Tracing and Trace Management

Tracing Overview

Tracing is a function that logs internal events. Trace files are automatically created and saved to the tracelogs directory on the harddisk: file system on the router, which stores tracing files in bootflash:. Trace files are used to store tracing data.

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

- Troubleshooting—If a router is having an issue, the trace file output may provide information that is useful for locating and solving the problem. Trace files can almost always be accessed through diagnostic mode even if other system issues are occurring.
- Debugging—The trace file outputs can help users get a more detailed view of system actions and operations.

How Tracing Works

The tracing function logs the contents of internal events on the router. Trace files with all trace output for a module are periodically created and updated and are 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 most recent trace information for a specific module can be viewed using the **show platform software trace message** privileged EXEC and diagnostic mode command. This command can be entered to gather trace log information even during an IOS failure because it is available in diagnostic mode.

Trace files can be copied to other destinations using most file transfer functions (such as FTP, TFTP, and so on) and opened using a plaintext editor.

Tracing cannot be disabled on the router. Trace levels, however, which set the message types that generate trace output, are user-configurable and can be set using the **set platform software trace** command. If a user wants to modify the trace level to increase or decrease the amount of trace message output, the user should set a new tracing level using the **set platform software trace** command. Trace levels can be set by process using the **all-modules** keyword within the **set platform software trace** command, or by module within a process. See the **set platform software trace** command reference for more information on this command, and the Tracing Levels, on page 2 section of this document for additional information on tracing levels.

Tracing Levels

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

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

Table 1: Tracing Levels and Descriptions

Trace 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.
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 for the 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, the noise level will become equal to the level of that new enhancement.

Trace level settings are leveled, meaning that every setting will contain all messages from the lower setting plus the messages from its own setting. For instance, setting the trace level to 3(error) ensures that the trace file will contain all output for the 0 (emergencies), 1 (alerts), 2 (critical), and 3 (error) settings. Setting the trace level to 4 (warning) will ensure that all trace output for the specific module will be included in that trace file.

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

All trace levels are not user-configurable. Specifically, the alert, critical, and notice tracing levels cannot be set by users. If you wish to trace these messages, set the trace level to a higher level that will collect these messages.

When setting trace levels, it is also important to remember that the setting is not done in a configuration mode, so trace level settings are returned to their defaults after every router reload.

Caution Setting tracing of a module to the debug level or higher can have a negative performance impact. Setting tracing to this level or higher should be done with discretion.

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

Viewing a Tracing Level

By default, all modules on the router are set to notice. This setting will be maintained unless changed by a user.

To see the tracing level for any module on the router, enter the **show platform software trace level** command in privileged EXEC or diagnostic mode.

In the following example, the **show platform software trace level** command is used to view the tracing levels of the Forwarding Manager processes:

```
Router#show platform software trace level forwarding-manager rp active
Module Name                     Trace Level
-----------------------------------------------
acl                             Notice
bfd                             Notice
binos                           Notice
bipc                            Notice
bridge-domain                   Notice
bsignal                         Notice
btrace                          Notice
bump_ptr_alloc                  Notice
cce                             Notice
cdllib                          Notice
cef                             Notice
chasfs                          Notice
chasutil                        Notice
cos-marking                     Notice
cyan                            Notice
efp                             Notice
eoam                            Notice
ether-channel                   Notice
ether-dplb                      Notice
evlib                           Notice
evutil                          Notice
fhrp                            Notice
file_alloc                      Notice
flash                           Notice
fman_rp                         Notice
inject-marking                  Notice
interfaces                      Notice
ipc                             Notice
ipclog                          Notice
ipp-to-cos                      Notice
```

```
ipsec                           Notice
ipsla                           Notice
l2cp                            Notice
l2fib                           Notice
local_span                      Notice
macinmac                        Notice
mgmte-acl                       Notice
mqipc                           Notice
om                              Notice
pbr                             Notice
peer                            Notice
protection                      Notice
protocol-marking                Notice
punt-police                     Notice
qos                             Notice
qos-account                     Notice
qos-event                       Notice
qos-hqf                         Notice
qos-infra                       Notice
qos-init                        Notice
qos-police                      Notice
qos-set                         Notice
qos-stats                       Notice
remote_span                     Notice
route-map                       Notice
services                        Notice
source                          Notice
subsys                          Notice
sw_wdog                         Notice
syshw                           Notice
tdl_acl_db                      Notice
tdl_bdomain_common              Notice
tdl_bdomain_db                  Notice
tdl_cdlcore                     Notice
tdl_cef_config                  Notice
tdl_cef_config_common           Notice
tdl_cef_route                   Notice
tdl_dpidb_config                Notice
tdl_dpidb_db                    Notice
tdl_ether_efp                   Notice
tdl_ether_efp_db                Notice
tdl_fman_rp_uea                 Notice
tdl_ipc_ack                     Notice
tdl_l2cp_db                     Notice
tdl_l2fib_config                Notice
tdl_l2fib_db                    Notice
tdl_om                          Notice
tdl_tdl_toc                     Notice
tdl_ui                          Notice
tdl_urpf_config                 Notice
tdl_urpf_db                     Notice
tdl_vrf_config                  Notice
tdl_vrf_db                      Notice
tdllib                          Notice
trans_avl                       Notice
trans_gbt                       Notice
trccfg                          Notice
uihandler                       Notice
uipeer                          Notice
uistatus                        Notice
urpf                            Notice
virtual-ethernet                Notice
vista                           Notice
vs_flock                        Notice
```

Setting a Tracing Level

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

In the following example, the trace level for the ACL module in the Forwarding Manager of the ESP processor in slot 0 is set to info.

set platform software trace forwarding-manager F0 acl info

See the **set platform software trace** command reference for additional information about the options for this command.

Viewing the Content of the Trace Buffer

To view the trace messages in the trace buffer or file, enter the **show platform software trace message** privileged EXEC and diagnostic mode command.

In the following example, the trace messages for the Host Manager process in Route Switch Processor slot 0 are viewed using the **show platform software trace message** command:

```
Router# show platform software trace message 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
```