

# Drawing your Kubernetes cluster the right way

(how to present the cluster without scaring people)

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# The Kubernetes is known for its high entrance threshold

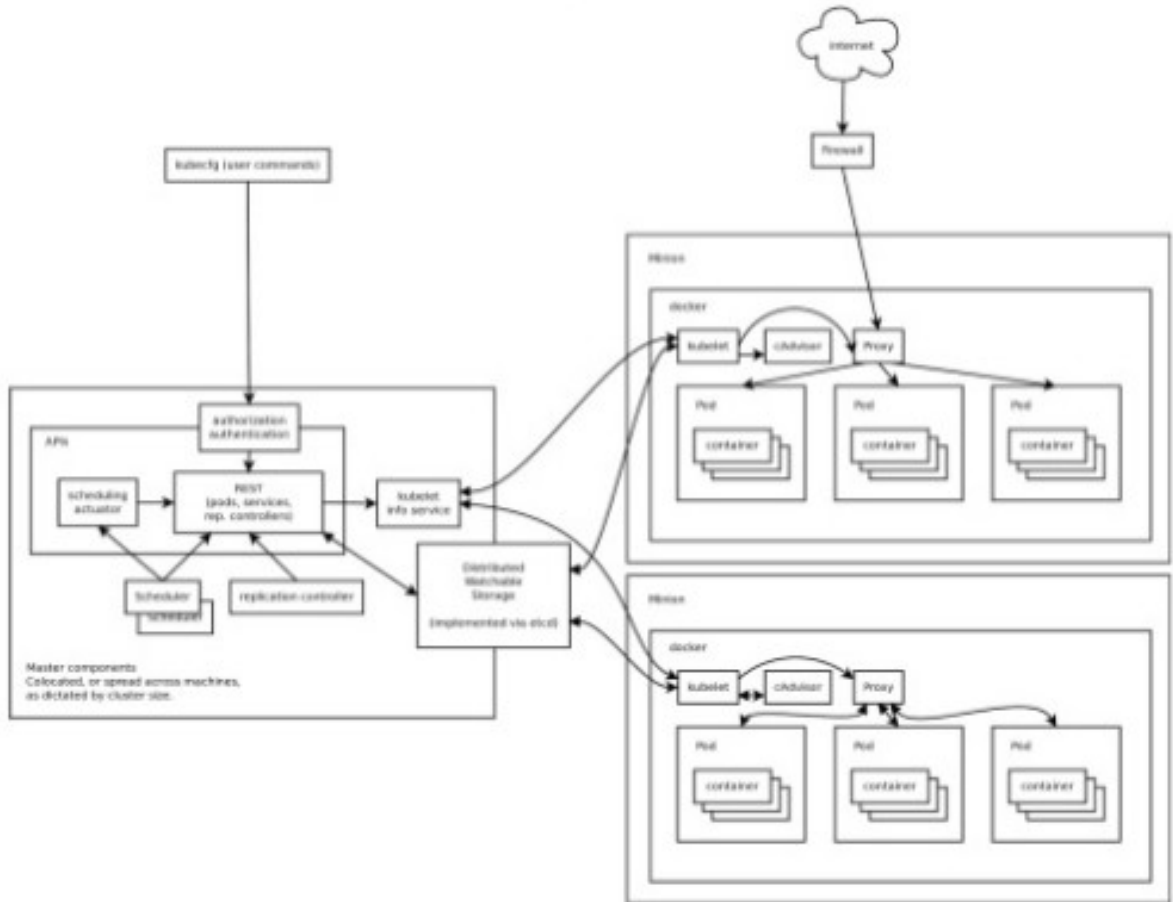
- A lot of interacting entities specific to K8S
  - Master node
  - Worker node
  - Pod
  - Replication Controller Service
  - Label, Selector
  - Deployment
  - Volume
  - Load balancer
  - Secret
  - Probe
  - Namespace
  - taints/tolerations
  - affinity/antiaffinity
  - Operator
  - ...
- A good drawing makes it easier to understand...
  - ...but the opposite is true as well :)

# What makes drawing your Kubernetes cluster so different?

- Connection lines are outdated :)
  - Years ago we were drawing network diagrams with cables...
  - ...but the “network” of your cluster is more about Namespaces, Network Policies, ...
  - ...so there’s much more sense in drawing **objects**, and putting them in **groups** than in connecting them with lines
- Groups are objects
  - Ouch :)
  - Sometimes it’s tricky to decide whether we should draw something as a group or as a single object

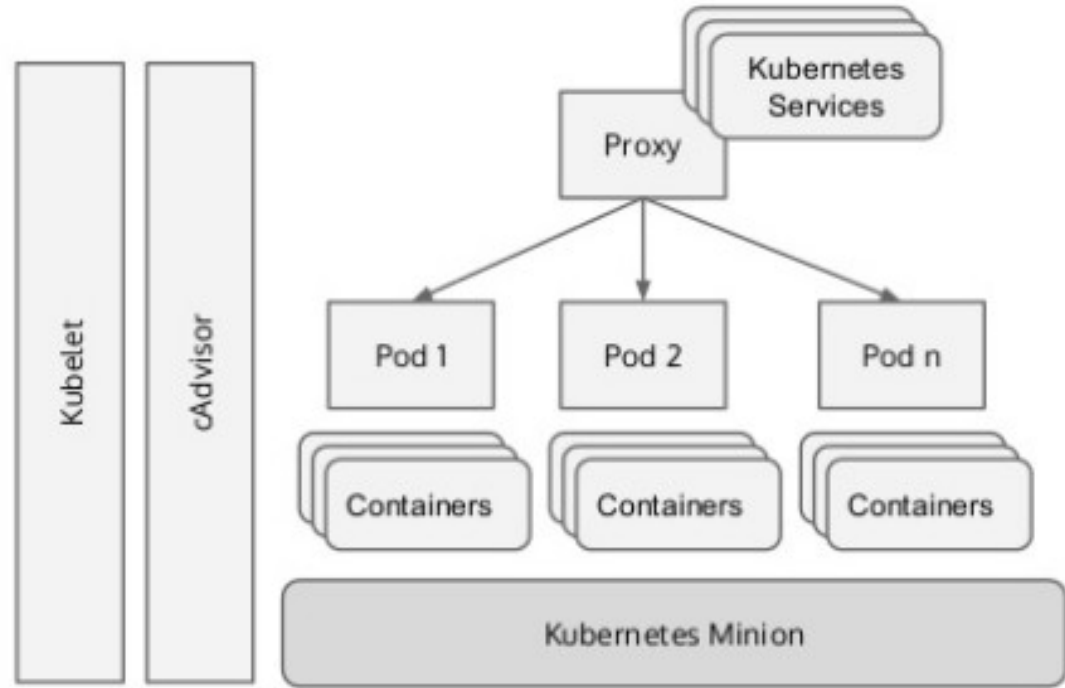
# Black&White drawings (1/4)

- Some people draw their cluster with graphviz
  - good old-school way...
  - or not so good?
    - Do you remember your cluster is not a graph?



