File created: 6-Mar-2022 22:19:48 **{DSK}<Users>kaplan>Local>medley3.5>my-medley>sources>CMLDEFFER.;2**

previous date: 4-Jun-90 15:11:57 {DSK}<Users>kaplan>Local>medley3.5>my-medley>sources>CMLDEFFER.;1

Read Table: XCL

Package: XEROX-COMMON-LISP

Format: XCCS


```
(IL:RPAQQ IL:CMLDEFFERCOMS
          (
```

;;; DEF-DEFINE-TYPE and DEFDEFINER -- Your One-Stop Providers of Customized File Manager Facilities.

;; BE VERY CAREFUL CHANGING ANYTHING IN THIS FILE!!! It is heavily self-referential and thick with bootstrapping problems. All
;; but the most trivial changes (and some of those) are very tricky to make without blowing yourself out of the water... You have been
;; warned.

;;; Also see the file deffer-runtime for stuff that must be defined before fasl files may be loaded into the init

```
(IL:COMS                                                ; Filepkg interface
       (IL:FUNCTIONS REMOVE-COMMENTS PPRINT-DEFINER PPRINT-DEFINER-FITP PPRINT-DEFINER-RECURSE)
       (IL:VARIABLES IL:*REMOVE-INTERLISP-COMMENTS*)
                                                        ; Share with xcl?
       (IL:FUNCTIONS %DEFINE-TYPE-DELDEF %DEFINE-TYPE-GETDEF %DEFINE-TYPE-FILE-DEFINITIONS
              %DEFINE-TYPE-FILEGETDEF %DEFINE-TYPE-SAVE-DEFN %DEFINE-TYPE-PUTDEF))
(IL:COMS                                                ; Compatibility with old cmldeffer
       (IL:DECLARE\: IL:DOCOPY IL:DONTEVAL@LOAD (IL:P (IL:MOVD '%DEFINE-TYPE-DELDEF
                                                              'IL:\\DEFINE-TYPE-DELDEF)
                                                       (IL:MOVD '%DEFINE-TYPE-GETDEF
                                                              'IL:\\DEFINE-TYPE-GETDEF)
                                                       (IL:MOVD '%DEFINE-TYPE-FILE-DEFINITIONS
                                                              'IL:\\DEFINE-TYPE-FILE-DEFINITIONS)
                                                       (IL:MOVD '%DEFINE-TYPE-FILEGETDEF
                                                              'IL:\\DEFINE-TYPE-FILEGETDEF)
                                                       (IL:MOVD '%DEFINE-TYPE-SAVE-DEFN
                                                              'IL:\\DEFINE-TYPE-SAVE-DEFN)
                                                       (IL:MOVD '%DEFINE-TYPE-PUTDEF
                                                              'IL:\\DEFINE-TYPE-PUTDEF)
                                                       (IL:MOVD 'PPRINT-DEFINER 'IL:PPRINT-DEFINER))))
(IL:DECLARE\: IL:DOCOPY IL:DONTEVAL@LOAD
       (IL:P ;; Set up fake definer prototype stuff for FNS
             (ADD-PROTOTYPE-FN 'IL:FNS 'IL:NLAMBDA
                    #'(LAMBDA (NAME)
                              (AND (SYMBOLP NAME)
                                   `(IL:DEFINEQ (,NAME (IL:NLAMBDA ,@(%MAKE-FUNCTION-PROTOTYPE)))))))
             (ADD-PROTOTYPE-FN 'IL:FNS 'IL:LAMBDA
                    #'(LAMBDA (NAME)
                              (AND (SYMBOLP NAME)
                                   `(IL:DEFINEQ (,NAME (IL:LAMBDA ,@(%MAKE-FUNCTION-PROTOTYPE))))))))
(IL:COMS                                                ; The groundwork for bootstrapping
       (IL:DEFINE-TYPES IL:DEFINE-TYPES IL:FUNCTIONS IL:VARIABLES)
                                                        ; DefDefiner itself and friends
       (IL:FUNCTIONS SI::EXPANSION-FUNCTION SI::MACRO-FUNCALL WITHOUT-FILEPKG))
(IL:COMS                                                ; Compatibility with old cmldeffer
       (IL:FUNCTIONS IL:WITHOUT-FILEPKG))
(IL:COMS                                                ; Some special forms
       (IL:FUNCTIONS DEFINER NAMED-PROGN))
(IL:COMS                                                ; Auxiliary functions
       (IL:FUNCTIONS GET-DEFINER-NAME %DELETE-DEFINER)
       (IL:FUNCTIONS DEF-DEFINE-TYPE DEFDEFINER)
       (IL:FUNCTIONS %EXPAND-DEFINER %DEFINER-NAME))
(IL:COMS                                                ; The most commonly-used definers
       (IL:FUNCTIONS DEFUN DEFINLINE DEFMACRO)
       (IL:FUNCTIONS DEFVAR DEFPARAMETER DEFCONSTANT DEFGLOBALVAR DEFGLOBALPARAMETER))
(IL:COMS                                                ; Here so that the evaluator can be in the init without definers
                                                        ; being in the init.
       (IL:DEFINE-TYPES IL:SPECIAL-FORMS)
       (IL:FUNCTIONS %REMOVE-SPECIAL-FORM)
       (IL:FUNCTIONS DEFINE-SPECIAL-FORM)
                                                        ; Form for defining interpreters of special forms
       )
(IL:COMS                                                ; Don't note changes to these properties/variables
       (IL:PROP IL:PROPTYPE IL:MACRO-FN :UNDEFINERS IL:UNDEFINERS :DEFINER-FOR IL:DEFINER-FOR
              :DEFINED-BY IL:DEFINED-BY :DEFINITION-NAME IL:DEFINITION-NAME)
                                                        ; Templates for definers not defined here. These should really
                                                        ; be where they're defined.
       (IL:PROP :DEFINITION-PRINT-TEMPLATE DEFCOMMAND DEFINE-CONDITION DEFINE-MODIFY-MACRO
              DEFINE-SETF-METHOD DEFSETF DEFSTRUCT DEFTYPE))
```

;; Arrange for the correct compiler to be used.

```
(IL:PROP (IL:FILETYPE IL:MAKEFILE-ENVIRONMENT)
```

```
                IL:CMLDEFFER)))
```

;;; DEF-DEFINE-TYPE and DEFDEFINER -- Your One-Stop Providers of Customized File Manager Facilities.

