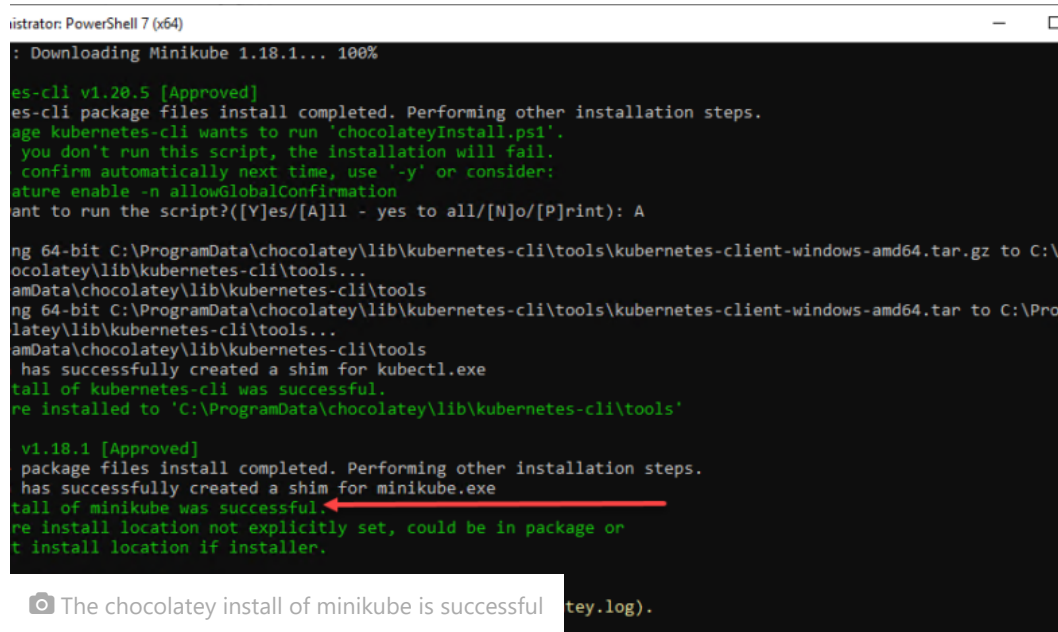


Kubernetes

Install minikube on Windows Server 2019 Hyper-V

👤 brandon.lee • March 30, 2021 📖 5 minutes read



```
istrator: PowerShell 7 (x64)
: Downloading Minikube 1.18.1... 100%

es-cli v1.20.5 [Approved]
es-cli package files install completed. Performing other installation steps.
age kubernetes-cli wants to run 'chocolateyInstall.ps1'.
you don't run this script, the installation will fail.
confirm automatically next time, use '-y' or consider:
ature enable -n allowGlobalConfirmation
ant to run the script?([Y]es/[A]ll - yes to all/[N]o/[P]rint): A

ng 64-bit C:\ProgramData\chocolatey\lib\kubernetes-cli\tools\kubernetes-client-windows-amd64.tar.gz to C:\
ocolatey\lib\kubernetes-cli\tools...
amData\chocolatey\lib\kubernetes-cli\tools
ng 64-bit C:\ProgramData\chocolatey\lib\kubernetes-cli\tools\kubernetes-client-windows-amd64.tar to C:\Pro
latey\lib\kubernetes-cli\tools...
amData\chocolatey\lib\kubernetes-cli\tools
has successfully created a shim for kubect1.exe
tall of kubernetes-cli was successful.
re installed to 'C:\ProgramData\chocolatey\lib\kubernetes-cli\tools'

v1.18.1 [Approved]
package files install completed. Performing other installation steps.
has successfully created a shim for minikube.exe
tall of minikube was successful.
re install location not explicitly set, could be in package or
t install location if installer.

📷 The chocolatey install of minikube is successful (see chocolatey.log).
```

If you are looking for a great way to get up to speed with learning Kubernetes, getting your hands in a lab environment is one of the best ways to do that. Kubernetes is arguably not for the faint of heart to deploy correctly and get a working environment.

However, there is a way to easily get up and running with a one node Kubernetes “cluster” to get a feel for working with Kubernetes. The solution is called **minikube**. This post will take a look at how to install minikube on [Windows Server 2019](#) Hyper-V, including configuration, interacting with, and deploying applications. Let’s take a look.

What is minikube?

