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previous date: 16-May-90 15:32:24 {DSK}<python>lde>lispcore>sources>DEFSTRUCT-RUN-TIME.;1

Read Table: XCL

Package: LISP

Format: XCCS

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```
(IL:RPAQQ IL:DEFSTRUCT-RUN-TIMECOMS
  ( (IL:COMS
    ;; Remembering parsed structures
    (IL:VARIABLES *PARSED-DEFSTRUCTS*)
    (IL:FUNCTIONS PARSED-STRUCTURE SET-PARSED-STRUCTURE)
    (IL:SETFS PARSED-STRUCTURE))
    (IL:COMS
    ;; Declaring storage for structures
    (IL:FUNCTIONS SI::%STRUCTURE-DECLARE-DATATYPE)
    (IL:DECLARE\ : IL:DONTEVAL@LOAD IL:DOCOPY
      ;; This defines the root of the defstruct type hierarchy.
      (IL:P (IL:\ASSIGNDATATYPE1 'STRUCTURE-OBJECT NIL 0))))
    (IL:COMS
    ;; Support for self expansions etc
    (IL:VARIABLES *DEFSTRUCT-INFO-CACHE*)
    (IL:FUNCTIONS ESTABLISH-SETFS-AND-OPTIMIZERS ESTABLISH-PREDICATE)
    (IL:FUNCTIONS GET-PS-FROM-ACCESSOR GET-PS-FROM-PREDICATE GET-SLOT-DESCRIPTOR-FROM-PS)
    (IL:FUNCTIONS CACHE-SETF-INFO))
    (IL:COMS
    ;; defstruct IO
    (IL:VARIABLES XCL:*PRINT-STRUCTURE*)
    (IL:FUNCTIONS PRINT-STRUCTURE-INSTANCE DEFAULT-STRUCTURE-PRINTER STRUCTURE-SLOT-NAMES)
    ;; For reading
    (IL:FUNCTIONS IL:CREATE-STRUCTURE STRUCTURE-CONSTRUCTOR))
    (IL:PROP (IL:FILETYPE IL:MAKEFILE-ENVIRONMENT)
      IL:DEFSTRUCT-RUN-TIME)
    (IL:DECLARE\ : IL:DONTEVAL@LOAD IL:DOEVAL@COMPILE IL:DONTCOPY IL:COMPILEVAR (IL:ADDVARS (IL:NLAMA)
      (IL:NLAML)
      (IL:LAMA))))))

;; Remembering parsed structures

(DEFVAR *PARSED-DEFSTRUCTS* (IL:HASHARRAY 100)
  ;; All declared structures
  )

(DEFMACRO PARSED-STRUCTURE (NAME &OPTIONAL (NO-ERROR NIL))
  ;; Returns the parsed-structure corresponding to name
  (COND
    (NO-ERROR `(IL:GETHASH ,NAME *PARSED-DEFSTRUCTS*))
    (T `(OR (IL:GETHASH ,NAME *PARSED-DEFSTRUCTS*)
      (ERROR "~s is not a defined structure" ,NAME))))))

(DEFUN SET-PARSED-STRUCTURE (NAME PS &OPTIONAL (EXTRA NIL EXTRA-P))
  ;; SETF method for CL::PARSED-STRUCTURE. Extra arg is because CL::PARSED-STRUCTURE takes an optional, which we ignore here, but that
  ;; pushes the new value over one.
  (WHEN EXTRA-P (SETQ PS EXTRA))
  (IL:PUTHASH NAME PS *PARSED-DEFSTRUCTS*))

(DEFSETF PARSED-STRUCTURE SET-PARSED-STRUCTURE)

;; Declaring storage for structures

(DEFUN SI::%STRUCTURE-DECLARE-DATATYPE (NAME FIELD-SPECIFICATIONS FIELD-DESCRIPTORS WORD-LENGTH
  SUPERTYPE)
  ;; analagous to declare-datatype, but does not prepend the supers descriptors. You must include all descs.
  ;; N.B. descriptions and specs are for ALL slots, not just local-slots.
  ;; field-specifications is a list of the form '(pointer pointer (bits 3) (bits 5) word fixp). See p. 8.21 IRM
```

;; field-descriptors is the list returned from translate.datatype when given the above FIELD-SPECIFICATIONS. They are legal to pass to fetchfield.
;; word-length is the car of the result of translate.datatype.
;; supertype is the typename of the supertype.

```
(IF (NOT (AND (SYMBOLP NAME)
              (IL:SMALLPOSP WORD-LENGTH)))
    (ERROR "Illegal arguments: ~s ~s" NAME WORD-LENGTH))
(LET ((REFERENCE-COUNTED-POINTERS (MAPCAN #'(LAMBDA (DESCRIPTOR)
                                             (CASE (CADDR DESCRIPTOR)
                                                  ((IL:POINTER IL:FULLPOINTER) (LIST (CADR DESCRIPTOR)))
                                                  (FIELD-DESCRIPTORS)))
                                           (MULTIPLE-VALUE-BIND (TYPE-NUMBER REDECLARED?)
                                             (IL:\\ASSIGNDATATYPE1 NAME FIELD-DESCRIPTORS WORD-LENGTH FIELD-SPECIFICATIONS
                                                                    REFERENCE-COUNTED-POINTERS SUPERTYPE)
                                           ;; set the magic global to the allocated type number
                                           (IL:SETTOPVAL (IL:\\TYPEGLOBALVARIABLE NAME T)
                                                         TYPE-NUMBER)
                                           (VALUES FIELD-DESCRIPTORS REDECLARED?))))
      (IL:DECLARE\ : IL:DONTEVAL@LOAD IL:DOCOPY
      (IL:\\ASSIGNDATATYPE1 'STRUCTURE-OBJECT NIL 0)
      )
```

;; Support for self expansions etc

