
Subject: [PATCH 0/1][RFC] prepare_write positive return value V(2)
Posted by [Dmitriy Monakhov](#) on Mon, 12 Feb 2007 09:45:45 GMT
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Changes from ver(1)

- `__page_symlink()`: In order to be on a safe side add explicit zeroing content before fail (just in case).
- `do_lo_send_aops()`: If `prepare_write` can't handle total size of bytes requested from `loop_dev` it is safer to fail.
- `pipe_to_file()`: Limit the size of the copy to size which `prepare_write` ready to handle. instead of failing.
- `ecryptfs`: was't changed in this version, because where is no even `AOP_TRUNCATED_PAGE` handling code where.

Almost all read/write operation handles data with chunks (segments or pages) and result has integral behaviour for following scenario:

```
for_each_chunk() {  
    res = op(...);  
    if(IS_ERROR(res))  
        return progress ? progress : res;  
    progress += res;  
}
```

`prepare_write` may have integral behaviour in case of `blksize < pgsz`, for example we successfully allocated/read some blocks, but not all of them, and then some error happens. Currently we eliminate this progress by doing `vmtruncate()` after `prepare` has failed.

It is good to have ability to signal about this progress. Interpret positive `prepare_write()` return code as bytes number that fs ready to handle at this moment.

BTH: This approach was used in OpenVZ 2.6.9 kernel in order to make FS with delayed allocation more correct, and it works well.

I think not everybody will be happy about this, but let's discuss all advantages and disadvantages of this change.

fixes not directly connected with proposed `prepare_write` semantic changes:

- `__page_symlink`: If `find_or_create_page` has failed on second retry attempt function will exit with wrong error code.
- `__generic_cont_expand`: Add correct `AOP_TRUNCATED_PAGE` handling.

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```
diff --git a/drivers/block/loop.c b/drivers/block/loop.c  
index 6b5b642..dc332dc 100644  
--- a/drivers/block/loop.c  
+++ b/drivers/block/loop.c  
@@ -224,6 +224,7 @@ static int do_lo_send_aops(struct loop_device *lo, struct bio_vec *bvec,  
    sector_t IV;
```

```

unsigned size;
int transfer_result;
+ int partial = 0;

IV = ((sector_t)index << (PAGE_CACHE_SHIFT - 9))+(offset >> 9);
size = PAGE_CACHE_SIZE - offset;
@@ -239,11 +240,20 @@ static int do_lo_send_aops(struct loop_device *lo, struct bio_vec
*bvec,
    page_cache_release(page);
    continue;
}
- goto unlock;
+ if (ret > 0 && ret < PAGE_CACHE_SIZE) {
+ /*
+  * ->prepare_write() can't handle total size of bytes
+  * requested. In fact this is not likely to happen,
+  * because we request one block only.
+  */
+ partial = 1;
+ size = ret;
+ } else
+ goto unlock;
}
transfer_result = lo_do_transfer(lo, WRITE, page, offset,
    bvec->bv_page, bv_offs, size, IV);
- if (unlikely(transfer_result)) {
+ if (unlikely(transfer_result || partial)) {
    char *kaddr;

/*
@@ -266,7 +276,7 @@ static int do_lo_send_aops(struct loop_device *lo, struct bio_vec *bvec,
}
goto unlock;
}
- if (unlikely(transfer_result))
+ if (unlikely(transfer_result || partial))
    goto unlock;
    bv_offs += size;
    len -= size;
diff --git a/fs/buffer.c b/fs/buffer.c
index 1ad674f..ed06560 100644
--- a/fs/buffer.c
+++ b/fs/buffer.c
@@ -2027,13 +2027,20 @@ static int __generic_cont_expand(struct inode *inode, loff_t size,
    if (size > inode->i_sb->s_maxbytes)
        goto out;

