TestHelmInstall(t *testing.T) {
```

 **nplanet** 18 days ago Owner
what is the goal/scope of this test ? it's not directly related (out of scope) to skydive
it's just testing if helm is installed correctly and working, that we assume it is in functional test

 **hunchback** 5 days ago Contributor
It attempts to install skydive via helm chart (on the minikube environment), this was just a
minimal test which (in future) should be extended to test that skydive (after installed by helm)
is actually functioning correctly.

 **nplanet** 18 minutes ago Owner
Skydive functional tests is not designed for these tests
Please move this patch in a new scripts/ci/run-helm-tests.sh and run only inside the skydive
functional k8s test (TEST_PATTERN=...)
We will trigger it after the docker job

 Reply...

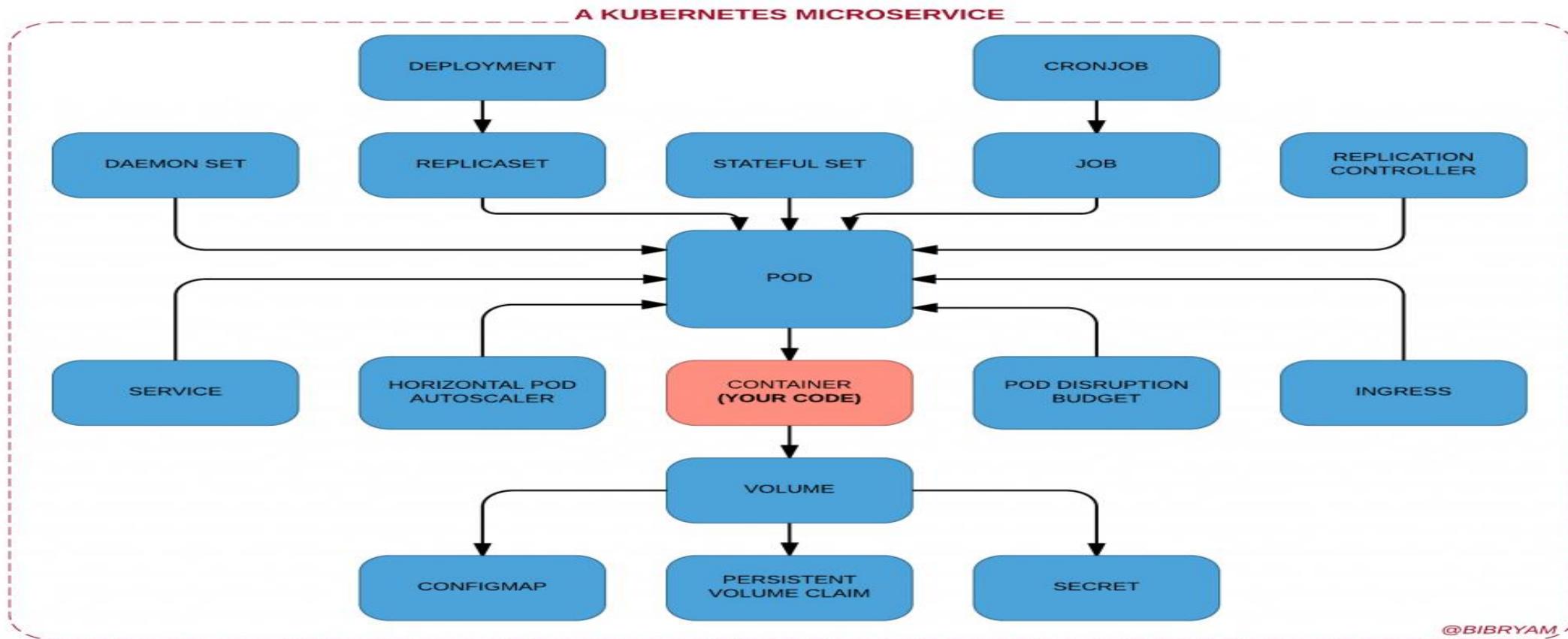
Merge/Close Pull-Request

The screenshot shows a GitHub repository page for 'skydive-project / skydive'. The 'Pull requests' tab is selected, showing 20 pull requests. The search bar contains the query 'is:pr is:closed author:hunchback'. The interface includes filters for 'Labels' and 'Milestones', and a green 'New pull request' button. The list of closed pull requests includes:

- #1006 by hunchback was merged 6 days ago
- #1003 by hunchback was merged 5 days ago
- #990 by hunchback was merged 3 days ago
- #989 by hunchback was merged 4 hours ago

Lesson 4: priorities may change,
focus may shift, to counter this break
your effort into bite-sized PRs

K8s Object Model



K8s PRs

1 Open ✓ 30 Closed		Author ▾	Labels ▾	Projects ▾	Milestones ▾	Reviews ▾	Assignee ▾	Sort ▾
k8s: add stateful-set probe ✓	#1060 by hunchback was merged 5 days ago							3
k8s: add replication-controller probe ✓	#1059 by hunchback was merged 5 days ago							13
k8s: add persistent-volume-claim probe ✓	#1038 by hunchback was merged 6 days ago							8
k8s: add persistent-volume probe ✓	#1037 by hunchback was merged 6 days ago							10
k8s: add replicaset probe ✓	#1036 by hunchback was merged 6 days ago							3
k8s: add job probe ✓	#1035 by hunchback was merged 7 days ago							1

Configurable Modularity

```
k8s:  
  # EXPERIMENTAL: k8s probe is still under development and should not be used  
  # on production systems  
  
  # kubeconfig resolution order:  
  # - if config_file param is defined then use it;  
  # - else if $KUBECONFIG environment is define then use it;  
  # - else if $HOME/.kube/config file exists then use it;  
  # - else use empty configuration (for accessing from within the k8s cluster).  
  
