

GFI Software[™]
Aurea SMB Solutions



THE EXINDA VIRTUAL
APPLIANCE GUIDE



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Installing an Exinda Virtual Appliance

The Exinda range of unified performance management (UPM) appliances is available as fully featured virtual appliances. There is no difference between the software that runs on bare metal hardware and the software that runs on the virtual appliance. If the Exinda software detects it is running on a hypervisor, it automatically enables certain optimizations to ensure maximum performance.

Exinda provides support for Virtual Appliances running on the following hypervisors:

- » VMware vSphere (ESX and ESXi) (5.5 and 6.0)
- » Citrix XenServer (6.2 and 6.5)
- » Microsoft Hyper-V (Windows Server 2008 R2 and later)
- » Linux KVM (Intel VT or AMD-V)

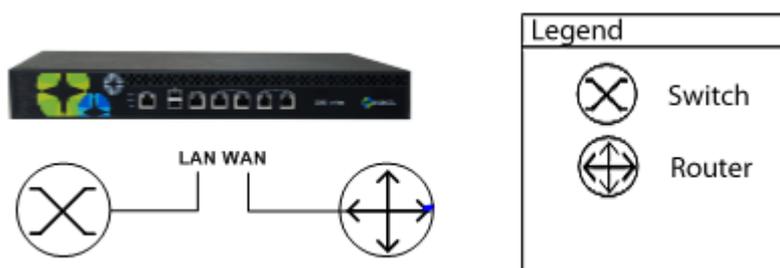
Exinda Appliances deploy the same ways as hardware appliances. For more information refer to [Deployment options](#).

The two typical deployment topologies are in-path and out-of-path.

0.1 Overview of in-path deployment

In-path deployments involve one or more LAN/WAN port pairs bridged together at layer 2. To be monitored and optimized by an Exinda Virtual Appliance, traffic must go through the bridge.

In an in-path topology, an Exinda Virtual Appliance is deployed inline. Using an image of a hardware appliance to represent a virtual appliance, an inline Exinda Virtual Appliance plugs into the network via the LAN and WAN ports like this:



Screenshot 1: Inline deployment

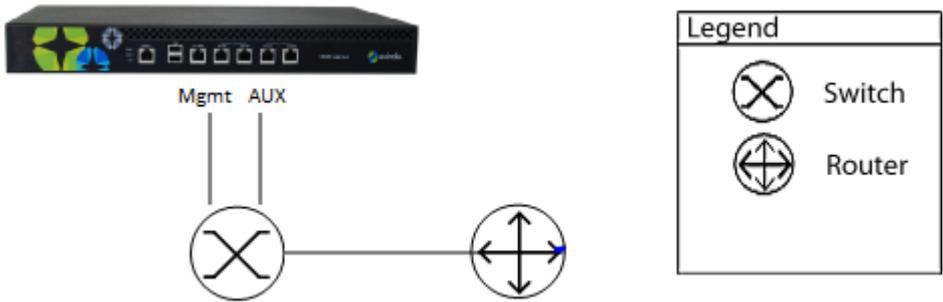
The challenge in a virtual environment is deciding how to pass traffic through the bridge. The method you choose depends on your virtual environment and hypervisor.

There are several options:

- » Dedicate two physical NICs on the host to be LAN and WAN ports.
- » Used shared NICs on the host to be LAN and WAN ports, but logically separate the traffic with VLAN tags.
- » Create a virtual network and direct traffic through virtual LAN/WAN ports.

0.2 Overview of out-of-path deployment

Out-of-path deployments are typically used in SPAN port mirroring, WCCP, high availability (HA) and clustering scenarios. Using an image of a hardware appliance to represent a virtual appliance, an Exinda Virtual Appliance plugs into the network like this:



Screenshot 2: Out-of-path deployment

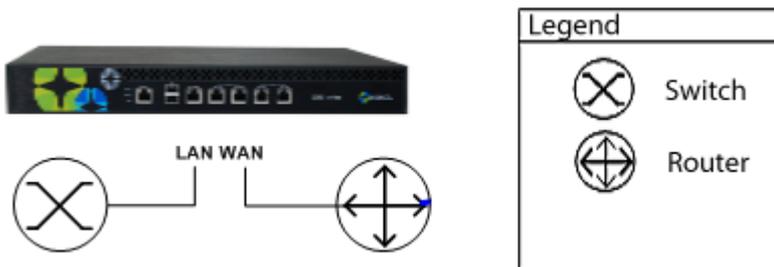
The setup is straightforward, requiring one NIC for management and another for auxiliary.

See the following topic for more information about installing and running an Exinda Virtual Appliance.

Virtual Appliance Deployment Options

Virtual Appliances can be deployed in all the same ways hardware appliances can. There are generally two typical deployment topologies, in line and out-of-path. Inline deployments involve one or more LAN/WAN port pairs bridged together at layer 2. Traffic must be directed through the bridge in order to be Monitored and Optimized.

Using a hardware appliance as an example, here is what an inline deployment looks like:



Screenshot 3: Inline deployment

The challenge in a virtual environment is how to pass traffic through the bridge. There are several options:

- » Dedicate 2 physical NICs on the host to be LAN and WAN ports.
- » Used shared NICs on the host to be LAN and WAN ports, but logically separate the traffic with VLAN tags.
- » Create a virtual network such that traffic is directed through virtual LAN/WAN ports.

How this is best achieved largely depends on the virtual environment and which hypervisor technology is used.

Out-of-path deployments are typically used in SPAN port mirroring, WCCPv2, HA and Clustering scenarios. Using a hardware appliance as an example, here is what an out-of path deployment looks like:



Screenshot 4: Out-of-path deployment

This is quite straight forward to setup in a virtual environment, you need one NIC for Management and another NIC for Auxiliary

Exinda supports a virtualization solution for most of the following hypervisor solutions:

- » VMware ESX/ESXi versions 5.5 and 6.0
- » Citrix XenServer versions 5.5, 5.6, and 6.0
- » Microsoft Hyper-V Windows 2008 R2, 2012, and 2012 R2
- » Linux KVM

This document provides an overview of the supported Exinda deployments for its virtualization solution, and includes the following information:

- » Diagrams of each supported deployment,
- » Lists of supported software versions,
- » Recommendations for sizing (CPU, Memory, and storage),
- » Limitations for each hypervisors, where applicable,
- » Reference links for supporting material.

Sizing and resource requirements

Exinda supports:

- » 50Mbps to 10Gbps for Diagnostics
- » 20Mbps to 10Gbps for Diagnostics and Shaping
- » 1Mbps to 1Gbps for Diagnostics, Shaping, and Acceleration

NOTE

The recommended CPU is the minimum number of CPUs to achieve the performance numbers. The CPU must be VT Enabled & 64-bit.

The Exinda virtual appliance has a Flexible Storage option, with which you can adjust the size of the storage for Edge Cache, SMB1 cache and WAN Memory cache. By increasing the virtual file sizes for each of these caches, you can greatly improve the performance of your Exinda virtual appliance.

For Edge Cache and SMB1 Cache there is no limit to the size of the file created on the external storage. Use common sense when creating the file sizes. Exinda recommends that 80% of the actual file size be allocated to Edge Cache and SMB1 Cache. For example, if your SMB1 cache is 1TB then the recommendation is 800MB.

For WAN Memory, size should be based on the following:

- » For systems with 2GB RAM – Max WAN Memory Cache is 300GB
- » For all other systems – Max WAN Memory Cache is 1TB

Depending on the WAN bandwidth, use the following sizing specifications to estimate the host resources required for each of the Exinda virtual appliances.

| Virtual Appliance | Diagnostics | Diagnostics and Shaping | Diagnostics, Shaping, and Acceleration | Virtual CPUs (Qty × GHz) | Minimum RAM | Minimum Disk Storage |
|----------------------|----------------|-------------------------|--|--------------------------|-------------|----------------------|
| VM Small | Up to 150 Mbps | Up to 50 Mbps | Up to 10 Mbps | 4 × 2.0GHz | 6GB | 250GB |
| VM Medium | Up to 1 Gbps | Up to 500 Mbps | Up to 20 Mbps | 4 × 2.4GHz | 8GB | 250GB |
| VM Large | Up to 5 Gbps | Up to 5 Gbps | Up to 200 Mbps | 8 × 2.4GHz | 32GB | 500GB |
| VM Extra Large | Up to 10 Gbps | Up to 10 Gbps | Up to 1 Gbps | 12–24 × 2.4GHz | 64GB | 1TB |
| VM Extra Extra Large | Up to 15 Gbps | Up to 15 Gbps | Up to 1 Gbps | 12–24 × 2.4GHz | 128GB | 1TB |

NOTE

On the Exinda Virtual Appliance 10063, the number of CPUs depends on the licensed bandwidth for Diagnostics, Shaping, and Acceleration.

NOTE

In the case of Minimum Disk Storage, storage at higher throughput will require higher disk I/O bandwidth, so the underlying storage should be RAID-based, ideally RAID 10.

IMPORTANT

There are several factors that may mean more or fewer resources are required in individual environments.

Factors that may have an effect include:

- » Quality, speed, performance of the host CPUs.
- » Quality and performance of host NICs.
- » Host disk I/O bandwidth.

Use these topics for more guidance on sizing, specifications and resource requirements:

- » [VM Small](#)
 - » [VM Medium](#)
 - » [VM Large](#)
 - » [VM Extra Large](#)
 - » [VM Extra Extra Large](#)
-
-

0.3 Exinda Virtual Appliance model VM Small specifications

| Requirement | Details |
|---|---------|
| Diagnostics Licensed Bandwidth (in mbps) | 150M |
| Diagnostics and Shaping Licensed Bandwidth (in mbps) | 50M |
| Diagnostics, Shaping, and Acceleration Licensed Bandwidth (in mbps) | 5M 10M |
| Max Concurrent Flows | 150,000 |
| Max L7 New Connection Rate | 4,000 |
| Maximum Accelerated Connections | 2,000 |
| Reports | 20 |
| SLAs | 100 |
| APS Objects | 100 |
| Policies | 512 |
| Edge Cache Max Throughput (in mbps) | 20 |

0.5 Exinda Virtual Appliance model VM Large specifications

| Specification | Details | | | |
|--|----------------------------|------|----|--|
| Diagnostics Licensed Bandwidth (Gbps) | 5G | | | |
| Diagnostics and Shaping Licensed Bandwidth (Gbps) | 3G | 4G | 5G | |
| Diagnostics, Shaping, and Acceleration Licensed Bandwidth (Mbps) | 100M | 200M | | |
| Max Concurrent Flows | 1,200,000 | | | |
| Max L7 New Connection Rate | 25,000 | | | |
| Maximum Accelerated Connections | 20,000 | | | |
| Reports | 100 | | | |
| SLAs | 300 | | | |
| APS Objects | 300 | | | |
| Policies | 4,096 | | | |
| Edge Cache Max Throughput (Mbps) | 175 | | | |
| CPUs (Qty × GHz) ² | 8 × 2.4GHz | | | |
| Minimum Storage (GB) | 500GB | | | |
| Minimum Memory (GB) | 32GB | | | |
| EC-IOPS | 80 | | | |
| Monitoring-IOPS | 150 | | | |
| Default Bridge (interface) | br10 (eth10, eth11)/bypass | | | |

0.6 Exinda Virtual Appliance model VM Extra Large specifications

| Specification | Details | | | |
|---|-----------|-----|-----|-----|
| Diagnostics Licensed Bandwidth (Gbps) | 10G | | | |
| Diagnostics and Shaping Licensed Bandwidth | 6G | 7G | 8G | 10G |
| Diagnostics, Shaping, and Acceleration Licensed Bandwidth | 300 | 400 | 500 | 1G |
| Max Concurrent Flows | 1,800,000 | | | |
| Max L7 New Connection Rate | 30,000 | | | |
| Maximum Accelerated Connections | 30,000 | | | |
| Reports | 100 | | | |
| SLAs | 300 | | | |

| Specification | Details |
|----------------------------------|---|
| APS Objects | 300 |
| Policies | 4,096 |
| Edge Cache Max Throughput (Mbps) | 250 |
| Default Bridge (Interface) | br10 (eth10 eth11)/bypass |
| CPU (Qty × GHz) | 12 × 2.4 (<=300M3) 24 × 2.4 (>300M3) |
| | <p>NOTE All virtual machine models must be run on hosts with Intel® Xeon® class CPUs. CPU ratings requirements are as quoted in the table. These CPUs must be VT Enabled and 64-Bit</p> <p>NOTE On the EXNV-10063, the number of CPUs depends on the licensed bandwidth for Diagnostics, Shaping, and Acceleration.</p> |
| Minimum Storage (TB) | 2TB |
| Minimum Memory (GB) | 64GB |
| EC-IOPS | 80 |
| Monitoring-IOPS | 150 |

0.7 Exinda Virtual Appliance model VM Extra Extra Large specifications

| Specification | Details |
|---|---|
| Diagnostics Licensed Bandwidth (Gbps) | 15 |
| Diagnostics and Shaping Licensed Bandwidth | 6G 7G 8G 10G |
| Diagnostics, Shaping, and Acceleration Licensed Bandwidth | 300 400 500 1G |
| Max Concurrent Flows | 1,800,000 |
| Max L7 New Connection Rate | 30,000 |
| Maximum Accelerated Connections | 30,000 |
| Reports | 100 |
| SLAs | 300 |
| APS Objects | 300 |
| Policies | 4,096 |
| Default Bridge (Interface) | br10 (eth10, eth11)/bypass |

| Specification | Details |
|----------------------------------|---|
| Edge Cache Max Throughput (Mbps) | 250 |
| CPU (Qty x GHz) | 12 x 2.4 (<=300M3) 24 x 2.4 (>300M3) <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p>NOTE All virtual machine models must be run on hosts with Intel® Xeon® class CPUs. CPU ratings requirements are as quoted in the table. These CPUs must be VT Enabled and 64-Bit</p> </div> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p>NOTE On the EXNV-12063, the number of CPUs depends on the licensed bandwidth for Diagnostics, Shaping, and Acceleration.</p> </div> |
| Minimum Storage (TB) | 2TB |
| Minimum Memory (GB) | 128GB |
| EC-IOPS | 80 |
| Monitoring-IOPS | 150 |

Exinda Virtual Appliance use cases

Learn different ways of deploying the Exinda virtual appliance. These use cases cover both inline and out-of-path deployments. All of the hypervisors referenced in this documentation support out-of-path deployments. Inline deployments are supported on VMware vSphere and Citrix XenServer, but NOT on Microsoft Hyper-V.

0.8 Inline deployment with externally attached LAN

In this use case, the Exinda Virtual Appliance is set up for inline mode deployment with an externally attached LAN. There are primarily two scenarios for inline deployment of the virtual appliance:

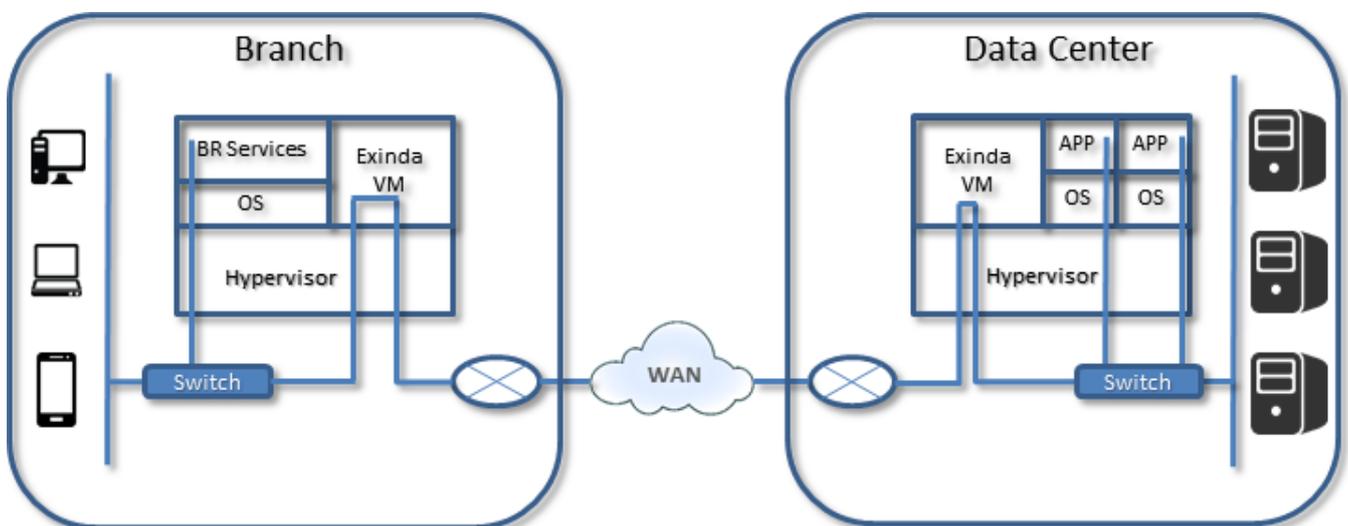
1. The LAN-side users and applications connect to the Exinda Virtual Appliance through a physical NIC interface.
2. The applications are virtualized and isolated on the same host as the Exinda, on the LAN side interface of the Exinda Virtual Appliance.

This use case discusses the first scenario.

NOTE

This scenario is only possible using VMware vSphere (v5.5 and v6.0) and Citrix XenServer (v6.2 and v6.5) hosts. Microsoft Hyper-V does not support inline deployments.

Scenario

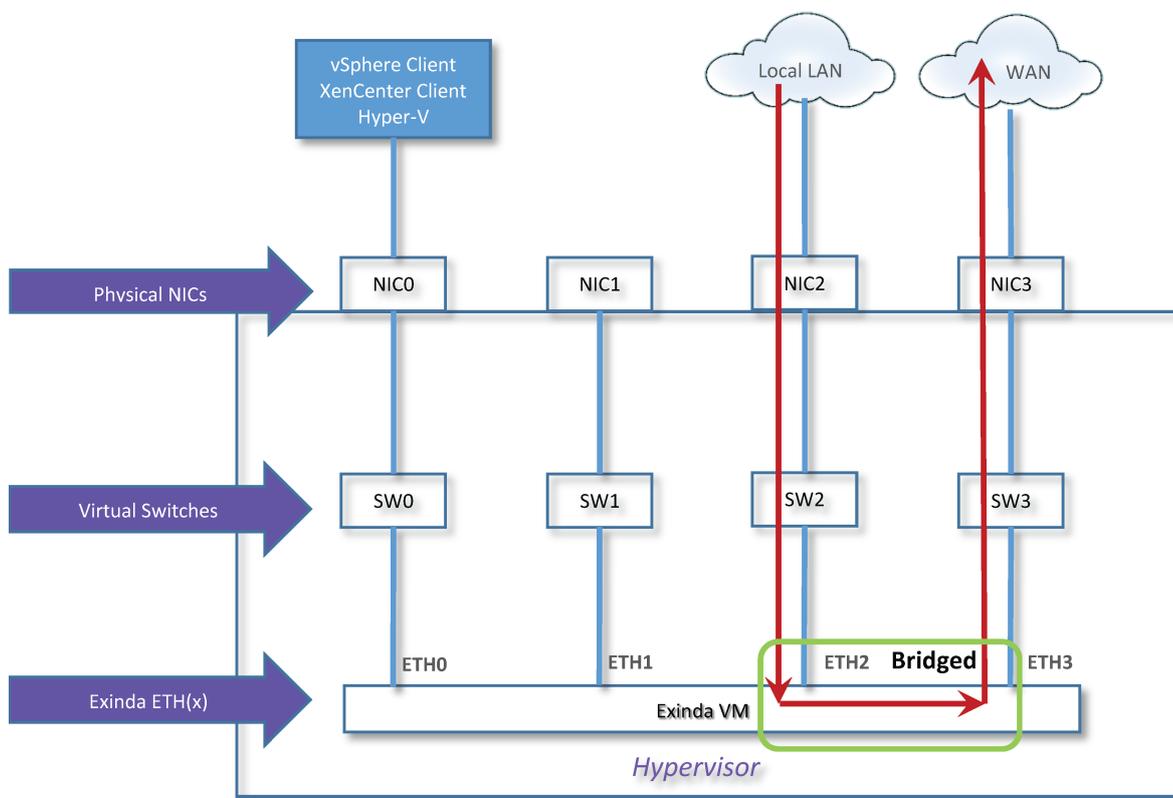


Screenshot 5: Scenario details

- » The branch users access virtualized local services (such as print, DHCP, and Active Directory).
- » At least two physical NIC interfaces are bridged together in the virtual Exinda Virtual Appliance.
- » User connections from the branch office to the Data Center applications are in line through the Exinda Virtual Appliance on both ends of the connections, and through external NIC interfaces.
- » The Exinda provides diagnostic, shaping, and acceleration for all traffic in this configuration.
- » Optionally, install the Exinda Virtual Appliance in a separate host in an inline mode configuration and connect through an external switch.

Use Case

In this scenario the hypervisor configuration is done at either a branch office with virtual infrastructure, or in the data center where the applications are running on the host VM. So, the local users accessing the WAN leverage the Exinda for diagnostics, shaping, and acceleration.



Screenshot 6: Use-case for Inline deployment with externally attached LAN

In this use-case:

- » The local LAN is sitting behind the hypervisor.
- » The host has four NIC interfaces. NIC 0 is dedicated for management of the system and NIC 1 is idle or used for other purposes.
- » NIC2 and NIC3 are mapped to SW2 and SW3.
- » SW2 and SW3 are mapped to Exinda Virtual Appliance ETH2 and ETH3.
- » ETH2 and ETH3 are mapped to NIC 2 and NIC 3, and are configured and bridged together by the Exinda virtual appliance.
- » The data path from a client on the local LAN goes through the Exinda virtual appliance in Inline Mode and out to the WAN.
- » Exinda Exinda Virtual Appliance software version is 7.4.2.
- » This deployment works with either local or external storage.

0.9 Inline deployment with an isolated virtual LAN and virtual applications

In this use case, the Exinda Virtual Appliance is set up for an inline mode deployment with an isolated virtual LAN and virtual applications. There are primarily two scenarios for inline deployment of the virtual appliance:

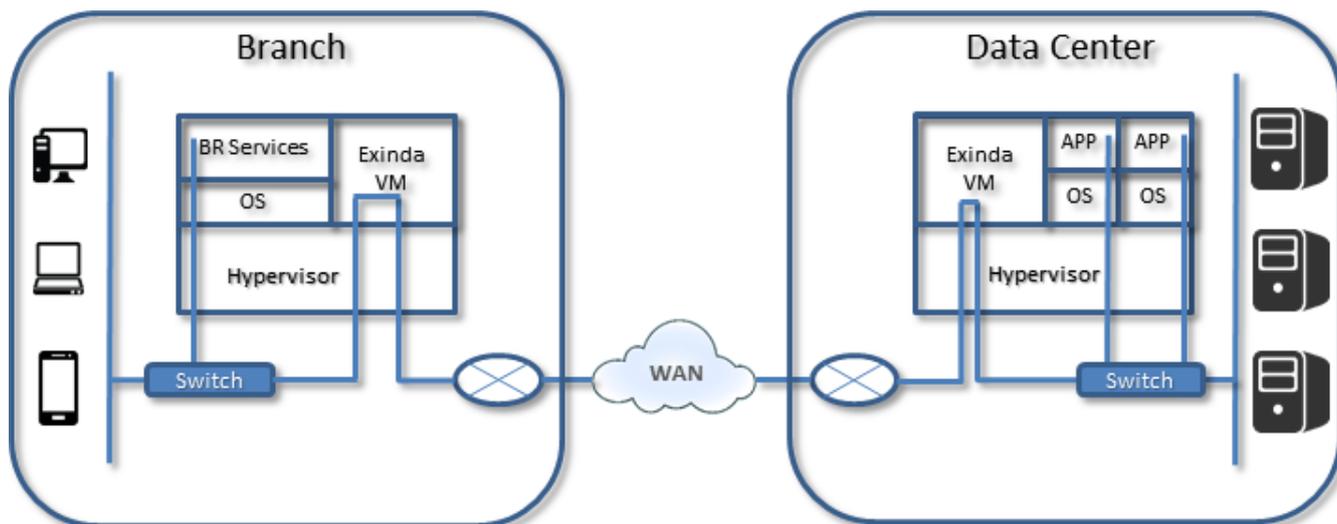
1. The LAN side users and applications connect to the Exinda Virtual Appliance through a physical NIC interface.
2. The applications are virtualized and isolated on the same host as the Exinda on the LAN side interface of the Exinda Virtual Appliance.

This use case discusses the second scenario.

NOTE

This scenario is only possible using VMware vSphere (v5.5 and v6.0) and Citrix XenServer (v6.2 and v6.5) hosts. Microsoft Hyper-V does not support inline deployments.

