

# Business Objects Product Suite

## IPv6 Support in BusinessObjects XI 3.1

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### Overview

With the growth of Internet Protocol Version 6 (IPv6) technology, demand for IPv6 compatible applications has increased. In response to this demand, Business Objects supports IPv6 in its newest product release BusinessObjects XI 3.1.

This white paper explains the story behind IPv6 and Business Objects' response to this new technical trend. Ideally, for Business Objects' customers who are planning to migrate to IPv6 in the near future, this support will make the transition to IPv6 easier.

This white paper also describes in detail the IPv6 support added to the newest Business Objects products. Next, it lists a few points customers must consider before deploying Business Objects products in an IPv6 environment. Finally, three IPv6 related enterprise deployments scenarios are explored.

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## Introduction

Today's global Internet and major computer networks are based on Internet Protocol Version 4 IPv4. As a well-established protocol, IPv4 has served the world for years. However, concerns over its limitations are increasing, such as the short supply of available IP addresses its complex routing table, and security issues. Because these problems originate from the design of IPv4, they can only be solved by major architecture level changes. , And so IPv6 was invented by IETF in the early 1990s

As the next generation network protocol, IPv6 provides these technical benefits:

- Long IP addresses  
IPv6 uses 128-bit long IP addresses instead of the current 32-bit addresses IPv4 is using. The whole IPv6 address space allows 340 **trillion, trillion, trillion** addresses. As a result, the world will have a nearly endless supply of IP addresses .
- Improved routing management  
IPv6 introduces the hierarchical addressing policy and adds more headers in network packets. This greatly simplifies routing table management and accelerates packet processing in the overall network.
- Automatic configuration  
IP addresses can be configured automatically. . As a result, new devices can be easily connected to an IPv6 network.
- Security  
IPv6 includes IPSec as mandatory. The encryption and authentication are built into the network communication.
- Mobility  
IPv6 provides extensive support for mobile devices.

Note: IPv6 is not backwards compatible with IPv4. Therefore, an IPv6-only host cannot directly communicate with an IPv4-only host, and vice versa.

The future of IPv6 is promising. Many countries have already taken big steps towards migrating to the IPv6 infrastructure. In the United States, the federal government set 2008 as the as a target for its network system to switch to IPv6. The U.S. Department of Defence (Dod) and some universities have switched to IPv6. In Japan, the Japanese telecommunication leader NTT announced in 2001 the first commercial Internet service supporting IPv6. China is developing its IPv6 based China's Next Generation Internet(CNGI), which currently connects 100 universities, 100 research institutes, and 100 companies in 20 different cities. Meanwhile, the IT industry leaders, such as Cisco, IBM, and Microsoft, all claim support for IPv6. According to most experts, IPv6

will be integrated into the current IPv4 infrastructure within the next 5 to 10 years and finally replace the IPv4 networks.

## Support for IPv6 in BusinessObjects XI 3.1

As of BusinessObjects XI 3.1, Business Objects products will be able to do the following:

- Accept and handle 128-bit IPv6 addresses
- Run on these environments: IPv6-only (IPv6 stack enabled, IPv4 stack disabled), IPv6/IPv4 mixed (both IPv6 stack and IPv4 stack enabled), and IPv4 only (IPv4 stack enabled, IPv6 stack disabled or uninstalled) hosts.

Although IPv6 will eventually replace IPv4, IPv4 may coexist with IPv6 for years to come for these reasons:

- Unavailability of IPv6 capable products  
Many hardware and software products are not yet IPv6 compatible. Customers must use many IPv4 based products for the time being.
- Legacy investment  
Replacing existing products with the new IPv6 capable ones means considerable extra cost for customers. Most customers will prefer to protect their current investment.
- Complex transition process  
Because IPv6 is not compatible with IPv4, the transition will affect the customers' network infrastructure and their regular business. A transition from IPv4 to IPv6 can only be implemented step by step.

Aware of these challenges, as a design requirement Business Objects products are able to run in IPv6-only, IPv6/IPv4 mixed and IPv4-only hosts. Business Objects products will automatically choose the proper protocol for network communication.

The communication rules between client and server are shown here:

		Servers		
		IPv4	IPv6	IPv6/IPv4 mixed
Clients	IPv4	Yes	No	Yes (IPv4)
	IPv6	No	Yes	Yes (IPv6)
	IPv6/IPv4 mixed	Yes (IPv4)	Yes (IPv6)	Yes (Based on the IP stack preference setting)

Business Objects products can be deployed on IPv6/IPv4 mixed hosts or IPv6-only hosts the same way that they are deployed on IPv4 only hosts. Application administrators don't need to change network settings (except where IP address binding is used).

