



ILLB-INBOUND DNS BASED LINK LOAD BALANCING

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Over View

A common inquiry we receive is whether or not any of our solutions have the capability to automate switching **inbound traffic** between common office WAN Internet connections, such as DSL, Cable and Lease lines. The quick answer is "absolutely!" Total Uptime Failover solutions are perfect for automatically failing inbound traffic over these types of WAN links if your organization has something that needs to be accessed externally, like a Remote Desktop server, mail server, web server, VPN or almost any IP accessible device.

In Other word - Inbound Link Load Balancing distributes inbound data traffic over multiple WAN links to computers/servers behind NetXGATE NextGen Firewall. This brings in an additional responsibility of ensuring continuous availability of the application from outside --from the Internet.

- Traditionally such a problem is addressed by BGP. This is always preceded by obtaining an Autonomous Number from respective NIC.
- This approach, compared to BGP-based solution, is cost-effective and operator independent.

Prerequisites

Configure the NetXGATE NGFW as Authoritative DNS for domain "example.com" means NetxGATE will hold all DNS records (**A, MX, CNAME, TXT** etc) for the domain. You would need to modify the NS records on Domain Registrar (The company that you purchased the domain name, such as Bigrock etc), and point the NS records to NetXGATE's IP which defined as DNS Server.

Configure Inbound DNS load balancing and Failover : ILLB

You can add multiple DNS host entries for a single website hosted behind NetXGATE NG Series Firewall, which enables Inbound DNS load balancing.

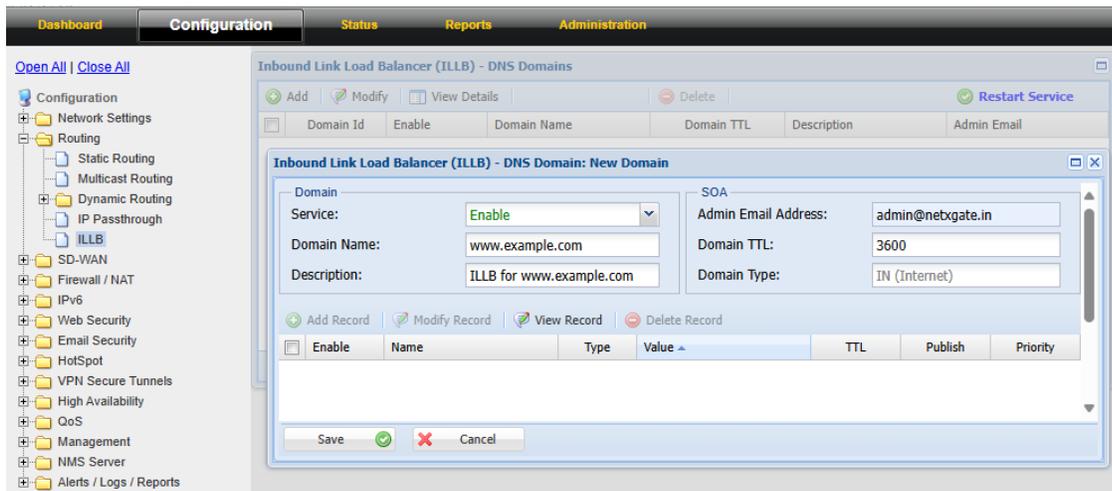
NetXGATE Firewall acts as a DNS name server that provides the requesting endpoint computer with 'A' records to resolve their requested URL. Adding multiple DNS host entries for a single website hosted behind the firewall allows inbound DNS traffic to be distributed over multiple WAN links and provides failover for an unreachable or dead interface.

First, configure a DNS host entry for the website/Sub-Domain . Specify multiple WAN IP addresses to turn on Inbound load balancing and failover. Do as follows:

Step 1-

1. Login in the Firewall .
2. Click on **Configuration** and Navigate to **Routing** Settings tab.
3. Choose and click on the **ILLB** , new window will appears with name '**Inbound Link Load balancing (ILLB) - DNS Domain**
4. Click on **+** (Add) icon to add configuration, again a new window appears with name '**Inbound Link Load balancing -DNS Domain: New Domain**'
5. Under Domain table, Enable **Service** (Default value- Enable)
6. Enter < Sub domain name > in **Domain name** Field and Its **Description**
7. Under SOA table, Mention **Admin Email Address** . Left the **Domain TTL** as default value .

