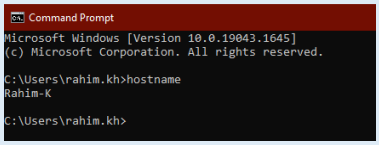
#	Document name / number / date:	Lecture	1	19.05.2022

DOCUMENT RULES:	
Lecture are consist of modules and sub modules	**1. Lectures** **a. Sub lectures** **b. Sub lectures**
Task name & column name should be written:	**Bold (CTRL+B)**
Commands should be written in the after # sign:	*Italic (CTRL+I) #hostname*
Output photo should be cropped or compressed: **Photo could be more than one:** **If you need extra lines, add the line next after it:**	***Description photo should be with title bar (CTRL + I + B)*** 
All other text should be written:	Standard
Font name and text size:	Calibri and 9
Course introduction	1. Course Introduction 2. Support and Course Materials 3. Procedure Documents

1. Course Introduction

- My name is Mr. Rahim Khasiyev. I am your trainer for this course.
- DevOPS is no easy task, so reach out to me using Q&A if you are stuck somewhere
- For the first time Kubernates cluster could be hard but once you are passed initial lectures, it will get easier

Course Overview

1. **Introduction**
    a. **What is Kubernetes**
    b. **Cloud / On-premises setup**
    c. **Cluster Setup**
    d. **Building Containers**
    e. **Running your first app**
    f. **Building Container Images**
2. **Kubernetes Basics**
    a. **Node Architecture**
    b. **Scaling pods**
    c. **Deployments**
    d. **Services**
    e. **Labels**
    f. **Health checks**

   g. **Readiness Probe**
   h. **Pod State & Lifecycle**
   i. **Secrets**
   j. **WebUI**
3. **Advanced topics**
   a. **Service auto-discovery**
   b. **Config Map**
   c. **Ingress**
   d. **External DNS**
   e. **Volumes**
   f. **Pod Presents**
   g. **Stateful sets**
   h. **Daemon sets**
   i. **Monitoring**
   j. **Autoscaling**
   k. **Node Affinity**
   l. **InterPod(Anti-)Affinity**
   m. **Taints and Tolerations**
   n. **Operators**
4. **Administration**
   a. **Master Services**
   b. **Quotes and Limits**
   c. **Namespaces**
   d. **User management**
   e. **RBAC**
   f. **Networking**
   g. **Node maintenance**
   h. **High Availability**
   i. **TLS on ELB**
5. **Packaging**
   a. **Introduction to helm**
   b. **Creating Helm Charts**
   c. **Helm Repository**
   d. **Building and deploying**
6. **Extras**
   a. **Kubeadm**
   b. **TLS Certificates with cert-manager**

Course objectives

- To be able to **understand, deploy** and **use** Kubernetes
- To get started with **Containerization** and run those containers on Kubernetes

- To deploy Kubernetes on your **desktop, on-prem** and on **AWS**
- To be able to run **stateless** and **stateful** applications on Kubernetes
- To be able to **administer** Kubernetes
- To be able to **package and deploy** applications using Helm

2. Support and Course Materials

Feedback and support

- **To provide feedback or get support, use the discussion groups**
  - **Discussion platform "Discord"**
  - **Community name is "IATC" - Israel Azerbaijan Training Center**

Text channels in Discord = "Dev_ops_1_tn" and "Dev_ops_2_tn"

https://discordapp.com/channels/974273338312654848/974273480612806716

https://discordapp.com/channels/974273338312654848/974273713316958258

We also have a resource group in the Discord name called = "Dev_ops1_tn_resources" and "Dev_ops2_tn_resources"

https://discordapp.com/channels/974273338312654848/974289197408075846

https://discordapp.com/channels/974273338312654848/974295471407390790

To download all the resources for the course

• All resources are in a github repository

• You can clone that git repository

• You can download a zip file on the github website

• Repository URL: https://github.com/iatc-devops/kubernetes-course - **not ready yet**

3. Procedure Documents

Procedure Document

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Kubernetes Procedure Document

Github repository [Read this first]

- Download all the course material from: https://github.com/iatc-devops/ **kubernetes-course not ready yet**
- Kubernetes releases minor version updates of its distribution every 3-6 months
    - Rather than updating the scripts in the video lectures, t**he repository in Github is updated if any script need changes**
    - The changes are often very minor, the API is very stable. Often API versions like v1betaX change to v1betaX+1 or to v1 (stable)
    - All the scripts you can find in the repository **should work with the latest version of Kubernetes**, if you have any issues, contact me through one of the channels listed below

Kubernetes setup lectures

There are multiple ways to set up a kubernetes **cluster**. You only need 1 working cluster to do the demos, but I've added different ways that you can create your cluster.

- A local cluster (on your machine): you can follow the minikube or docker for windows/mac lectures
- A production cluster using **Kops** on AWS
- A on-prem or cloud-agnostic cluster using kubeadm (lecture is at the end of the course)
- A managed production cluster on AWS using EKS - Elastic Kubernete Service (lecture can also be found at the end of the course)

If you want to test all features, **kops** is the best choice. If you want to have a local cluster, try out **minikube** first. If you have issues getting **minikube** up, **docker** for windows/mac comes with **kubernetes** and is a great alternative.

Kops gives you full access to the **master nodes**. To learn to work with **Kubernetes**, **kops** is preferred. If you have issues setting up **kops**, you can give EKS a try (lectures at the end of the course). EKS is more expensive than kops, so make sure to keep an eye on your billing and destroy the cluster after you're done with testing/demos.

If you want to **deploy** a cluster on any **cloud** or on an **on-prem** machine, then **kubeadm** will be the way to go. If you want to use a **cloud provider** like Azure, Google, or DigitalOcean, that will also work. They all provide their own **managed kubernetes solutions**.

Slides

The slides will share with you weekly

Download Kubectl

- **Linux:** https://storage.googleapis.com/kubernetes-release/release/v1.17.0/bin/linux/amd64/kubectl
- **MacOS:** https://storage.googleapis.com/kubernetes-release/release/v1.17.0/bin/darwin/amd64/kubectl
- **Windows:** https://storage.googleapis.com/kubernetes-release/release/v1.17.0/bin/windows/amd64/kubectl.exe
- **Or use a packaged version for your OS: see** https://kubernetes.io/docs/tasks/tools/install-kubectl/

Minikube

- Project URL: https://github.com/kubernetes/minikube
- Latest Release and download instructions: https://github.com/kubernetes/minikube/releases
- VirtualBox: http://www.virtualbox.org

Minikube on windows:

- Download the latest minikube-version.exe
- Rename the file to minikube.exe and put it in C:\minikube
- Open a cmd (search for the app cmd or powershell)
- Run: cd C:\minikube and enter *#minikube start*

Test your cluster commands

Make sure your cluster is running, you can check with **minikube status**.

If your cluster is not running, enter **minikube start** first.

Run the hello-minikube deployment:

```
1. #kubectl create deployment hello-minikube
   --image=k8s.gcr.io/echoserver:1.4
2. #kubectl expose deployment hello-minikube --type=NodePort
   --port=8080
```

then run:

#minikube service hello-minikube --url

<open a browser and go to that url>

Kops

Project URL

- **https://github.com/kubernetes/kops**

Free DNS Service

- Sign up at http://freedns.afraid.org/
  - Choose for subdomain hosting
  - Enter the AWS **nameservers** given to you in **route53** as **nameservers** for the subdomain
- http://www.dot.tk/ provides a free .tk domain name you can use and you can point it to the amazon AWS nameservers
- Namecheap.com often has promotions for tld's like .co for just a couple of bucks