
Subject: [PATCH 01/11] fuse: general infrastructure for pages[] of variable size
Posted by [Maxim Patlasov](#) on Wed, 19 Sep 2012 16:31:45 GMT

[View Forum Message](#) <> [Reply to Message](#)

The patch removes inline array of FUSE_MAX_PAGES_PER_REQ page pointers from fuse_req. Instead of that, req->pages may now point either to small inline array or to an array allocated dynamically.

This essentially means that all callers of fuse_request_alloc[_nofs] should pass the number of pages needed explicitly.

The patch doesn't make any logic changes.

Signed-off-by: Maxim Patlasov <mpatlasov@parallels.com>

fs/fuse/dev.c | 46 ++++++-----

fs/fuse/file.c | 4 ++--

fs/fuse/fuse_i.h | 15 ++++++---

fs/fuse/inode.c | 4 ++--

4 files changed, 49 insertions(+), 20 deletions(-)

diff --git a/fs/fuse/dev.c b/fs/fuse/dev.c

index 7df2b5e..1b5fc73 100644

--- a/fs/fuse/dev.c

+++ b/fs/fuse/dev.c

```
@@ -34,34 +34,54 @@ static struct fuse_conn *fuse_get_conn(struct file *file)
     return file->private_data;
 }
```

```
-static void fuse_request_init(struct fuse_req *req)
```

```
+static void fuse_request_init(struct fuse_req *req, struct page **pages,
+    unsigned npages)
```

```
{
    memset(req, 0, sizeof(*req));
    INIT_LIST_HEAD(&req->list);
    INIT_LIST_HEAD(&req->intr_entry);
    init_waitqueue_head(&req->waitq);
    atomic_set(&req->count, 1);
```

```
+ req->pages = pages;
```

```
+ req->max_pages = npages;
```

```
}
```

```
-struct fuse_req *fuse_request_alloc(void)
```

```
+static struct fuse_req *__fuse_request_alloc(int npages, gfp_t flags)
```

```
{
- struct fuse_req *req = kmem_cache_alloc(fuse_req_cachep, GFP_KERNEL);
- if (req)
-     fuse_request_init(req);
```

```

+ struct fuse_req *req = kmem_cache_alloc(fuse_req_cachep, flags);
+ if (req) {
+   struct page **pages;
+
+   if (npages <= FUSE_REQ_INLINE_PAGES)
+     pages = req->inline_pages;
+   else
+     pages = kcalloc(sizeof(struct page *) * npages, flags);
+
+   if (!pages) {
+     kmem_cache_free(fuse_req_cachep, req);
+     return NULL;
+   }
+
+   fuse_request_init(req, pages, npages);
+ }
+ return req;
+ }
+
+struct fuse_req *fuse_request_alloc(int npages)
+{
+ return __fuse_request_alloc(npages, GFP_KERNEL);
+}
EXPORT_SYMBOL_GPL(fuse_request_alloc);

-struct fuse_req *fuse_request_alloc_nofs(void)
+struct fuse_req *fuse_request_alloc_nofs(int npages)
+ {
- struct fuse_req *req = kmem_cache_alloc(fuse_req_cachep, GFP_NOFS);
- if (req)
-   fuse_request_init(req);
- return req;
+ return __fuse_request_alloc(npages, GFP_NOFS);
+ }

void fuse_request_free(struct fuse_req *req)
+ {
+ if (req->pages != req->inline_pages)
+   kfree(req->pages);
+   kmem_cache_free(fuse_req_cachep, req);
+ }

@@ -116,7 +136,7 @@ struct fuse_req *fuse_get_req(struct fuse_conn *fc)
+ if (!fc->connected)
+   goto out;

- req = fuse_request_alloc();
+ req = fuse_request_alloc(FUSE_MAX_PAGES_PER_REQ);

