A10 Networks

■ **Deployment Guide**

A10 Networks/Infoblox Joint DNS64 and NAT64 Solution

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1   INTRODUCTION

A10 Networks and Infoblox offer a comprehensive and jointly tested solution—a high performance NAT64 gateway and full DNS64 service—that has already been deployed by enterprises and service providers. The solution is enhanced by each company's product features that allow enhanced security, optimized DNS support and scalability.

2   DEPLOYMENT GUIDE OVERVIEW

This deployment guide provides detailed instructions for configuring both the A10 Networks and Infoblox portions of the deployment. This basic configuration provides a simple setup of NAT64 that enables IPv6 clients to access IPv4 webservers and DNS64 for AAAA-to-A record conversions. The A10 Networks AX Series will provide the NAT64 solution and the Infoblox NIOS will provide the DNS64 services.

The AX Series also offers DNS Load Balancing, DNS64 Load Balancing, DNS Application Firewall and DNS Optimization.

3   LAB SETUP REQUIREMENTS

The lab setup has been configured with the following software versions:

- AX Series: AX 2500 2.6.4-P2 Build 140

- NIOS 6.1.0-121754

Note: NAT64 and DNS64 features are supported only on 64-bit ACOS models: AX 2500, AX 2600, AX 3000, AX 5100, and AX 5200.

4   ARCHITECTURE OVERVIEW

This document illustrates a joint solution of A10 Networks AX Series that provides the NAT64 solution and Infoblox NIOS appliance that provides a full DNS64 solution.
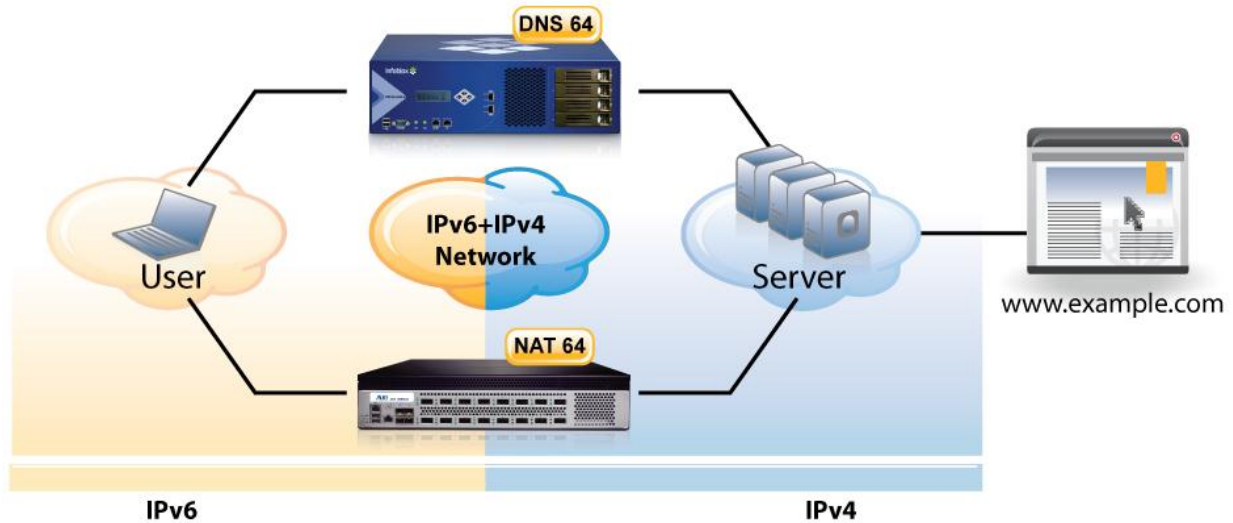