;; BE VERY CAREFUL CHANGING ANYTHING IN THIS FILE!!! It is heavily self-referential and thick with bootstrapping problems. All but the most ;; trivial changes (and some of those) are very tricky to make without blowing yourself out of the water... You have been warned.

;;; Also see the file deffer-runtime for stuff that must be defined before fasl files may be loaded into the init

;; Filepkg interface

(DEFUN **REMOVE-COMMENTS** (X)

;;; Removes SEdit-style comments from the given list structure.

```
   (COND
      ((NOT (CONSP X))
       X)
      ((AND (CONSP (CAR X))
            (EQ (CAAR X)
                'IL:*)
            (CONSP (CDAR X))
            (OR (MEMBER (CADAR X)
                        '(IL:\; IL:|;;| IL:|;;;| IL:|;;;;| IL:\|)
                        :TEST
                        #'EQ)                                    ; a sedit comment
                (EQ IL:*REMOVE-INTERLISP-COMMENTS* T)            ; always strip
                (PROGN (IF (EQ IL:*REMOVE-INTERLISP-COMMENTS* ':WARN)
                           (WARN "Possible comment not stripped ~S" (CAR X)))
                       NIL)))
       (REMOVE-COMMENTS (CDR X)))
      (T (LET ((A (REMOVE-COMMENTS (CAR X)))
               (D (REMOVE-COMMENTS (CDR X))))
           (IF (AND (EQ A (CAR X))
                    (EQ D (CDR X)))
               X
               (CONS A D))))))
```

```
(DEFUN PPRINT-DEFINER (DEFINE-EXPRESSION)
   (DECLARE (SPECIAL IL:FORMFLG IL:SPACEWIDTH))                  ; Bound in prettyprinter
   (COND
      ((OR (NULL IL:FORMFLG)
           (ATOM (CDR DEFINE-EXPRESSION)))                     ; Degenerate cases or printing as a quoted form--punt to default
                                                               ; prettyprinting
       DEFINE-EXPRESSION)
      (T (LET ((IL:TAIL DEFINE-EXPRESSION)
               (IL:LEFT (IL:DSPXPOSITION))
               TEMPLATE TOP-LEVEL-P NEXT TYPE FORM NEWLINEP)
           (DECLARE (SPECIAL IL:TAIL IL:LEFT))                 ; For comment printer
           (SETQ TOP-LEVEL-P (EQ IL:LEFT (IL:DSPLEFTMARGIN)))  ; Printing definition to file, etc.
           (SETQ IL:LEFT (+ IL:LEFT (* 3 IL:SPACEWIDTH)))      ; Place we will indent body
           (IL:PRIN1 "(")
           (IL:PRIN2 (CAR IL:TAIL))
           (SETQ TEMPLATE (OR (GET (POP IL:TAIL)
                                   :DEFINITION-PRINT-TEMPLATE)
                              '(:NAME)))
```

;; This code should, and doesn't, pay attention to the NAME function to determine where the name is to decide what should and ;; shouldn't be bold. Right now, it always bolds the second thing. Fortunately, we currently don't have any definers that don't have ;; either the second or CAR of the second as the definition name.

;; Also, this code should be careful about calling the NAME function on the form. Sometimes, the form is not really a call to the ;; definer but instead a back-quoted expression in a macro. In most such cases, the name is not really there; some comma-quoted ;; expression is there instead.

```
           (IL:WHILE (CONSP IL:TAIL)
              IL:DO (COND
                       ((AND (LISTP (SETQ NEXT (CAR IL:TAIL)))
                             (EQ (CAR NEXT)
                                 IL:COMMENTFLG)
                             (IL:SEMI-COLON-COMMENT-P NEXT))   ; Comments can appear anywhere, so print this one without
                                                               ; consuming the template. ENDLINE has side effect of printing
                                                               ; comments
                        (IL:SUBPRINT/ENDLINE IL:LEFT *STANDARD-OUTPUT*)
                        (SETQ NEWLINEP T))
                       ((OR (ATOM TEMPLATE)
                            (EQ (SETQ TYPE (POP TEMPLATE))
                                :BODY))                        ; Once we hit the body, there's nothing more special to do.
                        (RETURN))
                       (T (IL:SPACES 1)
                          (CASE TYPE
                              (:NAME                           ; Embolden the name of this thing
                                 (SETQ NEWLINEP NIL)
                                 (COND
                                    ((NOT TOP-LEVEL-P)         ; Nothing special here--could even be a backquoted thing
                                     (PPRINT-DEFINER-RECURSE))
                                    (T (POP IL:TAIL)
```

```
                                    (COND
                                       ((CONSP NEXT)                ; Name is a list.  Assume the real name is the car and the rest is
                                                                    ; an options list or something
                                        (UNLESS (EQ (IL:DSPYPOSITION)
                                                    (PROGN (IL:PRIN1 "(")
                                                           (IL:PRINTOUT NIL IL:.FONT IL:LAMBDAFONT IL:.P2
                                                                  (CAR NEXT)
                                                                  IL:.FONT IL:DEFAULTFONT)
                                                           (IL:SPACES 1)
                                                           (IL:PRINTDEF (CDR NEXT)
                                                                  T T T IL:FNSLST)
                                                           (IL:PRIN1 ")")
                                                           (IL:DSPYPOSITION)))
                                                                    ; This thing took more than one line to print, so go to new line
                                            (IL:SUBPRINT/ENDLINE IL:LEFT *STANDARD-OUTPUT*)
                                            (SETQ NEWLINEP T)))
                                       (T                           ; Atomic name is bold
                                          (IL:PRINTOUT NIL IL:.FONT IL:LAMBDAFONT IL:.P2 NEXT IL:.FONT
                                                IL:DEFAULTFONT))))))
                                 (:ARG-LIST                         ; NEXT is some sort of argument list.
                                    (COND
                                       ((NULL NEXT)                 ; If NIL, be sure to print as ()
                                        (IL:PRIN1 "()")
                                        (POP IL:TAIL))
                                       (T (PPRINT-DEFINER-RECURSE)))
                                    (SETQ NEWLINEP NIL))
                                 (T                                 ; Just print it, perhaps starting a new line
                                    (UNLESS (OR NEWLINEP (PPRINT-DEFINER-FITP NEXT))
                                                                    ; Go to new line if getting crowded
                                        (IL:PRINENDLINE IL:LEFT))
                                    (PPRINT-DEFINER-RECURSE)
                                    (SETQ NEWLINEP NIL))))))
              ;; We've now gotten to the end of stuff we know how to print.  Just prettyprint the rest
              (UNLESS (NULL IL:TAIL)
                  (COND
                     (NEWLINEP                                      ; Already on new line
                           )
                     ((OR (EQ TYPE :BODY)
                          (NOT (PPRINT-DEFINER-FITP (CAR IL:TAIL))))
                                                                    ; Go to new line and indent a bit.  Always do this for the part
                                                                    ; matching &BODY, whether or not the prettyprinter thought that
                                                                    ; the remainder would "fit"
                      (IL:PRINENDLINE IL:LEFT NIL T))
                     (T (IL:SPACES 1)))
                  (IL:WHILE (AND (CONSP IL:TAIL)
                                 (ATOM (SETQ FORM (CAR IL:TAIL))))
                     IL:DO
                           ;; Print this doc string or whatever on its own line.  This is because otherwise the prettyprinter gets confused and
                           ;; tries to put the next thing after the string
                           (PPRINT-DEFINER-RECURSE)
                           (WHEN (AND (KEYWORDP FORM)
                                      (CONSP IL:TAIL))              ; Some sort of keyword-value pair stuff--print it on same line
                               (IL:SPACES 1)
                               (PPRINT-DEFINER-RECURSE))
                           (WHEN (NULL IL:TAIL)
                                 (RETURN))
                           (IL:SUBPRINT/ENDLINE IL:LEFT *STANDARD-OUTPUT*))
                  (IL:PRINTDEF IL:TAIL T T T IL:FNSLST))
              (IL:PRIN1 ")")
              NIL))))
```