# Black&White drawings (2/4)

- Some use LibreOffice or something similar
  - Actually, it's easier to make drawing slightly better
  - You get filled background with no additional efforts

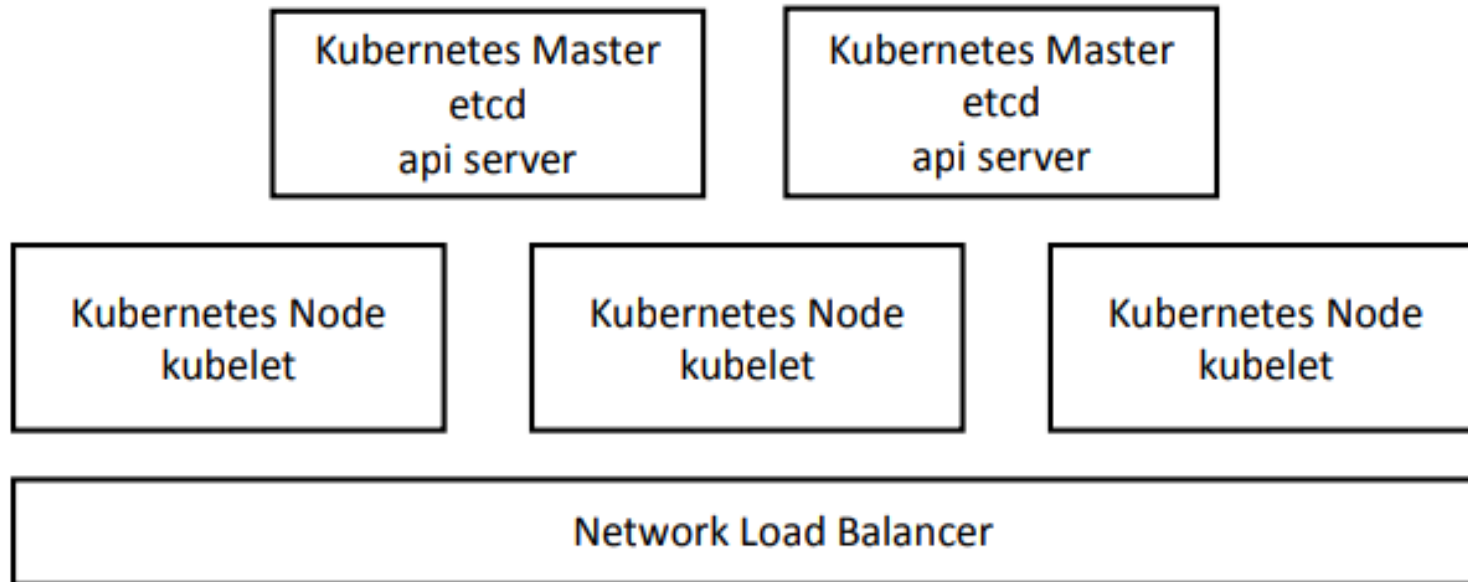


# Black&White drawings (3/4)

- Grouping is actively used
- Black and white style with no background works more or less well for nested groups...
  - But 50 shades of gray for the background make it easier to distinguish different types of groups!!!
  - OK, less shades :)

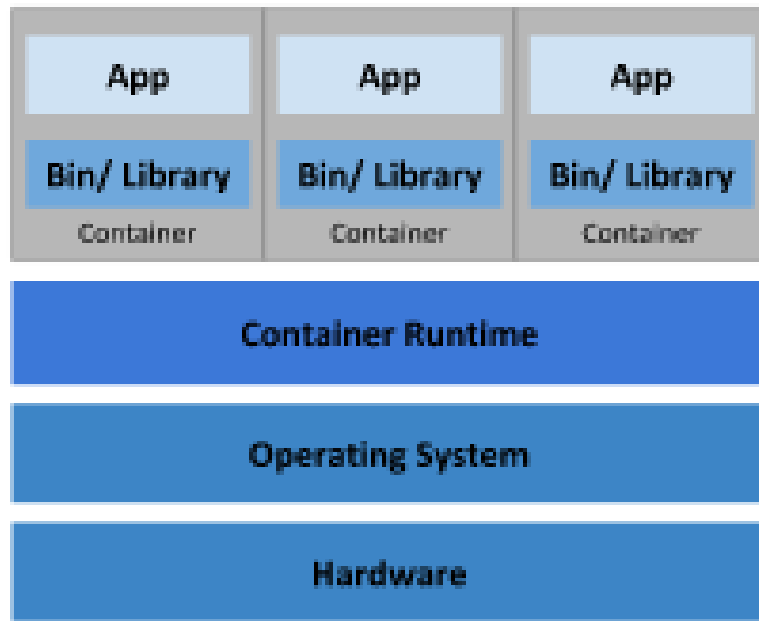
# Black&White drawings (4/4)

- Often there are nodes without connections
- Sometimes without them at all, absolutely :)



# Adding color (1/2)

- Of course, not only shades of gray are suitable for highlighting groups
- By the way, this is one of several diagrams in the official k8s docks :)
- And by the way, black on blue is a bad choice, minimal contrast



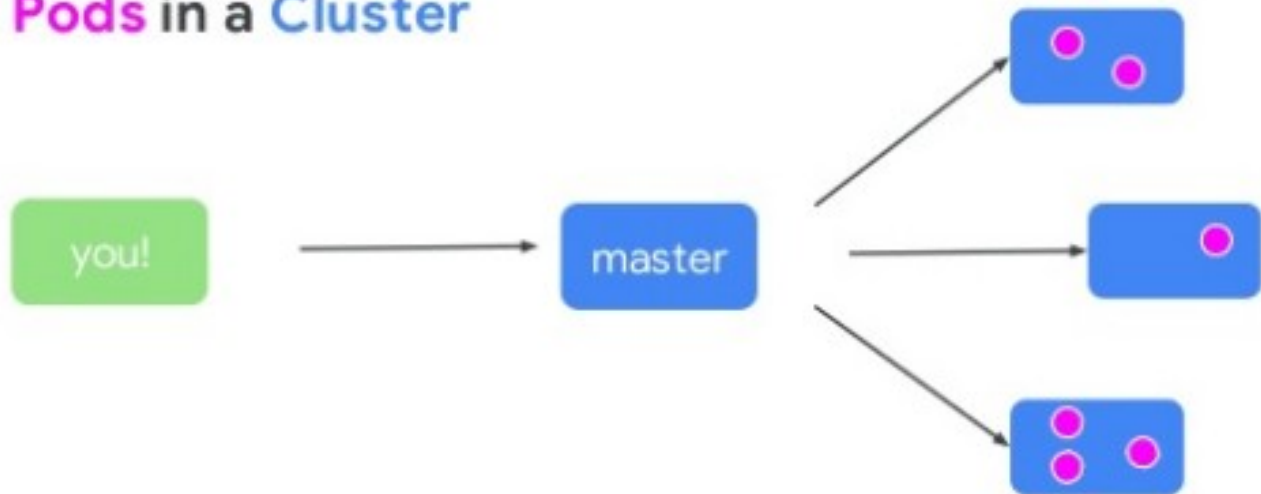
## Container Deployment



# Adding color (2/2)

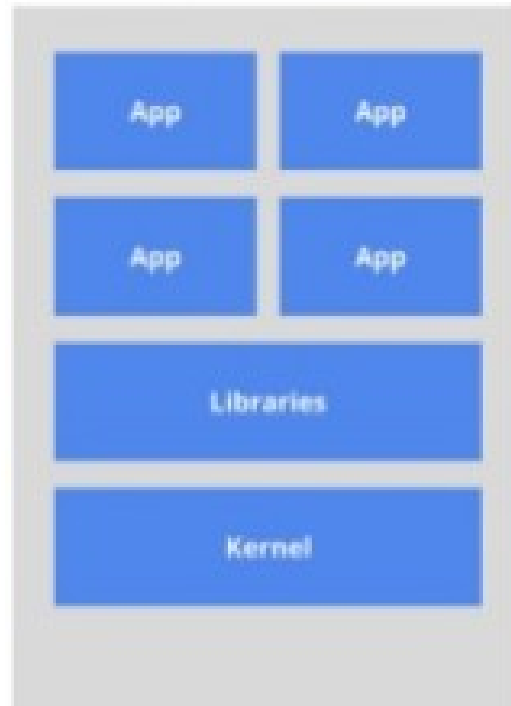
- Few examples from Megan O'Keefe (2019):

