
Subject: [PATCH 1/6] fuse: general infrastructure for pages[] of variable size
Posted by [Maxim Patlasov](#) on Fri, 07 Sep 2012 17:41:07 GMT
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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.

```
fs/fuse/dev.c | 40 ++++++-----
fs/fuse/file.c | 4 +-
fs/fuse/fuse_i.h | 9 +++++-
fs/fuse/inode.c | 4 +-
4 files changed, 40 insertions(+), 17 deletions(-)
```

```
diff --git a/fs/fuse/dev.c b/fs/fuse/dev.c
index 7df2b5e..c0283a1 100644
```

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

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

```
@@ -36,32 +36,52 @@ static struct fuse_conn *fuse_get_conn(struct file *file)
```

```
static void fuse_request_init(struct fuse_req *req)
{
+ struct page **pages = req->pages;
+
+ 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;
}
```

```
-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)
+ struct fuse_req *req = kmem_cache_alloc(fuse_req_cachep, flags);
+ if (req) {
+ if (npages <= 1)
+ req->pages = req->inline_pages;
+ else
```

```

+ req->pages = kmalloc(sizeof(struct page *) * npages,
+     flags);
+
+ if (!req->pages) {
+     kmem_cache_free(fuse_req_cachep, req);
+     return NULL;
+ }
+
+     fuse_request_init(req);
+ }
+     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;
@@ -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..5e78840 100644
--- a/fs/fuse/fuse_i.h
+++ b/fs/fuse/fuse_i.h
@@ -291,7 +291,10 @@ struct fuse_req {
    } misc;

    /** page vector */
- struct page *pages[FUSE_MAX_PAGES_PER_REQ];
+ struct page **pages;
+
+ /** inline page vector */
+ struct page *inline_pages[1];

    /** number of pages in vector */
    unsigned num_pages;
@@ -658,9 +661,9 @@ 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;
 }

```
