

Tracing Overview

Tracing is a function that logs internal events. Trace files containing trace messages are automatically created and saved to the tracelogs directory on the hard disk: file system on the router, which stores tracing files in bootflash.

The contents of trace files are useful for the following purposes:

- Troubleshooting—Helps to locate and solve an issue with a router. The trace files can be accessed in diagnostic mode even if other system issues are occurring simultaneously.
- Debugging—Helps to obtain a detailed view of system actions and operations.

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How Tracing Works

Tracing logs the contents of internal events on a router. Trace files containing all the trace output pertaining to a module are periodically created and updated and stored in the tracelog directory. Trace files can be erased from this directory to recover space on the file system without impacting system performance. The files can be copied to other destinations using file transfer functions (such as FTP and TFTP) and opened using a plain text editor.

Note Tracing cannot be disabled on a router.

Use the following commands to view trace information and set tracing levels:

- **show logging process module**—Shows the most recent trace information for a specific module. This command can be used in privileged EXEC and diagnostic modes. When used in diagnostic mode, this command can gather trace log information during a Cisco IOS XE failure.
- **set platform software trace**—Sets a tracing level that determines the types of messages that are stored in the output. For more information on tracing levels, see Tracing Levels, on page 2.

Tracing Levels

Tracing levels determine how much information should be stored about a module in the trace buffer or file.

The following table shows all the tracing levels that are available and provides descriptions of what types of messages are displayed with each tracing level.

Table 1: Tracing Levels and Descriptions

Tracing Level	Level Number	Description
Emergency	0	The message is regarding an issue that makes the system unusable.
Alert	1	The message is regarding an action that must be taken immediately.
Critical	2	The message is regarding a critical condition. This is the default setting for every module on the router.
Error	3	The message is regarding a system error.
Warning	4	The message is regarding a system warning.
Notice	5	The message is regarding a significant issue, but the router is still working normally.
Informational	6	The message is useful for informational purposes only.
Debug	7	The message provides debug-level output.
Verbose	8	All possible tracing messages are sent.
Noise	—	All possible trace messages pertaining to a module are logged. The noise level is always equal to the highest possible tracing level. Even if a future enhancement to tracing introduces a higher tracing level than verbose level, the noise level will become equal to the level of the newly introduced tracing level.

If a tracing level is set, messages are collected from both lower tracing levels and from its own level.

For example, setting the tracing level to 3 (error) means that the trace file will contain output messages for levels: 0 (emergencies), 1 (alerts), 2 (critical), and 3 (error).

If you set the trace level to 4 (warning), it results in output messages for levels: 0 (emergencies), 1 (alerts), 2 (critical), 3 (error), and 4 (warning).

The default tracing level for every module on the router is 5 (notice).

A tracing level is not set in a configuration mode, which results in tracing-level settings being returned to default values after the router reloads.

Caution Setting the tracing level of a module to debug level or higher can have a negative impact on the performance.

Caution Setting high tracing levels on a large number of modules can severely degrade performance. If a high tracing level is required in a specific context, it is almost always preferable to set the tracing level of a single module to a higher level rather than setting multiple modules to high levels.

Viewing a Tracing Level

By default, all the modules on a router are set to 5 (notice). This setting is maintained unless changed by a user.

To see the tracing level for a module on a router, enter the **show logging process** command in privileged EXEC mode or diagnostic mode.

The following example shows how the **show logging process** command is used to view the tracing levels of the forwarding manager processes on an active RP:

```
Router# showlogging process forwarding-manager rp active
Module Name                    Trace Level
-----------------------------------------------
acl                            Notice
binos                          Notice
binos/brand                    Notice
bipc                           Notice
bsignal                        Notice
btrace                         Notice
cce                            Notice
cdllib                         Notice
cef                            Notice
chasfs                         Notice
chasutil                       Notice
erspan                         Notice
ess                            Notice
ether-channel                  Notice
evlib                          Notice
evutil                         Notice
file_alloc                     Notice
fman_rp                        Notice
fpm                            Notice
fw                             Notice
icmp                           Notice
interfaces                     Notice
```

```
iosd                              Notice
ipc                               Notice
ipclog                            Notice
iphc                              Notice
IPsec                             Notice
mgmte-acl                         Notice
mlp                               Notice
mqipc                             Notice
nat                               Notice
nbar                              Notice
netflow                           Notice
om                                Notice
peer                              Notice
qos                               Notice
route-map                         Notice
sbc                               Notice
services                          Notice
sw_wdog                           Notice
tdl_acl_config_type               Notice
tdl_acl_db_type                   Notice
tdl_cdlcore_message               Notice
tdl_cef_config_common_type        Notice
tdl_cef_config_type               Notice
tdl_dpidb_config_type             Notice
tdl_fman_rp_comm_type             Notice
tdl_fman_rp_message               Notice
tdl_fw_config_type                Notice
tdl_hapi_tdl_type                 Notice
tdl_icmp_type                     Notice
tdl_ip_options_type               Notice
tdl_ipc_ack_type                  Notice
tdl_IPsec_db_type                 Notice
tdl_mcp_comm_type                 Notice
tdl_mlp_config_type               Notice
tdl_mlp_db_type                   Notice
tdl_om_type                       Notice
tdl_ui_message                    Notice
tdl_ui_type                       Notice
tdl_urpf_config_type              Notice
tdllib                            Notice
trans_avl                         Notice
uihandler                         Notice
uipeer                            Notice
uistatus                          Notice
urpf                              Notice
vista                             Notice
wccp                              Notice
```

Setting a Tracing Level

To set a tracing level for a module on a router, or for all the modules within a process on a router, enter the **set platform software trace** command in the privileged EXEC mode or diagnostic mode.

The following example shows the tracing level for the ACL module in the Forwarding Manager of the ESP processor in slot 0 set to `info`:

```
set platform software trace forwarding-manager F0 acl info
```

Viewing the Content of the Trace Buffer

To view the trace messages in the trace buffer or file, enter the **show logging process** command in privileged EXEC or diagnostic mode. In the following example, the trace messages for the Host Manager process in Route Processor slot 0 are viewed using the **show logging process command**:

```
Router# show logging process host-manager R0
08/23 12:09:14.408 [uipeer]: (info): Looking for a ui_req msg
08/23 12:09:14.408 [uipeer]: (info): Start of request handling for con 0x100a61c8
08/23 12:09:14.399 [uipeer]: (info): Accepted connection for 14 as 0x100a61c8
08/23 12:09:14.399 [uipeer]: (info): Received new connection 0x100a61c8 on descriptor 14
08/23 12:09:14.398 [uipeer]: (info): Accepting command connection on listen fd 7
08/23 11:53:57.440 [uipeer]: (info): Going to send a status update to the shell manager in
 slot 0
08/23 11:53:47.417 [uipeer]: (info): Going to send a status update to the shell manager in
 slot 0
```