Scenario

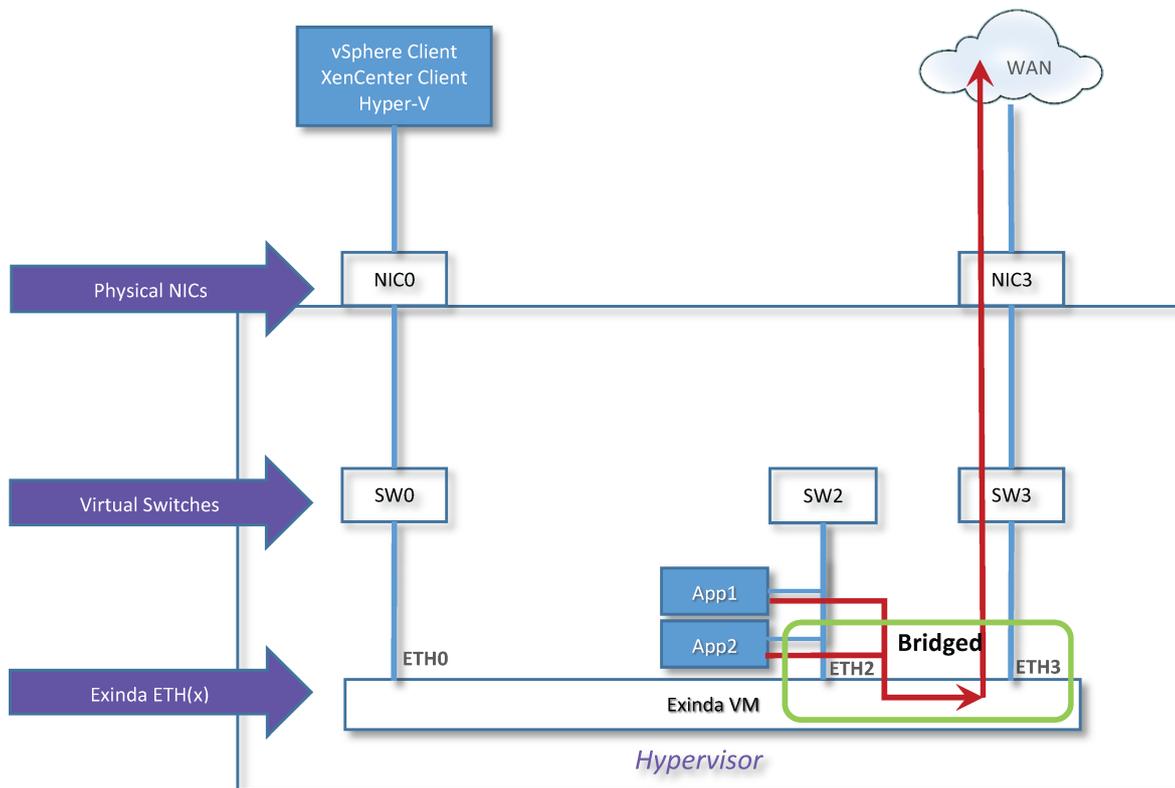


Screenshot 7: Scenario details

- » Branch users access virtualized local services (such as print, DHCP, and Active Directory).
- » One physical NIC interface is configured to the WAN side link.
- » Two virtual switches are bridged together in the virtual Exinda Virtual Appliance. The first switch is on the LAN side; the second one is for the WAN side. This results in isolating the applications behind the Exinda Virtual Appliance.
- » Users connecting from the branch office to the Data Center applications are in line through the Exinda virtual machine(s) on both ends of the connections and through a single external NIC interface to the WAN.
- » The Exinda appliance provides Diagnostics, Shaping, and Acceleration for all traffic in this configuration.

Use-case

This configuration will be in either a branch office with virtual infrastructure, or in the data center where the applications are running on the host VM and local users accessing the WAN leverage the Exinda for Diagnostics, Shaping, and Acceleration.



Screenshot 8: Use-case for Inline deployment with an isolated virtual LAN and virtual applications

- » In the diagram above, a virtual LAN is isolated and sits behind the Exinda Virtual Appliance all running on the same host hypervisor.
- » The host has two NICs; NIC 0 is dedicated for management of the system and NIC 1 is idle or used for other purposes.
- » All virtual application workloads are configured in the hypervisor to SW2.
- » SW2 is configured to map to Exinda Virtual Appliance ETH2
- » ETH2 is configured as part of a bridged connection defined as BR2.
- » BR2 bridges NIC 2 and NIC 3 together in the Exinda virtual appliance. The data path for any application connected to the SW2 virtual switch goes through the Exinda Virtual Appliance in inline mode through the ETH2/ETH3 bridged configuration and out the NIC3 interface to the WAN.
- » OPTIONAL: If this is a branch office with local users, configure local users to connect through the NIC2 physical interface and SW2/ETH2 Exinda Virtual Appliance interface and out to the WAN. This require mapping a third NIC interface.

0.10 Out-of-band (WCCP) mode

You can set up your Exinda Virtual Appliance in out-of-band mode, using WCCP protocol for deployment. This deployment is typical for customers who have chosen to redirect a percentage of their traffic for acceleration and traffic shaping through the Exinda Virtual Appliance. In the event the Exinda Virtual Appliance fails, all traffic previously redirected to the Exinda Virtual Appliance goes through un-optimized and un-accelerated.

Use Cases

- » Out-of-band (WCCP) mode (VMware ESXi)
- » Out-of-band and High Availability (PBR/VRRP) Mode

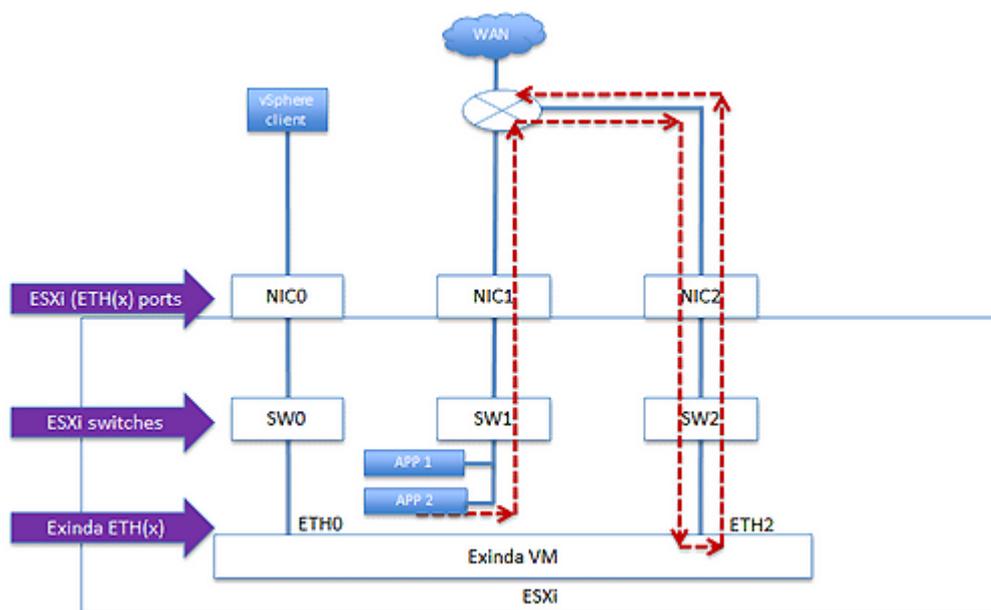
0.10.1 Out-of-band (WCCP) mode (VMware ESXi)

This configuration can be done either at a branch office with virtual infrastructure, or in the data center where the application and local user traffic accessing the WAN is redirected to the Exinda Virtual Appliance for diagnostics, shaping, and acceleration.

Scenario

- » Branch users access local services (print, DHCP, Active Directory) that are virtualized.
- » One physical NIC interface is dedicated for management of the virtual machines and hypervisor.
- » One physical NIC interface is configured on the hypervisor for LAN access, and has a routed connection to the WAN router.
- » One physical NIC interface is configured and mapped to the AUX port on the Exinda Virtual Appliance.
- » OPTIONAL: It is possible to configure and map all data traffic through a single NIC interface on the hypervisor; however, for performance reasons it is recommended to segment the un-optimized traffic from the optimized traffic.
- » User access from the branch office to the Data Center applications has two paths:
 - Path one is directly to the WAN router, with no traffic shaping or acceleration.
 - Path two is through the re-directed path invoked by the router (using WCCP) to the Exinda virtual appliance. The traffic is optimized and accelerated.
- » Traffic on the Data Center side has the same path as the branch side. Traffic that is selected to be optimized and accelerated is redirected to the Exinda Virtual Appliance through WCCP on the WAN router.
- » The Exinda provides Diagnostics, Shaping, and Acceleration for only redirected traffic in this configuration

Use Case



Screenshot 9: Use-case for Out-of-band (WCCP) mode (VMware ESXi)

In this use case:

- » The virtual LAN with application servers (APP1 W2003 or 8 and APP2) are configured in the ESXi hypervisor on SW1 and mapped to NIC1. They have a direct path the WAN router.
- » The physical server is a re-purposed Dell Server and has the following physical/logical interface mappings for illustration purposes only (you are encouraged to select your own server):

| | | | |
|-----------------------|------|------|------|
| ESXi Ethernet Ports | NIC0 | NIC1 | NIC2 |
| Exinda Ethernet Ports | ETH0 | ETH1 | ETH2 |
| ESXi Virtual Switches | SW0 | SW1 | SW2 |

- » The host has three NICs; NIC 0 is dedicated for management of the system.
- » NIC 1 is dedicated to all virtual application workloads hosted on the ESXi.
- » All virtual application workloads are configured in the ESXi to SW1.
- » The Exinda Virtual Appliance is configured on SW2 virtual switch and is mapped to the NIC2 interface.
- » The NIC2 interface has a direct connection to the WAN router, and is configured for WCCP GRE layer 3 mode between the router and the Exinda Virtual Appliance.
- » VMware version = 5.5 and 6.0
- » Exinda Virtual Appliance firmware version = 7.4.9
- » The data path for virtualized applications configured on SW1 takes two paths:
 - Path one – un-optimized and un-accelerated traffic is forwarded directly to the WAN router through NIC1.
 - Path two – traffic to be optimized (traffic shaped) and accelerated traffic is forwarded to the router for redirection through WCCP to the Exinda Virtual Appliance through NIC2/SW2 on the AUX port of the Exinda Virtual Appliance.
- » (Optional) It is possible to configure and map all data traffic on SW1 and SW2 to the NIC1 interface; however, for performance reasons it is recommended to segment the optimized traffic on its own NIC and virtual switch for performance reasons, and in the event of failure of the Exinda Virtual Appliance.

0.10.2 Out-of-band and High Availability (PBR/VRRP) Mode

In this use case, there are multiple Exinda Virtual Appliances set up for out-of-band mode and configured for High Availability. PBR is the protocol used for redirection while the appliances act as VRRP nodes. One Exinda acts as the Master node, receiving all redirected traffic from the WAN router, and all remaining Exinda Virtual Appliances act as Backup nodes in case the Master fails.

This deployment would be typical for customers who are choosing to redirect a percentage of their traffic for acceleration and traffic shaping through the Exinda virtual appliances.

To configure PBR/VRRP on the Exinda Virtual Appliance, see [VRRP with PBR](#).

This configuration would work in either a branch office with virtual infrastructure, or in a data center where the application and local user traffic accessing the WAN is redirected to the Exinda virtual appliance for Diagnostics, Shaping, and Acceleration.

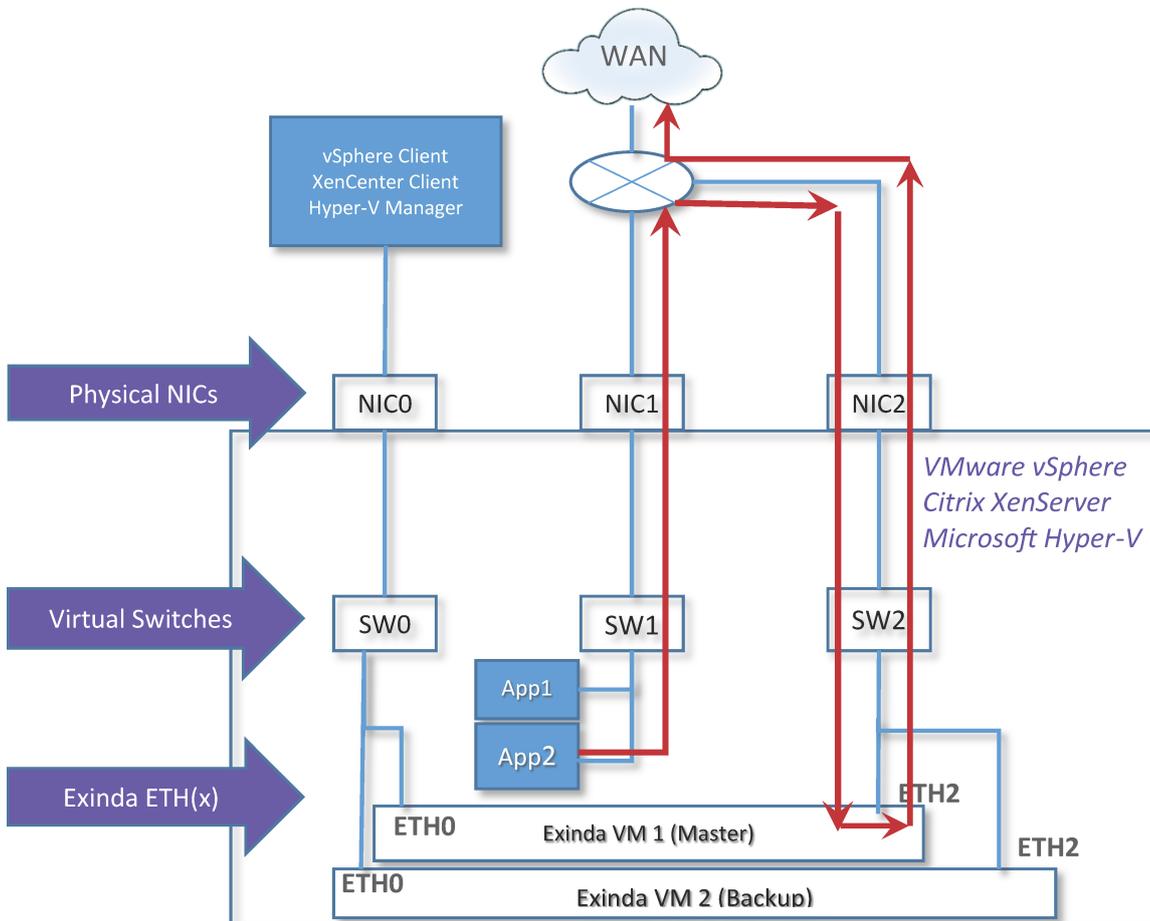
Scenario

- » Branch users access virtualized, local services (print, DHCP, Active Directory, etc).
- » One physical NIC interface is dedicated for management of the virtual machines and hypervisor.
- » One physical NIC interface is configured on the hypervisor for LAN access, and has a routed connection to the WAN router.
- » One physical NIC interface is configured and mapped to the virtual switch that is connected to the virtual AUX ports on all the Exinda Virtual Appliances.
- » User access from the branch office to the Data Center applications has two paths:

- Path one is directly to the WAN router, with no traffic shaping or acceleration.
- Path two is through the re-directed path invoked by the router (using PBR) to the Exinda virtual appliances. The traffic is received by the Exinda configured as the VRRP Master. In case of acceleration, the Exinda Virtual Appliances have the capability to share load, this happens automatically and requires no user intervention.

» Traffic on the Data Center side has the same path as the branch side. Traffic that is selected to be optimized and accelerated is redirected to the Exinda Virtual Appliance through PBR on the WAN router.

Use Case



Screenshot 10: Use-case for Out-of-band and High Availability (PBR/VRRP) Mode

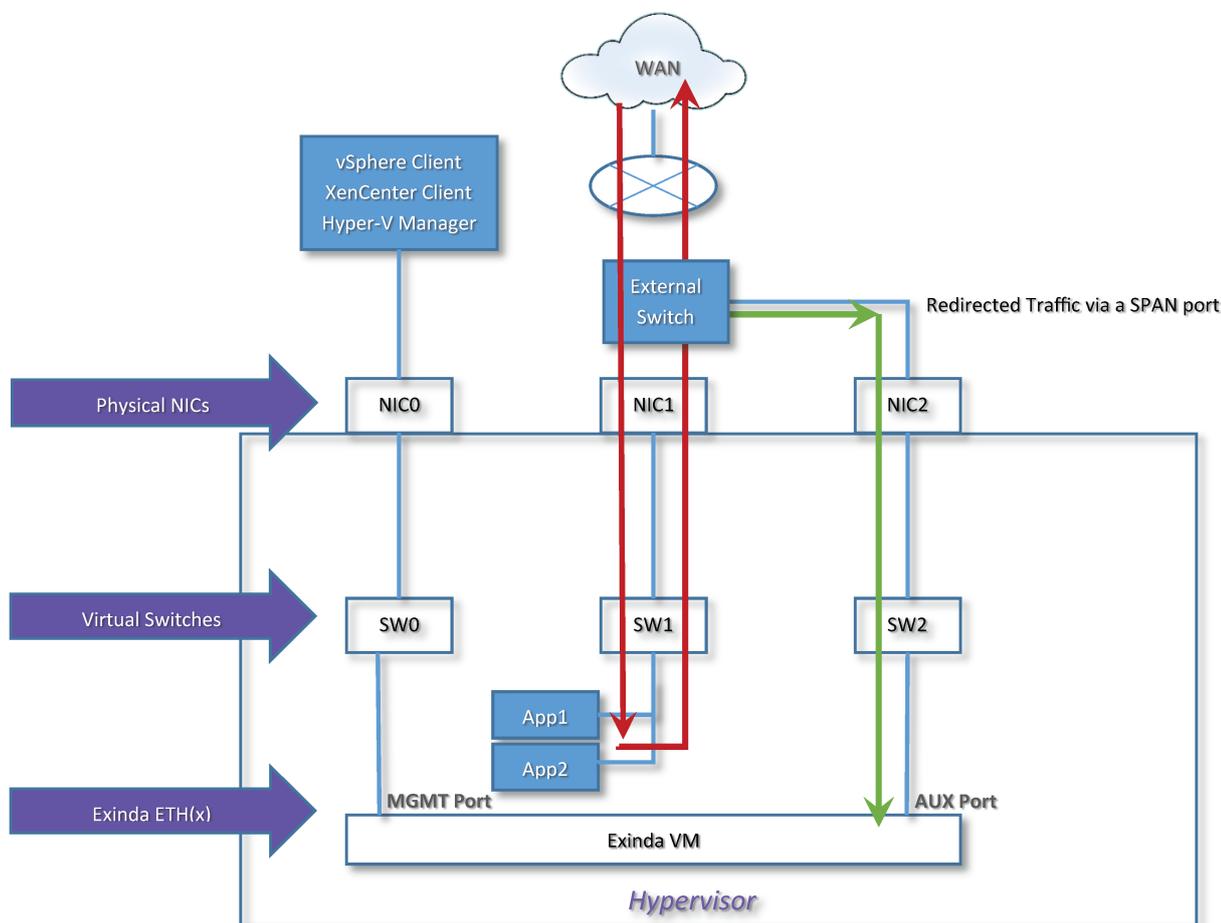
In this diagram:

- » The virtual LAN with application servers (APP1 and APP2) are configured in the hypervisor on SW1 and mapped to NIC1. They have a direct path the WAN router.
- » For simplicity, both Exinda Virtual Appliances installed in the same host hypervisor. However, it is possible to install Exinda Virtual Appliances on separate hypervisors to achieve physical high availability
- » The host has three NICs; NIC 0 is dedicated for management of the system.
- » NIC 1 is dedicated to all virtual application workloads hosted on the hypervisor
- » All virtual application workloads are configured in the hypervisor to SW1.
- » The Exinda Virtual Appliances are configured on SW2 virtual switch and are mapped to the NIC2 interface.
- » The NIC2 interface has a direct connection to the WAN router, which configured for PBR redirection. For more information refer to [Deployment Topologies](#).
- » Exinda Virtual Appliance firmware version = 7.4.2.

0.11 Port mirroring/SPAN port Configuration

Port mirroring/SPAN port Configuration can be used to perform network audits as it provides great flexibility in restricted and complex network environments.

In this use case, the Exinda Virtual Appliance is set up to monitor and collect traffic for only reporting only, without installing the appliance in the inline mode. The appliance monitors and reports on all applications presented on the SPAN/mirror port.

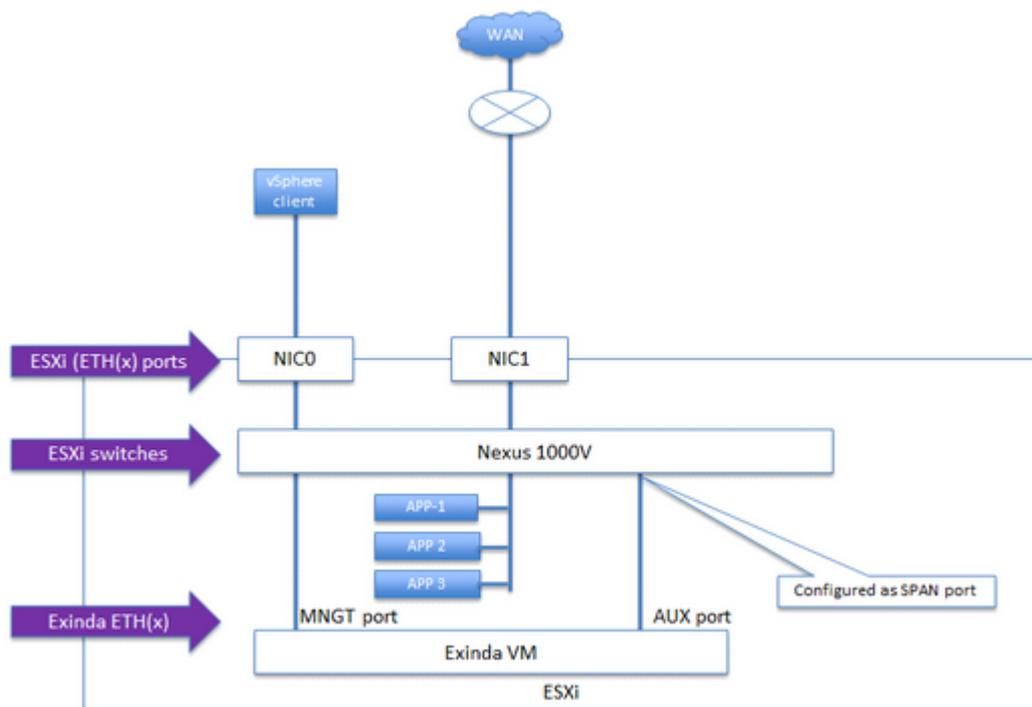


Screenshot 11: Use-case for Port mirroring/SPAN port Configuration

In this use-case:

- » The Exinda Virtual Appliance is used for monitoring and reporting, and is configured in the hypervisor to use the dedicated NIC2 interface, and dedicated virtual switch SW2.
- » The Exinda Virtual Appliance management port is mapped to SW0 and NIC0.
- » The Exinda Virtual Appliance has three Ethernet interfaces (ETH0–2) with the APP1 and APP2 both mapped to SW1 and NIC1, and connected to the external Switch.
- » The AUX (ETH1) port is configured for SPAN port mirroring and management of the Exinda Virtual Appliance.
- » The NIC2 interface is connected to an external switch on a port that has been configured to support SPAN port mirroring. It is recommended that this port be dedicated so there is no impact to traffic performance.
- » Application virtual workloads (APP1 and APP2) are on a separate virtual SW1 and mapped to NIC1.
- » NIC1 is directly attached to the external switch.
- » The switch can also be a virtual one installed in the hypervisor.

0.13 Port mirroring with a virtual Nexus switch



Screenshot 13: Use-case for Port mirroring with a virtual Nexus switch

In this use-case:

0.13.1 VMware

NOTE

In this configuration VMware supports vMotion, HA, and Fault Tolerant.

» The Cisco Nexus 1000V Series VEM runs as part of the VMware ESX or ESXi kernel and replaces the VMware Virtual Switch functionality. The VEM uses the VMware vNetwork Distributed Switch (vDS) API, which was developed jointly by Cisco and VMware, to provide advanced networking capability to virtual machines. This level of integration helps ensure that the Cisco Nexus 1000V Series is fully aware of all server virtualization events, such as VMware VMotion and Distributed Resource Scheduler (DRS). The VEM takes configuration information from the VSM and performs Layer 2 switching and advanced networking functions namely Monitoring:

- NetFlow
- Switch Port Analyzer (SPAN)
- Encapsulated Remote SPAN (ERSPAN)

» VMware versions - 5.5 and 6.0

0.13.2 XenServer

» EXN-V versions – 7.4.9

» The Nexus 1000V is configured and mapped to NIC1, which has a direct connection to the WAN router.

» The EXN-V has two four Ethernet interfaces (ETH0 / ETH10-3) with the AUX (ETH1) configured for Mirroring and ETH0 for management and management of the EXN-V.