  # specify the path of k8s configuration YAML file.  
  # config_file: /etc/skydive/kubeconfig  
  
  # list of (sub) probes comprising k8s probe.  
  # if list is empty then will resolve to all existing (sub) probes.  
  probes:  
    - cluster  
    - container  
    - deployment  
    - ingress  
    - job  
    - namespace  
    - networkpolicy  
    - node  
    - persistentvolume  
    - pod  
    - replicaset  
    - replicationcontroller  
    - service  
    - statefulset
```

+ cluster



Skydive Analyzer f7b3c5820410

Topology Conversation Discovery

Preferences Documentation Logout

Captures Generator Flows Alerts

Create

Metadata

K8s

Manager: k8s
Name: cluster
Namespace:
Type: cluster

Topology view

Full Live

Cluster icon

Search and filter icons

A screenshot of the Skydive web interface. The top navigation bar includes 'Skydive Analyzer f7b3c5820410', tabs for 'Topology', 'Conversation', and 'Discovery', and links for 'Preferences', 'Documentation', and 'Logout'. On the left, there's a sidebar with a menu icon and search/filter buttons. The main area shows a dark background with a single node labeled 'cluster' highlighted by a green circle. A tooltip at the bottom right says 'Topology view' with options 'Full' and 'Live'. The right side has a panel titled 'Metadata' showing details for the 'cluster' node, such as Manager: k8s, Name: cluster, Namespace:, and Type: cluster. At the bottom, there are more search/filter icons.

+ node



Skydive Analyzer f7b3c5820410 Topology Conversation Discovery Preferences Documentation Logout

Captures Generator Flows Alerts

Create

Metadata

K8s

- ObjectMeta
- Annotations
 - node
 - alpha
 - kubernetes
 - io/ttl : 0
- volumes
 - kubernetes
 - io/controller-managed-attach-detach : true
- ClusterName :
- CreationTimestamp
- Time
- DeletionGracePeriodSeconds
- DeletionTimestamp
- Finalizers
- GenerateName :
- Generation : 0

Topology view

Full

Live

The topology diagram shows a 'dev' node (represented by a green circle with a monitor icon) connected to a 'cluster' node (represented by a green circle with a gear icon). The 'cluster' node is part of a larger cluster structure, indicated by a blue capsule shape containing multiple nodes. A search bar and filter icons are at the bottom left, and a navigation bar with 'Topology', 'Conversation', 'Discovery', and 'Logout' buttons is at the top.

+ namespace



Skydive Analyzer f7b3c5820410 Topology Conversation Discovery Preferences Documentation Logout

The topology view displays a cluster node at the center, connected to four other nodes representing namespaces: dev, kube-public, default, and kube-system. Each namespace node contains a book icon and a blue gear icon.

Topology view
Full Live

CreationTimestamp
Time

DeletionGracePeriodSeconds

DeletionTimestamp

Finalizers

GenerateName : default

Generation : 0

Initializers

Labels

Name : default

Namespace :

OwnerReferences :

ResourceVersion : 4

SelfLink : /api/v1/namespaces/default

UID : a6914db5-6285-11e8-bb1b-5254001c08b7

Spec

Finalizers :

Status

Phase : Active

TypeMeta

APIVersion :

Kind :

Manager : k8s

Name : default

Namespace :

Type : namespace

+ pod



Skydive Analyzer f7b3c5820410

Topology Conversation Discovery Preferences Documentation Logout

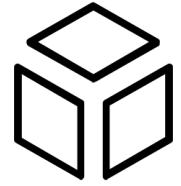
The diagram illustrates a network topology within a Kubernetes cluster. A central node labeled 'dev' is connected to several other nodes: 'kube-dns-54c...', 'kube-addon-m...', 'kubernetes-d...', 'storage-prov...', 'hello-node-9...', and 'default'. These nodes are interconnected, forming a cluster. To the right of the cluster, there are additional nodes: 'cluster', 'kube-public', and 'kube-system'. A large blue rounded rectangle highlights the cluster of nodes centered around 'dev'.

Topology view
Full Live

Pod details:

- RunAsUser
- SELinuxOptions
- SupplementalGroups
- ServiceAccountName : default
- Subdomain :
- TerminationGracePeriodSeconds : 30
- Tolerations :
- Volumes :
- Status
 - Conditions :
 - ContainerStatuses :
 - HostIP : 10.0.2.15
 - InitContainerStatuses :
 - Message :
 - Phase : Pending
 - PodIP : 172.17.0.2
 - QOSClass : BestEffort
 - Reason :
 - StartTime
 - Time
- TypeMeta
 - APIVersion :
 - Kind :
- Manager : k8s
- Name : hello-node-9f5f775d6-w7ljt
- Namespace : default
- Type : pod

+ container



Skydive Analyzer f7b3c5820410 Topology Conversation Discovery Preferences Documentation Logout

Topology view
Full Live

Args
Command
Env :
EnvFrom :
Image : hello-node:v1
ImagePullPolicy : IfNotPresent
Lifecycle
LivenessProbe
Name : hello-node
Ports :
ReadinessProbe
Resources
Limits
Requests
SecurityContext
Stdin : false
StdinOnce : false
TTY : false
TerminationMessagePath : /dev/termination-log
TerminationMessagePolicy : File
VolumeMounts :
WorkingDir :
Manager : k8s
Name : hello-node
Namespace : default
Type : container

+ service



Skydive Analyzer f7b3c5820410-tainted **Topology** Conversation Discovery Preferences Documentation Logout

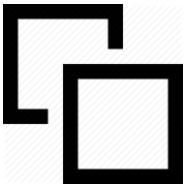
Topology view
Full Live

Search icons: magnifying glass, filter, refresh, etc.

Spec

- ClusterIP : 10.96.0.1
- ExternalIPs
- ExternalName :
- ExternalTrafficPolicy :
- HealthCheckNodePort : 0
- LoadBalancerIP :
- LoadBalancerSourceRanges
- Ports :
- PublishNotReadyAddresses : false
- Selector
- SessionAffinity : ClientIP
- SessionAffinityConfig
 - ClientIP
 - TimeoutSeconds : 10800
 - Type : ClusterIP
- Status
- LoadBalancer
 - Ingress :
- TypeMeta
- APIVersion :
- Kind :
- Manager : k8s
- Name : kubernetes
- Namespace : default
- Type : service

+ replication-set



Skydive Analyzer f7b3c5820410-tainted

Topology Conversation Discovery Preferences Documentation Logout

Topology view
Full Live

AvailableReplicas : 0
Conditions :
FullyLabeledReplicas : 1
ObservedGeneration : 1
ReadyReplicas : 0
Replicas : 1
Status
Manager : k8s
Name : kubernetes-dashboard-77d8b98585
Namespace : kube-system
Type : replicaset

RestartPolicy : Always
SchedulerName : default-scheduler
SecurityContext
FSGroup
RunAsNonRoot
RunAsUser
SELinuxOptions
SupplementalGroups
ServiceAccountName :
Subdomain :
TerminationGracePeriodSeconds : 30
Tolerations :
Volumes :

TypeMeta
APIVersion :
Kind :
Name : kubernetes-dashboard-77d8b98585
Namespace : kube-system
Type : replicaset

+ persistent-volume



Skydive Analyzer f7b3c5820410-tainted

Topology Conversation Discovery Preferences Documentation Logout

HostPath
Path : /tmp/hostpath-provisioner/pvc-2b000970-632e-11e8-bb1b-5254001c08b7
Type :
ISCSI
Local
NFS
PhotonPersistentDisk
PortworxVolume
Quobyte
RBD
ScaleIO
StorageOS
VsphereVolume
StorageClassName : standard
Status
Message :
Phase : Bound
Reason :
TypeMeta
APIVersion :
Kind :
Manager : k8s
Name : pvc-2b000970-632e-11e8-bb1b-5254001c08b7
Namespace :
Type : persistentvolume

Topology view
Full Live

Search icons

+ persistent-volume-claim



+ deployment



Skydive Analyzer f7b3c5820410-tainted

Topology Conversation Discovery Preferences Documentation Logout

Topology view
Full Live

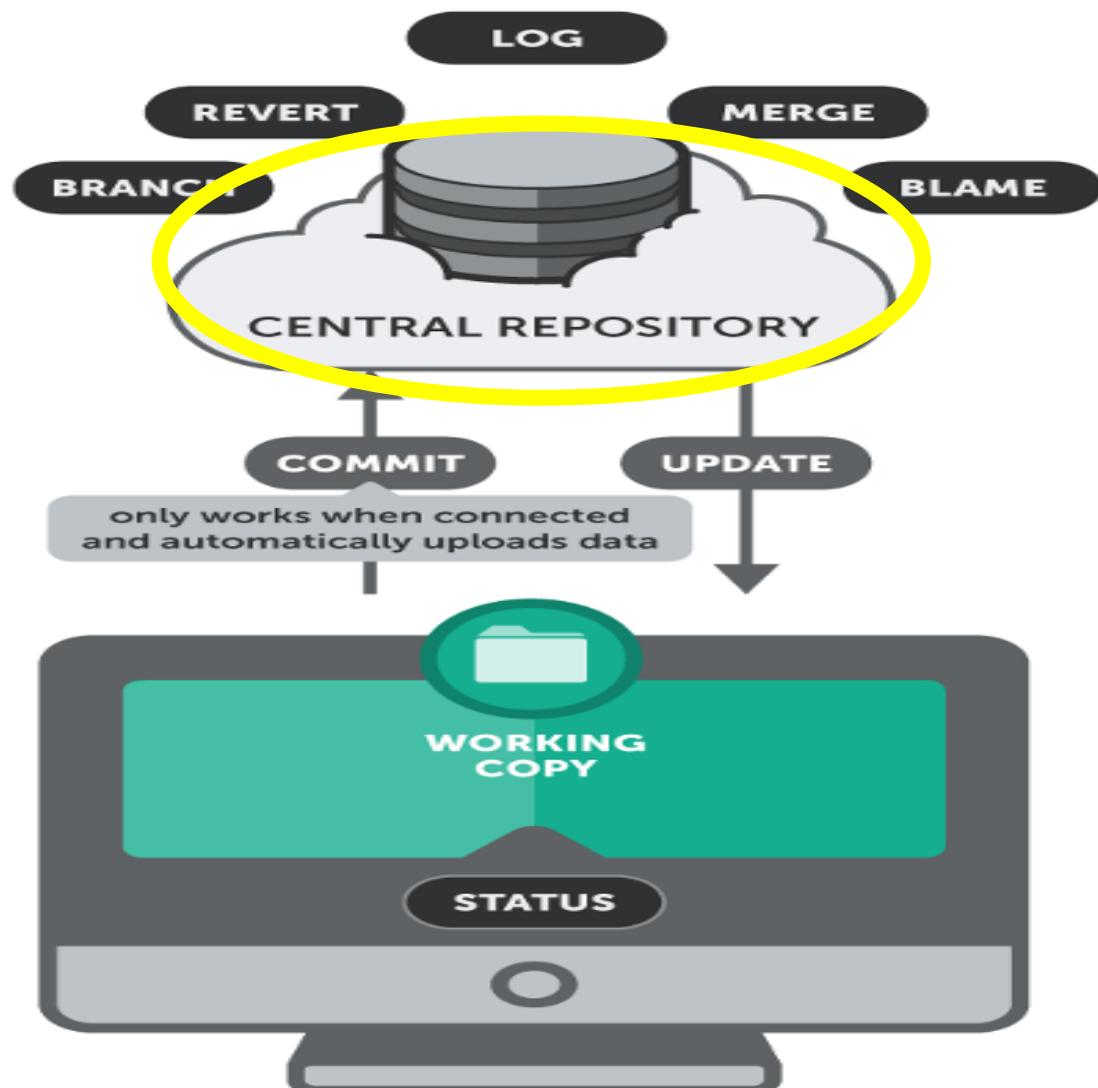
SecurityContext
FSGroup
RunAsNonRoot
RunAsUser
SELinuxOptions
SupplementalGroups
ServiceAccountName :
Subdomain :
TerminationGracePeriodSeconds : 30
Tolerations :
Volumes :

Status
AvailableReplicas : 0
CollisionCount
Conditions :
ObservedGeneration : 1
ReadyReplicas : 0
Replicas : 1
UnavailableReplicas : 1
UpdatedReplicas : 1

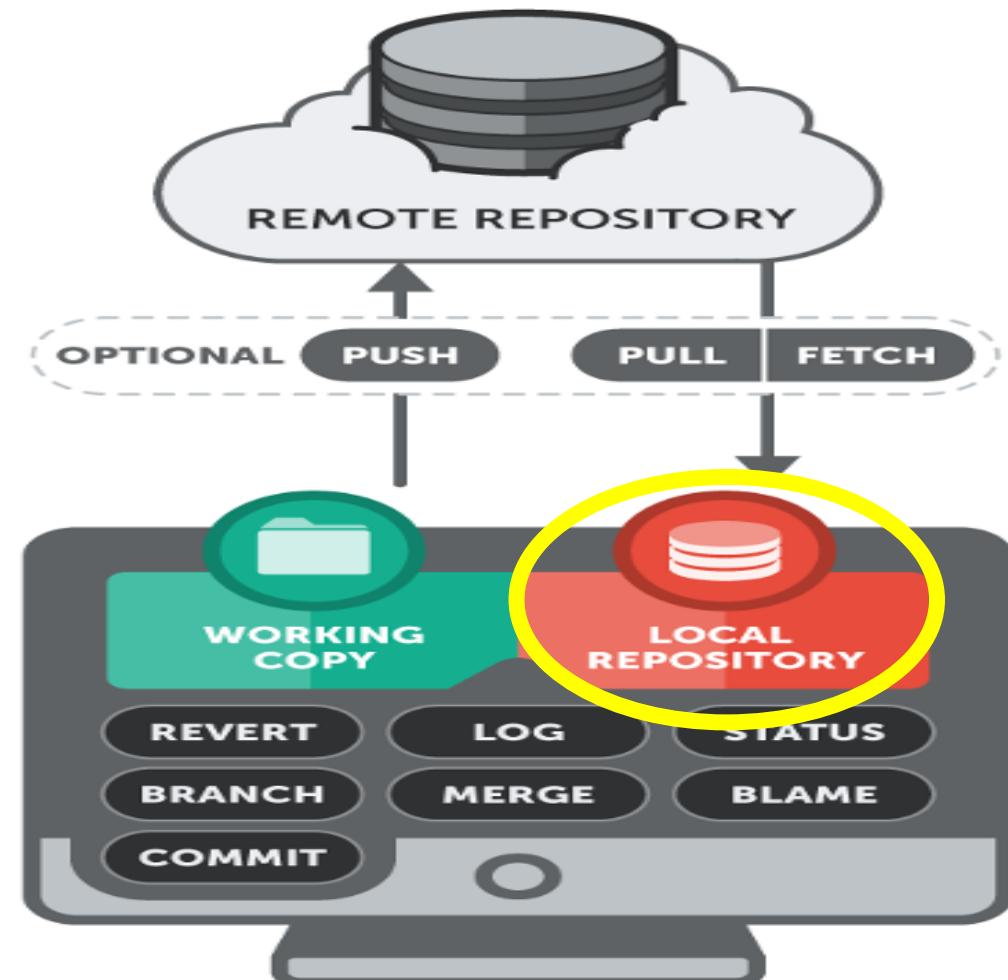
TypeMeta
APIVersion :
Kind :
Manager : k8s
Name : hello-node
Namespace : default
Type : deployment

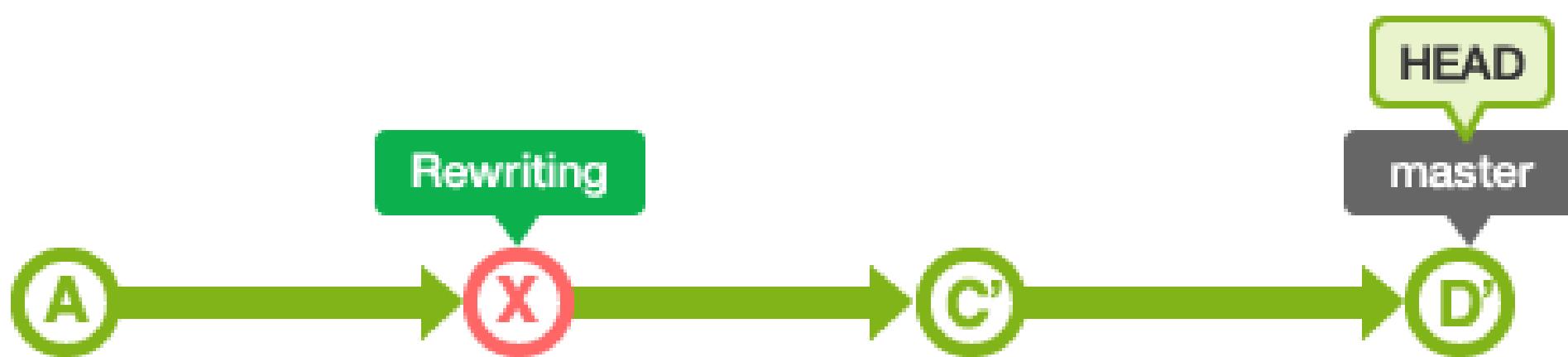
Lesson 5: with GIT you can
manage a local history - clean it
before pushing PR upstream

SUBVERSION



GIT





R-writting History

