Rocky Enterprise Linux 9.2 Manual Pages on command 'syslog.2'

$ man syslog.2

SYSLOG(2) Linux Programmer's Manual SYSLOG(2)

NAME

syslog, klogctl - read and/or clear kernel message ring buffer; set console_loglevel

SYNOPSIS

```
int syslog(int type, char *bufp, int len);
            /* No wrapper provided in glibc */
/* The glibc interface */
#include <sys/klog.h>
int klogctl(int type, char *bufp, int len);
```

DESCRIPTION

Note: Probably, you are looking for the C library function syslog(), which talks to syslogd(8); see syslog(3) for details.

This page describes the kernel syslog() system call, which is used to control the kernel printk() buffer; the glibc wrapper function for the system call is called klogctl().

The kernel log buffer

The kernel has a cyclic buffer of length LOG_BUF_LEN in which messages

given as arguments to the kernel function printk() are stored (regard? less of their log level). In early kernels, LOG_BUF_LEN had the value 4096; from kernel 1.3.54, it was 8192; from kernel 2.1.113, it was 16384; since kernel 2.4.23/2.6, the value is a kernel configuration op? tion (CONFIG_LOG_BUF_SHIFT, default value dependent on the architec? ture). Since Linux 2.6.6, the size can be queried with command type 10 (see below).

Commands

The type argument determines the action taken by this function. The list below specifies the values for type. The symbolic names are de? fined in the kernel source, but are not exported to user space; you will either need to use the numbers, or define the names yourself.

SYSLOG_ACTION_CLOSE (0)

Close the log. Currently a NOP.

SYSLOG_ACTION_OPEN (1)

Open the log. Currently a NOP.

SYSLOG_ACTION_READ (2)

Read from the log. The call waits until the kernel log buffer is nonempty, and then reads at most len bytes into the buffer pointed to by bufp. The call returns the number of bytes read. Bytes read from the log disappear from the log buffer: the in? formation can be read only once. This is the function executed by the kernel when a user program reads /proc/kmsg.

SYSLOG_ACTION_READ_ALL (3)

Read all messages remaining in the ring buffer, placing them in the buffer pointed to by bufp. The call reads the last len bytes from the log buffer (nondestructively), but will not read more than was written into the buffer since the last "clear ring buffer" command (see command 5 below)). The call returns the number of bytes read.

SYSLOG_ACTION_READ_CLEAR (4)

Read and clear all messages remaining in the ring buffer. The call does precisely the same as for a type of 3, but also exe?

cutes the "clear ring buffer" command.

SYSLOG_ACTION_CLEAR (5)

The call executes just the "clear ring buffer" command. The bufp and len arguments are ignored.

This command does not really clear the ring buffer. Rather, it sets a kernel bookkeeping variable that determines the results returned by commands 3 (SYSLOG_ACTION_READ_ALL) and 4 (SYS? LOG_ACTION_READ_CLEAR). This command has no effect on commands 2 (SYSLOG_ACTION_READ) and 9 (SYSLOG_ACTION_SIZE_UNREAD).

SYSLOG_ACTION_CONSOLE_OFF (6)

The command saves the current value of console_loglevel and then sets console_loglevel to minimum_console_loglevel, so that no messages are printed to the console. Before Linux 2.6.32, the command simply sets console_loglevel to minimum_con? sole_loglevel. See the discussion of /proc/sys/kernel/printk, below.

The bufp and len arguments are ignored.

SYSLOG_ACTION_CONSOLE_ON (7)

If a previous SYSLOG_ACTION_CONSOLE_OFF command has been per? formed, this command restores console_loglevel to the value that was saved by that command. Before Linux 2.6.32, this command simply sets console_loglevel to default_console_loglevel. See the discussion of /proc/sys/kernel/printk, below.

The bufp and len arguments are ignored.

SYSLOG_ACTION_CONSOLE_LEVEL (8)

The call sets console_loglevel to the value given in len, which must be an integer between 1 and 8 (inclusive). The kernel silently enforces a minimum value of minimum_console_loglevel for len. See the log level section for details. The bufp argu? ment is ignored.