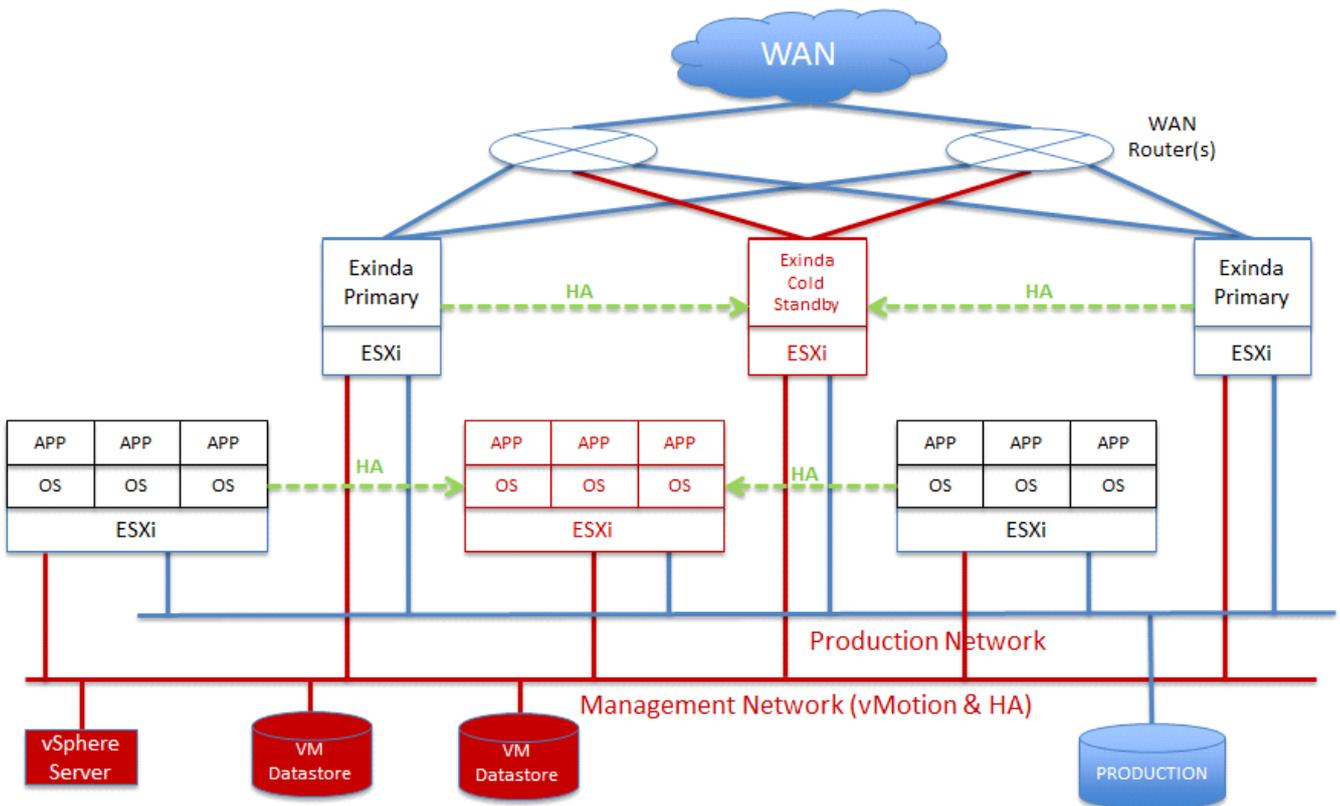
- » The EXN-V AUX port is configured to a port configured with SPAN port mirroring on the Nexus 1000V. This port should be dedicated to ensure there is no performance impact to data traffic.
- » The applications (APP1 to 3) are connected to a separate switch port on the Nexus 1000V.

0.14 VMware High Availability (HA)

In this use case, we discuss the recommended configuration and best practices for installing the Exinda virtual appliance where the requirement is for:

- » Exinda firmware – 7.4.9
- » ESX/ESXi HA software versions 5.5 and 6.0
- » vMotion support,
- » vMotion = Yes for INLINE-line
- » VMware best practice recommends that at least three hosts are used for this configuration, and
- » Licensing for the Exinda Virtual Appliance units include two full licenses and one cold standby license.

Each Exinda Virtual Appliance must maintain network connectivity with the Exinda License server and will shut down the Exinda virtual appliance after 96 hours without a successful connection.



Screenshot 14: Use-case for High Availability (HA) on VMware

In this use-case:

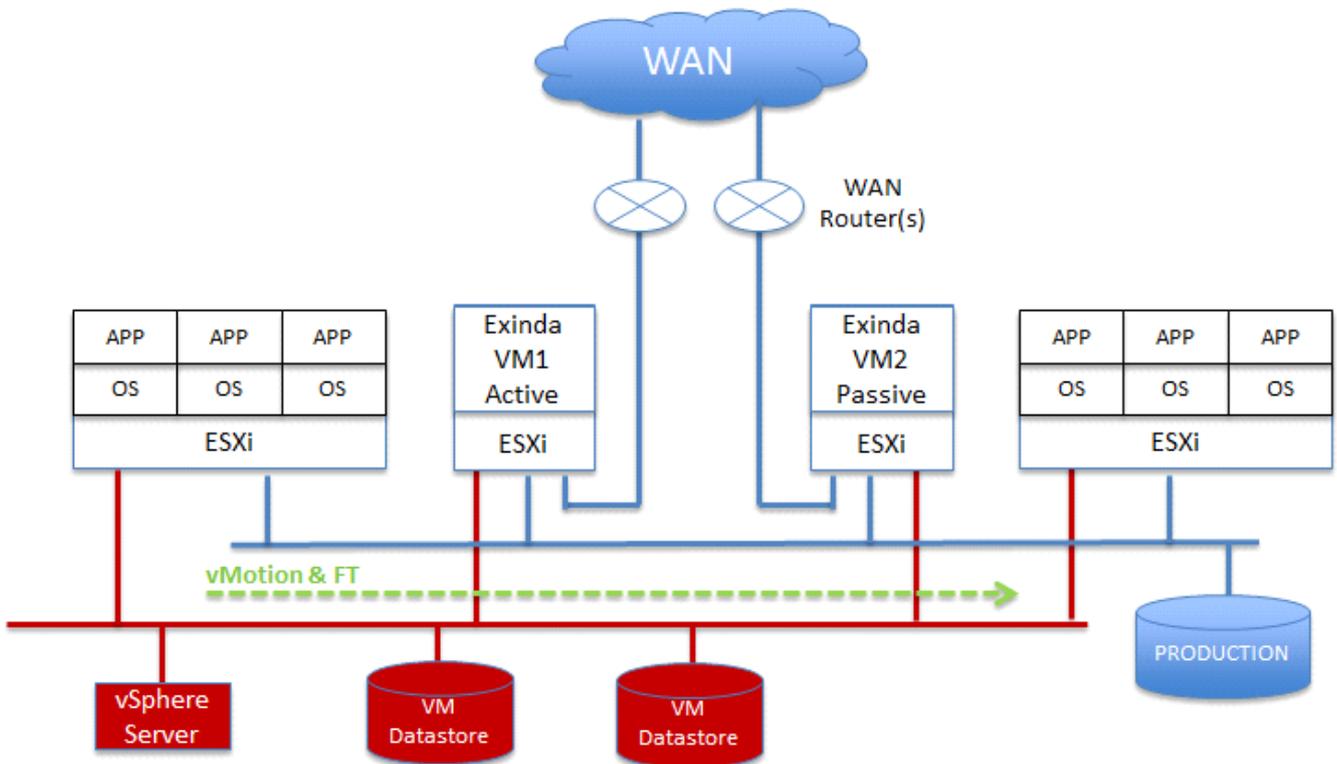
- » There are six ESX/ESXi hosts (can be done with three):
 - Two running virtual workloads, and a third as the backup HA system
 - Two running Exinda Virtual Appliances and a third running as a cold standby

- » Optionally you can move the Exinda Virtual Appliance to co-reside on the same hosts as the virtual workloads; however if vMotion is a requirement you must provide an external switch and separate NIC to pass the traffic between the workloads and the Exinda Virtual Appliance.
- » Having a separate host for the Exinda Virtual Appliance allows you to:
 - Segment other virtual appliances from the application workloads.
 - Support vMotion just for the application workloads and not for the host running the Exinda virtual appliance.
- » There are two networks:
 - A management network for vMotion and access to the external workload VMDK data stores.
 - A production network for data traffic to and from the applications and WAN.
- » This configuration assumes INLINE mode; optionally you can run in out of path mode, but WCCP is required.
- » Downtime for any workload in HA mode is for the duration of the virtual workload and/or the Exinda Virtual Appliance to reboot.

0.15 VMware Fault Tolerance (FT) cluster

In this use case, we discuss the recommended configuration and best practices for installing the Exinda Virtual Appliance on VMware Fault Tolerance (FT) cluster. For this use-case, you require:

- » Exinda firmware version – 7.4.9
- » Hypervisor Fault Tolerance Cluster (software versions 5.5 and 6.0)
- » vMotion support
- » vMotion = Yes for INLINE
- » VMware best practice recommends that at least 4 hosts are used for this configuration
- » Licensing for the Exinda Virtual Appliance units will include one full license and one cold standby license.
 - Each Exinda Virtual Appliance must maintain network connectivity with the Exinda License server and will shut down the Exinda virtual appliance after 96 hours without a successful connection.
- » Optionally, the Exinda Virtual Appliance can co-reside with the Application workloads, but an external switch and an additional NIC is required for vMotion support.

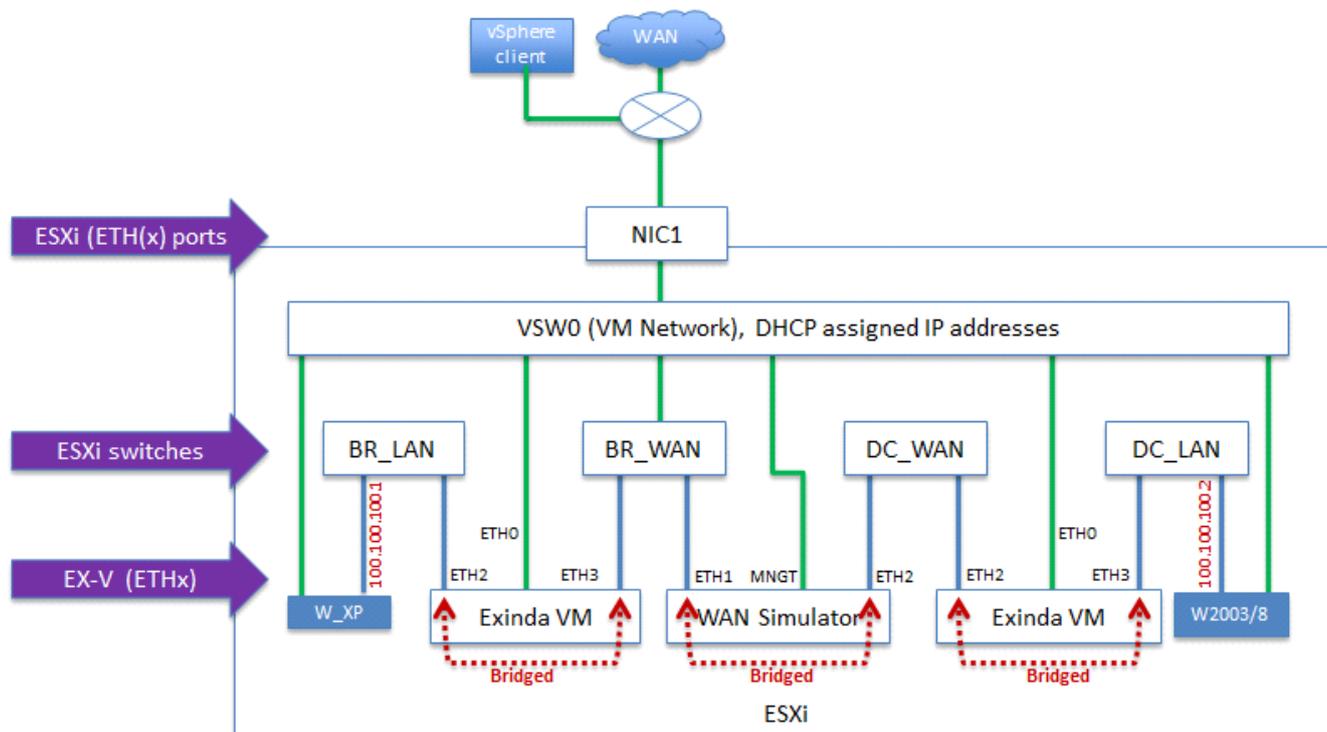


Screenshot 15: Use-case for VMware Fault Tolerance (FT) cluster

In this use-case:

- » There are four hypervisor hosts:
 - one running virtual workloads and a second as the Fault Tolerance system
 - one running Exinda Virtual Appliance active and a second running as a cold standby and Fault Tolerant.
- » Optionally, move the Exinda Virtual Appliance to co-reside on the same hosts as the virtual workloads; however if vMotion is a requirement you must provide an external switch and separate NIC to pass the traffic between the workloads and the Exinda Virtual Appliance.
- » Having a separate host for the Exinda Virtual Appliance allows you to:
 - Segment other virtual appliances from the application workloads.
 - Support vMotion just for the application workloads, and not for the host running the Exinda virtual appliance.
- » There are two networks:
 - A management network for vMotion and access to the external workload VMDK data stores
 - A production network for data traffic to and from the applications and WAN
- » This configuration assumes INLINE mode; optionally you can run in out of path mode which requires WCCP.

0.16 Virtual WAN simulator in an isolated network (VMware ESXi)



Screenshot 16: Use-case for Virtual WAN simulator in an isolated network

In this use-case:

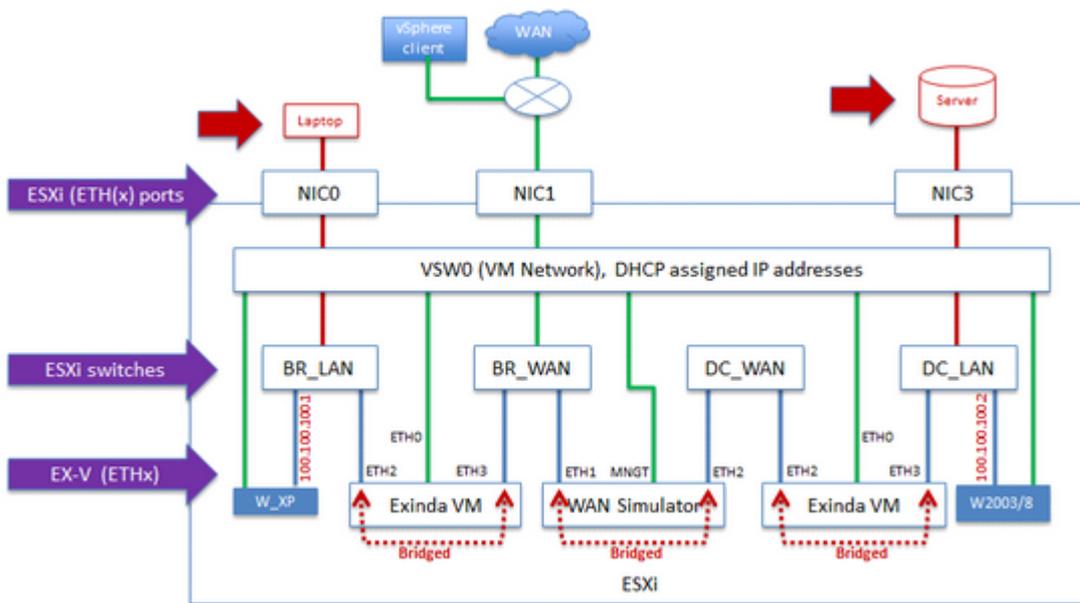
- » The hypervisor has one NIC:
 - NIC0, NIC2, and NIC3 are unused
 - NIC1 is connected to an external network and has access to the WAN for management and licensing of the virtual machines.

NOTE

Any physical NIC interface can be used, NIC1 is used for illustration purposes.

- » VMware software version = 5.5 and 6.0
- » Exinda Virtual Appliance firmware version = 7.4.9
- » WANEM Virtual Simulator software = 2.3
 - <http://wanem.sourceforge.net/>
 - You can use your own WAN simulator of choice
- » Four virtual switches have been defined on the ESX/ESXi host:
 - BR_LAN – branch side LAN switch
 - BR_WAN – branch side WAN switch
 - DC_WAN – data center side WAN switch
 - DC_LAN – data center side LAN switch

- » Each Exinda Virtual Appliance is configured for INLINE Mode and a single management interface on ETH0.
- » DHCP is assumed on the network for management interfaces on the Exinda Virtual Appliance appliances.
- » Private network space is configured for the Windows Client and Server on the data path between them and a second Ethernet interface is configured for DHCP to manage each system through RDP.
- » Exinda Virtual Appliance and the WAN Simulator data path are bridged.
- » Optionally, you can configure the WAN Simulator as a router and change the default gateway of the client and server accordingly.
- » Optionally with a system that has at least 3 NIC interfaces you can attach an external workstation and server and pass traffic through the demo system.
 - You will need to configure on the ESX/ESXi host mapping BR_LAN to NIC0 and DC_LAN to NIC3 to connect the external workstation and server.
 - The benefit is you can test through the isolated virtual Exinda Virtual Appliance environment with no impact to a product network



Screenshot 17: WAN external workstation

Hypervisor limitations

Consider these additional planning items when installing Exinda Virtual Appliance on other Hypervisors in the market including:

- » XenServer 6.2, and 6.5
- » Microsoft Hyper-V on Windows 2008 R2, 2012, and 2012 R2

0.16.1 XenServer

- » No Silicom Hardware Bypass Card driver support. Exinda is working with our NIC vendor to provide this support.
- » Promiscuous mode is supported, and must be configured via the CLI. You can find the commands in the Exinda Virtualization How to Configure Guide, or refer to the Citrix site for XenServer hypervisor configuration guidance.
- » Traffic shaping, reporting, and optimization are supported for INLINE mode.
- » Reporting and optimization are supported for out of path (WCCP GRE) mode.

0.16.2 VMware

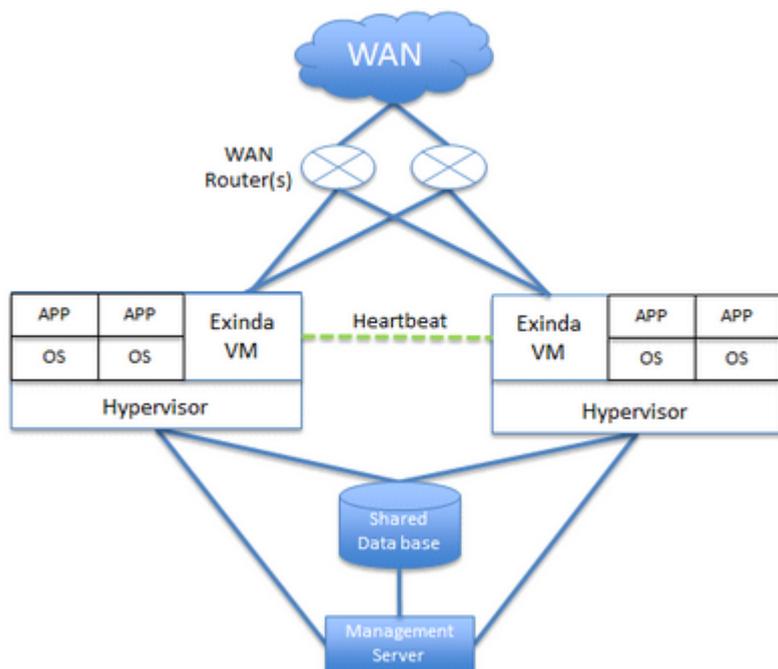
- » Bypass NIC card drivers are supported in 5.5 and 6.0.

0.16.3 Hyper-V

- » No support for Parallel virtualization drivers, meaning the guest machine does not know it's virtualized.
- » Only out-of-band deployments are supported for Hyper-V.

External storage is supported and recommended for virtual machine workloads, and the Exinda virtual appliance

In the diagram below, the Exinda is running in Active/Active mode with a Heartbeat between the two systems. There must be a separate Virtual NIC configured for Heartbeat traffic to transit.



Running on VMware vSphere (ESX and ESXi)

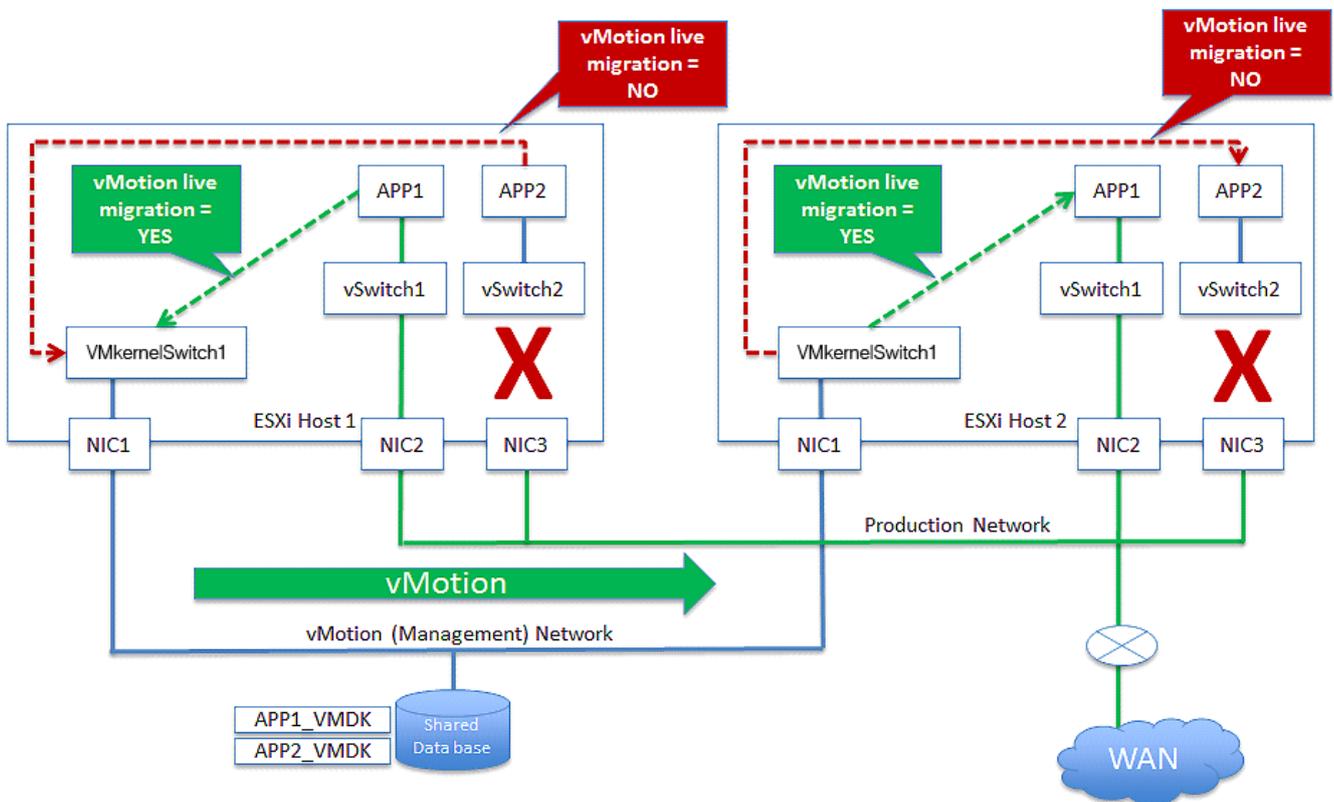
Learn how to run and customize the Exinda Virtual Appliance on VMware vSphere client.

NOTE

VMware ESX/ESXi 5.5 (or later) is required.

0.17 Understanding how VMotion works

For isolated virtual applications on the Exinda Virtual Appliance LAN port for inline mode, the VMware vMotion feature does not work. It is a requirement from VMware that any virtual switch must be mapped to a physical NIC and then to an external network. Below is a brief illustration of the process.



» There are two types of virtual switches in the ESX/ESXi hypervisor: VMkernel Switch and vSwitch. The VMkernel Switch is used by the hypervisor exclusively. VMkernel is the bare metal hypervisor, and provides core and memory allocation, disk and network virtualization, and a driver to low level devices. The vSwitch is used by virtual machines, and behaves just like any external layer 2 switch. All virtual machines have a path to the external Data-store where each VMDK is stored through the hypervisor layer to the VMkernel Switch mapped to the NIC attached to the storage.

» There are two networks:

- Management network where vMotion moves workloads between ESXi hosts
- Production network where the applications are accessed by the users

- » The VMkernelSwitch1 is mapped to external NIC1 and connected to the management network.
- » The vSwitch1 is mapped to NIC2 and connects APP1 to the production network.
- » The vSwitch2 is mapped to APP2 but does not have a mapping to external NIC3. The use case for this is that a network administrator may have one, or many, virtual workloads isolated on the host for testing purposes.
- » vMotion is executed for APP1 on ESXi 1 and moved over to ESXi 2 with no disruption to the application workload.
- » vMotion is executed for APP2 on ESXi 1 and fails because vSwitch2 mapped to APP2 is not mapped to an external NIC.
- » If an Exinda Virtual Appliance has at least one vSwitch mapped to it, and the vSwitch is not mapped to an external NIC interface, vMotion will not work for Exinda Virtual Appliance or workloads isolated behind it.

0.18 Install the Virtual Appliance on VMware

1. Liaise with your local Exinda representative to obtain the download files.
2. Open the VMware vSphere client.
3. Select **File > Deploy OVF Template**.
4. Copy the URL of the latest release of the Exinda VMware Virtual Appliance from Exinda.com, and paste it into the **Deploy from...** field, and click **Next**.
5. Confirm the OVF template details are correct, and click **Next**.
6. Review and accept the End User License Agreement (EULA), and click **Next**.
7. Specify a name for the virtual appliance. If prompted, choose the location to deploy the virtual appliance, and click **Next**.
8. Choose the format to store the virtual disks for the virtual appliance. Exinda recommends **Thick Provisioning**(the default).

NOTE

By default, the Virtual Appliance is configured with a single 50GB disk. Additional storage can be added in the form of another disk after the Virtual Appliance has been deployed. See the [Additional Storage](#) section for more information.

9. Connect the network interfaces to the appropriate network, by doing the following:
 - a. Connect the Management interface to a network where you can manage the virtual appliance.
 - b. If you are configuring the virtual appliance for clustering, high availability, or out-of-path deployments, map the AUX interface to the appropriate network. This interface can be left disconnected if it is not required.
 - c. If you are deploying the virtual appliance in line, [add additional NICs](#).
4. Click **Next**.
5. Review the deployment settings, and click **Finish** to complete the deployment.

Related Topics

Review the following topics after completing the VM deployment:

- » [Adjusting the RAM available to the Virtual Machine](#)
- » [Adjusting the NICs available to the Virtual Machine](#)

- » [Add Storage to the VMware Virtual Machine](#)

0.19 Modifying the VMware Virtual Machine Configuration

To improve the performance of the virtual appliance, change the number of CPUs, the RAM, networking, and storage allocated to the virtual machine.