When an organization is transitioning its network infrastructure from IPv4 to IPv6-only or an IPv6/IPv4 mixed environment, administrators

are NOT required to migrate objects or apply special server settings to accommodate Business Objects products. And any switch to a new IPv6-only environment, will be transparent to end-users of Business Objects products. However, end users will see that they are able to use numeric IPv6 addresses to access products in the IPv6/IPv4 mixed or IPv6-only environment.

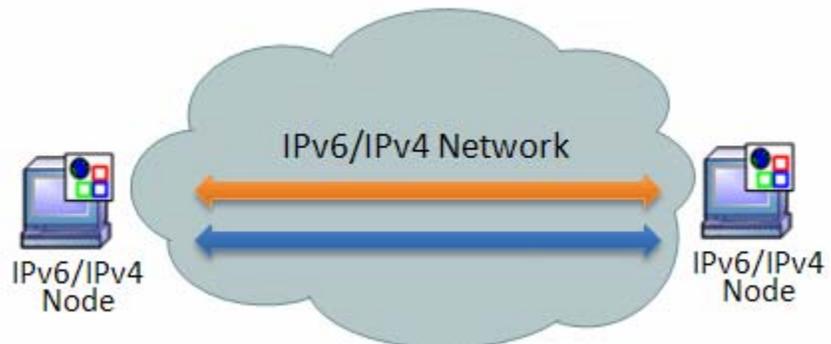
## Considerations on switching to IPv6

When an organization chooses to move to IPv6, its IT department must define a clear migration plan. From the software vendor's perspective, Business Objects recommends that the IT department to consider the following before creating the plan.

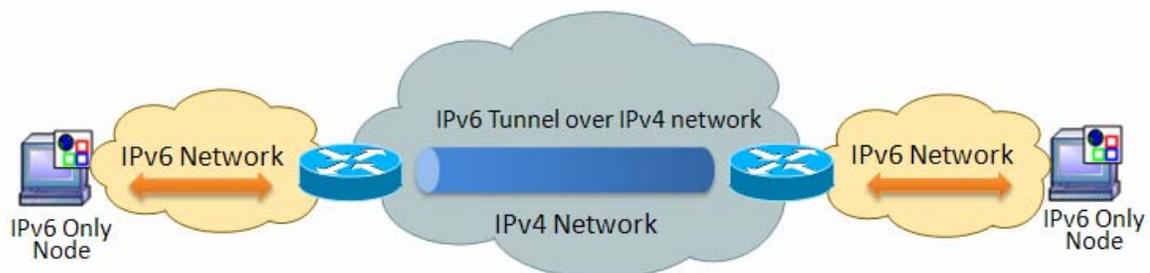
### Gradual network transition

Before fully moving to an IPv6-only network, an organization can migrate to a transition network environment so that both IPv4 based applications and IPv6 capable applications can work at the same time. Three transition mechanisms are currently available:

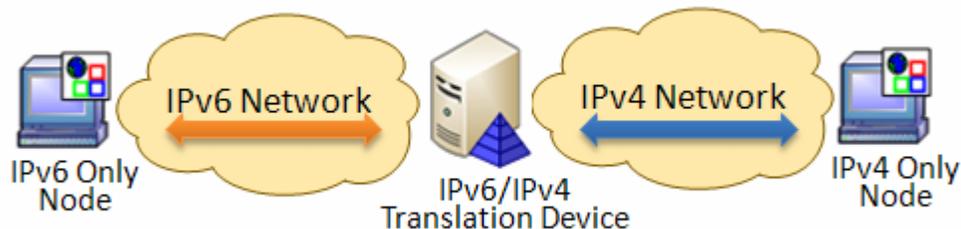
- IPv6/IPv4 dual stack  
All network devices (routers) and nodes (hosts) have both IPv4 and IPv6 stacks enabled.



- IPv6 over IPv4 tunneling  
When two IPv6-only nodes or networks communicate to each other, the IPv6 packet is embedded into IPv4 packets and transferred over the IPv4 backbone network.



- IPv6/IPv4 translation (NAT-PT and other translation tools)  
The IPv6/IPv4 translator is set between an IPv4-only network and an IPv6-only network. An IPv4 packet is translated to its IPv6 correspondent, and vice versa.



