

Chapter 4 Trace Statements

4.1 Trace Overview

Trace statements control tracing options. GateD's tracing options may be configured at many levels. Tracing options include the file specifications, control options, and global and protocol-specific tracing options. Unless overridden, tracing options from the next higher level are inherited by lower levels. For example, BGP peer tracing options are inherited from BGP group tracing options, which are inherited from global BGP tracing options, which are inherited from global GateD tracing options. At each level, additional tracing specifications override the inherited options.

When more than one trace options line is used in a section, the "last" trace options line to be parsed by GateD is the one that takes effect. In the case of global tracing, any trace files specified in any trace options line will be created, but tracing will cease for that file when the next trace options line is parsed.

4.2 Trace Syntax

```
traceoptions [ trace_file [ replace ]  
             [ size tracesize [ k | m ] files tracefiles ] ]  
             [ nostamp ][ trace_global_options ]  
             [ except trace_global_options ] ;  
traceoptions none ;
```

More detailed descriptions of these commands can be found on page 3 of the *Command Reference Guide*.

This sequence of options is used to specify the name of the trace file (*trace_file*) or files and parameters about these files. Trace files can be specified as a global parameter for all of GateD, for a protocol instance, or for a peer or peers within a protocol.

4.3 Global, Protocol, and Packet Tracing

GateD uses three types of trace options: those that affect only global operations, those that have potential significance to protocols, and those that affect packets.

4.3.1 Global Significance Only

The *trace_options* that have only global significance are:

parse

parse specifies to trace the lexical analyzer and parser. **parse** is used mostly by GateD developers for debugging configuration parsing processing.

adv

adv specifies to trace the allocation of and freeing of policy blocks. **adv** is used mostly by GateD developers for debugging the use of adv-entry structures in parsing.

symbols

symbols specifies to trace symbols read from the kernel at startup. The only useful way to specify this level of tracing is via the `-t` option on the command line, because the symbols are read from the kernel before parsing the configuration file.

iflist

iflist specifies to trace the reading of the kernel interface list. To trace the initial read of the interface information, specify **iflist** with the `-t` option on the command line, because the first interface scan is done before reading the configuration file.

4.3.2 Protocol Significance

The *trace_options* that have potential significance to protocols are:

all

all specifies to turn on **detail**, **packets**, and all of the following:

general

general specifies to trace both **normal** and **route**.

normal

normal specifies to trace normal protocol occurrences. Abnormal protocol occurrences are always traced.

route

route specifies to trace routing table changes for routes installed by this protocol or peer.

state

state specifies to trace state machine transitions in the protocols.

policy

policy specifies to trace application of protocol- and user-specified policy to routes being imported and exported.

task

task specifies to trace system interface and processing associated with this protocol or peer.

timer

timer specifies to trace timer usage by this protocol or peer.

none

none disables all tracing for this protocol or peer.

Not all of the above options apply to all of the protocols. In some cases, their use does not make sense (for instance, RIP does not have a state machine), and in some cases, the requested tracing has not been implemented.

When protocols inherit their tracing options from the global tracing options, tracing options that don't make sense (such as **parse**, **adv**, and **packet** tracing options) are masked out.

Global tracing statements have an immediate effect, especially parsing options that affect the parsing of the configuration file. Tracing values inherited by protocols are initially inherited from the global options that are currently in effect as the protocol configuration entries are parsed, unless they are overridden by more specific options. After the configuration file is read, protocol tracing options that were not explicitly specified are inherited from the global options in effect at the end of the configuration file.

4.3.3 Packet Tracing

These options apply to the protocol-specific `traceoptions` statements, but are supplied here for reference.

```
[ detail ] [ send | receive ] packets
```

Tracing of packets is very flexible. For any given protocol, there are one or more options for tracing packets. Protocol-specific tracing options are described in the *GateD Command Reference Guide* under the protocols' trace commands. All protocols allow use of the `packets` keyword for tracing all packets sent and received by the protocol. Most protocols have other options for limiting tracing to a useful subset of packet types. These tracing options can be further controlled with the following modifiers:

detail

Normally, packets are traced in a terse form of one or two lines. When `detail` is specified, a more verbose format provides further detail on the contents of the packet. If a protocol allows for several different types of packet tracing, modifiers may be applied to each individual type. However, be aware that within one tracing specification, the trace options are "orred" together, so specifying `detail packets` will turn on full tracing for all packets.

send or rcv

`send` or `rcv` limit the tracing to packets sent or received, respectively. If neither is specified, both sent and received packets will be traced. Only one of these keywords can be specified in any given instance.

`detail`, `send`, and `rcv` are all optional. If `detail` is specified, it must immediately precede any `send` or `rcv` specification. If `detail` and/or `send` or `rcv` is specified, at least one packet type trace option must immediately follow.