NOTE

You will need to shut the virtual appliance down before you can modify its configuration.

Related Topics

- » [Adjusting the number of CPUs available to the Virtual Machine](#)
- » [Adjusting the RAM available to the Virtual Machine](#)
- » [Adjusting the NICs available to the Virtual Machine](#)
- » [Converting two NICs into a Bridge](#)
- » [Allow Ports to Accept and Bridge Packets \(Promiscuous Mode\)](#)
- » [Add Storage to the VMware Virtual Machine](#)

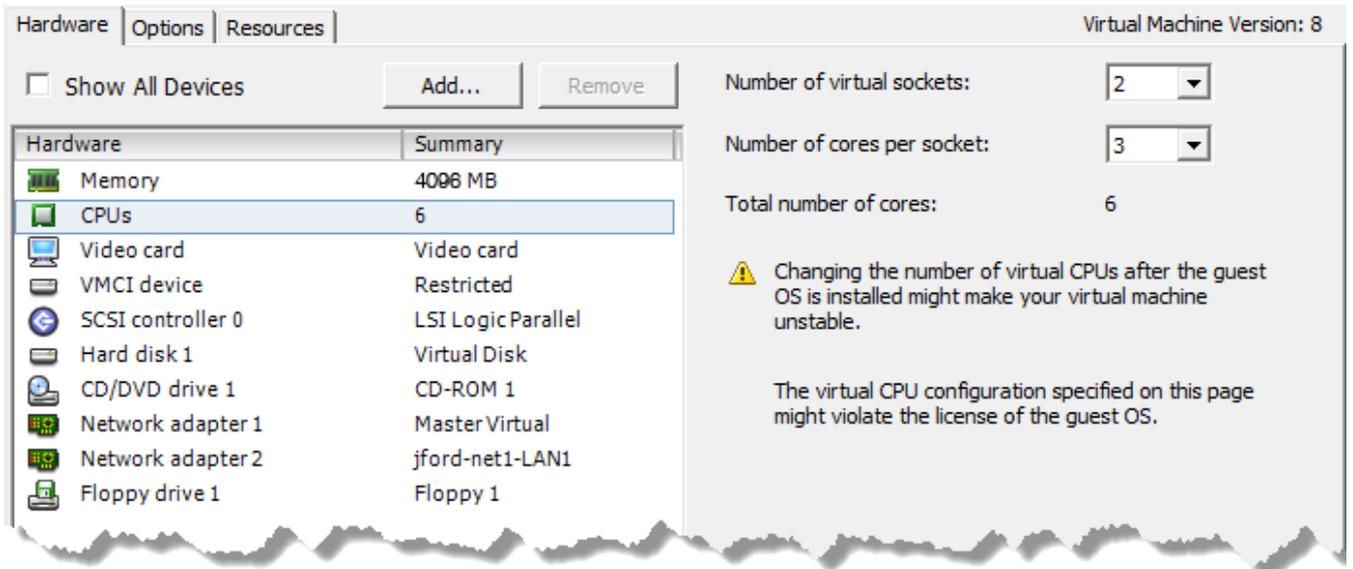
0.20 Adjusting the number of CPUs available to the Virtual Machine

By default, all Virtual Appliances come configured with two virtual CPUs. Increase the number of CPUs to suit your requirements.

NOTE

If the memory or hard disk space needs to be adjusted, please contact Exinda Support.

1. Open the **VMware vSphere Client**.
2. Right-click on the Exinda Virtual Appliance, and select **Edit Settings**.
3. On the **Hardware** tab, select **CPUs**.
4. Select the **Number of virtual sockets**.
5. Select the **Number of cores per socket**. The resulting total number of cores is a number equal to or less than the number of logical CPUs on the host. For example, if the **Number of virtual sockets** is 2, and the **Number of cores per socket** is 3, the total number of cores will be 6. [Show Image...](#)

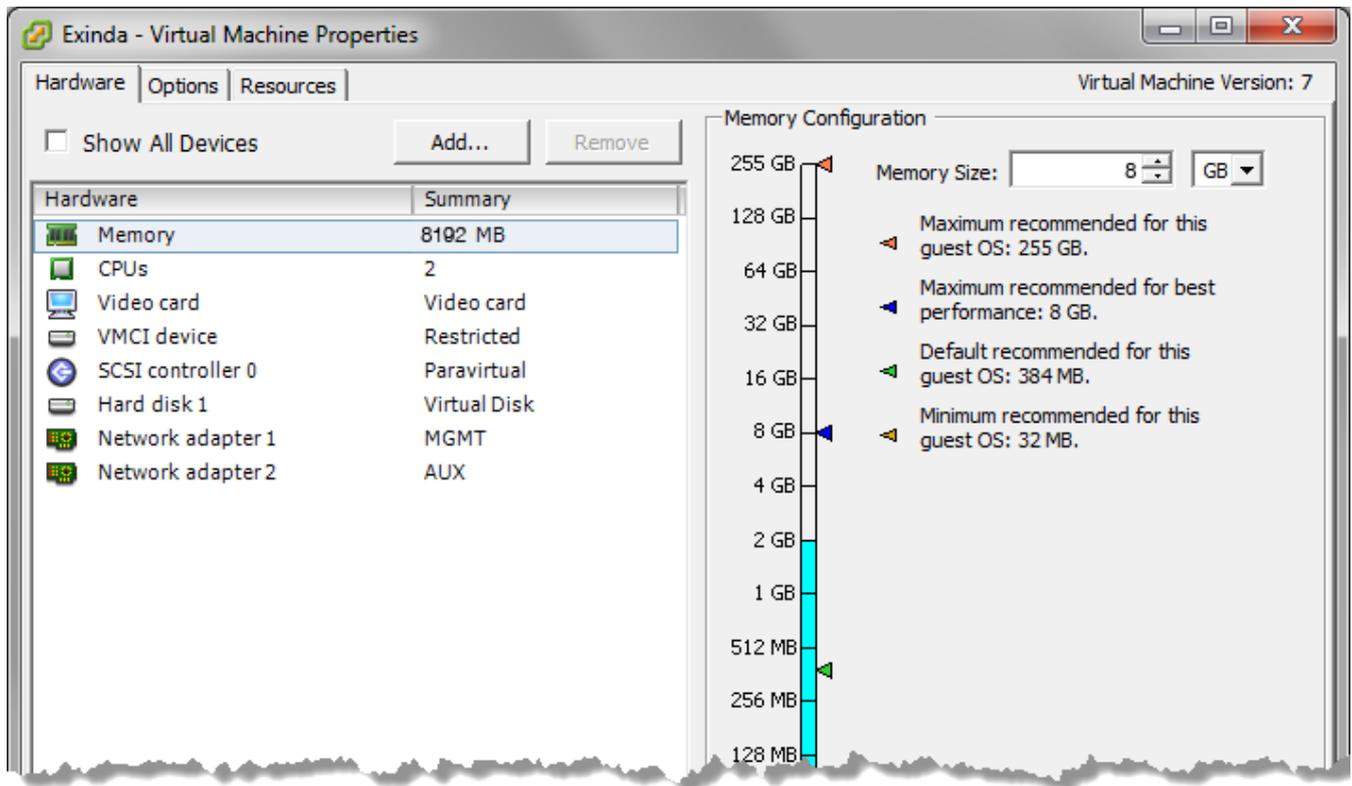


6. Click **OK**.

0.21 Adjusting the RAM available to the Virtual Machine

By default, all Virtual Appliances come configured with 4GB of RAM. Increase the amount of RAM to suit your requirements.

1. Open the **VMware vSphere Client**.
2. Right-click the Exinda Virtual Appliance, and select **Edit Settings**.
3. On the **Hardware** tab, select **Memory**.
4. Click **OK**.
5. Select the desired **Memory Size**



0.22 Adjusting the NICs available to the Virtual Machine

By default, all Exinda Virtual Appliances come with four NICs. Of these, the first NIC is the Management Interface (for managing the Virtual Appliance), the second NIC is the Auxiliary Interface (for HA topologies, clustering and out-of-path deployments), while the remaining two ports are bundled as a bridge for inline deployments.

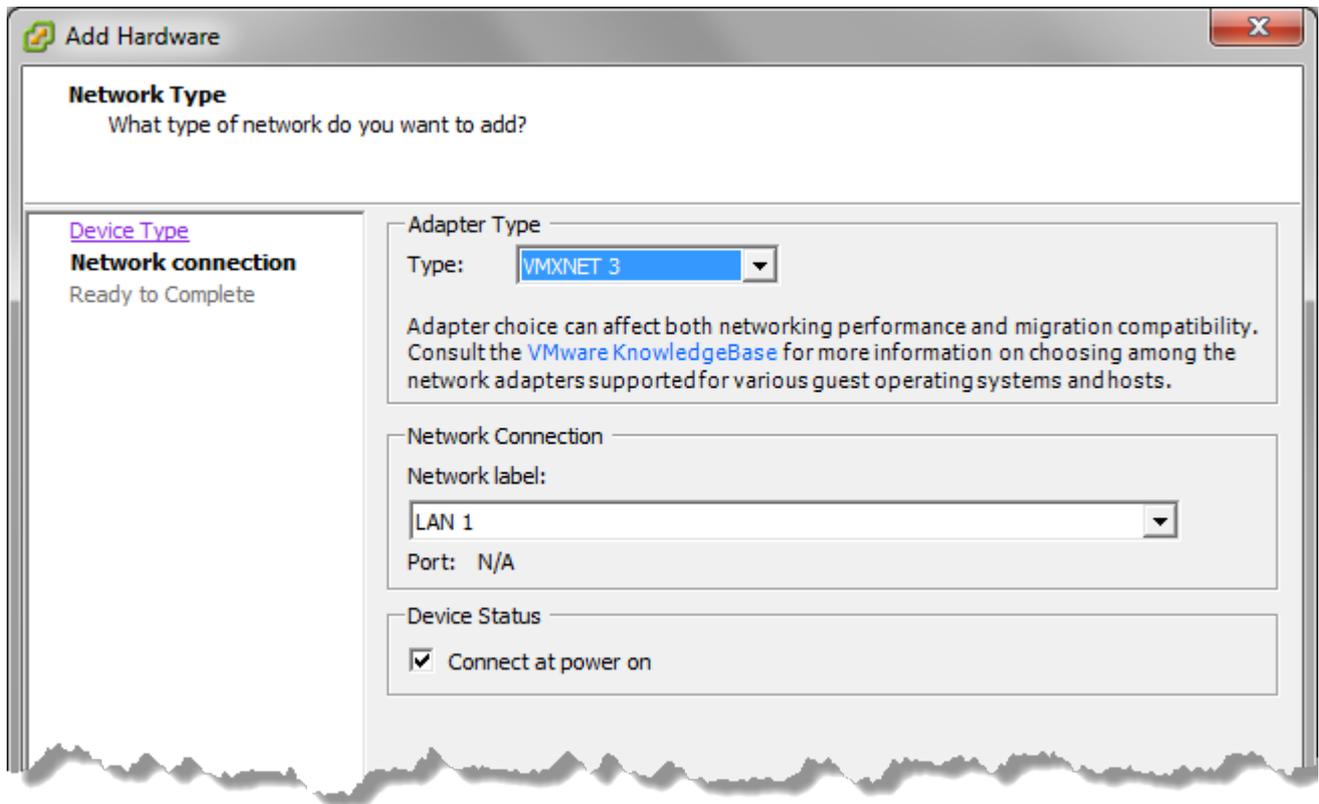
When placing the virtual appliance in line, you can add 2 extra NICs to be used as extra LAN and WAN ports for other circuits. The additional NIC pairs are bridged by default. For more information, refer to [Converting two NICs into a Bridge](#) (page 36)..

The following steps describe how to add extra NICs to the Virtual Appliance. You need to add extra NICs in pairs, in order to create LAN/WAN bridges.

NOTE

Even though there is no limitation on the number of bridges a given Virtual Exinda appliance can have, the number of connections can affect the performance of the VM. For more information, refer to [Sizing and resource requirements](#) (page 9). Please ensure that the virtual hardware is appropriate to handle the number of expected connections.

1. Open the **VMware vSphere Client**.
2. Right-click the Exinda Virtual Appliance, and select **Properties**.
3. Switch to the **Hardware** tab.
4. Click **Add**.
5. From the Device Type list, select **Ethernet Adaptor** and click **Next**.
6. In the Adapter Type list, select **VMXNET 3**.
7. Select the network to map the NIC to.



8. Click **Next**.
9. Review the information and click **Finish** to add the NIC.
10. Restart the virtual appliance. The new NICs are automatically detected and any additional NIC pairs are bridged.

0.23 Converting two NICs into a Bridge

Convert the first two NICs into a bridge so the Management Interface becomes a LAN Interface, and the Auxiliary Interface becomes a WAN Interface.

Start the virtual appliance and then...

1. On your browser, open the Exinda Web UI (https://Exinda_IP_address).
2. Key-in the **User** and **Password**.
3. Click **Login**.
5. Navigate to **Configuration > System > Network > IP Address**.
6. To bridge the two NICs together, select the bridge number you would like to convert and click **Apply Changes**.
7. To manage the Virtual Appliance, in the **IPv4** or **IPv6** field specify an IP Address for the bridge.

Network Setup

NICs

IP Address

Routes

DNS

HTTP Proxy

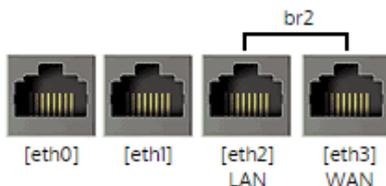
Email

SNMP

Active Directory

Choose the mode of operation and enter IP Address and Netmask details for that mode. Also specify a Default Route.

Note: Take care when making changes here as this appliance may become unreachable.



| Interface Settings | |
|--|---|
| br0 <input type="checkbox"/> | |
| Role: | <input type="checkbox"/> Cluster <input type="checkbox"/> Mirror <input type="checkbox"/> WCCP <input type="checkbox"/> PBR |
| Autoconf: | IPv4: <input checked="" type="checkbox"/> DHCP IPv6: <input type="checkbox"/> SLAAC |
| Dynamic Addresses: | 10.10.6.53/16 fe80::20c:29ff:fe0c:47ca/64 |
| Static Addresses: | <input type="text"/> / <input type="text"/> |
| Comment: | <input type="text"/> |
| eth0 | |
| Role: | <input type="checkbox"/> Cluster <input type="checkbox"/> Mirror <input type="checkbox"/> WCCP <input type="checkbox"/> PBR |
| Autoconf: | IPv4: <input type="checkbox"/> DHCP IPv6: <input type="checkbox"/> SLAAC |
| Static Addresses: | <input type="text"/> / <input type="text"/> |
| Comment: | <input type="text"/> |
| eth1 | |
| Autoconf: | IPv4: <input type="checkbox"/> DHCP IPv6: <input type="checkbox"/> SLAAC |
| Dynamic Addresses: | fe80::20c:29ff:fe0c:47de/64 |
| Static Addresses: | <input type="text"/> / <input type="text"/> |
| Comment: | <input type="text"/> |
| br2 <input checked="" type="checkbox"/> | |
| Autoconf: | IPv4: <input type="checkbox"/> DHCP IPv6: <input type="checkbox"/> SLAAC |
| Dynamic Addresses: | fe80::20c:29ff:fe0c:47de/64 |
| Static Addresses: | <input type="text"/> / <input type="text"/> |
| Comment: | <input type="text"/> |
| Gateway Settings | |
| IPv4: | <input type="text"/> |
| IPv6: | <input type="text"/> |

Apply Changes

NOTE

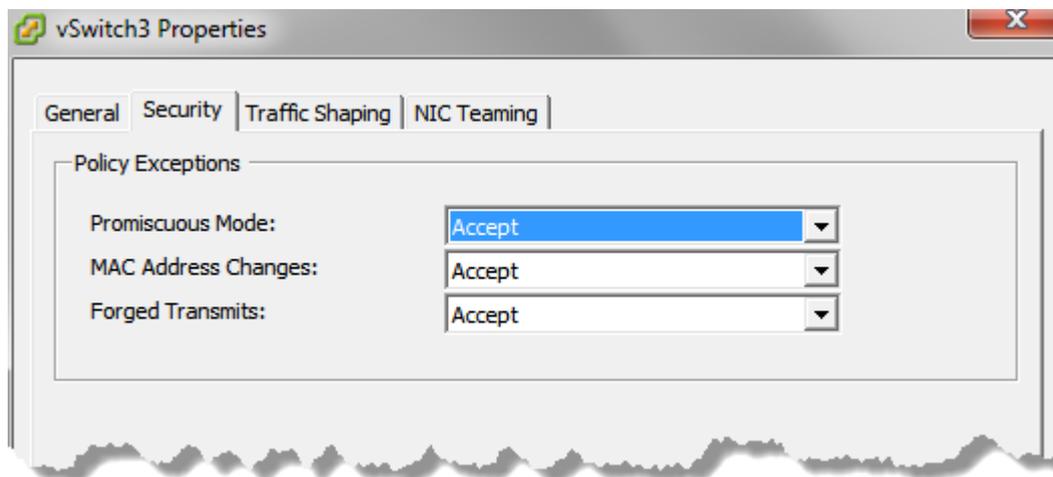
For inline deployments to work correctly under VMware, the virtual switches need to allow promiscuous mode. For more information, refer to [Allow Ports to Accept and Bridge Packets \(Promiscuous Mode\)](#) (page 37).

0.24 Allow Ports to Accept and Bridge Packets (Promiscuous Mode)

Any VMware virtual NIC used to deploy the virtual appliance in line must be configured to allow promiscuous mode, ensuring the LAN and WAN ports are capable of accepting and bridging packets that are not destined for them.

1. Open the **VMware vSphere Client**.
2. Select the ESXi server, and switch to the **Configuration** tab.

3. In the list of Hardware configuration options, select **Networking**.
4. Beside the switch name, click **Properties**.
5. In the switch properties, switch to the **Security** tab.



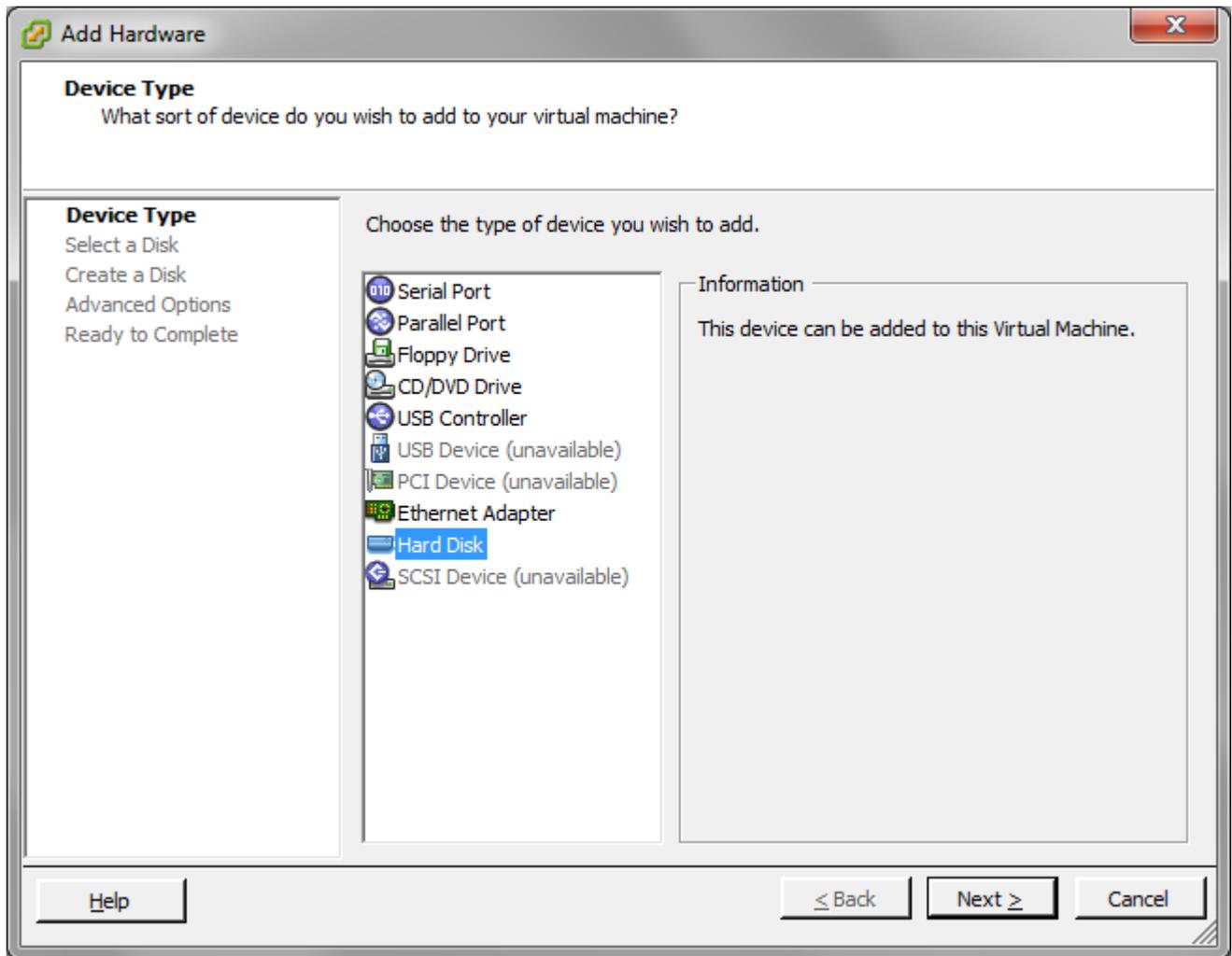
6. Set **Promiscuous Mode** to **Accept**.
7. Click **OK**.
8. Repeat these steps for each virtual switch that is attached to a NIC used in an inline deployment.

0.25 Add Storage to the VMware Virtual Machine

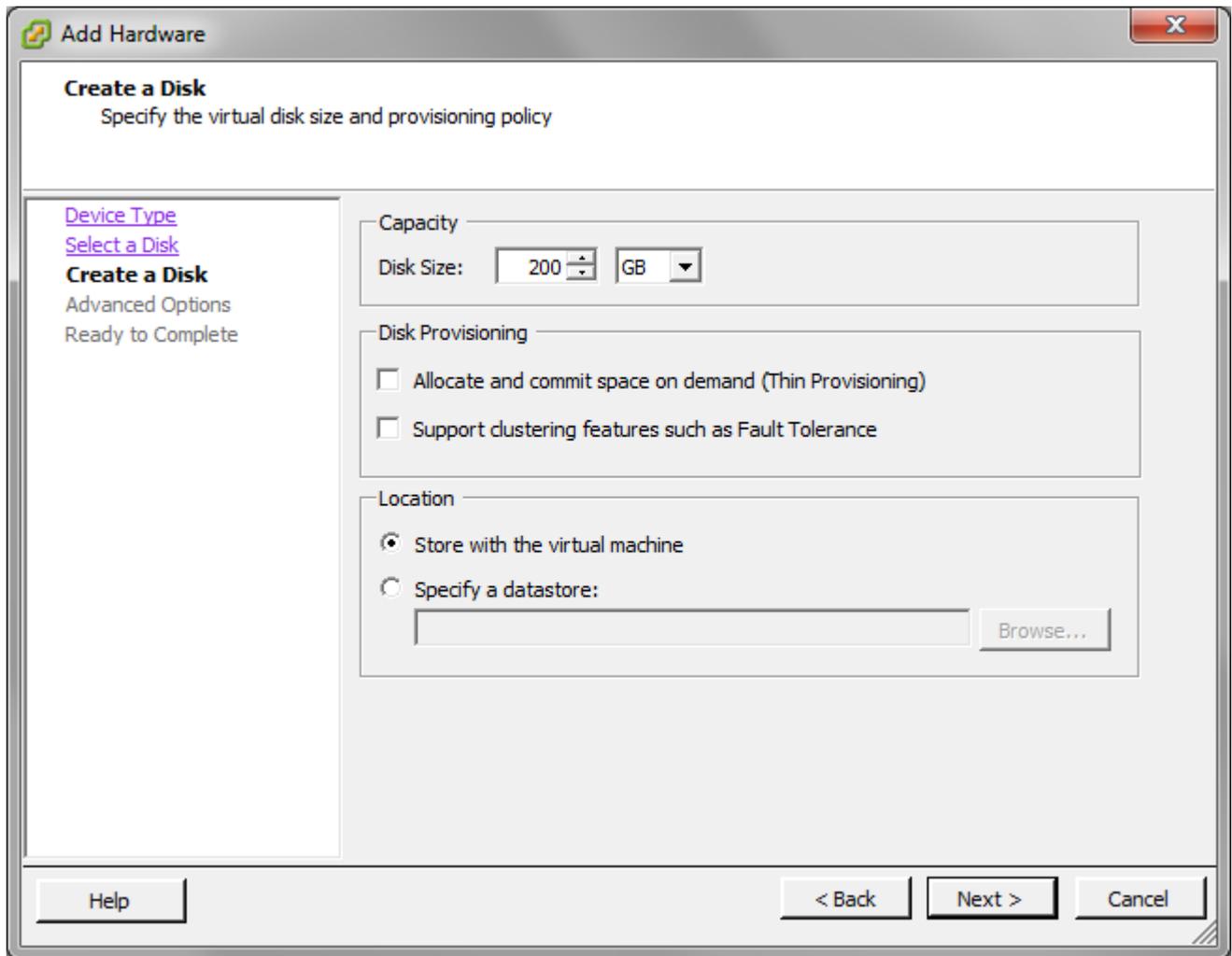
By default, all Exinda Virtual Appliances come with a single 50GB (fixed-size) disk. Usually, you will want more storage for features such as WAN Memory and Edge Cache. This is achieved by adding an additional disk to the Virtual Appliance.