Figure 1: A10 and Infoblox solution

Figure 2 shows how DNS64 allows the resolution of addresses from the IPv4 network by creating synthesized AAAA records for hosts where no AAAA record is available. This is done by pairing a standards-based IPv6 prefix with the IPv4 address provided by an A record lookup. The IPv4 address is embedded within the last 32 bits of the IPv6 address.
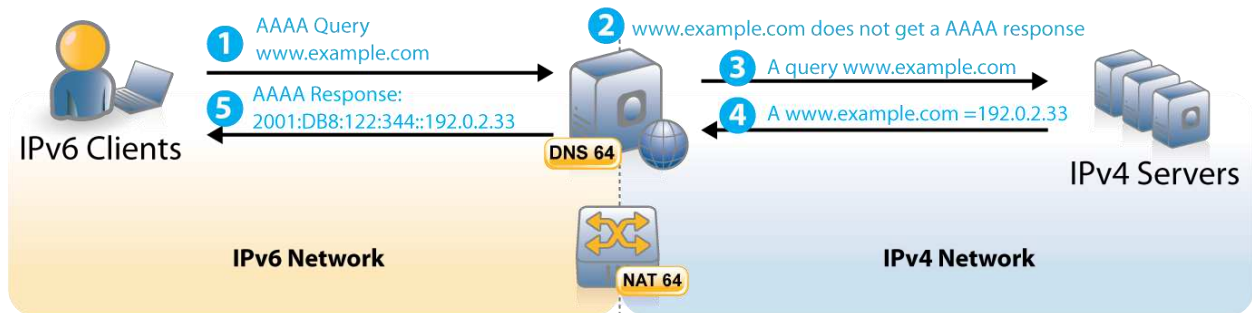

Figure 2: DNS64 resolving unknown hosts on IPv6 networks

5   ACCESS CREDENTIALS

The access credentials are the default settings within the AX Series and NIOS appliances.

A10 Networks AX Series access defaults:

- Default username is "admin".

- Default password is "a10".

- Default management IP address of the device is "172.31.31.31".

Infoblox NIOS access defaults:

- Default username is "admin".

- Default password is "infoblox".

- Default IP address of the device is "192.168.1.2".

Note: Both AX Series and NIOS appliances can support a Graphical User Interface (GUI) and Command Line User Interface (CLI).To access the CLI interfaces for both AX Series and NIOS, you will be required to use an SSH client such as putty.exe.

6   DNS64 AND NAT64 CONFIGURATION

Figure 3 shows the lab setup tested for this deployment. The configuration steps in this section provide:

- Simple and quick implementation to deploy NAT64 and DNS64 solutions

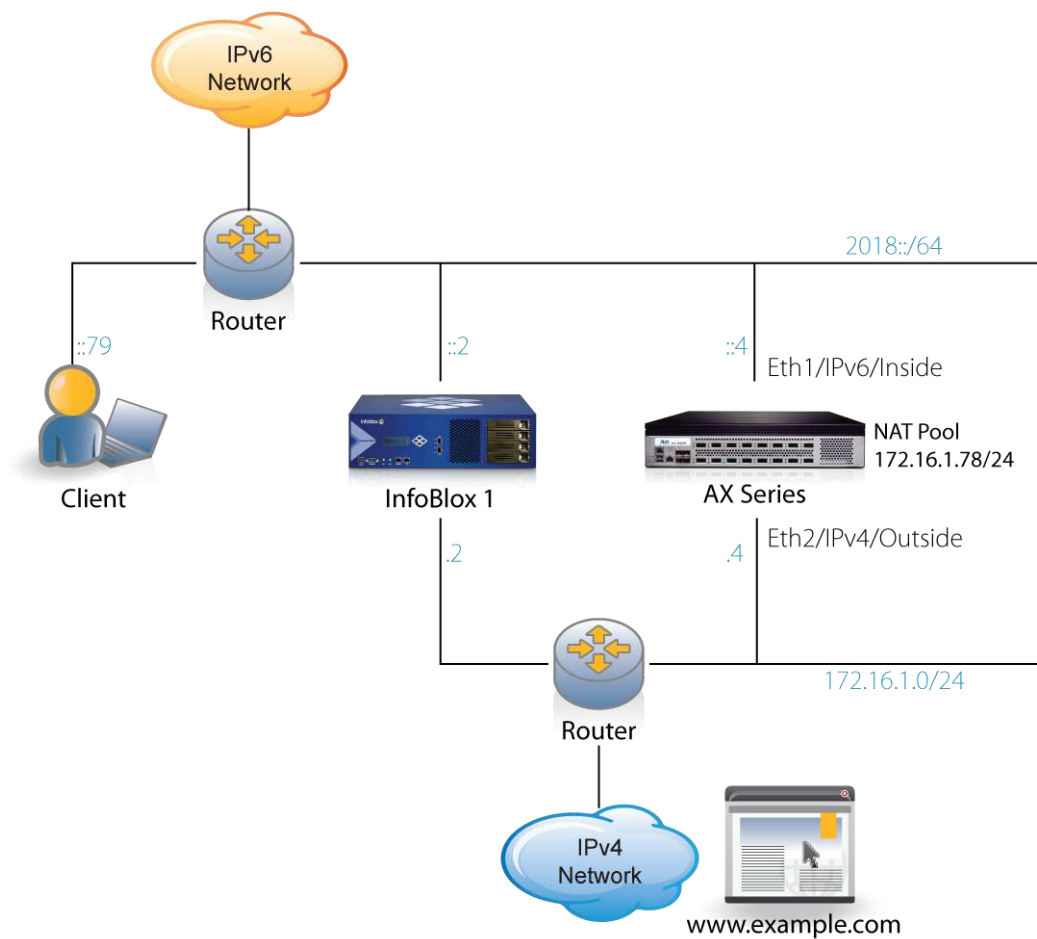- Seamless transition from IPv6 network to access IPv4 contents

