

## Using forwarders

DNS servers can be configured to send all recursive queries to a selected list of servers, known as forwarders. Servers used in the list of forwarders provide recursive lookup for any queries that a DNS server receives that it cannot answer based on its local zones. During the forwarding process, a DNS server configured to use forwarders (either one or more servers, based upon the forwarders list) essentially behaves as a DNS client to its forwarders.

## Benefits of using forwarders

Forwarders are often desirable when access to remote DNS servers requires use of a slow link, such as a fast-speed internal network linked to the Internet over a relatively low-speed connection. Using forwarders in this situation can cut down on expensive traffic over the low-speed link in two ways:

1. **Reduce the number of overall queries that get sent across the slow link** — for example, if your DNS server has a slow, expensive dial-up connection to an Internet service provider (ISP).

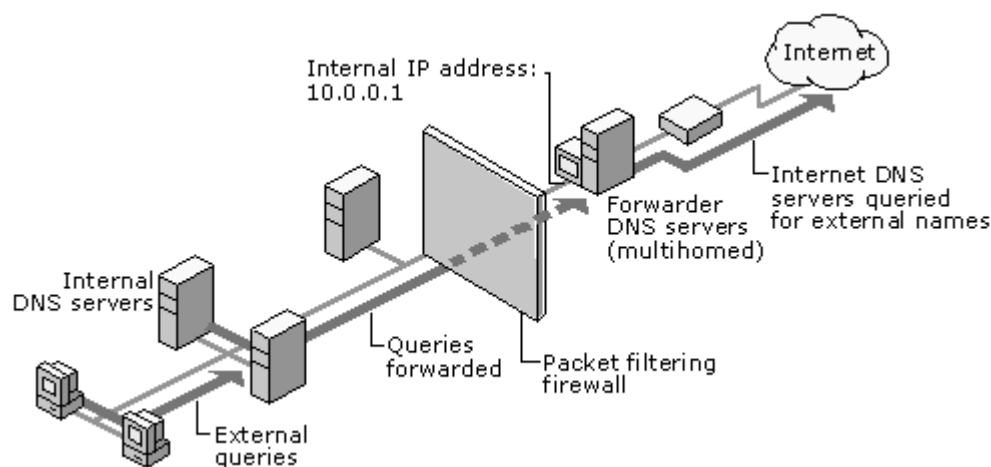
When the DNS server used as a forwarder for your internal network receives a query for a remote name on the Internet, it can directly contact remote servers on the Internet. It can repeat additional queries until it determines the authoritative server for the name. Once it finds the authoritative server, the forwarder contacts it and receives a complete response.

Another option that can reduce traffic is using a DNS server on the Internet as a forwarder. Before deciding on this configuration, obtain permission to use an Internet DNS server as your designated forwarder, such as a server managed by your ISP. In this configuration, the DNS server at your ISP is forwarded all remote queries once and responds only when it has the complete answer. Each query represents a single round-trip across the slow link.

2. **Share remote results on your local network.**

Forwarders provide a way to share information about remote names with a group of DNS servers located in the same area. For example, assume your organization has several DNS servers on a LAN. Rather than having each server send queries through a firewall and out to the Internet, all DNS servers are configured to forward queries to one DNS server (perhaps sitting on the firewall) that makes the necessary queries to the remote servers. In the process, the forwarder builds up a cache of Internet DNS names from the responses it receives. Over time, as local DNS servers continue to forward queries to it, the forwarder answers more queries from its cache because it begins to have an increasing number of answers based on previous queries for the same or similar names.

As shown in the following graphic, a forwarder is typically used in a barrier or firewall that exists between your network and the Internet. However, this is just one suggested configuration and not a requirement for using forwarders.



When a list of forwarders is configured, listed servers are identified by IP address. The first server listed should be preferred and used primarily to build a local cache. Generally speaking, however, more than one forwarder should be listed. Each server on the list is only tried once and any additional retry attempts to the same server can only be caused by repeating its IP address in the list.

If a DNS server is not configured to use forwarders, it uses the normal iterative query process to answer recursive queries for remote names.

## Using forwarders exclusively (no recursion)

When a DNS server is configured to use forwarders, they are used before any other means of resolving a name is tried. If the list of forwarders fails to provide a positive answer, a DNS server can attempt to resolve the query itself using iterative queries and standard recursion.

A server can also be configured to not perform recursion after forwarders fail. In this configuration, the server does not attempt any further recursive queries itself to resolve the name. Instead, it fails the query if it does not get a successful query response from any of the forwarders.

This forces a DNS server to use its configured forwarders exclusively to perform final resolution when resolving a name query. In this mode of operation, a server configured to use forwarders can still check in its configured zones first to attempt to resolve a queried name. If it finds a match in its authoritative data there, it can answer the query based on that information.

To use this option, select the **Do not use recursion** option on the **Forwarders** tab when a server is configured to use forwarders.

### Note

- When using forwarders, queries are sent to each forwarder in the list, which is given a time-out value, in seconds, within which it must respond before the next forwarder is tried.