



| IBM Software Group

IBM WebSphere Partner Gateway V6.1

IPv6 support



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This presentation provides details on the new IPv6 support added in WebSphere® Partner Gateway V6.1

IPv6 overview

- IPv6 increases the number of bits used for addressing compared to IPv4 addressing normally used in servers
 - ▶ IPv6: 128-bit addressing expressed in hexadecimal format
 - ▶ IPv4: 32-bit dotted-decimal notation
- Preferred IPv6 address uses eight 16-bit hexadecimal sections - example:
 - ▶ ABCD:EF12:3456:7890:ABCD:EF12:3456:7890
- Many enterprise clients are moving to IPv6 infrastructure



Internet Protocol Version 4 or IPv4 is no longer sufficient for many businesses because it is based on 32-bit architecture. There is a growing shortage of IPv4 addresses. Internet Protocol Version 6 or IPv6 is based on 128-bit architecture, which allows far more addresses to be available for use over the Internet

IPv6 notation conventions

- Sample IPv6 address formats
 - ▶ `http://[FEDC:BA98:7654:3210:FEDC:BA98:7654:3210]:80/index.html`
 - ▶ `http://[1080:0:0:0:8:800:200C:417A]/index.html`
 - ▶ `http://[1080::8:800:200C:417A]/foo`
- “::” represents a string of zeros
 - ▶ Example: `1234:0:0:0:ABCD:0:0:123` can be represented as `1234::ABCD:0:0:123` or `1234:0:0:0:ABCD::123`
- Mixed addresses can use mixed format
 - ▶ Example: `0:0:0:0:0:0:131.107.6.100` can be represented as `::131.107.6.100`



Strings of zeros are common in IPv6 addresses. Consequently, an alternate form of address representation allows "::" to be used to represent a portion of the address containing consecutive zeros. The "::" placeholder can be used to represent more than one zero, but may not be used more than once in an address.

Textually displaying addresses is used in environments with a mixture of IPv4 and IPv6 nodes. In this notation, the six high-order (leftmost) 16-bit sections are displayed in hexadecimal, but the remaining bits are displayed in the familiar dotted-decimal notation.

Requirements for IPv6

- IPv6 stack need to be supported by the operating system and turned on within the operating system
- WebSphere Partner Gateway V6.1 exploits the IPv6 support in the underlying WebSphere Application Server V6.1



IPv6 must be supported and enabled in the operating system where WebSphere Partner Gateway V6.1 is running. At the end of this presentation, the Reference section contains links on where to find information for configuring IPv6 on different operating systems.

WebSphere Partner Gateway V6.1 exploits the IPv6 support present in the WebSphere Application Server V6.1. The IPv6 support has been enabled in WebSphere Application Server V6.0.2 and beyond. Since WebSphere Partner Gateway V6.0 used WebSphere Application Server V6.0, there was no IPv6 support in WebSphere Partner Gateway V6.0.

Section

WebSphere Partner Gateway V6.1 support for IPv6

This section provides more details on IPv6 support added in WebSphere Partner Gateway V6.1

Support for IPv6 in V6.1

- WebSphere Partner Gateway V6.1 can use IPv6 addressing when installed on machines where IPv6 is supported by the operating system
- WebSphere Partner Gateway V6.1 exploits the IPv6 support in the underlying WebSphere Application Server V6.1
- Additional checks in V6.1 to support IPv6 are:
 - ▶ **Installation:** Validation when specifying the host IP address
 - ▶ **Console:** Validation when creating receivers and destinations that uses HTTP, FTP, POP3 transport protocol
 - ▶ Route the document from a machine that supports IPv6 address format to another machine that supports IPv6
- IPv6 address should be given in numeric format while creating targets or gateways and not the host name

WebSphere Application Server Version 6.1 supports a *dual mode* environment in which you can have some applications running on IPv4 and other applications running on IPv6. Additional checks are included during installation and in the administrative console while creating receivers and destinations that require you to specify a host name or IP address. When you are creating targets or gateways, you should give IPv6 addresses in numeric format rather than using the host name.

System Properties to control of use of IPv6

- IPv6 support is controlled by two Java™ system (OS) properties on machine hosting WebSphere Partner Gateway:
- ***java.net.preferIPv4Stack***
 - ▶ **False (default):** If IPv6 is available, the underlying native socket will be an IPv6 socket - this allows Java applications to connect too, and accept connections from, both IPv4 and IPv6 hosts
 - ▶ **True:** Only use IPv4 sockets - application will not be able to communicate with IPv6 hosts
- ***java.net.preferIPv6Addresses*** (valid only if `java.net.preferIPv4Stack = false`)
 - ▶ **False (default):** Even if IPv6 is available, continue to use IPv4 – this is more for backward compatibility
 - ▶ **True:** Use IPv6 addresses over IPv4 addresses
- These properties must be same on all the servers for the console, receiver and the document manager
- Default setting supports IPv6 and IPv4



IPv6 support is controlled by two Java system properties on machine hosting WebSphere Partner Gateway.

The first property is `java.net.preferIPv4Stack` which by default is set to false. If IPv6 is available on the operating system, the underlying native socket will be an IPv6 socket. This allows Java applications to connect to, and accept connections from, both IPv4 and IPv6 hosts. If an application has a preference to only use IPv4 sockets, then this property can be set to true. The implication is that the application will not be able to communicate with IPv6 hosts.

