To: Distribution

From: Jerold C. Whitmore

Date: September 23, 1974

Subject: Reporting Process Access Mode to the User

I.   Introduction

There are three commonly used hcs_ primitives which attempt to
return the caller's mode of access to a branch. Today, this mode
is the raw mode from the ACL of the branch. The raw mode
currently can be misleading to the user since it does not account
for ring brackets.

The Access Isolation Mechanism will make the raw ACL mode even
more misleading to the user. The following changes to the three
primitives are proposed to provide the user process with mode
information which is both correct and upward compatible with
existing software.

II. hcs_$star_list_

This primitive returns a structure containing a mode field for
each branch which matches the star name. There is no field in
the structure for ring bracket data. Therefore, the user would
have to make a separate call to properly determine his access.

The mode returned in this structure should be changed to the
user's effective mode at his current validation level. The
effective mode would be a combination of ACL mode, ring brackets
and Access Isolation restrictions all factored together.

This will ensure that programs which make decisions based on the
mode data in the structure will work correctly. If these
programs already obtain the ring bracket data to properly
determine access, they will still get the same answer, but also
consistent with the Access Isolation Mechanism. Hence, this
change is upward compatible.

_____

Programs which report the mode data in the structure to the user
(e.g., the list command) will now report the correct mode for the
process at his current validation level. More detailed access
information will still be available to the process through other
primitives or by the use of commands.

III.   hcs_$status_

This primitive returns a structure for a specified branch. The
structure contains the caller's raw ACL mode without factoring in
the ring brackets or returning the ring bracket data.

The mode returned in this structure should also be changed to the
effective mode as described above. This change will also be
upward compatible for the same reasons.

IV.   hcs_$status_long

This primitive also returns a structure for a specified branch.
The structure contains both mode and ring bracket fields. Before
the addition of the Access Isolation Mechanism, this data was
sufficient for the user to determine his access to the branch.
Now this is not the case. The size of the structure does not
provide space for the branch access class to be included and the
length cannot be increased for compatability reasons.

Therefore, the mode data currently returned should also be
changed to the caller's effective mode. In addition, the 13 bit
pad field of the structure can be changed to provide the raw ACL
mode (this will leave an 8 bit pad). The raw mode data will be
useful for status reporting (e.g., in the status command).

This change is also upwards compatible for programs making
decisions based on access data and programs which need the raw
ACL mode can be trivially modified to use it.

V. Other hcs_ primitives

The primitive hcs_$fs_get_mode returns the caller's effective
mode at his current validation level. The effective mode will
still be returned, but with the Access Isolation restrictions
factored in.

The primitive hcs_$status is not called by any system software.
It returns directory information in a packed structure. This
primitive is not a documented user interface and should be
deleted.

The primitive hcs_$list_dir is only used by backup_dump_recurse. The mode returned in its packed structure is thus backup's mode to the branch. Since backup is running in ring 1 when it calls hcs_$list_dir, it can believe the mode data for segment branches. The mode is not currently used for access decisions by backup. However, for consistency, the mode should have the Access Isolation restrictions factored in. This will help to avoid mis-interpretation in future changes or in other programs which may be designed to call this primitive.

VI. Note on Compatibility

These changes have been designed to properly integrate the Access Isolation Mechanism into existing primitives and to minimize the impact on current user software. For installations operating at a single access class, the changes will be invisible except for ring bracket factoring. At all installations, the information returned by the primitives will be correct and complete.

Programs which report or save information about branch status must be changed eventually to include the branch access class. The returned structures mentioned in this MTB will not be changed to include this data for compatibility reasons. New primitives will be provided for this purpose.

If these changes cause major problems for any user, please call:

            Jerry Whitmore   or   Andy Kobzlar
            491-7300   491-6300

or send MIT mail to:

            Whitmore.MPLS   or   Kobzlar.MPLS