The IPv6/IPv4 dual stack and IPv6 over IPv4 tunneling are supported by Business Objects. IPv6/IPv4 translation is not currently supported for these reasons:

- The translation mechanism breaks the end-to-end communication between nodes. This drawback may cause security issues and single point failures.
- The IPv6/IPv4 translation technology is not mature and widely available. Translation techniques are varied, and no technique has become standard. The setup process is complex and confusing.
- The top IPv6/IPv4 translation technique, NAT-PT, has been deprecated. For more information, see RFC 2766 (<http://www.ietf.org/rfc/rfc2766.txt>) and RFC 4966 (<http://www.ietf.org/rfc/rfc4966.txt>).

For example, a Crystal Reports Designer cannot be deployed on an IPv6-only host to access the Central Management Server (CMS) deployed on an IPv4-only host.

## IPv6 addresses

When an IPv6 stack is enabled on a host machine, multiple IPv6 addresses are assigned to it. These addresses include the following:

- global unicast IPv6 addresses
- scope-local addresses
- link-local addresses
- Automatic Pseudo-Tunnel addresses

It is recommended to use the global unicast IPv6 address when using Business Objects products or when configuring the DNS system, unless using a IPv6/IPv4 tunneling technique such as ISATAP.

## DNS Configuration

The DNS configuration is key to using Business Objects products in IPv6 environment. This section explains how a DNS in an IPv6 environment must be configured to run Business Objects products.

DNS Server side:

- Make sure both forward and reverse name lookup are workable. Otherwise, some CMS logon issues may happen. To test the name lookups, use the following commands:
  - Windows: ping -6 fulldnsname
  - Solaris: ping -A inet6 fulldnsname
  - AIX: ping -a inet6 fulldnsname
  - HP: ping -f inet6 fulldnsname
  - Linux: ping6 fulldnsname
- Make sure the DNS system is aligned with the actual machine configuration. A common configuration mistake is that a server machine has only the IPv6 stack enabled while, in the DNS server, it has both IPv4 record and IPv6 record enabled. As a result, the client machine may first try to access the server machine by its IPv4 address and fail.

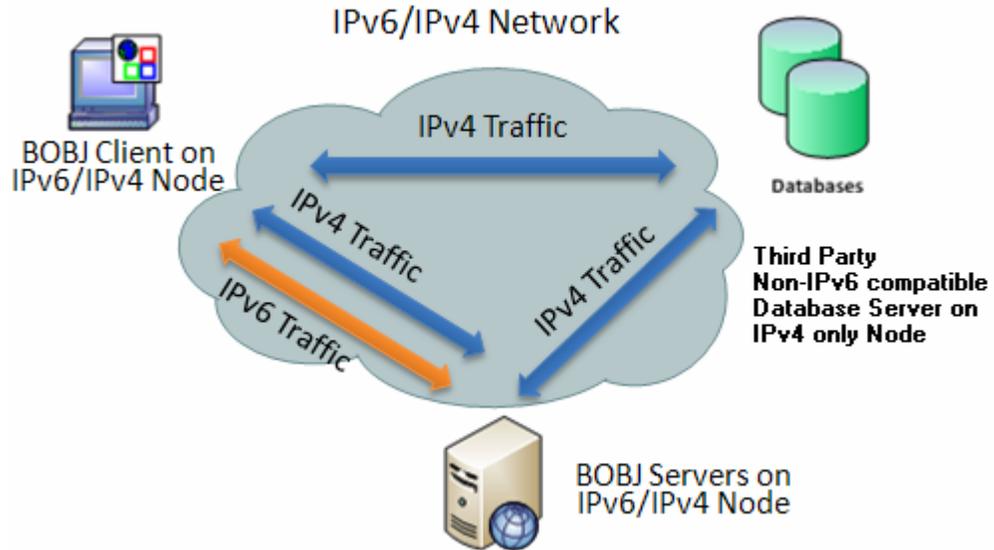
DNS Client side:

- Make sure the client machine can still resolve the DNS names when only the IPv6 stack is enabled. On Windows Vista, you can assign the DNS server's IPv6 address from the Network Properties dialog box.
- Make sure the client machine has the DNS suffix configured. The DNS suffix must match the one set on the DNS server. The DNS suffix can be configured in the Computer Properties dialog box in Windows XP and Vista.

## Third-party software products

When deploying Business Objects products in enterprise environments, customers must consider the availability of the IPv6 compatibility of other third-party software products. Not every software product is IPv6 compatible for now. For example, some RDBMS products or LDAP products may not support IPv6. Before migrating to IPv6, contact the corresponding software vendors to find out the IPv6 compatibility of the third-party software products being used.

