

NetScaler VPXTM 15.1

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NetScaler VPX 15.1 Tech Preview overview

NetScaler® 15.1 Tech Preview introduces the NetScaler VPX for on-premises hypervisors and public clouds. This release represents a foundational evolution of the NetScaler VPX platform.

NOTE:

NetScaler VPX 15.1 is built on a Linux-based architecture, replacing the legacy FreeBSD-based implementation.

The Tech Preview release enables you to:

- Evaluate the next-generation NetScaler VPX platform.
- Validate deployments across the supported hypervisors and public clouds.
- Provide early feedback ahead of General Availability (GA).

Why NetScaler VPX 15.1

NetScaler VPX 15.1 addresses the platform agility, performance, and lifecycle constraints of earlier implementations.

The following sections describe the key benefits.

Faster platform innovation

- Rapid onboarding of new drivers, hardware, and hypervisors.
- Support for new drivers is up to 3x faster.

Modern compute and performance scaling

- Supports 50% higher compute density with up to 28 cores and planned scalability enhancements.
- Built on a NetScaler BLX and DPDK-based data plane for line-rate throughput.

Faster boot, upgrade, and recovery

- Up to 4x improvement in boot time (for example, from approximately 4 minutes to 1 minute, as observed on ESX and Xen).
- GRUB-based rollback for reinstalling the current or previous versions of NetScaler without impacting configurations.

Enhanced security posture

- Faster operating system and third-party patching cycles.
- Built-in security capabilities, such as:
 - Address Space Layout Randomization (ASLR) for mitigating position-dependent exploits on Linux.
 - SELinux for auditing security violations.
 - Yama for restricting process-level privileges to strengthen protection.

Modern observability and debugging

- Industry-standard tools, such as `journalctl`, `strace`, `perf`, and `htop`.
- Unified logging and service management through `systemctl` and `journald`.

Automated provisioning and deployment

- Native `cloud-init` support for Day-0 automation.
- Simplified onboarding workflows.

Future-ready platform

- Built to support large platform-level enhancements.

Supported hypervisors

The Tech Preview build supports the following hypervisors:

- [VMware ESXi](#)
- [Citrix Hypervisor™](#)
- [Linux KVM](#)
- [Microsoft Hyper-V](#)

Supported public clouds

The Tech Preview also supports deployment on the following public clouds:

- [AWS](#)
- [Microsoft Azure](#)
- [Google Cloud Platform](#)

NetScaler VPX™ 15.1 Tech Preview release summary

The NetScaler VPX 15.1 rollout started with on-premises hypervisors and now expands to public clouds. This Tech Preview build supports deployment on both on-premises hypervisors and public cloud platforms.

What's New

The Tech Preview build supports the following on-premises hypervisors:

- [VMware ESXi](#)
- [Citrix Hypervisor™ \(XenServer\)](#)
- [Linux KVM](#)
- [Microsoft Hyper-V](#)

The refreshed Tech Preview build (15.1-9.x) extends support to the following public clouds:

- [AWS](#)
- [Microsoft Azure](#)
- [Google Cloud Platform](#)

Intended usage

This release is intended for the following scenarios:

- Non-production environments only.
- Evaluation and validation of the next-generation NetScaler VPX platform.

NOTE:

Do not deploy this Tech Preview build in production environments.

Points to note

- Feature completeness is still evolving across builds.
- Known limitations apply. For more information, see [Limitations and deprecated features](#) and [FAQs](#).
- Known issues are expected during this phase.
- Behavior might change across subsequent builds.

Known issues

- On cloud instance sizes that include a local temporary (ephemeral) disk, upgrading a NetScaler VPX instance from release 14.1 to 15.1 might intermittently leave NetScaler unreachable after the upgrade. This issue affects only instance sizes with a local temporary disk. As a workaround, do one of the following:
 - Use an instance size that does not include a local temporary disk for the upgrade.
 - Take a snapshot of the VM before you begin the upgrade so that you can restore the appliance if it does not come back online.
- Azure high availability (HA) solution templates do not correctly configure NetScaler 15.1 deployments, causing the HA pair formation to fail automatically after the deployment. As a workaround, deploy the latest 14.1 version by using the existing Azure templates, and then upgrade to 15.1 by using the upgrade bundle available on the [NetScaler downloads page](#).

NetScaler VPX™ support matrix

NOTE:

This feature matrix is available for evaluation purposes and is not intended for production use.

NetScaler® 15.1 introduces a Linux-based VPX across all on-premises hypervisor platforms as a tech preview. This guide provides the support matrix for deploying NetScaler VPX 15.1 on VMware ESXi, Citrix Hypervisor™, Microsoft Hyper-V, and Linux KVM. In-place upgrades from NetScaler 14.1 (FreeBSD-based) require a minimum build version of 14.1-56.x. It also covers the supported public cloud platforms: Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP).

VPX on VMware ESXi

Performance range: 10 Mbps to 100 Gbps

ESXI VERSION	MINIMUM VPX VERSION
ESXi 9.0.x	15.1 Tech Preview
ESXi 8.0 (all updates)	
ESXi 7.0 (all updates)	

NOTE:

ESXi versions earlier than 7.0 are not supported on NetScaler 15.1 Tech Preview.

VPX on Citrix Hypervisor (XenServer)

Performance range: 10 Mbps to 40 Gbps

CITRIX HYPERVISOR VERSION	MINIMUM VPX VERSION
8.4, 8.2, 8.0, 7.6, 7.1, 7.0	15.1 Tech Preview

NOTE:

Citrix Hypervisor versions earlier than 7.0 are not supported on NetScaler 15.1 Tech Preview.

VPX on Microsoft Hyper-V

Performance range: 10 Mbps to 3 Gbps

HYPER-V VERSION	MINIMUM VPX VERSION
Windows Server 2025, 2022, 2019, and 2016	15.1 Tech Preview

NOTE:

Hyper-V versions earlier than Windows Server 2016 are not supported on NetScaler 15.1 Tech Preview.

VPX on Linux KVM

Performance range: 10 Mbps to 100 Gbps

HOST OS	MINIMUM VPX VERSION
RHEL 9.x, 8.x, 7.6	15.1 Tech Preview
Ubuntu 24.04, 18.04	

NOTE:

For RHEL 7.6 and Ubuntu 18.04, append `kvm_intel.preemption_timer=0` to `GRUB_CMDLINE_LINUX` in `/etc/default/grub`, regenerate the GRUB config, and restart the host.

VPX features supported on hypervisors

FEATURE	ESXI PV	ESXI SR-IOV	XENSER VER PV	XENSER VER SR-IOV	HYPER-V	KVM PV
Multi-PE Support	Yes	Yes	Yes	Yes	Yes	Yes
Clustering	Yes	Yes ¹	Yes	Yes ¹	Yes	Yes
VLAN Tagging	Yes	Yes	Yes	Yes	Yes	Yes
Link events/ HAMON	No ²	Yes ³	No ²	Yes ³	No ²	No ²
Interface Param Config	No	No	No	No	No	No
Static LA	Yes ²	Yes ³	Yes ²	Yes ³	Yes ²	Yes ²
LACP	No	No	No	No	No	No
Static CLAG	No	No	No	No	No	No
LACP CLAG	Yes ²	Yes ³	Yes ²	Yes ³	Yes ²	Yes ²
Hot-plug	No	No	No	No	No	No

Superscript Legend:

1. Clustering on SR-IOV is supported only on client-facing interfaces and server-facing interfaces, not on the backplane.
2. Interface DOWN events are not captured on VPX instances.
3. For Static LA configurations, traffic might still route to interfaces with physical status DOWN.

