NAME

append_rec, create_file, create_id, create_rec, create_rec_id, destroy_file, destroy_rec, lfid_of_lrid, truncate_rec, update_rec, update_rec_hdr – Class ss_m Methods for File/Record Operations

SYNOPSIS

```
#include <sm_vas.h>  // which includes sm.h


    /* Logical-ID version */
static rc_t                 create_file(const lvid_t& lvid,
                        serial_t&           lfid,
                        store_property_t    property);

    /* Physical-ID version */
static rc_t                 create_file( vid_t        vid,
                        stid_t&       fid,
                        store_property_t    property,
                        const serial_t&           logical_id = serial_t::null,
                        shpid_t       cluster_hint = 0); // not used


    /* Logical-ID version */
static rc_t                 destroy_file(const lvid_t&      lvid,
                        const serial_t&           lfid);

    /* Physical-ID version */
static rc_t                 destroy_file(const stid_t&      fid);


    /* Logical-ID version */
static rc_t                 create_rec(const lvid_t&  lvid,
                        const serial_t&           lfid,
                        const vec_t&        hdr,
                        smsize_t            len_hint,
                        const vec_t&        data,
                        serial_t&           lrid);

    /* Logical-ID version */
static rc_t                 create_id(const lvid_t&   lvid,
                        int                 id_count,
                        serial_t&           id_start);

    /* Logical-ID version */
static rc_t                 create_rec_id(const lvid_t&     lvid,
                        const serial_t&           lfid,
                        const vec_t&        hdr,
                        smsize_t            len_hint,
                        const vec_t&        data,
                        const serial_t&           lrid);

    /* Physical-ID version */
static rc_t                 create_rec(const stid_t&  fid,
                        const vec_t&        hdr,
```

```
                        smsize_t                len_hint,
                        const vec_t&        data,
                        rid_t&              new_rid,
                        const serial_t&           serial = serial_t::null );


    /* Logical-ID version */
static rc_t                 destroy_rec(const lvid_t& lvid,
                        const serial_t&           lrid);

    /* Physical-ID version */
static rc_t                 destroy_rec(const rid_t&  rid);


    /* Logical-ID version */
static rc_t                 update_rec(const lvid_t&  lvid,
                        const serial_t&           lrid,
                        smsize_t            start,
                        const vec_t&        data);

    /* Physical-ID version */
static rc_t                 update_rec(const rid_t&   rid,
                        smsize_t            start,
                        const vec_t&        data);


    /* Logical-ID version */
static rc_t                 update_rec_hdr(const lvid_t&    lvid,
                        const serial_t&           lrid,
                        smsize_t            start,
                        const vec_t&        hdr);

    /* Physical-ID version */
static rc_t                 update_rec_hdr(const rid_t&     rid,
                        smsize_t            start,
                        const vec_t&        hdr);
                        // see also pin_i::update_rec*()


    /* Logical-ID version */
static rc_t                 append_rec(const lvid_t&  lvid,
                        const serial_t&           lrid,
                        const vec_t&        data);

    /* Physical-ID version */
static rc_t                 append_rec(const rid_t&   rid,
                        const vec_t&        data,
                        bool                allow_forward);


    /* Logical-ID version */
static rc_t                 truncate_rec(const lvid_t&      lvid,
                        const serial_t&     lrid,
```

```
                        smsize_t            amount);

    /* Physical-ID version */
static rc_t                 truncate_rec(const rid_t& rid,
                        smsize_t            amount);


    // lfid_of_lrid converts a logical record ID into a logical file ID
    /* Logical-ID version */
static rc_t                 lfid_of_lrid(const lvid_t&      lvid,
                        const serial_t&     lrid,
                        serial_t&           lfid);
```

DESCRIPTION

The above class **ss_m** methods all deal with manipulating files and records. The logical-ID and physical-ID APIs have direct analogues, except when it comes to creating records. When using logical IDs, it is possible to pre-allocate logical IDs to apply to records upon creation of the records. For this, there is no counterpart in the physical-ID API.

Common Parameters

There are a number of common parameters for these methods:

lvid Logical volume ID of volume containing a file/record.

lfid Logical file ID, the serial number of a file.

lrid Logical record ID, the serial number of a record.

data A vector pointing to data used to fill/overwrite the body of a record.

hdr A vector pointing to data used to fill/overwrite the header of a record.

create_file(lvid, lfid, property)

The **create_file** method creates a new file on the volume *lvid*, and returns its serial number in *lfid*. The *property* parameter specifies whether the file is temporary or not. See **enum(ssm)** for more information on file properties.