## Pods in a Cluster



## Virtual Machines

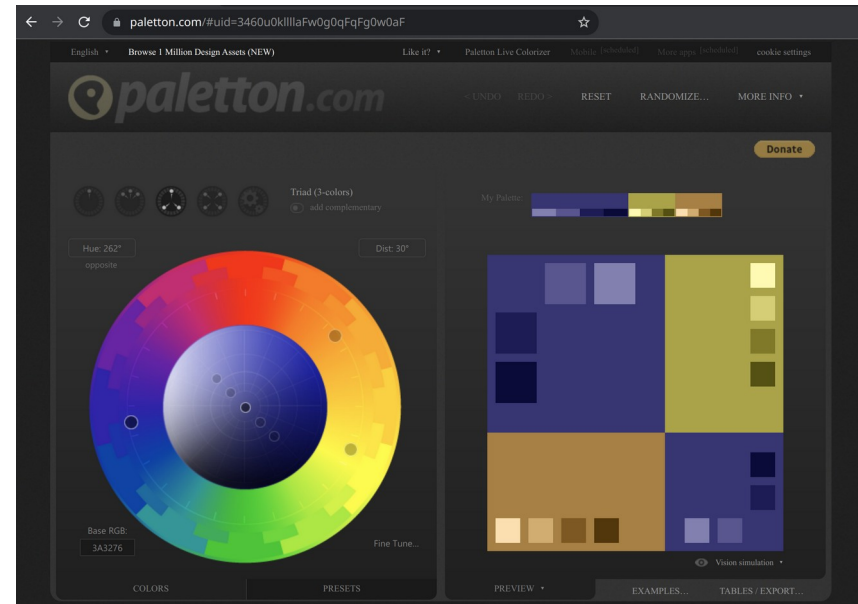
The old way: Applications on host



Heavyweight, non-portable  
Relies on OS package manager

# Choosing colors

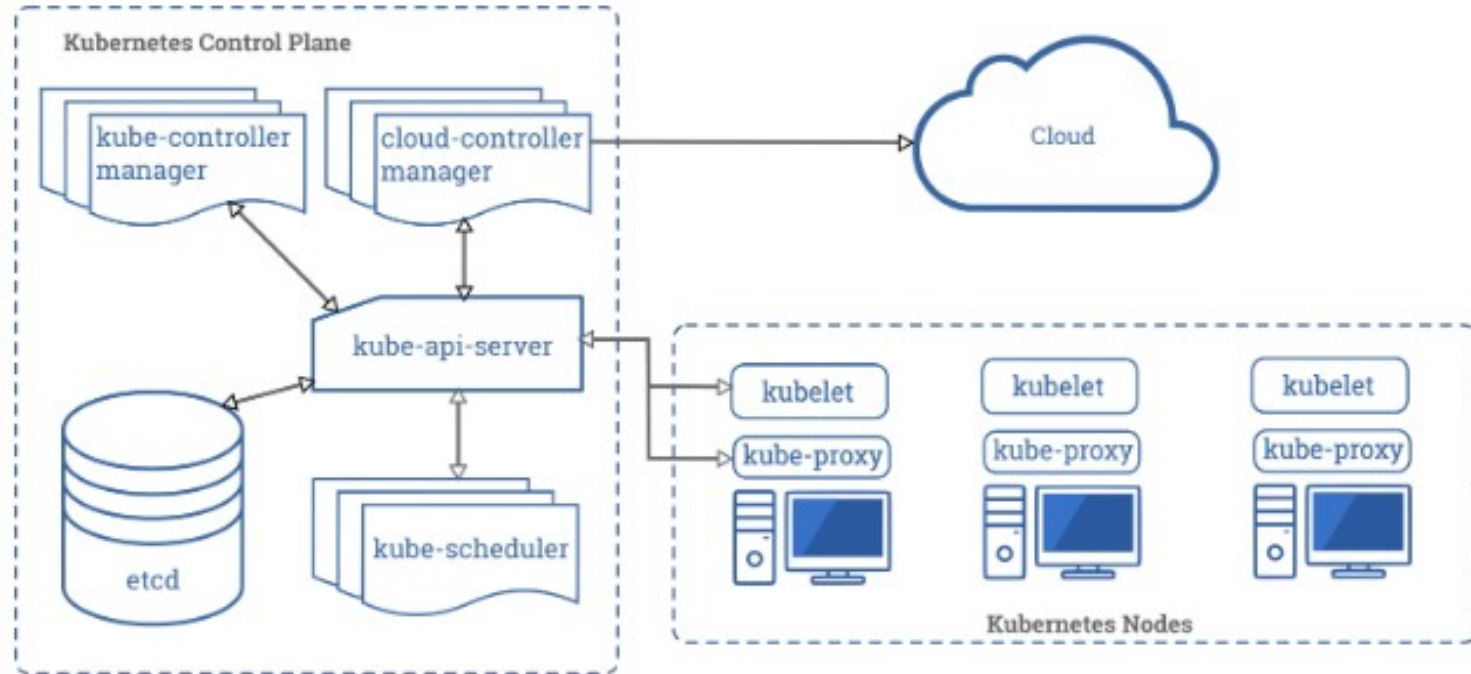
- Use color wheel
  - Tons of sites allow you find out good 2-, 3-, and 4-color combinations
    - <https://paletton.com/>
    - <https://www.canva.com/colors/color-wheel/>
    - ...
- If you have recommended set of colors – great!
  - e.g. when you make docs for some product, or corporate presentation, etc. – it's a strong point!
    - You're getting your own recognizable style of diagrams for free



# What about network diagrams (1/3)

The 2<sup>nd</sup> drawing comes from the official k8s docs :)

