Azure Kubernetes Service on Azure Stack HCI

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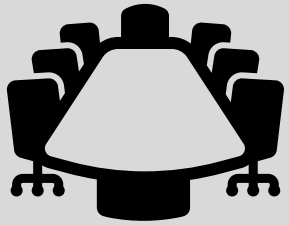
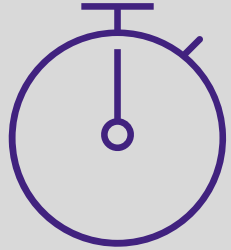
People want AKS in their datacenters

Disconnected apps



Business need

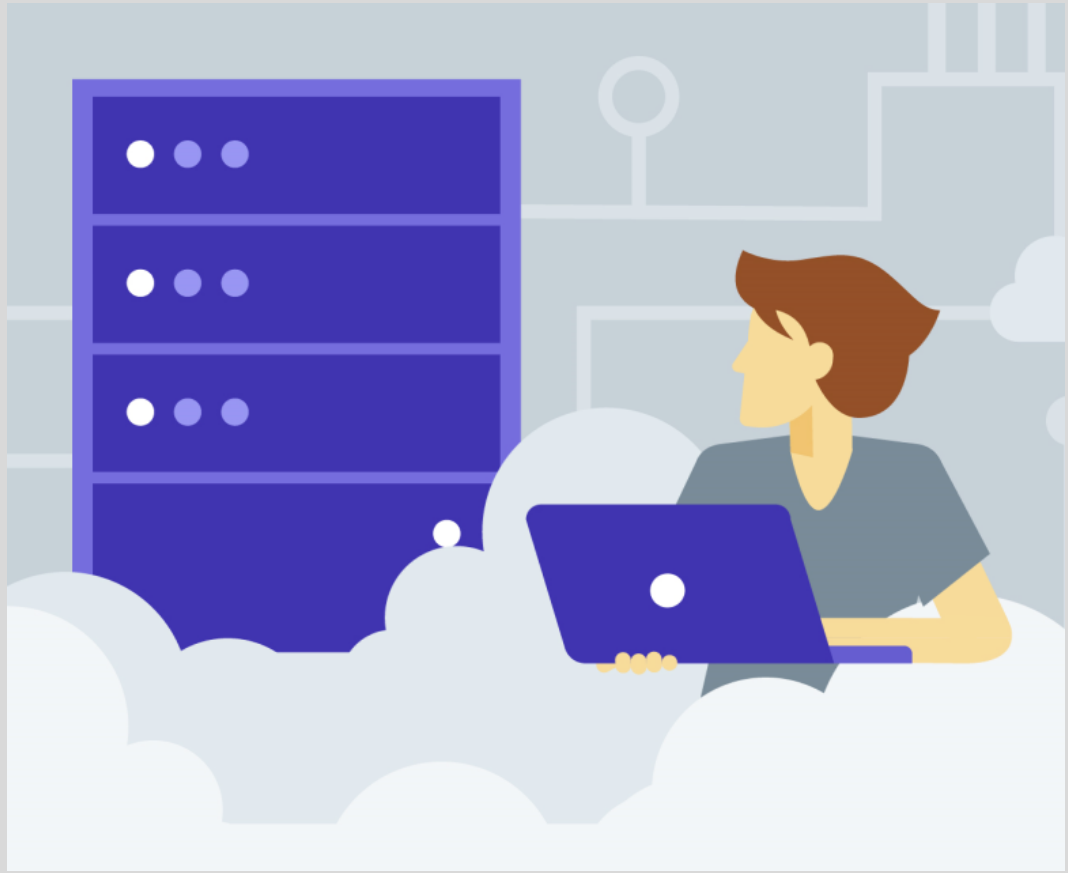


Fast deployments

AKS Consistent

- AKS consistent
- Azure Arc
- Upstream K8s code
- Windows + Linux clusters

- Easy and fast deployments
- Msft managed & updated
- PowerShell + Windows Admin Center
- Single support vendor
- Enterprise security



