
FreeBSD VPS v3

IPv6 Supplement

First Edition
November 2007

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Introduction

Important: Although this document provides a general overview of Internet Protocol, version six (IPv6) for the FreeBSD Virtual Private Server, version three (or *VPS v3*), it does not provide details of how to implement IPv6 for all software packages or services. Knowledgeable administrators who wish to utilize IPv6 should refer to other resources and documentation, such as the *FreeBSD General Commands Manual* (or *Man Pages*).

Computers communicate over the Internet using the Internet Protocol. Most computers use version four of the protocol (IPv4), introduced over 30 years ago. The VPS v3 product also uses IPv4 for network communication. However, new VPS v3 accounts ordered after November 12, 2007, can also choose to add an IPv6 address in addition to IPv4 address(es). The VPS v3 product has also been updated to support the IPv6 protocol for important and popular services and programs.

This document provides you with basic information about IPv4 and IPv6, VPS v3 compatibility with IPv6, and other considerations when implementing IPv6 solutions for VPS v3.

Overview of the Documentation Library

Technical information regarding the IPv6 offering of VPS v3 is contained in this document. At this time, customer documentation outside of this document does not address IPv6 information, usage, or compatibility.

This document provides an update to the following print-ready customer documentation which is included, at no cost, as a feature of your account:

- *FreeBSD VPS v3 Getting Started Guide*
- *FreeBSD VPS v3 Release Notes*
- *FreeBSD VPS v3 User's Guide*

There are also Web site resources such as FreeBSD VPS v3 Documentation Library and Frequently-Asked Questions (FAQ).

Other Resources

More information about IPv4 and IPv6 can be obtained from additional sources, including the following Web sites:

- www.ipv6.org
- www.w3.org
- www.ietf.org
- www.ipv6forum.org
- www.ipv6ready.org
- www.ipv6tf.org
- www.ipv6style.jp/en

Overview of this Document

This document includes the following sections:

- “IPv4 and IPv6” on page 3.
- “VPS v3 Compatibility with IPv6” on page 4.
- “Considerations” on page 6.

IPv4 and IPv6

For most computers using the Internet, IPv4 serves as the standard for network communication. This specification allows distant computers to communicate and transfer information through packets. IPv4 addresses appear as four sets of numbers from 0 to 255, separated by periods, as in the following example:

```
198.164.1.2
```

The IPv6 specification represents a potential replacement for IPv4. IPv6 addresses are commonly written in eight sets of up to 4 hexadecimal digits, separated by colons, as in the following example:

```
1080:0:FF:0:8:800:200C:417A
```

Advantages of IPv6

Several elements of the IPv4 specification pose challenges for the growing Internet population in the world. The IPv6 protocol was developed to address these challenges. Some major benefits of IPv6 include the following:

- Total number of available addresses increased by several orders of magnitude.
- Improved packet headers.
- Inherent security features.
- Better mobile support.

IPv6 for VPS v3

When ordering VPS v3 accounts after November 12, 2007, you can choose to assign an IPv6 address to your VPS v3. This address is assigned to your account in addition to IPv4 address(es) assigned by default. The VPS v3 supports both IPv4 and IPv6 protocols simultaneously, or a *dual stack*. This extended support provides a great advantage when configuring applications and programs, allowing for testing and implementation of both protocols.

VPS v3 Compatibility with IPv6

With the initial release of IPv6 support, important and popular VPS v3 features have been tested for compatibility with the protocol. Most services and programs at the application layer are not impacted by IPv6, since it is a networking standard. However, certain commands, services, and popular programs do not completely support the IPv6 protocol in the VPS v3 environment at this time.

Information about popular VPS v3 and IPv6 features and their compatibility with VPS v3 is contained in “Table 1: VPS v3 compatibility with IPv6”. All features listed in the table have been tested for IPv6 compatibility. The table includes the name of the feature, whether the VPS v3 implementation of the feature is compatible with IPv6, and any noteworthy issues to consider when using the feature with IPv6 on VPS v3.