Supported processors for NetScaler VPX

PLATFORM	INTEL	AMD
VMware ESXi	Yes	Yes
Citrix Hypervisor / XenServer	Yes	Yes
Microsoft Hyper-V	Yes	No
Linux KVM	Yes	No

Supported NICs for SR-IOV and PCI Passthrough

NIC	ESXI	XENSERVR	HYPER-V	KVM
Mellanox ConnectX-4	Yes	No	No	Yes
Mellanox ConnectX-5	Yes	No	No	Yes
Intel 82599 SR-IOV VF	Yes	Yes	No	Yes
Intel X710/ XL710/X722 SR-IOV VF	No	Yes	No	Yes
Intel X710/ XL710/XXV710 PCI Passthrough	Yes	No	No	Yes

In-Place upgrade support

SOURCE PLATFORM	SOURCE VERSION	TARGET VERSION	SUPPORTED
VMware ESXi (FreeBSD → Linux)	14.1-56.x or later	15.1 Tech Preview	Yes

SOURCE PLATFORM	SOURCE VERSION	TARGET VERSION	SUPPORTED
Citrix Hypervisor/ XenServer (FreeBSD → Linux)			Yes
Linux KVM (FreeBSD → Linux)			Yes
Microsoft Hyper-V (FreeBSD → Linux)			Yes

Public cloud offerings

PLATFORM	OFFERING	LICENSE	BUILD
AWS	NetScaler VPX 15.1 Tech Preview	BYOL	15.1-9.x
Microsoft Azure			
GCP			

NOTE:

FIPS and FIPS ENA offerings are not supported in the 15.1 Tech Preview.

Public cloud deployment support

PLATFORM	DEPLOYMENT MODEL	SUPPORTED
AWS	Standalone	Yes
AWS	HA in the same availability zone	Yes
AWS	HA across availability zones using Elastic IP	Yes

PLATFORM	DEPLOYMENT MODEL	SUPPORTED
AWS	HA across availability zones using private IP	Yes
Azure	Single NIC, single IP	Yes
Azure	Single NIC, multiple IPs	Yes
Azure	Multiple NICs, multiple IPs	Yes
Azure	Active-standby HA using availability set	Yes
Azure	Active-standby HA using availability zones	Yes
GCP	Single-NIC standalone	Yes
GCP	Multi-NIC standalone	Yes

AWS instance support

CATEGORY	INSTANCE FAMILIES
General purpose	M5, M5a, M5n, M6i, M7i, M8i, T3a
Compute optimized	C5, C5n, C6in
Memory optimized	R7iz

LICENSED THROUGHPUT	RECOMMENDED INSTANCE
Up to 200 Mbps	m6i.xlarge
1–5 Gbps	m6i.2xlarge
5–8 Gbps	c5n.4xlarge
8–25 Gbps	c5n.9xlarge

For more information, see [AWS regions and supported services](#).

Azure compute and architecture support

ITEM	SUPPORTED VALUE
Minimum	2 virtualized cores and 4 GB RAM
Processors	Intel and AMD
Recommended VM sizes	Standard_D2s_v5, Standard_D4s_v5, Standard_D8s_v5, Standard_D8ds_v5, Standard_D16_v5
Additional Tech Preview families	Dsv6 and Dsv7
Maximum documented throughput	10 Gbps
Accelerated networking	Recommended above 1 Gbps

For more information, see [Azure sizing and architecture guidance](#).

GCP machine and network support

MACHINE FAMILY	MINIMUM SUPPORTED MACHINE TYPES
General purpose	c3-standard-4, n4-standard-2, c4-standard-2, c4d-standard-2

ITEM	SUPPORTED VALUE
Minimum compute	2 vCPUs and 4 GB RAM
More than two NICs	Minimum 4 vCPUs
Multi-NIC networking	Separate VPC network for each NIC
IPv6	Not supported

For more information, see [GCP machine and deployment guidance](#).

Related information

For step-by-step upgrade instructions, see [Migrate NetScaler VPX from 14.1 to 15.1 Tech Preview](#).

For public cloud deployment procedures, see [Deploy on AWS](#), [Deploy on Microsoft Azure](#), and [Deploy on Google Cloud Platform](#).

Migrate NetScaler VPX™ from 14.1 (FreeBSD) to 15.1 Tech Preview (Linux)

NOTE:

This tech preview feature is provided for evaluation purposes only and is not intended for production use.

Overview

NetScaler® 15.1 introduces a Linux-based VPX, replacing the FreeBSD-based VPX available in release 14.1 and earlier. In-place migration from 14.1 (FreeBSD) to 15.1 (Linux) is supported across the following on-premises hypervisor platforms:

- [VMware ESXi](#)
- [Citrix Hypervisor™ \(XenServer\)](#)
- [Linux KVM](#)
- [Microsoft Hyper-V](#)

Starting with 15.1-9.x, in-place migration from 14.1 (FreeBSD) to 15.1 (Linux) is also supported on the following public clouds:

- [AWS](#)
- [Microsoft Azure](#)
- [Google Cloud Platform](#)

The migration process ensures that your existing configuration is carried over automatically.

You can migrate by using either of the following methods:

- **Method 1: In-place upgrade:** Upgrades a single appliance, or one node at a time.
- **Method 2: Node-by-node HA replacement:** Provides a zero-downtime upgrade for HA pairs.

Method 1: In-place upgrade

Prerequisites

Before you start the migration, ensure that the following requirements are met:

REQUIREMENT	DETAILS
Minimum source builds	The VPX must be running NetScaler 14.1 build 56.x or later. If it is on an earlier 14.1 build, upgrade to 14.1-56.x or later with the standard FreeBSD bundle first.
Memory	A minimum of 4 GB RAM
Disk space	There must be at least 4 GB of unused (available) disk space in the <code>/var</code> filesystem on the NetScaler VPX before you start the migration.

Critical pre-upgrade considerations

Review the following considerations before you begin:

- **VM snapshot (mandatory):** Take a hypervisor snapshot of the VPX before you begin. The migration repartitions the disk and is not internally reversible. The snapshot is your guaranteed rollback path. Do not start the migration without a snapshot.
- **External backup (recommended):** Back up critical configuration and any custom data.
- Confirm that your deployment relies only on features that are available in the 15.1 Tech Preview. For more information, see [Limitations](#).

Data backup and preservation

The migration automatically preserves the NetScaler configuration, certificates, licenses, and signatures held in a fixed set of directories. Representative preserved locations include:

- `/flash/nsconfig` (ns.conf, licenses, SSL, custom scripts)
- `/flash/boot`
- `/flash/configdb`
- `/var/tmp/*.csv`

- `/var/AAA`
- `/var/analytics_conf`
- `/var/download`
- `/var/krb`
- `/var/learnt_data`
- `/var/metrics_conf`
- `/var/netScaler/gui`
- `/var/netScaler/locdb`
- `/var/netScaler/logon`
- `/var/netScaler/ssl`
- `/var/nstemplates`
- `/var/vpn`
- `/var/vpns`
- `/var/clusterd/nsclusterd.conf`
- `/var/mastools`
- `/var/log/ns-upgrade.log`

The active installer's files and the generated support bundle are also retained. Anything stored outside the preserved directories is removed during the disk repartition and must be backed up manually beforehand.

NOTE:

If you have customized configuration files in the `/etc` directory, see [Upgrade considerations for customized configuration files in the /etc directory](#) before proceeding with the migration.

Customizations to `rc.netScaler`, `nsbefore.sh`, `nsafter.sh`, and `crontab` are preserved on disk. However, because the base OS changes from FreeBSD to Linux, they might not work as before. Review and update them after migrating.

Upgrade procedure

To perform the in-place upgrade, complete the following steps:

1. Verify the current build. Log in to the NetScaler CLI and confirm that the build is 14.1-56.x or later:

```
show ns version
```

2. Save the configuration:

```
save ns config
```

3. Take the mandatory VM snapshot from your hypervisor (ESXi, XenServer, KVM, or Hyper-V), and copy any data held outside the preserved directories off the appliance.
4. Go to **Citrix.com > Downloads > NetScaler > Virtual Appliances**, and download the NetScaler VPX upgrade bundle.
5. Copy the downloaded `build-<version-build>_lx_64.tgz` file to the `/var/nsinstall/` directory on the NetScaler VPX shell and extract it.
6. Run `./installns` and reboot the appliance when prompted.

IMPORTANT:

Do not turn off the VM during the multiple reboots required for the process.

Post-upgrade validation

After the upgrade completes, validate the deployment:

- Log in to the NetScaler VPX GUI or CLI and verify that the running version matches the target upgrade bundle version.
- Validate all virtual services, SSL certificates, and policies to ensure correct functionality.

Method 2: Node-by-node HA replacement

The node-by-node HA replacement method enables a zero-downtime upgrade to a 15.1 Linux-based appliance.

Step 1. Lock the HA state of your legacy primary node.

1. Log in to your 14.1 (FreeBSD) primary node and run the following command:

```
set ha node -hastatus STAYPRIMARY
```

2. On the legacy secondary node, remove its HA pairing with the primary node:

```
rm ha node <primary-nsip>
```

3. Verify that the primary node continues to serve traffic without interruption while you proceed with the migration or replacement tasks.