The size of the disk you should add largely depends on the amount of RAM allocated to the Virtual Appliance. As a general rule, you should add a maximum of 100GB of disk storage per 1GB of RAM. So if you have given 4GB of RAM to your Virtual Appliance, you can add up to 400GB of extra storage.

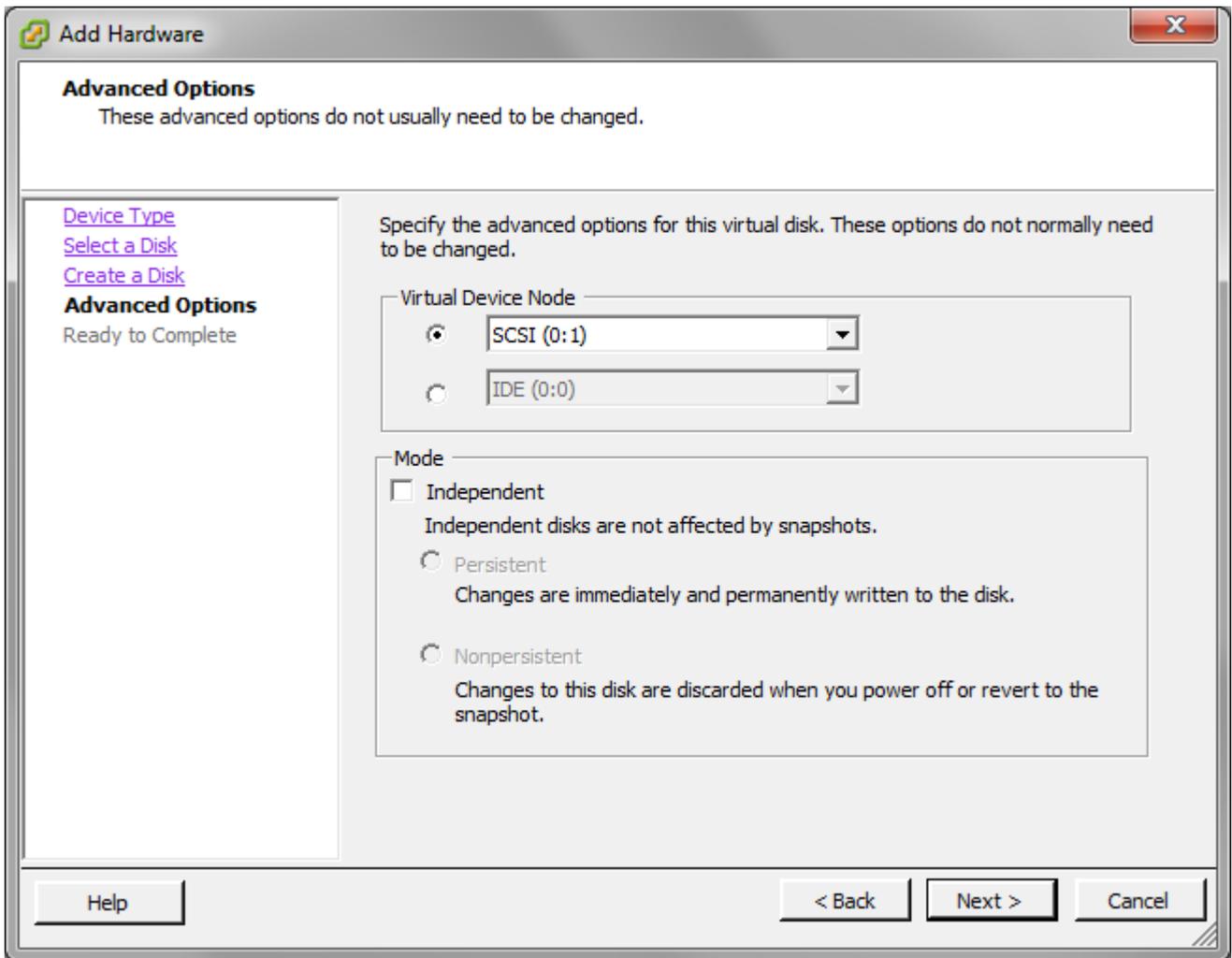
1. Open the **VMware vSphere Client**.
2. From the Hardware tab in the Exinda Virtual Appliance Properties screen, click **Add**.
3. Select **Hard Disk**, then click **Next**.



4. Specify the size of the additional disk to create. This space will be added to the default 50GB that comes with the Virtual Appliance. So if you add a 200GB disk here, the total storage for the Virtual Appliance will be 250GB.



5. Click **Next**.
6. Attach the new disk to the next available SCSI node for best performance.



7. Click **Next**.

8. Review the information and click **Finish** to add the disk.

9. When the Virtual Appliance is next booted, you can use the storage commands in the CLI to provision the new storage. The **show storage** command lists the current storage allocations as well as the Virtual Appliance's disks.

```
(config) # show storage
Services:
cifs: available - 3743.46M free of 3876M total
edge-cache: available - 3723.53M free of 3872M total
monitor: available - 9882.83M free of 10G total
users: available - 974.62M free of 1024M total
wan-memory: available - 17.21G free of 17.65G total

Disks:
sda10(internal): in use - 36.22 GB
sdb: not in use - 214.7 GB

Total: 36.22
Unallocated: 0
```

10. The output shows that our new 200G disk is called 'sdb' and it's currently not in use. **The storage disk add** command is used to provision the new disk.

```
(config) # storage disk add sdb
This will erase all data on the disk. Do you really want to do this (Y/N)? [N] Y
```

11. After this command has executed, another look at **show storage** shows that the new disk is now in use and our 200G is ready for allocation.

```
(config) # show storage
Services:
  cifs: available - 3743.46M free of 3876M total
  edge-cache: available - 3723.53M free of 3872M total
  monitor: available - 9882.83M free of 10G total
  users: available - 974.62M free of 1024M total
  wan-memory: available - 17.21G free of 17.65G total

Disks:
  sda10(internal): in use - 36.22 GB
  sdb: in use - 200.00 GB

Total: 236.21G
Unallocated: 200G
```

0.26 Starting the VMware Virtual Appliance

When you are ready to start the virtual appliance for the first time, Power it on. The Virtual Appliance boots, and displays a login prompt on the VMware console. At this point, you can login with the default username admin and password exinda.

If the first NIC is connected to a network that provides addresses using DHCP, the Virtual Appliance should have picked up an IP address. On the Virtual Appliance summary screen, VMware tools should display the IP address that the Virtual Appliance has obtained.

```
VMware Tools:    Unmanaged
IP Addresses:    192.168.0.221
DNS Name:        exinda-aab541
```

NOTE

The VMware Tools state 'Unmanaged' is normal. This simply means that VMware Tools are installed and running, but are managed by the guest (the Exinda Virtual Appliance) rather than the host.

If the first NIC is not able to obtain an address using DHCP, you'll need to use the VMware console to enter the following CLI commands to set a static IP address.

```
> en
# conf t
(config) # interface eth0 ip address <ip> <netmask>
(config) # ip default-gateway <default gateway>
(config) # ip name-server <dns server>
```

Once you have determined the IP address or set a static IP address, you can access the web-based user interface by navigating to <https://<ip address>>.

Related Topics

At this point, the following tasks should be completed before using the Virtual Appliance:

- » Add extra [NICs](#) (if required) and deploy the Virtual Appliance either in line or out-of-path.
- » Add and provision extra [storage](#) (if required).
- » Obtain a [license](#) for this Virtual Appliance.

0.27 Install the Silicom Bypass Driver on ESXi 5.5 and 6.0

If your ESX/ESXi server has a Silicom network interface card (NIC), you must install the Silicom bypass driver.

1. Enable SSH on your ESX system.

a. Enable SSH through the CLI

- i. In the `/etc/ssh/sshd_config` modify the following variable: `PermitRootLogin yes`
- ii. Restart the sshd service: `# service sshd restart`

b. Enable local or remote TSM from the Direct Console User Interface (DCUI)

- i. At the DCUI of the ESXi host, press F2 and provide credentials when prompted.
- ii. Scroll to **Troubleshooting Options**, and press **Enter**.
- iii. If you want to enable local TSM, select **Local Tech Support** and press **Enter** once. This allows users to login on the virtual console of the ESXi host.
- iv. If you want to enable remote TSM, select **Remote Tech Support (SSH)** and press **Enter** once. This allows users to login via SSH on the virtual console of the ESXi host.

RECOMMENDATION

Have your virtual Exinda already installed with the number of interfaces already set, keep it turned off, we will work with it later.

2. Query the existing VIBs. Make sure you are in maintenance mode: `# vim-cmd /hostsvc/maintenance_mode_enter`

NOTE

If the VIB you are deploying exist, you must first remove the existing VIB.

3. Run the following command to determine if any of the existing VIBs match the VIB you are deploying: `# esxcli software vib list | grep bpvm`

NOTE

If there are no matches with your VIB, skip the next step.

4. If necessary, remove the existing VIB.

```
# esxcli software vib remove -n net-bpvm
# reboot
```

- Download the Silicom Driver for ESXi 5.1, 5.5 and 6.0 from: https://updates.exinda.com/exos/virtual/vmware/bypass/5.1-5.5-6.0/net-bpvm-2.0.1.15-1OEM.510.0.0.802205.x86_64.vib
- Copy the driver into the ESX system with SCP or SFTP, drop it on the `/tmp` directory: `# scp net-bpvm-2.0.1.15-1OEM.510.0.0.802205.x86_64.vib root@<esx-serverip>:/tmp`
- Deploy the VIB on the ESX system: `# esxcli software vib install -v /tmp/net-bpvm-2.0.1.15-1OEM.510.0.0.802205.x86_64.vib --no-sig-check`

NOTE

Ensure that you specify the full path to the `.vib` file.

- Reboot the appliance: `# reboot`
- When the ESXi server comes back, verify that a new network adapter named "bpvm0" is listed under **Configuration > Network Adapters**:

| Device | Speed | Configured | Switch | MAC Address | Observed IP ranges | Wake on LAN |
|--|-----------|------------|----------|-------------------|--------------------|-------------|
| bpvm0 | 1000 Full | 1000 Full | vSwitch4 | 00:e0:ed:18:75:8a | None | No |
| Broadcom Corporation Broadcom NetXtreme II BCM5709 1000Base-T | | | | | | |
| vmnic3 | Down | Negotiate | vSwitch7 | 78:2b:cb:35:7b:2e | None | Yes |
| vmnic2 | 100 Full | Negotiate | vSwitch5 | 78:2b:cb:35:7b:2e | None | Yes |

NOTE

Network interfaces of the silicom card will now show up with the following duplex/speed settings if disconnected:

| | | | | | | |
|---------------|-------------------|-----------|------|-------------------|------|-----|
| vmnic7 | 65535 Half | Negotiate | None | 00:e0:ed:1e:85:15 | None | Yes |
| vmnic6 | 65535 Half | Negotiate | None | 00:e0:ed:1e:85:14 | None | Yes |

- Create two standalone vSwitches, and assign the LAN interface of the bridge to one of them and the WAN interface of the bridge to the other. (Configure both standalone switches with Promiscuous Mode and as accepting all VLANs (4065).
- Look around in the **Configuration > Networking** configuration to see if the `bpvm0` adapter is already attached to a standalone vSwitch that is not one of the ones created in the previous two steps. If that is the case, simply disconnect that `bpvm0` adapter from it and assign it to the vSwitch that is currently connected to the LAN interface of the virtual Exinda by using the following command: `# esxcli network vswitch standard uplink remove -L bpvm0 vSwitch <NUMBER>`

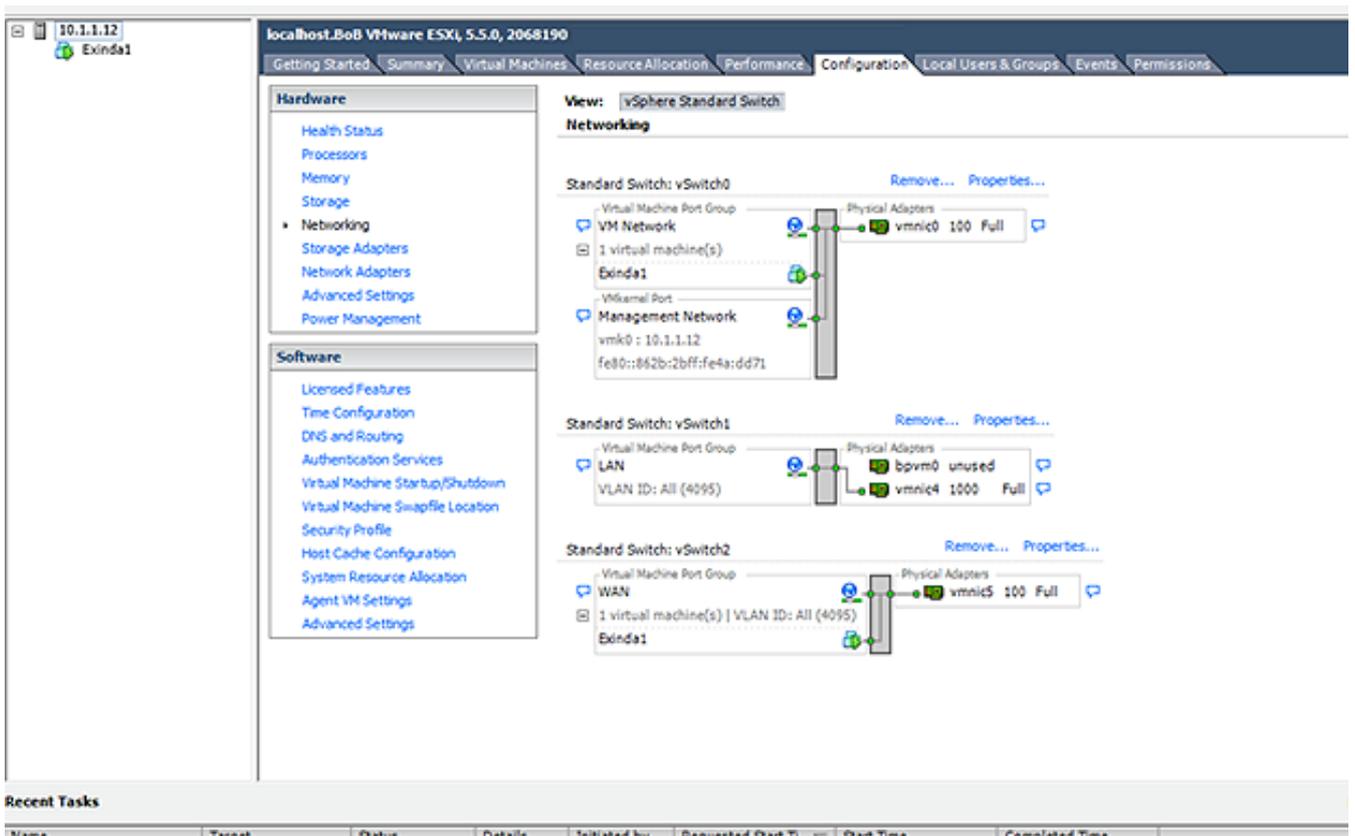
NOTE

It is possible that the above command could fail saying that the `bpvm0` uplink already exists or that the device is busy. If this happens, reboot the ESXi server one more time with the `reboot` command.

- Connect the physical interfaces of the bridge to its peers (usually to the core switch and to the router/firewall).
- Exit maintenance mode (You can right click the name of the ESXi server for this purpose).
- Turn the Exinda ON

When the Exinda Appliance comes back, you should see the bypass capability available and the duplex/speed negotiations pointing to the right values. One vSwitch should have both the LAN interface of the bridge and the `bpvm0` driver while the other vSwitch will have the WAN interface of the bridge, refer to the below pictures (In the below

example, the virtual exinda is configured with 4 interfaces, the first two are standalone interfaces while the last two are for bridging purposes):



NOTE

From ESXI v6.0, it is possible that after assigning the `bpvmm0` driver to the “LAN” switch, the driver will not show up as a Physical Adapter (unused) as in the above screenshot. if this is the case, you can continue”

Network Setup

NICs | IP Address | Routes | DNS | HTTP Proxy | Email | SNMP | Active Directory

Use the form below to set the speed/duplex and MTU of the System NICs. In most cases the default settings will work, however, sometimes explicitly setting speed/duplex is required.

Note: Ensure that the devices connected to the Exinda appliance have the same speed/duplex settings for their network interfaces (autonegotiation is acceptable). If they are different, and the Exinda appliance is in bypass mode, the devices may not communicate. It is recommended you set all your devices, including the Exinda, to either auto-negotiate OR fixed to the same speed/duplex mode.

[View NIC Diagnostics...](#)

| Interface | Media | HW Address | Speed | Duplex | MTU | Link Status |
|-----------|--------------|-------------------|-------|--------|------|---|
| eth0 | Twisted Pair | 00:0C:29:16:E3:80 | Auto | Auto | 1500 | Admin UP, Link UP, Speed: 10000Mb/s, Duplex: Full |
| eth1 | Twisted Pair | 00:0C:29:16:E3:8A | Auto | Auto | 1500 | Admin UP, Link UP, Speed: 10000Mb/s, Duplex: Full |
| eth2 | Twisted Pair | 00:0C:29:16:E3:94 | Auto | Auto | 1500 | Admin UP, Link UP, Speed: 10000Mb/s, Duplex: Full |
| eth3 | Twisted Pair | 00:0C:29:16:E3:9E | Auto | Auto | 1500 | Admin UP, Link UP, Speed: 10000Mb/s, Duplex: Full |

Apply Changes

Use the form below to configure bypass state and failover settings.

Note: Take care when making changes here as this appliance may become unreachable.

| Bridge | Status | Running Mode | Enable Fallover | On Fallover |
|--------|--------|--------------|-------------------------------------|-------------|
| br2 | Active | Active | <input checked="" type="checkbox"/> | Bypass |

Apply Changes

Use the form below to configure Link State Mirroring. This feature will automatically bring down the second port of a bridge pair if the first port goes down.

Link State Mirroring

Link State Mirroring Enable

Apply Changes

10.1.1.12 vSphere Client

File Edit View Inventory Administration Plug-ins Help

Home > Inventory > Inventory

10.1.1.12 Exinda1

Exinda1 - Virtual Machine Properties

Hardware | Options | Resources | Virtual Machine Version: 7

Show All Devices Add... Remove

| Hardware | Summary |
|-------------------|--------------|
| Memory | 4096 MB |
| CPUs | 2 |
| Video card | Video card |
| VMCI device | Restricted |
| SCSI controller 0 | Paravirtual |
| Hard disk 1 | Virtual Disk |
| Network adapter 1 | VM Network |
| Network adapter 2 | VM Network |
| Network adapter 3 | LAN |
| Network adapter 4 | WAN |

Memory Configuration

Memory Size: 4 GB

255 GB
128 GB
64 GB
32 GB
16 GB
8 GB
4 GB
2 GB
1 GB
512 MB
256 MB
128 MB
64 MB
32 MB
16 MB
8 MB
4 MB

Maximum recommended for this guest OS: 255 GB.
Maximum recommended for best performance: 20472 MB.
Default recommended for this guest OS: 2 GB.
Minimum recommended for this guest OS: 512 MB.

Help OK Cancel

Recent Tasks Name, Target or Status

0.28 Monitor IOPS in VMware vSphere

IOPS (Input/output Operations per Second; pronounced "eye-ops") is a common performance measurement used to benchmark computer storage devices like hard disk drives (HDD), solid state drives (SSD), and storage area networks (SAN). As with any benchmark, IOPS numbers published by storage device manufacturers do not guarantee real-world application performance. IOPS are measured in both Commands per Second (IO operations per second) or Throughput (Megabytes per Second).

In the sizing charts for the Exinda virtual appliance (EXN-V) we have represented the measurement in Commands per Second. There are three numbers for IOPS:

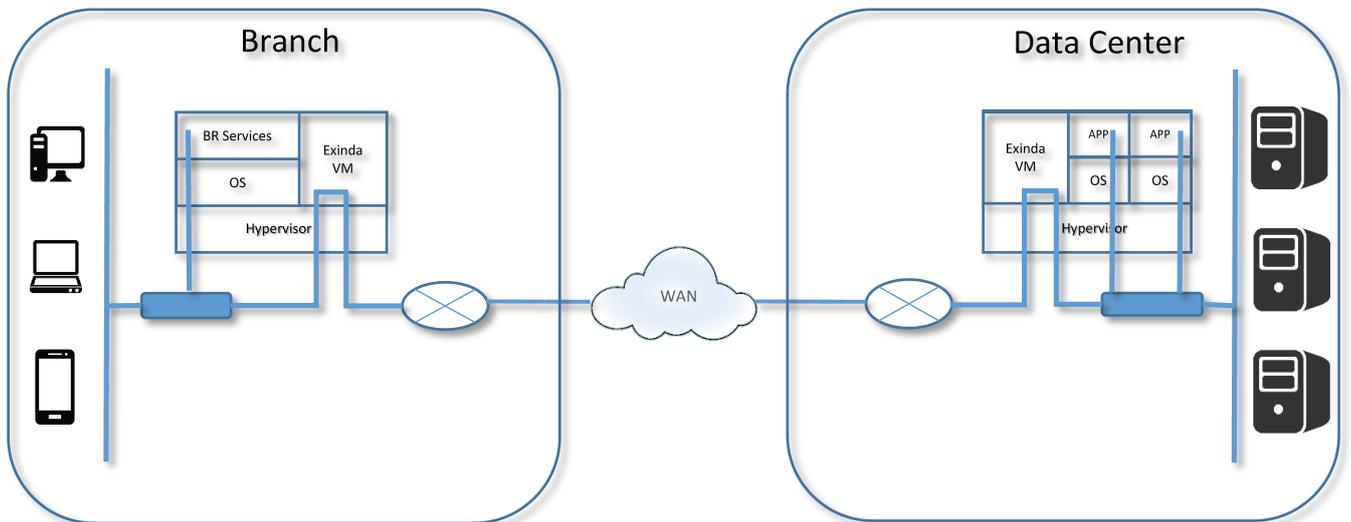
- » EC IOPS for Edge Cache IOPS
- » Monitoring IOPS
- » Average IOPS for Optimization IOPS

The formula to calculate the IOPS for EXN-V you will add the IOPS for each service:

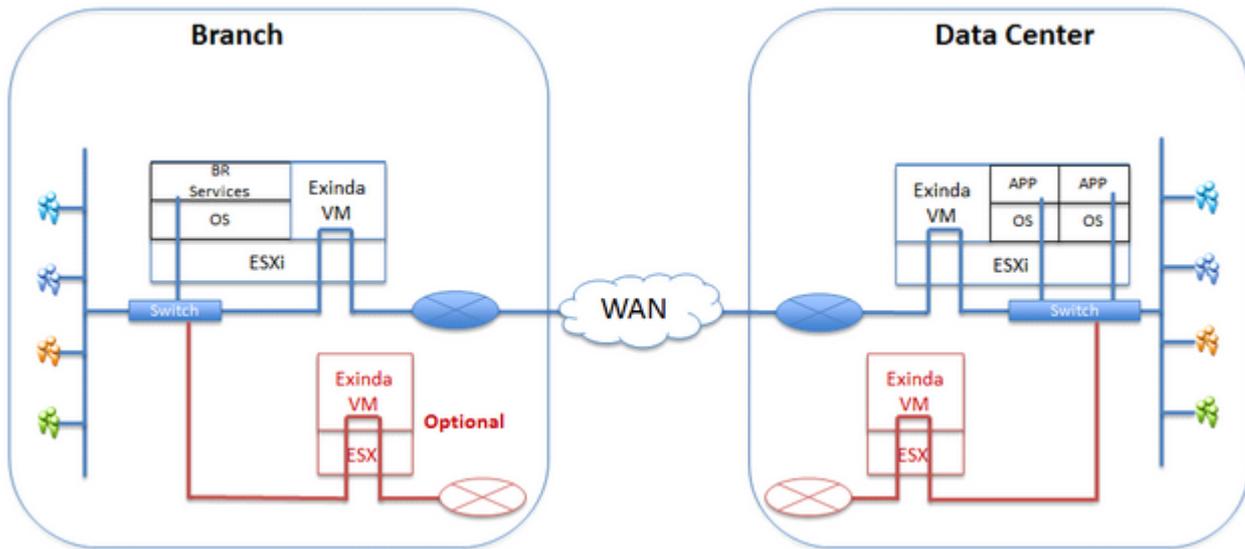
$$\text{Edge Cache IOPS} + \text{Monitoring IOPS} + \text{Average Optimization IOPS} = \text{Total IOPS}$$

| Example: Virtual Model - 2061 | IOPS |
|-------------------------------|------|
| Edge Cache IOPS | 30 |
| Monitoring IOPS | 140 |
| Average Optimization IOPS | 200 |
| Total IOPS | 370 |

1. On the Custom Performance Chart for the EXN-V, select **Virtual disk > Real-time**.



2. Select **Average write requests per second (inbound and outbound)**. The report indicates the Minimum, Maximum, and Average Commands per Second.



Running on Citrix XenServer

Learn how to deploy Exinda Virtual Appliance as well as customize the virtual hardware to suit your requirements. Exinda Virtual Appliances are available for Citrix XenServer hypervisors.

NOTE

The Exinda Virtual Appliance must be run on either Citrix XenServer 6.2 or 6.5.