Note- This configuration is Mainly for SOA record .



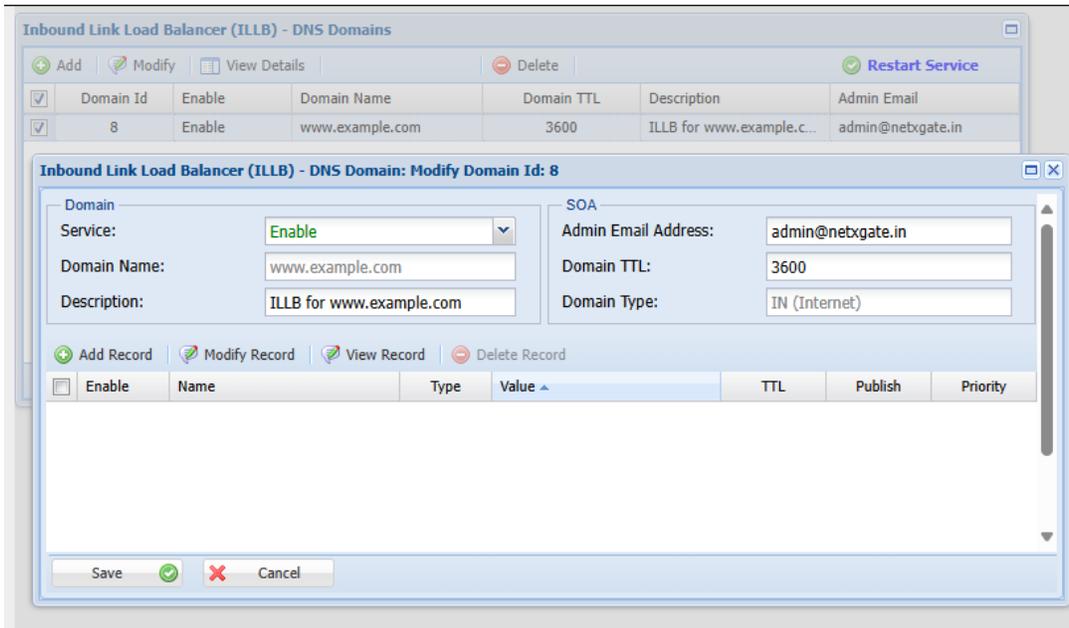
Once finished, Click **Save** to the continue.

Step-2

Creating DNS Records

To create new DNS records for a domain, perform the following steps:

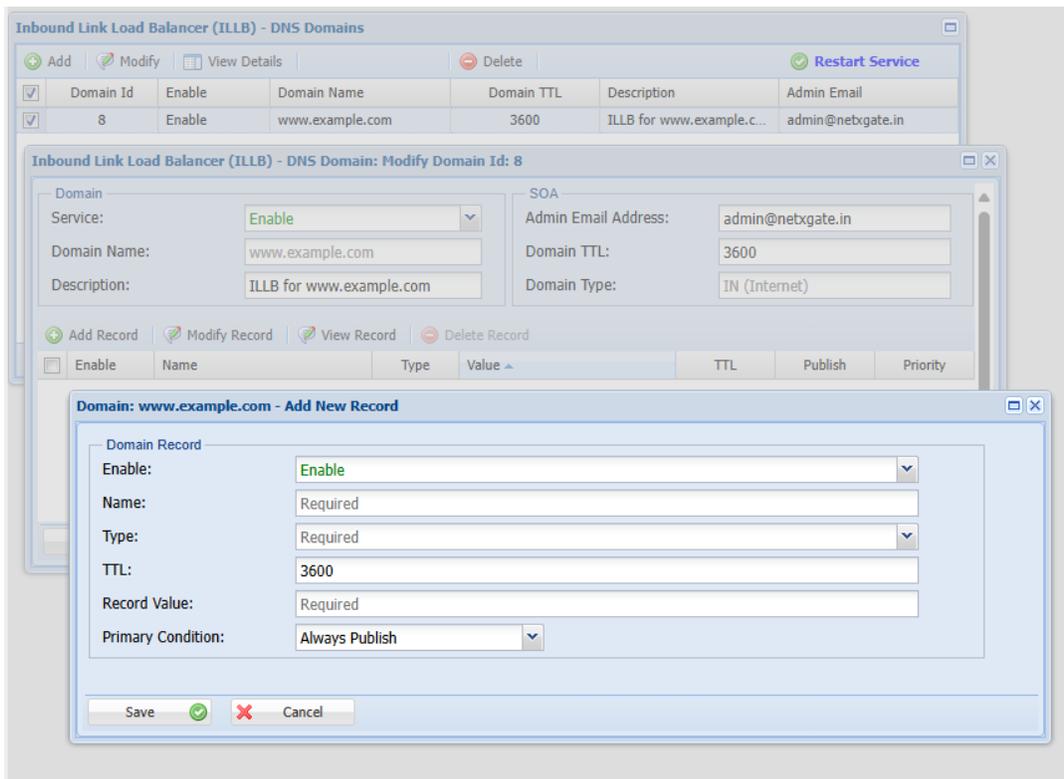
1. Select the Newly created domain and Click to **Modify**, A new window with name '**Inbound Link Load balance (ILLB)-DNS Domain: Modify Domain Id**' will be displayed as shown below Pic.



