
Subject: [PATCH 2/6] fuse: categorize fuse_get_req()
Posted by [Maxim Patlasov](#) on Fri, 07 Sep 2012 17:41:19 GMT
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The patch categorizes all fuse_get_req() invocations into three categories:

- fuse_get_req_nopages() - when caller doesn't care about req->pages
- fuse_get_req_onepage() - when caller need exactly one page
- fuse_get_req_multipage() - in other cases.

The decision to split one fuse_get_req() into three different functions was made because having fuse_get_req(fc, n) scattered over code would be too error prone. After splitting, it's clear from the first glance when a caller needs multi-page fuse_req.

The patch doesn't make any logic changes. In multi-page case, it silly allocates array of FUSE_MAX_PAGES_PER_REQ page pointers. This will be amended by future patches.

```
---
fs/fuse/cuse.c | 2 +-
fs/fuse/dev.c | 10 +++++-----
fs/fuse/dir.c | 38 ++++++-----
fs/fuse/file.c | 30 ++++++-----
fs/fuse/fuse_i.h | 36 ++++++-----
fs/fuse/inode.c | 2 +-
6 files changed, 74 insertions(+), 44 deletions(-)
```

```
diff --git a/fs/fuse/cuse.c b/fs/fuse/cuse.c
index 3426521..672d86a 100644
--- a/fs/fuse/cuse.c
+++ b/fs/fuse/cuse.c
@@ -411,7 +411,7 @@ static int cuse_send_init(struct cuse_conn *cc)
```

```
    BUILD_BUG_ON(CUSE_INIT_INFO_MAX > PAGE_SIZE);
```

```
- req = fuse_get_req(fc);
+ req = fuse_get_req_onepage(fc);
  if (IS_ERR(req)) {
    rc = PTR_ERR(req);
    goto err;
```

```
diff --git a/fs/fuse/dev.c b/fs/fuse/dev.c
index c0283a1..6e38af5 100644
--- a/fs/fuse/dev.c
+++ b/fs/fuse/dev.c
@@ -117,7 +117,7 @@ static void fuse_req_init_context(struct fuse_req *req)
  req->in.h.pid = current->pid;
 }
```

```
-struct fuse_req *fuse_get_req(struct fuse_conn *fc)
```

```

+struct fuse_req *fuse_get_req(struct fuse_conn *fc, int npages)
{
    struct fuse_req *req;
    sigset_t oldset;
@@ -136,7 +136,7 @@ struct fuse_req *fuse_get_req(struct fuse_conn *fc)
    if (!fc->connected)
        goto out;

- req = fuse_request_alloc(FUSE_MAX_PAGES_PER_REQ);
+ req = fuse_request_alloc(npages);
    err = -ENOMEM;
    if (!req)
        goto out;
@@ -207,13 +207,13 @@ static void put_reserved_req(struct fuse_conn *fc, struct fuse_req
*req)
    * filesystem should not have it's own file open. If deadlock is
    * intentional, it can still be broken by "aborting" the filesystem.
    */
-struct fuse_req *fuse_get_req_nofail(struct fuse_conn *fc, struct file *file)
+struct fuse_req *fuse_get_req_nofail_nopages(struct fuse_conn *fc, struct file *file)
{
    struct fuse_req *req;

    atomic_inc(&fc->num_waiting);
    wait_event(fc->blocked_waitq, !fc->blocked);
- req = fuse_request_alloc(FUSE_MAX_PAGES_PER_REQ);
+ req = fuse_request_alloc(0);
    if (!req)
        req = get_reserved_req(fc, file);

@@ -1563,7 +1563,7 @@ static int fuse_retrieve(struct fuse_conn *fc, struct inode *inode,
    unsigned int offset;
    size_t total_len = 0;

- req = fuse_get_req(fc);
+ req = fuse_get_req_multipage(fc, FUSE_MAX_PAGES_PER_REQ);
    if (IS_ERR(req))
        return PTR_ERR(req);

diff --git a/fs/fuse/dir.c b/fs/fuse/dir.c
index 324bc08..ff7af98 100644
--- a/fs/fuse/dir.c
+++ b/fs/fuse/dir.c
@@ -178,7 +178,7 @@ static int fuse_dentry_revalidate(struct dentry *entry, unsigned int flags)
    return -ECHILD;

    fc = get_fuse_conn(inode);
- req = fuse_get_req(fc);