(DEFUN **PPRINT-DEFINER-FITP** (ITEM)

```
    ;; True if it won't look silly to try to print ITEM at current position instead of starting new line
    (IF (CONSP ITEM)
        (OR (EQ (CAR ITEM)
                IL:COMMENTFLG)
            (AND (< (IL:COUNT ITEM)
                    20)
                 (IL:FITP ITEM)))
        (< (+ (IL:DSPXPOSITION)
              (IL:STRINGWIDTH ITEM *STANDARD-OUTPUT*))
           (IL:DSPRIGHTMARGIN))))
```

(DEFUN **PPRINT-DEFINER-RECURSE** ()

```
    ;; Print and pop the next element.  Prettyprinter uses the variable IL:TAIL for lookahead
    (DECLARE (SPECIAL IL:TAIL))
    (IL:SUPERPRINT (CAR IL:TAIL)
           IL:TAIL NIL *STANDARD-OUTPUT*)
    (SETQ IL:TAIL (CDR IL:TAIL)))
```

(DEFVAR **IL:*REMOVE-INTERLISP-COMMENTS*** ':WARN "Either NIL (don't) T (always do) or :WARN (don't and

```
                                                    warn)")
```

;; Share with xcl?

```
(DEFUN %DEFINE-TYPE-DELDEF (NAME TYPE)
```

;; DELETE definition of definer-defined NAME as TYPE

```
   (UNDOABLY-SETF (DOCUMENTATION NAME TYPE)
          NIL)
   (LET* ((HT (GETHASH TYPE *DEFINITION-HASH-TABLE*))
          (DEFN (AND HT (GETHASH NAME HT))))
         (AND HT (IL:/PUTHASH NAME NIL HT))
         (DOLIST (FN (OR (GET TYPE ':UNDEFINERS)
                         (GET TYPE 'IL:UNDEFINERS)))
             (FUNCALL FN NAME))
         (DOLIST (FN (OR (GET (CAR DEFN)
                              ':UNDEFINERS)
                         (GET (CAR DEFN)
                              'IL:UNDEFINERS)))
             (FUNCALL FN NAME))
         NAME))
```

```
(DEFUN %DEFINE-TYPE-GETDEF (NAME TYPE OPTIONS)
```

;; GETDEF method for all definers. The EDIT is so that when you say EDITDEF you get a copy & can know when you made edits.

```
   (LET* ((HASH-TABLE (GETHASH TYPE *DEFINITION-HASH-TABLE*))
          (DEFN (AND HASH-TABLE (GETHASH NAME HASH-TABLE))))
         (IF (TYPECASE OPTIONS
                 (CONS (MEMBER 'IL:EDIT OPTIONS :TEST #'EQ))
                 (T (EQ OPTIONS 'IL:EDIT)))
             (COPY-TREE DEFN)
             DEFN)))
```

```
(DEFUN %DEFINE-TYPE-FILE-DEFINITIONS (TYPE NAMES)
```

;; get the definitions for NAMES suitable for printing on a file. Like GETDEF but checks.

```
   (MAPCAR #'(LAMBDA (NAME)
                     (LET ((DEF (%DEFINE-TYPE-GETDEF NAME TYPE '(IL:NOCOPY))))
                          (IF (NULL DEF)
                              (ERROR 'IL:NO-SUCH-DEFINITION :NAME NAME :TYPE TYPE)
                              DEF)))
          NAMES))
```

```
(DEFUN %DEFINE-TYPE-FILEGETDEF (NAME TYPE SOURCE OPTIONS NOTFOUND)
   (LET ((VAL (IL:LOADFNS NIL SOURCE 'IL:GETDEF
```

