SE489 DevOps Engineering

Lab 8



Lab 8: Installation of Kubernetes on Windows Platform

Objectives:

On successful completion of this lab, students will learn how to download, install, configure and run Kubernetes on windows platform.

Installation of Kubernetes on windows is not straight forward, in its simplest form, which we are going to follow, has two steps-

- a. Installation of Kubernetes Cluster (Kubernetes Instance)
- b. Installation of **kubectl** (Command Line Interface for interaction with Kubernetes)

Pre-requisite: As Kubernetes from scratch is an application natively designed for the Linux, few setting needs to be confirmed before we proceed with installation.

 For windows 11, In the Search bar, search for "apps", and select Apps and features. Select Optional features → Add a feature→scroll down to Windows features. or

For windows 10, You can also press Windows Key + R to open the Run dialog, type **"optionalfeatures"**, and press Enter

Windows Features			_		×
Turn Windows feature	es on or off				
To turn a feature on, select it box. A filled box means that	s check box. To tur only part of the fe	n a feature ature is turr	off, cle ned on	ear its che	ck
Microsoft XPS Doo	ument Writer				
🕀 🖃 🔚 Print and Docume	nt Services				
Remote Differenti	al Compression AP	I Support			
Simple TCPIP servi	ces (i.e. echo, dayti	me etc)			
🕀 🖃 🔚 SMB 1.0/CIFS File :	Sharing Support				
Telnet Client					
TFTP Client					
Virtual Machine Pl	atform				
Vindows Hypervis	or Platform				
Windows Identity	Foundation 3.5				
🗄 🔽 🔚 Windows PowerSh	ell 2.0				
🗄 🔲 🔚 Windows Process	Activation Service				
Windows Projecte	d File System				
		ОК	:	Canc	el
	D1 . C				

Select Windows Hypervisor Platform

After completion of installation, following screen will appear

	×	
Windows Features		
Windows completed the requested changes.		
Windows needs to reboot your PC to finish installing the requested changes.		
Restart now Don't restart		

2. Now start the Docker desktop, and browse to the setting pane of the docker, click on Kubernetes, then check Enable Kubernetes, this will install standalone cluster of Kubernetes.

	Docker Desktop	Upgrade p	an			ë 😒	Sign in 😫			
3	Settings									
			General Resources Docker Engine Experimental features		Kubernetes v1.25.0 Enable Kubernetes Start a Kubernetes single-node cluster when starting Docker Desktop. Show System containers (advanced) Show Kubernetes internal containers when using Docker commands.					
		•9 *	Software updates Extensions							
1						Cancel	Apply &	Restart		
		2	RAM 1.80GB	CPU 0.06%	🕷 Not connected to Hub			V	4.12.0	Ô.

3. Click on apply and restart, this will install additional components required for running Kubernetes.



An internet connection is required for downloading and installing required components.

	General	Kubernetes
0	Resources	v1.25.0
٠	Docker Engine	 Enable Kubernetes Starting
à	Experimental features	Show system containers (advanced)
۲	Kubernetes	Show Kubernetes internal containers when using Docker commands.
Ð	Software updates	Reset Kubernetes Cluster
*	Extensions	All stacks and Kubernetes resources will be deleted.

4. Once finished, you can see bottom left corner of the Docker desktop interface, Kubernetes icon appears in green along with whale icon of the docker, indicating Kubernetes has been installed and running successfully.

T					
e		Kubernetes running			
5	<u></u>	۲	RAM 3.30GB	CPU 0.90%	🕷 Not connected to Hub

5. Now for installation of **kubectl**, a CLI interface for the Kubernetes, search for **kubectl** on the google



click install on windows.

6. On the page opened, click on **latest release**

Q Search • Home • Getting started • Concepts • Tasks • Install and Set Up • Install and Set Up Install and Set Up Install and Set Up Kubection Linux Install and Set Up Kubection macOS Install kubection macOS Install kubection Vindows • Administer a Cluster • Configure Pods and Containers Monitoring. Logging, and Debugging • Manage Kubernetes Objects • Manage Kubernetes Objects • Manage Kubernetes Objects • Manage Kubernetes Objects • Manag	Q Search • Home • Getting started • Concepts • Install and Set Up • Install and Set Up Install and Set Up Install and Set Up Kuberti on Linux Install and Set Up Kuberti on Linux Install and Set Up Kuberti on macOS Install and Set Up Kuberti on Windows • Administer a Cluster • Configure Pods and Containers • Monitoring, Logging, and Debugging • Manage Kubernetes Objects • Managing Secrets • Managing Secrets • Managing Secrets • Managing Secrets <th>🛞 kubernetes</th> <th>Documentation Kubernetes Blog</th>	🛞 kubernetes	Documentation Kubernetes Blog
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7. Now, on search, look for "Environment", Environment Variable link will appear, click and open Environment variable setting of the system.