Figure 3: NAT64 and DNS64 lab overview

6.1   CONFIGURATION OVERVIEW

This section provides the steps for configuring the following items:

- DNS64 NIOS

- NAT64 interface

- LSN NAT pool

- NAT64 LID

- Class list

- NAT64 global settings

6.1.1   ENABLING NAT64 ON NIOS

Note: This document assumes you have already set up the Infoblox system on the network and have enabled it to accept recursive DNS queries.

To configure the Infoblox NIOS for DNS64 configuration, log in to the NIOS appliance and navigate to **GRID > GRID Manager > DNS > Select the NIOS Appliance > Edit**.

1. Click **Basic**.
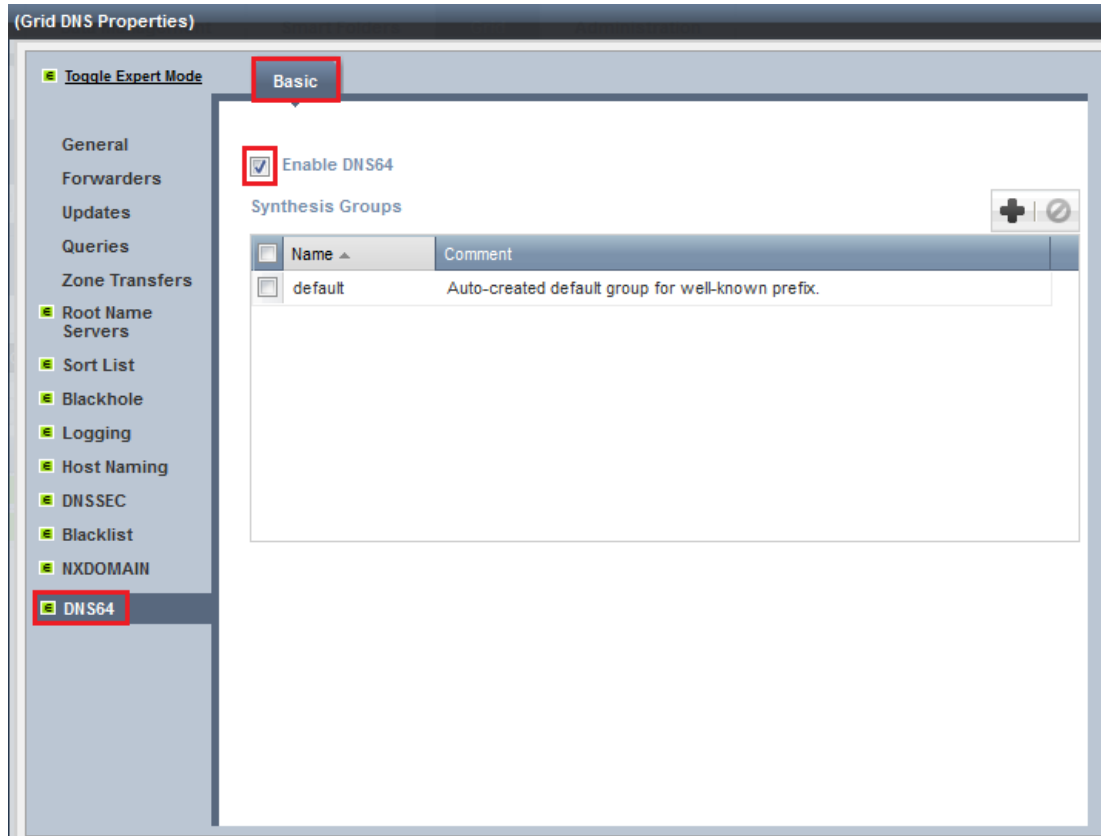
2. Click **DNS64**.

3. Select **Enable DNS64**.

Figure 4: Enabling DNS64 on NIOS

4. Click **OK** and save the configuration.

6.1.2 VERIFY DNS64 PREFIX

The DNS64 prefix must have the same value as NAT64 prefix for the solution to work. To verify that the prefix is correct, navigate to **Data Management > DNS > Grid DNS Properties**.

