Microsoft

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, Rancher 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.
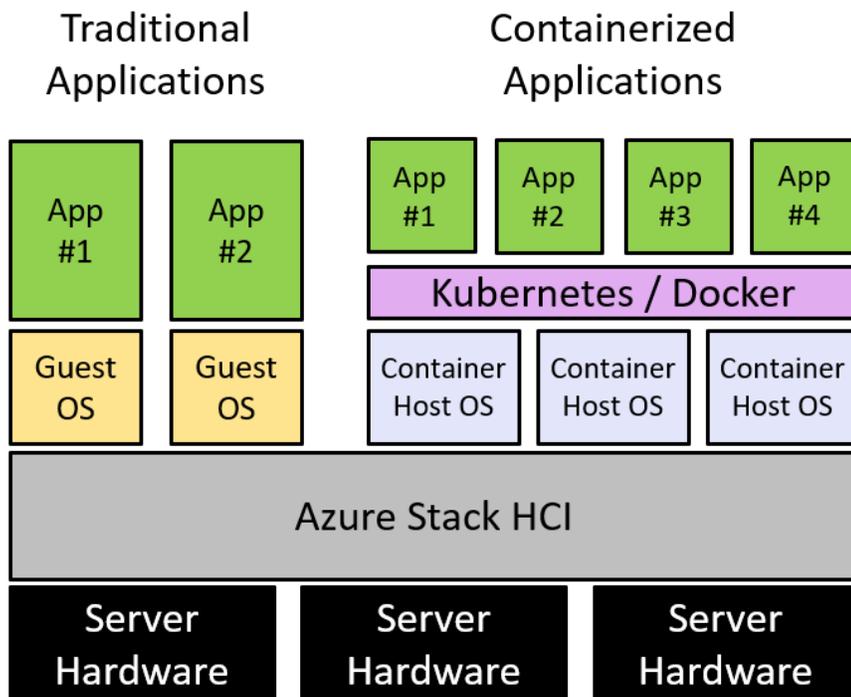


**Why Azure Stack HCI?**

*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 HCI 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.

**Monitor and receive notifications about server health with Azure Monitor**

Get full observability into your applications infrastructure, and network.

Get an overview of Azure Monitor

Set up
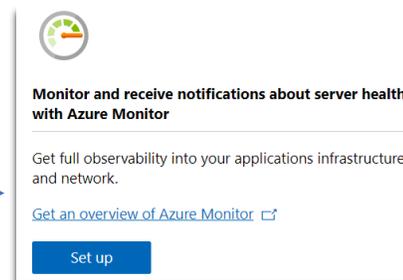
High-level Architecture of Rancher 2.  The figure, below, depicts a Rancher installation that manages two Kubernetes clusters: one created by Rancher Kubernetes Engine (RKE) on Azure Stack HCI and another created by Azure Kubernetes Service (AKS).
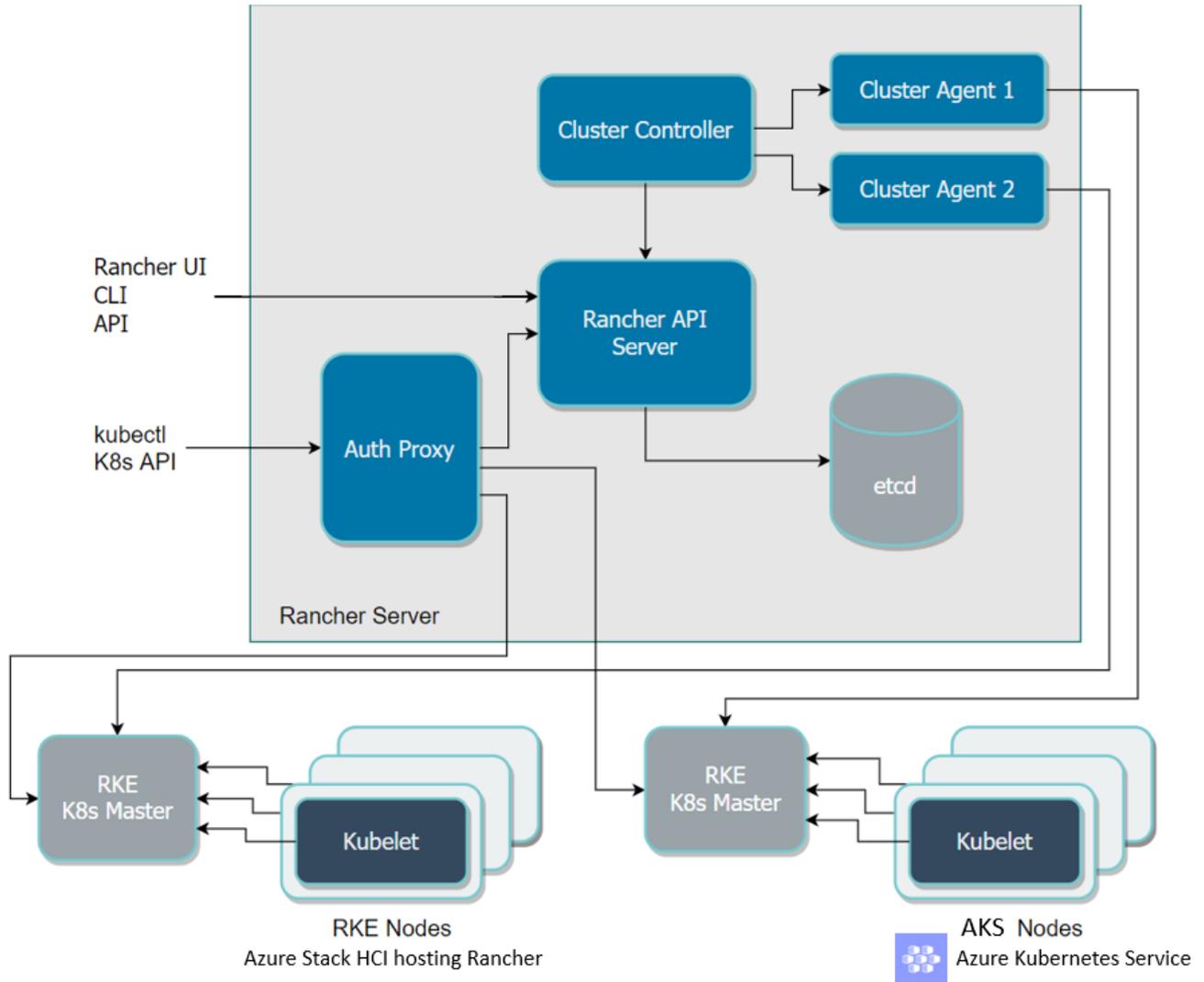
2. Prepare Azure Stack HCI for Rancher
   a. See Rancher installation requirements to see a list of supported Operating Systems and Rancher roles
   b. Read the Best Practices for running Linux on Hyper-V to optimize Hyper-V performance with Linux VMs
   c. From Windows Admin Center (WAC)
      i. Navigate 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
      ii. 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).
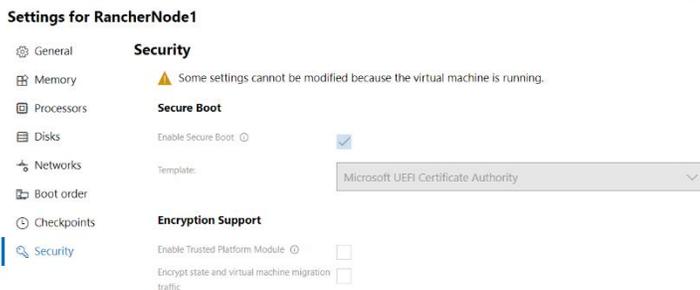