Q envi	
All Apps Documents Web More ~	0 7 M
Best match	
Edit the system environment variables Control panel	
Settings	Edit the system environment variables Control panel
Edit environment variables for > your account	🖸 Open

8. On the setting window opened thus, click on "Environment Variables" at the bottom

System Properties	\times
Computer Name Hardware Advanced System Protection Remote	
You must be logged on as an Administrator to make most of these changes. Performance Visual effects, processor scheduling, memory usage, and virtual memory Settings	
User Profiles Desktop settings related to your sign-in Settings	
Startup and Recovery System startup, system failure, and debugging information Settings	
OK Cancel Apply	J

9. On the subsequent window opened, either select **New** on User variables section (if you want to make changes for current user only) or select **New** on System variables section (this will make changes system wise for all user of the system)

Variable	Value
OneDrive	C:\Users\mzafa\OneDrive
OneDriveConsumer	C:\Users\mzafa\OneDrive
Path	C:\Users\mzafa\AppData\Local\Microsoft\WindowsApps;
TEMP	C:\Users\mzafa\AppData\Local\Temp
TMP	C:\Users\mzafa\AppData\Local\Temp
	New Edit Delete
	New Edit Delete
vstem variables	New Edit Delete
rstem variables Variable	New Edit Delete
rstem variables Variable AMDRMSDKPATH	New Edit Delete Value C:\Program Files\AMD\RyzenMasterSDK\
vstem variables Variable AMDRMSDKPATH ComSpec	New Edit Delete Value C:\Program Files\AMD\RyzenMasterSDK\ C:\WINDOWS\system32\cmd.exe
rstem variables Variable AMDRMSDKPATH ComSpec DriverData	New Edit Delete Value C:\Program Files\AMD\RyzenMasterSDK\ C:\WINDOWS\system32\cmd.exe C:\Windows\System32\DriverS\DriverData
vstem variables Variable AMDRMSDKPATH ComSpec DriverData Java_Home	New Edit Delete Value C:\Program Files\AMD\RyzenMasterSDK\ C:\WINDOWS\system32\cmd.exe C:\Windows\System32\Drivers\DriverData C:\Program Files\Java\jre1.8.0_341\bin
vstem variables Variable AMDRMSDKPATH ComSpec DriverData Java_Home NUMBER_OF_PROCESSORS	New Edit Delete Value
vstem variables Variable AMDRMSDKPATH ComSpec DriverData Java_Home NUMBER_OF_PROCESSORS OnlineServices	New Edit Delete Value
vstem variables Variable AMDRMSDKPATH ComSpec DriverData Java_Home NUMBER_OF_PROCESSORS OnlineServices OS	New Edit Delete Value
vstem variables Variable AMDRMSDKPATH ComSpec DriverData Java_Home NUMBER_OF_PROCESSORS OnlineServices OS	New Edit Delete Value

10. Add variable, write kubectl for the variable name and either provide value for this or browse to the location where **kubectl.exe** file was saved.

New System Variable	Browse For Folder X
Variable name: kubectl Variable value:	ESD > hp
DriverData (Java_Home (NUMBER_OF_PROCESSORS 1 OnlineServices (OS V	IIIe > hpswsetup Windows\Sy: > MSOCache Program File > OneDriveTemp Inine Services PerfLogs Indows_NT Folder: Kubectl OK
	OK Cancel

Once done, click on Ok, a new Environment Variable entry has been made, and it should be visible as well.

AMDRMSDKPATH ComSpec	C:\Program Files\AMD\RyzenMasterSDK\ C:\WINDOWS\svstem32\cmd.exe
ComSpec	C:\WINDOWS\system32\cmd.exe
DriverData	C:\Windows\System32\Drivers\DriverData
Java_Home	C:\Program Files\Java\jre1.8.0_341\bin
kubectl	c:\kubectl
NUMBER_OF_PROCESSOR	S 12
OnlineServices	Online Services
OS	Windows_NT
Path	C:\Program Files (x86)\Common Files\Oracle\Java\javapath;C:\Progr
PATHEXT	.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC
	New Edit Delete

Click on OK to finalize everything.

11. Open command prompt, and type **kubectl**, if it responds with a verbose screen like below, means you have set everything perfectly.



Some basic commands

12. On command window, write kubectl config current-context



it shows current context of the Kubernetes instance, which in turn reveals that it is going to run on docker-desktop cluster 13. To know the information about the nodes available on current cluster, run these commands



it shows that only one machine is running

14. To know about pods available on the current cluster, use this command **kubectl get pods**



15. To know about all the details of the Kubernetes cluster, use this command **kubectl version -output=yaml**

Command Prompt × + ~	-	\times
C:\Users\mzafa>kubectl versionoutput=yaml		
clientVersion:		
buildDate: "2022-08-23T17:44:59Z"		
compiler: gc	0-7	
gittmaeState: clean	oaz	
gitVersion: v1 25 0		
goVersion: go1.19		
major: "1"		
minor: "25"		
platform: windows/amd64		
kustomizeVersion: v4.5.7		
serverVersion:		
buildDate: "2022-08-23117:38:152"		
complier: gc	8-2	
gitteeState clean	oaz	
gitVersion: v1.25.0		
goVersion: gol.19		
major: "1"		
minor: "25"		
platform: linux/amd64		

C:\Users\mzafa>