



Introduction to the ASAv

The Adaptive Security Virtual Appliance (ASAv) brings full firewall functionality to virtualized environments to secure data center traffic and multitenant environments.

You can manage and monitor the ASAv using ASDM or CLI. Other management options may be available.

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Hypervisor Support

For hypervisor support, see [Cisco ASA Compatibility](#).

Licensing for the ASAv

The ASAv uses Cisco Smart Software Licensing. For complete information, see [Smart Software Licensing](#).



Note You must install a smart license on the ASAv. Until you install a license, throughput is limited to 100 Kbps so you can perform preliminary connectivity tests. A smart license is required for regular operation.

See the following sections for information about ASAv licensing entitlements and resource specifications for the supported private and public deployment targets.

Licensing for the ASAv

See the following tables for information about ASAv licensing entitlements, licensing states, required resources, and model specifications:

- [Table 1: ASAv Smart License Entitlements](#)—Shows the compliant resources scenarios that match license entitlement for the ASAv platform.



Note The ASAv uses Cisco Smart Software Licensing. A smart license is required for regular operation. Until you install a license, throughput is limited to 100 Kbps so you can perform preliminary connectivity tests.

- [Table 2: ASAv Licensing States](#)—Shows the ASAv states and messages connected to resources and entitlement for the ASAvs.
- [Table 3: ASAv Model Descriptions and Specifications](#)—Shows the ASAv models and associated specifications, resource requirements, and limitations.

Smart License Entitlements

The ASAv uses Cisco Smart Software Licensing. For detailed information, see [Smart Software Licensing for the ASAv and ASA](#).



Note You must install a smart license on the ASAv. Until you install a license, throughput is limited to 100 Kbps so you can perform preliminary connectivity tests. A smart license is required for regular operation.

Table 1: ASAv Smart License Entitlements

License Entitlement	vCPU/RAM	Throughput	Rate Limiter Enforced
Lab Edition Mode (no license)	All Platforms	100Kbps	Yes
ASAv5 (100M)	1vCPU/1 GB to 1.5 GB (2 GB recommended)	100Mbps	Yes
ASAv10 (1 GB)	1vCPU/2 GB	1Gbps	Yes
ASAv30 (2 GB)	4vCPU/8 GB	2Gbps	Yes

Licensing States

Table 2: ASAv Licensing States

State	Resources vs. Entitlement	Actions and Messages
Compliant	Resource = Entitlement limits (vCPU, GB of RAM)	Appliances optimally resourced No actions, no messages
	Resources < Entitlement limits Under-provisioned	No actions while Warning messages are logged that ASAv cannot run at licensed throughput.

State	Resources vs. Entitlement	Actions and Messages
Non-compliant	Resources > Entitlement limits Over-provisioned	ASAv rate limiter engages to limit performance and log Warnings on the console.

Model Descriptions and Specifications

Table 3: ASAv Model Descriptions and Specifications

Model	License Requirement
ASAv5	<p>Smart License</p> <p>See the following specifications:</p> <ul style="list-style-type: none"> • 100 Mbps throughput • 1 vCPU • 1 GB RAM (adjustable to 1.5 GB) <p>Note For optimum performance we recommend 2 GB of memory for the ASAv5.</p> <ul style="list-style-type: none"> • 50,000 concurrent firewall connections • Does not support AWS • Supports Azure on a Standard D3 and Standard D3_v2 instances
ASAv10	<p>Smart License</p> <p>See the following specifications:</p> <ul style="list-style-type: none"> • 1 Gbps throughput • 1 vCPU • 2 GB RAM • 100,000 concurrent firewall connections • Supports AWS on c3.large, c4.large, and m4.large instances • Supports Azure on a Standard D3 and Standard D3_v2 instances

Model	License Requirement
ASAv30	Smart License See the following specifications: <ul style="list-style-type: none"> • 2 Gbps throughput • 4 vCPUs • 8 GB RAM • 500,000 concurrent firewall connections • Supports AWS on c3.xlarge, c4.xlarge, and m4.xlarge instances • Supports Azure on a Standard D3 and Standard D3_v2 instances

Guidelines and Limitations

The ASAv firewall functionality is very similar to the ASA hardware firewalls, but with the following guidelines and limitations.

Guidelines and Limitations for the ASAv (all models)

Disk Storage

The ASAv supports a maximum virtual disk of 8 GB by default. You cannot increase the disk size beyond 8 GB. Keep this in mind when you provision your VM resources.

Context Mode Guidelines

Supported in single context mode only. Does not support multiple context mode.

Failover for High Availability Guidelines

For failover deployments, make sure that the standby unit has the same model license; for example, both units should be ASAv30s.



Important When creating a high availability pair using ASAv, it is necessary to add the data interfaces to each ASAv in the same order. If the exact same interfaces are added to each ASAv, but in different order, errors may be presented at the ASAv console. Failover functionality may also be affected.