```
$ git checkout feature-a  
$ git rebase -i HEAD~10  
$ git rebase origin/master  
$ git push --force origin HEAD:feature-a
```

Amending Commit Content 1/3

```
$ git rebase -i HEAD~3
pick f7f3f6d changed my name a bit
pick 310154e updated README formatting and added blame
pick a5f4a0d added cat-file

# Rebase 710f0f8..a5f4a0d onto 710f0f8
#
# Commands:
# p, pick = use commit
# r, reword = use commit, but edit the commit message
# e, edit = use commit, but stop for amending
# s, squash = use commit, but meld into previous commit
# f, fixup = like "squash", but discard this commit's log message
# x, exec = run command (the rest of the line) using shell
```

Amending Commit Content 2/3

```
$ git rebase -i HEAD~3
pick f7f3f6d changed my name a bit
edit 310154e updated README formatting and added blame
pick a5f4a0d added cat-file

# Rebase 710f0f8..a5f4a0d onto 710f0f8
#
# Commands:
# p, pick = use commit
# r, reword = use commit, but edit the commit message
# e, edit = use commit, but stop for amending
# s, squash = use commit, but meld into previous commit
# f, fixup = like "squash", but discard this commit's log message
# x, exec = run command (the rest of the line) using shell
```

Amending Commit Content 3/3

```
$ git rebase -i HEAD~3
pick f7f3f6d changed my name a bit
pick 3242ffa1 updated README formatting and added blame
pick a5f4a0d added cat-file

# Rebase 710f0f8..a5f4a0d onto 710f0f8
#
# Commands:
# p, pick = use commit
# r, reword = use commit, but edit the commit message
# e, edit = use commit, but stop for amending
# s, squash = use commit, but meld into previous commit
# f, fixup = like "squash", but discard this commit's log message
# x, exec = run command (the rest of the line) using shell
```

Amending Commit Message 1/2

```
$ git rebase -i HEAD~3
reword f7f3f6d changed my name a bit
pick 3242ffa1 updated README formatting and added blame
pick a5f4a0d added cat-file

# Rebase 710f0f8..a5f4a0d onto 710f0f8
#
# Commands:
# p, pick = use commit
# r, reword = use commit, but edit the commit message
# e, edit = use commit, but stop for amending
# s, squash = use commit, but meld into previous commit
# f, fixup = like "squash", but discard this commit's log message
# x, exec = run command (the rest of the line) using shell
```

Amend Commit Message 2/2

Amend a commit message

```
$ git rebase -i HEAD~3
reword 3241ffde changed my name
pick 3242ffa1 updated README formatting and added blame
pick a5f4a0d added cat-file
```

```
# Rebase 710f0f8..a5f4a0d onto 710f0f8
#
# Commands:
# p, pick = use commit
# r, reword = use commit, but edit the commit message
# e, edit = use commit, but stop for amending
# s, squash = use commit, but meld into previous commit
# f, fixup = like "squash", but discard this commit's log message
# x, exec = run command (the rest of the line) using shell
```

Reorder Commits 1/2

```
$ git rebase -i HEAD~3
pick a4323411 changed my name
pick a5f4a0d added cat-file
pick 3242ffa1 updated README formatting and added blame
```

```
# Rebase 710f0f8..a5f4a0d onto 710f0f8
#
# Commands:
# p, pick = use commit
# r, reword = use commit, but edit the commit message
# e, edit = use commit, but stop for amending
# s, squash = use commit, but meld into previous commit
# f, fixup = like "squash", but discard this commit's log message
# x, exec = run command (the rest of the line) using shell
```

Reorder Commits 2/2

Reorder commits

```
$ git rebase -i HEAD~3
pick a4323411 changed my name
pick fdfd12312 updated README formatting and added blame
pick 33ddff44 added cat-file
```

```
# Rebase 710f0f8..a5f4a0d onto 710f0f8
#
# Commands:
# p, pick = use commit
# r, reword = use commit, but edit the commit message
# e, edit = use commit, but stop for amending
# s, squash = use commit, but meld into previous commit
# f, fixup = like "squash", but discard this commit's log message
# x, exec = run command (the rest of the line) using shell
```

Merge Commits 1/2

```
$ git rebase -i HEAD~3
pick a4323411 changed my name
pick fdfd12312 updated README formatting and added blame
squash 33ddff44 added cat-file
```

```
# Rebase 710f0f8..a5f4a0d onto 710f0f8
#
# Commands:
# p, pick = use commit
# r, reword = use commit, but edit the commit message
# e, edit = use commit, but stop for amending
# s, squash = use commit, but meld into previous commit
# f, fixup = like "squash", but discard this commit's log message
# x, exec = run command (the rest of the line) using shell
```

Merge Commits 2/2

```
$ git rebase -i HEAD~2
pick a4323411 changed my name
pick 4431f1f1 updated README formatting and added blame and added cat-file
```

```
# Rebase 710f0f8..a5f4a0d onto 710f0f8
#
# Commands:
# p, pick = use commit
# r, reword = use commit, but edit the commit message
# e, edit = use commit, but stop for amending
# s, squash = use commit, but meld into previous commit
# f, fixup = like "squash", but discard this commit's log message
# x, exec = run command (the rest of the line) using shell
```

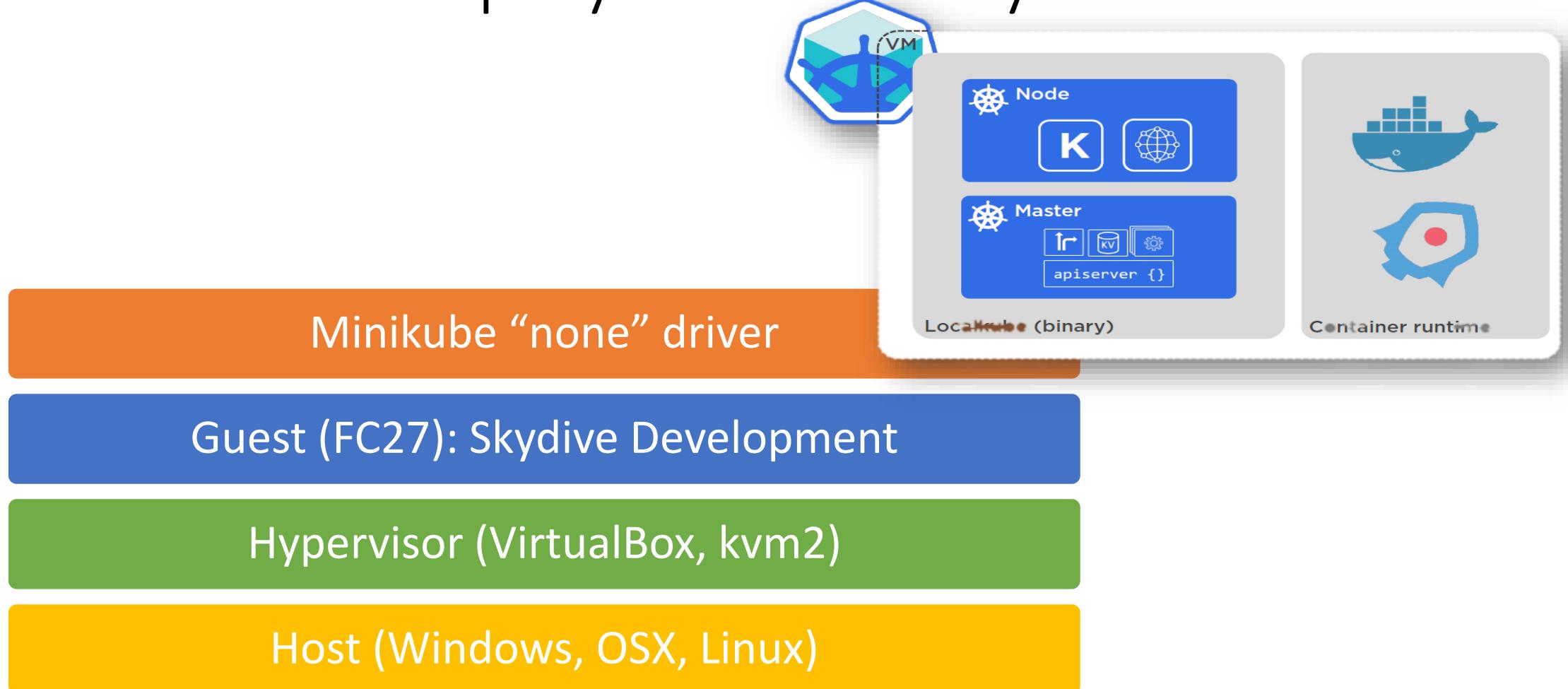
Test Your Commits

```
$ git rebase -i HEAD~2
pick a4323411 changed my name
exec /bin/bash
pick 4431f1f1 updated README formatting and added blame and added cat-file