Note- This page is for defining the domain's SOA like A, NS, MX, TXT, CNAME and PTR ,records. Table is presented in this page for defining the Six types of records.

2. Click on **+** (Add Record) icon to add A record and NS record , new window appears with name **"Domain ' www.example.com'- Add New Record "**

Note- In your case domain Name can be different.



3. Enter <Sub domain name> in name Field. Example: `www.example.com`
4. Select 'NS' under Type.

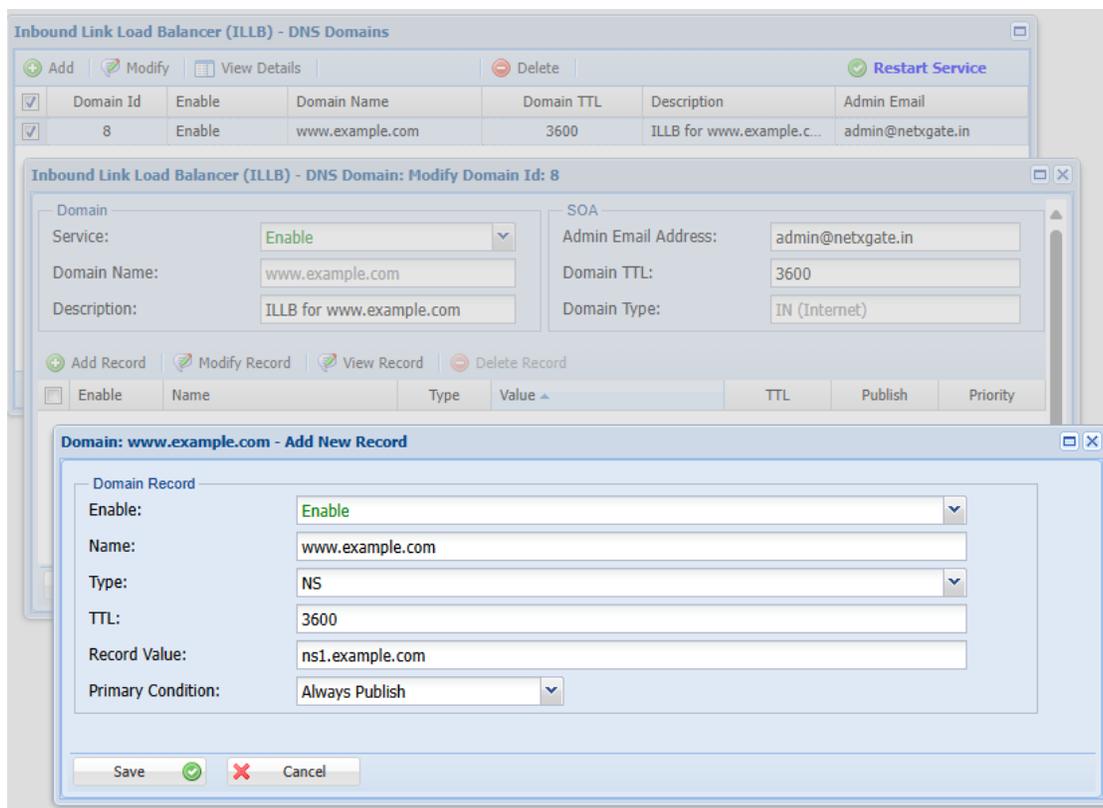
Note- Here you will get multiple Record Type. First, we selected '**Name Server**' type

5. TTL value - < Default-3600>.
6. Record value - Name Server name as defined in SOA record and configured over domain Provider 'DNS Management'. Example: `ns1.example.com`.

