Introducing the New Features of Microsoft Azure Stack HCI 21H2

Planning / Implementation

Azure Stack HCI, a host operating system from Microsoft, is Microsoft's HCI solution for customers who wish to run workloads on-premises and extend easily to Microsoft Azure for hybrid capabilities such as back-up, site recovery, storage, cloud-based monitoring and more. Lenovo ThinkAgile MX Series Solutions are built using Lenovo's popular servers and Microsoft Azure Stack HCI software.

Microsoft requires that Azure Stack HCI needs to be updated at least once every six months to be in supported state. The recommendation is to install the quality and security updates once they are released, every month.

More details about the modern Lifecycle Policy that Azure Stack HCI follows is described in the followoing web page:
https://docs.microsoft.com/en-us/lifecycle/policies/modern

Information about the naming convention for Azure Stack HCI updates is described in the following page:
https://docs.microsoft.com/en-us/azure-stack/hci/concepts/updates

Lenovo ThinkAgile MX

Lenovo has worked closely with Microsoft for many years to ensure our products perform smoothly and reliably with Microsoft operating systems and software. Our customers can leverage the benefits of our partnership with Microsoft by taking advantage of HCI solutions that have been certified under the Microsoft Azure Stack HCI program using the Azure Stack HCI operating system.

The benefits of Lenovo ThinkAgile MX Series solutions include:

- Highly available and scale-on-demand compute/storage integrated solutions
- Easy to provision new IT services and reduce deployment time
- Better performance and lower Total Cost of Ownership (TCO)
- Flexible infrastructure and data centers

Lenovo ThinkAgile MX Series uses the Storage Spaces Direct technology to aggregate the storage and compute in one flexible solution. With the release of Azure Stack HCI version 21H2, support for GPU pools has been added consolidating multiple services in one solution. The continuous development of Windows Admin Center is making sure that the clusters and the services running can be managed from a single interface accessible from any modern browser.

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GPU usage with clustered virtual machines

Azure Stack HCI 21H2 allows attaching GPU`s to the VM`s running on the cluster. The GPU is passed-through over Discrete Device Assignment with little or no performance penalty. The GPU`s from multiple nodes can be pooled together and allow a VM to be failed over from one node to another (the nodes must have a GPU available). In this release for Azure Stack HCI, the live migration feature is not available. Management and creation of the GPU resources can be done from Windows Admin Center (the GPU extension must be installed) or from PowerShell.

The certified solutions provided by Lenovo are validated to work with various GPU`s that can suit different computing requirements. Some of the GPU`s supported at this moment are: NVIDIA A40, A100, A10, T4 and A2.

For more information and instructions on using the a GPU with Azure Stack HCI, see the following page: https://docs.microsoft.com/en-us/azure-stack/hci/manage/use-gpu-with-clustered-vm

Storage thin provisioning

Thin provisioning is now available for the volumes created on the Azure Stack HCI cluster. By enabling thin provisioning better usage of the resources available can be done and based on the usage, more drives can be added to the pool to accommodate growth. Overprovisioning can be done and to avoid running out of space, alerts can be configured to alert when a certain percentage of the pool capacity is used. The thin provisioning is available with any resiliency available. Also fixed volumes cannot be converted to thin provisioning.

As most of the new features the storage provisioning option can be accessed when a volume is created from Windows Admin Center or from PowerShell

For more information and instructions to enable the feature, see the following page: https://docs.microsoft.com/en-us/azure-stack/hci/manage/thin-provisioning

Storage repair speed adjustment

Adjusting the storage repair speed gives administrators the option to prioritize the workloads that are running Azure Stack HCI 21H2 to prioritize the active workloads instead of the resync process. By default, the setting is Medium (there are five settings ranging from very low to very high). The setting can be adjusted from Windows Admin Center or from PowerShell.

For more information and instructions to enable the feature, see the following page: https://docs.microsoft.com/en-us/azure-stack/hci/manage/storage-repair-speed

Kernel Soft Reboot

This new feature allows in certain circumstances for the cluster node to bypass the traditional reboot BIOS/firmware initialization and have less downtime during restart. The feature can be used with Cluster-Aware Updating (CAU), Windows Update plugin for Quality Updates and Hotfix plugin for MSI/MSU/EXEs files only.

The feature can be enabled from PowerShell for all the CAU future runs:

```
Get-Cluster | Set-ClusterParameter -Name CauEnableSoftReboot -Value 1 -Creat
e
```

Or a certain CAU by just adding `-AttemptSoftReboot` at the end of the PowerShell command.

For more information and instructions to enable the feature, see the following page: https://docs.microsoft.com/en-us/azure-stack/hci/manage/kernel-soft-reboot

Nested virtualization on AMD CPUs

Another feature that is helpful especially in testing scenarios is the option to enable nested virtualization also on AMD CPUs. This allows enabling Hyper-V in virtual machines on Azure Stack HCI 21H2 and lowering the costs for testing or training scenarios. It is required to have an AMD CPU with SVM enabled (is supported on first generation EPYC and newer), VM configuration newer than 10.0 and Azure Stack HCI 21H2

For more information and instructions to enable the feature, see the following page:
https://docs.microsoft.com/en-us/azure-stack/hci/concepts/nested-virtualization

Dynamic CPU compatibility mode

This feature checks the capabilities that the CPU`s across the nodes supports and calculating the common denominator across all the processors. Only on virtual machines with the latest configuration (10.0) and running on Azure Stack HCI 21H2 the performance can be improved by enabling compatibility mode for the processor.

By enabling this feature live migration of a virtual machine is possible between nodes that have processors with different capabilities. This is limited to processors from the same manufacturer (to move the VM from a node with AMD CPU to another one that has an Intel CPU it is required to shut down the VM first).

The processor compatibility mode can be enabled from Windows Admin Center and PowerShell.

For more information and instructions to enable the feature, see the following page:
https://docs.microsoft.com/en-us/azure-stack/hci/manage/processor-compatibility-mode

Network ATC

Network ATC comes to simplify the network configuration on Azure Stack HCI clusters allowing a consistent and clear configuration across all nodes of a cluster. For a smooth deployment it is recommended that the network interfaces have the same specifications across the nodes, to use the same PCI slots and to be configured (DCB, MTU, and VLANs).

Network ATC supports multiple scenarios where it can manage the networks. Some of the scenarios are presented in the following document:
https://docs.microsoft.com/en-us/azure-stack/hci/deploy/network-atc

Resources

For more information see:

- What's new in Azure Stack HCI, version 21H2
  https://docs.microsoft.com/en-us/azure-stack/hci/whats-new
- ThinkAgile MX product page:
  https://www.lenovo.com/us/en/p/servers-storage/sdi/thinkagile-mx-certified-node/wmd00000377

Related product families

Product families related to this document are the following:

- ThinkAgile MX Series

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