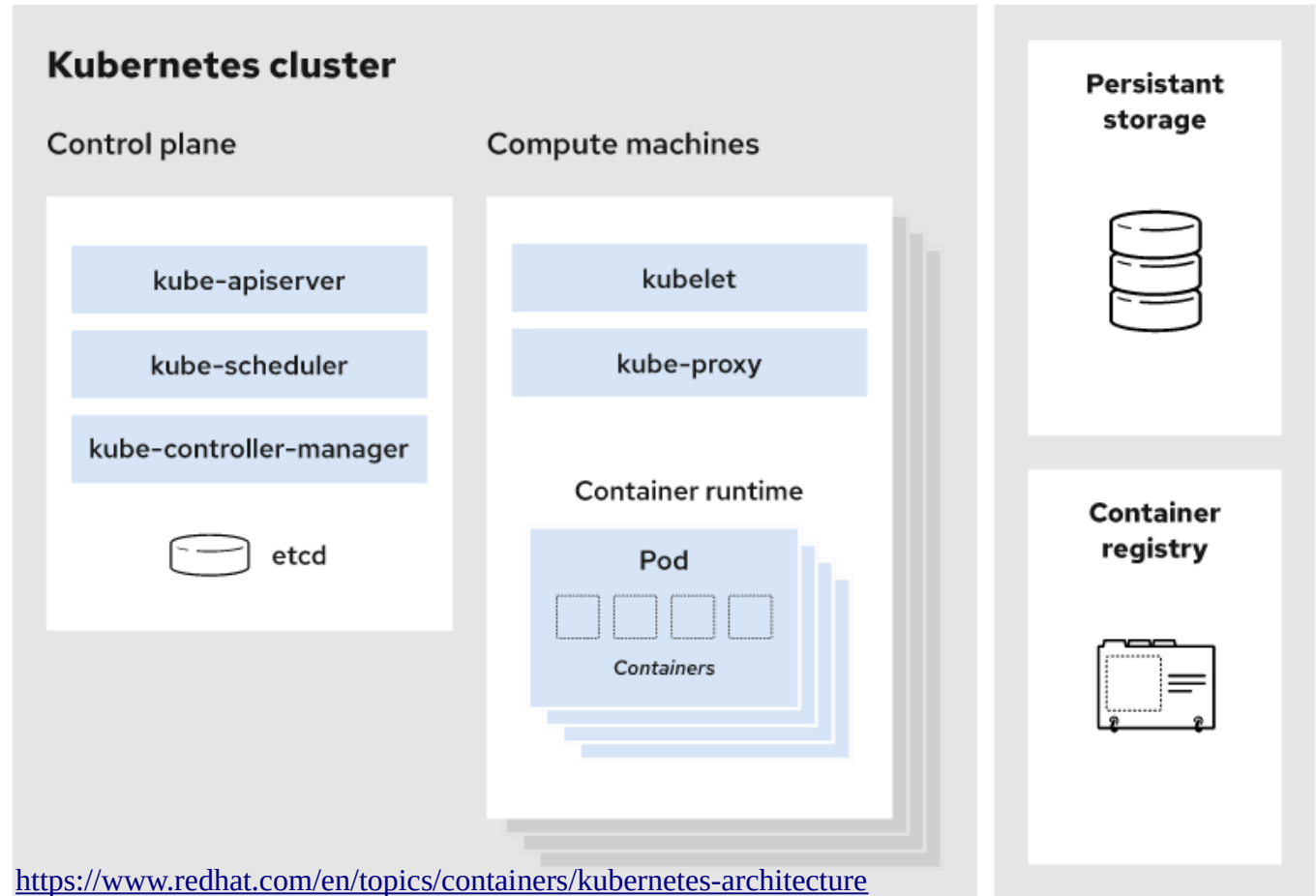
- stacks
- UML-like arrows
- LibreOffice



Let's draw it quickly :)

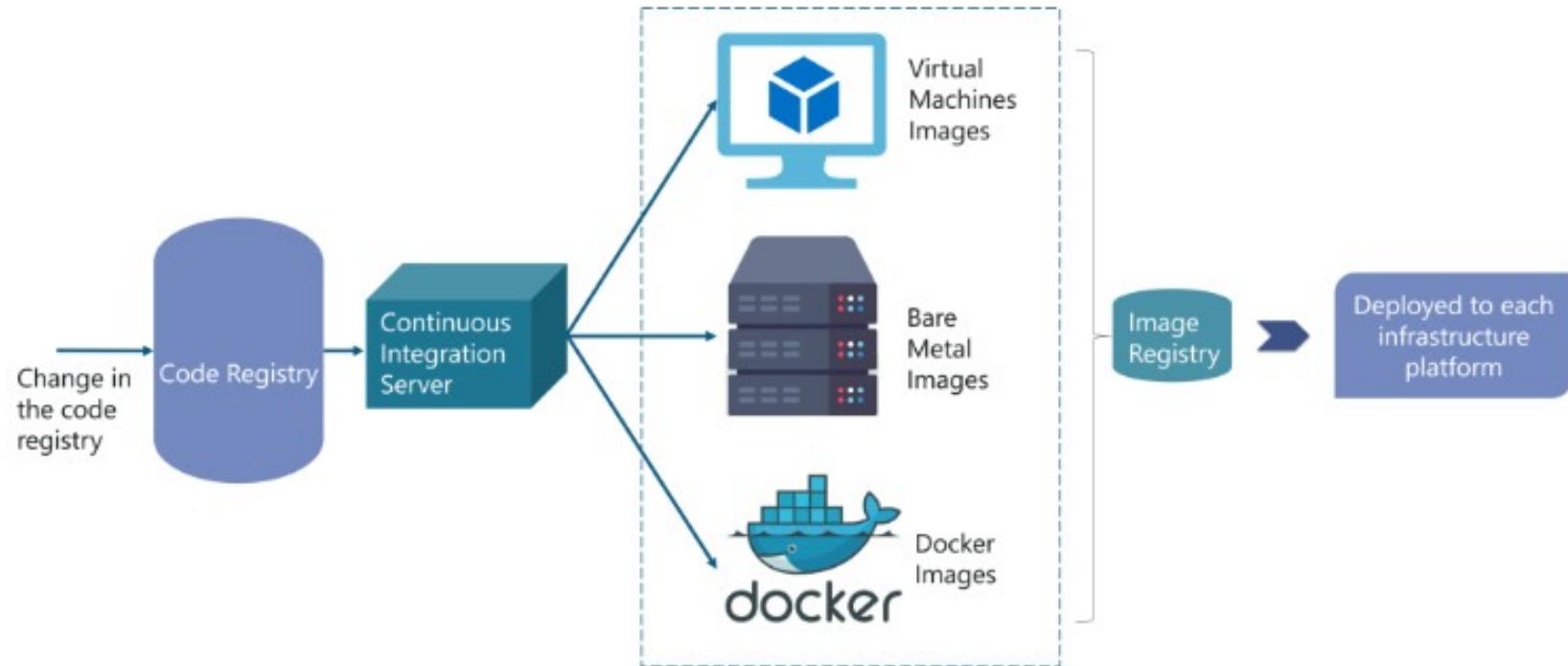
# What about network diagrams (2/3)

