

# IPv6 Support in VMware® Infrastructure 3

## VMware Infrastructure 3

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Since the early 1980s, the Internet and private internetworks have flourished using the dominant network layer protocol known as Internet Protocol version 4 (IPv4). As the scale and use of networking have grown, some limitations have emerged with IPv4. These limitations include native security support and, perhaps most notably, the lack of address space for the rapidly increasing number of connected end devices.

Internet Protocol version 6 (IPv6) was created by the Internet Engineering Task Force (IETF) in the 1990s to address the shortcomings of IPv4. It is now designated as the successor to IPv4. IPv6 uses 128-bit addresses, compared to the 32-bit addresses used in IPv4. IPv6 also improves upon IPv4 in the areas of routing, security, and mobility. IPv6 is defined in a number of IETF requests for comment (RFCs). The IPv6 specification is defined by RFC 2460, IPv6 addressing by RFC 4291, and transition mechanisms by RFC 2893.

This document details the support for IPv6 in VMware Infrastructure 3, including VMware ESX 3.5, VMware ESXi 3.5, and VMware VirtualCenter 2.5.

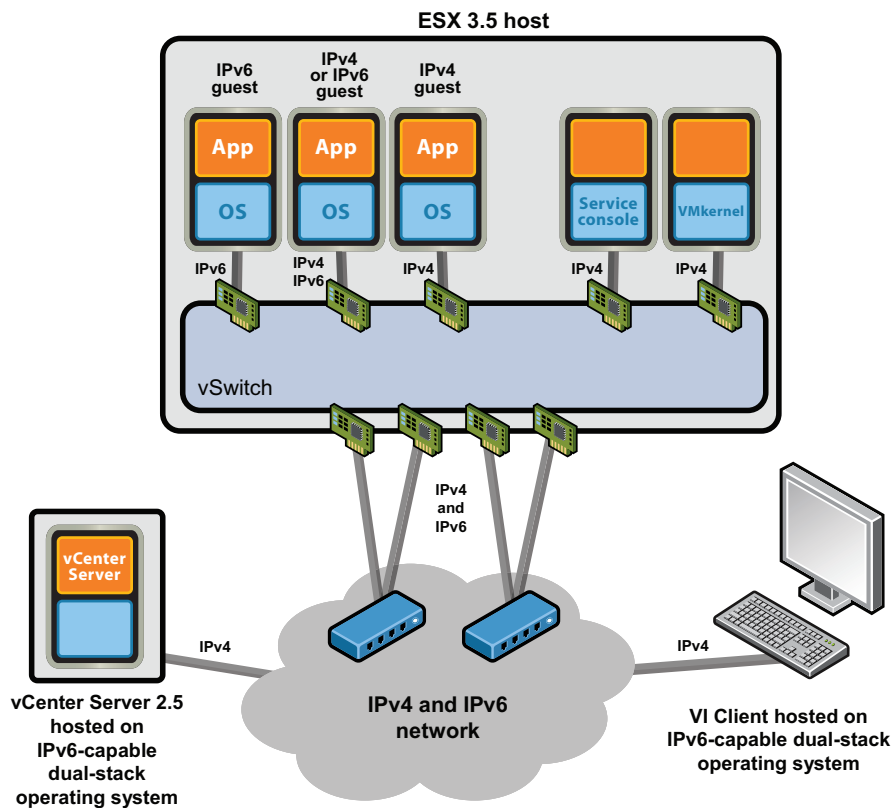
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## IPv6 Support in VMware Infrastructure 3

VMware Infrastructure 3 comprises a number of individual products and features. The sections below cover IPv6 support in the ESX, vCenter Server (formerly known as VirtualCenter Server), and Virtual Infrastructure Client products.

**Figure 1.** VMware Infrastructure 3 Environment Using Both IPv4 and IPv6



### ESX 3.5

IPv6 support for guest operating systems was introduced in ESX 3.5. This support is included in all editions of ESX 3.5 including ESX 3.5 and the installable and embedded editions of ESXi 3.5.