Step 2. Deploy a new secondary node.

1. Provision a new NetScaler VPX by using the 15.1 image.
2. Assign the management IP address previously used by your legacy secondary node.
3. Complete the initial setup, apply the license, and verify that the network configuration is correct.
4. Join the HA nodes:

```
add ha node <primary-nsip>
```

5. Verify that the HA status is UP and synchronization is successful:

```
show ha node status
```

Step 3. Promote the new secondary node to primary.

1. On the old primary node, unset the stay-primary status:

```
unset ha node -stayprimary
```

2. Force a failover:

```
force ha failover
```

3. Verify that the newly deployed secondary node has successfully become the primary node and is fully operational:

```
show ha node status
```

4. Set the new primary node to stay primary:

```
set ha node -hastatus STAYPRIMARY
```

NOTE:

- If HA synchronization fails, manually synchronize the RPC passwords on both nodes by using the `set rpcNode <peer-ip> -password <password>` command.
- If any problems arise during this step, fail back to the old primary and restore the legacy secondary node. For assistance, contact the Citrix Support team.

Step 4. Replace the legacy secondary with a new VPX.

1. Remove the legacy secondary node from the HA configuration:

```
rm ha node <legacy-secondary-nsip>
```

2. Provision another new VPX instance by using the 15.1 (Linux) image.
3. Assign the management IP address of the legacy secondary node to the new VPX instance.
4. Complete the setup and license activation.
5. Join this new VPX to the HA pair:

```
add ha node <new-primary-nsip>
```

6. Verify that the HA status is stable, UP, and synchronized:

```
show ha node status
```

Step 5. Validate and finalize.

1. Verify the HA roles and synchronization status across both new nodes.
2. Validate all virtual services, SSL certificates, and policies to ensure correct functionality.
3. Perform failover and failback tests to verify redundancy.
4. Back up all configurations and snapshot the new environment.
5. After successful validation, delete the legacy VPX instances to free up resources.

Rollback or downgrade to 14.1 (FreeBSD)

If you need to return to 14.1 (FreeBSD) after migrating, use either of the following options:

- **Revert from the VM snapshot** taken before migration. This option is the fastest and recommended.
- **In-place downgrade:** You can downgrade only to the NetScaler release version 14.1-73.x, which is not yet released. Follow the migration process described in [Method 1: In-place upgrade](#), but use a FreeBSD `_nc_*` bundle (`build-14.1-<build>_nc_64.tgz`) instead of the `_lx_64` bundle. The configuration held in the preserved directories is retained.

Critical considerations

- **Backup:** Retain backups of your legacy nodes until the new VPX environment is fully validated and stable.
- **Linux KVM only:** If the appliance does not boot after the upgrade to Linux, power off the VM, set its CPU mode to host-passthrough (libvirt domain XML: `<cpu mode='host-passthrough'/>` , or `virt-install --cpu host-passthrough`), then power it back on.
- **Unsupported features:** Migration is not recommended if your current deployment relies on features that are not supported. For more information, see [Limitations](#).

On-premises hypervisors

NOTE:

This tech preview feature is provided for evaluation purposes only and is not intended for production use.

Overview

Starting with NetScaler® release 15.1, the NetScaler VPX virtual appliance is based on Linux, replacing the FreeBSD-based VPX available in release 14.1 and earlier. This first phase of the 15.1 rollout focuses on on-premises hypervisors. Future phases will expand support to public clouds.

You can deploy the NetScaler VPX instance on any of the following supported hypervisors. In-place upgrade from 14.1 (FreeBSD-based) to 15.1 (Linux-based) is supported. The instance must be on 14.1 build 72.x or later before upgrading.

Supported hypervisors

HYPERVISOR	MINIMUM HOST VERSION	INSTALLATION GUIDE
VMware ESXi	7.0 or later	Install on VMware ESXi
Citrix Hypervisor™	7.0 or later	Install on Citrix Hypervisor
Linux KVM	Red Hat Enterprise Linux or Ubuntu 24.04	Install on Linux KVM
Microsoft Hyper-V	Windows Server 2016 or later, with the Hyper-V role enabled	Install on Microsoft Hyper-V

For per-feature support across hypervisors and the list of supported NICs for SR-IOV and PCI passthrough, see the [Support matrix](#).

Before you begin

- Confirm that the target host meets the minimum requirements listed on the hypervisor's installation page.
- Verify hardware-assisted virtualization (Intel VT-x or AMD-V) is enabled on the host.
- Review the [Limitations and deprecated features](#) before deploying.

Install a NetScaler VPX™ instance on VMware ESXi

NOTE:

This tech preview feature is provided for evaluation purposes only and is not intended for production use.

Overview

Starting with NetScaler® release 15.1, the NetScaler VPX virtual appliance for VMware ESXi is based on Linux, replacing the FreeBSD-based VPX available in release 14.1 and earlier. The installation workflow uses the standard VMware OVF deployment through the vSphere Client or vCenter.

In-place upgrade from 14.1 (FreeBSD-based) to 15.1 (Linux-based) is supported. The instance must be on 14.1 build 72.x or later before upgrading.

System requirements

The following tables list the minimum requirements for the ESXi host and the NetScaler VPX instance.

ESXi host

RESOURCE	MINIMUM REQUIREMENT
ESXi version	7.0 or later
CPU	64-bit x86 with Intel VT-x or AMD-V enabled
Network	One 1 Gbps NIC (two recommended)

NetScaler VPX instance

RESOURCE	MINIMUM REQUIREMENT
vCPU	2
Memory	4 GB
Storage	20 GB
Virtual NICs	2
VM hardware version	7 or later

NOTE:

For production-grade deployments, reserve 100% of memory and allocate CPU cycles equal to at least one physical ESXi core.

Before you begin

Before you install a NetScaler VPX instance on VMware ESXi, ensure that the following prerequisites are met:

- VMware vSphere Client is installed on a management workstation.
- A virtual switch and port group are configured on the ESXi host.
- VPX license files are available.

Obtain the VPX image

To download the VPX image package, complete the following steps:

1. Go to my.citrix.com and navigate to **Downloads > NetScaler > Virtual Appliances**.
2. Select **NetScaler 15.1** and download the ESXi image package.
3. Copy all three files to the same folder on your workstation:

```
NSVPX-ESX-15.1-<build>_lx_64-disk1.vmdk
```

```
NSVPX-ESX-15.1-<build>_lx_64.ovf
```

```
NSVPX-ESX-15.1-<build>_lx_64.mf
```

NOTE:

The `_lx_64` suffix identifies the Linux-based image introduced in 15.1.

Install NetScaler VPX on ESXi

Deploy the VPX instance from the OVF template by using the vSphere Client. Complete the following steps:

Step 1. Deploy the OVF template.

1. Open the vSphere Client and connect to the ESXi host or vCenter.
2. Go to **File > Deploy OVF Template**.
3. Browse to the `.ovf` file and click **Next**.
4. Accept the defaults through the wizard. On the **Network Mapping** screen, map each OVF network to the appropriate port group on the ESXi host.
5. Click **Finish** to begin deployment.

Step 2. Power on the VM.

1. After deployment completes, right-click the VPX VM and select **Power On**.
2. Open the **Console** tab.

Step 3. Complete the initial configuration.

When the VPX boots for the first time, a configuration menu appears.

1. Enter the NSIP, subnet mask, and default gateway.
2. Select **Save and Continue**.

Step 4. Apply the license.

Log in at `https://<NSIP>` and apply the VPX license from **System > Licenses**.

Upgrade to NetScaler 15.1 Tech Preview

Perform an in-place upgrade of an existing NetScaler VPX instance to the 15.1 Tech Preview build. Complete the following steps:

Prerequisite:

Ensure that the NetScaler VPX instance is running version 14.1 build 72.x or later.

Step 1. Download the upgrade bundle.

Download the ESXi-specific bundle `build-15.1-<build>_lx_64.tgz` from `my.citrix.com` by navigating to **Downloads > NetScaler > Virtual Appliances**.

IMPORTANT:

Use only the `_lx_64` bundle. The standard FreeBSD upgrade bundle is not compatible and fails.

Step 2. Transfer and extract.