- Figure from RedHat
- Network-style icons
- stacks
- No lines
- Easy reading



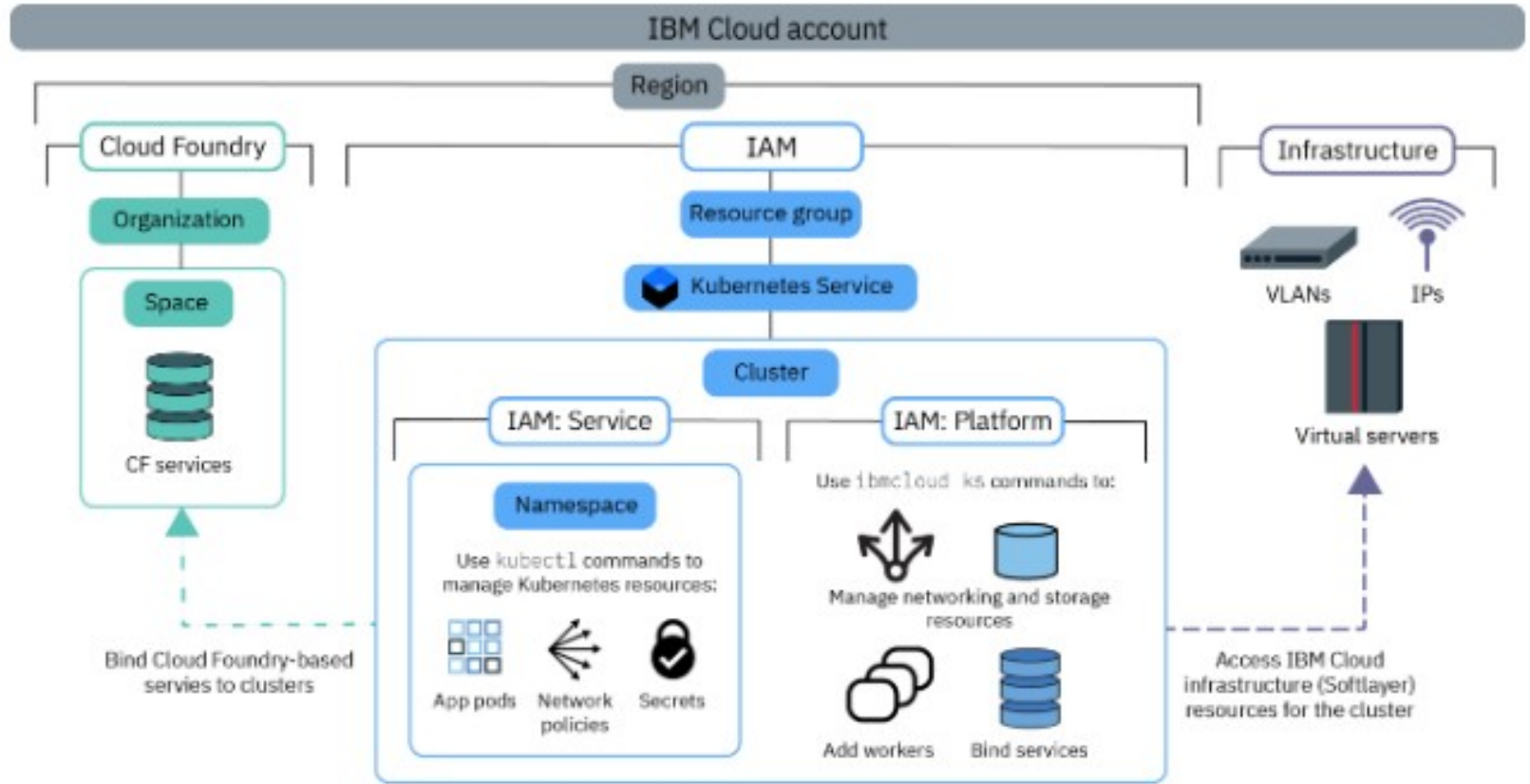
# What about network diagrams (3/3)

- One more example from Sahiti Kappagantula (2019)  
<https://www.edureka.co/blog/kubernetes-tutorial>



# What if we add more icons?

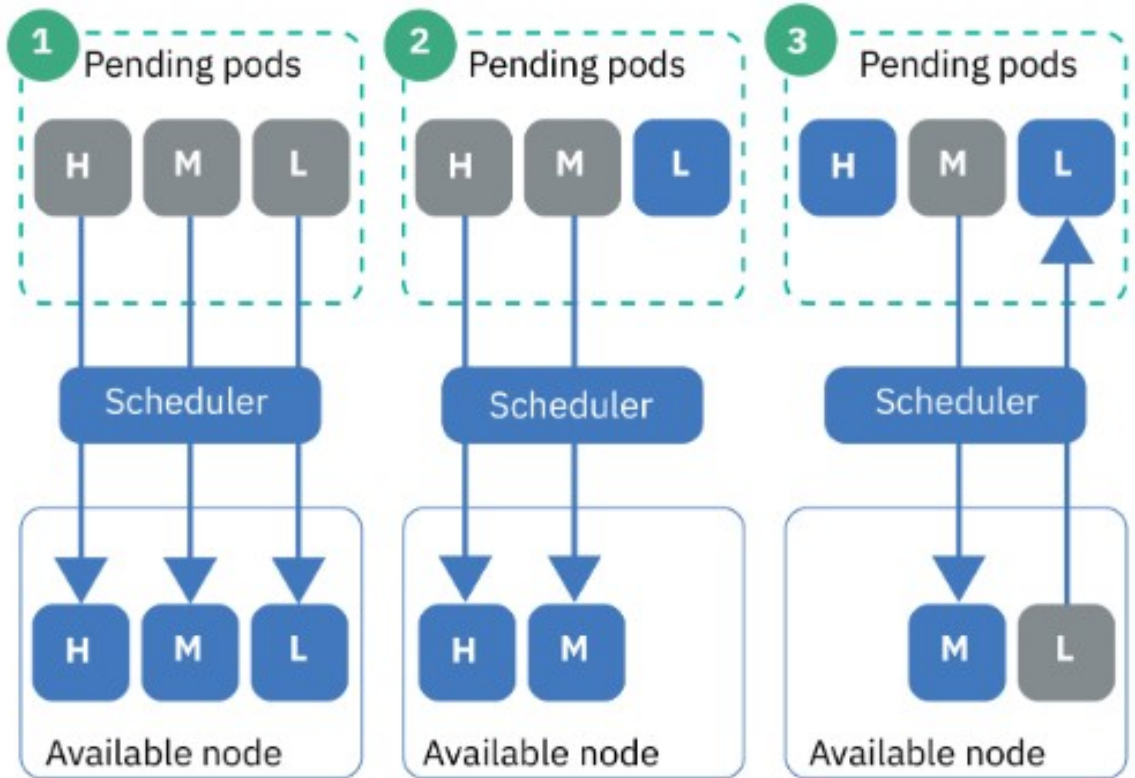
- Let's say icon and text should be equal?
- The diagram becomes hard to read, that's what :)
- And the lack of lines on it will make the user feel bad :)
  - No gaze anchors



BTW, that's an example from IBM <https://cloud.ibm.com/docs/containers?topic=containers-health&locale=en>