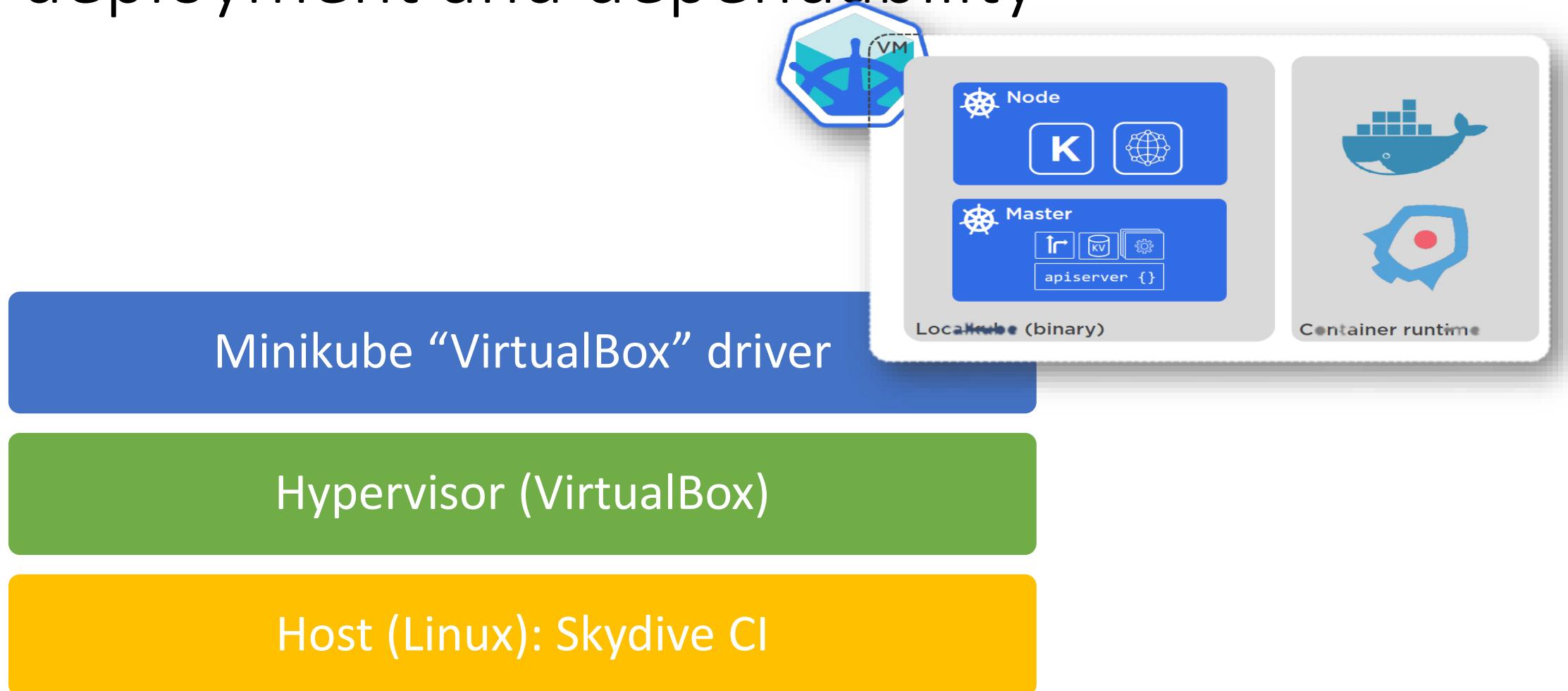
# Rebase 710f0f8..a5f4a0d onto 710f0f8
#
# Commands:
# p, pick = use commit
# r, reword = use commit, but edit the commit message
# e, edit = use commit, but stop for amending
# s, squash = use commit, but meld into previous commit
# f, fixup = like "squash", but discard this commit's log message
# x, exec = run command (the rest of the line) using shell
```

**Lesson 6: optimize your environments according to target
(e.g. development, testing,
production)**

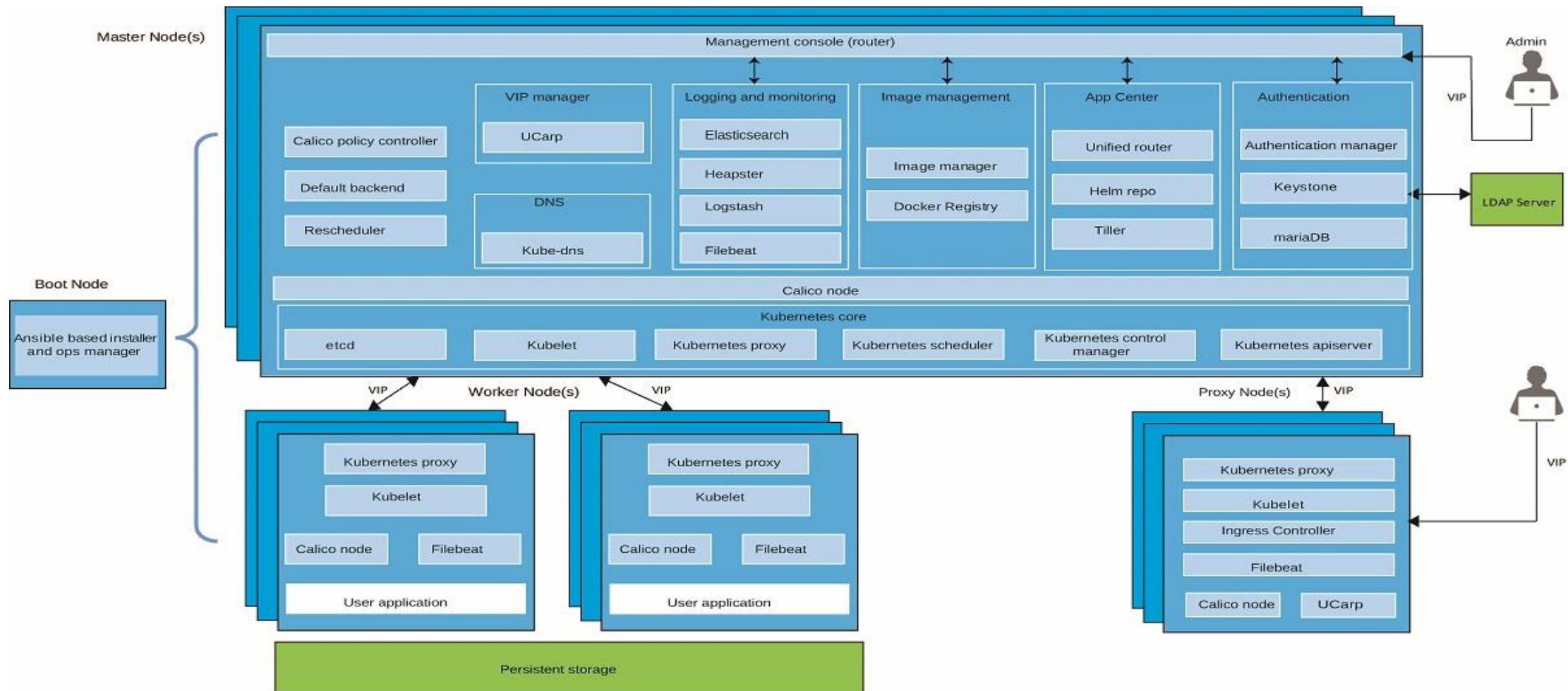
Development (Minikube “none”): optimized for ease of deployment on any host



Test (Minikube “VB”): optimized of ease of deployment and dependability

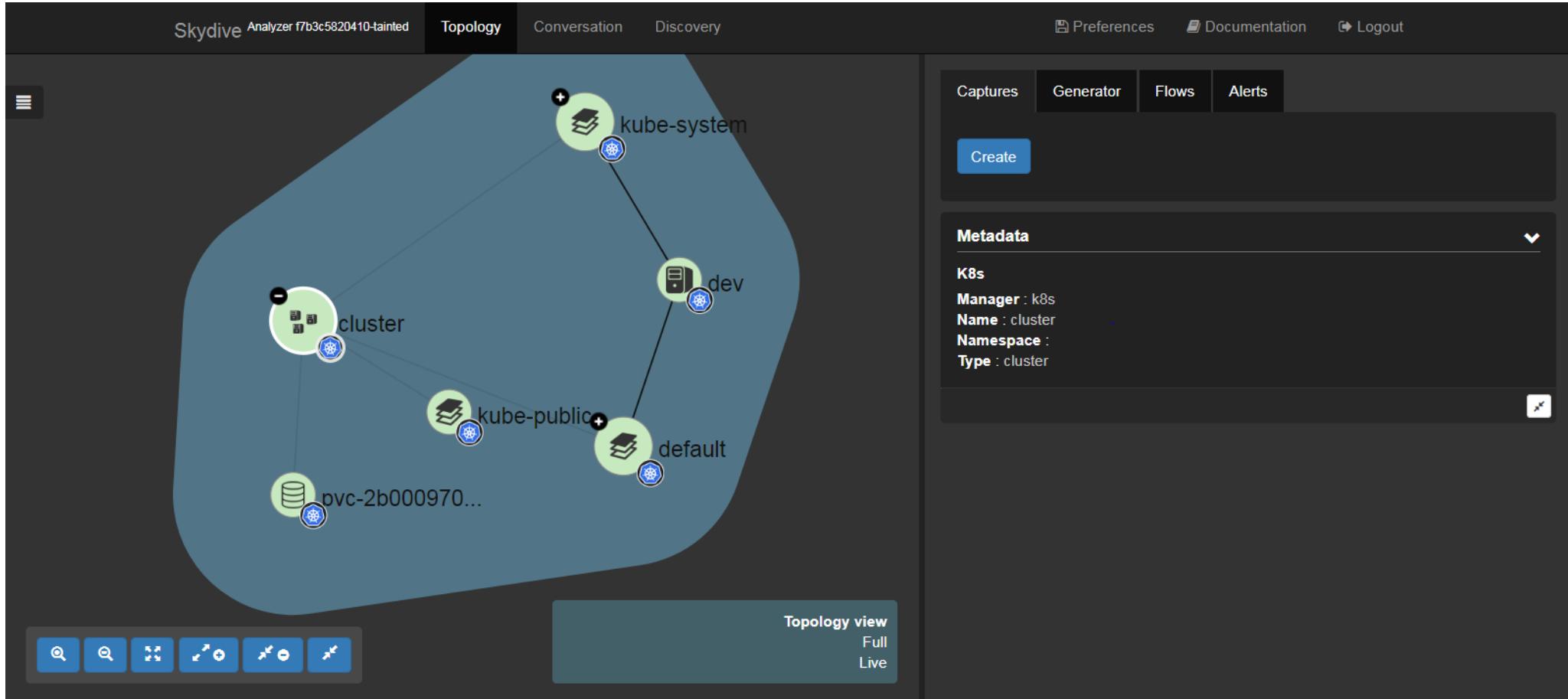


Production (IBM Cloud Private): optimized for on-premise cost/performance

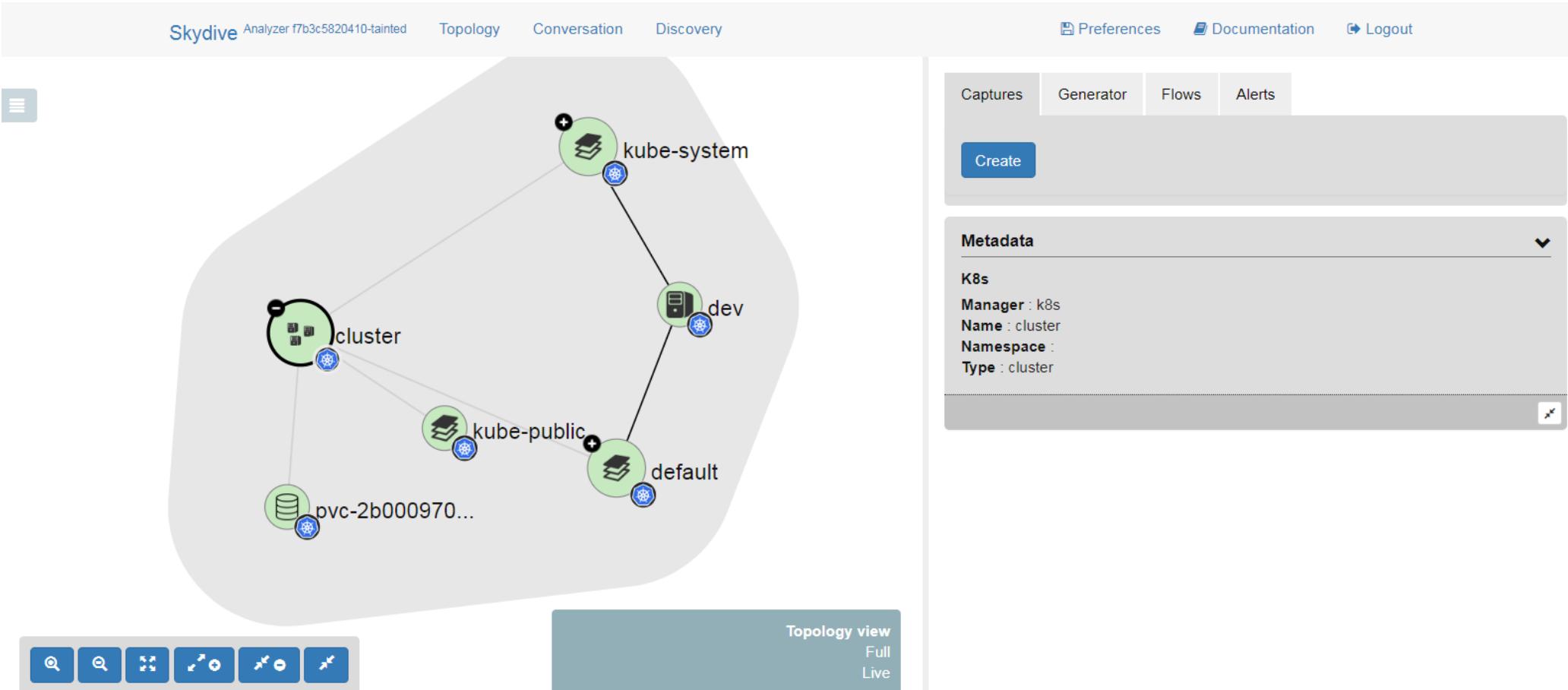


Lesson 7: it's easier to get new functionality accepted (by the community) if you don't change existing default behavior

Original Skydive Color Theme

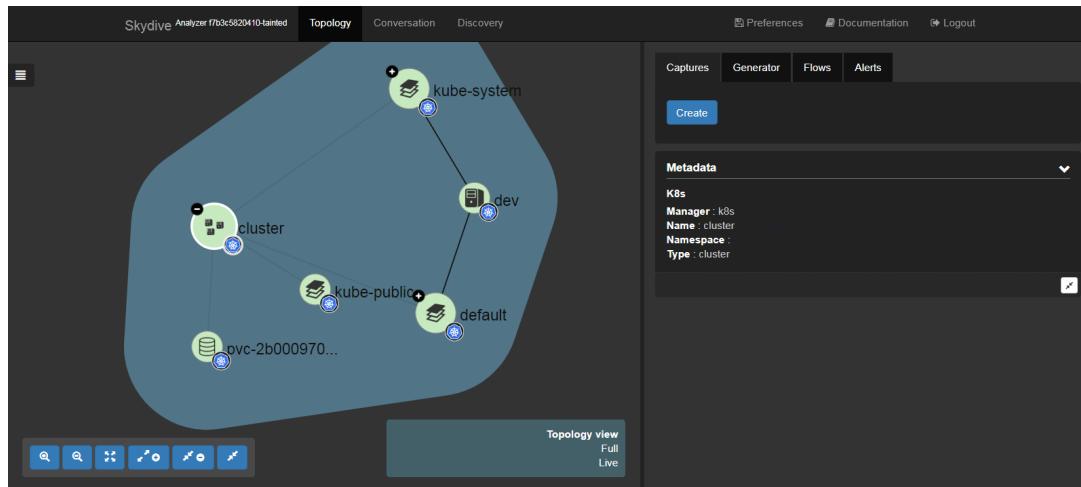


CogNETive repository “IBM” color theme

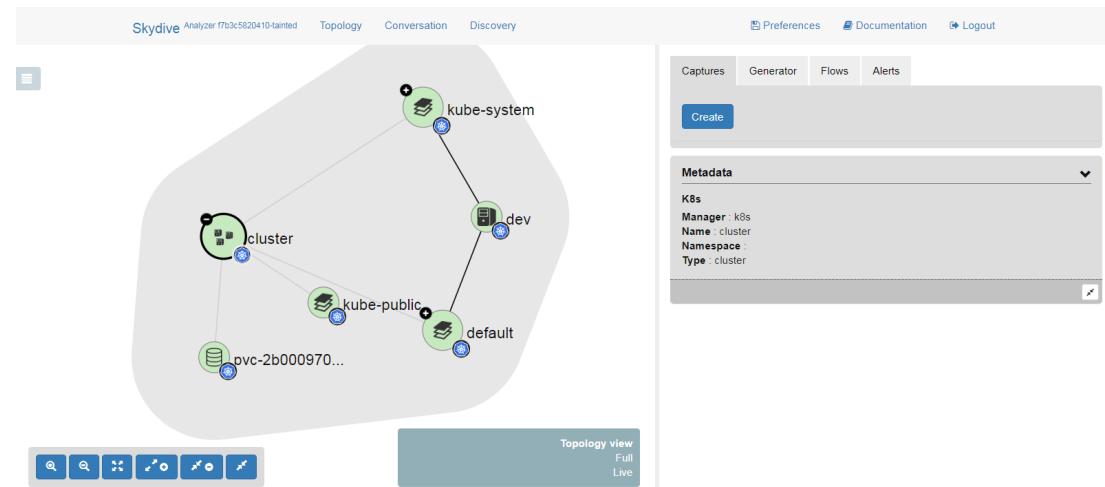


PR adds a new “light” color theme

`ui.theme == "" or ui.theme == "dark"`



`ui.theme == "light"`



Lesson 8: the earlier the phase in
which an issue is discovered the
lower the cost to address it

What is the 10x rule?

- The [Systems Sciences Institute](#) at IBM has reported that “the cost to fix an error found after product release was four to five times as much as one uncovered during design, and up to 100 times more than one identified in the maintenance phase.”

Build-time rather than execution-time

137	-	prefix := "G"	138	+	prefix := g.G
138		if !live {	139		if !live {
139	-	prefix = "G.At('-0s', 300)"	140	+	prefix = prefix.At("-0s", 300)
140		}	141		}
141	-	gremlin := fmt.Sprintf("%s.Flows().Has('LayersPath', 'Ethernet/IPv4/ICMPv4', 'NodeTID', '%s').Sort()", prefix, tid)	142	+	gremlin := prefix.Flows().Has("LayersPath", "Ethernet/IPv4/ICMPv4", "NodeTID", tid).Sort()

Development rather than testing (CI)

skydive-project / skydive

Watch 69 Unstar 682 Fork 149

Code Issues 68 Pull requests 14 Projects 0 Wiki Insights

devmode: fix vagrant virtualbox (deps, chmod, doc) #1007 Edit

Merged lebauc merged 6 commits into skydive-project:master from hunchback:devmode-vbox-fix 8 days ago

Conversation 84 Commits 6 Checks 0 Files changed 2

Changes from all commits ▾ Jump to... +68 -26

Diff settings Review changes

View

8 contrib/ansible/roles/skydive_dev/tasks/fedora.yml