Copy the bundle to the VPX shell and extract it under `/var/nsinstall/`.

```
tar -xvzf build-15.1-<build>_lx_64.tgz -C /var/nsinstall/
```

Step 3. Install and reboot.

```
cd /var/nsinstall/build-15.1-<build>_lx_64  
  
./installns  
  
reboot
```

NOTE:

The same upgrade process applies to subsequent upgrades between 15.1 builds.

Limitations

LIMITATION	DETAILS
VMware vMotion	Supported with E1000 and VMXNET3 interfaces only. Not supported with SR-IOV or PCI passthrough.

LIMITATION	DETAILS
VMware Tools	Included with the NetScaler software. You cannot install or upgrade VMware Tools independently.
VMXNET3 receive ring size	Configuring the receive ring size for VMXNET3 network interfaces is not supported.
Feature parity	Some features from release 14.1 are not available in the 15.1 Tech Preview. For details, see the Release summary .

Related information

For complete ESXi deployment details, including SR-IOV, VMXNET3, PCI passthrough, and VLAN configuration, see the [Installing NetScaler VPX on VMware ESXi - 14.1 documentation](#).

Install a NetScaler VPX™ instance on Citrix Hypervisor™ (XenServer)

NOTE:

This tech preview feature is provided for evaluation purposes only and is not intended for production use.

Overview

Starting with NetScaler® release 15.1, the NetScaler VPX virtual appliance for Citrix Hypervisor (XenServer) is based on Linux, replacing the FreeBSD-based VPX available in release 14.1 and earlier. The installation workflow uses XenCenter standard VM import with the XenServer-native `.xva` image format.

In-place upgrade from 14.1 (FreeBSD-based) to 15.1 (Linux-based) is supported. The instance must be on 14.1 build 72.x or later before you upgrade.

System requirements

The following tables list the minimum requirements for the Citrix Hypervisor host and the NetScaler VPX instance.

Citrix Hypervisor host

RESOURCE	MINIMUM REQUIREMENT
Citrix Hypervisor version	7.0 or later
CPU	64-bit x86 with Intel VT-x or AMD-V enabled
Network	One 1 Gbps NIC (two recommended)

NOTE:

The Citrix Hypervisor control domain reserves approximately 4 GB of host disk. Ensure that available storage accounts for this reservation.

NetScaler VPX instance

RESOURCE	MINIMUM REQUIREMENT
vCPU	2
Memory	4 GB
Virtual NICs	2

NOTE:

For production-grade deployments, set VM CPU priority to the highest in XenCenter VM properties to improve scheduling and reduce network latency.

Before you begin

Before you install a NetScaler VPX instance on Citrix Hypervisor, ensure that the following prerequisites are met:

- XenCenter is installed on a separate Windows management workstation. XenCenter cannot run on the same machine as the Hypervisor host.
- A virtual network interface is configured on the Hypervisor host.
- VPX license files are available.

Obtain the VPX image

To download the VPX image package, complete the following steps:

1. Go to `my.citrix.com`, and navigate to **Downloads > NetScaler > Virtual Appliances**.
2. Select **NetScaler 15.1**, and then download the Citrix Hypervisor image package: `NSVPX-XEN-15.1-<build>_lx_64.xva`.

NOTE:

The `_lx_64` suffix identifies the Linux-based image introduced in NetScaler VPX 15.1.

Install NetScaler VPX on Citrix Hypervisor

Use XenCenter to import and provision the VPX instance. Complete the following steps:

Step 1. Connect to the Hypervisor with XenCenter.

1. Launch XenCenter on your management workstation.
2. Go to **Server > Add**, and then enter the Hypervisor host IP address or DNS name.
3. Enter administrator credentials, and then click **Connect**.

Step 2. Import the VPX image.

1. Select the target Hypervisor host in the navigation pane.
2. Go to **VM > Import**.
3. Browse to the downloaded `.xva` file, confirm **Exported VM** is selected, and then click **Next**.
4. Select the target Hypervisor host, and then click **Next**.
5. Select the storage repository, and then click **Import**.
6. Monitor import progress in the **Log** tab.

Repeat this process for each additional VPX instance. The number of instances you can deploy depends on available host memory.

Step 3. Configure virtual network interfaces.

1. After import, add, modify, or remove virtual network interfaces (VIFs) as needed.
2. Map each VIF to the appropriate network on the Hypervisor host.
3. Click **Next > Finish**.

Step 4. Power on the VM.

1. Right-click the VPX VM, and then select **Start**.
2. Open the **Console** tab.

Step 5. Complete the initial configuration.

When the VPX boots for the first time, a menu-driven interface appears.

1. Enter the NSIP, subnet mask, and default gateway.
2. Select **Save and Continue**.

Step 6. Apply the license.

Log in at `https://<NSIP>`, and then apply the VPX license from **System > Licenses**.

Upgrade to NetScaler 15.1 Tech Preview

Perform an in-place upgrade of an existing NetScaler VPX instance to the 15.1 Tech Preview build. Complete the following steps:

Prerequisite:

Ensure that the NetScaler VPX instance is running version 14.1 build 72.x or later.

Step 1. Download the upgrade bundle.

Download the Citrix Hypervisor-specific bundle from `my.citrix.com` by navigating to **Downloads > NetScaler > Virtual Appliances**:

```
build-15.1-<build>_lx_64.tgz
```

IMPORTANT:

Use only the `_lx_64` bundle. The standard FreeBSD upgrade bundle is not compatible and fails.

Step 2. Transfer and extract.

Copy the bundle to the VPX shell and extract it under `/var/nsinstall/`:

```
tar -xvzf build-15.1-<build>_lx_64.tgz -C /var/nsinstall/
```

Step 3. Install and reboot.

```
cd /var/nsinstall/build-15.1-<build>_lx_64  
  
./installns  
  
reboot
```

NOTE:

The same process applies when upgrading between 15.1 builds.

Limitations

LIMITATION	DETAILS
XenMotion live migration	Not supported with SR-IOV configurations.
Citrix VM Tools	Bundled with NetScaler software and cannot be installed or upgraded independently.
Feature parity	Some features available in 14.1 might not be available in the 15.1 Tech Preview. For details, see the Release summary .

More information

For complete Citrix Hypervisor deployment details, including SR-IOV and VLAN configuration, see the [NetScaler VPX on Citrix Hypervisor 14.1 documentation](#).

Install a NetScaler VPX™ instance on Linux KVM

NOTE:

This tech preview feature is provided for evaluation purposes only and is not intended for production use.

Overview

Starting with NetScaler® release 15.1, the NetScaler VPX instance for Linux KVM is based on Linux, replacing the FreeBSD-based VPX available in release 14.1 and earlier. NetScaler VPX on KVM can be provisioned using Virtual Machine Manager for a graphical workflow, or `virsh` for CLI-based and scripted deployments.

In-place upgrade from 14.1 (FreeBSD-based) to 15.1 (Linux-based) is supported. The instance must be on 14.1 build 72.x or later before upgrading.

System requirements

The following tables list the minimum requirements for the KVM host and the NetScaler VPX instance.

KVM host

RESOURCE	MINIMUM REQUIREMENT
CPU	64-bit x86 with hardware virtualization (Intel VT-x or AMD-V) enabled
Kernel	64-bit Linux kernel 2.6.20 or later (3.6.11-4 or later recommended)
Tested distributions	Red Hat Enterprise Linux, Ubuntu 24.04

VPX instance

RESOURCE	MINIMUM REQUIREMENT
vCPU	2
Memory	4 GB
Storage	20 GB

Before you begin

Before you provision a NetScaler VPX instance on Linux KVM, ensure that the following prerequisites are met:

- KVM and QEMU are installed on the Linux host.

- The `vhost_net` module is loaded for optimal network performance.

```
modprobe vhost_net
```

- Generic Receive Offload (GRO) and Large Receive Offload (LRO) are disabled on the physical interfaces attached to the VPX VM.

```
ethtool -K <interface> gro off
```

```
ethtool -K <interface> lro off
```

- A Linux bridge or MacVTap interface is configured on the host.
- Each VPX instance uses its own dedicated disk image. A single disk image cannot be shared across multiple instances.
- VPX license files are available and ready to apply to the instance.