If customers need to use Business Objects products along with other third-party products that do not support IPv6, deploying all products in the IPv6/IPv4 mixed network is a recommended solution. In such a case, Business Objects products can use IPv4 protocol to communicate with these third-party products.



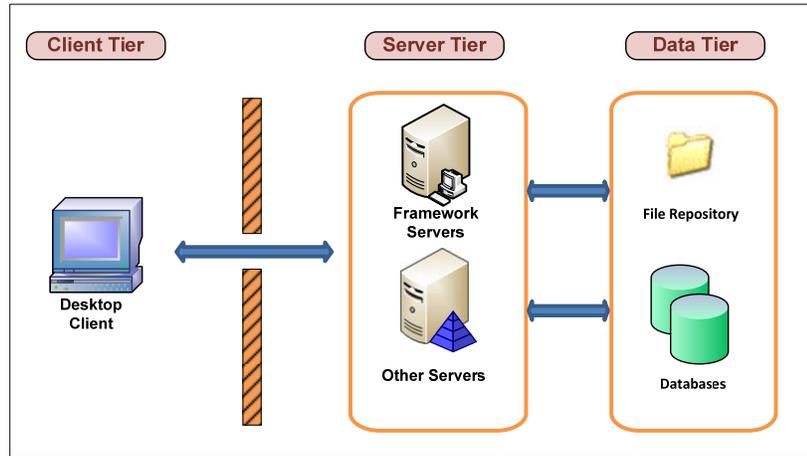
## Known limitations

- **SAP Integration Kit does not support IPv6 in BusinessObjects XI 3.1 yet.**
- **Desktop Intelligence does not support IPv6 in BusinessObjects XI 3.1 yet.**
- **Crystal Reports Processing Server and Report Application Server (RAS) requires IPv4 stack on Unix Platforms.**  
Due to the limitation of a third-party component used by the Crystal Reports Processing Server and RAS on Unix Platforms, these two Business Objects servers cannot yet support IPv6-only mode. On Unix platforms, the Crystal Reports Processing Server and RAS need the IPv4 stack enabled.
- **On Windows Vista/2008, JDK 5 has a known limitation.** To make the host machine an IPv6-only node when using Business Objects products, disable the IPv4 stack but keep the IPv4 stack installed. If the IPv4 stack is uninstalled, the Java based socket programs will throw exceptions when binding sockets. As a result, both Tomcat and Java based Business Objects clients/servers will fail to work properly. For more information, see JDK bug [6379550](#).
- **Disabling IPv4 stack on Windows 2003/XP is not recommended.** Because Windows 2003/XP only use IPv4 based messages to resolve DNS names, users must not disable the IPv4 stack. Otherwise, the IPv6 address must be used to access other

machines, instead of using DNS names. For more information, see IPv6 for Microsoft Windows Frequently Asked Questions.

## Enterprise Deployment Scenarios

### Enterprise Deployment with Firewall



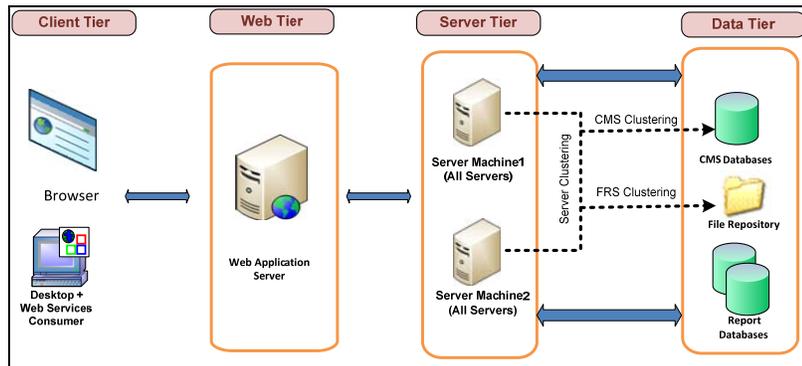
Validation:

- BusinessObjects Enterprise clients on an IPv6-only host machine can communicate with BusinessObjects Enterprise backend servers on IPv6-only host machines.
- BusinessObjects Enterprise clients on an IPv6/IPv4 mixed host machine can communicate with BusinessObjects Enterprise backend servers on IPv6/IPv4 mixed host machines.