Minikube is arguably the easiest and quickest way to create a local Kubernetes cluster. It allows doing this on macOS, Linux, and

Windows. It is a great tool for both developers as well as those who are new to Kubernetes and want to learn more about the solution, how it works, and how to interact with it. In my opinion it is a great way to get exposed to Kubernetes, so you can then go back and understand what you are building when you want to build everything from scratch. After all, if you don't understand what the puzzle is supposed to look like in the end, it is hard to build it in the first place.

What are some of the features of the minikube solution?

- Cross-platform and supports all the major OS'es including Linux, macOS, and Windows
- You can deploy it as a VM, a [container](#), or on bare-metal depending on what resources you have available
- It supports many different container runtimes, including Docker, CRI-O, and containerd
- It supports the latest Kubernetes releases, plus six minor versions
- Docker installed API endpoint for fast image pushes in the environment
- You have access to advanced features for further learning such as LoadBalancer, filesystem mounts, and FeatureGates
- You also have access to Kubernetes application addons
- Easy to use command line tool
- Control plane is managed using the minikube tool

Install minikube on Windows Server 2019 Hyper-V

In my home lab, I have many different OS'es to play around with. However, I had just spun up a new Windows Server 2019 server to play around with Docker on Windows and had already installed Hyper-V for Hyper-V isolated containers so this box made a good, quick environment to start playing around with minikube. However, You can create virtual machines of many different varieties for this purpose. You can install minikube on Windows Server 2019 Hyper-V in the following steps:



1. Check the prerequisites
2. Use a package manager for minikube
3. Install minikube
4. Configure [Hyper-V](#) if needed
5. Start the Kubernetes cluster
6. Connect to Kubernetes and view the Kubernetes dashboard
7. Running a Kubernetes application on minikube

1. Check the prerequisites

What are the prerequisites? You will need to have the following in place per the documentation to deploy and use the minikube application:

- 2GB of free memory
- 2 CPUs or more
- 20GB of free disk space
- Internet connection
- Virtual machine manager or Container runtime, such as: [Docker](#), [Hyperkit](#), [Hyper-V](#), [KVM](#), [Parallels](#), [Podman](#), [VirtualBox](#), or [VMWare](#)

2. Use a package manager for minikube

As mentioned, I already had Windows Server 2019 with the Hyper-V role installed and ready to go. In case you are wondering about the lab environment, I am running the Windows Server 2019 virtual machine on top of a VMware vSphere 7 Update 2 vSAN cluster with hardware CPU instructions exposed to the VM, etc.

There are a couple of different package managers that are supported for installing minikube in Windows. Those are:

- The new **Windows Package Manager**
- Chocolatey

In my case, I wanted to use the Windows Package Manager just to try it out for this purpose, however, it is not supported for Windows Server 2019. Chocolatey is a great package manager for

Windows though so for my case, it was the option for Windows Server 2019. Below is a screenshot of installing Chocolatey using the steps provided in the Chocolatey individual walkthrough:

<https://chocolatey.org/install#individual>

```
Administrator: C:\Program Files\PowerShell\7\pwsh.exe
Getting Chocolatey from https://chocolatey.org/api/v2/package/chocolatey/0.10.15.
Downloading https://chocolatey.org/api/v2/package/chocolatey/0.10.15 to C:\Users\ADMINI~1\AppData\Local\Temp\1\chocolatey\chocoInstall\chocolatey.zip
Not using proxy.
Extracting C:\Users\ADMINI~1\AppData\Local\Temp\1\chocolatey\chocoInstall\chocolatey.zip to C:\Users\ADMINI~1\AppData\Local\Temp\1\chocolatey\chocoInstall
Installing Chocolatey on the local machine
Creating ChocolateyInstall as an environment variable (targeting 'Machine')
  Setting ChocolateyInstall to 'C:\ProgramData\chocolatey'
WARNING: It's very likely you will need to close and reopen your shell
  before you can use choco.
WARNING: Not able to set permissions for C:\ProgramData\chocolatey.
We are setting up the Chocolatey package repository.
The packages themselves go to 'C:\ProgramData\chocolatey\lib'
  (i.e. C:\ProgramData\chocolatey\lib\yourPackageName).
A shim file for the command line goes to 'C:\ProgramData\chocolatey\bin'
  and points to an executable in 'C:\ProgramData\chocolatey\lib\yourPackageName'.

Creating Chocolatey folders if they do not already exist.

WARNING: You can safely ignore errors related to missing log files when
  upgrading from a version of Chocolatey less than 0.9.9.
  'Batch file could not be found' is also safe to ignore.
  'The system cannot find the file specified' - also safe.
chocolatey.nupkg file not installed in lib.
  Attempting to locate it from bootstrapper.
PATH environment variable does not have C:\ProgramData\chocolatey\bin in it. Adding...
WARNING: Not setting tab completion: Profile file does not exist at 'C:\Users\administrator\Documents\PowerShell\Microsoft.PowerShell_profile.ps1'.
Chocolatey (choco.exe) is now ready.
You can call choco from anywhere, command line or powershell by typing choco.
Run choco /? for a list of functions.
You may need to shut down and restart powershell and/or consoles
  first prior to using choco.
Ensuring Chocolatey commands are on the path
Ensuring chocolatey.nupkg is in the lib folder
PS C:\Program Files\PowerShell\7>
```

