## kubectl config view --minify | grep namespace:Prerequisite:

Knows GO. Do you understand <https://play.golang.org/p/iWLcHgSnoRs> ?

Phase 0: Install kind and kubectl

* Install kind
  + <https://kind.sigs.k8s.io/docs/user/quick-start/>

| curl -Lo ./kind https://kind.sigs.k8s.io/dl/v0.16.0/kind-linux-amd64  chmod +x ./kind  sudo mv ./kind /usr/local/bin/kind  kind create cluster  kind delete cluster |
| --- |

* Install kubectl

| curl -LO "https://dl.k8s.io/release/$(curl -L -s https://dl.k8s.io/release/stable.txt)/bin/linux/amd64/kubectl"  chmod +x ./kubectl  sudo mv ./kubectl /usr/local/bin/kubectl |
| --- |

| kubectl get nodes |
| --- |

* kubectl fish auto complete
  + kubectl completion -h
  + <https://github.com/evanlucas/fish-kubectl-completions>

## Kubectl plugins

Install krew

<https://krew.sigs.k8s.io/docs/user-guide/quickstart/>

kubectl krew install ns

kubectl krew install view-secret

kubectl krew install ctx

## 

## Phase 1: Learn Kubernetes as a user (2 weeks)

| [Videos, Kubernetes](https://docs.google.com/document/d/1UuDnCiE95Eg2XGFFkescMJehkeIrYlmiMq41A6TucjM/edit)  [Book: Kubernetes Up & Running](https://drive.google.com/file/d/1jcGP6C57IjD9nixPxdUrR0yA0aLJNlYl/view?usp=share_link) (3rd ed) (Ch 1-6, 9-14) (skip ch 7-8 from this book and read the networking book)  [Networking and Kubernetes](https://github.com/appscode/books/blob/master/networking/Networking%20and%20Kubernetes.pdf) (Ch 1-5)   * <https://iximiuz.com/en/posts/container-networking-is-simple/>   Workload, Networking, Storage, Configmap/Secret, RBAC(authentication / authorization) |
| --- |

* Read Tutorials
  + <https://kubernetes.io/docs/tutorials/kubernetes-basics/>
* <https://kubernetes.io/docs/tutorials/stateless-application/hello-minikube/>
* Read concepts
  + <https://kubernetes.io/docs/concepts/>
  + <https://www.youtube.com/watch?v=jgmdY73RF6w&list=PLMPZQTftRCS8Pp4wiiUruly5ODScvAwcQ>
* Deploy Book server in minikube using kubectl and YAML files

Video: [Sysdevbd batch-1 2018-11-13.31 Mi1 (W9): Kubernetes](https://www.youtube.com/watch?v=Pv5yKnOGSSc)

## Phase 2: Do kubectl-y things using k8s.io/client-go (2 days)

**Video:** [**https://youtu.be/peK6LQZ6ePo**](https://youtu.be/peK6LQZ6ePo)

[https://kubernetes.io/docs/reference/using-api/api-ove: 8080rview/](https://kubernetes.io/docs/reference/using-api/api-overview/)

<https://kubernetes.io/docs/reference/using-api/api-concepts/>

Video: [Authentication Options for HTTP api & Kuber/home/user/go/src/github.com/sheikh-arman/api-servernetes](https://youtu.be/lRE7OHZB420)

* client-go: Learn about client-go and deploy book server using Go code
  + <https://github.com/kubernetes/client-go>
  + <https://medium.com/programming-kubernetes/building-stuff-with-the-kubernetes-api-part-4-using-go-b1d0e3c1c899>
  + <https://github.com/kubernetes/client-go#how-to-use-it>
  + <https://kubernetes.io/docs/tasks/run-application/update-api-object-kubectl-patch/>
* Example
  + <https://github.com/kubernetes/client-go/tree/master/examples>
    - Configuration
* [Authenticate in cluster](https://github.com/kubernetes/client-go/blob/master/examples/in-cluster-client-configuration): Configure a client while running inside the Kubernetes cluster.
* [Authenticate out of cluster](https://github.com/kubernetes/client-go/blob/master/examples/out-of-cluster-client-configuration): Configure a client to access a Kubernetes cluster from outside.