See the "ROOT INDEX METHODS" section of **volume(ssm)** for information on how to keep track of the files on a volume.

destroy_file(lvid, lfid)

The **destroy_file** method destroys all records in the file and deallocates space used by a file. The space used by the file is not available for reuse until the transaction destroying the file commits.

create_rec(lvid, lfid, hdr, len_hint, data, lrid)

The **create_rec** method creates a record in a file. The ID of the new record is returned in the *lrid* parameter. The *len_hint* parameter is a "hint" about the final length of the record. If the creation will be followed by appends, *len_hint* should ideally be set to the final length of the record. This will allow the SM to place the record in a location with sufficient contiguous space for the record. A value of 0 should be used if the final length is unknown. No order is defined on the records in a file: when a new record is created, the I/O subsystem may place the record anywhere in the file.

create_id(lvid, id_count, id_start)

The **create_id** method generates *id_count* new IDs that can be used later by **create_rec_id** to associate a records with the IDs. The first ID is returned in *id_start.* The other IDs should be obtained by calling **id_start::increment(1)** *id_count* -1 times.

create_rec_id(lvid, lfid, hdr, len_hint, data, lrid)

The **create_rec_id** method is identical to **create_rec** except that the record ID is specified by the caller with the *lrid* parameter rather than being generated and returned in *lrid* as is done in **create_rec.**

destroy_rec(lvid, lrid)

The **destroy_rec** method destroys the specified record.

update_rec(lvid, lrid, start, data)

The **update_rec** method updates a range of bytes in the body of the record specified by *lvid, lrid* . The byte offset, from the beginning of the record body, for the beginning of the range is specified by the *start* parameter. The length of the range is the length of the *data* vector. The range is replaced by the bytes pointed to by the *data* parameter. Note that **update_rec** cannot be used to change the size of the record. It is an error to specify a starting location and vector length that imply updating beyond the end of the record.

update_rec_hdr(lvid, lrid, start, hdr)

The **update_rec_hdr** method updates a range of bytes in the header of the record specified by *lvid, lrid* . The byte offset, from the beginning of the header, for the beginning of the range is specified by the *start* parameter. The length of the range is the length of the *hdr* vector. The range is replaced by the bytes pointed to by the *hdr* parameter.

Note: There are no methods for appending to a record header or truncating a record header (as there are for a record body). If these methods would be useful for you, please contact the Shore developers.

append_rec(lvid, lrid, data)

The **append_rec** method appends the bytes pointed to by *data* to the end of the record body.

truncate_rec(lvid, lrid, amount)

The **truncate_rec** method removes *amount* bytes from the end of a record body.

lfid_of_lrid(lvid, lrid, lfid)

The **lfid_of_lrid** method returns, in *lfid,* the ID of file containing the record, *lrid.*

UNINITIALIZED DATA

The functions **create_rec, append_rec,** and **update_rec** can be used to write blocks of data that are all zeroes, with minimal logging. This is useful, for example, when a value-added server creates a record of a known size but with uninitialized data. To make use of this feature, these functions are called with data vectors of a specialized type, *zvec_t,* whose constructor takes only a size:

```
rc_t    rc;
char    h[HEADER_SIZE];
vec_t   hdr(h, sizeof(h));

// ... fill in hdr

// create a vector representing 1000
// contiuous bytes of zeroes
zvec_t  zdata(1000);

rc = ss_m::create_rec(lvid, lfid, hdr,
    HEADER_SIZE + 1000, zdata, result);
```

ERRORS

All of the above methods return a **w_rc_t** error code. If an error occurs during a method that is updating persistent data (the create, update, append, and truncate methods will update data) then the record/file could be in an inconsistent state. The caller then has the choice of aborting the transaction or rolling back to the nearest save-point (see **transaction(ssm)**).

See **errors(ssm)** for more information on error handling.

EXAMPLES

To Do.

VERSION

This manual page applies to Version 2.0 of the Shore Storage Manager.

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SEE ALSO

vec_t(common), pin_i(ssm), scan_file_i(ssm), intro(ssm),