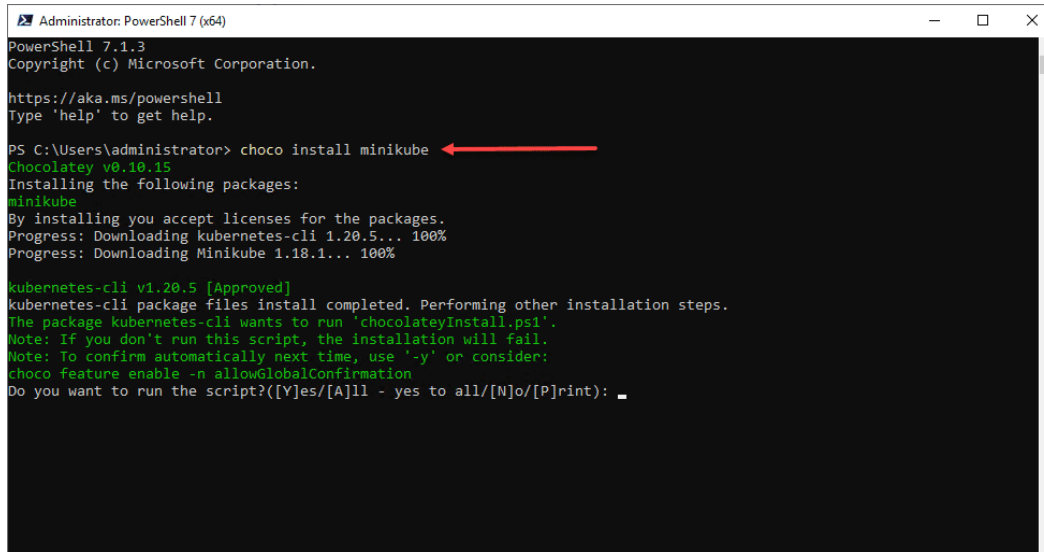
Installing chocolatey for installing minikube

3. Install minikube

Once you have the Chocolatey package manager installed, you can easily use it to install minikube. To do that, use the comand:

```
choco install minikube
```

You will be prompted to run the script and confirm.



```
Administrator: PowerShell 7 (x64)
PowerShell 7.1.3
Copyright (c) Microsoft Corporation.

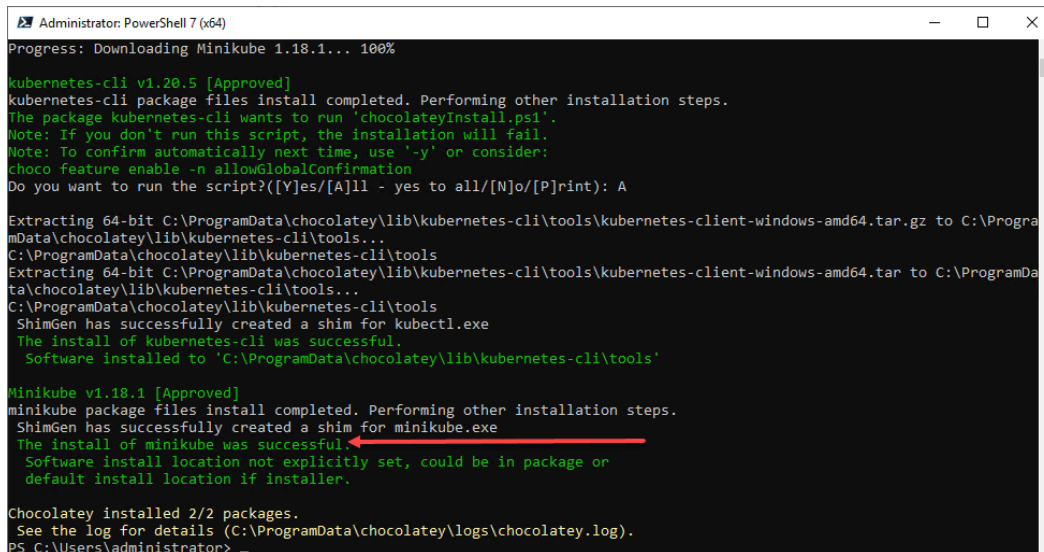
https://aka.ms/powershell
Type 'help' to get help.

PS C:\Users\administrator> choco install minikube
chocolatey v0.10.15
Installing the following packages:
minikube
By installing you accept licenses for the packages.
Progress: Downloading kubernetes-cli 1.20.5... 100%
Progress: Downloading Minikube 1.18.1... 100%

kubernetes-cli v1.20.5 [Approved]
kubernetes-cli package files install completed. Performing other installation steps.
The package kubernetes-cli wants to run 'chocolateyInstall.ps1'.
Note: If you don't run this script, the installation will fail.
Note: To confirm automatically next time, use '-y' or consider:
choco feature enable -n allowGlobalConfirmation
Do you want to run the script?([Y]es/[A]ll - yes to all/[N]o/[P]rint):
```