;; The bletcherous lambda form is require by the interface to loadfns (can't pass a closure)

```
                       `(IL:LAMBDA (FIRST SECOND)
                          (AND (MEMBER FIRST ',(OR (GET TYPE ':DEFINED-BY)
                                                   (GET TYPE 'IL:DEFINED-BY))
                                       :TEST
                                       #'EQ)
                               (LET ((NAMER (OR (GET FIRST ':DEFINITION-NAME)
                                                (GET FIRST 'IL:DEFINITION-NAME)
                                                'SECOND)))
                                    (IF (EQ NAMER 'SECOND)
                                        (EQUAL SECOND ',NAME)
                                        (EQUAL (FUNCALL NAMER (REMOVE-COMMENTS (IL:READ)))
                                               ',NAME)))))))
         (COND
            ((EQ (CAAR VAL)
                 'IL:NOT-FOUND\:)
             NOTFOUND)
            ((CDR VAL)
             (CONS 'PROGN VAL))
            (T (CAR VAL)))))
```

```
(DEFUN %DEFINE-TYPE-SAVE-DEFN (NAME TYPE DEFINITION)
   (SETQ TYPE (IL:GETFILEPKGTYPE TYPE 'TYPE))
   (LET ((HASH-TABLE (GETHASH TYPE *DEFINITION-HASH-TABLE*)))
        (WHEN (NULL HASH-TABLE)
            (WARN "Couldn't find a hash-table for ~S definitions.~%One will be created." TYPE)
            (SETQ HASH-TABLE (SETF (GETHASH TYPE *DEFINITION-HASH-TABLE*)
                                   (MAKE-HASH-TABLE :TEST #'EQUAL :SIZE 50 :REHASH-SIZE 50))))
        (LET ((OLD-DEFINITION (GETHASH NAME HASH-TABLE)))
             (UNLESS (EQUAL DEFINITION OLD-DEFINITION)
                 (WHEN (AND OLD-DEFINITION (NOT (EQ IL:DFNFLG T)))
                     (FORMAT *TERMINAL-IO* "~&New ~A definition for ~S~:[~; (but not installed)~].~%" TYPE NAME
                             (MEMBER IL:DFNFLG '(IL:PROP IL:ALLPROP)
                                     :TEST
                                     #'EQ)))
                 (IL:/PUTHASH NAME DEFINITION HASH-TABLE)
```

```
                (IL:MARKASCHANGED NAME TYPE (IF OLD-DEFINITION
                                                'IL:CHANGED
                                                'IL:DEFINED))))))


(DEFUN %DEFINE-TYPE-PUTDEF (NAME TYPE DEFINITION REASON)
   (IF (NULL DEFINITION)
       (%DEFINE-TYPE-DELDEF NAME TYPE)
       (LET ((DEFN-WITHOUT-COMMENTS (REMOVE-COMMENTS DEFINITION)))
            (UNLESS (AND (CONSP DEFN-WITHOUT-COMMENTS)
                         (MEMBER (CAR DEFN-WITHOUT-COMMENTS)
                                 (OR (GET TYPE ':DEFINED-BY)
                                     (GET TYPE 'IL:DEFINED-BY))
                                 :TEST
                                 #'EQ)
                         (EQUAL NAME (FUNCALL (OR (GET (CAR DEFN-WITHOUT-COMMENTS)
                                                       ':DEFINITION-NAME)
                                                  (GET (CAR DEFN-WITHOUT-COMMENTS)
                                                       'IL:DEFINITION-NAME)
                                                  'SECOND)
                                              DEFN-WITHOUT-COMMENTS)))
                (SIGNAL 'IL:DEFINER-MISMATCH :NAME NAME :TYPE TYPE :DEFINITION DEFINITION))
            (SETQ DEFINITION (COPY-TREE DEFINITION))
            (EVAL (IF IL:LISPXHIST
                      (MAKE-UNDOABLE DEFINITION)
                      DEFINITION)))))
```

;; Compatibility with old cmldeffer

```
(IL:DECLARE\: IL:DOCOPY IL:DONTEVAL@LOAD

(IL:MOVD '%DEFINE-TYPE-DELDEF 'IL:\\DEFINE-TYPE-DELDEF)

(IL:MOVD '%DEFINE-TYPE-GETDEF 'IL:\\DEFINE-TYPE-GETDEF)

(IL:MOVD '%DEFINE-TYPE-FILE-DEFINITIONS 'IL:\\DEFINE-TYPE-FILE-DEFINITIONS)

(IL:MOVD '%DEFINE-TYPE-FILEGETDEF 'IL:\\DEFINE-TYPE-FILEGETDEF)

(IL:MOVD '%DEFINE-TYPE-SAVE-DEFN 'IL:\\DEFINE-TYPE-SAVE-DEFN)

(IL:MOVD '%DEFINE-TYPE-PUTDEF 'IL:\\DEFINE-TYPE-PUTDEF)

(IL:MOVD 'PPRINT-DEFINER 'IL:PPRINT-DEFINER)
)

(IL:DECLARE\: IL:DOCOPY IL:DONTEVAL@LOAD
```

;; Set up fake definer prototype stuff for FNS

```
(ADD-PROTOTYPE-FN 'IL:FNS 'IL:NLAMBDA #'(LAMBDA (NAME)
                                                 (AND (SYMBOLP NAME)
                                                      `(IL:DEFINEQ (,NAME (IL:NLAMBDA ,@(%MAKE-FUNCTION-PROTOTYPE)
                                                                                       ))))))

(ADD-PROTOTYPE-FN 'IL:FNS 'IL:LAMBDA #'(LAMBDA (NAME)
                                                (AND (SYMBOLP NAME)
                                                     `(IL:DEFINEQ (,NAME (IL:LAMBDA ,@(%MAKE-FUNCTION-PROTOTYPE)))
                                                             ))))
)
```

;; The groundwork for bootstrapping

```
(DEF-DEFINE-TYPE IL:DEFINE-TYPES "Definition type")


(DEF-DEFINE-TYPE IL:FUNCTIONS "Common Lisp functions/macros"
   :UNDEFINER IL:UNDOABLY-FMAKUNBOUND)


(DEF-DEFINE-TYPE IL:VARIABLES "Common Lisp variables"
   :UNDEFINER UNDOABLY-MAKUNBOUND)
```

;; DefDefiner itself and friends

```
(DEFUN SI::EXPANSION-FUNCTION (NAME ARG-LIST BODY)
```

;;; Shared code between DEFMACRO and DEFDEFINER. Takes the parts of a DEFMACRO and returns two values: a LAMBDA form for the expansion
;;; function, and the documentation string found, if any.

```
   (MULTIPLE-VALUE-BIND (PARSED-BODY PARSED-DECLARATIONS PARSED-DOCSTRING)
       (IL:PARSE-DEFMACRO ARG-LIST 'SI::$$MACRO-FORM BODY NAME NIL :ENVIRONMENT 'SI::$$MACRO-ENVIRONMENT)
     (VALUES `(LAMBDA (SI::$$MACRO-FORM SI::$$MACRO-ENVIRONMENT)
```

```
                    ,@PARSED-DECLARATIONS
                    (BLOCK ,NAME ,PARSED-BODY))
            PARSED-DOCSTRING)))
```

