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Identification

User Search Control
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Purpose

When a process needs a segment for the first time, the segment must be found in the file system hierarchy. Since a user has some control over the placement of a segment in the file system hierarchy, a standard searching technique is not likely to work in all cases--the user needs to have some control over searching for his segments.

The Search Module allows the user to choose between the standard searching technique provided by the system and a searching technique provided by the user.

If the user wants to supply his own searching technique to the Search Module, he must know how to construct searching advice in the language recognized by the Search Module and he must know how to use the system option search.

Section BD.4 describes the implementation of the Search Module; section BX.13 describes the means with which the user can direct the Search Module.

Discussion

When a procedure references a segment with a particular symbolic name for the first time, the reference results in a directed fault. The Linker (section BD.7.01) gains control and asks the Segment Housekeeping Module (section BD.3.00) to get the segment to be used for the symbolic name. If the Segment Housekeeping Module cannot obtain this information from its Segment Name Table (section BD.3.01), the Segment Housekeeping Module invokes the Search Module with the call:

```
call search(name, callerptr, dpath, entry)
```

where it provides the Search Module with the first two items of information and expects the last two items to be returned.

name is the symbolic name for which a segment is sought.

callerptr is the pointer to the faulting segment, i.e., the procedure which wants a segment for name.

dpath is the path name of the directory in which the desired segment resides.

entry is the entry name of the desired segment in the directory dpath.

With this information the Search Module determines what segments defining a searching technique are to be used to find name. The Search Module finds the segments, interprets them for searching directions, and obtains the segment for name. The Search Module uses the error handling procedures of section BY.11 in the event an error occurs.

Searching advice

The user constructs searching advice with the ordinary system input and editing facilities for creating segments and storing them in the file system hierarchy. The Search Module expects a segment which should be interpreted for searching advice to consist of a sequence of searching rule statements. A searching rule statement is a keyword followed by a blank, followed by any relevant arguments and terminated by a semi-colon (;).

The keywords recognized by the Search Module enable the user to indicate the directories to be searched for the segment, to specify a particular segment to be used, to invoke an external procedure, etc.. The user can restrict the use of searching rule statements on the basis of the name sought, the name of the faulting procedure and the ring number of the faulting procedure. Section BX.13.01 describes the complete set of keywords recognized by the Search Module and the syntax for constructing searching rule statements. The user can invoke the command checkrule (BX.13.02) to check segments for their acceptability as searching rule statements.

Setting searching advice

Once the user has constructed segments to be interpreted for searching advice, he can direct the Search Module to use them by setting the system option search. (Section BX.12.00 contains a general discussion of options.) The search option enables the user to switch between the standard advice provided by the system and the advice provided by the user.

The search option is a binary switch, set either "off" or "on", with a specification for the "on" setting. When the option is off, the Search Module uses the advice provided by the system (see section BD.4.03); when the option is on, the Search Module obtains the segments to be interpreted for advice from the option's specification. The specification for the search option is a list of the names of the segments containing the desired searching rule statements. The order of the segment names in the specification determines the order in which the segments will be interrogated for searching advice.

Initially the search option is set off. The user changes the setting by calling the system command option (described in BX.12.02). For example, a user who wants to use his own searching advice could say:

```
option p search on `seg1 seg2';
```

which directs the Search Module to interpret the segments "seg1" and "seg2", in that order, for searching advice.

If the Search Module finds that the search option is on but no specification exists, it uses the error handling method described in section BY.11 to signal this erroneous setting and then returns to the Segment Housekeeping Module.

Enforcing searching advice

An administrator at any level may enforce searching advice in order to regulate the searching techniques of the users under him. For example, an instructor may wish to restrict his class to using utility routines which appear in a certain library when a linkage fault occurs in the user base ring. To enforce searching advice for a ring, an administrator uses the enforce command described in section BX.13.03. Searching advice provided by the administrator takes precedence over the advice indicated by the search option.

In general, the system administrator enforces searching advice upon all users for linkage faults occurring in the administrative ring where the flexible supervisor resides. (Section BD.4.04 describes the enforced advice provided by the system administrator for the administrative ring.)