Kicking off the choco install minikube command

After confirming the running of the script for installing minikube.



```
Administrator: PowerShell 7 (x64)
Progress: Downloading Minikube 1.18.1... 100%

kubernetes-cli v1.20.5 [Approved]
kubernetes-cli package files install completed. Performing other installation steps.
The package kubernetes-cli wants to run 'chocolateyInstall.ps1'.
Note: If you don't run this script, the installation will fail.
Note: To confirm automatically next time, use '-y' or consider:
choco feature enable -n allowGlobalConfirmation
Do you want to run the script?([Y]es/[A]ll - yes to all/[N]o/[P]rint): A

Extracting 64-bit C:\ProgramData\chocolatey\lib\kubernetes-cli\tools\kubernetes-client-windows-amd64.tar.gz to C:\ProgramData\chocolatey\lib\kubernetes-cli\tools...
C:\ProgramData\chocolatey\lib\kubernetes-cli\tools
Extracting 64-bit C:\ProgramData\chocolatey\lib\kubernetes-cli\tools\kubernetes-client-windows-amd64.tar to C:\ProgramData\chocolatey\lib\kubernetes-cli\tools...
C:\ProgramData\chocolatey\lib\kubernetes-cli\tools
ShimGen has successfully created a shim for kubect.exe
The install of kubernetes-cli was successful.
Software installed to 'C:\ProgramData\chocolatey\lib\kubernetes-cli\tools'

Minikube v1.18.1 [Approved]
minikube package files install completed. Performing other installation steps.
ShimGen has successfully created a shim for minikube.exe
The install of minikube was successful.
Software install location not explicitly set, could be in package or default install location if installer.

Chocolatey installed 2/2 packages.
See the log for details (C:\ProgramData\chocolatey\logs\chocolatey.log).
PS C:\Users\administrator>
```