(DEFMACRO **SI::MACRO-FUNCALL** (EXPANSION-FUNCTION MACRO-CALL ENV)

;;; Used by DEFDEFINER as a mechanism for delaying macro-expansion until after checking the value of DFNFLG. The arguments (unevaluated) are a ;;; macro-expansion function and a call on that macro. The call to MACRO-FUNCALL should expand into the result of expanding the given macro-call.

```
   (FUNCALL EXPANSION-FUNCTION MACRO-CALL ENV))
```

```
(DEFMACRO WITHOUT-FILEPKG (&BODY BODY)
   `(PROGN (EVAL-WHEN (LOAD)
                  ,@BODY)
           (EVAL-WHEN (EVAL)
                  (UNLESS (OR (EQ IL:DFNFLG 'IL:PROP)
                              (EQ IL:DFNFLG 'IL:ALLPROP))
                      (LET ((IL:FILEPKGFLG NIL)
                            (IL:DFNFLG T))
                           ,@BODY)))))
```

;; Compatibility with old cmldeffer

```
(DEFMACRO IL:WITHOUT-FILEPKG (&BODY BODY)
   `(WITHOUT-FILEPKG ,@BODY))
```

;; Some special forms

```
(DEFMACRO DEFINER (TYPE NAME DEFINITION &OPTIONAL ENV)
   (LET* ((EXPANDER (GET NAME :DEFINITION-EXPANDER))
          (DEFINITION-WITHOUT-COMMENTS (REMOVE-COMMENTS DEFINITION))
          (DEFINITION-NAME (FUNCALL (GET NAME :DEFINITION-NAME)
                                    DEFINITION-WITHOUT-COMMENTS)))
         `(PROGN (WITHOUT-FILEPKG (SI::MACRO-FUNCALL ,EXPANDER ,DEFINITION-WITHOUT-COMMENTS ,ENV))
                 (EVAL-WHEN (EVAL)
                        (UNLESS (NULL IL:FILEPKGFLG)
                            (%DEFINE-TYPE-SAVE-DEFN ',DEFINITION-NAME ',TYPE ',DEFINITION)))
                 ',DEFINITION-NAME)))
```

```
(DEFMACRO NAMED-PROGN (DEFINER NAME &REST FORMS)
   ;; Used by the compiler when processing definers
   `(PROGN ,@FORMS ',NAME))
```