Note- In your case Name Server record value can be different

7. Primary condition – Always Publish < default value>.

Click **Save**.



The screenshot displays the 'Inbound Link Load Balancer (ILLB) - DNS Domains' management interface. It features a table of domains and two configuration windows. The top window shows a domain 'www.example.com' with a TTL of 3600 and description 'ILLB for www.example.c...'. The middle window, titled 'Modify Domain Id: 8', shows the domain settings: Service (Enable), Domain Name (www.example.com), Description (ILLB for www.example.com), SOA Admin Email Address (admin@netxgate.in), Domain TTL (3600), and Domain Type (IN (Internet)). The bottom window, titled 'Domain: www.example.com - Add New Record', shows the record configuration: Enable (Enable), Name (www.example.com), Type (NS), TTL (3600), Record Value (ns1.example.com), and Primary Condition (Always Publish). Buttons for 'Save' and 'Cancel' are visible at the bottom of the record window.

Similarly, can be configure for `ns2.example.com` (if available)

Note- The DNS records of type "NS" delegate the resolution of hostname `www.example.com` to two places: `ns1` and `ns2`

- `ns1` represents the hostname at which NetXGATE can be reached via its WAN1 connection.
- `ns2` represents the hostname at which NetXGATE can be reached via its WAN2 connection.
- Both `ns1` and `ns2` are returned as the result of the DNS query.

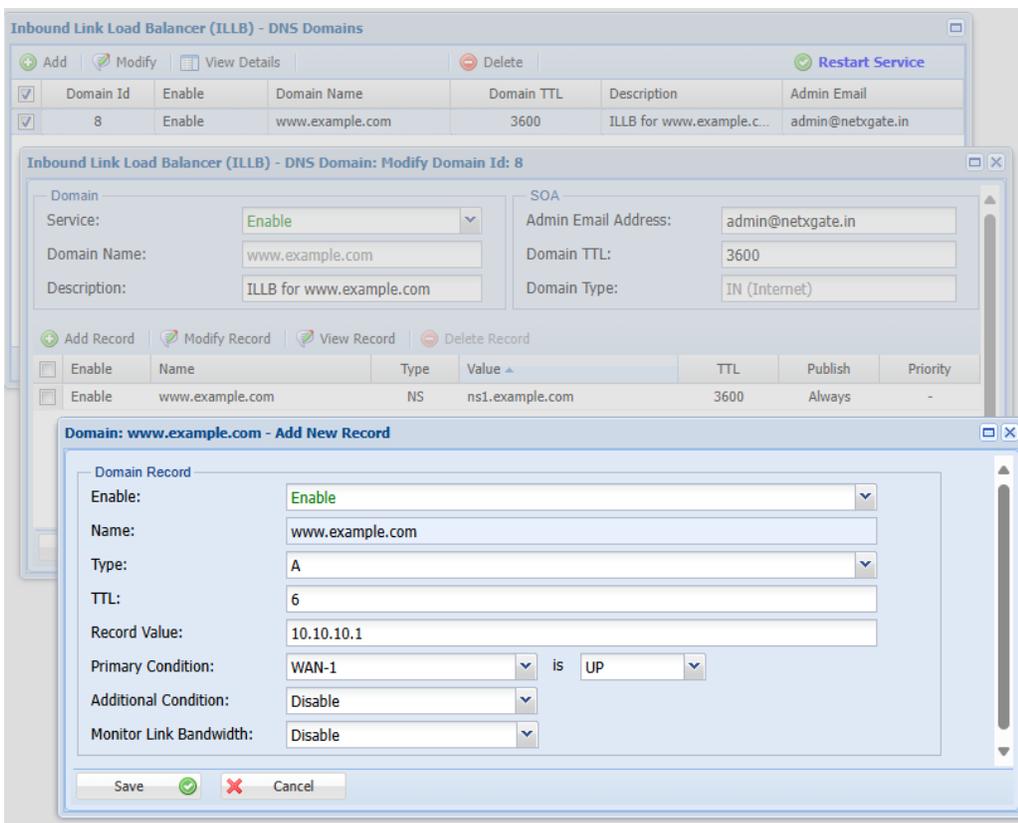
Note- The client computer first sends a DNS query to **ns1** of NetXGATE to resolve **www.example.com**. If the **WAN1** connection is down, this query will fail. However, because the DNS protocol includes built-in redundancy, automatically it send the query to **ns2** as the next resolver, allowing the hostname **www.example.com** to be resolved successfully if the second path is available.