```
@@ -1,6 +1,8 @@
1 ...
2 -- package:
3 -   name: "http://download1.rpmfusion.org/free/fedora/rpmfusion-free-release-27.noarch.rpm"
4 -   state: present
5
6   - name: "Updating packages"
7     shell: "dnf update -y"
8
1 ...
2 +- name: "Installing the rpmfusion repo packages"
3 + dnf: name={{ item }}
4 + state=present
5 + with_items:
6 +   - http://download1.rpmfusion.org/free/fedora/rpmfusion-free-release-{{ ansible_distribution_version }}.noarch.rpm
7   - name: "Updating packages"
8     shell: "dnf update -y"
```

Testing (CI) rather than production

helm: added a minimal install/delete test #944

Edit

 Open hunchback wants to merge 2 commits into skydive-project:master from hunchback:helm-tests

Conversation 75

Commits 2

Checks 0

Files changed 6

+174 -25

Commits on Jun 6, 2018

minikube: add MINIKUBE_DRIVER to default VirtualBox driver for CI

 hunchback committed 9 days ago



e125ec6



helm: added a minimal skydive-helm-chart create/delete test

 hunchback committed 9 days ago 



80ab4a8



Lesson 9: by standardizing
formatting/syntax/layout you free
developers to be creativity in places
it actually provides some benefit

Gofmt: tool to re-format code

- Usage