;; Auxiliary functions

```
(DEFUN GET-DEFINER-NAME (DEFINER STRING)
   (VALUES (INTERN (CONCATENATE 'STRING STRING (STRING DEFINER))
                   (SYMBOL-PACKAGE DEFINER))))
```

```
(DEFUN %DELETE-DEFINER (NAME)
   (AND (SYMBOLP NAME)
        (LET ((TYPE (OR (GET NAME ':DEFINER-FOR)
                        (GET NAME 'IL:DEFINER-FOR))))
             (IL:/REMPROP NAME ':DEFINER-FOR)
             (IL:/REMPROP NAME 'IL:DEFINER-FOR)
             (IL:/REMPROP NAME ':DEFINITION-NAME)
             (IL:/REMPROP NAME 'IL:DEFINITION-NAME)
             (IL:/REMPROP NAME ':DEFINITION-EXPANDER)
             (WHEN TYPE
                 (IF (GET TYPE ':DEFINED-BY)
                     (IL:/PUTPROP TYPE ':DEFINED-BY (REMOVE NAME (GET TYPE ':DEFINED-BY)))
                     (IL:/PUTPROP TYPE 'IL:DEFINED-BY (REMOVE NAME (GET TYPE 'IL:DEFINED-BY))))
                 ;; need to remove the prototype function!
                 (LET* ((LOOKUP-TYPE (ASSOC TYPE *DEFINITION-PROTOTYPES* :TEST #'EQ)))
                       (IL:/RPLACD LOOKUP-TYPE (REMOVE NAME (CDR LOOKUP-TYPE)
                                                       :KEY
                                                       #'CAR)))))))
```

```
(DEFDEFINER (DEF-DEFINE-TYPE (:PROTOTYPE (LAMBDA (NAME)
                                                 (AND (SYMBOLP NAME)
                                                      `(DEF-DEFINE-TYPE ,NAME "Description string")))))
    IL:DEFINE-TYPES (NAME DESCRIPTION &KEY UNDEFINER &AUX (CHANGELST (INTERN (CONCATENATE 'STRING "CHANGED"
                                                                                          (STRING NAME)
                                                                                          "LST")
                                                                              (SYMBOL-PACKAGE NAME))))
   "Define NAME as a new definition type"
```

```
;; This definition is a clean interface to a hokey implementation.  It works even before the file package is loaded.
`(PROGN (SETF (DOCUMENTATION ',NAME 'IL:DEFINE-TYPES)
              ',DESCRIPTION)
        (PUSHNEW '(,NAME X (IL:P IL:* (%DEFINE-TYPE-FILE-DEFINITIONS ',NAME 'X)))
                 IL:PRETTYDEFMACROS :TEST 'EQUAL)
        ;; the information about a type in the file package is split up into a number of different places. PRETTYTYPELST contains a random
        ;; amount: the changelist is the variable whose top level value contains the list of changed items, and the description is a string used by
        ;; files? This is duplicated in the CL:DOCUMENTATION mechanism
        (PUSHNEW '(,CHANGELST ,NAME ,DESCRIPTION)
                 IL:PRETTYTYPELST :TEST 'EQUAL)
        (DEFGLOBALVAR ,CHANGELST NIL)
        ;; the definition hash table is where the definitions are really stored. Create an entry for this type. Note that definitions are compared using
        ;; CL:EQUAL so that names can be strings, lists, etc.
        (UNLESS (GETHASH ',NAME *DEFINITION-HASH-TABLE*)
            (SETF (GETHASH ',NAME *DEFINITION-HASH-TABLE*)
                  (MAKE-HASH-TABLE :TEST 'EQUAL :SIZE 50 :REHASH-SIZE 50)))
        (PUSHNEW ',NAME IL:FILEPKGTYPES)
        (SETF (GET ',NAME 'IL:GETDEF)
              '%DEFINE-TYPE-GETDEF)
        (SETF (GET ',NAME 'IL:DELDEF)
              '%DEFINE-TYPE-DELDEF)
        (SETF (GET ',NAME 'IL:PUTDEF)
              '%DEFINE-TYPE-PUTDEF)
        (SETF (GET ',NAME 'IL:FILEGETDEF)
              '%DEFINE-TYPE-FILEGETDEF)
        (SETF (GET ',NAME 'IL:FILEPKGCONTENTS)
              'IL:NILL)
        ,@(WHEN UNDEFINER
              `((PUSHNEW ',UNDEFINER (GET ',NAME ':UNDEFINERS))))))

(DEFDEFINER (DEFDEFINER (:NAME (LAMBDA (WHOLE)
                                       (LET ((NAME (SECOND WHOLE)))
                                            (IF (CONSP NAME)
                                                (CAR NAME)
                                                NAME))))
                        (:PROTOTYPE (LAMBDA (NAME)
                                            (AND (SYMBOLP NAME)
                                                 `(DEFDEFINER ,NAME ,(IF (EQ (IL:EDITMODE)
                                                                             'IL:SEDIT)
                                                                         (SYMBOL-VALUE (INTERN "BASIC-GAP"
                                                                                               "SEDIT"))
                                                                         "Type") ,@(%MAKE-FUNCTION-PROTOTYPE))
                                                 )))
                        (:UNDEFINER %DELETE-DEFINER)
                        (:TEMPLATE (:NAME :TYPE :ARG-LIST :BODY)))
    IL:FUNCTIONS (NAME TYPE ARG-LIST &BODY BODY)
   (LET* ((OPTIONS (COND
                       ((CONSP NAME)
                        (PROG1 (CDR NAME)
                            (SETQ NAME (CAR NAME))))
                       (T NIL)))
          (NAME-FN NIL)
          (UNDEFINER NIL)
          (PROTOTYPE-FN NIL)
          (TEMPLATE NIL)
          (PRETTYMACRO NIL))
         (DOLIST (OPT-LIST OPTIONS)
             (CASE (CAR OPT-LIST)
                 ((:UNDEFINER) (SETQ UNDEFINER (CADR OPT-LIST)))
                 ((:NAME) (SETQ NAME-FN (CADR OPT-LIST)))
                 ((:PROTOTYPE) (SETQ PROTOTYPE-FN (CADR OPT-LIST)))
                 ((:TEMPLATE) (SETQ TEMPLATE (CADR OPT-LIST)))
                 ((:PRETTYPRINTMACRO) (SETQ PRETTYMACRO (CADR OPT-LIST)))
                 (OTHERWISE (CERROR "Ignore the option" "Unrecognized option to DefDefiner: ~S" OPT-LIST))))
         (MULTIPLE-VALUE-BIND (EXPANSION-FN DOC)
             (SI::EXPANSION-FUNCTION NAME ARG-LIST BODY)
           (UNLESS (OR TEMPLATE PRETTYMACRO (NOT (MEMBER '&BODY ARG-LIST)))
                                                                ; Tell default prettyprinter where the body is
               (SETQ TEMPLATE (NCONC (IL:FOR X IL:IN ARG-LIST IL:UNTIL (EQ X '&BODY) IL:UNLESS (MEMBER X
                                                                                                    LAMBDA-LIST-KEYWORDS
                                                                                                    )
                                                                                                    IL:COLLECT NIL)
                                     (LIST :BODY)))
               (WHEN (AND (NULL (CAR TEMPLATE))
                          (NULL NAME-FN))                       ; Name is in default place
                   (SETF (CAR TEMPLATE)
                         :NAME)))
           (LET ((EXPANDER-NAME (GET-DEFINER-NAME NAME "definition-expander-"))
                 (NAME-FN-NAME (IF (CONSP NAME-FN)
                                   (GET-DEFINER-NAME NAME "name-fn-"))))
                `(PROGN (EVAL-WHEN (LOAD EVAL COMPILE)
                                   (SETF (GET ',NAME ':DEFINER-FOR)
                                         ',TYPE)
                                   (PUSHNEW ',NAME (GET ',TYPE ':DEFINED-BY))
                                   (SETF (SYMBOL-FUNCTION ',EXPANDER-NAME)
```

```
                                    #',EXPANSION-FN)
                                (SETF (GET ',NAME ':DEFINITION-EXPANDER)
                                      ',EXPANDER-NAME)
                                ,@(IF NAME-FN-NAME
                                      `((SETF (SYMBOL-FUNCTION ',NAME-FN-NAME)