The chocolatey install of minikube is successful

4. Configure Hyper-V if needed

There isn't really any complicated configuration needed for Hyper-V. However, I wanted to show a couple of things that I ran into with my vanilla [Windows Server 2019](https://www.virtualizationhowto.com/2021/03/install-minikube-on-windows-server-2019-hyper-v/) Hyper-V server. I hadn't checked, but I had not configured a default External switch for the server. If you don't have an external virtual switch configured, you will see the error below, which I ran into.

```

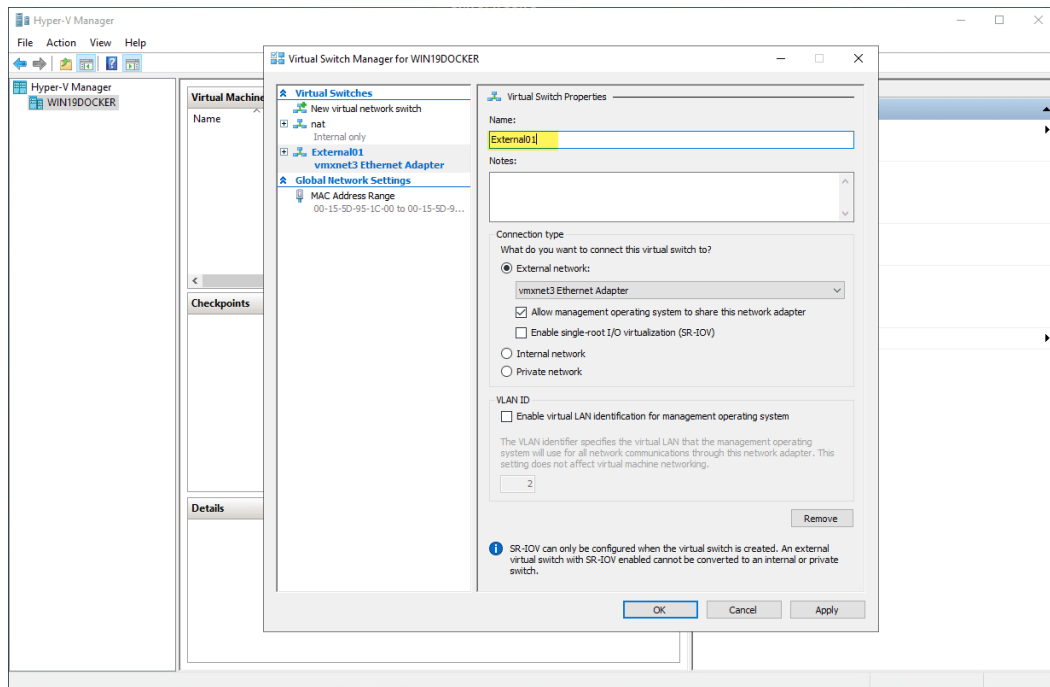
Administrator: PowerShell 7 (x64)
PS C:\Users\administrator> minikube start
* minikube v1.18.1 on Microsoft Windows Server 2019 Standard 10.0.17763 Build 17763
* Automatically selected the hyperv driver
* Downloading VM boot image ...
  > minikube-v1.18.0.iso.sha256: 65 B / 65 B [-----] 100.00% ? p/s 0s
  > minikube-v1.18.0.iso: 212.99 MiB / 212.99 MiB [ 100.00% 109.84 MiB p/s 2s
* Starting control plane node minikube in cluster minikube
* Downloading Kubernetes v1.20.2 preload ...
  > preloaded-images-k8s-v9-v1...: 491.22 MiB / 491.22 MiB 100.00% 104.50 M
* Creating hyperv VM (CPUs=2, Memory=2200MB, Disk=20000MB) ...
! StartHost failed, but will try again: creating host: create: precreate: no External vswitch nor Default Switch found.
A valid vswitch must be available for this command to run. Check https://docs.docker.com/machine/drivers/hyper-v/
* Creating hyperv VM (CPUs=2, Memory=2200MB, Disk=20000MB) ...
* Failed to start hyperv VM. Running "minikube delete" may fix it: creating host: create: precreate: no External vswitch
nor Default Switch found. A valid vswitch must be available for this command to run. Check https://docs.docker.com/machine/drivers/hyper-v/
! Startup with hyperv driver failed, trying with alternate driver ssh: Failed to start host: creating host: create: precreate: no External vswitch nor Default Switch found. A valid vswitch must be available for this command to run. Check https://docs.docker.com/machine/drivers/hyper-v/
! Failed to delete cluster minikube, proceeding with retry anyway.

X Exiting due to MK_USAGE: No IP address provided. Try specifying --ssh-ip-address, or see https://minikube.sigs.k8s.io/docs/drivers/ssh/
PS C:\Users\administrator>