Example Configuration:

Firewall:	Redhat Enterprise 5 with NetFilter as the firewall. For more information, see the <a href="#">Redhat Enterprise Linux 5 Deployment Guide</a> .
Client:	Windows Vista running as non-administrator
Server:	Windows 2008 Server, full install of BusinessObjects Enterprise XI 3.1

## Enterprise Deployment with Multiple Backend servers



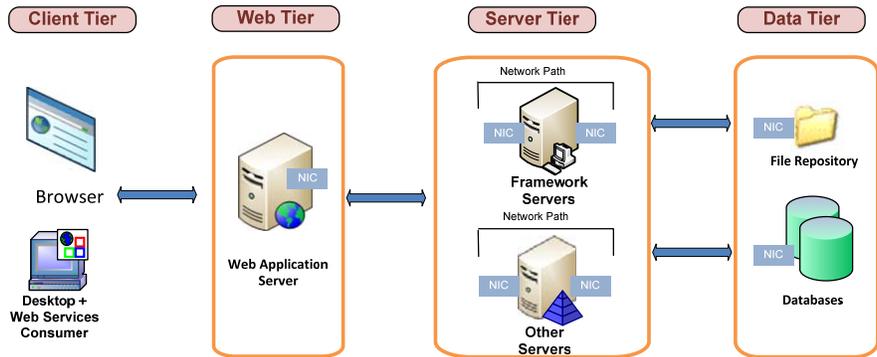
Validation:

- BusinessObjects Enterprise clients and browsers on an IPv6-only host machine can communicate with BusinessObjects Enterprise backend servers on IPv6-only host machines.
- BusinessObjects Enterprise clients and browsers on an IPv6/IPv4 mixed host machine can communicate with BusinessObjects Enterprise backend servers on IPV6/IPv4 mixed host machines.

Example Configuration:

Client:	Windows Vista running as non-administrator
Web Application Server:	Windows 2003 Enterprise Server SP2, Websphere 6.1
Server Machine 1	Windows 2003 Enterprise Server SP2, full install of BusinessObjects Enterprise XI 3.1, CMS cluster, and FRS cluster
Server Machine 2	Windows 2003 Enterprise Server SP2, full install of BusinessObjects Enterprise XI 3.1, CMS cluster, and FRS cluster
Database Server	Windows 2003 Enterprise Server SP2, Microsoft SQL Server 2005 SP1

## Enterprise Deployment with Multi-homed servers



Validation:

- BusinessObjects Enterprise clients and browsers on an IPv6-only host machine can communicate with BusinessObjects Enterprise backend servers on IPv6-only host machines.
- BusinessObjects Enterprise clients and browsers on an IPv6/IPv4 mixed host machine can communicate with BusinessObjects Enterprise backend servers on IPv6-only host machines.

Example Configuration:

Client:	Windows Vista running as non-administrator
Web Application Server:	Windows Vista, Tomcat 5
Server Machine 1	Windows 2008 Server, bind BusinessObjects Enterprise XI 3.1 servers to a specific IPv6 address.
Server Machine 2	Windows 2008 Server, bind BusinessObjects Enterprise XI 3.1 servers to a specific IPv6 address.
Database Server	Windows 2008 Server, Microsoft SQL Server 2005 SP1

## Conclusion

As the successor of IPv4, IPv6 offers an almost unlimited resource of IP addresses, a simplified network structure, automated configuration, integrated security, and built-in mobility. Because of its outstanding

advantages over IPv4, many organizations, including governments, are actively pushing the adoption of IPv6 by setting timelines for the transition or investing in the experimental IPv6 network backbone. The transition to IPv6 network not only requires the availability of IPv6 capable network devices, but also urges a high demand of IPv6 compatible applications.

As the leader of the Business Intelligence solutions, Business Objects has responded to this technical trend by supporting IPv6 in BusinessObjects XI 3.1. BusinessObjects XI 3.1 products accept IPv6 addresses and work in IPv6-only, IPv6/IPv4 mixed, and IPv4-only environment respectively. Although BusinessObjects XI 3.1 supports IPv6, customers still need to consider other factors, such as network transition mechanisms, and the availability of IPv6 capable third-party products, when transitioning to IPv6.

## Glossary

IPv4 -- Internet Protocol Version 4

IPv6 -- Internet Protocol Version 6

DNS -- Domain Name Server

IETF -- Internet Engineering Task Force

NAT-PT -- Network Address Translation - Protocol Translation

## Finding more information

For more information and resources, refer to the product documentation and visit the support area of the web site at

<http://support.businessobjects.com/>

▶ [www.businessobjects.com](http://www.businessobjects.com)

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