Table 1: VPS v3 compatibility with IPv6

Feature	IPv6 Compatible	Notes
Apache Web server, version 2.x	Yes	Version 1.3.x does not support IPv6.
Berkeley Internet Name Domain (BIND) version 9 DNS server	Yes	
ClamAV email filter	Yes	
CPX: Control Panel	No	
Domain Information Groper (<code>dig</code>) command	No	
Digital certificates	Yes	Includes shared certificate.
Dovecot email server	Yes	Includes Post Office Protocol (POP) and Internet Message Access Protocol (IMAP).
Domain Name System (DNS) and reverse DNS resolution	Yes	IPv6 uses AAAA record.
iManager Web interface	No	
Internet Super-Server (<code>inetd</code>) service controller	Yes	
IP security (IPsec) specification	No	Not implemented at this time.
Network statistics (<code>netstat</code>) command	Yes	
Echo request/response (<code>ping</code>) command	Yes	Use <code>ping6</code> or <code>ping -6</code> when testing an IPv6 address.
ProFTPD FTP program	Yes, when you apply additional configuration.	See “Additional Configuration” on page 5.
Sendmail email routing system	Yes	
Software firewall	Yes	When configuring manually, use <code>ipf -6</code> to configure rules for IPv6 traffic.
SpamAssassin mail filter	Yes	
Open Secure Shell (OpenSSH) connectivity tool	Yes	Use <code>ssh -6</code> when connecting to an IPv6 address.

Feature	IPv6 Compatible	Notes
Open Secure Sockets Layer (OpenSSL) toolkit	Yes	
<code>telnet</code> command	Yes	Use <code>telnet -6</code> when connecting to an IPv6 address.
<code>traceroute</code> command	Yes	Use <code>traceroute6</code> or <code>traceroute -6</code> when connecting to an IPv6 address.
University of Washington IMAP (UW-IMAP) email server	Yes	Includes POP and IMAP protocols.
<code>vaddcert</code> command-line utility	Yes	See “Considerations” on page 6.
<code>vaddhost</code> command-line utility	Yes, when you apply additional configuration.	See “Additional Configuration” on page 5.

Additional Configuration

Some features do not completely support IPv6 in the VPS v3 environment at this time, but may be configured manually to support IPv6. This configuration will usually require technical knowledge and understanding of command-line programs and administration.

Features which require additional configuration include the following:

- While Apache 2.x Web server supports the IPv6 protocol, the proprietary `vaddhost` command-line utility, which assists with easily adding subhosts to the VPS v3 Apache Web server configuration, does not support IPv6 addresses at this time. You can, however, add a domain using the `vaddhost` utility and select an IPv4 address. Then you can enable IPv6 support with the following steps:
 1. Manually edit the `VirtualHost` tags for the given domain in the `/www/conf/httpd.conf` file.
 2. Either replace the IPv4 address with the correct IPv6 address to support only IPv6 traffic, or add the IPv6 address configuration to the existing IPv4 configuration. Having both addresses causes the Apache Web server to route traffic for addresses in both protocols to the given domain.
 3. After saving the changes to the `httpd.conf` file, restart the Web server by executing the `restart_apache` command.
- The ProFTPD program, which comes as the default FTP service, does not support the IPv6 protocol when IPv4 is disabled. ProFTPD will only function correctly when IPv4 is enabled.

Considerations

Several issues should be considered when implementing IPv6 on VPS v3 with this release. These issues include the following:

- General industry expertise and experience with IPv6 is limited at this time because of the limited availability and use of the protocol in the Internet.
- Limitations of routing systems or Internet Service Providers (*ISPs*) must be considered when testing any IPv6 application or implementation. Neither this document nor the VPS v3 and its provisioning system attempt to address limitations of other systems or companies.
- At this time, only one (1) IPv6 address is available for each VPS v3 account.
- No IPv6 tools for IPv6 tunneling or emulation are provided with the VPS v3. However, several of these kinds of tools are available. Use your favorite Web search engine to discover more information about IPv6 tunneling and emulation.
- The `vaddcert` command-line utility, which assists with easily associating a digital certificate with a domain name, does not support the correct display of IPv6 addresses. This affects the display of addresses in the utility interface only. The utility does correctly configure certificates for domains which utilize IPv6.
- When enabling or discontinuing the IPv6 add-on for a VPS v3 account, an AAAA record will be added or removed from the zone file of the current hostname for the account. For other domains, you will need to add or remove the AAAA record manually.
- When IPv4 and IPv6 are both present, as in the dual-stack implementation of VPS v3, many services and programs may use IPv4 by default. When testing IPv6 capabilities and functionality, you should consider configuration carefully to ensure the feature is actually utilizing the IPv6 protocol.