                                              #',NAME-FN)))
                                (SETF (GET ',NAME ':DEFINITION-NAME)
                                      ',(OR NAME-FN-NAME NAME-FN 'SECOND))
                                ,@(AND UNDEFINER (LET ((UNDEFINER-FN-NAME (GET-DEFINER-NAME NAME
                                                                            "undefiner-fn-")))
                                                   `((SETF (SYMBOL-FUNCTION ',UNDEFINER-FN-NAME)
                                                           #',UNDEFINER)
                                                     (PUSHNEW ',UNDEFINER-FN-NAME (GET ',NAME ':UNDEFINERS))))
                                                 )
                                ,@(AND PROTOTYPE-FN (LET ((PROTOTYPE-FN-NAME (GET-DEFINER-NAME NAME
                                                                               "prototype-fn-")))
                                                      `((SETF (SYMBOL-FUNCTION ',PROTOTYPE-FN-NAME)
                                                              #',PROTOTYPE-FN)
                                                        (ADD-PROTOTYPE-FN ',TYPE ',NAME ',PROTOTYPE-FN-NAME)))
                                                    )
                                ,@(AND DOC `((SETF (DOCUMENTATION ',NAME 'FUNCTION)
                                                   ,DOC)))
                                ,@(AND TEMPLATE `((SETF (GET ',NAME ':DEFINITION-PRINT-TEMPLATE)
                                                        ',TEMPLATE)))
                                (PUSHNEW '(,NAME ,@(OR PRETTYMACRO 'PPRINT-DEFINER))
                                       IL:PRETTYPRINTMACROS :TEST 'EQUAL))
                            (DEFMACRO ,NAME (&WHOLE DEFINITION &ENVIRONMENT ENV)
                               `(DEFINER ,',TYPE ,',NAME ,DEFINITION ,ENV)))))))

(DEFUN %EXPAND-DEFINER (DEFINER DEFINITION-WITHOUT-COMMENTS &OPTIONAL ENV)
   (FUNCALL (GET DEFINER :DEFINITION-EXPANDER)
          DEFINITION-WITHOUT-COMMENTS ENV))

(DEFUN %DEFINER-NAME (DEFINER DEFINITION-WITHOUT-COMMENTS)
   (FUNCALL (GET DEFINER :DEFINITION-NAME)
          DEFINITION-WITHOUT-COMMENTS))

;; The most commonly-used definers

(DEFDEFINER (DEFUN (:PROTOTYPE (LAMBDA (NAME)
                                       (AND (SYMBOLP NAME)
                                            `(DEFUN ,NAME ,@(%MAKE-FUNCTION-PROTOTYPE)))))
                   (:TEMPLATE (:NAME :ARG-LIST :BODY)))
    IL:FUNCTIONS (NAME ARGS &BODY (BODY DECLS DOCUMENTATION))
   `(PROGN (SETF (SYMBOL-FUNCTION ',NAME)
                 #'(,'LAMBDA ,ARGS ,@DECLS (BLOCK ,NAME ,@BODY)))
           ,@(AND DOCUMENTATION `((SETF (DOCUMENTATION ',NAME 'FUNCTION)
                                        ,DOCUMENTATION)))))

(DEFDEFINER (DEFINLINE (:PROTOTYPE (LAMBDA (NAME)
                                           (AND (SYMBOLP NAME)
                                                `(DEFINLINE ,NAME ,@(%MAKE-FUNCTION-PROTOTYPE)))))
                       (:TEMPLATE (:NAME :ARG-LIST :BODY)))
    IL:FUNCTIONS (NAME ARG-LIST &BODY BODY &ENVIRONMENT ENV)

;;; This is an INTERIM version of DEFINLINE.  Eventually, this will just turn into a DEFUN and a PROCLAIM INLINE.  (It says so right here.)  If you're
;;; using this one, DO NOT make any recursive calls in the body of the DEFINLINE.  If you do, the compiler will run forever trying to expand the
;;; optimizer...  Once the INLINE version gets working (in the PavCompiler only) that restriction will be lifted.

   (MULTIPLE-VALUE-BIND (CODE DECLS DOC)
       (PARSE-BODY BODY ENV T)
     (LET ((NEW-LAMBDA `(,'LAMBDA ,ARG-LIST ,@DECLS (BLOCK ,NAME ,@CODE))))
          `(PROGN (DEFUN ,NAME ,ARG-LIST
                    ,@BODY)
                  (DEFOPTIMIZER ,NAME ,(PACK (LIST "definline-" NAME)
                                             (SYMBOL-PACKAGE NAME))
                                      (&REST ARGS)
                                      (CONS ',NEW-LAMBDA ARGS))))))

(DEFDEFINER (DEFMACRO (:PROTOTYPE (LAMBDA (NAME)
                                          (AND (SYMBOLP NAME)
                                               `(DEFMACRO ,NAME ,@(%MAKE-FUNCTION-PROTOTYPE)))))
                      (:UNDEFINER (LAMBDA (NAME)
                                          (REMPROP NAME 'IL:ARGNAMES)))
                      (:TEMPLATE (:NAME :ARG-LIST :BODY)))
    IL:FUNCTIONS (NAME DEFMACRO-ARGS &BODY DEFMACRO-BODY)
   (UNLESS (AND NAME (SYMBOLP NAME))
          (ERROR "Illegal name used in DEFMACRO: ~S" NAME))
   (LET
    ((CMACRONAME (PACK (LIST "expand-" NAME)
                       (SYMBOL-PACKAGE NAME))))
    (MULTIPLE-VALUE-BIND (EXPANSION-FN DOC-STRING)
        (SI::EXPANSION-FUNCTION NAME DEFMACRO-ARGS DEFMACRO-BODY)
      `(PROGN (SETF (SYMBOL-FUNCTION ',CMACRONAME)
                    #',EXPANSION-FN)
```

```
              (SETF (MACRO-FUNCTION ',NAME)
                    ',CMACRONAME)
              ,@(AND DOC-STRING `((SETF (DOCUMENTATION ',NAME 'FUNCTION)
                                        ,DOC-STRING)))
              ,@(WHEN COMPILER::*NEW-COMPILER-IS-EXPANDING*
                    `((SETF (GET ',NAME 'IL:ARGNAMES)
                            ',(MAPCAR #'(LAMBDA (ARG)
                                          (IF (MEMBER ARG LAMBDA-LIST-KEYWORDS)
                                              ARG
                                              (PRIN1-TO-STRING ARG)))
                                      (IL:\\SIMPLIFY.CL.ARGLIST DEFMACRO-ARGS)))))))))

(DEFDEFINER (DEFVAR (:PROTOTYPE (LAMBDA (NAME)
                                  (AND (SYMBOLP NAME)
                                       `(DEFVAR ,NAME)))))
    IL:VARIABLES (NAME &OPTIONAL (INITIAL-VALUE NIL IVP)
                         DOCUMENTATION)
   `(PROGN (PROCLAIM '(SPECIAL ,NAME))
           ,@(AND IVP `((OR (BOUNDP ',NAME)
                            (SETQ ,NAME ,INITIAL-VALUE))))
           ,@(AND DOCUMENTATION `((SETF (DOCUMENTATION ',NAME 'VARIABLE)
                                        ,DOCUMENTATION)))))

(DEFDEFINER (DEFPARAMETER (:PROTOTYPE (LAMBDA (NAME)
                                        (AND (SYMBOLP NAME)
                                             `(DEFPARAMETER ,NAME "Value"
                                                "Documentation string")))))
    IL:VARIABLES (NAME INITIAL-VALUE &OPTIONAL DOCUMENTATION)
   `(PROGN (PROCLAIM '(SPECIAL ,NAME))
           (SETQ ,NAME ,INITIAL-VALUE)
           ,@(AND DOCUMENTATION `((SETF (DOCUMENTATION ',NAME 'VARIABLE)
                                        ,DOCUMENTATION)))))

(DEFDEFINER (DEFCONSTANT (:PROTOTYPE (LAMBDA (NAME)
                                       (AND (SYMBOLP NAME)
                                            `(DEFCONSTANT ,NAME "Value"
                                               "Documentation string")))))
    IL:VARIABLES (NAME VALUE &OPTIONAL DOCUMENTATION)
   `(PROGN ,@(IF (CONSTANTP NAME)
                 `((SET-CONSTANTP ',NAME NIL)))
           (SETQ ,NAME ,VALUE)
           (PROCLAIM '(SI::CONSTANT ,NAME))
           ,@(AND DOCUMENTATION `((SETF (DOCUMENTATION ',NAME 'VARIABLE)
                                        ,DOCUMENTATION)))))

(DEFDEFINER (DEFGLOBALVAR (:PROTOTYPE (LAMBDA (NAME)
                                        (AND (SYMBOLP NAME)
                                             `(DEFGLOBALVAR ,NAME)))))
    IL:VARIABLES (NAME &OPTIONAL (INITIAL-VALUE NIL IVP)
                         DOCUMENTATION)
```