```

```

+ req = fuse_get_req_nopages(fc);
  if (IS_ERR(req))
    return 0;

@@ -271,7 +271,7 @@ int fuse_lookup_name(struct super_block *sb, u64 nodeid, struct qstr
*name,
  if (name->len > FUSE_NAME_MAX)
    goto out;

- req = fuse_get_req(fc);
+ req = fuse_get_req_nopages(fc);
  err = PTR_ERR(req);
  if (IS_ERR(req))
    goto out;

@@ -391,7 +391,7 @@ static int fuse_create_open(struct inode *dir, struct dentry *entry,
  if (!forget)
    goto out_err;

- req = fuse_get_req(fc);
+ req = fuse_get_req_nopages(fc);
  err = PTR_ERR(req);
  if (IS_ERR(req))
    goto out_put_forget_req;

@@ -592,7 +592,7 @@ static int fuse_mknod(struct inode *dir, struct dentry *entry, umode_t
mode,
{
  struct fuse_mknod_in inarg;
  struct fuse_conn *fc = get_fuse_conn(dir);
- struct fuse_req *req = fuse_get_req(fc);
+ struct fuse_req *req = fuse_get_req_nopages(fc);
  if (IS_ERR(req))
    return PTR_ERR(req);

@@ -623,7 +623,7 @@ static int fuse_mkdir(struct inode *dir, struct dentry *entry, umode_t
mode)
{
  struct fuse_mkdir_in inarg;
  struct fuse_conn *fc = get_fuse_conn(dir);
- struct fuse_req *req = fuse_get_req(fc);
+ struct fuse_req *req = fuse_get_req_nopages(fc);
  if (IS_ERR(req))
    return PTR_ERR(req);

@@ -647,7 +647,7 @@ static int fuse_symlink(struct inode *dir, struct dentry *entry,
{
  struct fuse_conn *fc = get_fuse_conn(dir);
  unsigned len = strlen(link) + 1;
- struct fuse_req *req = fuse_get_req(fc);

```

```

+ struct fuse_req *req = fuse_get_req_nopages(fc);
  if (IS_ERR(req))
    return PTR_ERR(req);

@@ -664,7 +664,7 @@ static int fuse_unlink(struct inode *dir, struct dentry *entry)
{
  int err;
  struct fuse_conn *fc = get_fuse_conn(dir);
- struct fuse_req *req = fuse_get_req(fc);
+ struct fuse_req *req = fuse_get_req_nopages(fc);
  if (IS_ERR(req))
    return PTR_ERR(req);

@@ -696,7 +696,7 @@ static int fuse_rmdir(struct inode *dir, struct dentry *entry)
{
  int err;
  struct fuse_conn *fc = get_fuse_conn(dir);
- struct fuse_req *req = fuse_get_req(fc);
+ struct fuse_req *req = fuse_get_req_nopages(fc);
  if (IS_ERR(req))
    return PTR_ERR(req);

@@ -723,7 +723,7 @@ static int fuse_rename(struct inode *olddir, struct dentry *oldent,
  int err;
  struct fuse_rename_in inarg;
  struct fuse_conn *fc = get_fuse_conn(olddir);
- struct fuse_req *req = fuse_get_req(fc);
+ struct fuse_req *req = fuse_get_req_nopages(fc);

  if (IS_ERR(req))
    return PTR_ERR(req);
@@ -776,7 +776,7 @@ static int fuse_link(struct dentry *entry, struct inode *newdir,
  struct fuse_link_in inarg;
  struct inode *inode = entry->d_inode;
  struct fuse_conn *fc = get_fuse_conn(inode);
- struct fuse_req *req = fuse_get_req(fc);
+ struct fuse_req *req = fuse_get_req_nopages(fc);
  if (IS_ERR(req))
    return PTR_ERR(req);

@@ -848,7 +848,7 @@ static int fuse_do_getattr(struct inode *inode, struct kstat *stat,
  struct fuse_req *req;
  u64 attr_version;

- req = fuse_get_req(fc);
+ req = fuse_get_req_nopages(fc);
  if (IS_ERR(req))
    return PTR_ERR(req);