```

Minikube startup failure due to a missing hyper v external switch

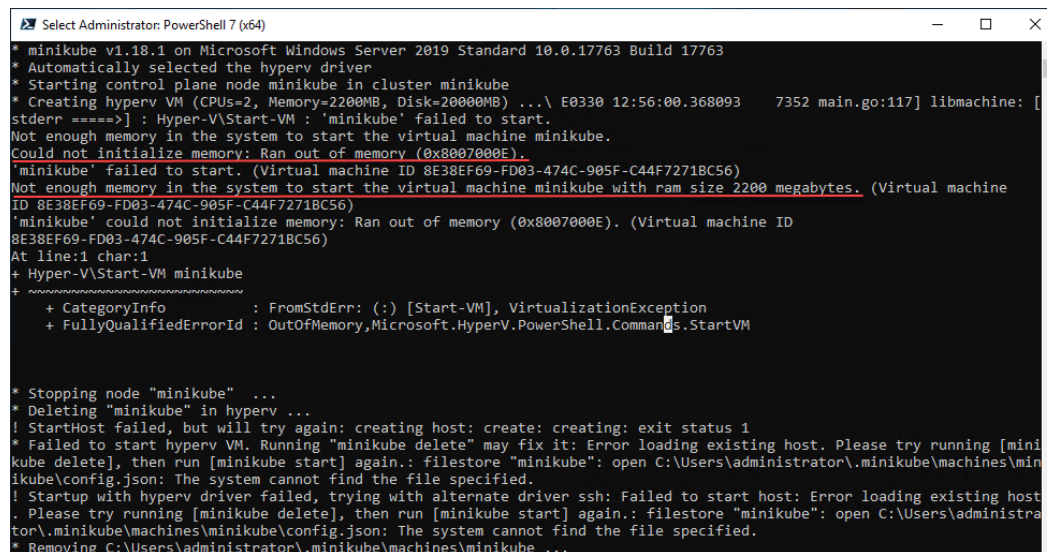
Below, I just created a simple shared management network
External virtual switch.



Creating a new external virtual switch in hyper v

The next error I had was related to not having enough memory configured. The Windows Server 2019 Hyper-V host only had 4 GB of memory configured out of my template deployment. So, if you only have 4 GB on Windows Server 2019, you will most likely see the same error I did below – **not enough memory in the**

system to start the virtual machine. So, basically, at this point, I shut down the Hyper-V host and added 4 GB of memory for a total of 8 GB.



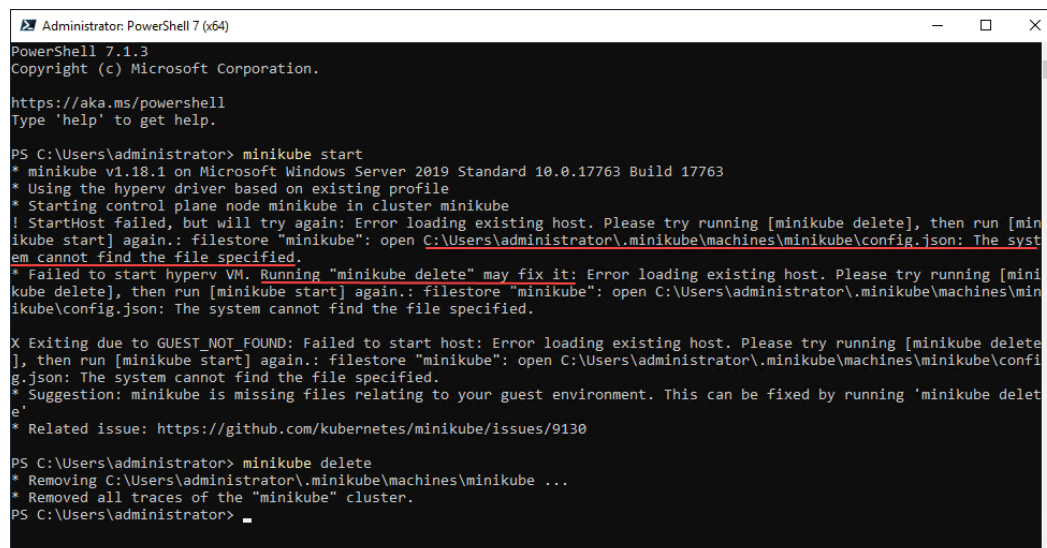
```
Select Administrator: PowerShell 7 (x64)

* minikube v1.18.1 on Microsoft Windows Server 2019 Standard 10.0.17763 Build 17763
* Automatically selected the hyperv driver
* Starting control plane node minikube in cluster minikube
* Creating hyperv VM (CPUs=2, Memory=2200MB, Disk=20000MB) ... E0330 12:56:00.368093 7352 main.go:117] libmachine: [
stderr =====] : Hyper-V\Start-VM : 'minikube' failed to start.
Not enough memory in the system to start the virtual machine minikube.
Could not initialize memory: Ran out of memory (0x8007000E).
'minikube' failed to start. (Virtual machine ID 8E38EF69-FD03-474C-905F-C44F72718C56)
Not enough memory in the system to start the virtual machine minikube with ram size 2200 megabytes. (Virtual machine
ID 8E38EF69-FD03-474C-905F-C44F72718C56)
'minikube' could not initialize memory: Ran out of memory (0x8007000E). (Virtual machine ID
8E38EF69-FD03-474C-905F-C44F72718C56)
At line:1 char:1
+ Hyper-V\Start-VM minikube
+ ~~~~~
+ CategoryInfo          : FromStdErr: (:) [Start-VM], VirtualizationException
+ FullyQualifiedErrorId : OutOfMemory,Microsoft.HyperV.PowerShell.Commands.StartVM