The second property is `java.net.preferIPv6Addresses` which by default is set to false. If IPv6 is available on the operating system, the default preference is to prefer an IPv4-mapped address over an IPv6 address. This is for compatibility reasons—for example, applications that depend on access to an IPv4-only service, or applications that depend on the representation of an IP address. This property can be set to true to change the preferences to use IPv6 addresses over IPv4 addresses. This allows applications to be tested and deployed in environments where the application is expected to connect to IPv6 services.

IPv4 and IPv6 Product Compatibility

Product	IPv4 Machine	IPv6 Machine
WebSphere Partner Gateway Components	Supported	Supported
DB2® / Oracle	Supported	Not Supported
MQSeries 5.3 (for any external communication)	Supported	Not Supported



This slide lists the table showing the compatibility of various products required by the WebSphere Partner Gateway to IPv4 and IPv6. Since IPv6 is set at the operating system level, when WebSphere Partner Gateway V6.1 uses IPv6, the database (DB2 or Oracle) will need to be on a separate machine because the databases do not support IPv6.

Section

Summary and References

This section provides a brief summary of the presentation.

References

- Java property settings in order to support IPv6
http://java.sun.com/j2se/1.4.2/docs/guide/net/ipv6_guide/
- Visit following URLs to find some more information on Operating systems which supports IPv6
<http://www.join.uni-muenster.de/Implementationen/Betriebssysteme.php?lang=en>
- Configuring Windows® 2003 and Windows XP for IPv6
<http://www.microsoft.com/windowsserver2003/techinfo/overview/ipv6faq.mspx>
- Configuring IPv6 for Red Hat Linux®
<http://www.tldp.org/HOWTO/Linux+IPv6-HOWTO/>
- Configuring IPv6 for AIX® V5.3
http://publib16.boulder.ibm.com/pseries/en_US/aixbman/commadm/HT_commadm_mki_ipv6.htm

WebSphere Partner Gateway V6.1 now supports IPv6. DB2 and Oracle do not have support for IPv6. So they cannot exist in a pure IPv6 environment and if the machine hosting your WebSphere Partner Gateway instance is going to be in a pure IPv6 environment, the databases cannot exist on the same machine. Also listed on this slide and the next slide are references that you can use to get more details on IPv6 and support for IPv6 in several other products.

References (cont.)

- Visit following URLs to find some more information on Operating systems which supports IPv6
<http://www.join.uni-muenster.de/Implementationen/Betriebssysteme.php?lang=en>
- IPv6 is not supported for MQ 5.3 with CSD08 or later.
<http://www-1.ibm.com/support/docview.wss?uid=swg21170755>
- Internet explorer does not support the URLs with IPv6 string literals:
<http://www.microsoft.com/technet/itsolutions/network/ipv6/ipv6faq.msp>
- RFC 2428 – FTP Commands specific for IPv6 communication
<http://www.rfc-archive.org/getrfc.php?rfc=2428>



Here are some more references to materials for IPv6.

Additional reference

Configuring IPv6

The next two slides provide more details on how to configure Windows and Red Hat Linux for IPv6.

Configuring Windows for IPv6

- Steps on how to configure Windows 2003 and XP for IPv6
 - ▶ Log on to the computer with a user account that has privileges to change network configuration
 - ▶ Click Start, click Control Panel, and then double-click Network Connections
 - ▶ Right-click any local area connection, and then click Properties
 - ▶ Click Install
 - ▶ In the Select Network Component Type dialog box, click Protocol, and then click Add
 - ▶ In the Select Network Protocol dialog box, click Microsoft® TCP/IP version 6, and then click OK
 - ▶ Click Close to save changes to your network connection
- URL for entire instructions:
<http://www.microsoft.com/windowsserver2003/techinfo/overview/ipv6faq.msp>



Here are the steps to configure IPv6 for Windows 2003 and XP. The URL links to the Website that contains more details on IPv6 configuration and support for Windows.

Configuring Red Hat Linux for IPv6

- Check whether IPv6 supports or not.
 - ▶ Go to **proc/net** directory and see the following sub directories related to IPv6
 - if_inet6 or ipv6_route
- How to enable machine on network IPv6. This for static IP configuration
 - ▶ Open the file `/etc/sysconfig/network` and add the following entry
 - **NETWORKING_IPV6=yes**
 - Save and exit
 - ▶ Open the file `/etc/sysconfig/network-scripts/ifcfg-eth0` and add the following entries
 - **IPv6INIT=yes**
 - **IPv6TO4INIT=yes**
 - ▶ Save and exit
 - ▶ Restart the network service by following command below.
 - **service network restart**
- Enabling FTP server (vsftpd) which comes default with Red Hat Enterprise Linux for IPv6
 - ▶ Open the file `etc/vsftpd/vsftpd.conf`
 - ▶ Add the following entries
 - **listen_IPv6=yes**
 - ▶ Comment the entry
 - **#listen=yes**
 - ▶ Restart the **vsftpd** server

These are the steps to configure Red Hat Linux to use IPv6.

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