Unsupported ASA Features

The ASAv does not support the following ASA features:

- Clustering (for all entitlements, except KVM and VMware)
- Multiple context mode

- Active/Active failover
- EtherChannels
- Shared AnyConnect Premium Licenses

Limitations

- The ASAv is not compatible with the 1.9.5 i40en host driver for the x710 NIC. Older or newer driver versions will work. (VMware only)

Guidelines and Limitations for the ASAv5

Performance Guidelines

- Supports 8000 connections per second, 25 maximum VLANs, 50,000 concurrent session, and 50 VPN sessions.
- The ASAv5 is intended for users who require a small memory footprint and small throughput, so that you can deploy larger numbers of ASAv5s without using unnecessary memory.
- Beginning with 9.5(1.200), the memory requirement for the AVAv5 was reduced to 1GB. Downgrading the available memory on an ASAv5 from 2 GB to 1 GB is not supported. To run with 1 GB of memory, the ASAv5 VM must be redeployed with version 9.5(1.200) or later. Similarly, if you try to downgrade to a version earlier than 9.5(1.200), you must increase the memory to 2 GB.



Note For optimum performance we recommend 2 GB of memory for the ASAv5.

- In some situations, the ASAv5 may experience memory exhaustion. This can occur during certain resource heavy applications, such as enabling AnyConnect or downloading files.
 - Console messages related to spontaneous reboots or critical syslogs related to memory usage are symptoms of memory exhaustion.
 - In these cases, you can enable the ASAv5 to be deployed in a VM with 1.5 GB of memory. To change from 1GB to 1.5 GB, power down your VM, modify the memory, and power the VM back on.
 - You can display a summary of the maximum memory and current free memory available to the system using the `show memory` command from the CLI.
- The ASAv5 will begin to drop packets soon after the threshold of 100 Mbps is reached (there is some headroom so that you get the full 100 Mbps).

Limitations

- ASAv5 is not compatible with AnyConnect HostScan 4.8, which requires 2 GB of RAM.
- ASAv5 is not supported on Amazon Web Services (AWS).
- Jumbo frames are not supported.

ASAv Interfaces and Virtual NICs

As a guest on a virtualized platform, the ASAv uses the network interfaces of the underlying physical platform. Each ASAv interface maps to a virtual NIC (vNIC).

- ASAv Interfaces
- Supported vNICs

ASAv Interfaces

The ASAv includes the following Gigabit Ethernet interfaces:

- Management 0/0
For AWS and Azure, Management 0/0 can be a traffic-carrying “outside” interface.
- GigabitEthernet 0/0 through 0/8. Note that the GigabitEthernet 0/8 is used for the failover link when you deploy the ASAv as part of a failover pair.
- Hyper-V supports up to eight interfaces. Management 0/0 and GigabitEthernet 0/0 through 0/6. You can use GigabitEthernet 0/6 as a failover link.

Supported vNICs

The ASAv supports the following vNICs.

Table 4: Supported vNics

Table 5: Supported vNics

vNIC Type	Hypervisor Support		ASAv Version	Notes
	VMware	KVM		
e1000	Yes	Yes	9.2(1) and later	VMware default
virtio	No	Yes	9.3(2.200) and later	KVM default

Disable LRO for VMware and VMXNET3

Large Receive Offload (LRO) is a technique for increasing inbound throughput of high-bandwidth network connections by reducing CPU overhead. It works by aggregating multiple incoming packets from a single stream into a larger buffer before they are passed higher up the networking stack, thus reducing the number of packets that have to be processed. However, LRO can lead to TCP performance problems where network packet delivery may not flow consistently and could be "bursty" in congested networks.



Important VMware enables LRO by default to increase overall throughput. It is therefore a requirement to disable LRO for ASAv deployments on this platform.

You can disable LRO directly on the ASAv machine. Power off the virtual machine before you make any configuration changes.

1. Find the ASAv machine in the vSphere Web Client inventory.
 - a. To find a virtual machine, select a data center, folder, cluster, resource pool, or host.
 - b. Click the **Related Objects** tab and click **Virtual Machines**.
2. Right-click the virtual machine and select **Edit Settings**.
3. Click **VM Options**.
4. Expand **Advanced**.
5. Under Configuration Parameters, click the **Edit Configuration** button.
6. Click **Add Parameter** and enter a name and value for the LRO parameters:
 - Net.VmxnetSwLROSL | 0
 - Net.Vmxnet3SwLRO | 0
 - Net.Vmxnet3HwLRO | 0
 - Net.Vmxnet2SwLRO | 0
 - Net.Vmxnet2HwLRO | 0



Note Optionally, if the LRO parameters exist, you can examine the values and change them if needed. If a parameter is equal to 1, LRO is enabled. If equal to 0, LRO is disabled.

7. Click **OK** to save your changes and exit the **Configuration Parameters** dialog box.
8. Click **Save**.

See the following VMware support articles for more information:

- VMware KB [1027511](#)
- VMware KB [2055140](#)