;; Use IL:SETQ here or the INIT dies.

```
   `(PROGN (PROCLAIM '(GLOBAL ,NAME))
           ,@(AND IVP `((OR (BOUNDP ',NAME)
                            (SETQ ,NAME ,INITIAL-VALUE))))
           ,@(AND DOCUMENTATION `((SETF (DOCUMENTATION ',NAME 'VARIABLE)
                                        ,DOCUMENTATION)))))

(DEFDEFINER (DEFGLOBALPARAMETER (:PROTOTYPE (LAMBDA (NAME)
                                              (AND (SYMBOLP NAME)
                                                   `(DEFGLOBALPARAMETER ,NAME "Value"
                                                      "Documentation string")))))
    IL:VARIABLES (NAME INITIAL-VALUE &OPTIONAL DOCUMENTATION)
   `(PROGN (PROCLAIM '(GLOBAL ,NAME))
           (SETQ ,NAME ,INITIAL-VALUE)
           ,@(AND DOCUMENTATION `((SETF (DOCUMENTATION ',NAME 'VARIABLE)
                                        ,DOCUMENTATION)))))
```

;; Here so that the evaluator can be in the init without definers being in the init.

```
(DEF-DEFINE-TYPE IL:SPECIAL-FORMS "Common Lisp special forms"
   :UNDEFINER %REMOVE-SPECIAL-FORM)

(DEFUN %REMOVE-SPECIAL-FORM (X)
   (IL:/REMPROP X 'IL:SPECIAL-FORM))

(DEFDEFINER (DEFINE-SPECIAL-FORM (:TEMPLATE (:NAME :ARG-LIST :BODY))) IL:SPECIAL-FORMS (NAME ARGS &REST
                                                                                        BODY)
   (COND
      ((NULL BODY)
       (ASSERT (SYMBOLP NAME)
               NIL "Ill-formed short DEFINE-SPECIAL-FORM; ~S is not a symbol." ARGS)
       `(SETF (GET ',NAME 'IL:SPECIAL-FORM)
              ',ARGS))
      (T (LET ((SF (INTERN (CONCATENATE 'STRING "interpret-" (STRING NAME))
```

```
                    (SYMBOL-PACKAGE NAME))))
            (MULTIPLE-VALUE-BIND (PARSED-BODY DECLS DOC)
                (IL:PARSE-DEFMACRO ARGS '$$TAIL BODY NAME NIL :PATH '$$TAIL :ENVIRONMENT '$$ENV)
              `(PROGN (SETF (SYMBOL-FUNCTION ',SF)
                            #'(LAMBDA ($$TAIL $$ENV)
                                      ,@DECLS
                                      (BLOCK ,NAME ,PARSED-BODY)))
                      (SETF (GET ',NAME 'IL:SPECIAL-FORM)
                            ',SF)))))))
```

;; Form for defining interpreters of special forms

;; Don't note changes to these properties/variables

(IL:PUTPROPS **IL:MACRO-FN IL:PROPTYPE** IL:FUNCTIONS)

(IL:PUTPROPS **:UNDEFINERS IL:PROPTYPE** IGNORE)

(IL:PUTPROPS **IL:UNDEFINERS IL:PROPTYPE** IGNORE)

(IL:PUTPROPS **:DEFINER-FOR IL:PROPTYPE** IGNORE)

(IL:PUTPROPS **IL:DEFINER-FOR IL:PROPTYPE** IGNORE)

(IL:PUTPROPS **:DEFINED-BY IL:PROPTYPE** IGNORE)

(IL:PUTPROPS **IL:DEFINED-BY IL:PROPTYPE** IGNORE)

(IL:PUTPROPS **:DEFINITION-NAME IL:PROPTYPE** IGNORE)

(IL:PUTPROPS **IL:DEFINITION-NAME IL:PROPTYPE** IGNORE)

;; Templates for definers not defined here. These should really be where they're defined.

(IL:PUTPROPS **DEFCOMMAND :DEFINITION-PRINT-TEMPLATE** (:NAME :ARG-LIST :BODY))

(IL:PUTPROPS **DEFINE-CONDITION :DEFINITION-PRINT-TEMPLATE** (:NAME :VALUE :BODY))

(IL:PUTPROPS **DEFINE-MODIFY-MACRO :DEFINITION-PRINT-TEMPLATE** (:NAME :ARG-LIST))

(IL:PUTPROPS **DEFINE-SETF-METHOD :DEFINITION-PRINT-TEMPLATE** (:NAME :ARG-LIST :BODY))

(IL:PUTPROPS **DEFSETF :DEFINITION-PRINT-TEMPLATE** (:NAME :ARG-LIST :ARG-LIST :BODY))

(IL:PUTPROPS **DEFSTRUCT :DEFINITION-PRINT-TEMPLATE** (:NAME :BODY))

(IL:PUTPROPS **DEFTYPE :DEFINITION-PRINT-TEMPLATE** (:NAME :ARG-LIST :BODY))

;; Arrange for the correct compiler to be used.

(IL:PUTPROPS **IL:CMLDEFFER IL:FILETYPE** :COMPILE-FILE)

(IL:PUTPROPS **IL:CMLDEFFER IL:MAKEFILE-ENVIRONMENT** (:READTABLE "XCL" :PACKAGE "XCL"))

(IL:PUTPROPS **IL:CMLDEFFER IL:COPYRIGHT** ("Venue & Xerox Corporation" 1986 1900 1987 1988 1990))

FUNCTION INDEX

PROPERTY INDEX

DEFINER INDEX

MACRO INDEX

DEFINE-TYPE INDEX

VARIABLE INDEX