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ABSTRACT and CONTENTS

This document proposes a method for controlling special
capabilities such as "system diagnostic", etc. When
approved it will be part of the M1 file and sub-process
systems.

Control of Capabilities

Some method must be available for a sub-process to acquire extraordinary capabilities when they are needed. Through the addition of three operations in the basic file system, we gain the ability to both access and control capabilities. Both operations involve the use of a new item in the MIB header, the user capability word (UCW).

A sub-process acquires extra capabilities by:

1) setting TAK to the appropriate user number, and

2) executing MERGE'SCB(UNDK,SPTX).

This operation merges the UCW of the MIB specified by UNDK into the status control bits (SCB) of sub-process SPTX. The operation fails unless TAK appears on the owner-access lock list with ownership access to the MIB. It also fails if SPTX is not controlled by the calling sub-process. If desirable the sub-process can then use SET' SPT'FIELD to reduce the capabilities acquired.

The other two operations are for reading and setting the UCW. READ'UCW(UNDK) returns the UCW of the specified MIB. It requires read access to the MIB. SET'UCW(UNDK1,UNDK2,ON,OFF) copies part of the UCW of UNKD1 to UNDK2. It requires ownership access to both MIBs. The bits selected by ON are set; those selected by OFF are reset. The operation fails if the bits selected by ON are not part of the UCW of UNDK1.

Thus capabilities are normally assigned to users. They may
be acquired by the user's sub-processes or by sub-processes
which own the user's MIB. Further capabilities may be
granted or withdrawn by a sub-process which controls the
capability and owns the source and target MIBs. All that is
needed is the prime source of capabilities. This will be
the system owner's MIB. The UCW of this MIB will contain
all capabilities. The few, totally privileged, programs
running from this MIB can then dispense capabilities
according to policy decisions beyond the scope of this
document.