Applications

Custom apps 

BI 

Analytics 

Azure Portal

Azure Arc

Azure Arc for Data Services

SQL

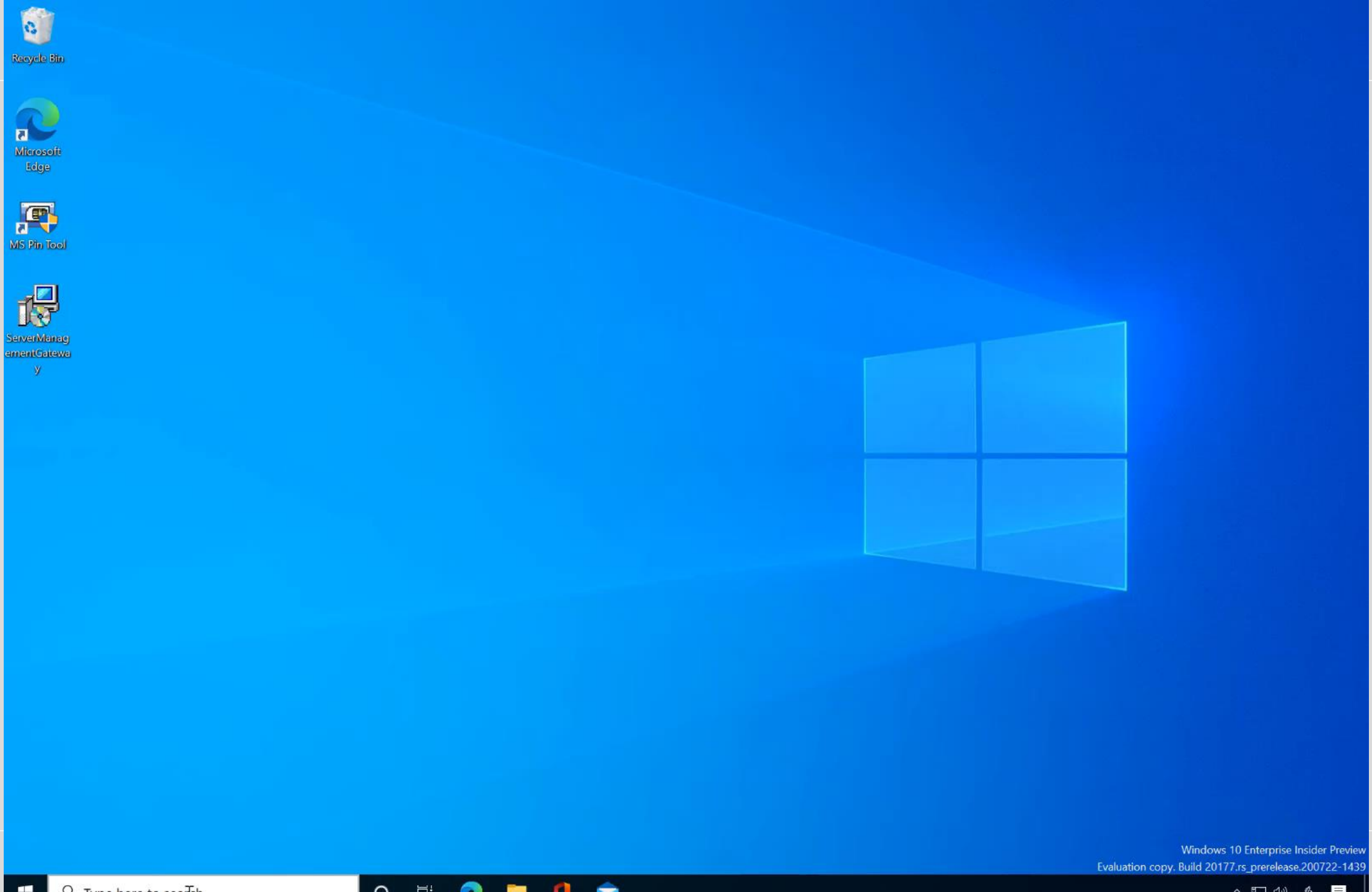
AKS on Azure Stack HCI

Azure Stack HCI / Windows Server 2019

Validated hardware

Admin Center

Demo 1 – Installing AKS On Azure Stack HCI using Windows Admin Center STOP WE


Recycle Bin
Microsoft Edge
MS Pin Tool
ServerManagementGateway
Windows 10 Enterprise Insider Preview
Evaluation copy. Build 20177.rs_prerelease.200722-1439

AKS on HCI / Development

- Bridging infrastructure gaps to bring AKS to HCI
- Embracing Open Source
  - Cluster API (CAPI)
    - Infrastructure Providers
- Open sourcing AKS on HCI components
  - AKS on HCI provider (cluster-api-provider-azurestackhci)
  - SDK
- Contributing
  - Sharing our learnings and giving back to the open source community

Our Journey Begins...