ESX 3.5 supports guest operating systems configured for any combination of IPv4 and IPv6. Individual guest operating systems can be configured to use IPv6 only, IPv4 only, or both IPv4 and IPv6 depending on the capabilities of the individual operating systems. Additionally, an ESX host can transparently accommodate any combination of guest operating systems configured for IPv4 or IPv6.

In ESX 3.5, the service console and VMkernel ports support only IPv4 connectivity. Where guest operating systems are configured for IPv6 only, the physical network should be configured for “dual-stack” (IPv6 and IPv4) connectivity to ensure service console and VMkernel service connectivity for management, VMotion, and IP storage (iSCSI and NFS).

Under ESX 3.5, IPv6 offloads are not supported on the virtual NICs (vNICs) irrespective of capabilities of the underlying physical NICs.

### vCenter Server 2.5

VMware vCenter Server (formerly known as VMware VirtualCenter Server 2.5) does not communicate using IPv6. Because the service console and VMkernel ports on ESX 3.5 are IPv4 only, vCenter Server must use an IPv4 address to communicate.

VMware vCenter Server 2.5 can run on an IPv6-capable dual-stack (IPv4 and IPv6) operating system.

## VI Client

As with vCenter Server, in VMware Infrastructure 3, the VI Client can communicate with ESX hosts and vCenter Server only using IPv4. However, the VI Client can run on an IPv6-capable dual-stack (IPv4 and IPv6) operating system.

## More Information on Guest Operating System Support for IPv6

See your guest operating system's IPv6 support documentation and also the VMware *Guest Operating System Installation Guide* ([http://www.vmware.com/pdf/GuestOS\\_guide.pdf](http://www.vmware.com/pdf/GuestOS_guide.pdf)) for additional information on IPv6 support in particular guest operating systems. The VMware guide is updated regularly and provides the latest details on installing guest operating systems in VMware virtual machines.

## IPv6 Capability Certifications

A number of independent bodies are offering IPv6 certification programs for vendors and end users to ensure consistency and interoperability among various IPv6 implementations. Among these are the IPv6Ready Logo Program and the Joint Interoperability Test Command (JITC) IPv6 program.

## JITC IPv6 Capability Program

The U.S. government is currently using the JITC IPv6 Program to validate IPv6 capabilities for all new product purchases.

To validate that support, the U.S. Department of Defense has established the DoD IPv6 Capable Profiles, a document that identifies the specific technical standards different types of products must meet to be considered IPv6 capable. These standards have been converted into testing suites, used by the JITC, to certify products as IPv6 capable. Once certified, products are then placed on the DoD Approved Products List. The JITC, Department of Defense and other U.S. government agencies use this IPv6 plan to test the IPv6 capabilities of both commercial and government off-the-shelf devices.

## Product Classification

At the time this document was written, the Department of Defense had identified six product classes for IPv6 network devices according to the type of device and its specific capabilities. These classes are:

- Host or workstation
- Network appliance server (simple and advanced)
- Router
- Layer 3 switch
- Information assurance device

## IPv6 Conformance Testing for VMware Infrastructure

VMware is committed to supporting IPv6 for VMware Infrastructure and following JITC testing as an industry-accepted IPv6 conformance process.

The parts of VMware Infrastructure relevant to IPv6 conformance are VMware ESX and VMware vCenter Server (VirtualCenter).

In a future version of ESX, VMware will extend the IPv6 capabilities of ESX to all components including the service console for management and the VMkernel ports for VMotion and IP storage functions. JITC will test this future version of VMware ESX for IPv6 conformance in 2009.

The extension of IPv6 capabilities and the testing and conformance certification will also cover the installable and embedded versions of ESX.

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If you have comments about this documentation, submit your feedback to: [docfeedback@vmware.com](mailto:docfeedback@vmware.com)

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