```
$ go fmt path/to/your/package  
$ gofmt -w yourcode.go
```

- Examples

- Fix alignment and indentation

- Benefits

- easier to **write**: never worry about minor formatting concerns while hacking away,
 - easier to **read**: when all code looks the same you need not mentally convert others' formatting style into something you can understand.
 - easier to **Maintain**: mechanical changes to the source don't cause unrelated changes to the file's formatting; diffs show only the real changes.
 - **uncontroversial**: never have a debate about spacing or brace position ever again!

Golint: identify style mistakes

- Usage
 - `$ go get -u golang.org/x/lint/golint`
 - `$ golint yourcode.go`
- Examples
 - A variable is public scope but is only used within the package
- Benefits
 - Cleaner code

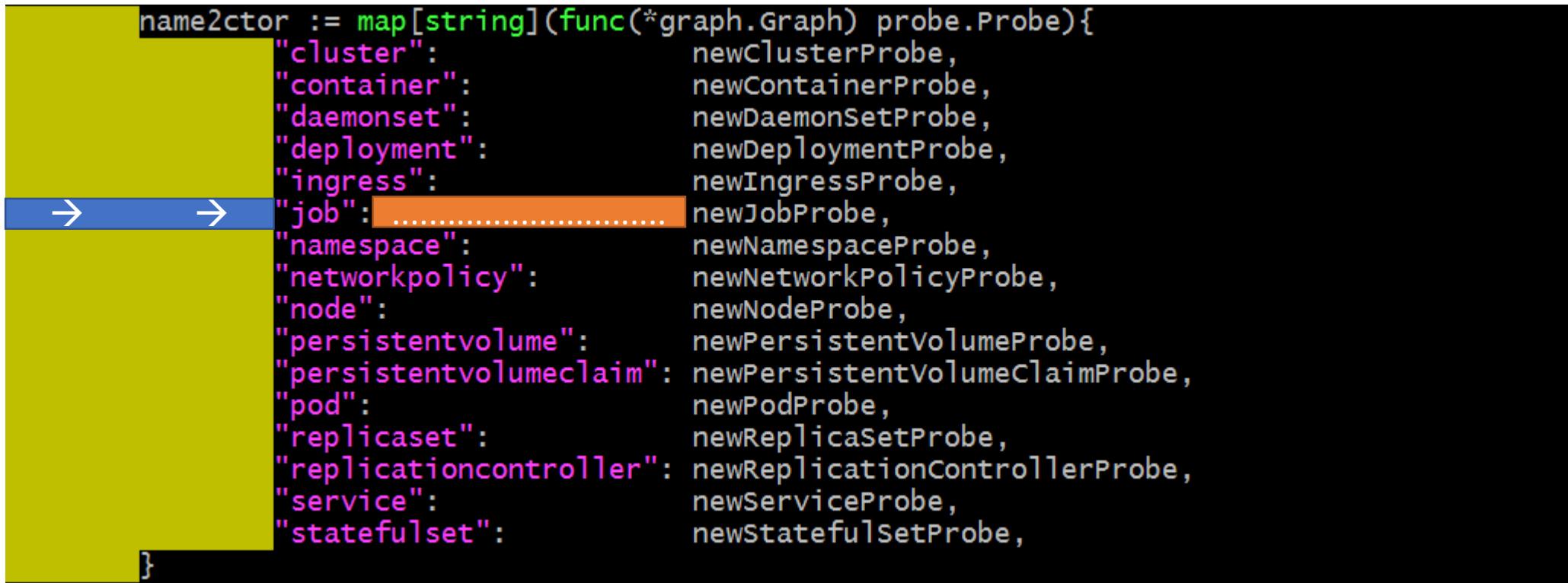
enforced by gofmt

```
25 import (
26     "github.com/skydive-project/skydive/config"
27     "github.com/skydive-project/skydive/logging"
28     "github.com/skydive-project/skydive/probe"
29     "github.com/skydive-project/skydive/topology/graph"
30 )
31
32 // Probe for tracking k8s events
33 type Probe struct {
34     bundle *probe.ProbeBundle
35 }
36
37 func makeProbeBundle(g *graph.Graph) *probe.ProbeBundle {
38     name2ctor := map[string](func(*graph.Graph) probe.Probe){
39         "cluster":      newClusterProbe,
40         "container":    newContainerProbe,
41         "deployment":   newDeploymentProbe,
42         "ingress":      newIngressProbe,
43         "namespace":    newNamespaceProbe,
44         "networkpolicy": newNetworkPolicyProbe,
45         "node":         newNodeProbe,
46         "pod":          newPodProbe,
47         "service":      newServiceProbe,
48     }
```

enforced by coding convention

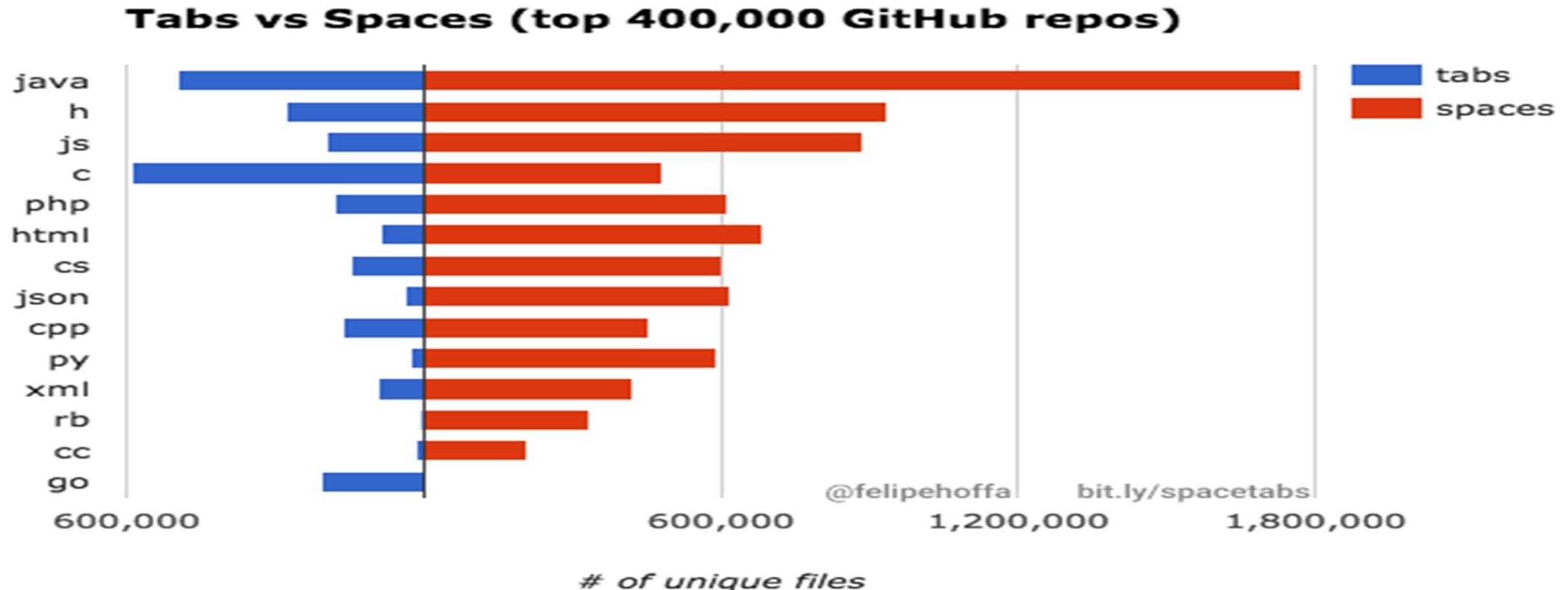
Lesson: favor spaces over tabs
(when you have the choice ...)

No choice in GO as gofmt automatically: indents with tabs aligns with spaces



```
name2ctor := map[string](func(*graph.Graph) probe.Probe){
    "cluster":           newClusterProbe,
    "container":         newContainerProbe,
    "daemonset":         newDaemonSetProbe,
    "deployment":        newDeploymentProbe,
    "ingress":           newIngressProbe,
    "job": .....       newJobProbe,
    "namespace":         newNamespaceProbe,
    "networkpolicy":     newNetworkPolicyProbe,
    "node":               newNodeProbe,
    "persistentvolume":  newPersistentVolumeProbe,
    "persistentvolumeclaim": newPersistentVolumeClaimProbe,
    "pod":                 newPodProbe,
    "replicaset":         newReplicaSetProbe,
    "replicationcontroller": newReplicationControllerProbe,
    "service":             newServiceProbe,
    "statefulset":         newStatefulSetProbe,
}
```

When there is a choice most GitHub developers favor spaces (for both indent and alignment)



<https://medium.com/@hoffa/400-000-github-repositories-1-billion-files-14-terabytes-of-code-spaces-or-tabs-7cfe0b5dd7fd>

Spaces vs. tabs



looks identical
on all editors



diff format
always
readable



type 8 spaces
or set your
editor

```
.....foreach (var rev in revs)
....{
....    if (prevRawText.Length
....    {
....        uid = rev.UserId.
....        score = LevenshteinDistance(prevRawText, rev.RawText);
....        totScore += score;
....        compares++;
....        if (scores.ContainsKey(uid))
....            scores[uid]++;
....        else
....            scores.Add(uid, score);
....    }
....    prevRawText = rev.RawText;
....}
```