```

```

@@ -1029,7 +1029,7 @@ static int fuse_access(struct inode *inode, int mask)
    if (fc->no_access)
        return 0;

- req = fuse_get_req(fc);
+ req = fuse_get_req_nopages(fc);
    if (IS_ERR(req))
        return PTR_ERR(req);

@@ -1167,7 +1167,7 @@ static int fuse_readdir(struct file *file, void *dstbuf, filldir_t filldir)
    if (is_bad_inode(inode))
        return -EIO;

- req = fuse_get_req(fc);
+ req = fuse_get_req_onepage(fc);
    if (IS_ERR(req))
        return PTR_ERR(req);

@@ -1197,7 +1197,7 @@ static char *read_link(struct dentry *dentry)
{
    struct inode *inode = dentry->d_inode;
    struct fuse_conn *fc = get_fuse_conn(inode);
- struct fuse_req *req = fuse_get_req(fc);
+ struct fuse_req *req = fuse_get_req_nopages(fc);
    char *link;

    if (IS_ERR(req))
@@ -1410,7 +1410,7 @@ static int fuse_do_setattr(struct dentry *entry, struct iattr *attr,
    if (attr->ia_valid & ATTR_SIZE)
        is_truncate = true;

- req = fuse_get_req(fc);
+ req = fuse_get_req_nopages(fc);
    if (IS_ERR(req))
        return PTR_ERR(req);

@@ -1518,7 +1518,7 @@ static int fuse_setxattr(struct dentry *entry, const char *name,
    if (fc->no_setxattr)
        return -EOPNOTSUPP;

- req = fuse_get_req(fc);
+ req = fuse_get_req_nopages(fc);
    if (IS_ERR(req))
        return PTR_ERR(req);

@@ -1557,7 +1557,7 @@ static ssize_t fuse_getxattr(struct dentry *entry, const char *name,
    if (fc->no_getxattr)

```

```

return -EOPNOTSUPP;

- req = fuse_get_req(fc);
+ req = fuse_get_req_nopages(fc);
  if (IS_ERR(req))
    return PTR_ERR(req);

@@ -1609,7 +1609,7 @@ static ssize_t fuse_listxattr(struct dentry *entry, char *list, size_t size)
  if (fc->no_listxattr)
    return -EOPNOTSUPP;

- req = fuse_get_req(fc);
+ req = fuse_get_req_nopages(fc);
  if (IS_ERR(req))
    return PTR_ERR(req);

@@ -1654,7 +1654,7 @@ static int fuse_removexattr(struct dentry *entry, const char *name)
  if (fc->no_removexattr)
    return -EOPNOTSUPP;

- req = fuse_get_req(fc);
+ req = fuse_get_req_nopages(fc);
  if (IS_ERR(req))
    return PTR_ERR(req);

diff --git a/fs/fuse/file.c b/fs/fuse/file.c
index 7423ea4..c811f3d 100644
--- a/fs/fuse/file.c
+++ b/fs/fuse/file.c
@@ -25,7 +25,7 @@ static int fuse_send_open(struct fuse_conn *fc, u64 nodeid, struct file *file,
  struct fuse_req *req;
  int err;

- req = fuse_get_req(fc);
+ req = fuse_get_req_nopages(fc);
  if (IS_ERR(req))
    return PTR_ERR(req);

@@ -368,7 +368,7 @@ static int fuse_flush(struct file *file, fl_owner_t id)
  if (fc->no_flush)
    return 0;

- req = fuse_get_req_nofail(fc, file);
+ req = fuse_get_req_nofail_nopages(fc, file);
  memset(&inarg, 0, sizeof(inarg));
  inarg.fh = ff->fh;
  inarg.lock_owner = fuse_lock_owner_id(fc, id);
@@ -436,7 +436,7 @@ int fuse_fsync_common(struct file *file, loff_t start, loff_t end,

