NAME

s390_guarded_storage − operations with z/Architecture guarded storage facility

SYNOPSIS

#include <asm/guarded_storage.h>

int s390_guarded_storage(int *command*, **struct gs_cb ***_gs_cb_**);**

DESCRIPTION

The **s390_guarded_storage**() system call enables the use of the Guarded Storage Facility (a z/Architecture-specific feature) for user-space processes.

The guarded storage facility is a hardware feature that allows marking up to 64 memory regions (as of z14) as guarded; reading a pointer with a newly introduced "Load Guarded" (LGG) or "Load Logical and Shift Guarded" (LLGFSG) instructions will cause a range check on the loaded value and invoke a (previously set up) user-space handler if one of the guarded regions is affected.

The *command* argument indicates which function to perform. The following commands are supported:

GS_ENABLE
: Enable the guarded storage facility for the calling task. The initial content of the guarded storage control block will be all zeros. After enablement, user-space code can use the "Load Guarded Storage Controls" (LGSC) instruction (or the **load_gs_cb**() function wrapper provided in the *asm/guarded_storage.h* header) to load an arbitrary control block. While a task is enabled, the kernel will save and restore the calling content of the guarded storage registers on context switch.

GS_DISABLE
: Disables the use of the guarded storage facility for the calling task. The kernel will cease to save and restore the content of the guarded storage registers, the task-specific content of these registers is lost.

GS_SET_BC_CB
: Set a broadcast guarded storage control block to the one provided in the *gs_cb* argument. This is called per thread and associates a specific guarded storage control block with the calling task. This control block will be used in the broadcast command **GS_BROADCAST**.

GS_CLEAR_BC_CB
: Clears the broadcast guarded storage control block. The guarded storage control block will no longer have the association established by the **GS_SET_BC_CB** command.

GS_BROADCAST
: Sends a broadcast to all thread siblings of the calling task. Every sibling that has established a broadcast guarded storage control block will load this control block and will be enabled for guarded storage. The broadcast guarded storage control block is consumed; a second broadcast without a refresh of the stored control block with **GS_SET_BC_CB** will not have any effect.

The *gs_cb* argument specifies the address of a guarded storage control block structure and is currently used only by the **GS_SET_BC_CB** command; all other aforementioned commands ignore this argument.

RETURN VALUE

On success, the return value of **s390_guarded_storage**() is 0.

On error, −1 is returned, and *errno* is set appropriately.

ERRORS

EFAULT
: *command* was **GS_SET_BC_CB** and the copying of the guarded storage control block structure pointed by the *gs_cb* argument has failed.

EINVAL
: The value provided in the *command* argument was not valid.

ENOMEM
command was one of **GS_ENABLE** or **GS_SET_BC_CB**, and the allocation of a new guarded storage control block has failed.

EOPNOTSUPP
The guarded storage facility is not supported by the hardware.

VERSIONS
This system call is available since Linux 4.12.

CONFORMING TO
This Linux-specific system call is available only on the s390 architecture.

The guarded storage facility is available beginning with System z14.

NOTES
Glibc does not provide a wrapper for this system call, use **syscall**(2) to call it.

The description of the guarded storage facility along with related instructions and Guarded Storage Control Block and Guarded Storage Event Parameter List structure layouts is available in "z/Architecture Principles of Operations" beginning from the twelfth edition.

The *gs_cb* structure has a field *gsepla* (Guarded Storage Event Parameter List Address), which is a user-space pointer to a Guarded Storage Event Parameter List structure (that contains the address of the aforementioned event handler in the *gseha* field), and its layout is available as a **gs_epl** structure type definition in the *asm/guarded_storage.h* header.

SEE ALSO
syscall(2)

COLOPHON
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