SYSLOG_ACTION_SIZE_UNREAD (9) (since Linux 2.4.10)

The call returns the number of bytes currently available to be read from the kernel log buffer via command 2 (SYSLOG_AC?

TION_READ). The bufp and len arguments are ignored.

SYSLOG_ACTION_SIZE_BUFFER (10) (since Linux 2.6.6)

This command returns the total size of the kernel log buffer. The bufp and len arguments are ignored.

All commands except 3 and 10 require privilege. In Linux kernels before 2.6.37, command types 3 and 10 are allowed to unprivileged processes; since Linux 2.6.37, these commands are allowed to unprivileged processes only if /proc/sys/kernel/dmesg_restrict has the value 0. Before Linux 2.6.37, "privileged" means that the caller has the CAP_SYS_ADMIN capability. Since Linux 2.6.37, "privileged" means that the caller has either the CAP_SYS_ADMIN capability (now deprecated for this purpose) or the (new) CAP_SYSLOG capability.

/proc/sys/kernel/printk

/proc/sys/kernel/printk is a writable file containing four integer values that influence kernel printk() behavior when printing or logging error messages. The four values are:

console_loglevel

Only messages with a log level lower than this value will be printed to the console. The default value for this field is DEFAULT_CONSOLE_LOGLEVEL (7), but it is set to 4 if the kernel command line contains the word "quiet", 10 if the kernel command line contains the word "debug", and to 15 in case of a kernel fault (the 10 and 15 are just silly, and equivalent to 8). The value of console_loglevel can be set (to a value in the range 1?8) by a syslog() call with a type of 8.

default_message_loglevel

This value will be used as the log level for printk() messages that do not have an explicit level. Up to and including Linux 2.6.38, the hard-coded default value for this field was 4 (KERN_WARNING); since Linux 2.6.39, the default value is a defined by the kernel configuration option CONFIG_DEFAULT_MESSAGE_LOGLEVEL, which defaults to 4.

minimum_console_loglevel

The value in this field is the minimum value to which con?
sole_loglevel can be set.

default_console_loglevel

This is the default value for console_loglevel.

The log level

Every printk() message has its own log level. If the log level is not explicitly specified as part of the message, it defaults to de? fault_message_loglevel. The conventional meaning of the log level is as follows:

Kernel constant	Level value	Meaning
KERN_EMERG	0	System is unusable
KERN_ALERT	1	Action must be taken immediately
KERN_CRIT	2	Critical conditions
KERN_ERR	3	Error conditions
KERN_WARNING	4	Warning conditions
KERN_NOTICE	5	Normal but significant condition
KERN_INFO	6	Informational
KERN_DEBUG	7	Debug-level messages

The kernel printk() routine will print a message on the console only if it has a log level less than the value of console_loglevel.

RETURN VALUE

For type equal to 2, 3, or 4, a successful call to syslog() returns the number of bytes read. For type 9, syslog() returns the number of bytes currently available to be read on the kernel log buffer. For type 10, syslog() returns the total size of the kernel log buffer. For other values of type, 0 is returned on success.

In case of error, -1 is returned, and errno is set to indicate the er? ror.

ERRORS

EINVAL Bad arguments (e.g., bad type; or for type 2, 3, or 4, buf is NULL, or len is less than zero; or for type 8, the level is out? side the range 1 to 8).

ENOSYS This syslog() system call is not available, because the kernel

was compiled with the CONFIG_PRINTK kernel-configuration option disabled.

EPERM An attempt was made to change console_loglevel or clear the ker? nel message ring buffer by a process without sufficient privi? lege (more precisely: without the CAP_SYS_ADMIN or CAP_SYSLOG capability).

ERESTARTSYS

System call was interrupted by a signal; nothing was read. (This can be seen only during a trace.)

CONFORMING TO

This system call is Linux-specific and should not be used in programs intended to be portable.

NOTES

From the very start, people noted that it is unfortunate that a system call and a library routine of the same name are entirely different ani? mals.

SEE ALSO

dmesg(1), syslog(3), capabilities(7)

COLOPHON

This page is part of release 5.10 of the Linux man-pages project. A description of the project, information about reporting bugs, and the latest version of this page, can be found at https://www.kernel.org/doc/man-pages/.