```

```

fuse_sync_writes(inode);

- req = fuse_get_req(fc);
+ req = fuse_get_req_nopages(fc);
  if (IS_ERR(req)) {
    err = PTR_ERR(req);
    goto out;
@@ -544,7 +544,7 @@ static int fuse_readpage(struct file *file, struct page *page)
  */
  fuse_wait_on_page_writeback(inode, page->index);

- req = fuse_get_req(fc);
+ req = fuse_get_req_onepage(fc);
  err = PTR_ERR(req);
  if (IS_ERR(req))
    goto out;
@@ -657,7 +657,7 @@ static int fuse_readpages_fill(void *_data, struct page *page)
  (req->num_pages + 1) * PAGE_CACHE_SIZE > fc->max_read ||
  req->pages[req->num_pages - 1]->index + 1 != page->index)) {
  fuse_send_readpages(req, data->file);
- data->req = req = fuse_get_req(fc);
+ data->req = req = fuse_get_req_multipage(fc, FUSE_MAX_PAGES_PER_REQ);
  if (IS_ERR(req)) {
    unlock_page(page);
    return PTR_ERR(req);
@@ -683,7 +683,7 @@ static int fuse_readpages(struct file *file, struct address_space *mapping,

  data.file = file;
  data.inode = inode;
- data.req = fuse_get_req(fc);
+ data.req = fuse_get_req_multipage(fc, FUSE_MAX_PAGES_PER_REQ);
  err = PTR_ERR(data.req);
  if (IS_ERR(data.req))
    goto out;
@@ -890,7 +890,7 @@ static ssize_t fuse_perform_write(struct file *file,
  struct fuse_req *req;
  ssize_t count;

- req = fuse_get_req(fc);
+ req = fuse_get_req_multipage(fc, FUSE_MAX_PAGES_PER_REQ);
  if (IS_ERR(req)) {
    err = PTR_ERR(req);
    break;
@@ -1072,7 +1072,7 @@ static ssize_t fuse_direct_io(struct file *file, const char __user *buf,
  ssize_t res = 0;
  struct fuse_req *req;

```

```

- req = fuse_get_req(fc);
+ req = fuse_get_req_multipage(fc, FUSE_MAX_PAGES_PER_REQ);
  if (IS_ERR(req))
    return PTR_ERR(req);

@@ -1108,7 +1108,7 @@ ssize_t fuse_direct_io(struct file *file, const char __user *buf,
    break;
    if (count) {
      fuse_put_request(fc, req);
- req = fuse_get_req(fc);
+ req = fuse_get_req_multipage(fc, FUSE_MAX_PAGES_PER_REQ);
      if (IS_ERR(req))
        break;
    }
@@ -1470,7 +1470,7 @@ static int fuse_getlk(struct file *file, struct file_lock *fl)
    struct fuse_lk_out outarg;
    int err;

- req = fuse_get_req(fc);
+ req = fuse_get_req_nopages(fc);
    if (IS_ERR(req))
      return PTR_ERR(req);

@@ -1505,7 +1505,7 @@ static int fuse_setlk(struct file *file, struct file_lock *fl, int flock)
    if (fl->fl_flags & FL_CLOSE)
      return 0;

- req = fuse_get_req(fc);
+ req = fuse_get_req_nopages(fc);
    if (IS_ERR(req))
      return PTR_ERR(req);

@@ -1574,7 +1574,7 @@ static sector_t fuse_bmap(struct address_space *mapping, sector_t
block)
    if (!inode->i_sb->s_bdev || fc->no_bmap)
      return 0;

- req = fuse_get_req(fc);
+ req = fuse_get_req_nopages(fc);
    if (IS_ERR(req))
      return 0;

@@ -1872,7 +1872,7 @@ long fuse_do_ioctl(struct file *file, unsigned int cmd, unsigned long
arg,
    num_pages++;
  }

- req = fuse_get_req(fc);

