Identification

listacl
C. A. Cushing, C. Marceau, K. Martin

Purpose

The user may wish to check access control information
for segments in his own or in other users' directories.
He can, using listacl, print access control information
for a particular segment or for all segments in a directory.
The user of listacl should be familiar with access control
conventions as described in BG.9.00 and BX.8.00. BX.8.02
discusses commands for setting access control information.

Usage

listacl   entry acname1 -- acnamen

listacl lists information from the common access control
list (CACL) of the directory containing entry, and information
from the access control list (ACL) of each segment in
the set entry. The CACL of a directory contains the access
control information that applies to every entry in the
directory.

Entry is the pathname, relative to the working directory or to
        the root directory, of a segment or a set of segments
        specified using the * convention. If entry is null,
        only information on the CACL of the working directory
        is listed. (Entry may be omitted entirely only if
        acname1 -- acnamen are omitted.)

Acname1 -- acnamen are the three-element access control names
        (personal name, project ID, instance ID). If
        acname1 -- acnamen are omitted, listacl prints the
        access control information for all access control
        names in the CACL of the directory containing entry
        and in the ACL of the entry.

Comments

The user issuing the command listacl must have the read
attribute on in the directory defined by entry. If entry
defines a link, it is necessary for the caller to have

the execute attribute on for the directory containing
the link and all directories containing intermediate links;
the read attribute must be on for the directory containing
the non-link entry to which this link eventually points.
An error message will be printed if access control information
cannot be listed for an entry in the set _entry_.

To list access control information from the CACL of a
directory b with pathname a>b, the user specifies as _entry_
argument "a>b>". The final ">" signifies that information
from the CACL of b is to be listed, rather than from the
ACL of the branch which points to b. I.e., the user wants
access control information about the segments in b, not
about b itself.

Errors
‾‾‾‾‾‾

There are two types of errors which the user may make
in using listacl:

1) The user may not have the requisite access privileges
   for reading access control lists. For example, he
   attempts to read the ACL of segment b in directory a,
   · but does not have the Read attribute on in directory a.

2) The user supplies incorrect arguments to listacl. For
   example, he specifies entry "a>b>", but b is not a
   directory, hence contains no CACL.

Implementation
‾‾‾‾‾‾‾‾‾‾‾‾‾‾

The ACL for a segment (as well as the CACL for a directory)
consists of a list of access control names, with access
control information for each name, as discussed in sections
BX.8.00 and BX.8.02. An ACL is represented by the following
structure:

        dcl 1 acl (aclct) ctl (aclp),

            2 acname,

                3 name char (24),

                3 projid char (24),

                3 instance_id char (2),

```
        2 mode bit (5),

        2 plistp ptr,

        2 trapp ptr;
```

acl -   an array of access control names with
                   associated information. The number of
                   names is aclct.

acname -   an access control name, consisting of
                   three elements: a personal name, a project
                   ID (projid) and an instance ID.

mode -   five bits, representing TREWA (the attributes
                   Trap, Read, Execute, Write, and Append).
                   If a bit is 1, the corresponding attribute
                   is on.

plistp -   pointer to an adjustable bit string
                   containing the protection list.

trapp -   pointer to an adjustable character string
                   which represents a trap procedure with
                   arguments.

Listacl weights each of the names in acname1 -- acnamen
(or the user's name if they are omitted) through a call
to the external function weighter described in section
BX.8.02). Each name is entered into the following array:

```
dcl 1 namelist (n),

    2 name char (24),      /* personal name of user */

    2 projid char (24),    /* project ID */

    2 instance_id char (2),

    2 weight fixed bin (17); /* weight attached to access
                                  control name */
```

Here n is the number of names in acname1 -- acnamen.
The external function orderusers (see BX.8.02) orders
namelist so that namelist(1) contains the "heaviest" access
control name and namelist(n) the "lightest" access control
name.

Next listacl considers the argument entry, a path name
relative to the working directory or to the root directory.
Listacl calls the entryarg procedure (see BX.8.05) which
analyzes entry and returns:

1) the path name (relative to the root directory) of the
   directory which contains the entry or set of entries
   defined by the symbolic entry name,

2) the segment name (not a path name).

If the segment name is null (i.e. the argument entry ends
in ">") listacl lists only information from the CACL of
entry. Otherwise, listacl obtains the CACL of the directory
containing entry by calling readacl (see above) which
contains the common access control list for the directory.
Listacl now extracts and prints at the user's console
the CACL access information for the names in acname1 --
acnamen.

Next listacl goes on to the set of entries in the directory
which were defined by entry. If the entry name returned
by entry_arg has * or ** as a component (signifying a
set of segments in the directory) then the entries it
defines are obtained by calling the file system library
procedure star (see BY.2.08).

For each entry returned by star or list_dir, listacl calls
readacl to obtain the ACL for that entry. (Readacl supplies
a CACL if a null (zero-length) entry name is supplied
to it, an ACL if a segment name is given to it as the
second argument.) Listacl now extracts the access information
for the names in acname1 -- acnamen from the ACL of the
entry or, if they are not found there, from the CACL of
the directory containing the entry. Listacl prints this
at the console.