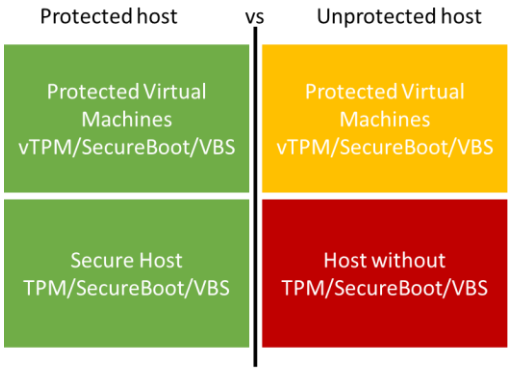
AZURE STACK HCI: TRUSTED ENTERPRISE VIRTUALIZATION

Leverage your Azure Stack HCI investment to run workloads on a highly secure infrastructure by choosing the hardware designed for the Trusted enterprise virtualization scenario, with unparalleled levels of operating system security enabled with virtualization-based security (VBS) and hybrid cloud capabilities made easy through Windows Admin Center and Azure portal.
Below, you will find a how-to guide for building an infrastructure for the Trusted enterprise virtualization scenario on Azure Stack HCI.

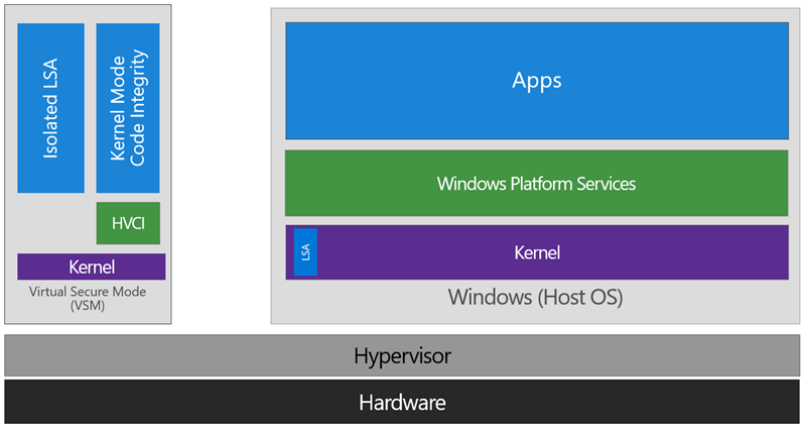
Overview of Trusted enterprise virtualization scenario

Virtualization-based security (VBS) is a key component of the security investments in Azure Stack HCI to protect hosts and virtual machines from security threats.
For example, the Security Technical Implementation Guide (STIG) is published as a tool to improve the security of Department of Defense (DoD) information systems, and lists VBS and hypervisor-protected-code-integrity (HVCI) as general security requirements. It is imperative to use host hardware that is VBS and HVCI enabled, in order for the protected workloads on virtual machines to fulfil their security promise because protection of virtual machines is not guaranteed on a compromised host.



VBS uses hardware virtualization features to create and isolate a secure region of memory from the normal operating system. Windows can use this "virtual secure mode" to host a number of security solutions, providing them with greatly increased protection from vulnerabilities in the operating system, and preventing the use of malicious exploits which attempt to defeat protections.

VBS uses the Windows hypervisor to create this “virtual secure mode”, and to enforce restrictions which protect vital system and operating system resources, or to protect security assets such as authenticated user credentials. With the increased protections offered by VBS, even if malware gains access to the operating system kernel the possible exploits can be greatly limited and contained, because the hypervisor can prevent the malware from executing code or accessing platform secrets.



One such security solution example is HVCI, which uses VBS to significantly strengthen code integrity policy enforcement. Kernel mode code integrity checks all kernel mode drivers and binaries before they are started and prevents unsigned drivers or system files from being loaded into system memory.

HVCI leverages VBS to run the code integrity service inside a virtual secure mode, providing stronger protections against kernel viruses and malware. The hypervisor, the most privileged level of system software, sets and enforces page permissions across all system memory. Pages are only made executable after code integrity checks inside the virtual secure mode have passed, and

executable pages are not writable. That way, even if there are vulnerabilities like buffer overflow that allow malware to attempt to modify memory, code pages cannot be modified, and modified memory cannot be made executable.

How to deploy VBS and HVCI-enabled Azure Stack HCI

1. Plan Hardware Deployment

   All the Azure Stack HCI solutions by Supermicro are certified for the Hardware Assurance Additional Qualification, which tests for all the functionality needed for VBS. However, VBS and HVCI are not automatically enabled in Azure Stack HCI and Step 2 will guide you on how to enable them.

   Warning: Hypervisor-protected code integrity (HVCI) may be incompatible with devices not listed in the Azure Stack HCI catalog. Microsoft strongly recommends using an Azure Stack HCI validated solution from our hardware partners for the Trusted enterprise virtualization scenario.

   ### Supermicro AMD Ultra Series

   Below are supported Supermicro AMD H11 Ultra server based solutions.

Supermicro AS-2023-TR4-HCI

Scale
2 to 4 nodes

Single Node Data
- 16 to 128 cores (AMD EPYC)
- 128GB to 8TB memory
- 4TB to 183TB storage
- NVMe + SDD + HDD
- Up to 100GbE

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TPM module by default is enabled in BIOS, therefore the customer does not need to change TPM settings in BIOS.
For enabling Secure Boot, please follow below steps:

1. Boot into BIOS >> Advanced >> PCIe/PCI/PnP Configuration, Change the "onboard Video Option ROM" from "Legacy" to "EFI". Save and exit the BIOS.
2. Boot system to BIOS again. Then go to Security >> Secure Boot. In "Key Management", enable the "Default Key Provision".
3. Disable the "CSM Support".
4. Enable the "Secure Boot".

2. Deploy VBS-Enabled Azure Stack HCI

   Step by Step guide to deploy Azure Stack HCI. Also install Windows Admin Center (WAC) for managing Azure Stack HCI.
   Enable virtualization-based protection of code integrity

3. From Windows Admin Center (WAC), set up Azure Security Center to add threat protection and quickly assess your security posture of your workloads.

   - You can also setup additional Azure hybrid services such as Backup, File Sync, Site Recovery, Point-to-Site VPN, Update Management, and Azure Monitor in WAC.

Summary

With the completion of the Azure Stack HCI Trusted enterprise virtualization deployment and the configuration of VBS / HVCI, you now have a platform with the highest security standards for protecting security sensitive workloads on both physical and virtual machines.

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