NAME
s390_guarded_storage − operations with z/Architecture guarded storage facility

LIBRARY
Standard C library (*libc*, *−lc*)

SYNOPSIS
#include <asm/guarded_storage.h> /* Definition of **GS_*** constants */
#include <sys/syscall.h>   /* Definition of **SYS_*** constants */
#include <unistd.h>

int syscall(SYS_s390_guarded_storage, int *command*,
        struct gs_cb *gs_cb**);**

Note: glibc provides no wrapper for **s390_guarded_storage**(), necessitating the use of **syscall**(2).

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 to indicate the error.

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.

STANDARDS

> This Linux-specific system call is available only on the s390 architecture.
>
> The guarded storage facility is available beginning with System z14.

NOTES

> 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 afore-mentioned 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)