* Stopping node "minikube" ...
* Deleting "minikube" in hyperv ...
! StartHost failed, but will try again: creating host: create: creating: exit status 1
* Failed to start hyperv VM. Running "minikube delete" may fix it: Error loading existing host. Please try running [mini
kube delete], then run [minikube start] again.: filestore "minikube": open C:\Users\administrator\.minikube\machines\min
ikube\config.json: The system cannot find the file specified.
! Startup with hyperv driver failed, trying with alternate driver ssh: Failed to start host: Error loading existing host
. Please try running [minikube delete], then run [minikube start] again.: filestore "minikube": open C:\Users\administra
tor\.minikube\machines\minikube\config.json: The system cannot find the file specified.
* Removing C:\Users\administrator\.minikube\machines\minikube ...
```

Out of memory error when starting minikube

After I rebooted the [Windows Server 2019](#) server, I tried to run the **minikube start** command and received the error below. However, as the message details, this is likely due to the failed start from the other attempts. As detailed, run the **minikube delete** command.



```
Administrator: PowerShell 7 (x64)

PowerShell 7.1.3
Copyright (c) Microsoft Corporation.

https://aka.ms/powershell
Type 'help' to get help.

PS C:\Users\administrator> minikube start
* minikube v1.18.1 on Microsoft Windows Server 2019 Standard 10.0.17763 Build 17763
* Using the hyperv driver based on existing profile
* Starting control plane node minikube in cluster minikube
! StartHost failed, but will try again: Error loading existing host. Please try running [minikube delete], then run [mini
kube start] again.: filestore "minikube": open C:\Users\administrator\.minikube\machines\minikube\config.json: The syst
em cannot find the file specified.
* Failed to start hyperv VM. Running "minikube delete" may fix it: Error loading existing host. Please try running [mini
kube delete], then run [minikube start] again.: filestore "minikube": open C:\Users\administrator\.minikube\machines\min
ikube\config.json: The system cannot find the file specified.

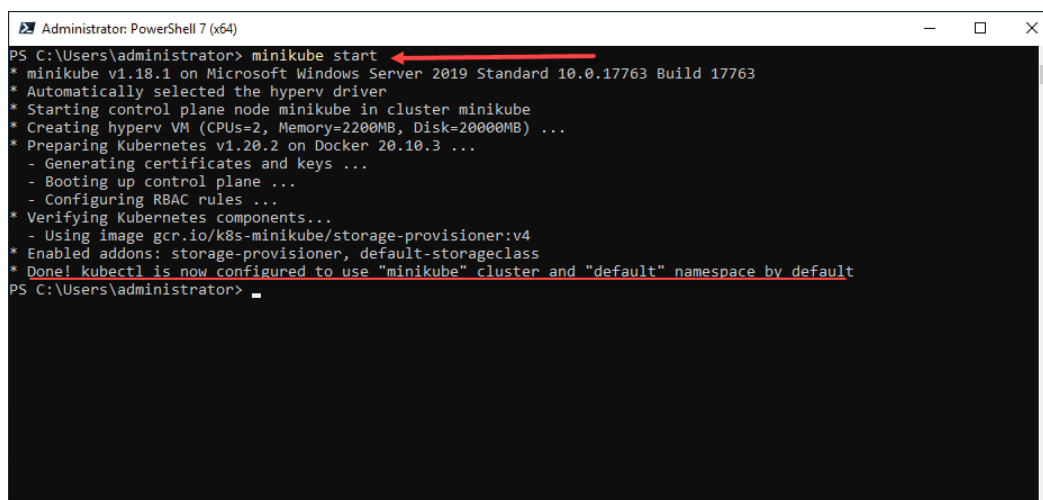
X Exiting due to GUEST_NOT_FOUND: Failed to start host: Error loading existing host. Please try running [minikube delete
], then run [minikube start] again.: filestore "minikube": open C:\Users\administrator\.minikube\machines\minikube\confi
g.json: The system cannot find the file specified.
* Suggestion: minikube is missing files relating to your guest environment. This can be fixed by running 'minikube delet
e'
* Related issue: https://github.com/kubernetes/minikube/issues/9130