```



```

+ req = fuse_get_req_multipart(fc, FUSE_MAX_PAGES_PER_REQ);
  if (IS_ERR(req)) {
    err = PTR_ERR(req);
    req = NULL;
@@ -2075,7 +2075,7 @@ unsigned fuse_file_poll(struct file *file, poll_table *wait)
  fuse_register_polled_file(fc, ff);
}

- req = fuse_get_req(fc);
+ req = fuse_get_req_nopages(fc);
  if (IS_ERR(req))
    return POLLERR;

@@ -2193,7 +2193,7 @@ long fuse_file_fallocate(struct file *file, int mode, loff_t offset,
  if (fc->no_fallocate)
    return -EOPNOTSUPP;

- req = fuse_get_req(fc);
+ req = fuse_get_req_nopages(fc);
  if (IS_ERR(req))
    return PTR_ERR(req);

diff --git a/fs/fuse/fuse_i.h b/fs/fuse/fuse_i.h
index 5e78840..f41b149 100644
--- a/fs/fuse/fuse_i.h
+++ b/fs/fuse/fuse_i.h
@@ -671,14 +671,44 @@ struct fuse_req *fuse_request_alloc_nofs(int npages);
void fuse_request_free(struct fuse_req *req);

/**
- * Get a request, may fail with -ENOMEM
+ * Get a request, may fail with -ENOMEM,
+ * caller should specify # elements in req->pages[] explicitly
+ */
-struct fuse_req *fuse_get_req(struct fuse_conn *fc);
+struct fuse_req *fuse_get_req(struct fuse_conn *fc, int npages);
+
+/**
+ * Get a request, may fail with -ENOMEM,
+ * useful for callers who doesn't use req->pages[]
+ */
+static inline struct fuse_req *fuse_get_req_nopages(struct fuse_conn *fc)
+{
+  return fuse_get_req(fc, 0);
+}
+
+/**
+ * Get a request, may fail with -ENOMEM,

```

```

+ * useful for callers who need only one page in req->pages[]
+ */
+static inline struct fuse_req *fuse_get_req_onepage(struct fuse_conn *fc)
+{
+ return fuse_get_req(fc, 1);
+}
+
+/**
+ * Get a request, may fail with -ENOMEM,
+ * useful for callers who need many pages in req->pages[]
+ */
+static inline struct fuse_req *fuse_get_req_multipage(struct fuse_conn *fc,
+ int n)
+{
+ return fuse_get_req(fc, n);
+}

/**
 * Gets a requests for a file operation, always succeeds
 */
-struct fuse_req *fuse_get_req_nofail(struct fuse_conn *fc, struct file *file);
+struct fuse_req *fuse_get_req_nofail_nopages(struct fuse_conn *fc,
+ struct file *file);

/**
 * Decrement reference count of a request. If count goes to zero free
diff --git a/fs/fuse/inode.c b/fs/fuse/inode.c
index 3f399ba..efb6144 100644
--- a/fs/fuse/inode.c
+++ b/fs/fuse/inode.c
@@ -411,7 +411,7 @@ static int fuse_statfs(struct dentry *dentry, struct kstatfs *buf)
     return 0;
 }

- req = fuse_get_req(fc);
+ req = fuse_get_req_nopages(fc);
     if (IS_ERR(req))
         return PTR_ERR(req);

```