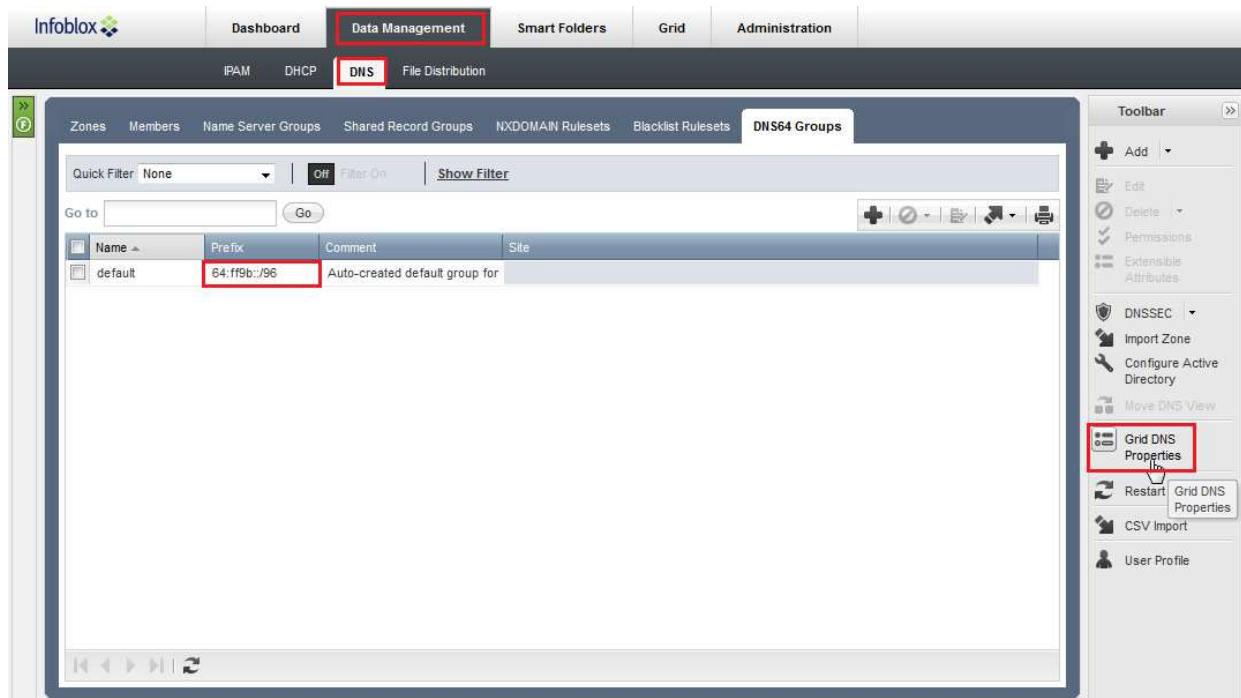In this example, the DNS64 prefix is configured as `64:ff9b::/96`.

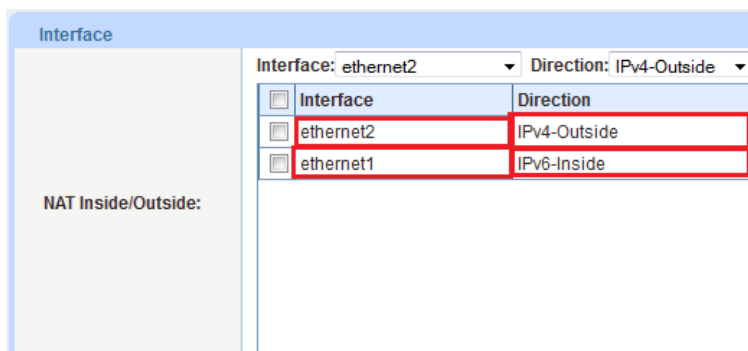*Figure 5: DNS64 prefix validation*

5. Click **OK** and save the configuration.

6. For detailed information as to how to configure the Infoblox NIOS appliance, refer to:

   http://ww2.infoblox.com/support/tech_lib/NIOS/NIOS_AdminGuide_6.1.0.pdf

6.1.3 NAT64 INTERFACE CONFIGURATION

To configure NAT64 features, log in to the AX Series and use the default login credentials above.