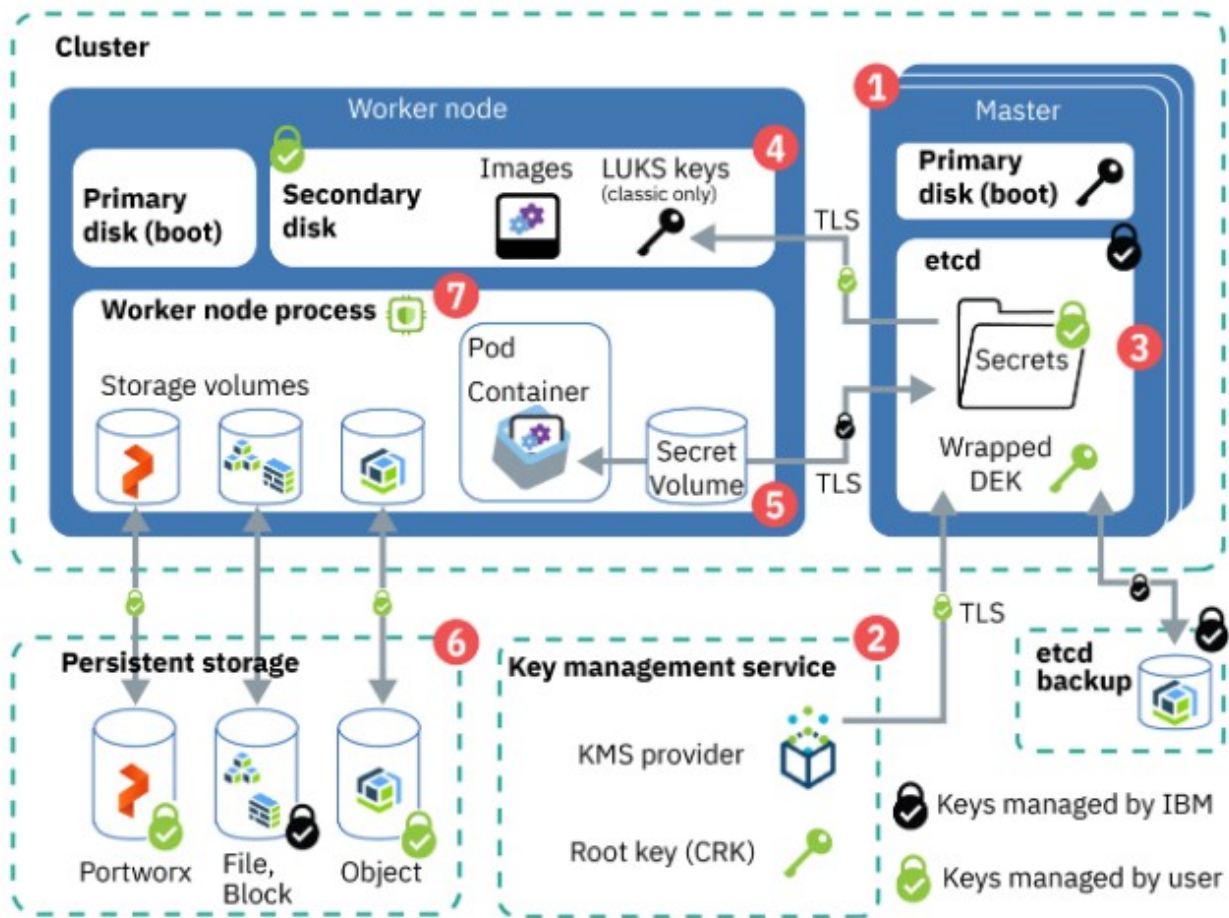
# Sequence drawing (1/2)

- Color does not indicate grouping, but the state of the object
- And the sequence can also be shown with numbers, as in the UML sequence diagram
  - An explanation of the numbers would not hurt :)



# Sequence drawing (2/2)

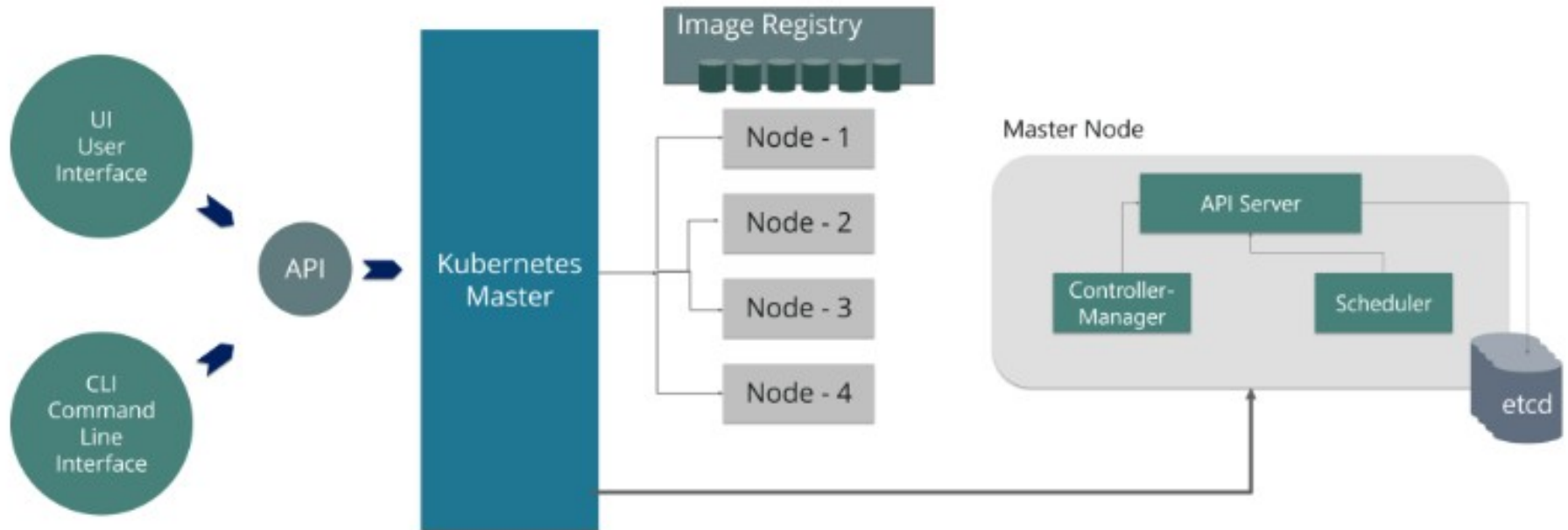
- In a more complex drawing, numbers are confused with icons
  - Even the color doesn't really help :)





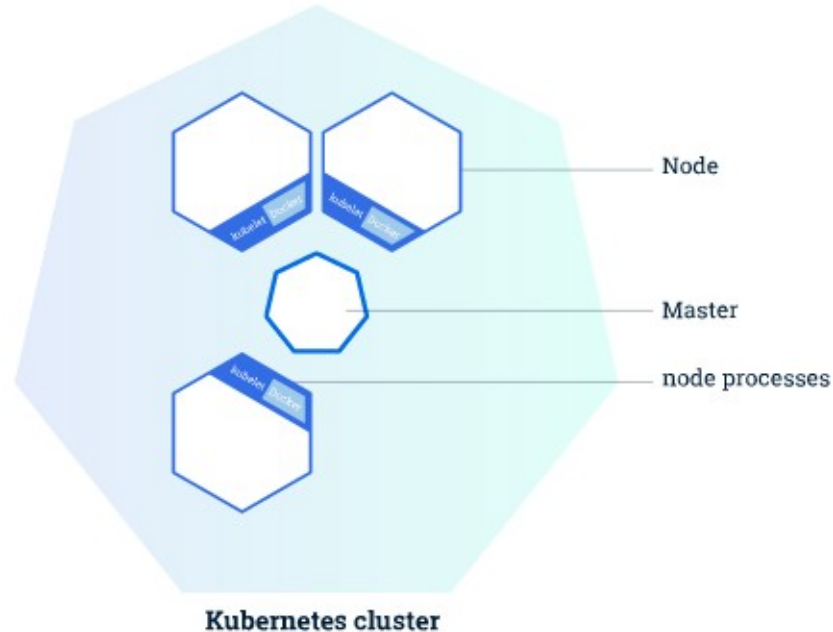
# Experiments with shape (1/2)

- Some authors try blocks of non-standard geometric shapes and 3D

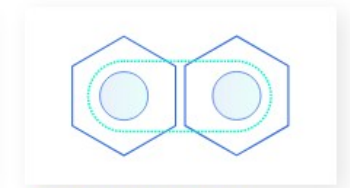


# Experiments with shape (2/2)

- Beautiful (when not overused)
- Non-horizontal text is harder to read
- It really depends on the artistic skills of the author



