

Section 17 - The dnslookup router

17. The dnslookup router

The dnslookup router looks up the hosts that handle mail for the recipient's domain in the DNS. A transport must always be set for this router, unless `verify_only` is set.

If SRV support is configured (see `check_srv` below), Exim first searches for SRV records. If none are found, or if SRV support is not configured, MX records are looked up. If no MX records exist, address records are sought. However, `mx_domains` can be set to disable the direct use of address records.

MX records of equal priority are sorted by Exim into a random order. Exim then looks for address records for the host names obtained from MX or SRV records. When a host has more than one IP address, they are sorted into a random order, except that IPv6 addresses are always sorted before IPv4 addresses. If all the IP addresses found are discarded by a setting of the `ignore_target_hosts` generic option, the router declines.

Unless they have the highest priority (lowest MX value), MX records that point to the local host, or to any host name that matches `hosts_treat_as_local`, are discarded, together with any other MX records of equal or lower priority.

If the host pointed to by the highest priority MX record, or looked up as an address record, is the local host, or matches `hosts_treat_as_local`, what happens is controlled by the generic `self` option. **17.1 Problems with DNS lookups**

There have been problems with DNS servers when SRV records are looked up. Some mis-behaving servers return a DNS error or timeout when a non-existent SRV record is sought. Similar problems have in the past been reported for MX records. The global `dns_again_means_nonexist` option can help with this problem, but it is heavy-handed because it is a global option.

For this reason, there are two options, `srv_fail_domains` and `mx_fail_domains`, that control what happens when a DNS lookup in a dnslookup router results in a DNS failure or a "try again" response. If an attempt to look up an SRV or MX record causes one of these results, and the domain matches the relevant list, Exim behaves as if the DNS had responded "no such record". In the case of an SRV lookup, this means that the router proceeds to look for MX records; in the case of an MX lookup, it proceeds to look for A or AAAA records, unless the domain matches `mx_domains`, in which case routing fails. **17.2 Private options for dnslookup**

The private options for the dnslookup router are as follows:

`check_secondary_mxUse: dnslookupType: booleanDefault: false`

If this option is set, the router declines unless the local host is found in (and removed from) the list of hosts obtained by MX lookup. This can be used to process domains for which the local host is a secondary mail exchanger differently to other domains. The way in which Exim decides whether a host is the local host is described in section 13.8.

`check_srvUse: dnslookupType: string†Default: unset`

The dnslookup router supports the use of SRV records (see RFC 2782) in addition to MX and address records. The support is disabled by default. To enable SRV support, set the `check_srv` option to the name of the service required. For example, `check_srv = smtp`

looks for SRV records that refer to the normal `smtp` service. The option is expanded, so the service name can vary from message to message or address to address. This might be helpful if SRV records are being used for a submission service. If the expansion is forced to fail, the `check_srv` option is ignored, and the router proceeds to look for MX records in the normal way.

When the expansion succeeds, the router searches first for SRV records for the given service (it assumes TCP protocol). A single SRV record with a host name that consists of just a single dot indicates "no such service for this domain"; if this is encountered, the router declines. If other kinds of SRV record are found, they are used to construct a host list for delivery according to the rules of RFC 2782. MX records are not sought in this case.

When no SRV records are found, MX records (and address records) are sought in the traditional way. In other words, SRV records take precedence over MX records, just as MX records take precedence over address records. Note that this behaviour is not sanctioned by RFC 2782, though a previous draft RFC defined it. It is apparently believed that MX records are sufficient for email and that SRV records should not be used for this purpose. However, SRV records have an additional "weight" feature which some people might find useful when trying to split an SMTP load

between hosts of different power.

See section 17.1 above for a discussion of Exim's behaviour when there is a DNS lookup error.

```
mx_domainsUse: dnslookupType: domain list&dagger;Default: unset
```

A domain that matches `mx_domains` is required to have either an MX or an SRV record in order to be recognised. (The name of this option could be improved.) For example, if all the mail hosts in `fict.example` are known to have MX records, except for those in `discworld.fict.example`, you could use this setting: `mx_domains = ! *.discworld.fict.example : *.fict.example`

This specifies that messages addressed to a domain that matches the list but has no MX record should be bounced immediately instead of being routed using the address record.

```
mx_fail_domainsUse: dnslookupType: domain list&dagger;Default: unset
```

If the DNS lookup for MX records for one of the domains in this list causes a DNS lookup error, Exim behaves as if no MX records were found. See section 17.1 for more discussion.

```
qualify_singleUse: dnslookupType: booleanDefault: true
```