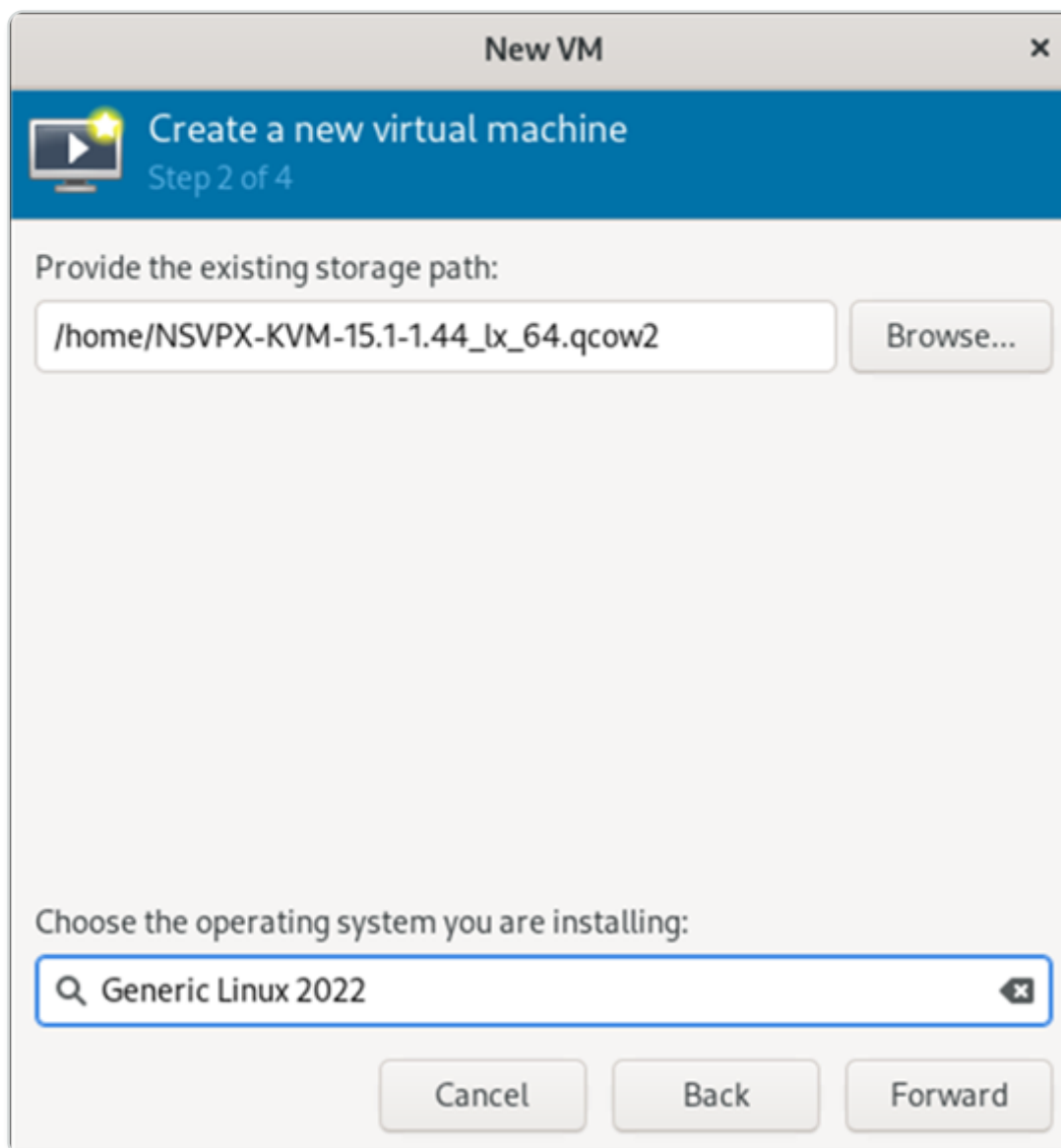
Method 1: Install using Virtual Machine Manager

Use Virtual Machine Manager to provision the VPX instance through a graphical workflow.

Complete the following steps:

Step 1. Create a new VM.

1. Open **Virtual Machine Manager** > **File** > **New Virtual Machine**.
2. Select **Import existing disk image** and browse to the `qcow2` file.
3. Set **OS type** to **Linux** and click **Forward**.

**Step 2. Allocate resources.**

1. Set **Memory** to **4096 MB** and **CPUs** to **2**.
2. Click **Forward**.

Step 3. Customize and configure networking.

1. Select **Customize configuration before install** and click **Finish**.
2. Set **Virt Type** to **KVM** and **Architecture** to **x86_64**.
3. Select the NIC, set **Device model** to **virtio**, and choose the appropriate source bridge or MacVTap interface.
4. Click **Apply > Begin Installation**.

Step 4. Apply license.

Log in at `https://<NSIP>` and apply the VPX license from **System > Licenses**.

Method 2: Install using virsh

Use virsh to provision the VPX instance from the command line, which is useful for scripted and automated deployments. Complete the following steps:

Step 1. Prepare the domain XML.

1. Copy and rename the XML file:

```
cp NSVPX-KVM-15.1-<build>_lx_64.xml NetScaler-VPX-15.1.xml
```

2. Edit the file. The domain name and all MAC addresses must be unique across all VMs on the host:

```
<name>NetScaler-VPX-15.1</name>

<mac address='52:54:00:29:74:b3' />

<source file='/root/NSVPX-KVM-15.1-<build>_lx_64.qcow2' />
```

Step 2. Configure networking.

Choose one of the following network interface types and add its interface definition to the domain configuration:

- **MacVTap bridge (recommended):**

```
<interface type='direct'>

    <mac address='52:54:00:29:74:b3' />

    <source dev='eth0' mode='bridge' />

    <model type='virtio' />

</interface>
```

- **Linux bridge:**

```
<interface type='bridge'>

  <mac address='52:54:00:2d:43:a4' />

  <source bridge='br0' />

  <model type='virtio' />

</interface>
```

Step 3. Define, start, and connect.

Run the following commands to define the VM from the domain configuration file, start it, and open a console session:

```
virsh define NetScaler-VPX-15.1.xml

virsh start NetScaler-VPX-15.1

virsh console NetScaler-VPX-15.1
```

Step 4. Configure management settings.

Configure the NSIP, subnet mask, and gateway when prompted, then select **Save and Continue**.

Upgrade to NetScaler 15.1 Tech Preview

Perform an in-place upgrade of an existing NetScaler VPX instance to the 15.1 Tech Preview build. Complete the following steps:

Prerequisite:

Ensure that the NetScaler VPX instance is running version 14.1 build 72.x or later.

Step 1. Download the upgrade bundle.

Download the KVM-specific bundle `build-15.1-<build>_lx_64.tgz` from `my.citrix.com` by navigating to **Downloads > NetScaler > Virtual Appliances**.

IMPORTANT:

Use only the `_1x_64` bundle. The standard FreeBSD upgrade bundle is not compatible and fails.

Step 2. Transfer and extract.

Copy the bundle to the VPX shell and extract it under `/var/nsinstall/`.

```
tar -xvzf build-15.1-<build>_1x_64.tgz -C /var/nsinstall/
```

Step 3. Install and reboot.

```
cd /var/nsinstall/build-15.1-<build>_1x_64  
  
./installns  
  
reboot
```

NOTE:

The same upgrade process applies to subsequent upgrades between 15.1 builds.

Limitations

LIMITATION	DETAILS
Live migration	KVM live migration of a VPX instance is not supported.
Shared disk images	Each VPX instance must use its own unique disk image.
Forced shutdown	Always shut down the VPX instance gracefully. Do not use Force Off .
Interface parameters	Speed, duplex, and autonegotiation settings are not configurable on virtual interfaces.

LIMITATION	DETAILS
Feature parity	Some features available in 14.1 might not be available in the 15.1 Tech Preview. For details, see the Release summary .

Related information

For complete KVM deployment details, including SR-IOV, PCI passthrough, DPDK, and VLAN configuration, see the [Installing NetScaler VPX on Linux KVM - 14.1 documentation](#).

Install a NetScaler VPX™ instance on Microsoft Hyper-V

NOTE:

This tech preview feature is provided for evaluation purposes only and is not intended for production use.

Overview

Starting with NetScaler® release 15.1, the NetScaler VPX virtual appliance for Microsoft Hyper-V is Linux-based, replacing the FreeBSD-based VPX available in release 14.1 and earlier. The VPX image is delivered in VHD format and imported using the standard **Import Virtual Machine** workflow in Hyper-V Manager.

An in-place upgrade from 14.1 (FreeBSD-based) to 15.1 (Linux-based) is supported. The instance must be on 14.1 build 72.x or later before upgrading.