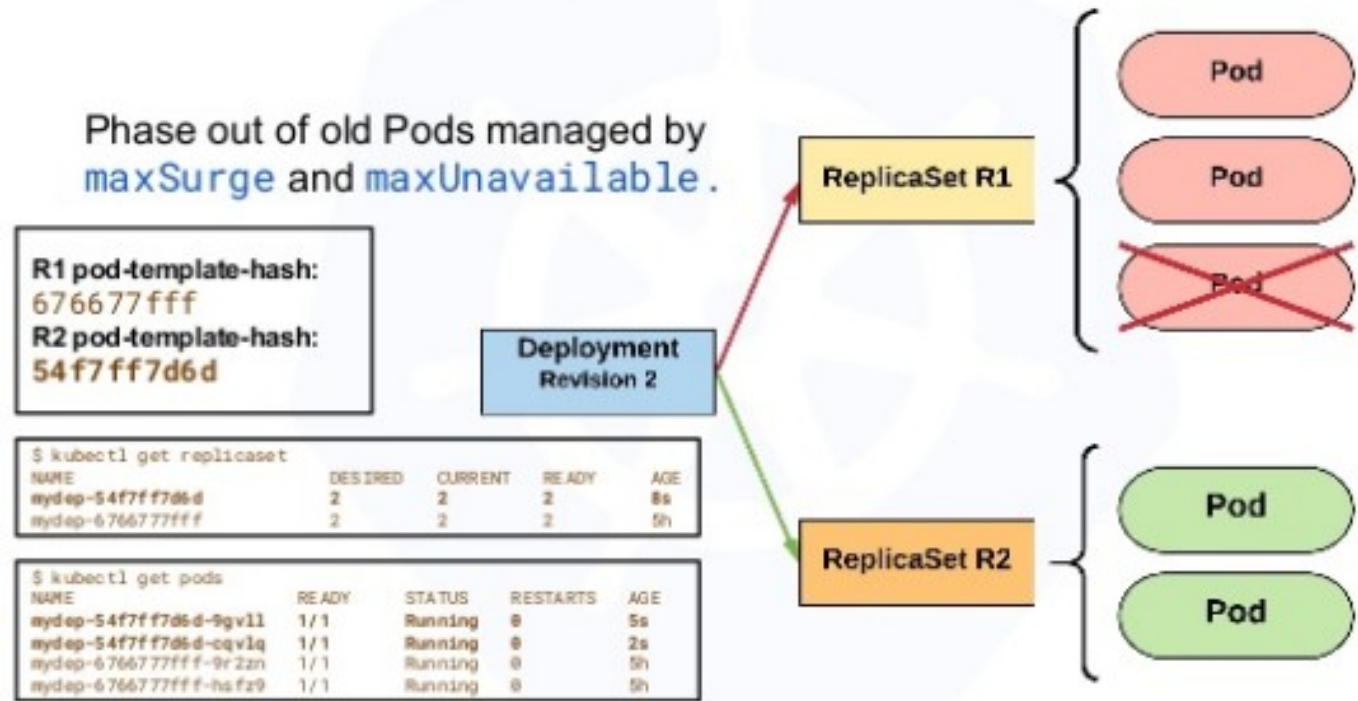
2. Deploy an app



5. Scale up your app

# Code fragments (1/2)

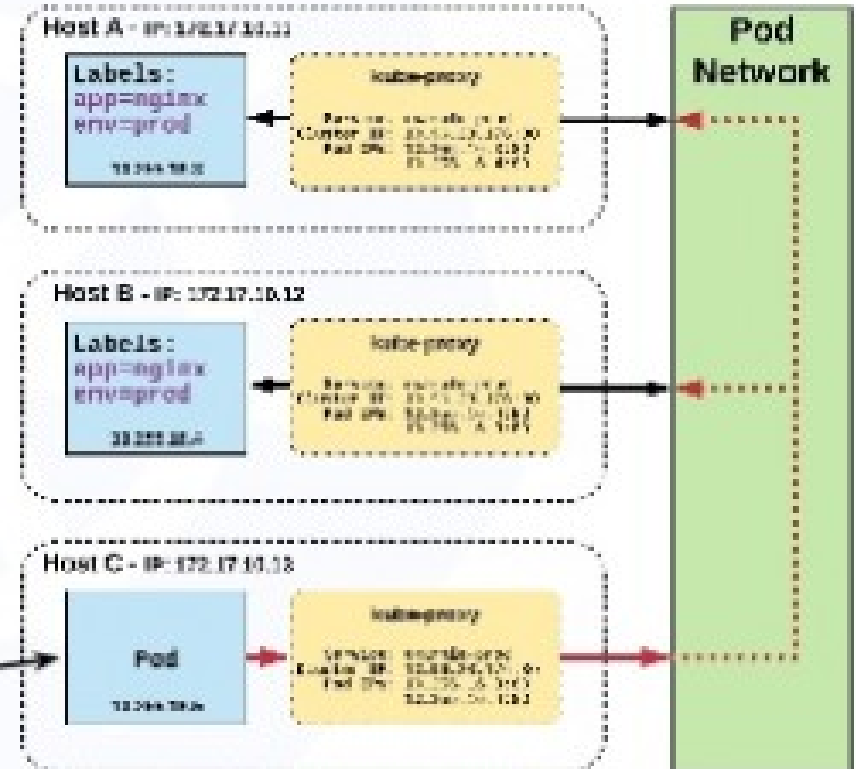
- Useful in some use cases:
  - Console screenshots
  - Fragments of config files
- It's OK for slides



# Code fragments (2/2)

```
Name:          example-prod
Selector:      app=nginx,env=prod
Type:         ClusterIP
IP:           10.96.28.176
Port:         <unset> 80/TCP
TargetPort:   80/TCP
Endpoints:    10.255.16.3:80,
              10.255.16.4:80
```