Step-3

Now need to configure 'A' record value for that Host or Sub Domain 'www.example.com'.

To add an 'A' record,

1. Click on **+** (Add Record) icon, Again Similar new window will appears with name 'Domain 'www.example.com'- Add New Record'.



2- In Name field – Enter the sub domain name

Note - This field specifies the A record of this sub-domain to be served by the NetXGATE Firewall.

3- Select 'A' under Type

4- TTL - 6

Note - This setting specifies the time to live of this record in external DNS caches. In order to reflect any dynamic changes on the IP addresses in case of link failure and recovery, this value should be set to a smaller value. E.g. 5 secs, 60 secs, etc.

5- Record Value - < Sub Domain Primary A record>

Note- This setting specifies lists of **WAN-specific Internet IP addresses** that are candidates to be returned when the NetxGATE Firewall responds to DNS queries for the domain name specified by Host Name. **The record Value are the Internet IP addresses associated with each of the WAN connections.**

6- Primary Connection - In first field , it will be the same WAN Link whose IP / record value we mentioned above. E.g. '**WAN1**' & second Field will be '**UP**'

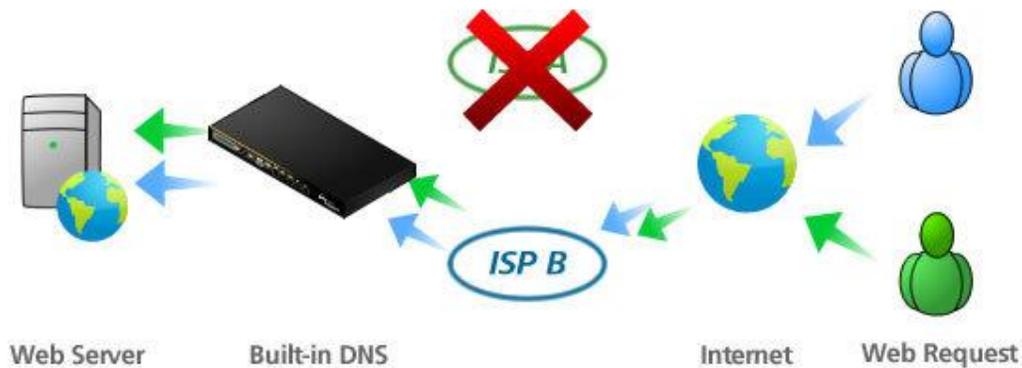
Note- If a WAN-1 connection is UP , the corresponding set of IP addresses will be returned. And If the If a WAN-1 connection is Down, the corresponding set of IP addresses will not be returned.

7- Similarly , need to follow same procedure to configure the Secondary WAN Link 'A' record type.

Note- Can be configure 3 or more WAN link / IP for redundancy.

NetXGATE, upon receiving the DNS query, responds to the client computer with the IP addresses of 'www.example.com' that correspond to the available WAN links. For example:

- If both WAN1 and WAN2 are available, then both the IP address that corresponds to WAN1 and that of WAN2 are returned. (May apply more condition)
- If WAN1 is available but WAN2 is down, then the IP address that corresponds to WAN1 is returned, but that of WAN2 is not returned.
- Additional condition can also apply as per requirement.



Step -4

Testing

From a host on the Internet, use an IP address of NetXGATE and nslookup to lookup the corresponding hostname. Check if the returned IP addresses are the desired addresses for the host name. The following is a sample Windows nslookup.