System requirements

The following tables list the minimum requirements for the Hyper-V host and the NetScaler VPX instance.

Hyper-V host

RESOURCE	MINIMUM REQUIREMENT
Windows Server version	2016 or later with the Hyper-V role enabled
CPU	1.4 GHz, 64-bit

NetScaler VPX instance

RESOURCE	MINIMUM REQUIREMENT
vCPU	2
Memory	4 GB
Storage	20 GB
Virtual NICs	1 minimum, up to 8 maximum

NOTE:

You cannot modify VM hardware settings while the VPX instance is powered on. Shut down the instance before making configuration changes.

Before you begin

Before you install a NetScaler VPX instance on Microsoft Hyper-V, ensure that the following prerequisites are met:

- The Hyper-V role is enabled on the Windows Server host.
- At least one virtual switch is configured in Hyper-V Manager and connected to a physical NIC.
- VPX license files are available.

Obtain the VPX image

To download and prepare the VPX image package, complete the following steps:

1. Go to my.citrix.com and navigate to **Downloads > NetScaler > Virtual Appliances**.
2. Select **NetScaler 15.1** and download the Hyper-V image package.
3. Extract the package. Hyper-V Manager requires the following folder structure to remain intact:

```
NSVPX-HyperV-15.1-<build>_lx_64/  
├─ Snapshots/  
  
├─ Virtual Hard Disks/  
  
└─ NSVPX-HyperV-15.1-<build>_lx_64.vhd
```

```
└─ Virtual Machines/  
    └─ <vm-config>.xml
```

NOTE:

The `_lx_64` suffix identifies the Linux-based image introduced in 15.1.

Install NetScaler VPX on Hyper-V

Use Hyper-V Manager to import and configure the VPX instance. Complete the following steps:

Step 1. Import the virtual machine.

1. Open Hyper-V Manager and select the target host in the navigation pane.
2. Go to **Action > Import Virtual Machine**.
3. Browse to the extracted VPX folder and click **Next**.
4. Select **Copy the virtual machine (create a new unique ID)** and click **Next**.
5. Click **Finish**.
6. Verify that the VPX VM appears in the **Virtual Machines** list.

NOTE:

Import each VPX instance from a separate extraction folder. Repeat this process for more instances.

Step 2. Configure virtual network adapters.

1. Right-click the VPX VM and go to **Settings > Add Hardware > Network Adapter > Add**.
2. Select the adapter and choose the required virtual switch from the **Network** list.
3. Repeat for each additional adapter required (up to 8 vNICs total).
4. Click **Apply > OK**.

Step 3. Power on the VM.

1. Right-click the VPX VM and select **Start**.
2. Double-click the VM to open the **Console**.

Step 4. Complete the initial configuration.

At first boot, the VPX displays a menu-driven interface.

1. Enter the NSIP, subnet mask, and default gateway.
2. Select **Save and Continue**.

Step 5. Apply the license.

Log in at `https://<NSIP>` and apply the VPX license from **System > Licenses**.

Upgrade to NetScaler 15.1 Tech Preview

Perform an in-place upgrade of an existing NetScaler VPX instance to the 15.1 Tech Preview build. Complete the following steps:

Prerequisite:

Ensure that the instance is running NetScaler VPX version 14.1 build 72.x or later.

Step 1. Download the upgrade bundle.

Download the Hyper-V-specific bundle `build-15.1-<build>_lx_64.tgz` from `my.citrix.com` by navigating to **Downloads > NetScaler > Virtual Appliances**.

IMPORTANT:

Use only the `_lx_64` bundle. The standard FreeBSD upgrade bundle is not compatible and fails.

Step 2. Transfer and extract.

Copy the bundle to the VPX shell and extract it under `/var/nsinstall/`.

```
tar -xvzf build-15.1-<build>_lx_64.tgz -C /var/nsinstall/
```

Step 3. Install and reboot.

```
cd /var/nsinstall/build-15.1-<build>_lx_64  
  
./installns
```

reboot

NOTE:

The same process applies when upgrading between 15.1 builds.

Limitations

LIMITATION	DETAILS
Shared import folder	Import each VPX instance from a unique folder.
Settings changes while running	VM hardware settings cannot be modified while the VPX is powered on.
Hyper-V Integration Services	Hyper-V Integration Services are bundled with NetScaler software and cannot be installed or upgraded independently.
Feature parity	Some features available in 14.1 might not be available in the 15.1 Tech Preview. For details, see the Release summary .

Related information

For complete Hyper-V deployment details, including System Center Virtual Machine Manager (SCVMM) provisioning, NIC teaming (CTX224494), and VLAN configuration, see the [Install NetScaler VPX on Microsoft Hyper-V - 14.1 documentation](#).

Public clouds

NOTE:

This tech preview feature is provided for evaluation purposes only and is not intended for production use.

Overview

Starting with NetScaler® release 15.1, the NetScaler VPX virtual appliance is Linux-based, replacing the FreeBSD-based VPX that was available in release 14.1 and earlier. The rollout started with on-premises hypervisors, and this phase expands support to public clouds.

You can deploy the NetScaler VPX instance on the supported public clouds listed in the following table. This preview supports the NetScaler VPX Customer Licensed offering with Bring Your Own License (BYOL). FIPS offerings are not included.

Supported public clouds

CLOUD PLATFORM	DEPLOYMENT GUIDE
AWS	Deploy on AWS
Microsoft Azure	Deploy on Microsoft Azure
Google Cloud Platform	Deploy on Google Cloud Platform

For more information on feature support and sizing, see the [Support matrix](#), and review the [Limitations and deprecated features](#) before deploying.

Deploy a NetScaler VPX instance on AWS

NOTE:

This tech preview feature is provided for evaluation purposes only and is not intended for production use.

Overview

NetScaler VPX 15.1 Tech Preview introduces the Linux-based NetScaler VPX platform on Amazon Web Services (AWS). The image is delivered as an Amazon Machine Image (AMI) and runs as an Amazon Elastic Compute Cloud (Amazon EC2) instance in an Amazon Virtual Private Cloud (VPC). Use this article to choose an evaluation topology, understand its principal design requirements, and then follow the linked deployment procedure.

Choose a deployment model

NetScaler VPX on AWS supports a standalone deployment and several high availability (HA) models. Select the model that matches the resilience and traffic-continuity requirements of your evaluation.

DEPLOYMENT MODEL	RECOMMENDED USE	TRAFFIC CONTINUITY MECHANISM
Standalone	Functional evaluation, proofs of concept, and policy validation	A single NetScaler VPX instance processes management, client, and server traffic.
HA in the same availability zone	Node-level resilience within one availability zone	Secondary private IP addresses on the client and server NICs move to the new primary during failover.
HA across availability zones using Elastic IP	Public applications that require zone-level resilience	The Elastic IP address associated with the active VIP is reassociated with the new primary.

DEPLOYMENT MODEL	RECOMMENDED USE	TRAFFIC CONTINUITY MECHANISM
HA across availability zones using private IP	Private applications, Transit Gateway, and routed VPC designs	VPC route tables direct traffic to the client interface of the active node.

Standalone deployment

A standalone deployment is the simplest way to evaluate NetScaler VPX on AWS. The NetScaler VPX instance runs inside a VPC and typically uses three subnets: a management subnet for the NSIP, a client-facing subnet for VIP traffic, and a server-facing subnet for SNIP traffic. Deploy through the AWS Management Console, a NetScaler CloudFormation template, or the AWS CLI. Prepare the VPC, subnets, security groups, route tables, network connectivity, and EC2 key pair before you launch the AMI.

For more information, see [Deploy a standalone VPX instance on AWS](#).

HA in the same availability zone

Use this model to evaluate active-passive failover while keeping both nodes in the same availability zone. Both nodes must use the same number of NICs, the same NIC order, and matching subnet mappings. Configure secondary private IP addresses for the VIP and SNIP functions. During failover, these addresses and the associated Elastic IP addresses move to the new primary. AWS Identity and Access Management (IAM) permissions are required for the address movement.

For more information, see [Deploy a VPX HA pair in the same AWS availability zone](#).

HA across availability zones using Elastic IP addresses

Use this model for internet-facing applications that require zone-level resilience. Deploy the two nodes in different subnets or availability zones, enable Independent Network Configuration (INC), configure an IP set, and associate an Elastic IP address with the active VIP. On failover, AWS reassociates that Elastic IP address with the private VIP on the new primary.