0.29 Installing the Virtual Appliance on XenServer

1. Liaise with your local Exinda representative to obtain the download files.
2. Download the Virtual Appliance XVA file.
3. Open your Citrix XenCenter client and select **File > Import...**
4. Select the Virtual Appliance XVA file, and click **Next**.
5. Select the target XenServer to deploy the Virtual Appliance, and click **Next**.
6. Choose the storage location for the Virtual Appliance. By default, the Virtual Appliance comes with a single, 50GB disk. Additional storage can be added in the form of another disk after the Virtual Appliance has been deployed. For more information, refer to [Add storage to the XenServer virtual appliance](#) (page 54). Then click **Next**.
7. Choose the NIC mapping. By default, the Virtual Appliance comes with 4 NICs. The first NIC is the Management Interface, and you should connect it to a network that allows you to manage the Virtual Appliance. The second NIC is an AUX Interface, and is usually used for clustering, high availability or out-of-path deployments. This interface can be left disconnected if not required. In order to fully deploy the Virtual Appliance in line, you may need the additional NICs beyond the four in the configuration. For more information, refer to [Additional NICs](#) (page 51). Then click **Next**.
8. Review the information and clear the 'Start VM(s) after import' box if you want to add extra NICs or storage, and click **Finish** to deploy the Virtual Appliance.
9. Select the Exinda virtual machine you are importing, and switch to the Log tab to see the progress and the completion notification.

TIP

It is highly recommend that you import the virtual machine on a Gigabit network connection or local storage, as the import file is large in size and installation is affected by slowly performing networks.

10. Right-click on the imported Exinda and select **Start the Exinda virtual appliance**. You will see the progress bar screen below in the Log tab indicating you have successfully started the virtual appliance.
11. On the **XenCenter Console** tab of the Exinda virtual machine, type the credentials and the default parameters as part of the first time wizard setup. The default user name is `admin`, and the password is `exinda`.
12. Press Enter to read the EULA agreement. Press Ctrl-C to get to the EULA agreement question.
13. Press Y to accept the EULA agreement and press **Enter**.

14. You will be prompted with a series of questions as part of the initial configuration Wizard. It is recommended you accept the defaults, as you have the option to configure the system later from the Exinda GUI. Press **Yes**. Use the following defaults to complete the wizard configuration.

- Select **No** to disable IPv6.
- Select **Yes** to configure ETH0 for management access. This will disable the BR0 bridge.
- Select **Yes** to use DHCP on ETH0.
- Select **null** to default to the Exinda hostname.
- Select **null** for SMTP server address.
- Select **null** for email address for reports and alerts.
- Select **null** to use the default password which is "exinda".
- Select **Yes** to change the interface speed.
- Select **AUTO** to configure the interface speed on ETH0 (assumes a gigabit NIC).

You have successfully completed the wizard setup.

15. Determine the IP address of your Exinda virtual appliance on the XenServer Network tab of the Exinda virtual machine and note the IP address assigned by default to NIC 0.

16. Browse to the Dashboard tab and find the Host-ID that the XenServer host created for this virtual machine.

Related Topics

Once the appliance is deployed, review the following sections:

- » [Custom Settings](#)
- » [Additional NICs](#)
- » [Add storage to the XenServer virtual appliance](#)

0.30 Modifying the XenServer Virtual Machine Configuration

To improve the performance of the virtual appliance, change the number of CPUs, the RAM, networking, and storage allocated to the virtual machine.

TIP

You will need to shut the virtual appliance down before you can modify its configuration.

Related Topics

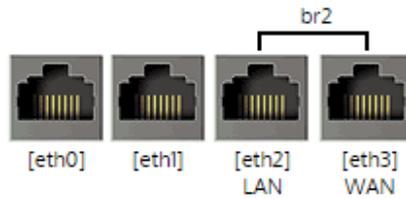
- » [Custom Settings](#)
- » [Additional NICs](#)
- » [Add storage to the XenServer virtual appliance](#)

0.31 Custom Settings

By default, all Exinda virtual appliances come with four network interface cards (NICs):

TIP

Before you can make changes to the virtual appliance, you will need to shut it down.



| Interface Settings | |
|--|---|
| br0 <input type="checkbox"/> | |
| Role: | <input type="checkbox"/> Cluster <input type="checkbox"/> Mirror <input type="checkbox"/> WCCP <input type="checkbox"/> PBR |
| Autoconf: | IPv4: <input checked="" type="checkbox"/> DHCP IPv6: <input type="checkbox"/> SLAAC |
| Dynamic Addresses: | 10.10.1.179/16 fe80::20c:29ff:fe2:4d11/64 |
| Static Addresses: | <input type="text"/> / <input type="text"/> |
| Comment: | <input type="text"/> |
| eth0 | |
| Role: | <input type="checkbox"/> Cluster <input type="checkbox"/> Mirror <input type="checkbox"/> WCCP <input type="checkbox"/> PBR |
| Autoconf: | IPv4: <input type="checkbox"/> DHCP IPv6: <input type="checkbox"/> SLAAC |
| Static Addresses: | <input type="text"/> / <input type="text"/> |
| Comment: | <input type="text"/> |
| eth1 | |
| Role: | <input type="checkbox"/> Cluster <input type="checkbox"/> Mirror <input type="checkbox"/> WCCP <input type="checkbox"/> PBR |
| Autoconf: | IPv4: <input type="checkbox"/> DHCP IPv6: <input type="checkbox"/> SLAAC |
| Static Addresses: | <input type="text"/> / <input type="text"/> |
| Comment: | <input type="text"/> |
| br2 <input checked="" type="checkbox"/> | |
| Autoconf: | IPv4: <input type="checkbox"/> DHCP IPv6: <input type="checkbox"/> SLAAC |
| Static Addresses: | <input type="text"/> / <input type="text"/> |
| Comment: | <input type="text"/> |
| Gateway Settings | |
| IPv4: | <input type="text"/> |
| IPv6: | <input type="text"/> |

If more interfaces are needed, please follow the next procedure (the Exinda appliance will recognize that if two NICs are added they can then be bridged). The following steps describe how to add extra NICs to the Virtual Appliance. In order to create LAN/WAN bridges, you need to add extra NICs in pairs.

1. From the **Networking** tab in the Exinda Virtual Appliance settings, click **Add** Interface.
2. Choose the network to which to map this new NIC, then click **Add**.

0.32 Additional NICs

By default, all Exinda Virtual Appliances come with four NICs. The first NIC is the Management Interface (for managing the Virtual Appliance) and the second NIC is the Auxiliary Interface (for use with HA, clustering, and out-of-path deployments).

There are 2 options when it comes to placing the Virtual Appliance in line:

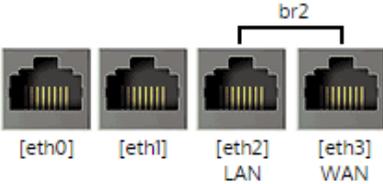
» Convert the first two NICs into a bridge, so that the Management Interface becomes a LAN Interface and the Auxiliary Interface becomes a WAN Interface. This is achieved by booting into the Virtual Appliance and navigating to the **Configuration > System > Network > IP Address** page on the Web UI, advanced mode. From this page, you can select the **br0** checkbox to bridge the first two NICs together. In order to manage the Virtual Appliance, an IP Address must be specified for this bridge. Stay cautious when using this option as this will cause the first two NICs to be bridged.

Network Setup

NICs | **IP Address** | Routes | DNS | HTTP Proxy | Email | SNMP | Active Directory

Choose the mode of operation and enter IP Address and Netmask details for that mode. Also specify a Default Route.

Note: Take care when making changes here as this appliance may become unreachable.



Interface Settings

| | |
|--|---|
| br0 <input type="checkbox"/> | Role: <input type="checkbox"/> Cluster <input type="checkbox"/> Mirror <input type="checkbox"/> WCCP <input type="checkbox"/> PBR Autoconf: IPv4: <input checked="" type="checkbox"/> DHCP IPv6: <input type="checkbox"/> SLAAC Dynamic Addresses: 10.10.6.53/16 fe80::20c:29ff:fe0c:47ca/64 Static Addresses: <input type="text"/> / <input type="text"/> Comment: <input type="text"/> |
| eth0 | Role: <input type="checkbox"/> Cluster <input type="checkbox"/> Mirror <input type="checkbox"/> WCCP <input type="checkbox"/> PBR Autoconf: IPv4: <input type="checkbox"/> DHCP IPv6: <input type="checkbox"/> SLAAC Static Addresses: <input type="text"/> / <input type="text"/> Comment: <input type="text"/> |
| eth1 | Role: <input type="checkbox"/> Cluster <input type="checkbox"/> Mirror <input type="checkbox"/> WCCP <input type="checkbox"/> PBR Autoconf: IPv4: <input type="checkbox"/> DHCP IPv6: <input type="checkbox"/> SLAAC Static Addresses: <input type="text"/> / <input type="text"/> Comment: <input type="text"/> |
| br2 <input checked="" type="checkbox"/> | Autoconf: IPv4: <input type="checkbox"/> DHCP IPv6: <input type="checkbox"/> SLAAC Dynamic Addresses: fe80::20c:29ff:fe0c:47de/64 Static Addresses: <input type="text"/> / <input type="text"/> Comment: <input type="text"/> |

Gateway Settings

IPv4:

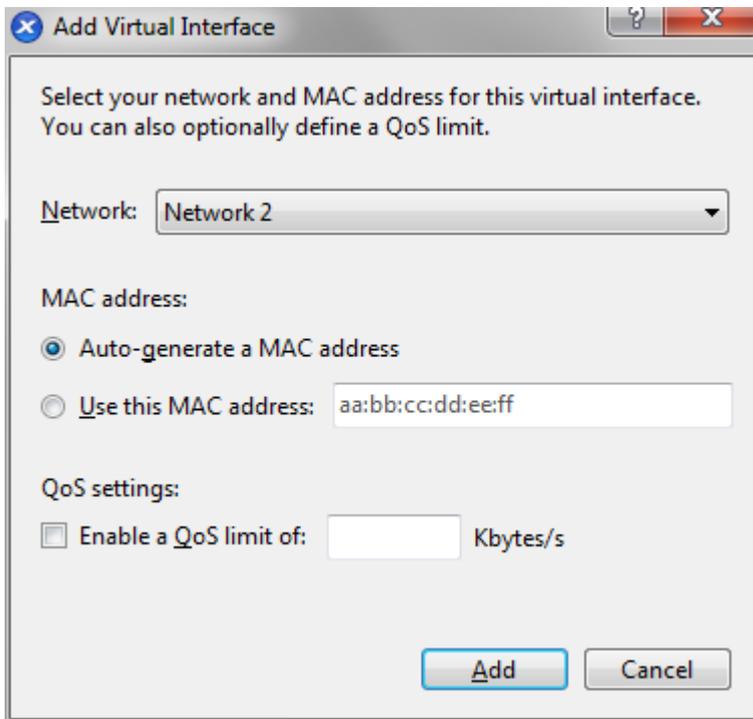
IPv6:

IMPORTANT
 You must power off the virtual appliance while changing the virtual machine configuration.

» Use the 2 extra NICs as LAN and WAN ports. These 2 additional NICs can be bridged to allow the Virtual Appliance to be placed in line.

The following steps describe how to add extra NICs to the Virtual Appliance. You need to add extra NICs in pairs, in order to create LAN/WAN bridges.

1. From the Networking tab in the Exinda Virtual Appliance settings, click **Add Interface**.
2. Choose the network to map this new NIC to, then click **Add**.



Add Virtual Interface

Select your network and MAC address for this virtual interface.
You can also optionally define a QoS limit.

Network: Network 2

MAC address:

Auto-generate a MAC address

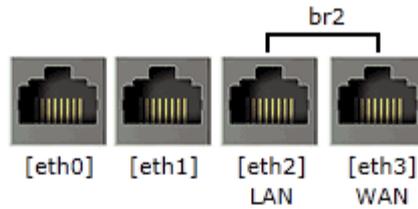
Use this MAC address: aa:bb:cc:dd:ee:ff

QoS settings:

Enable a QoS limit of: Kbytes/s

Add **Cancel**

3. Take care when using this option as this will cause the first two NICs to be bridged.
4. When the Virtual Appliance is next booted, the new NICs will be automatically detected and any additional NIC pairs will be bridged. Below is what the **System -> Network -> IP Address** page on the Web UI looks like after 2 extra NICs have been added.



| Interface Settings | |
|--|---|
| br0 <input type="checkbox"/> | Role: <input type="checkbox"/> Cluster <input type="checkbox"/> Mirror <input type="checkbox"/> WCCP Autoconf: IPv4: <input checked="" type="checkbox"/> DHCP IPv6: <input type="checkbox"/> SLAAC Dynamic Addresses: 192.168.0.225/24 fe80::10e0:9ff:febd:3021/64 Static Addresses: <input type="text"/> / <input type="text"/> Comment: <input type="text"/> |
| eth0 | |
| eth1 | Role: <input type="checkbox"/> Cluster <input type="checkbox"/> Mirror <input type="checkbox"/> WCCP Autoconf: IPv4: <input type="checkbox"/> DHCP IPv6: <input type="checkbox"/> SLAAC Dynamic Addresses: fe80::4430:b2ff:fe2a:c4a5/64 Static Addresses: <input type="text"/> / <input type="text"/> Comment: <input type="text"/> |
| br2 <input checked="" type="checkbox"/> | Autoconf: IPv4: <input type="checkbox"/> DHCP IPv6: <input type="checkbox"/> SLAAC Dynamic Addresses: fe80::2c5d:7fff:fe84:9221/64 Static Addresses: <input type="text"/> / <input type="text"/> Comment: <input type="text"/> |
| Gateway Settings | |
| IPv4: | <input type="text"/> |
| IPv6: | <input type="text"/> |

0.33 Add storage to the XenServer virtual appliance

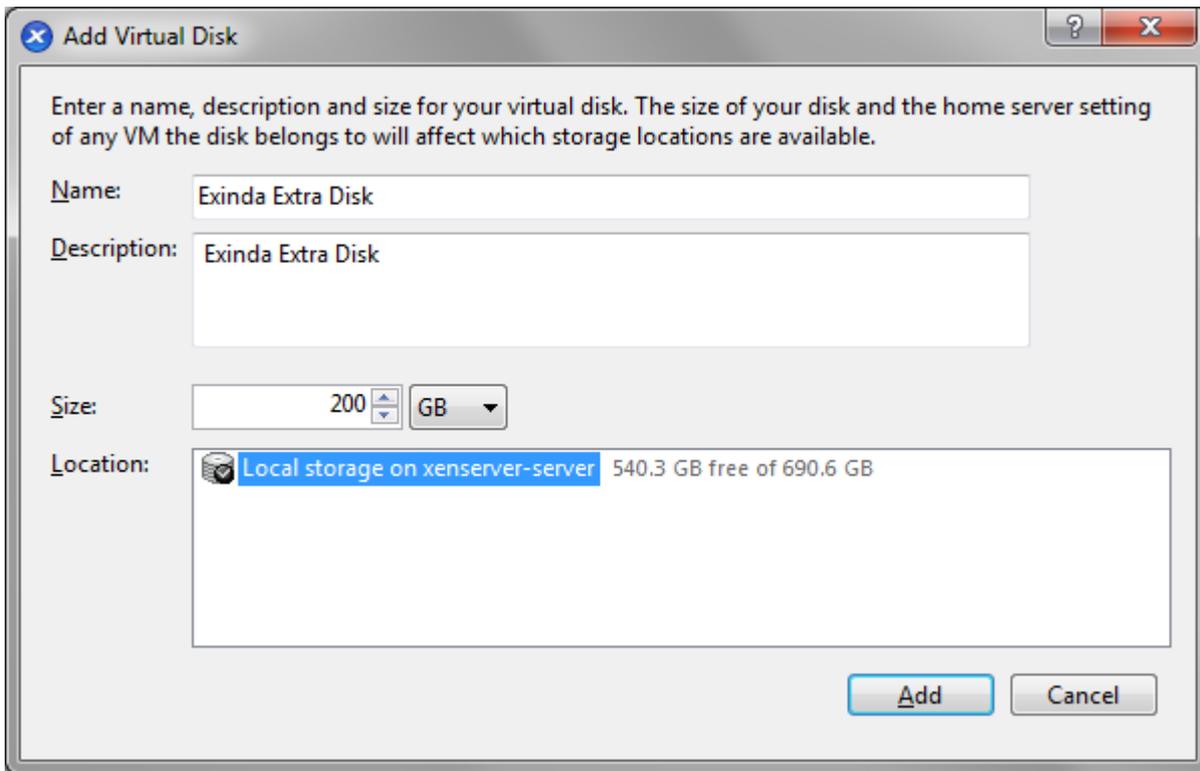
By default, all Exinda Virtual Appliances come with a single 50GB (fixed-size) disk. Usually, you will want more storage for features such as WAN Memory and Edge Cache. This is achieved by adding an additional disk to the Virtual Appliance.

The size of the disk you should add largely depends on the amount of RAM allocated to the Virtual Appliance. As a general rule, you should add a maximum of 100GB of disk storage per 1GB of RAM. So if you have given 4GB of RAM to your Virtual Appliance, you can add up to 400GB of extra storage.

IMPORTANT

You must power off the virtual appliance while changing the virtual machine configuration.

1. From the Storage tab in the Exinda Virtual Appliance settings, click **Add**.



2. Specify the size of the additional disk to create. This space will be added to the default 50GB that comes with the Virtual Appliance. So if you add a 200GB disk here, the total storage for the Virtual Appliance will be 250GB.

3. Then click Add. The Virtual Appliance storage should look something like this:

| Position | Name | Description | SR | Size | Read Only | Priority | Active | Device Path |
|----------|-------------------|-------------------|-----------------------------------|--------|-----------|-------------|--------|-------------|
| 0 | Exinda Base Disk | Exinda Base Disk | Local storage on xenserver-server | 50 GB | No | 0 (Highest) | No | <unknown> |
| 1 | Exinda Extra Disk | Exinda Extra Disk | Local storage on xenserver-server | 200 GB | No | 0 (Highest) | No | <unknown> |

4. When the Virtual Appliance is next booted, you can use the storage commands in the CLI to provision the new storage. The **show storage** command lists the current storage allocations as well as the Virtual Appliance's disks.

```
(config) # show storage
Services:
  cifs: available - 3743.46M free of 3876M total
  edge-cache: available - 3723.53M free of 3872M total
  monitor: available - 9882.83M free of 10G total
  users: available - 974.62M free of 1024M total
  wan-memory: available - 17.21G free of 17.65G total

Disks:
  xvda10(internal): in use - 36.22 GB
  xvdb: not in use - 214.7 GB

Total: 36.22
Unallocated: 0
```

5. The output shows that our new 200G disk is called 'xvdb' and it's currently not in use. The **storage disk add** command is used to provision the new disk.

```
(config) # storage disk add xvdb
This will erase all data on the disk. Do you really want to do this (Y/N)? [N] Y
```

6. After this command has executed, another look at **show storage** shows that the new disk is now in use and our 200G is ready for allocation.

```
(config) # show storage
Services:
  cifs: available - 3743.46M free of 3876M total
  edge-cache: available - 3723.53M free of 3872M total
  monitor: available - 9882.83M free of 10G total
  users: available - 974.62M free of 1024M total
  wan-memory: available - 17.21G free of 17.65G total

Disks:
  xvda10(internal): in use - 36.22 GB
  xvdb: in use - 200.00 GB

Total: 236.21G
Unallocated: 200G
```

For more information on adding disks in general and allocating storage, see [Configuring Storage](#).

0.34 Starting the XenServer Virtual Appliance

When you are ready to boot the Virtual Appliance for the first time, Power it on. The Virtual Appliance will boot, and when ready, will display a login prompt on the XenCenter console.

At this point, you can login with the default username **admin** and password **Exinda**.

If the first NIC is connected to a network that provides addresses using DHCP, the Virtual Appliance should have picked up an IP address. On the Virtual Appliance Networking screen, XenCenter should display the IP address that the Virtual Appliance has obtained.

Networks

| Device | MAC | Limit | Network | IP Address | Active |
|--------|-------------------|-------|-----------|---------------|--------|
| 0 | 12:e0:09:cd:30:21 | | Network 0 | 192.168.0.225 | Yes |
| 1 | 46:30:b2:2a:c4:a5 | | Network 1 | Unknown | Yes |

If the first NIC is not able to obtain an address using DHCP, you'll need to use the XenCenter console to enter the following CLI commands to set a static IP address.

```
> en
# con t
(config) # interface eth0 ip address <ip> <netmask>
(config) # ip default-gateway <default gateway>
(config) # ip name-server <dns server>
```

Once you have determined the IP address or set a static IP address, you can access the web-based user interface by navigating to `https://<ip address>`.

Related Topics

At this point, the following tasks should be completed before using the Virtual Appliance:

- » Obtain a license for this Virtual Appliance.
- » Add and provision extra [storage](#) (if required).
- » Add extra [NICs](#) (if required) and deploy the Virtual Appliance either in line or out-of-path.

Running on Microsoft Hyper-V

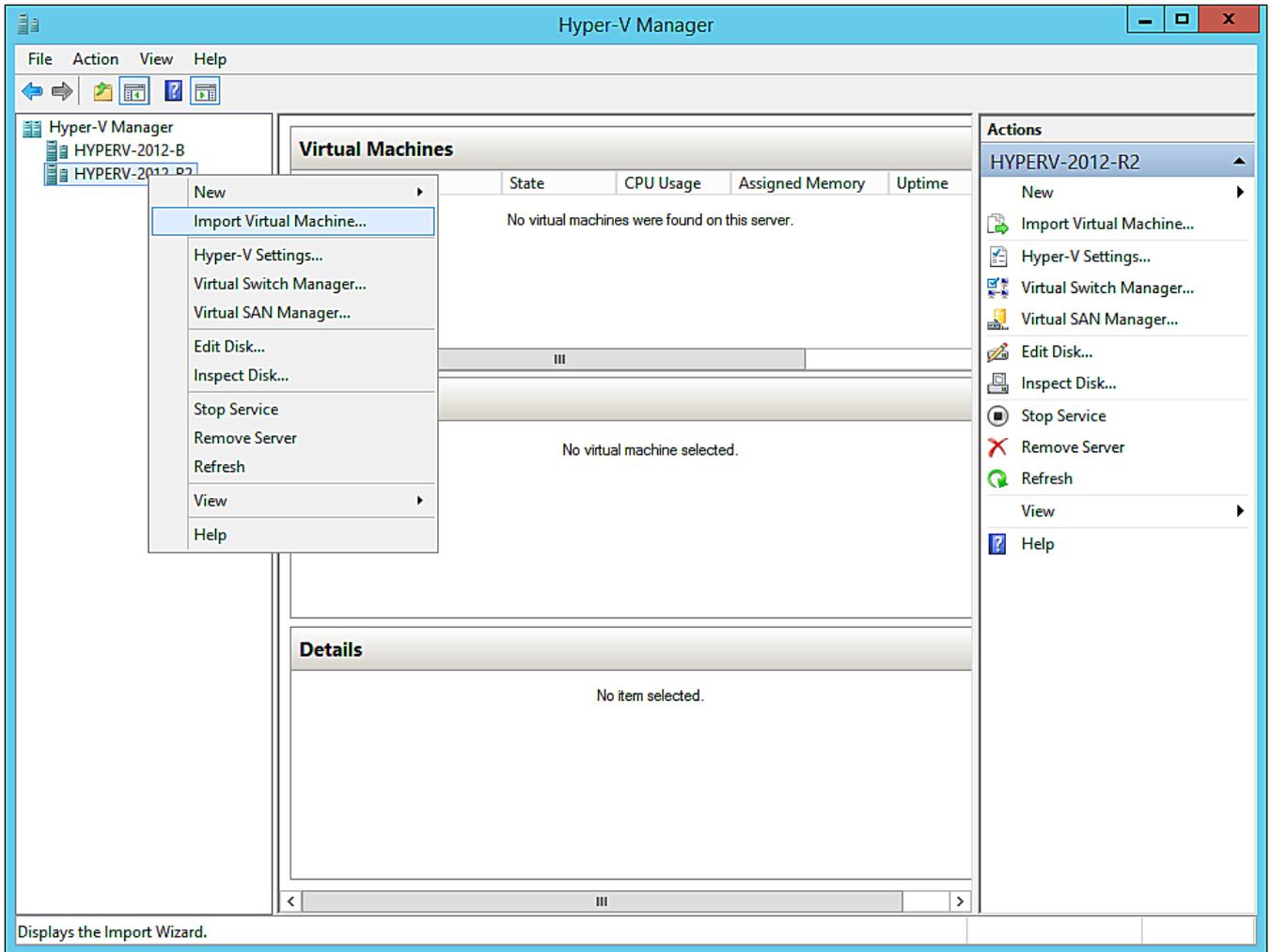
The following sections describe how to deploy Exinda Virtual Appliance as well as to customize the virtual hardware to suit your requirements.

The Exinda Virtual Appliance are available for Microsoft Hyper-V hypervisors.