- ClusterAPI v1alpha2 was the starting point.
- AzureStackHCI does not include “ARM”.
- Infrastructure Provider Model allows us to “plugin” our new Microsoft OnPremCloud APIs.
- Kubebuilder, a framework for building Kubernetes APIs using custom resource definitions.

Barriers to ClusterAPI Entry

- We had no native load balancing solution for AzureStackHCI without the inclusion of SDN.
  - Looked towards OpenSource.
  - HAProxy, KeepAliveD.
  - Newer Projects such as kube-vip.
- We did not have a cloud provider.
  - Traditionally Kubernetes had Cloud Providers in-tree.
  - Luckily, efforts made in the community to allow for external “cloud-providers”.

From ClusterAPI on AzureStack HCI to AKS On AzureStack HCI

- ClusterAPI is an extensible API that can serve as the building blocks for a managed Kubernetes service.
- ClusterAPI v1alpha3 brought more clarity and extensibility to deployments.
- Used Kubebuilder and ClusterCTL to build Operators and deployment tools for AKSHCI.

Cloud Operator

- Extend the success found by the ClusterAPI “Operator Driven Approach”.
- Using the “clusterctl” as a backbone, created an operator to install and upgrade ClusterAPI in a declarative model.
- Simplified the top-level ClusterAPI cluster creation UX.

Windows Worker Nodes

- Proof of Concept with Unattend.xml
- Teaming up with Cloudbase to bring Cloudbase-Init to ClusterAPI.
- CloudBase-Init allows for a Windows Guest OS to be provisioned using the same methods as cloud-init.

Learnings and Looking Forward…

- Built on top of and influenced by ClusterAPI that we would like to contribute back to Kubernetes community.
- Contribute back to the ClusterAPI, Cluster LifeCycle, and API-machinery codebases
  - Improvements to “addons support”
  - Operating System Upgrades for Machines
  - Optimized Management Cluster bring up.
  - Lessons and learnings from the Management Cluster Operator and Windows Node Support
- Ensure customer success by working with the community to deliver high-quality solutions in the open.

Shout Out!

https://github.com/kubernetes-sigs/cluster-api
https://github.com/kubernetes-sigs/kubebuilder
https://github.com/kubernetes-sigs/controller-runtime
https://github.com/plunder-app/kube-vip
https://github.com/microsoft/cluster-api-provider-azurestackhci
https://github.com/microsoft/moc-sdk-for-go

Demo 2 – Deploying a workload Kubernetes cluster using Windows Admin Center

Set up Azure Kubernetes Service

https://localhost:6516/clustermanager/connections/hcicluster/cppe.redmond.corp.microsoft.com/tools/aks/platform-setup-wizard

Not syncing

Windows Admin Center | Cluster Manager

Microsoft

cppe.redmond.corp.microsoft.com

Tools

Search Tools

- Dashboard
- Compute
  - Virtual machines
  - Servers
- Storage
  - Volumes
  - Drives
  - Storage Replica
- Networking
  - Virtual switches
- Tools
  - Azure Monitor
  - Updates
  - Diagnostics
  - Performance Monitor
- Extensions
  - Azure Kubernetes Service

Settings

Set up Azure Kubernetes Service PREVIEW

Prerequisites | System checks | Host configuration | Azure registration | 5 Review + create

Setup is complete
Duration: 45 minutes 28 seconds

Package download

Package	Destination	Download Size	Progress	Time completed
Packages	$env:LocalAppData\Azure Kubernetes...	40 GB	Complete	12/2/2020, 11:07:35 PM