For more information, see [Deploy cross-zone HA using Elastic IP addresses](#).

HA across availability zones using private IP addresses

Use this routed model for private application traffic or designs integrated with AWS Transit Gateway. Deploy equal-NIC nodes across availability zones, enable INC mode, use a VIP subnet that does not overlap the VPC, and add a VPC route that points the VIP subnet to the client elastic network interface (ENI) of the primary node. During failover, the route is updated to the new

primary. The deployment procedure covers both non-shared and shared VPCs and their IAM requirements.

For more information, see [Deploy cross-zone HA using private IP addresses](#).

Prepare the AWS environment

- Use separate subnets for management, client, and server traffic.
- Keep only the NSIP on the management ENI.
- Open the required ports in security groups, and associate every subnet with an appropriate route table.
- Use an Elastic IP address on the NSIP, or provide management internet access through a NAT device, for HA operations.
- For HA, attach IAM roles with the permissions required by the selected address-movement or route-update model.
- Allocate secondary private IP addresses in AWS before you configure them as NetScaler VPX VIPs or SNIPs.

For more information, see [AWS prerequisites and IAM permissions](#).

Sizing

Size the EC2 instance for both the licensed throughput and workload characteristics such as packets per second and SSL transactions. NetScaler recommends the M6i instance family for lower bandwidth tiers and C5n for higher bandwidth tiers. The support matrix lists the complete instance-family envelope and region availability.

For more information, see [AWS VPX support matrix](#).

Limitations and usage guidelines

- Clustering is not supported.
- Data and management traffic must use ENIs in different subnets, and only the NSIP must be present on the management ENI.
- Dynamic addition of ENIs is not supported. Stop the instance, attach the ENI, and then restart the instance.
- Because of AWS limitations, the AWS architecture does not support GARP, L2 mode, tagged VLAN, and virtual MAC.
- Disable the Source/Destination Check for Reverse Network Address Translation (RNAT).

- Hot plug is not supported with Elastic Network Adapter (ENA) interfaces. Hot removal is not supported with paravirtual (PV), SR-IOV, or ENA interfaces.

For more information, see [AWS limitations and usage guidelines](#).

Deploy a NetScaler VPX instance on Microsoft Azure

NOTE:

This tech preview feature is provided for evaluation purposes only and is not intended for production use.

Overview

NetScaler VPX 15.1 Tech Preview introduces the Linux-based NetScaler VPX platform on Microsoft Azure. Azure supports several NIC and IP architectures, so begin by selecting the architecture that matches the applications and the level of traffic separation you want to evaluate.

Choose an Azure architecture

ARCHITECTURE	RECOMMENDED USE	KEY DESIGN CHARACTERISTIC
Single NIC, single IP	Quick functional evaluation and simple publishing	One internal IP performs the NSIP, SNIP, and VIP functions. Azure port mapping exposes services.
Single NIC, multiple IPs	Standalone application delivery with multiple VIPs and separated IP roles	One NIC contains multiple Azure IP configurations used by the NSIP, VIP, and SNIP.
Multiple NICs, multiple IPs	Traffic separation, enterprise evaluation, and high availability (HA)	Management, client, and server traffic can use separate NICs, subnets, and IP configurations.

Single NIC, single IP

This is the simplest Azure model. One NIC and one internal address perform the management, server-side, and virtual-server functions. Azure translates public traffic to the internal address and a

mapped private port. Use this model when the goal is to become familiar with the Linux NetScaler VPX image or to validate a small number of services without managing several Azure IP configurations. This mode is specific to Azure.

For more information, see [Configure a standalone VPX instance](#).

Single NIC, multiple IPs

Use this architecture when a standalone NetScaler VPX needs distinct addresses for management, client, and server traffic but separate NICs are unnecessary. The first private IP configuration becomes the NSIP. Add more Azure IP configurations to the NIC, and then configure the corresponding private addresses on the NetScaler VPX instance as VIPs or SNIPs. Public IP association is optional for server-side addresses.

For more information, see [Configure multiple IP addresses on a standalone VPX](#).

Multiple NICs, multiple IPs

Use this architecture for stronger separation of management, client, and server traffic, and for active-standby HA. Any NIC can contain one or more private or public IP configurations. For Azure deployments, create a VLAN for each data interface without tagging, and bind the primary Azure NIC address as documented to avoid MAC moves and interface mutes.

For more information, see [Azure VPX architecture options](#).

Choose an availability model

DEPLOYMENT MODEL	WHEN TO USE	TRAFFIC HANDLING MECHANISM
Standalone	Node redundancy is not required for the evaluation	One NetScaler VPX instance processes application traffic.
HA using an availability set	You want protection from host or rack-level failures in a region	Azure Load Balancer probes both nodes and forwards traffic to the node that responds as primary.
HA using availability zones	You want zone-level resilience in a supported region	The HA pair spans fault-isolated zones and uses Azure Load Balancer for traffic steering.

Active-standby HA

Azure HA uses two NetScaler VPX instances in Independent Network Configuration (INC) mode and Azure Load Balancer health probes. Only the primary answers the probe. After failover, the new primary responds and the load balancer directs traffic to it. The documented multi-NIC template creates management, client, and server subnets with a NIC for each node in each subnet. Choose an availability set or availability zones based on the required failure boundary and regional support.

For more information, see [Configure Azure HA with multiple IP addresses and NICs](#).

For non-INC high availability that uses secondary IP configurations, see [Deploy an HA pair on Azure with secondary IP configurations](#).

Plan networking and access

- Create a resource group, virtual network, subnets, and network security groups before deployment.
- Allow every required management and application port through the network security group.
- Do not configure an Azure public IP as a NetScaler VPX VIP. Configure the internal IP and use Azure NAT or load-balancer rules.
- Assign a static internal IP if the VM might be deallocated, to prevent the address from changing when it restarts.
- For throughput above 1 Gbps, use a supported VM size with Azure accelerated networking.

For more information, see [Azure network architecture and port guidance](#).

Sizing and licensing

Use a VM size with at least two virtualized cores and at least 4 GB of memory for the Tech Preview. Select the VM size according to the licensed throughput and NIC count. The Azure deployment documentation provides sizing recommendations up to 10 Gbps. Apply a BYOL license and perform a warm restart before making configuration changes. The preview also includes the Dsv6 and Dsv7 instance families.

For more information, see [Azure performance and VM sizing](#).

Limitations

- The Azure architecture does not support GARP, L2 mode, tagged VLAN, dynamic routing, virtual MAC, USIP, and clustering.

- For throughput above 3 Gbps, the actual network throughput might not match the licensed rate, although SSL throughput and SSL transaction rates might improve.
- The Azure deployment ID is not visible in Azure Resource Manager (ARM) and cannot be used to deploy the appliance.
- IPv6 back-end autoscaling is not supported.
- IPv6 is not supported for NetScaler VPX HA deployment.
- Public IP does not support protocols that open port mappings dynamically, such as passive FTP or ALG.
- HA does not work for traffic that uses a public IP associated directly with a NetScaler VPX instance instead of a public IP (PIP) configured on Azure Load Balancer.

For complete deployment guidance, see [NetScaler VPX on Microsoft Azure](#).

Deploy a NetScaler VPX instance on Google Cloud Platform

NOTE:

This tech preview feature is provided for evaluation purposes only and is not intended for production use.

Overview

NetScaler VPX 15.1 Tech Preview introduces the Linux-based NetScaler VPX platform on Google Cloud Platform (GCP). GCP supports standalone deployment with either a single NIC or multiple NICs. Select the model according to the required traffic separation and operational simplicity.

Choose a deployment model

DEPLOYMENT MODEL	RECOMMENDED SCENARIO	PRIMARY DESIGN CHARACTERISTIC
Single NIC	Quick evaluation and simple application delivery	One NIC carries management, client, and server traffic. Alias IPs provide VIP and SNIP addresses.

DEPLOYMENT MODEL	RECOMMENDED SCENARIO	PRIMARY DESIGN CHARACTERISTIC
Multiple NICs	Realistic traffic separation and advanced validation	Dedicated VPC networks and NICs carry management, client, and server traffic.

Single-NIC standalone deployment

Use a single NIC when simplicity is more important than traffic separation. GCP uses the primary internal address for management. Add alias IP addresses to the instance for the client-side VIP and server-side SNIP, and then configure those aliases as NetScaler-owned IP addresses. Do not use the primary internal address as a VIP or SNIP. This model is well suited to compact evaluation environments.