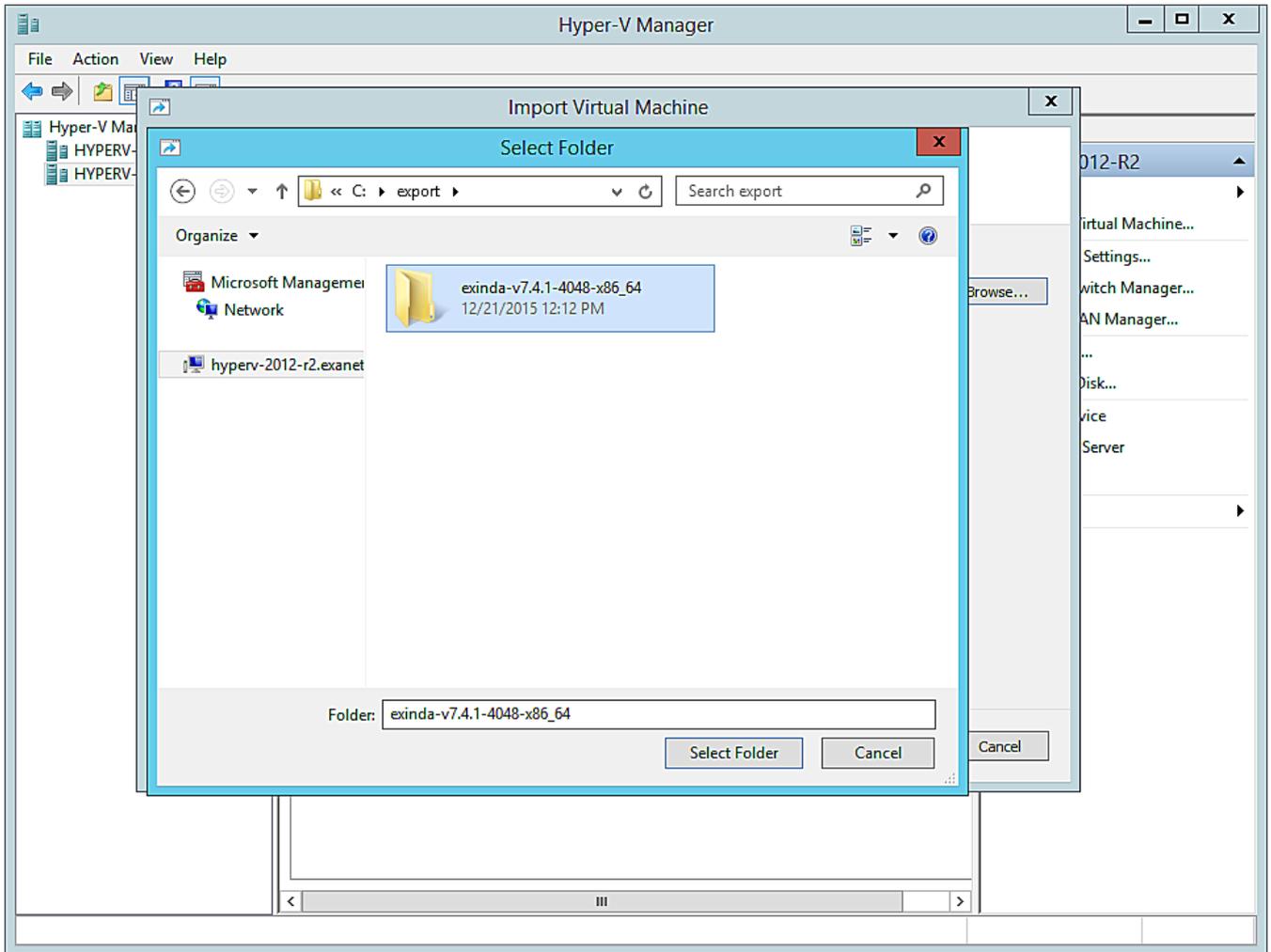
0.35 Install the Virtual Machine on Hyper-V

The Exinda Virtual Appliances have been prepared to run in a variety of virtual environments. Hyper-V provides support for hosting the Exinda Virtual Appliances in Microsoft Server 2012 and 2012 R2.

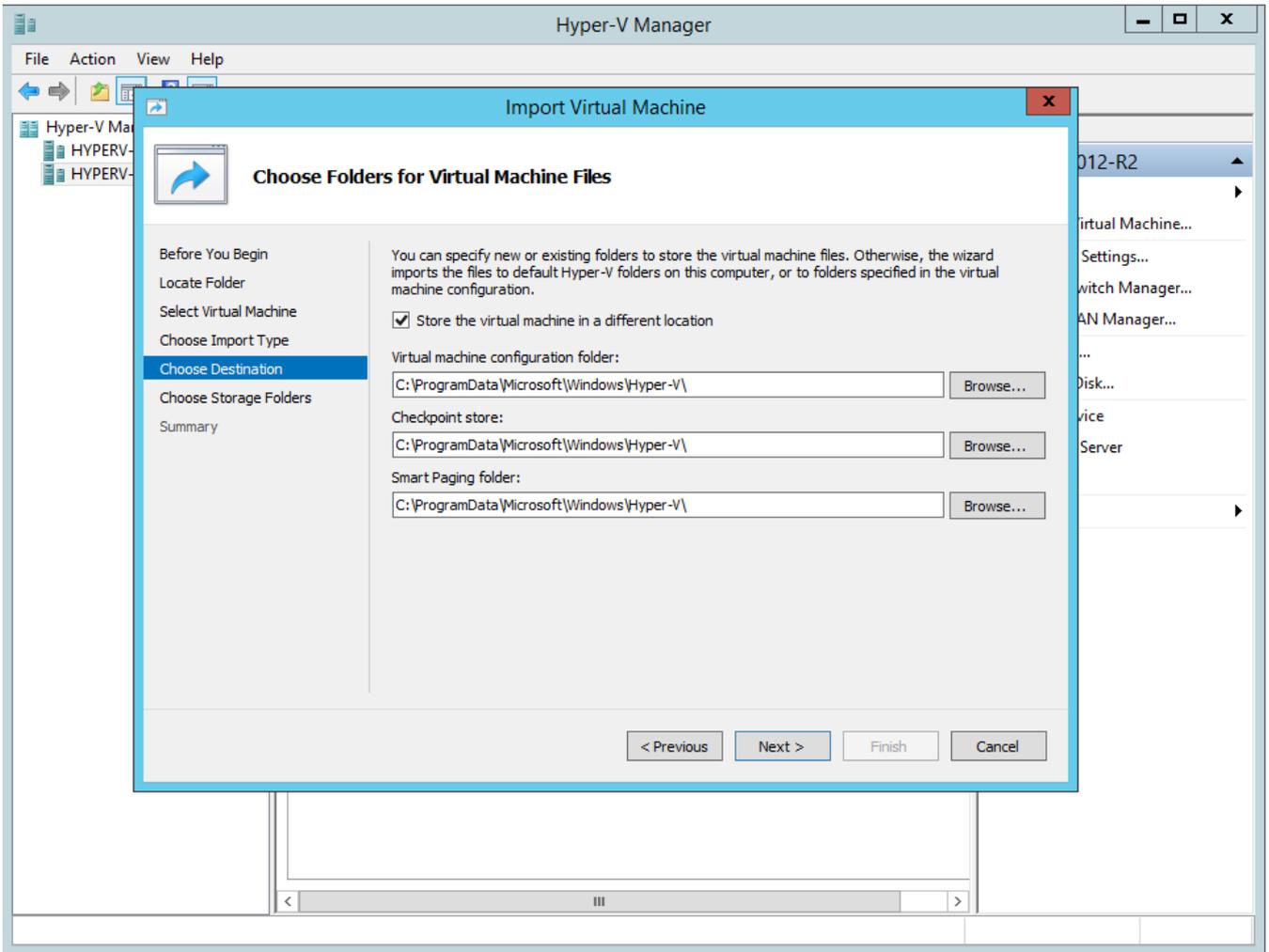
1. Liaise with your local Exinda representative to obtain the download files.
2. Unzip the ZIP file into a local folder. The ZIP archive contains three folders, which contain the following:
 - Snapshots – this folder is empty.
 - Virtual Hard Disks – contains the virtual machine file in VHDX format.
 - Virtual Machines – contains an XML file that in turn contains the configuration of the virtual machine.
3. Open the Hyper-V Manager.
4. In the left pane, right-click on the host machine and select **Import Virtual Machine**. The "Import Virtual Machine" wizard opens.



5. Click the **Browse** button and navigate to and select the local folder where you unzipped the downloaded file. The wizard then recognizes the virtual machine.

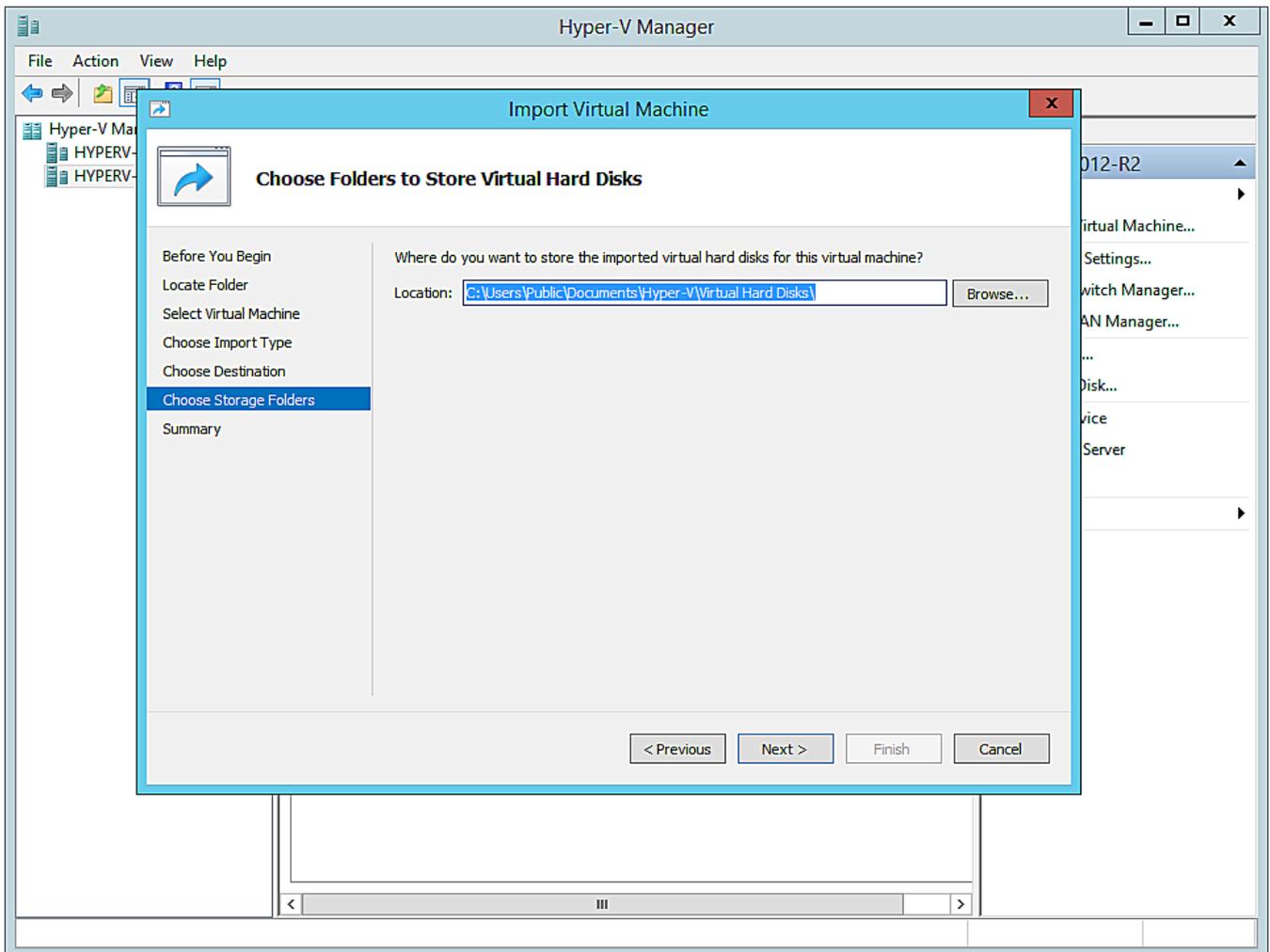


6. On the **Import Virtual Machine** dialog box, click **Next**. The "Choose Import Type" page of the wizard opens.
7. Select the **Copy the virtual machine...** radio button. The "Choose Folder for Virtual Machine Files" page of the wizard opens.
8. If you prefer not to use the default folders, select the **Store the virtual machine...** checkbox and for each of the three folder options browse to and select your preferred folder.



9. Click **Next**. The "Choose Folders to Store Virtual Disks" page of the wizard opens.

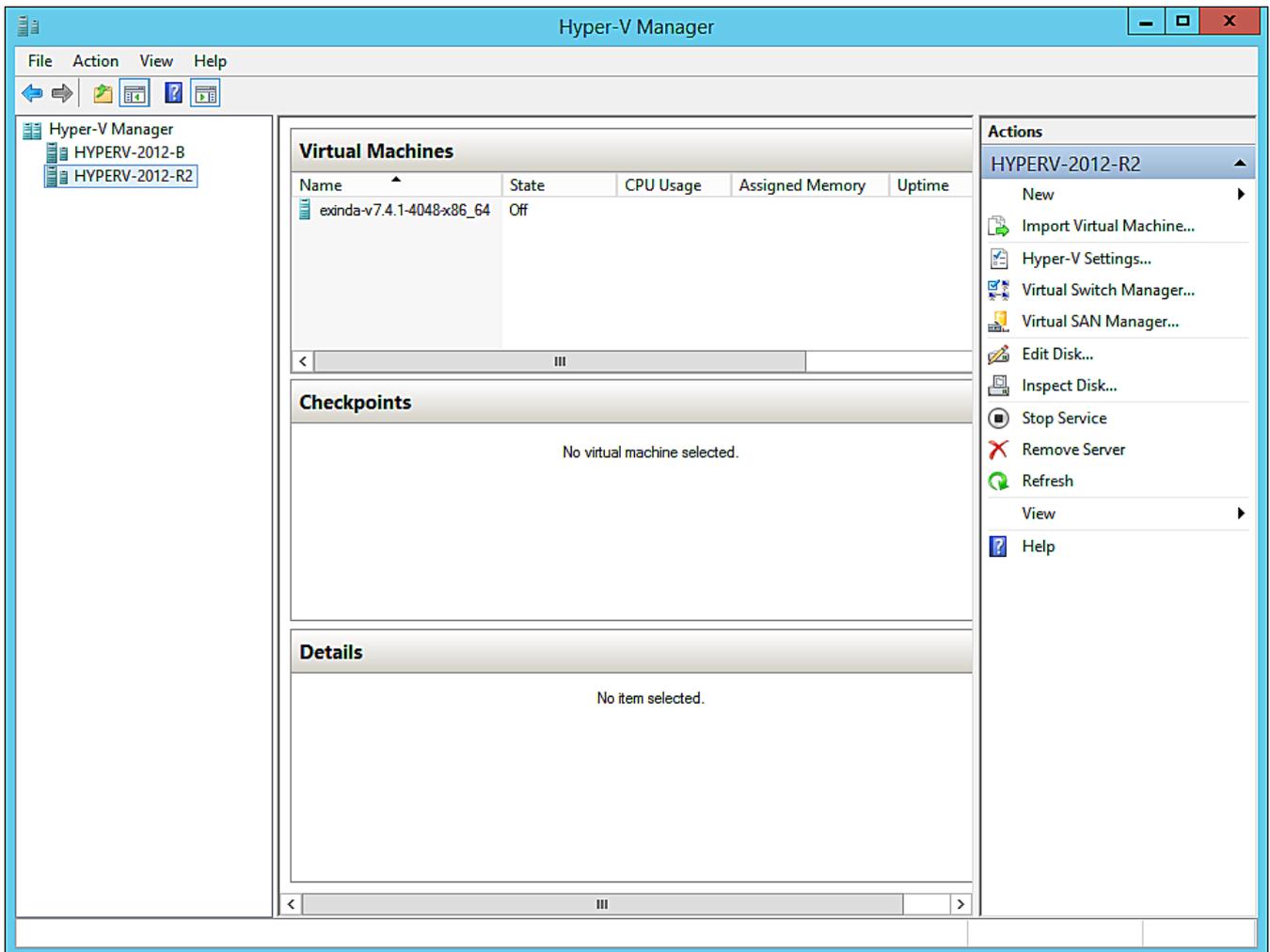
10. Click the **Browse** button and select the folder to use.



11. Click **Next**. The "Completing Import Wizard" page opens.

12. Review the settings in the right pane. If they are correct, click **Finish**. The installation proceeds.

When the installation is complete, an entry for the new virtual machine appears in the **Virtual Machines** pane in the **Hyper-V Manager**.



The Virtual Machine, as supplied by Exinda, may not have all of the configuration options you prefer. For example, the disk storage is confined to 50GB, which is unlikely to be sufficient for your needs. When preparing the Exinda Virtual Appliance for download, it is not possible to know just what hardware is available on the host machine. After you have installed the virtual machine, you will need to make some adjustments to the configuration using the controls in the Hyper-V Manager. See the following related tasks.

IMPORTANT

Before powering on your Exinda Virtual Appliance for the first time, you need to make sure that the virtual configuration is what you need. See the following Related Tasks to fully configure your VM.

Related Topics

- » [Adjusting the number of CPUs available to the Virtual Machine](#)
- » [Adjusting the RAM available to the Virtual Machine](#)
- » [Adjusting the NICs available to the Virtual Machine](#)
- » [Increasing the size of the virtual hard drive](#)

0.36 Modifying the Hyper-V Virtual Machine Configuration

As supplied, the Exinda Virtual Appliances will require some configuration changes before you introduce them to your network. For example, the virtual hard drives are limited to 50GB, which would be unlikely to be sufficient for your needs.

The virtual machines available are sized with minimal configuration as it is not possible to know just what hardware is available on any host machine. To edit the configuration, you need to open the settings for the virtual machine in the Hyper-V Manager.

There are many settings that you can change, but for the purposes of configuring the Exinda Virtual Appliance, these task instructions are limited to what is necessary for bringing the appliance into an operational state. If you need more information, please consult the documentation for Hyper-V. This topic deals with changes to the configuration related to the number of CPUs, the available RAM, the NICs, and adjusting the storage for the virtual machine.

The configuration changes are required before your initial use of the virtual machine. You can also make further changes to your virtual machine at any later time. If over time you require more resources for the virtual machine, as long as those resources are available on the host, you can make them available to the guest.

NOTE

You will need to shut the virtual appliance down before you can modify its configuration.

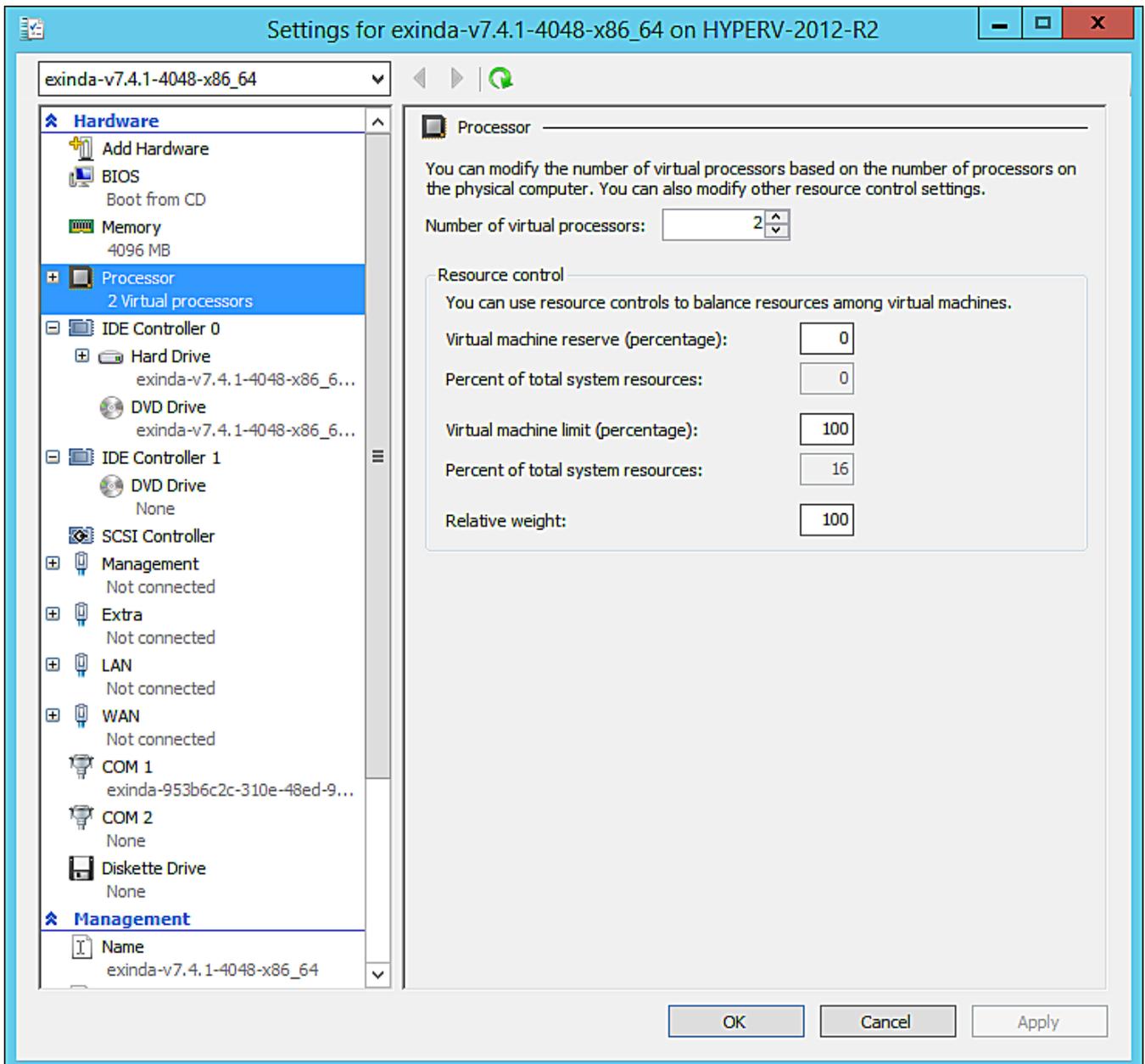
Related Topics

- » [Adjusting the number of CPUs available to the Virtual Machine](#)
- » [Adjusting the RAM available to the Virtual Machine](#)
- » [Adjusting the NICs available to the Virtual Machine](#)
- » [Increase storage by adding new virtual drives](#)

0.37 Adjusting the number of CPUs available to the Virtual Machine

After installing the virtual machine, you may need to adjust the number of CPUs that are available to the Exinda Virtual Appliance. The basic virtual machine configuration includes a minimal number of CPUs, but if you have spare CPUs on the host machine, you may want to make these available to the virtual machine. You make adjustments to the number of CPUs in the Hyper-V Manager.

1. Open the Hyper-V Manager.
2. In the left pane, right-click on the virtual machine you need to edit and select **Settings**. The Settings dialog box for the virtual machine opens.
3. In the left pane, under **Hardware**, select the **Processor** item. The processor settings open in the right pane.



4. In the **Number of virtual processors** spinbox, click the up- or down-arrows to adjust the number of CPUs.

NOTE

In this pane you can also adjust several other settings to balance resources among any other virtual machines. Consult the Hyper-V documentation for more information on these settings.

5. Click **OK**. The number of CPUs available to the virtual machine is immediately adjusted.

NOTE

These instructions also apply to changing the configuration after the virtual appliance has entered service.

Related Topics

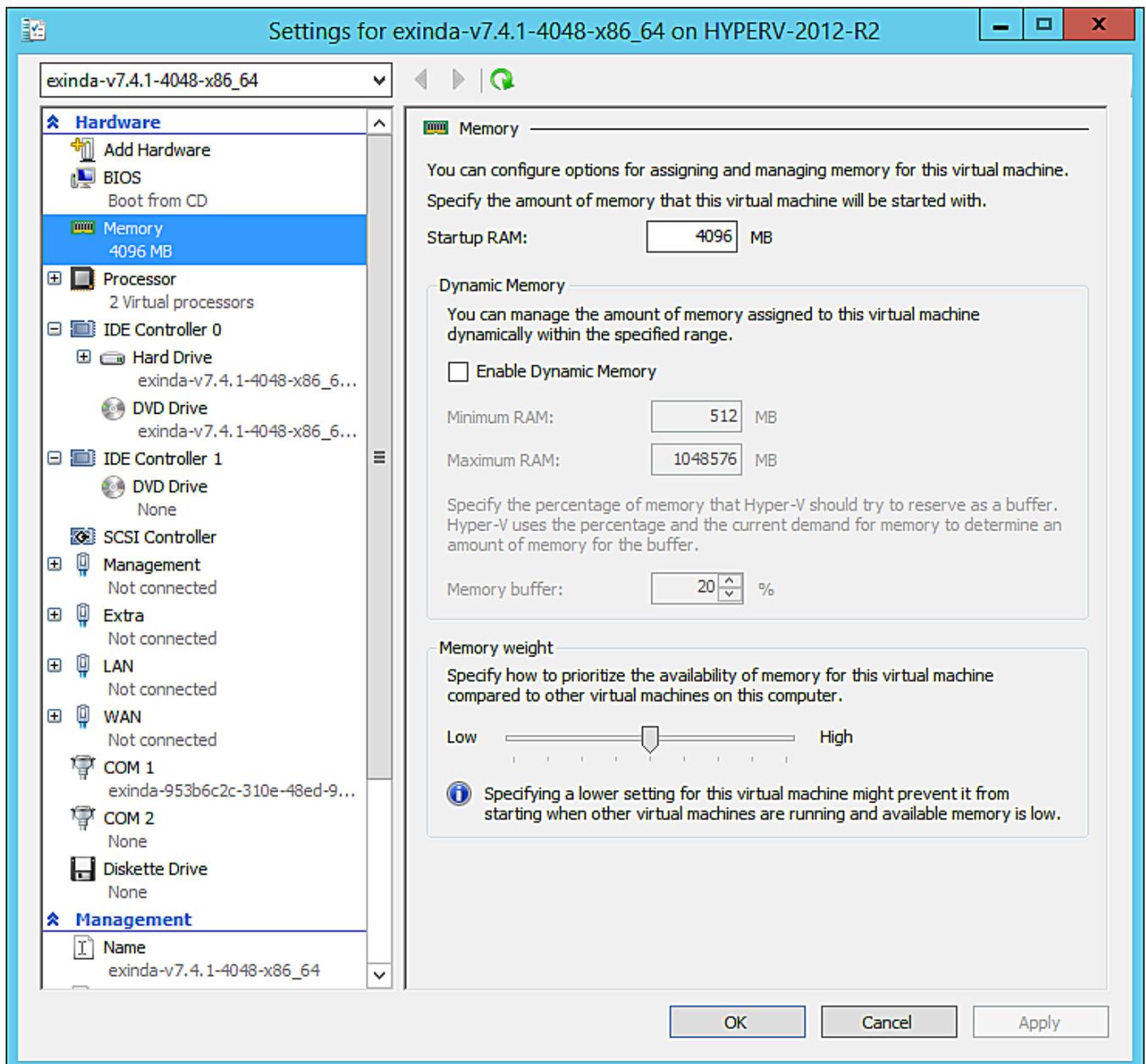
- » [Adjusting the RAM available to the Virtual Machine](#)
- » [Adjusting the NICs available to the Virtual Machine](#)

» Increasing the size of the virtual hard drive

0.38 Adjusting the RAM available to the Virtual Machine

After installing the virtual machine, you may need to adjust the amount of RAM that is available to the Exinda Virtual Appliance. There is a basic amount of RAM provided in the Exinda Virtual Appliance, but if you have spare RAM on the host machine, you may want to make this available to the virtual machine. You make adjustments to the amount of RAM in the Hyper-V Manager.