PS C:\Users\administrator> minikube delete
* Removing C:\Users\administrator\.minikube\machines\minikube ...
* Removed all traces of the "minikube" cluster.
PS C:\Users\administrator>
```

File error starting minikube on windows server 2019

5. Start the Kubernetes cluster

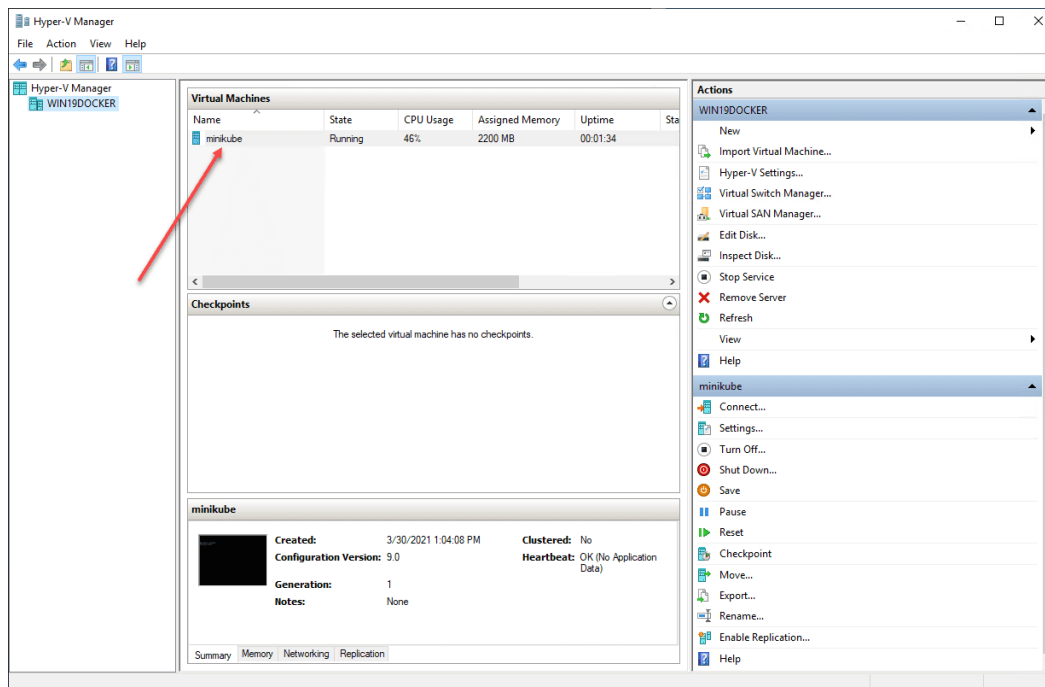
After running minikube delete, I reran the **minikube start** command once again. The minikube environment built successfully. As you can see below, minikube will select the vm driver to use with the host you have chosen. It is here using the **hyperv driver**. So, there are no configuration files you have to update manually, etc, which is nice.



```
Administrator: PowerShell 7 (x64)
PS C:\Users\administrator> minikube start
* minikube v1.18.1 on Microsoft Windows Server 2019 Standard 10.0.17763 Build 17763
* Automatically selected the hyperv driver
* Starting control plane node minikube in cluster minikube
* Creating hyperv VM (CPUs=2, Memory=2200MB, Disk=20000MB) ...
* Preparing Kubernetes v1.20.2 on Docker 20.10.3 ...
  - Generating certificates and keys ...
  - Booting up control plane ...
  - Configuring RBAC rules ...
* Verifying Kubernetes components...
  - Using image gcr.io/k8s-minikube/storage-provisioner:v4
* Enabled addons: storage-provisioner, default-storageclass
* Done! kubect1 is now configured to use "minikube" cluster and "default" namespace by default
PS C:\Users\administrator>
```

Successfully started minikube on windows server 2019

As you can see below, you can see the **minikube** virtual machine running in Hyper-V Manager.



Minikube vm provisioned in windows server 2019 hyper v

6. Connect to Kubernetes and view the Kubernetes dashboard

Now that you have the minikube environment up and running, you can connect to and interact with the minikube cluster.

```
kubectl get po -A
```