Basics

* [Managing resources with API](https://github.com/kubernetes/client-go/blob/master/examples/create-update-delete-deployment): Create, get, update, delete a Deployment resource. Dynamic Client Example
  + - <https://github.com/tamalsaha/who-is-pod-controller/tree/master>

## Phase 3: Helm (3 days)

Go template : [GO Template Example](https://gist.github.com/tamalsaha/cc86951e3ef7ae23de34f2b116814541)

<https://youtu.be/i7QDS7yGEG4>

<https://www.youtube.com/watch?v=-ykwb1d0DXU>

* [**https://helm.sh/docs/intro/quickstart/**](https://helm.sh/docs/intro/quickstart/)
* <https://helm.sh/docs/topics/charts/>
* <https://helm.sh/docs/chart_template_guide/getting_started/>
* <https://helm.sh/docs/howto/charts_tips_and_tricks/>
* <https://helm.sh/docs/topics/charts_hooks/>
* Go Template:
  + [https://gtpl := template.Must(template.New("").Parse(`{{ .A }}`))](https://golang.org/pkg/text/template/)
  + [tpl.Execute(os.Stdout, &o)](https://golang.org/pkg/text/template/)
  + [}olang.or g/pkg/text/template/](https://golang.org/pkg/text/template/)
  + <https://levelup.gitconnected.com/learn-and-use-templates-in-go-aa6146b01a38>
* Template Functions: <https://github.com/Masterminds/sprig/blob/master/docs/index.md>
* Function List: <https://helm.sh/docs/chart_template_guide/function_list/>

Recommended Label:

<https://kubernetes.io/docs/concepts/overview/working-with-objects/common-labels/>

## Phase 4: Learn Make (2-3 days)

* <https://makefiletutorial.com/>
* <https://opensource.com/article/18/8/what-how-makefile>
* [Makefiles for Go Developers](https://tutorialedge.net/golang/makefiles-for-go-developers/)
* Do you understand the Makefile in this project? <https://github.com/thockin/go-build-template> . All our makefiles are based on this project.
* Book:
  + <https://www.gnu.org/software/make/manual/html_node/index.html>

## Phase 5: Concepts of CRD and Controller

**Read Ch 1- 5 of Programming Kubernetes Book**

[https://github.comAutomating Co/appscode/books/tree/master/kubernetes](https://github.com/appscode/books/tree/master/kubernetes)

##### Doc:

[https://kubernetes.io/docs/concepts/api-extension/custom-resouAuthentication](https://kubernetes.io/docs/concepts/api-extension/custom-resources/)

[RBACrces/](https://kubernetes.io/docs/concepts/api-extension/custom-resources/)

[Extend the Kubernetes API with CustomResourceDefinitions](https://kubernetes.io/docs/tasks/access-kubernetes-api/custom-resources/custom-resource-definitions/)

[Get an overall good Idea on API Access Control](https://kubernetes.io/docs/reference/access-authn-authz/) specially :

* Authentication
* RBAC
* Finalizer
* Admission Controller
* Webhook

##### Videos:

Dec 12, 2018 : [Learning Kubernetes CRDs](https://youtu.be/qcSvXAxsvbY)

May 13 , 2020 : [Learning Kubernetes CRD in 2020](https://youtu.be/QMRZhSpuh2w)

## 5A - Make Custom Controller :

##### Code Generation blog

[Kubernetes Deep Dive: Code Generation for CustomResources](https://blog.openshift.com/kubernetes-deep-dive-code-generation-customresources/)

[kubernetes code generator tags](https://gist.github.com/tamalsaha/c99fc37fa28d6f8a0a5124a36afaf9a6)

##### Videos:

Feb 1, 2018 : [How to write a Kubernetes Controller](https://www.youtube.com/watch?v=LLUhMM0cAJQ)

Apr 2, 2018 : [Using Kubernetes CRD validation](https://www.youtube.com/watch?v=Ej0UBIbCP8o)

Nov 27, 2019 : [How status.observedGeneration field works in CRDs](https://youtu.be/d4It5GDF2xU)

Jan 21 , 2020 : [Designing CRD Types](https://youtu.be/12rMmW_4rJ8)

##### Community support ::

[API convention](https://github.com/kubernetes/community/blob/master/contributors/devel/sig-architecture/api-conventions.md)

[Garbage Collection](https://github.com/kubernetes/community/blob/master/contributors/design-proposals/api-machinery/garbage-collection.md)

[Writing Controllers](https://github.com/kubernetes/community/blob/master/contributors/devel/sig-api-machinery/controllers.md)

##### Code Example:

* Workqueue example:
  + <https://github.com/kubernetes/client-go/tree/master/examples/workqueue>
* Sample-controller

<https://github.com/kubernetes/sample-controller>

* Code-Generator

<https://github.com/kubernetes/code-generator>

## 5B- KubeBuilder:

[Kubebuilder Quick Start](https://book.kubebuilder.io/quick-start.html)

<https://book.kubebuilder.io/cronjob-tutorial/cronjob-tutorial.html>

Using Kubebuilder client:  
 <https://github.com/tamalsaha/kubedb-api-demo/blob/master/main.go>

##### Videos:

July 28, 2021 : [KubeBuilder Deep dive](https://www.youtube.com/watch?v=D4RVYuoGtNc&ab_channel=AppsCodeInc).

