Identification

procedures to push and pop the options stack
push_opt, pop_opt
C. Marceau

Purpose

To push and pop the options stack. A user should push the
options stack whenever he sets options which may override
values of the same options in previous frames. Section
BX.12.00 discusses the options stack and "pushing" and
"popping". Section BY.9.03 contains an example of how
a procedure uses push_opt and pop_opt when setting options.

Usage

        call push_opt

Each call to push_opt pushes down the options stack by
one frame. A limit on the depth of the options stack
is given by the "option_stack" option. When "option_stack"
is on, its specification gives the maximum depth of the
options stack. The default maximum (if "option_stack"
is off) is 40. If the user calls push_opt when options
are stacked to the maximum depth, push_opt signals an
error condition:

        signal condition (options_201);

To pop the options stack to frame n

        call pop_opt (n)

If the current frame number $< n$, pop_opt signals an error
without popping the stack:

        signal condition (options_202);

If $n = 0$, pop_opt pops up the stack by one frame. If $n < 0$,
pop_opt signals an error condition (options_203). If
$n = 1$, pop_opt signals an error, because the stack must
maintain frame 2 (console session) values until logout:

        signal condition (options_204).

Implementation

The implementation of push_opt and pop_opt follows trivially
from the representation of options presented in BX.12.01.

Push_opt adds one to the current frame number (option_seg.fno).
Pop_opt (n) sets option_seg.fno to n, and deletes all
frames >n. To delete frame i, pop_opt deletes all settings
in the chain pointed to by the ith entry of the frame
table. If k is the current frame number, pop_opt deletes
frame k, frame k-1, and so on, until frame n+1 is deleted.

At times push_opt may expand the frame table in order
to record a new frame. (Initially the frame table has
20 entries, but it may be expanded to 40 entries--or to
the number specified with the "option_stack" option.)
The frame table is expanded in the same way as the hash
table (see addopt, BY.9.05.)

Similarly pop_opt may contract the frame table when the
frame table is found to be unnecessarily large. When

$$\text{nframes} < \frac{\text{max}}{2} - 5,$$

(where nframes = number of frames and max > 20 is the
current size of the frame table), push_opt halves the
frame table. If max $\leq$ 20, the frame table is not contracted.

The contraction of the frame table is analogous to the
contraction of the hash table (see the implementation
of delete_opt, BY.9.05).