Key considerations

- Create one VPC network and the required firewall rules.
- Use a machine type with at least 2 vCPUs and 4 GB RAM.
- Reserve a static external IP if you need stable external management access.
- Add alias IP ranges before configuring VIP and SNIP on the NetScaler VPX instance.

For more information, see [Single-NIC deployment on Google Cloud Platform](#).

Multi-NIC, multi-IP standalone deployment

Use multiple NICs when the evaluation requires separation of management, client-facing, and back-end traffic. A typical design uses NIC 0 for the NSIP, NIC 1 for VIP traffic, and NIC 2 for SNIP traffic. GCP requires a separate VPC network for each NIC. Create all networks in the same region and configure communication routes between the NetScaler VPX instance, back-end servers, and external clients.

Key considerations

- Create separate management, client, and server VPC networks.
- Create firewall rules for SSH, HTTP, HTTPS, and application ports.
- Use at least 4 vCPUs when the instance has more than two NICs.
- Enable IP forwarding during instance creation when required.
- Plan all NICs before deployment because NICs cannot be added or removed afterward.

For more information, see [Multi-NIC deployment on Google Cloud Platform](#).

Sizing

A NetScaler VPX instance requires at least 2 vCPUs and 4 GB RAM. Select a documented machine type that meets the NIC and workload requirements.

CATEGORY	SUPPORTED MACHINE TYPES
General-purpose	C3, C4, C4D and N4

For more information, see [Supported GCP machine types](#).

Limitations

- IPv6 is not supported.
- Network interfaces cannot be added or removed after the instance is created.
- For a multi-NIC deployment, create a separate VPC network for each NIC. One NIC can be associated with only one network.
- An instance with more than two network interfaces requires at least 4 vCPUs.
- Enable IP forwarding while creating the instance and configuring the NIC.

For complete deployment guidance, see [NetScaler VPX on Google Cloud Platform](#).

Limitations and deprecated features

This document describes the unsupported features, system limitations, and deprecated features in the NetScaler® 15.1 Tech Preview. Feature gaps and hypervisor limitations apply.

Unsupported NetScaler features

The following NetScaler features are not supported in this release:

- [NextGen API](#)
- [Front End Optimization \(FEO\)](#)
- Autosave of the running configuration
- IPsec protocol
- Layer 3 cluster
- Link Aggregation Control Protocol (LACP) on NetScaler VPX™ for Linux running on ESXi or KVM
- The maximum number of admin partitions supported is 250
- Integrated Caching
- Jumbo frame support is unavailable on the following drivers: `igb`, `ixgbe`, `netvsc`, `af_packet`, and `ena`.

System limitations

The following system limitations apply in this release:

- Preboot user data for GCP
- The `nsapimgr` call options are partially supported. For the supported `nsapimgr` call options, see [FAQs](#).
- The `what` utility

Boot failure after upgrade on Linux KVM

NOTE:

This workaround applies to Linux KVM only.

If the appliance does not boot after you upgrade to Linux, complete the following steps:

1. Power off the VM.
2. Check the CPU model. If it is set to `qemu64` or `kvm64`, update the CPU model to `host-passthrough`:
 - Libvirt domain XML: `<cpu mode='host-passthrough' />`
 - `virt-install`: `--cpu host-passthrough`
3. Power on the VM.

Deprecated features

The following features are deprecated in this release:

- Routing Information Protocol (RIP)
- Routing Information Protocol next generation (RIPng)
- Intermediate System to Intermediate System (IS-IS) protocol
- Precision Time Protocol (PTP)
- File Transfer Protocol (FTP)
- Telnet

FAQs

Can I deploy the 15.1-1.x or 15.1-9.x Tech Preview builds in production?

No.

What is the minimum memory required for NetScaler VPX™?

A minimum of 4 GB of memory is required for NetScaler VPX.

Does NetScaler VPX support disk expansion beyond 20 GB?

Yes. To increase disk space on NetScaler VPX, expand the disk and reboot NetScaler VPX.

Is secondary disk supported on NetScaler VPX?

Yes, secondary disk is supported.

Is `sysctl` for NetScaler® variables supported on NetScaler VPX?

No. It is recommended to use specific NetScaler CLI commands to retrieve the same data. Instead of using `sysctl netScaler.version`, use the `show version` command.

How do I change the host name of NetScaler VPX?

The host name can be set using the `set hostname <hostName>` command.

Which disk partitions are persisted across reboots, upgrades, or reinstalls in NetScaler VPX?

Only files in the following directories are persisted across reboots:

- `/nsconfig` that points to the `/flash/nsconfig` directory
- `/var` directory

All other files are deleted across reboots.

How do I restore accidentally deleted system files (for example, binary files in `/usr/sbin`) in NetScaler VPX?

Reboot NetScaler VPX and select **Re-install NetScaler firmware version 15.1 x.x** during boot to restore the deleted system files. Your saved configuration remains intact.

How do I configure a custom log rotation in NetScaler VPX?

The `newsyslog.conf` file is not supported. Instead, log rotation is handled using the Linux `logrotate` utility, which runs once every hour. The configuration file is located at `/etc/logrotate.d/blx-syslog`.

How do I configure the domain name system (DNS) for NetScaler VPX?

Use the `add dns nameserver` command to configure DNS.

How do I debug DNS issues on NetScaler VPX?

DNS utilities such as `dig`, `nslookup`, and `host` are supported.

Which text editor is available in NetScaler VPX?

Vim is available as the text editor. The `vi` command is a symbolic link to the Vim binary.

How do I copy lines to the clipboard from a file opened in Vim through an SSH session?

To copy text, hold **Shift**, then drag your cursor to select your text.

How do I paste content in the Vim editor?

Enter insert mode using `i` and paste using the **Shift + Insert** key combination.

Is the `nsapimgr` command supported?

The `nsapimgr` command is supported. However, the call options are limited to the following.

COMMAND 1	COMMAND 2
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_weak_sso_type_enable</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_weak_sso_type_disable</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_sso_ntlm_use_ntdomain</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_sso_ntlm_dont_use_ntdomain</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_sso_kcd_use_spn_host</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_sso_kcd_dont_use_spn_host</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_redirect_for_artifact</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_post_for_artifact</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_enable_single_logout</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_disable_single_logout</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_enable_replay_protection</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_disable_replay_protection</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_enable_incl_ns_fix</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_disable_incl_ns_fix</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_enable_comma_sep_attr_res</code> <code>_no_encode</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_disable_comma_sep_attr_re</code> <code>s_no_encode</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_enable_comma_sep_attr_res</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_disable_comma_sep_attr_re</code> <code>s</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_dont_send_subject</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_send_subject</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_dont_send_session_index</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_send_session_index</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_dont_send_in_response</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_send_in_response</code>

COMMAND 1	COMMAND 2
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_dont_send_full_metadata</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_send_full_metadata</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_rba_login_enable_debug</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_rba_login_disable_debug</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_enable_schema_checks</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_disable_schema_checks</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_aaatm_drop_options_request</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_aaatm_dont_drop_options_request</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_aaatm_302_for_bearer</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_aaatm_401_for_bearer</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=ns_aaa_enable_api_access</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_aaa_disable_api_access</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=enable_webview_support</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=disable_webview_support</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=enable_rfweb_webview_support</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=disable_rfweb_webview_support</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=aaatm_disable_domain_cookie</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=aaatm_enable_domain_cookie</code>
<code>nsapimgr_wr.sh -ys</code> <code>call=aaa_strip_domain</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=aaa_dont_strip_domain</code>
<code>nsapimgr_wr.sh -ys arg1=<VAL> -ys</code> <code>call="ns_saml_set_deflate_size"</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_unset_deflate_size</code>
<code>nsapimgr_wr.sh -ys arg1=<VAL> -ys</code> <code>call="ns_saml_send_binding"</code>	<code>nsapimgr_wr.sh -ys</code> <code>call=ns_saml_dont_send_binding</code>
<code>nsapimgr_wr.sh -ys arg1=<VAL> -ys</code> <code>call="ns_push_set_timeout"</code>	<code>nsapimgr_wr.sh -ys arg1=<VAL> -ys</code> <code>call="ns_aaatm_cgitm_duration"</code>

fix

This is the content for the sample heading topic. It is hidden from the main table of contents but remains accessible via links.