Azure VMware Solution: Private Cloud Component Inventory

VMware Getting Started

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Introduction

This document describes the components provisioned when a new Azure VMware Solution private cloud is created and connected to an Azure VNet with the **Azure VNet connect** feature. These include:

- Azure resources
- vSphere components
- NSX-T components
- Add-on components

Components List

Azure Component Descriptions

The following Azure resources are created:

- An AVS Private cloud object
- An ExpressRoute connection to the Azure Dedicated Enterprise Edge
- A new VNet, if the user elects to create a new VNet with the **Azure VNet connect** wizard
- A subnet named `GatewaySubnet` if one does not already exist in the selected VNet
- A VNet gateway, with an auto-generated name of the form `VNetName-gateway`
- An ExpressRoute Authorization Key, named `er-auth-key`
- A Public IP address, with an auto-generated name of the form `VNetName-gateway-pip`
- A gateway connection, with an auto-generated name of the form `VNetName-gateway-conn`

vSphere Component Descriptions

The following vSphere components are deployed and configured:

- A vCenter Appliance configured with an embedded Platform Services Controller. Currently deployed version is 7.0 U3k. The vCenter receives an auto-generated name of the form `vc.UniqueIdentifier.azureregionname.avs.azure.com`
- One Datacenter object, named `SDDC-Datacenter`
- One cluster, named `Cluster-1`
- One vSAN datastore, named `vsanDatastore`
- Three or more VMware ESXi 7.0 U3k hosts. These hosts receive auto-generated names of the form `esx##-r##.p##.vCenterUniqueIdentifier.azureregionname.avs.azure.com.`
- Each ESXi host has four vmnic interfaces, each attached two one of two distributed switches:
  - vminc0 and vmnic3 are connected to an NSX-T virtual distributed switch, named in the form `TNT##-NVDS01`
  - vmnic1 and vmnic2 are connected to a distributed switch, named in the form `TNT##-DVS`
- Each ESXi host has five VMkernel adapters provisioned on the `TNT##-DVS` distributed switch.
  - vmk0 is assigned an Azure IP address, and is not used in normal customer operation
  - vmk1 is used for management communication
  - vmk2 is used for vMotion traffic
  - vmk3 is used for vSAN traffic, and has an MTU of 9000
  - vmk4 is used for vSphere Replication traffic

ESXi host configuration details--including vmnic assignments, VMkernel adapter configuration, distributed switch configuration, and NSX-T virtual distributed switch configuration--are managed by Microsoft and cannot be modified by customers. This information is provided only for reference.

NSX-T Components

The current version of NSX-T in AVS is 3.2.2. The following NSX-T components are deployed and configured:

- Three NSX management nodes
- One NSX-T Edge Cluster named in the form `TNT##-CLSTR`
- Two Edge Nodes named in the form `TNT##-EVM01` and `TNT##-EVM02`
- One Tier-0 gateway named in the form `TNT##-T0`
- One Tier-1 gateway named in the form `TNT##-T1`
- Six Transport Zones:
  - `TNT##-EVM-PRIVATE01-TZ` and `TNT##-EVM-PRIVATE02-TZ`, used by the Edge nodes to define T0 connectivity to top of rack

switches

- `TNT##-VLAN-TZ` is a used by the Edge nodes for VLAN uplinks
- `TNT##-OVERLAY-TZ` used for VM segments
- `nsx-overlay-transportzone` and `nsx-vlan-transportzones` are default NSX-T objects and are not used.

- Three Segments:
  - `TNT##-HCX-UPLINK` used for HCX uplink connectivity
  - `TNT##-T0-PRIVATE01-LS` is associated with the TNT##-EVM-PRIVATE01-TZ transport zone and T0 interfaces to Top-of-Rack switch 1
  - `TNT##-T0-PRIVATE02-LS` is associated with the TNT##-EVM-PRIVATE02-TZ transport zone and T0 interfaces to Top-of-Rack switch 2
- A DNS Service named `TNT##-DNS-FORWARDER`, associated with the T1 gateway
- A DNS forwarder one named `TNT##-DNS-FORWARDER-ZONE`, configured to forward all DNS requests to Cloudflare DNS servers (1.1.1.1, 1.0.0.1)

NSX-T management and edge clusters, transport zone configuration, and default segments are managed by Microsoft and cannot be modified by customers. This information is provided only for reference.

Customers can manage the default Tier-1 gateway, create and manage additional Tier-1 gateways, create and manage additional overlay segments, create and manage an NSX-hosted DHCP server or relay, and modify DNS configuration including the default DNS servers and conditional forwarders.

vSphere Management Component Footprint

The table below summarizes resource consumption for AVS management components.

Required Components:

Component	Provisioned vCPU	Provisioned RAM (GB)	Provisioned Storage (GB)	Typical CPU Usage (GHz)	Typical RAM Usage (GB)
vCenter Server	8	28	915	1.1	3.6
vSphere Cluster Service VM 1	1	0.1	5	0.1	0.1
vSphere Cluster Service VM 2	1	0.1	5	0.1	0.1
vSphere Cluster Service VM 3	1	0.1	5	0.1	0.1
ESXi Node 1	N/A	N/A	N/A	9.4	0.4
ESXi Node 2	N/A	N/A	N/A	9.4	0.4
ESXi Node 3	N/A	N/A	N/A	9.4	0.4
NSX Manager 1	6	24	300	5.5	8.5
NSX Manager 2	6	24	300	5.5	8.5
NSX Manager 3	6	24	300	5.5	8.5
NSX Edge 1	8	32	200	1.3	0.6
NSX Edge 2	8	32	200	1.3	0.6
Required Component Total:	**57**	**164.3**	**2,230**	**48.7**	**31.8**

Optional Add-On Components:

Component	Provisioned vCPU	Provisioned RAM (GB)	Provisioned Storage (GB)	Typical CPU Usage (GHz)	Typical RAM Usage (GB)
HCX Manager[1]	4	12	65	1	3.2
HCX IX	8	3	2	(Varies)	(Varies)
HCX NE	8	3	2	(Varies)	(Varies)
HCX WAN Optimization	8	14	100 / 5000 IOPS	(Varies)	(Varies)
Site Recovery Manager	4	12	33	1	1
vSphere Replication Manager Appliance	4	8	33	4.3	2.2
vSphere Replication Server Appliance	2	1	33	1	0.1
Optional Component Total:	**78**	**53**	**268**	**7.3**	**6.5**

Required and Optional Add-On Components Combined:

Category	Provisioned vCPU	Provisioned RAM (GB)	Provisioned Storage (GB)	Typical CPU Usage (GHz)	Typical RAM Usage (GB)
Required	57	164.3	2,230	48.7	31.8
Optional	78	53	268	7.3	6.5
Total	**135**	**217.3**	**2,498**	**56**	**38.3**

Summary and Additional Resources

This document described the components deployed when a new Azure VMware Solution private cloud is created, and their initial configurations.

Additional Resources

For more information about Azure VMware Solution, you can explore the following resources:

- Azure VMware Solution on VMware Cloud Tech Zone
- Azure VMware Solution Documentation
- VMware Cloud Well-Architected Framework for Azure VMware Solution: Shared Responsibility Model

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Changelog

The following updates were made to this guide:

Date	Description of Changes
2021/11/04	
2023/01/13	
2023/07/18	

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[1] HCX 4.4.2 is the version currently being deployed. Customers may upgrade as needed.