Host configuration and package install

Change Summary	Status
cppe.redmond.corp.microsoft.com	Complete

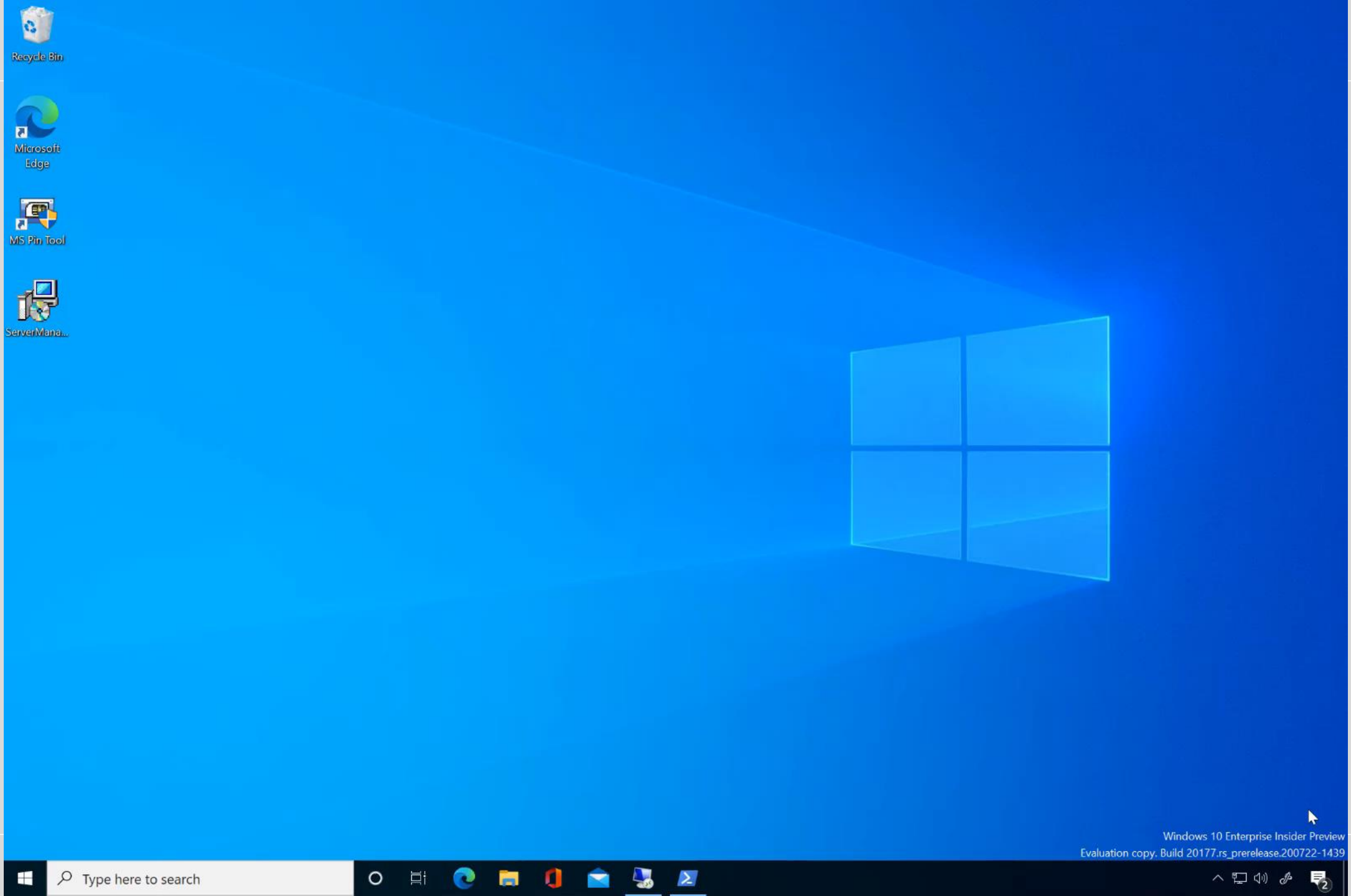
Management cluster creation

Change	Status
Cluster 'aks-management-cluster' set-up	Complete

Back | Finish | Exit

Type here to search

Demo 2 – Deploying and scaling a workload Kubernetes cluster using PowerShell


Recycle Bin
Microsoft Edge
MS Pin Tool
ServerMana...
Type here to search
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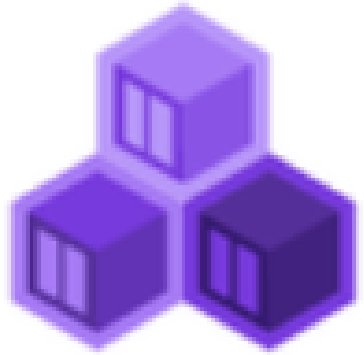

Try it out
aka.ms/aks-hci-evaluate

Read documentation
aka.ms/aks-hci-docs

Q&A!

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