      iii. During Linux installation in your VMs, add SSH Server and Docker options (*varies by Linux distribution selected*).

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. Create a Kubernetes cluster 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.



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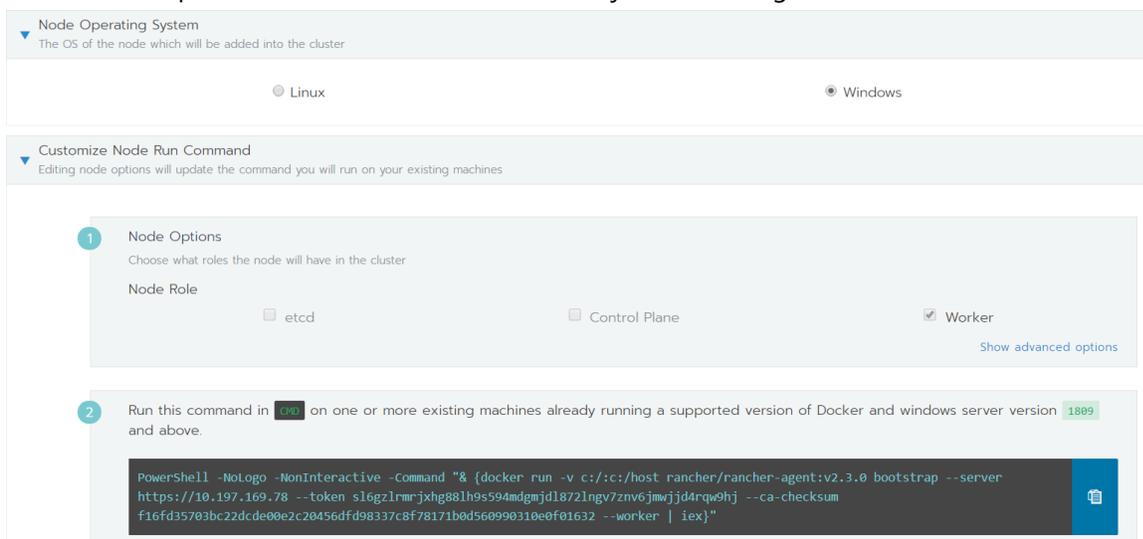
4.  Choose a Kubernetes storage option that aligns to your requirements
    a.  Utilize local path provisioner.  This provides a way for Kubernetes to utilize the local storage in each node.
    b.  Utilize one of the CSI (Container Storage Interface) Drivers to provide persistent storage options to your Kubernetes cluster.

5.  Connect to Azure as a Rancher Cloud Provider
    a.  In the Rancher UI, enable Azure resources to be integrated into your on-prem Rancher instantiation



    b.  Enable integration with Azure storage services

**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 deploy workloads.

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