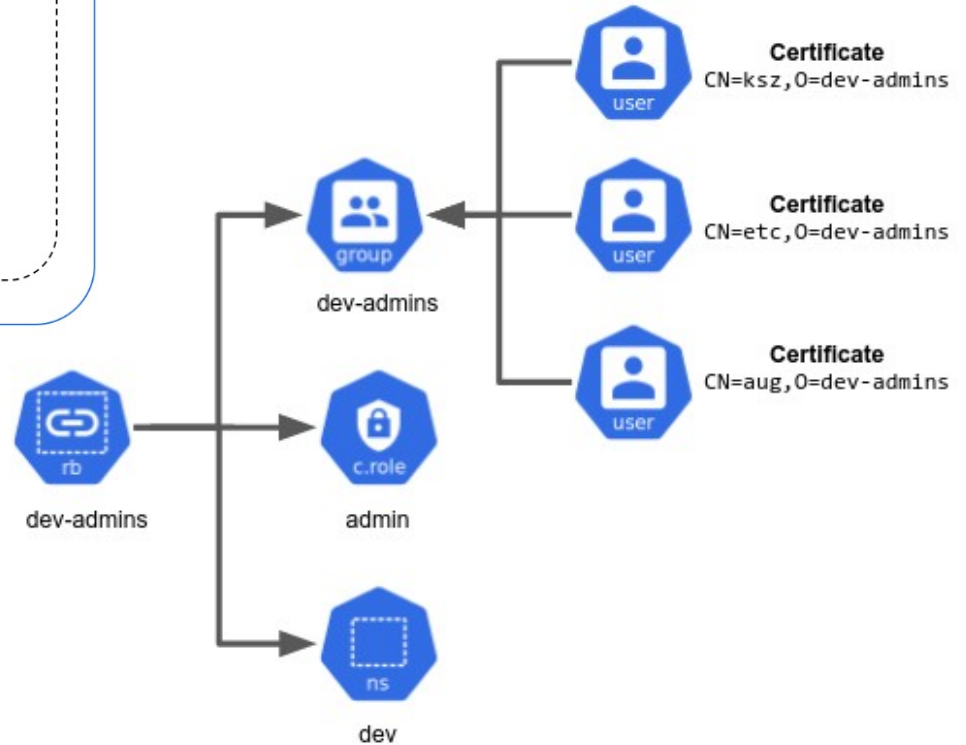
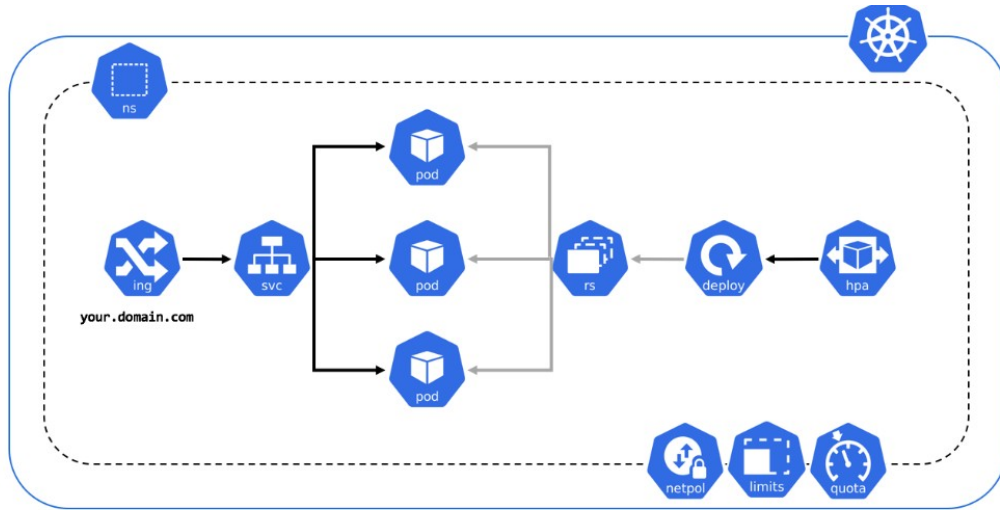
```
/ # nslookup example-prod.default.svc.cluster.local
Name:      example-prod.default.svc.cluster.local
Address 1: 10.96.28.176 example-prod.default.svc.cluster.local
```



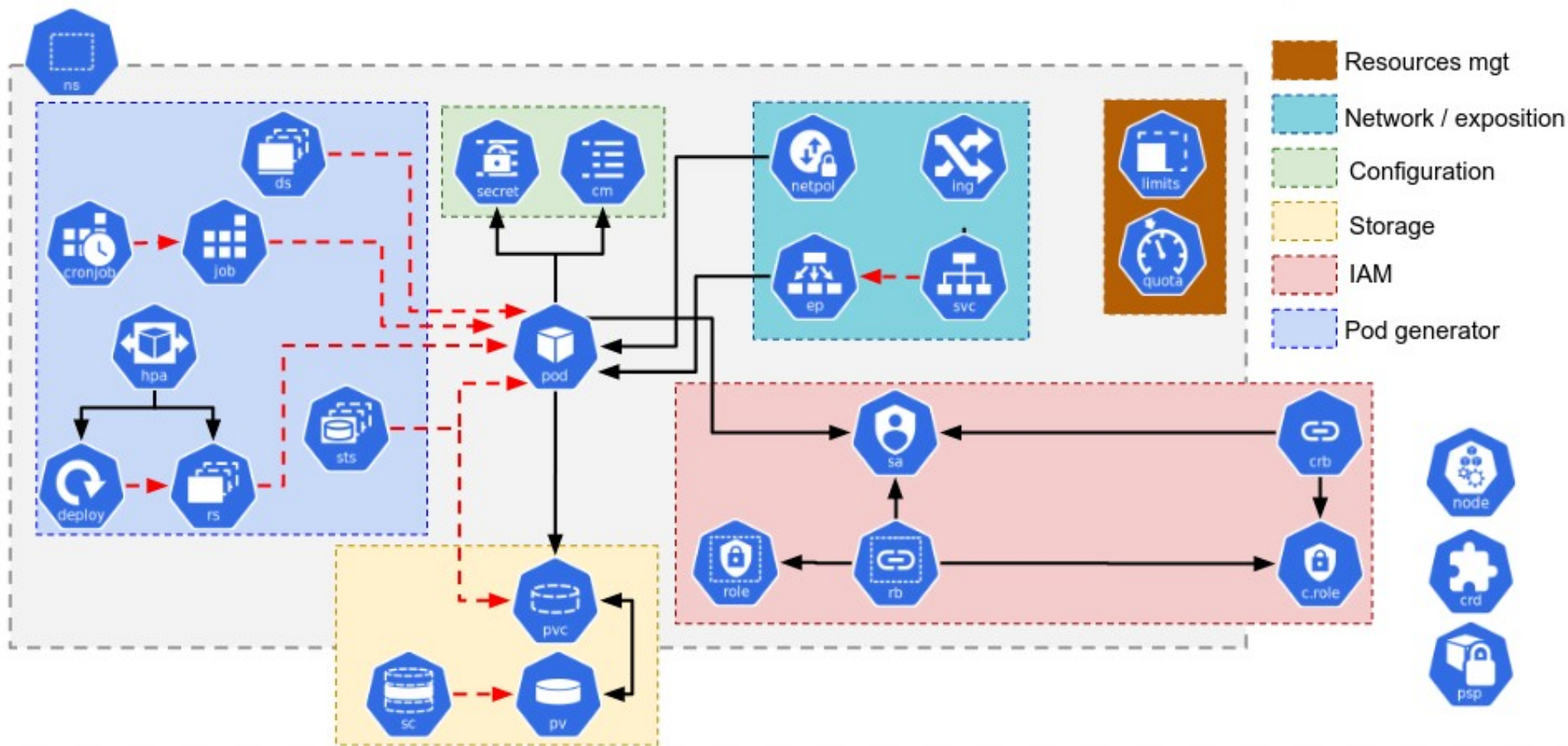
# Official k8s icons k8s (1/4)

- <https://github.com/kubernetes/community/tree/master/icons>
- Blue heptagons
- Grouping Rectangles
  - with rounded corners
  - with or without filling
- Arrows

# Official k8s icons k8s (2/4)



# Official k8s icons k8s (3/4)



# Official k8s icons (4/4)

- A diagram with a lot of heptagons is hard to read
  - White&Blue has good contrast, but the icons are small and still hard to read
  - Especially when they have some small text on them :)
- Angled shape increases stress
  - Sharp corners stimulate your sense of danger
  - Then you need rounded rectangles to lower it
- Rectangles marked with icons are also confusing
  - Some icons are objects and some are group labels
- Probably for this reason, there are no pictures made of the official Kubernetes icons in the official Kubernetes documentation :))



# Conclusions

- Low consumption of icons will save the user from visual overload
  - More text, less icons!!! :)
- Color runs the world
  - It makes diversification of fragments painless
- Round corners run the world as well :)
  - Especially with official Kubernetes icons
- Ideal drawing:
  - rectangles and a few lines
    - as a gaze anchor
  - Numbers, if you need to show the sequence of actions
  - A mixture of official icons with icons from some other systems works surprisingly well
  - Several simple drawings are much better than one complex drawing
    - This is always the case, but especially true in Kubernetes :)