```
→ → → foreach (var rev in revs)
→ → {
→ → → → if (prevRawText.Length
→ → → {
→ → → → → uid = rev.UserId.
→ → → → → score = LevenshteinDistance(prevRawText, rev.RawText);
→ → → → → totScore += score;
→ → → → → compares++;
→ → → → → if (scores.ContainsKey(uid))
→ → → → → → scores[uid]++;
→ → → → → → else
→ → → → → → → scores.Add(uid, score);
→ → → → → }
→ → → → → prevRawText = rev.RawText;
→ → → }
```



my look
different on
each editor



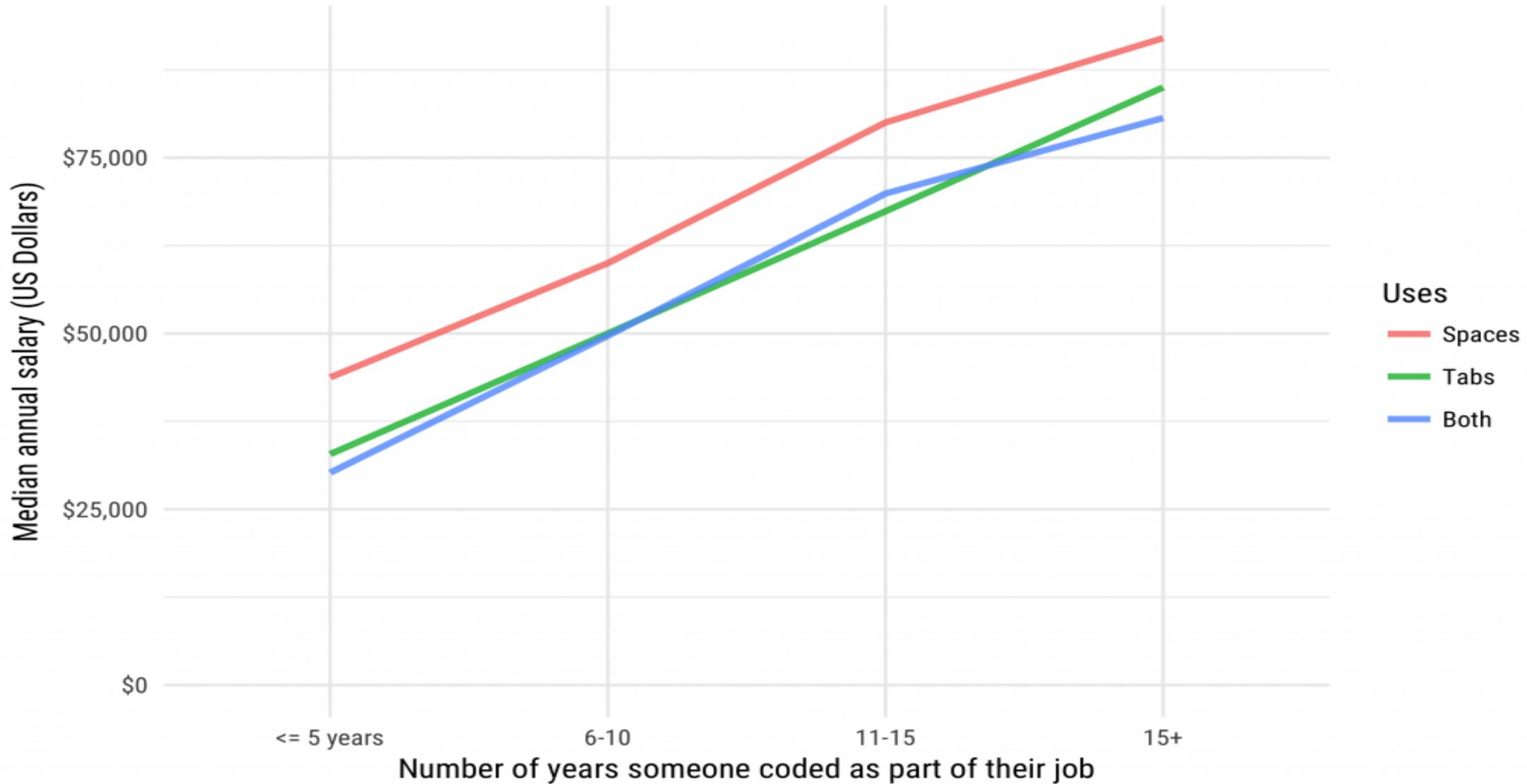
diff format
white spaces
are skew



type 1 tab

Salary differences between developers who use tabs and spaces

From 12,426 professional developers in the 2017 Developer Survey results, who provided tabs/spaces and salary



<https://stackoverflow.blog/2017/06/15/developers-use-spaces-make-money-use-tabs/>

Salary differences between developers who use tabs and spaces

From 12,426 respondents in the 2017 Developer Survey results

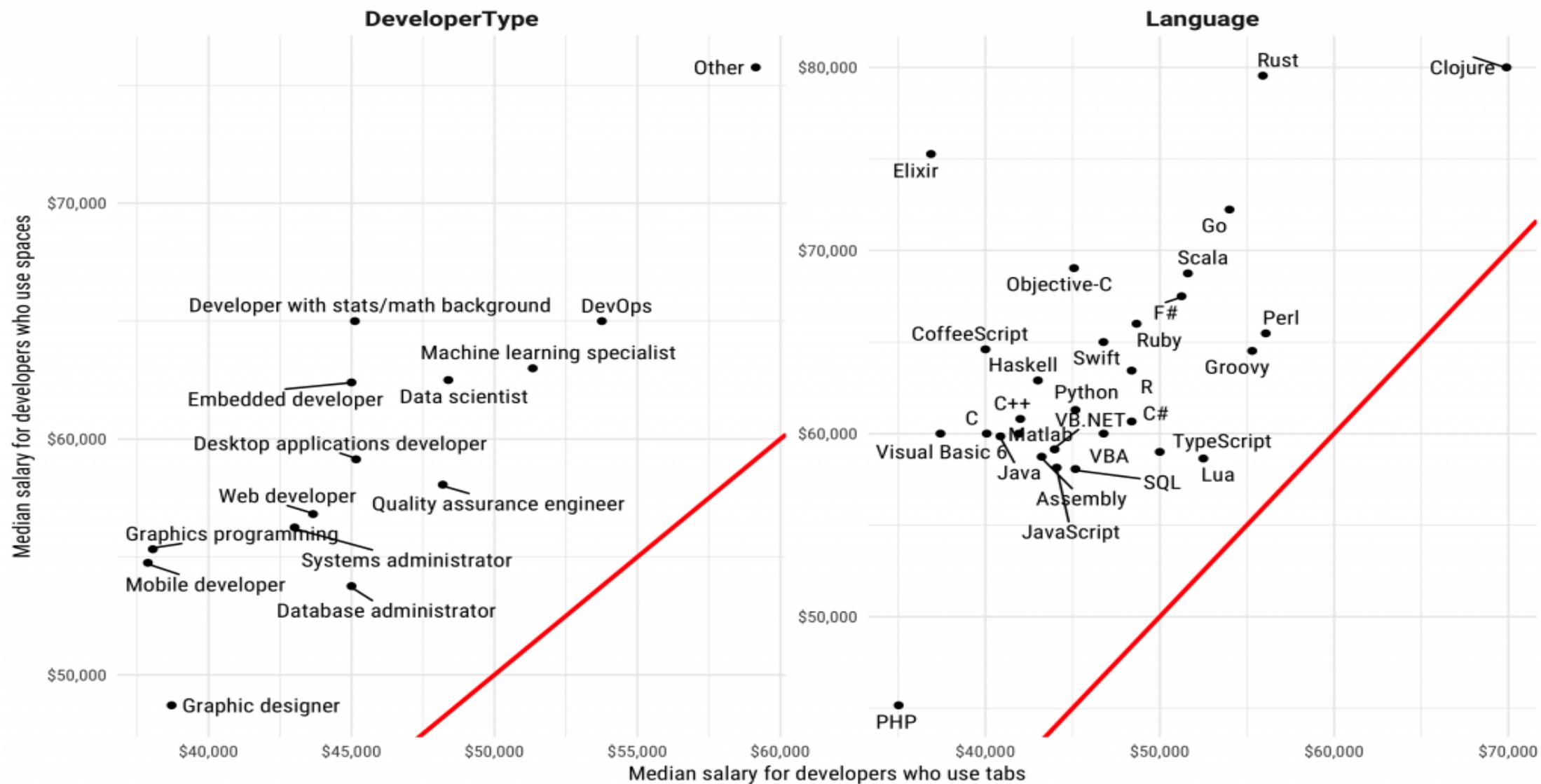


<https://stackoverflow.blog/2017/06/15/developers-use-spaces-make-money-use-tabs/>

Tabs/spaces gap within each developer type and language

Among 12,424 respondents on the 2017 Stack Overflow Developer Survey

Only languages/developer types marked by at least 100 respondents were included



The model estimated that **using spaces instead of tabs is associated with an 8.6% higher salary.**

Put another way, **using spaces instead of tabs is associated with as high a salary difference as an extra 2.4 years of experience.**

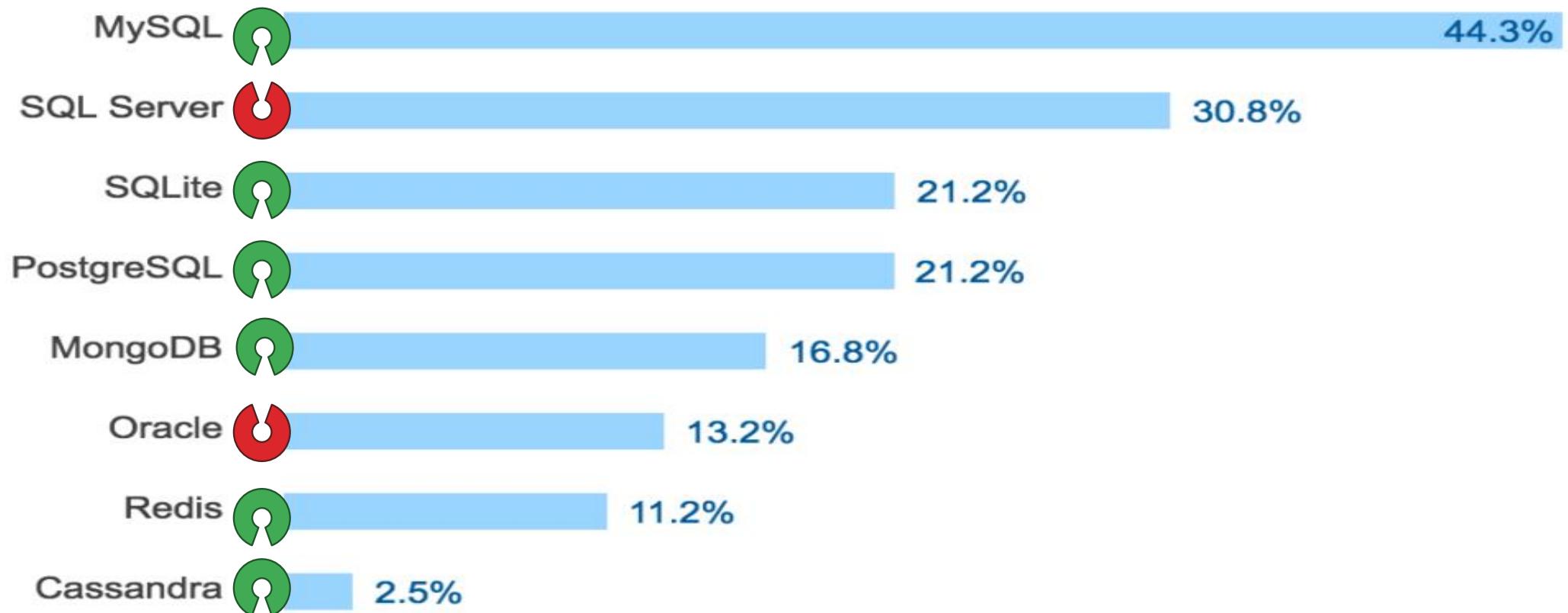


Lesson 10: the open source model *does* works

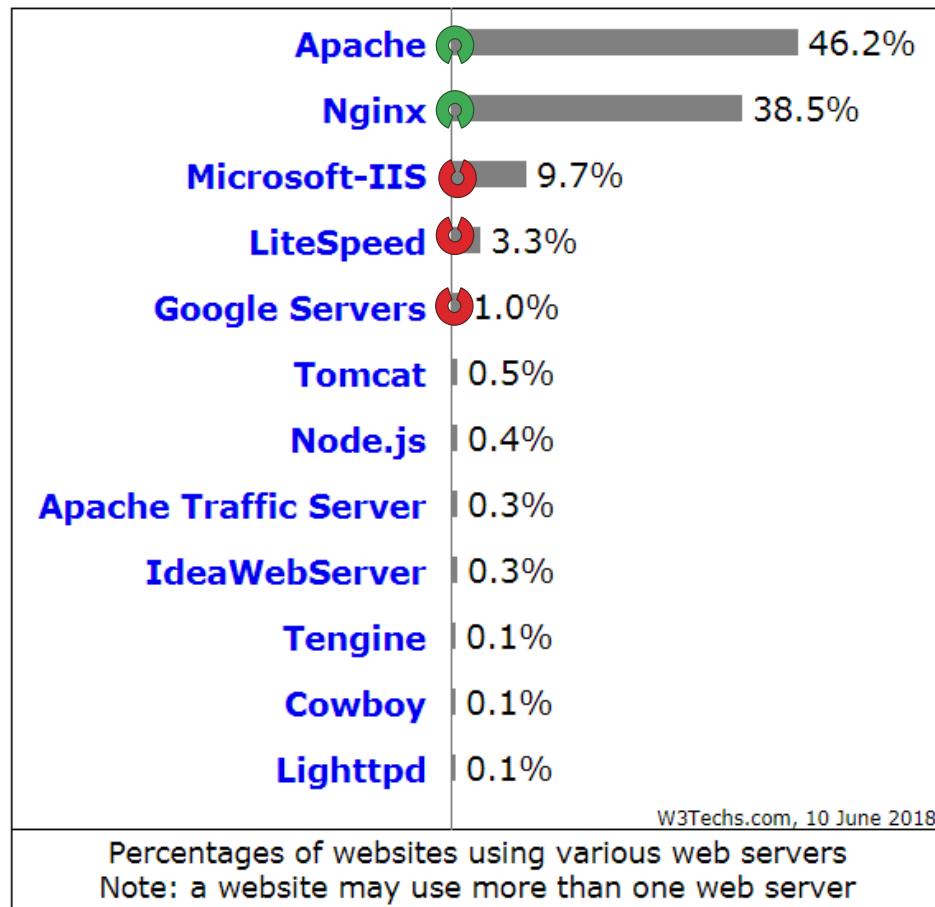
Why are organizations moving to OSS?