When this option is true, the resolver option `RES_DEFNAMES` is set for DNS lookups. Typically, but not standardly, this causes the resolver to qualify single-component names with the default domain. For example, on a machine called `dictionary.ref.example`, the domain `thesaurus` would be changed to `thesaurus.ref.example` inside the resolver. For details of what your resolver actually does, consult your man pages for `resolver` and `resolv.conf`.

```
rewrite_headersUse: dnslookupType: booleanDefault: true
```

If the domain name in the address that is being processed is not fully qualified, it may be expanded to its full form by a DNS lookup. For example, if an address is specified as `dormouse@teaparty`, the domain might be expanded to `teaparty.wonderland.fict.example`. Domain expansion can also occur as a result of setting the `widen_domains` option. If `rewrite_headers` is true, all occurrences of the abbreviated domain name in any `Bcc:`, `Cc:`, `From:`, `Reply-to:`, `Sender:`, and `To:` header lines of the message are rewritten with the full domain name.

This option should be turned off only when it is known that no message is ever going to be sent outside an environment where the abbreviation makes sense.

When an MX record is looked up in the DNS and matches a wildcard record, name servers normally return a record containing the name that has been looked up, making it impossible to detect whether a wildcard was present or not. However, some name servers have recently been seen to return the wildcard entry. If the name returned by a DNS lookup begins with an asterisk, it is not used for header rewriting.

```
same_domain_copy_routingUse: dnslookupType: booleanDefault: false
```

Addresses with the same domain are normally routed by the `dnslookup` router to the same list of hosts. However, this cannot be presumed, because the router options and preconditions may refer to the local part of the address. By default, therefore, Exim routes each address in a message independently. DNS servers run caches, so repeated DNS lookups are not normally expensive, and in any case, personal messages rarely have more than a few recipients.

If you are running mailing lists with large numbers of subscribers at the same domain, and you are using a `dnslookup` router which is independent of the local part, you can set `same_domain_copy_routing` to bypass repeated DNS lookups for identical domains in one message. In this case, when `dnslookup` routes an address to a remote transport, any other unrouted addresses in the message that have the same domain are automatically given the same routing without processing them independently, provided the following conditions are met:

-

No router that processed the address specified `headers_add` or `headers_remove`.

-

The router did not change the address in any way, for example, by "widening" the domain.

```
search_parentsUse: dnslookupType: booleanDefault: false
```

When this option is true, the resolver option `RES_DNSRCH` is set for DNS lookups. This is different from the

`qualify_single` option in that it applies to domains containing dots. Typically, but not standardly, it causes the resolver to search for the name in the current domain and in parent domains. For example, on a machine in the `fict.example` domain, if looking up `teaparty.wonderland` failed, the resolver would try `teaparty.wonderland.fict.example`. For details of what your resolver actually does, consult your man pages for `resolver` and `resolv.conf`.

Setting this option true can cause problems in domains that have a wildcard MX record, because any domain that does not have its own MX record matches the local wildcard.

```
srv_fail_domainsUse: dnslookupType: domain list&dagger;Default: unset
```

If the DNS lookup for SRV records for one of the domains in this list causes a DNS lookup error, Exim behaves as if no SRV records were found. See section 17.1 for more discussion.

```
widen_domainsUse: dnslookupType: string listDefault: unset
```

If a DNS lookup fails and this option is set, each of its strings in turn is added onto the end of the domain, and the lookup is tried again. For example, if `widen_domains = fict.example:ref.example`

is set and a lookup of `klingson.dictionary` fails, `klingson.dictionary.fict.example` is looked up, and if this fails, `klingson.dictionary.ref.example` is tried. Note that the `qualify_single` and `search_parents` options can cause some widening to be undertaken inside the DNS resolver. `widen_domains` is not applied to sender addresses when verifying, unless `rewrite_headers` is false (not the default). 17.3 Effect of `qualify_single` and `search_parents`

When a domain from an envelope recipient is changed by the resolver as a result of the `qualify_single` or `search_parents` options, Exim rewrites the corresponding address in the message's header lines unless `rewrite_headers` is set false. Exim then re-routes the address, using the full domain.

These two options affect only the DNS lookup that takes place inside the router for the domain of the address that is being routed. They do not affect lookups such as that implied by `domains = @mx_any` that may happen while processing a router precondition before the router is entered. No widening ever takes place for these lookups.