+retry:

```

```

err = -ENOMEM;
page = grab_cache_page(mapping, index);
if (!page)
    goto out;
err = mapping->a_ops->prepare_write(NULL, page, offset, offset);
+ if (err == AOP_TRUNCATED_PAGE) {
+   page_cache_release(page);
+   goto retry;
+ }
if (err) {
    /*
+   * ->prepare_write() called with from==to and must not
+   * return positive size of bytes in this case.
+   * ->prepare_write() may have instantiated a few blocks
+   * outside i_size. Trim these off again.
+   */
@@ -2044,6 +2051,10 @@ static int __generic_cont_expand(struct inode *inode, loff_t size,
    }

err = mapping->a_ops->commit_write(NULL, page, offset, offset);
+ if (err == AOP_TRUNCATED_PAGE) {
+   page_cache_release(page);
+   goto retry;
+ }

unlock_page(page);
page_cache_release(page);
diff --git a/fs/namei.c b/fs/namei.c
index e4f108f..6626277 100644
--- a/fs/namei.c
+++ b/fs/namei.c
@@ -2688,20 +2688,36 @@ int __page_symlink(struct inode *inode, const char *symname, int
len,
{
    struct address_space *mapping = inode->i_mapping;
    struct page *page;
- int err = -ENOMEM;
+ int err;
    char *kaddr;

retry:
+ err = -ENOMEM;
    page = find_or_create_page(mapping, 0, gfp_mask);
    if (!page)
        goto fail;
    err = mapping->a_ops->prepare_write(NULL, page, 0, len-1);
- if (err == AOP_TRUNCATED_PAGE) {
-   page_cache_release(page);

```

```

- goto retry;
- }
- if (err)
+ if(unlikely(err)){
+ if (err == AOP_TRUNCATED_PAGE) {
+ page_cache_release(page);
+ goto retry;
+ }
+ if (err > 0 && err < PAGE_CACHE_SIZE) {
+ /*
+  * ->prepare_write() can't handle total size of bytes requested.
+  * Really this is not likely to happen, because usually we need
+  * one block only. In order to preserve prepare/commit balanced
+  * invoke commit and fail with ENOSPC.
+  */
+ int ret;
+ kaddr = kmap_atomic(page, KM_USER0);
+ memset(kaddr, 0, err);
+ kunmap_atomic(kaddr, KM_USER0);
+ ret = mapping->a_ops->commit_write(NULL, page, 0, err);
+ err = (ret < 0) ? ret : -ENOSPC;
+ }
+ goto fail_map;
+ }
+ kaddr = kmap_atomic(page, KM_USER0);
+ memcpy(kaddr, symname, len-1);
+ kunmap_atomic(kaddr, KM_USER0);
diff --git a/fs/splice.c b/fs/splice.c
index 2fca6eb..78c3e88 100644
--- a/fs/splice.c
+++ b/fs/splice.c
@@ -649,6 +649,14 @@ find_page:
 }

ret = mapping->a_ops->prepare_write(file, page, offset, offset+this_len);
+ if (unlikely(ret > 0 && ret < PAGE_CACHE_SIZE)) {
+ /*
+  * Limit the size of the copy to size which prepare_write
+  * ready to handle.
+  */
+ this_len = ret;
+ ret = 0;
+ }
+ if (unlikely(ret)) {
+ loff_t isize = i_size_read(mapping->host);

diff --git a/mm/filemap.c b/mm/filemap.c
index 8332c77..8b4789d 100644

```

```
--- a/mm/filemap.c
+++ b/mm/filemap.c
@@ -2127,6 +2127,14 @@ generic_file_buffered_write(struct kiocb *iocb, const struct iovec *iov,
 }

    status = a_ops->prepare_write(file, page, offset, offset+bytes);
+ if (unlikely(status > 0 && status < PAGE_CACHE_SIZE)) {
+ /*
+  * Limit the size of the copy to size wich prepare_write
+  * ready to handle.
+  */
+ bytes = status;
+ status = 0;
+ }
    if (unlikely(status)) {
        loff_t isize = i_size_read(inode);
```