Aug 26, 2021 : [Using KubeBuilder](https://www.youtube.com/watch?v=86fks0mjvcY&ab_channel=AppsCodeInc).

Oct 20, 2021: [sample-controller using Kube Builder](https://www.youtube.com/watch?v=yYpKLC7WfL4&ab_channel=AppsCodeInc).

## Phase 6: Extended API server :

<https://github.com/tamalsaha/DIY-k8s-extended-apiserver>

Video: [DIY Kubernetes Extended API Server](https://www.youtube.com/watch?v=pTIwy6fpxwY&ab_channel=AppsCodeInc).

**Medium Series**

* [Programming a Kubernetes Extension API Server — Part 1](https://medium.com/@marcos30004347/programming-a-kubernetes-extension-api-server-part-1-60526e141a10)
* [Programming a Kubernetes Extension API Server — Part 2](https://medium.com/@marcos30004347/programming-a-kubernetes-extension-api-server-part-2-ab3b2123ad78)
* [Programming a Kubernetes Extension API Server — Part 3](https://medium.com/@marcos30004347/programming-a-kubernetes-extension-api-server-part-3-f7edddc974f4)

Mar 2, 2018 : [Handling Multiple Versions in Kubernetes Admission Webhook (Audio in Bangla)](https://www.youtube.com/watch?v=5jsEqQHrrb4)

Mar 9, 2018 : [Writing Extended API Server for Kubernetes](https://www.youtube.com/watch?v=3FUNlQMY9Ug)

* <https://github.com/kubernetes-incubator/apiserver-builder/tree/master/docs/concepts>
* <https://kubernetes.io/docs/concepts/extend-kubernetes/api-extension/apiserver-aggregation/>
* <https://github.com/appscode/stash/issues/353#issuecomment-372040217>
* **Sample-apiserver**
  + <https://github.com/kubernetes/sample-apiserver>
  + <https://github.com/openshift/kubernetes-namespace-reservation>
  + <https://github.com/openshift/generic-admission-server>

## Phase 7: Others

#### TLS

* [How to MTLS in golang](https://kofo.dev/how-to-mtls-in-golang)
* [Illustrated X.509 Certificate. Introduction | by Takahiko Kawasaki | Medium](https://darutk.medium.com/illustrated-x-509-certificate-84aece2c5c2e)

#### Learn Prometheus

<https://www.youtube.com/watch?v=ZtYMuxAj7EU>

Nana => [architecture](https://www.youtube.com/watch?v=h4Sl21AKiDg&list=PLe8ZS56qsN_mq2Af6tEHAAm7fsY3sHOfL&index=2&ab_channel=TechWorldwithNana) [setup](https://www.youtube.com/watch?v=QoDqxm7ybLc&list=PLe8ZS56qsN_mq2Af6tEHAAm7fsY3sHOfL&index=3&ab_channel=TechWorldwithNana)

<https://github.com/appscode/books/tree/master/Prometheus> (Important chapters 13, 14)

#### Operating Kubernetes

* [10 most common mistakes using kubernetes – pipetail Blog](https://blog.pipetail.io/posts/2020-05-04-most-common-mistakes-k8s/)

**Tasks**

* <https://kubernetes.io/docs/tasks/>

<https://github.com/appscode/voyager/issues/329>

--------------------------------------------------------------------------------------------------------------

#### Daniel Smith

[Kubernetes-style APIs of the Future - Daniel Smith, Google (Any Skill Level)](https://www.youtube.com/watch?v=S2U8GNHewpk)

[A Vision For API Machinery: Coming to Terms with the Platform We Built - Daniel Smith, Google](https://www.youtube.com/watch?v=u6weI_3WVTM)

[Deep Dive: API Machinery SIG - Stefan Schimanski, Red Hat & Daniel Smith, Google](https://www.youtube.com/watch?v=kz8BMn9_hk8)

# Extended API Server

* [Writing Extended API Server for Kubernetes](https://youtu.be/3FUNlQMY9Ug)
* [DIY Kubernetes Extended API Server](https://youtu.be/pTIwy6fpxwY)

<https://github.com/kubernetes/community/blob/master/contributors/design-proposals/api-machinery/aggregated-api-servers.md>

Kubebuilder

apiserver-builder

<https://github.com/kubernetes-incubator/apiserver-builder>

<https://github.com/kubernetes/sample-apiserver>

<https://github.com/openshift/generic-admission-server>

<https://github.com/openshift/kubernetes-namespace-reservation>

<https://docs.google.com/document/d/11xnIAftNvRirZ_BXrO7IgFwfBMVK3IxgrcE5DepeqzA/edit>

Video: <https://www.youtube.com/watch?v=3FUNlQMY9Ug>

Q/A: <https://github.com/appscode/stash/issues/353#issuecomment-372040217>