- Security – more eyeballs reviewing the code
- Quality – as has come up for many IT surveys
- Support – you have an eco-system supporting product
- Licensing – simple licensing (MIT, GPLv2, etc.)
- Longevity – fate of code not tied to a single entity

What is the most popular database?

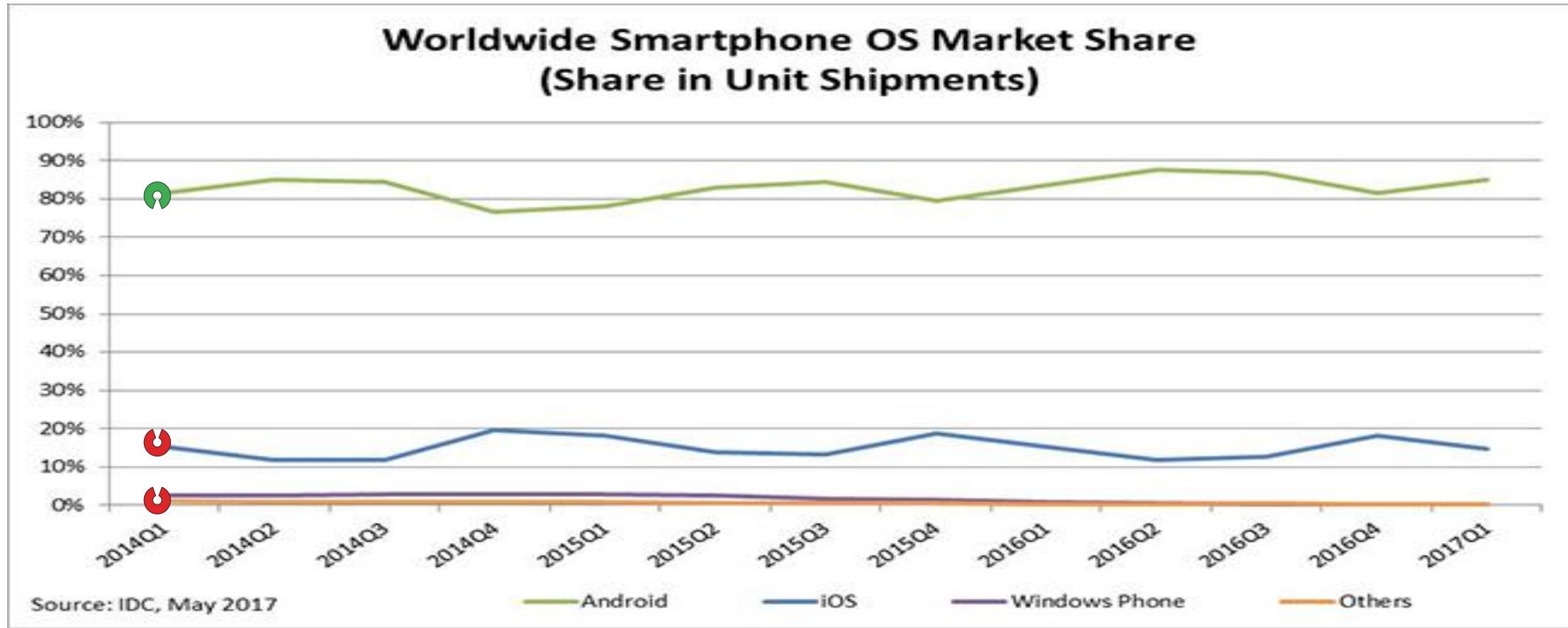


What is the most popular Webserver?



https://w3techs.com/technologies/overview/web_server/all

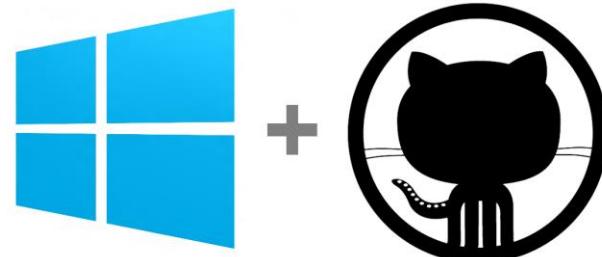
What is the most popular mobile OS?



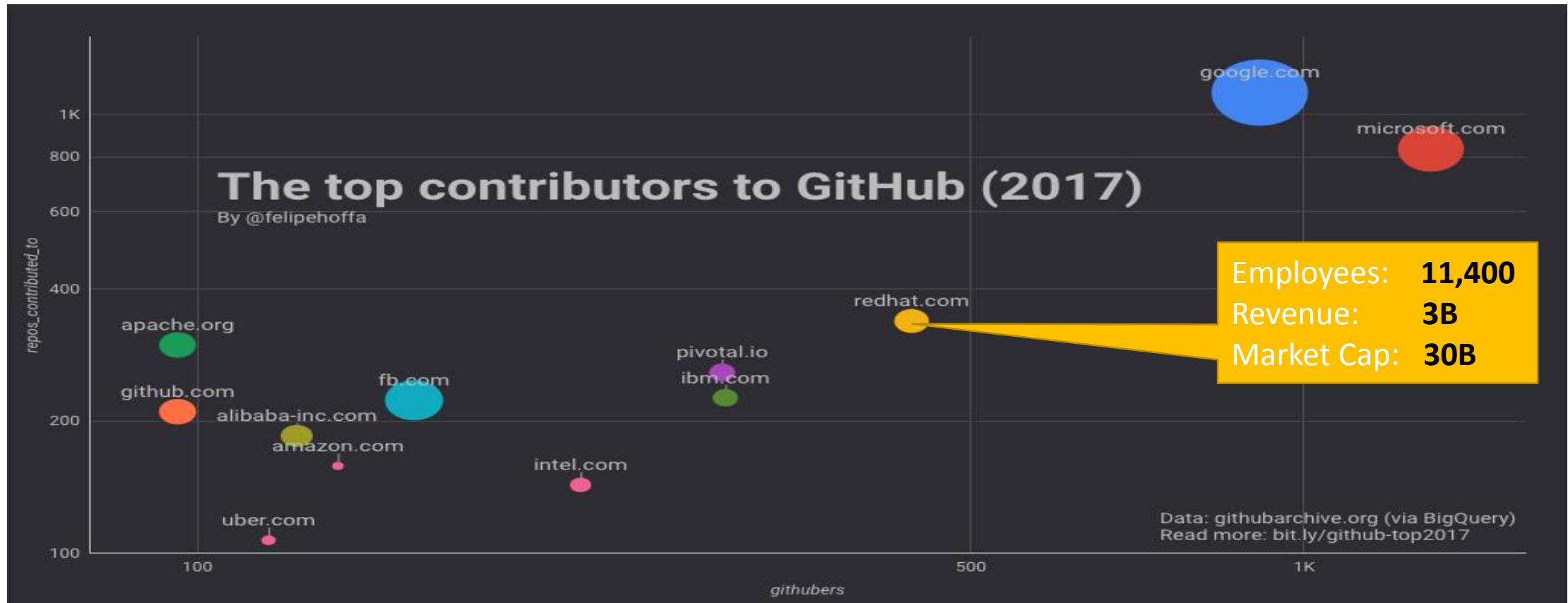
<https://www.idc.com/promo/smartphone-market-share/os>

Microsoft acquiring GitHub for \$7.5 billion

- Microsoft [joined the Linux Foundation](#) nearly two years ago, and more than 15 years after former CEO Steve Ballmer labeled Linux “a cancer.” The hostility between Microsoft and Linux is well and truly over, and developers and businesses are now reacting to the new era of [Microsoft acquiring GitHub](#). “This is pretty good news for the world of Open Source and we should celebrate Microsoft’s smart move,” [says Jim Zemlin](#), the executive director at the Linux Foundation.



Who really contributes to OSS?



<https://medium.freecodecamp.org/the-top-contributors-to-github-2017-be98ab854e87>

How is money being made off OSS?

- By running a SaaS offering based on OSS foundations
- By selling services and certification
- By combining OSS with proprietary software

Why should I participate in an OSS project?

- Disseminate your finding to a wide audience
- Get to work with and learn from professionals
- Connect immediately/directly with your customers
- Its' fun ...



Thank You!