1. Open the Hyper-V Manager.
2. In the left pane, right-click on the virtual machine you need to edit and select **Settings**. The Settings dialog box for the virtual machine opens.
3. In the left pane, under **Hardware**, select the **Memory** item. The memory settings open in the right pane.



4. In the **Startup RAM** field, type a new amount for the quantity of RAM.

TIP

In this pane you can also Enable Dynamic Memory and specify amounts, and adjust Memory weight. Consult the Hyper-V documentation for more information on these settings.

5. Click **OK**. The amount of RAM available to the virtual machine is immediately adjusted.

NOTE

These instructions also apply to changing the configuration after the virtual appliance has entered service.

Related Topics

- » [Adjusting the number of CPUs available to the Virtual Machine](#)
- » [Adjusting the NICs available to the Virtual Machine](#)
- » [Increasing the size of the virtual hard drive](#)

0.39 Adjusting the NICs available to the Virtual Machine

After installing the virtual machine, you will need to enable the NICs that are available to the Exinda Virtual Appliance. The basic virtual machine configuration does not include the configuration necessary to link the virtual devices to the physical hardware on the host machine. You make adjustments to the number of CPUs in the Hyper-V Manager.

1. Open the Hyper-V Manager.
2. In the left pane, right-click on the virtual machine you need to edit and select **Settings**. The Settings dialog box for the virtual machine opens.
3. In the left pane, under **Hardware**, select the network adapter to update. The network adapter settings open in the right pane.
4. In the **Virtual switch** drop-down list, select the network to which to map the NIC.

TIP

In this pane you can also enable Bandwidth Management. Consult the Hyper-V documentation for more information on these settings.

5. Click **OK**. The NIC configuration is immediately modified for when the virtual machine is started.

NOTE

These instructions also apply to changing the configuration after the virtual appliance has entered service.

Related Topics

- » [Adjusting the number of CPUs available to the Virtual Machine](#)

0.40 Increase storage by adding new virtual drives

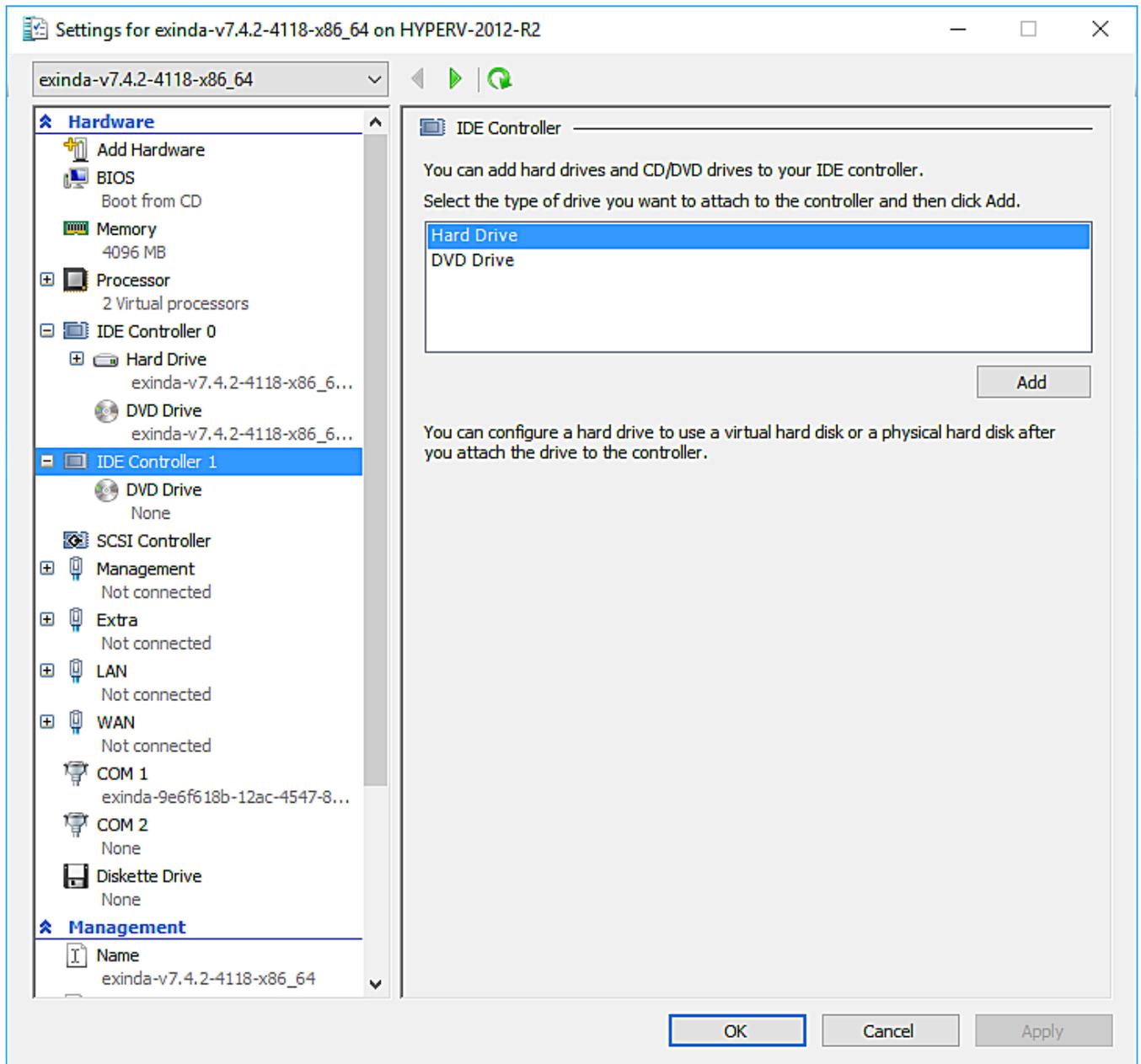
During the process of installing the virtual machine, you needed to connect the virtual hard drive (VHD) to the Exinda Virtual Appliance. Prior to powering the VM on for the first time, it is likely that you should need to increase the size of the VHD. You can also make this adjustment after bringing the Exinda Virtual Appliance into service. You make adjustments to the size of the VHD in the Hyper-V Manager by adding additional hard drives to the VM.

0.40.1 Prerequisites

Before starting this task, ensure that the virtual machine is switched off.

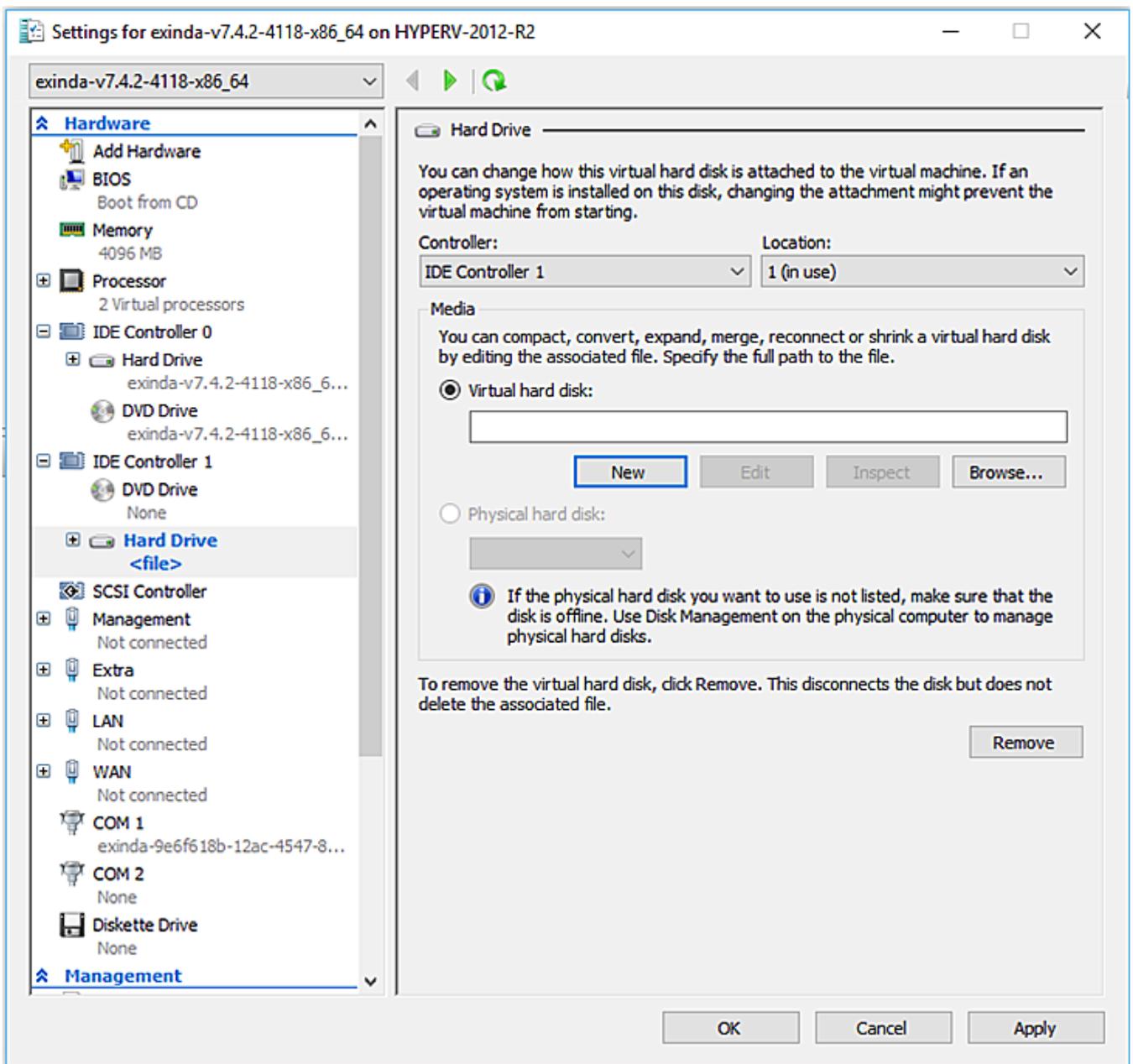
0.40.2 Procedure

1. Open the Hyper-V Manager.
2. In the left pane, right-click on the virtual machine you need to edit and select **Settings**. The Settings dialog box for the virtual machine opens.
3. In the left pane, under **Hardware**, select any IDE Controller item. The Hard Drive settings open in the right pane.
4. Select the **Hard Drive** option in the right panel and click **Add**.



5. In the Hard Drive section, select "IDE Controller 1" as the Controller and "1 (in use)" as the location. By default, this is the only slot available in the virtual machine to which to insert a new Virtual Hard Drive. However, if more hard drives are

needed in the future, you could remove the DVD Drives present by default given that these are not needed in the appliance. In such a case, Controller 0: Location 1 and Controller 1: Location 0 will also be available for further use.



6. Click **New**. The New Virtual Hard Disk wizard opens.



Choose Disk Format

Before You Begin

Choose Disk Format

Choose Disk Type

Specify Name and Location

Configure Disk

Summary

What format do you want to use for the virtual hard disk?

VHD

Supports virtual hard disks up to 2,040 GB in size.

VHDX

This format supports virtual disks up to 64 TB and is resilient to consistency issues that might occur from power failures. This format is not supported in operating systems earlier than Windows 8.

< Previous

Next >

Finish

Cancel

7. Select VHDX as the Disk Format type and click **Next**.



Choose Disk Type

Before You Begin

Choose Disk Format

Choose Disk Type

Specify Name and Location

Configure Disk

Summary

What type of virtual hard disk do you want to create?

Fixed size

This type of disk provides better performance and is recommended for servers running applications with high levels of disk activity. The virtual hard disk file that is created initially uses the size of the virtual hard disk and does not change when data is deleted or added.

Dynamically expanding

This type of disk provides better use of physical storage space and is recommended for servers running applications that are not disk intensive. The virtual hard disk file that is created is small initially and changes as data is added.

Differencing

This type of disk is associated in a parent-child relationship with another disk that you want to leave intact. You can make changes to the data or operating system without affecting the parent disk, so that you can revert the changes easily. All children must have the same virtual hard disk format as the parent (VHD or VHDX).

< Previous **Next >** Finish Cancel

8. In the **Choose Disk Type** section, select the **Fixed Size** option and click **Next**.



Specify Name and Location

Specify the name and location of the virtual hard disk file.

Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary

Name:

Location:

< Previous **Next >** Finish Cancel

9. Specify a **Name** and **Location** for the virtual hard drive, and click **Next**.



Configure Disk

Before You Begin

- Choose Disk Format
- Choose Disk Type
- Specify Name and Location
- Configure Disk**
- Summary

You can create a blank virtual hard disk or copy the contents of an existing physical disk.

Create a new blank virtual hard disk

Size: GB (Maximum: 64 TB)

Copy the contents of the specified physical disk:

| Physical Hard Disk | Size |
|--------------------|--------|
| \\.\PHYSICALDRIVE0 | 930 GB |

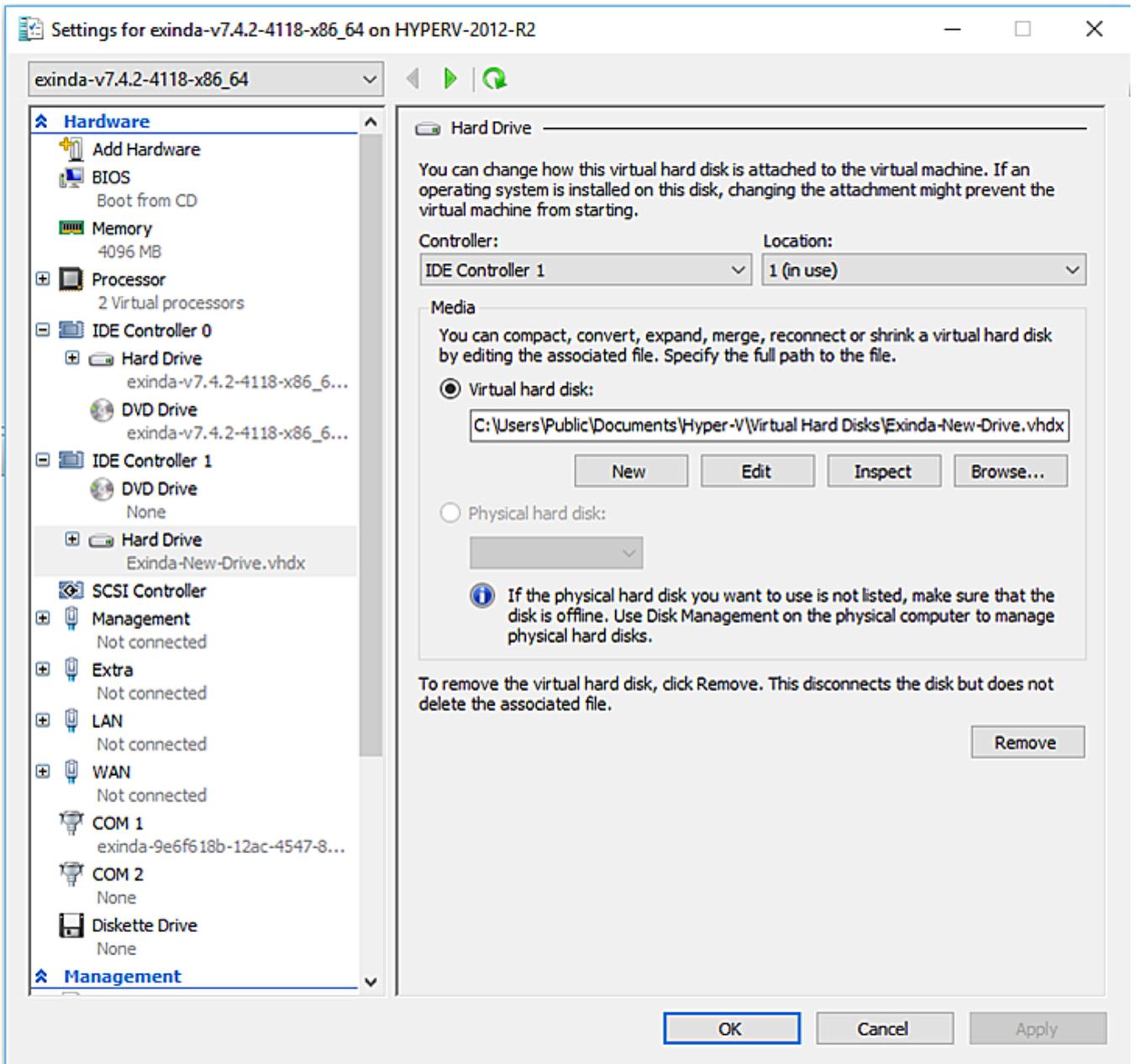
Copy the contents of the specified virtual hard disk

Path:

10. Set the **Disk Size** based on the license you have acquired and then click **Next**. The minimum recommended sizes are the following:

- EXNV-VM Small: 250 GB Total (Add a 200GB Disk)
- EXNV-VM Medium: 250 GB Total (Add a 200GB Disk)
- EXNV-VM Large: 500 GB Total (Add a 450GB Disk)
- EXNV-VM Extra Large: 500 GB Total (Add a 450GB Disk)
- EXNV-VM Extra Extra Large: 500 GB Total (Add a 450GB Disk)

6. Click **Finish** to create the hard drive. This can take a few minutes.



7. When the Hard Drive settings page for the newly created drive opens, click **OK**.

8. Start the virtual machine. When the VM starts, it will automatically recognize the new drive, but the new storage must be manually added the virtual appliance.

NOTE

Before connecting, the management interface must already have been configured with an IP address or will obtain an IP address using DHCP. You need to make sure that the Management Interface is connected to the proper Virtual Switch in your Hyper-V environment.

9. Find the IP address assigned to the management interface by right-clicking on the VM and selecting the **Connect** option. This provides console access.

10. Log on to the appliance using the default credentials (username: admin, password: exinda). You might need to accept the EULA before proceeding.

11. Apply the following commands. The output contains the IP address you need to access the appliance web user interface.

```
exinda> en
```

```
exinda># show int eth0
```

12. Connect through HTTPS to the Exinda appliance using a browser.

13. Once logged on, click **Configuration > System > Setup > Storage**.

14. Add the new drive.

NOTE

The following screenshot assumes that the chosen controller was **1**, and the location was **0**, so the new drive is **sdd**.

Configuration

System Setup

Date and Time | Access | SDP | SQL Access | Monitoring | Netflow | Scheduled Jobs | Alerts | License | Control | **Storage**

Modify Exinda appliance disk storage settings.
Before changing the size of a partition, you must remove the encryption on the partition and put the appliance into [Bypass mode](#).

Disk Storage Map.

| Storage Configuration | | | | | | |
|---------------------------------|-----------|--------------|----------------|----------|-----------|---------------------------|
| Service | Status | Free | Size | Minimum | Encrypted | Operation |
| cifs | available | 5117.65M 96% | 5340.00M | 1024.00M | ✘ | Resize Format Encrypt |
| edge-cache | available | 2184.37M 95% | 2304.00M | 1024.00M | ✘ | Resize Format Encrypt |
| monitor | available | 9657.20M 94% | 10.00G | 10.00G | | Resize Format |
| users | available | 974.62M 95% | 1024.00M | 512.00M | | Resize Format |
| wan-memory | available | 8168.84M 97% | 8448.00M | 5120.00M | ✘ | Resize Format Encrypt |
| unallocated storage | | | 200.00G | | | |
| Total Available Storage: | | | 228.71G | | | |

| Disk Configuration | | | |
|--------------------|--------|------------|-----------|
| Disk | Status | Size | Operation |
| sda | in-use | | |
| sdb | unused | 214.7 GB | Add |
| sdc10 | in-use | 28.72 GiB | Remove |
| sdd | in-use | 200.00 GiB | Add |

Refresh Disk Information

The new space appears as “unallocated storage” inside the “Storage Configuration” section.

NOTE

Exinda recommends that you resize the “monitor” partition to at least 100GB. If you are licensed for acceleration, you should allocate most of the remaining storage in “wan memory” partition (cache partition for all TCP protocols), but if you are accelerating CIFS/SMB protocols, allow some storage in the “cifs” partition.

15. Allocate the storage as appropriate.

Related Topics

- » Adjusting the number of CPUs available to the Virtual Machine
- » Adjusting the RAM available to the Virtual Machine
- » Adjusting the NICs available to the Virtual Machine

0.41 Customizing a Hyper-V Virtual Machine

As supplied, the Exinda Virtual Appliances will require some configuration changes before you introduce them to your network. For example, the virtual hard drives are limited to 50GB, which would be unlikely to be sufficient for your needs. The virtual machines available are sized with minimal configuration as it is not possible to know just what hardware is available on any host machine. To edit the configuration, you need to open the settings for the virtual machine in the Hyper-V Manager.

There are many settings that you can change, but for the purposes of configuring the Exinda Virtual Appliance, these task instructions are limited to what is necessary for bringing the appliance into an operational state. If you need more information, please consult the documentation for Hyper-V. This topic deals with changes to the configuration related to the number of CPUs, the available RAM, the NICs, and adjusting the storage for the virtual machine.

The configuration changes are required before your initial use of the virtual machine. You can also make further changes to your virtual machine at any later time. If over time you require more resources for the virtual machine, as long as those resources are available on the host, you can make them available to the guest.

Related Topics

- » [Adjusting the number of CPUs available to the Virtual Machine](#)
- » [Adjusting the RAM available to the Virtual Machine](#)
- » [Adjusting the NICs available to the Virtual Machine](#)
- » [Increasing the size of the virtual hard drive](#)

Running on Linux KVM

KVM (Kernel-based Virtual Machine) is a complete virtualization solution for Linux on x86 hardware.

It contains virtualization extensions (Intel VT or AMD-V) and a loadable kernel module, **kvm.ko**. This provides the core virtualization infrastructure; and a processor specific module **kvm-intel.ko** or **kvm-amd.ko**.

By using KVM, you can run multiple virtual machines running unmodified Linux or Windows images. Each virtual machine has private virtualized hardware: a network card, disk, graphics adapter, etc.

See the following for more information:

0.42 Installing KVM on Dedicated Hardware

[Learn to install KVM on dedicated hardware with Ubuntu server.](#)

You can Install KVM by running the below command:

```
sudo apt-get install qemu-kvm libvirt-bin virtinst bridge-utils cpu-checker
```

Verify that KVM is correctly installed by running the below command:

```
kvm-ok
```

If you get the below output then the server hardware is capable of running virtual machines. If not, you have to enable this from the BIOS.

```
INFO: /dev/kvm exists
```

```
KVM acceleration can be used
```

0.43 Network Setup

[Learn to setup the network](#)

The network setup depends on a particular configuration. Bridges are used in KVM to add network interfaces to a particular VM. Each Exinda appliance requires at least 2 network interfaces.

0.44 Installing the VM

To install the VM, run the below command:

```
sudo virt-install \
--virt-type=kvm \
--name <EXINDA_VM_NAME> \
--ram 4096 \
--vcpus=2 \
--os-variant=centos6.3 \
--virt-type=kvm \
--hvm \
--cdrom=<PATH_TO_ISO> \
```

```
--network=bridge=<BRIDGE_1>,model=virtio \  
--network=bridge=<BRIDGE_2>,model=virtio \  
--disk path=/var/lib/libvirt/images/<EXINDA_VM_  
NAME>.qcow2,size=40,bus=virtio,format=qcow2
```

The above command will create the VM and also allocate the disk stored in qcow2 format.

Note

You can get the installation media ISO from your Exinda partner.

The domain might take some time to be created, as the script that installs Exinda OS is being executed. You can view the progress by opening another console and running the below command:

```
sudo sudo virsh console $VM_ID
```

Where \$VM_ID is the unique identifier for the running VM. You can view running VMs by running `virsh list` and `virsh list --all` for all VMs (started and stopped).

Note

For Autostart run, `sudo virsh autostart $VM_ID`.

0.45 Learn to Configure Exinda

To configure Exinda from the console you can attach to the VM console using the below command:

```
sudo sudo virsh console $VM_ID
```

Alternatively, you can use the web browser and access the Exinda configuration through the web GUI.