To configure the NAT64 interfaces, navigate to **Config Mode > Service > LSN > Interface**. From the **Interface** drop-down menu, select the interface required and direction as shown below:

Figure 6: Interface configuration

6.1.4 LSN NAT POOL CONFIGURATION

To configure the LSN NAT pool, navigate to **Config Mode > Service > LSN > LSN Pool**.

1. Click **Add**.

2. Enter the following information:

    ♦ **Name**: "nat64pool"

    ♦ **Start IP Address**: "172.16.1.78"

    ♦ **End IP Address**: "172.16.1.78"

    ♦ **Netmask**: "255.255.255.0"

Figure 7: LSN NAT poolcConfiguration

3. Click **OK** and save the configuration.

Note: One (1) IP address can support up to 64 K flows.

6.1.5 NAT64 LID CONFIGURATION

To configure the NAT64 Limit ID (LID), navigate to **Mode > Service > LSN > LID**.

1. Click **Add**.

2. Enter ID "1".

3. Select pool "nat64pool" from the **LSN Pool** drop-down list.

Figure 8: LID configuration

4. Click **OK** and save the configuration.

6.1.6 CLASS LIST CONFIGURATION

To configure the NAT64 class list, navigate to **Config Mode > Service > LSN > Class List**.

1. Click **Add**.

2. Enter the following information:

    ♦ Name: "nat64_clients"

    ♦ Location: **Config**

    ♦ IPv4/IPv6: **IPv6**

3. In the **Entry** section, enter the following information:

    ♦ **IPv6 address**: "::"

    ♦ **Prefix Length**: "0"

    ♦ **LID**: "1"

4. Click **Add** to add the configuration to the list.

Figure 9: Class list configuration

5. Click **OK** and save the configuration.

6.1.7 NAT64 GLOBAL CONFIGURATION

To configure the NAT64 global parameters, navigate to **Config Mode > Service > LSN > NAT64 > Global**.

1. In the **Global** section, next to **Prefix**, select **Well-known**.

2. In the **Class List Binding** section, select "nat64_clients", created earlier.

3. Click **OK** and save the configuration.

Note: For additional information as to how to configure the A10 Networks AX Series load balancers, refer to: https://www.a10support.com/support-axseries/techlibrary.php. Login credentials are required to download the materials.

6.1.8 NAT64 CONFIGURATION VALIDATION

To validate that the NAT64 configuration works, use the putty.exe application and login to the AX Series. Generate traffic first, then enter the **show session** command.

Query Explanation:

Forward Source:	Forward Destination:	Reverse Source	Reverse Destination
Real Client IPv6	NAT64 Server IPv6	Real Server IPv4	LSN Client IPv4

```
Prot Forward Source        Forward Dest          Reverse Source    Reverse Dest        Age  Hash  Flags
------------------------------------------------------------------------------------------------------
Tcp  [2018::79]:60294      [64:ff9b::4a7d:e092]:80  74.125.224.146:80  192.168.18.78:60294  300  1    NS
Total Sessions:       1
AX-Infoblox#
```

Figure 10: Show session output

6.1.9 DNS64 CONFIGURATION VALIDATION

To validate that the DNS64 is configuration works, open a command shell from the IPv6 client. Use the **nslookup** command and enter the domain address.

If a prefix of `64:ff9b:` appears from the **nslookup** query, the Infoblox DNS64 appliance is working.

```
> www.blackboard.com
Server:  UnKnown
Address: 2020::73

Non-authoritative answer:
Name:    www.blackboard.com
Addresses: 64:ff9b::45c4:f4ab
           69.196.244.171
```

Figure 11: Nslookup validation

For additional software to test your DNS64 solution, download "dig" at:

http://ftp.isc.org/isc/bind9/9.7.3/BIND9.7.3.zip

7   CONCLUSION

The A10 Networks and Infoblox joint solution enables IPv6 migration while ensuring users can still retrieve IPv4-only content and connect to other IPv4 resources as needed. By choosing A10 Networks and Infoblox, customers are assured of a tested, quick solution and a certified solution from proven technology leaders.

A10 Networks and Infoblox provide new, reliable and innovative functionality that enables a competitive advantage to companies, ensuring new services can be available and no opportunities are missed as IPv6 becomes standard.