THIC: RANCHER

Leverage your Azure Stack HCI investment to run containerized applications alongside virtual workloads in highly-available and resilient patterns. See below for a how-to guide to installing and configuring one of the leading commercially supported Kubernetes Management Platforms available. In this example, <u>Rancher</u> is utilized for its' ease of use and simple management portal supporting all the latest Kubernetes features and functions.

- Plan and configure primeLine Solutions GmbH hardware and OS/tools to support Azure Stack HCI hosting Rancher
- Step by step documentation to install and configure Rancher including VM setup, Docker installation and Rancher design

High-level architecture of Azure Stack HCI (supports 2 to 16 physical servers) hosting traditional applications in Virtual Machines and a Kubernetes cluster on Linux and Windows Server VMs to support Linux and Windows Containers.



Why Azure Stack HCI?

Flexibility:

scale VMs (including Container hosts) to optimize workloads across physical hardware resources
ease of adding physical resources (servers) to increase capacity

- support traditional virtualized applications simultaneously with containerized applications

Resiliency:

- VMs (including Container hosts) can move across the physical server in the event of a physical server or device outage

Containers and pods can move across the Container hosts (nesting the resiliency on top of VMs)
all VM and Containers storage operations are

highly-available





1. Hardware and OS configuration for Rancher

These primeLine egino HCI Series SKUs are recommended for Scale-Out Storage scenarios.

primeLine egino HCI Series G2 22242i-C624-NA1 primeLine egino HCI Series G2 22242i-C624-NS1 primeLine egino HCI Series G2 22242i-C624-XA1 primeLine egino HCI Series A1 12121a-SoC-XN1 primeLine egino HCI Series A1 12121a-SoC-XA1

2. Plan Hardware Deployment

primeLine recommends using nodes with at least All-Flash for Container scenarios. We recommend to contact our Azure Stack HCl experts for individual configuration for the use case. primeLine offers services for deployment, management and training on the product.

3. Network and Switch Connectivity

All primeLine egino HCI Series SKUs support switchless design for easy implementation. All primeLine egino HCI Series G2 and A1 SKUs support RDMA (RoCE v2).

Step by Step guide to deploy Azure Stack HCI

- 1. Install Windows Server Datacenter
- 2. Add Roles and Features
- 3. Setup Failover Clustering and enable a Cluster Witness
- 4. Setup Storage Spaces Direct
- 5. Install Windows Admin Center (WAC)

From Windows Admin Center (WAC), Set up **Azure Monitor** to gain insight into your application, VM, container, network and server — health of your Azure Stack HCI-based Rancher instantiation.





The RANCHER

High-level Architecture of Rancher 2. The figure, below, depicts a Rancher installation that manages two Kubernetes clusters: one created by Rancher Kubernetes Engine (RKE) on Azure Stack HCl and another created by Azure Kubernetes Service (AKS).







- 2. Prepare Azure Stack HCI for Rancher
 - a. See Rancher installation requirements to see a list of supported Operating Systems and Rancher roles
 - b. Read the Best Practices for running Linux on Hyper-V to optimize Hyper-V performance with Linux VMs
 - c. From Windows Admin Center (WAC)
 - i. Navigate to Hyperconverged Cluster Manager
 - ii. Select Virtual Machines and view Inventory
 - d. Create at least one Hyper-V Gen2 VM to install Linux with Docker container support
 - Note: this Quick Start uses Ubuntu Server 18.04 LTS (the ...ISO file is available for download from ubuntu.com)
 - i. Choose all default Settings for your Gen2 VM except increase the RAM to 8GB and for Operating System, choose "Install an Operating System from an ISO file" and reference the Linux ISO that you downloaded
 - For a Gen2 VM to boot Linux, you must change Settings on the VM for Secure Boot Template to the Microsoft UEFI Certificate Authority (see WAC screenshot below).
 Settings for RancherNode1

ණී General	Security		
B Memory	Some settings cannot be modified because the virtual machine is running.		
Processors	Secure Boot		
Disks	Enable Secure Boot ()		
+ Networks	Template:	rosoft LIFFI Certificate Authority	~
🗈 Boot order		Controller certainente mationity	
Checkpoints	Encryption Support		
Security	Enable Trusted Platform Module ①		
	Encrypt state and virtual machine migration		

iii. During Linux installation in your VMs, add SSH Server and Docker options (varies by Linux distribution selected).

- 3. Install Rancher via Docker on the Linux VM(s) by running the following command
 - \$ sudo docker run -d --restart=unless-stopped -p 80:80 -p 443:443 rancher/rancher
 - a. Login to Rancher Access the Rancher portal by browsing to the hostname or IP address of your new Rancher VM
 - b. <u>Create a Kubernetes cluster</u> in the Rancher portal
 - c. To support Windows Containers, you must enable Windows Server cluster node support as a Worker role. In the Rancher portal, edit the Kubernetes cluster to join and configure the Windows Server VM.

Node Operating System The OS of the node which will be added into the cluster					
	Cinux		Windows		
Customize Node Run Command Editing node options will update the command you will run on your existing machines					
0	Node Options Choose what roles the node will have in the cluster Node Role	Control Plane	✓ Worker Show advanced options		
2	Run this command in Op on one or more existing mach and above. PowerShell -NoLogo -NonInteractive -Command "& {dock https://10.197.169.78 -token sl6g2lrmmjxhg88lh95594 f16fd35703bc22dcde00e2c20456dfd98337c8f78171b0d56099	hines already running a supported versi er run -v c:/:c:/host rancher/rancher mdgmjdl872lngv7znv6jmwjjd4rqw9hjca- 0310e0f01632worker iex}"	on of Docker and windows server version 1809 -agent:v2.3.0 bootstrapserver -checksum		



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Microsoft



- 4. Choose a Kubernetes storage option that aligns to your requirements
 - a. <u>Utilize local path provisioner</u>. This provides a way for Kubernetes to utilize the local storage in each node.
 - b. Utilize one of the CSI (Container Storage Interface) <u>Drivers</u> to provide persistent storage options to your Kubernetes cluster.
- 5. Connect to <u>Azure as a Rancher Cloud Provider</u>
 - a. In the Rancher UI, enable Azure resources to be integrated into your on-prem Rancher instantiation

Cloud Provider			
None			
C Amazon	Azure Cloud Provider		
Azure			
Custom			
Read more about the Kubernetes cloud providers			
aadClientCertPassword The password of the client certificate for an AAD application with RBAC access to talk to Azure RM APIs	Value		
aadClientSecret The ClientSecret for an AAD application with RBAC access to talk to Azure RM APIs	Value		
aadClientCertPath The path of a client certificate for an AAD application with RBAC access to talk to Azure RM APIs	Value		
aadClientId • The ClientID for an AAD application with RBAC access to talk to Azure RM APIs	Value		
\sim			

b. Enable integration with Azure storage services

rancher 🗸 Cluster Nodes Storage 🗸 Pro	jects/Namespaces Memb	ers Tools 🗸	🗮 × .
Add Storage Class			
Name			Add a Description
AzureStorageClass			
Provisioner			
Azure Disk			~
Parameters Configure the provider-specific parameters for the storage class			
Storage Account Type	Kind		
Standard_LRS	Managed	\sim	
\sim		\sim	





Summary

Following this guide, you have installed Azure Stack HCI, deployed Linux VMs (and Windows Server VMs for Windows Container support), installed and configured Docker, installed Rancher and setup a Kubernetes cluster. You also evaluated Kubernetes storage options and are ready to <u>deploy workloads</u>.

For production support of Rancher, Docker and Kubernetes, visit http://www.rancher.com/support