```

```

err = -ENOMEM;
if (!req)
    goto out;
@@ -166,7 +186,7 @@ static void put_reserved_req(struct fuse_conn *fc, struct fuse_req *req)
    struct fuse_file *ff = file->private_data;

    spin_lock(&fc->lock);
- fuse_request_init(req);
+ fuse_request_init(req, req->pages, req->max_pages);
    BUG_ON(ff->reserved_req);
    ff->reserved_req = req;
    wake_up_all(&fc->reserved_req_waitq);
@@ -193,7 +213,7 @@ struct fuse_req *fuse_get_req_nofail(struct fuse_conn *fc, struct file *file)

    atomic_inc(&fc->num_waiting);
    wait_event(fc->blocked_waitq, !fc->blocked);
- req = fuse_request_alloc();
+ req = fuse_request_alloc(FUSE_MAX_PAGES_PER_REQ);
    if (!req)
        req = get_reserved_req(fc, file);

diff --git a/fs/fuse/file.c b/fs/fuse/file.c
index aba15f1..7423ea4 100644
--- a/fs/fuse/file.c
+++ b/fs/fuse/file.c
@@ -57,7 +57,7 @@ struct fuse_file *fuse_file_alloc(struct fuse_conn *fc)
    return NULL;

    ff->fc = fc;
- ff->reserved_req = fuse_request_alloc();
+ ff->reserved_req = fuse_request_alloc(0);
    if (unlikely(!ff->reserved_req)) {
        kfree(ff);
        return NULL;
@@ -1272,7 +1272,7 @@ static int fuse_writepage_locked(struct page *page)

    set_page_writeback(page);

- req = fuse_request_alloc_nofs();
+ req = fuse_request_alloc_nofs(1);
    if (!req)
        goto err;

diff --git a/fs/fuse/fuse_i.h b/fs/fuse/fuse_i.h
index e24dd74..e686bf1 100644
--- a/fs/fuse/fuse_i.h
+++ b/fs/fuse/fuse_i.h
@@ -44,6 +44,9 @@

```

```

    doing the mount will be allowed to access the filesystem */
#define FUSE_ALLOW_OTHER      (1 << 1)

+/** Number of page pointers embedded in fuse_req */
+#define FUSE_REQ_INLINE_PAGES 1
+
+/** List of active connections */
extern struct list_head fuse_conn_list;

@@ -291,7 +294,13 @@ struct fuse_req {
} misc;

    /** page vector */
- struct page *pages[FUSE_MAX_PAGES_PER_REQ];
+ struct page **pages;
+
+ /** size of the 'pages' array */
+ unsigned max_pages;
+
+ /** inline page vector */
+ struct page *inline_pages[FUSE_REQ_INLINE_PAGES];

    /** number of pages in vector */
    unsigned num_pages;
@@ -658,9 +667,9 @@ void fuse_ctl_cleanup(void);
/**
 * Allocate a request
 */
-struct fuse_req *fuse_request_alloc(void);
+struct fuse_req *fuse_request_alloc(int npages);

-struct fuse_req *fuse_request_alloc_nofs(void);
+struct fuse_req *fuse_request_alloc_nofs(int npages);

/**
 * Free a request
diff --git a/fs/fuse/inode.c b/fs/fuse/inode.c
index ce0a283..3f399ba 100644
--- a/fs/fuse/inode.c
+++ b/fs/fuse/inode.c
@@ -1027,12 +1027,12 @@ static int fuse_fill_super(struct super_block *sb, void *data, int silent)
    /* only now - we want root dentry with NULL ->d_op */
    sb->s_d_op = &fuse_dentry_operations;

- init_req = fuse_request_alloc();
+ init_req = fuse_request_alloc(0);
    if (!init_req)
        goto err_put_root;

```

```
if (is_bdev) {  
- fc->destroy_req = fuse_request_alloc();  
+ fc->destroy_req = fuse_request_alloc(0);  
  if (!fc->destroy_req)  
    goto err_free_init_req;  
}
```
