
Subject: /proc/*/pagemap BUG: sleeping function called from invalid context
Posted by [Alexey Dobriyan](#) on Mon, 09 Apr 2007 08:18:06 GMT

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After

```
cat /proc/self/pagemap
```

BUG: sleeping function called from invalid context at include/asm/uaccess.h:453

```
in_atomic():1, irqs_disabled():0
```

```
1 lock held by cat/14183:
```

```
#0: (&mm->mmap_sem){----}, at: [<c017d17b>] pagemap_read+0x11f/0x21b
```

```
[<c01b7bc7>] copy_to_user+0x37/0x4c
```

```
[<c017cf92>] add_to_pagemap+0x49/0x6f
```

```
[<c017d034>] pagemap_pte_range+0x56/0x7e
```

```
[<c017cfde>] pagemap_pte_range+0x0/0x7e
```

```
[<c01b481d>] walk_page_range+0xf1/0x1a0
```

```
[<c017d1e3>] pagemap_read+0x187/0x21b
```

```
[<c01fdafa>] tty_write+0x1bb/0x1cc
```

```
[<c017d05c>] pagemap_read+0x0/0x21b
```

```
[<c01589b0>] vfs_read+0x72/0x95
```

```
[<c0158cce>] sys_read+0x41/0x67
```

```
[<c0103d96>] sysenter_past_esp+0x8f/0x99
```

```
[<c0103d66>] sysenter_past_esp+0x5f/0x99
```

```
=====
```

Subject: Re: /proc/*/pagemap BUG: sleeping function called from invalid context
Posted by [Matt Mackall](#) on Mon, 09 Apr 2007 17:43:02 GMT

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On Mon, Apr 09, 2007 at 12:25:54PM +0400, Alexey Dobriyan wrote:

```
> After
```

```
> cat /proc/self/pagemap
```

```
>
```

```
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```

```
> [<c0158cce>] sys_read+0x41/0x67
```

> [[c0103d96](#)] sysenter_past_esp+0x8f/0x99
> [[c0103d66](#)] sysenter_past_esp+0x5f/0x99

I'm still waking up but this is odd. mm->mmap_sem is an rwsem, sleeping inside of it should be perfectly valid.

Oh. You've got CONFIG_HIGHPTE and the note is really about the kmap_atomic inside pte_offset_map. I'll fix that up.

--

Mathematics is the supreme nostalgia of our time.

Subject: Re: /proc/*/pagemap BUG: sleeping function called from invalid context
Posted by [Matt Mackall](#) on Mon, 09 Apr 2007 21:43:19 GMT
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On Mon, Apr 09, 2007 at 12:25:54PM +0400, Alexey Dobriyan wrote:

> After
> cat /proc/self/pagemap
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> BUG: sleeping function called from invalid context at include/asm/uaccess.h:453
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> [[c017cfde](#)] pagemap_pte_range+0x0/0x7e
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> =====

This looks like it was caused by CONFIG_HIGHPTE making pte_offset_map call kmap_atomic. The message about mm->mmap_sem is spurious. Looking at a fix.

--

Mathematics is the supreme nostalgia of our time.

Subject: Re: /proc/*/pagemap BUG: sleeping function called from invalid context
Posted by [Matt Mackall](#) on Tue, 10 Apr 2007 20:07:03 GMT
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On Mon, Apr 09, 2007 at 12:25:54PM +0400, Alexey Dobriyan wrote:

```
> After
> cat /proc/self/pagemap
>
> BUG: sleeping function called from invalid context at include/asm/uaccess.h:453
> in_atomic():1, irqs_disabled():0
```

This should fix it:

When CONFIG_HIGHPTE is enabled, use double-buffering in pagemap to avoid calling copy_to_user while preemption is disabled.

Tested on x86 with HIGHPTE with DEBUG_SPINLOCK_SLEEP and PROVE_LOCKING.

Signed-off-by: Matt Mackall <mpm@selenic.com>

Index: mm/fs/proc/task_mmu.c

```
=====
--- mm.orig/fs/proc/task_mmu.c 2007-04-09 10:54:28.000000000 -0500
+++ mm/fs/proc/task_mmu.c 2007-04-10 14:47:21.000000000 -0500
@@ -535,6 +535,7 @@ struct pagemapread {
    struct mm_struct *mm;
    unsigned long next;
    unsigned long *buf;
+ pte_t *ptebuf;
    unsigned long pos;
    size_t count;
    int index;
@@ -573,6 +574,14 @@ static int pagemap_pte_range(pmd_t *pmd,
    int err;

    pte = pte_offset_map(pmd, addr);
+
+ #ifdef CONFIG_HIGHPTE
+ /* copy PTE directory to temporary buffer and unmap it */
+ memcpy(pm->ptebuf, pte, PAGE_ALIGN((unsigned long)pte) - (unsigned long)pte);
+ pte_unmap(pte);
+ pte = pm->ptebuf;
+ #endif
+
    for (; addr != end; pte++, addr += PAGE_SIZE) {
        if (addr < pm->next)
            continue;
@@ -583,7 +592,11 @@ static int pagemap_pte_range(pmd_t *pmd,
```

```

    if (err)
        return err;
    }
+
+#ifndef CONFIG_HIGHPTE
    pte_unmap(pte - 1);
+#endif
+
    return 0;
}

@@ -655,10 +668,16 @@ static ssize_t pagemap_read(struct file
    if (!page)
        goto out;

+#ifdef CONFIG_HIGHPTE
+ pm.ptebuf = kzalloc(PAGE_SIZE, GFP_USER);
+ if (!pm.ptebuf)
+ goto out_free;
+#endif
+
    ret = 0;
    mm = get_task_mm(task);
    if (!mm)
- goto out_free;
+ goto out_freepte;

    pm.mm = mm;
    pm.next = addr;
@@ -681,7 +700,7 @@ static ssize_t pagemap_read(struct file
    while (pm.count > 0 && vma) {
        if (!ptrace_may_attach(task)) {
            ret = -EIO;
- goto out;
+ goto out_mm;
        }
        vend = min(vma->vm_start - 1, end - 1) + 1;
        ret = pagemap_fill(&pm, vend);
@@ -700,8 +719,13 @@ static ssize_t pagemap_read(struct file
    if (!ret)
        ret = pm.pos - src;

+out_mm:
    mmput(mm);
+out_freepte:
+#ifdef CONFIG_HIGHPTE
+ kfree(pm.ptebuf);
out_free:

```

```
+#endif
  kfree(page);
out:
  put_task_struct(task);
```

```
--
Mathematics is the supreme nostalgia of our time.
```