```
(DEFVAR *DEFSTRUCT-INFO-CACHE* (IL:HASHARRAY 100)
        ;; Used to cache slots and predicates
        )
```

(DEFUN **ESTABLISH-SETFS-AND-OPTIMIZERS** (PS-NAME)

;; Caches shared self expanders and accessor optimizers where appropriate

```
(LET* ((PS (PARSED-STRUCTURE PS-NAME))
        (INLINE (PS-INLINE PS)))
      (MAPC #'(LAMBDA (SLOT)
              ;; function-defining-form decides whether or not the accessors should be defun, definline, etc.
              (LET ((ACCESSOR (PSLOT-ACCESSOR SLOT)))
                  (WHEN ACCESSOR
                    (REMHASH ACCESSOR *DEFSTRUCT-INFO-CACHE*)
                    (IF (NOT (PSLOT-READ-ONLY SLOT))
                      ;; install the self method expander that is shared for all accessors
                      (SET-SHARED-SETF-INVERSE ACCESSOR 'DEFSTRUCT-SHARED-SETF-EXPANDER))
                    (COND
                     ((EQ INLINE :ONLY)
                      (SETF (MACRO-FUNCTION ACCESSOR)
                            'DEFSTRUCT-SHARED-ACCESSOR-OPTIMIZER))
                     ((MEMBER :ACCESSOR INLINE :TEST #'EQ)
                      (SETF (GET ACCESSOR 'COMPILER:OPTIMIZER-LIST)
                            (LIST 'DEFSTRUCT-SHARED-ACCESSOR-OPTIMIZER))))
                    (T (REMPROP ACCESSOR 'COMPILER:OPTIMIZER-LIST))))
              (PS-ALL-SLOTS PS))))
```

(DEFUN **ESTABLISH-PREDICATE** (PS-NAME)

;; Establishes a shared a shared optimizer for a defstruct predicate

```
(LET* ((PS (PARSED-STRUCTURE PS-NAME))
        (PREDICATE (PS-PREDICATE PS)))
      (REMHASH PREDICATE *DEFSTRUCT-INFO-CACHE*)
      (IF (EQ (PS-INLINE PS) :ONLY)
          (SETF (MACRO-FUNCTION PREDICATE)
                'DEFSTRUCT-SHARED-PREDICATE-OPTIMIZER)
          (SETF (GET PREDICATE 'COMPILER:OPTIMIZER-LIST)
                (LIST 'DEFSTRUCT-SHARED-PREDICATE-OPTIMIZER))))
```

(DEFUN **GET-PS-FROM-ACCESSOR** (ACCESSOR &OPTIONAL (NO-ERROR-P NIL))

```
(OR (CATCH 'FIND-PS
      (MAPHASH #'(LAMBDA (KEY VALUE)
                  (DOLIST (SLOT (PS-ALL-SLOTS VALUE)
                             NIL)
                    (IF (EQ ACCESSOR (PSLOT-ACCESSOR SLOT))
                        (THROW 'FIND-PS VALUE))))
      *PARSED-DEFSTRUCTS*))
    (IF (NULL NO-ERROR-P)
        (ERROR "No such slot: ~s" ACCESSOR))))
```



```

      (DESCRIPTOR (IL:GETDESCRIPTORS TYPE)
        (CDR DESCRIPTOR)))
    ( (NULL FIELD))
  (WHEN (EQ (CAR FIELD)
    'SI:--STRUCTURE-DUMMY-SLOT--))
    (GO SKIP))
  (IL:\\OUTCHAR STREAM (IL:CONSTANT (CHAR-CODE #\Space)))
  (IF (AND LENGTHSOFAR (> (INCF LENGTHSOFAR
    *PRINT-LENGTH*))
    (PROGN (IL:\\ELIDE.PRINT.TAIL STREAM T)
      (RETURN NIL))
    (PROGN (PRINC (CAR FIELD)
      STREAM)
      (IF (AND LENGTHSOFAR (> (INCF LENGTHSOFAR
        *PRINT-LENGTH*))
        (PROGN (IL:\\ELIDE.PRINT.TAIL STREAM T)
          (RETURN NIL))
        (PROGN (IL:\\OUTCHAR STREAM (IL:CONSTANT (CHAR-CODE
          #\Space))
            )
          (IL:\\PRINDATUM (IL:FETCHFIELD (CAR DESCRIPTOR)
            STRUC)
            STREAM
            (1+ PRINT-LEVEL))))))
      SKIP)))
    (WRITE-STRING " " STREAM))))))
  T)))

```

```

(DEFUN STRUCTURE-SLOT-NAMES (STRUCTURE-NAME &OPTIONAL (DONT-COPY NIL))
  (LET* ((PS (PARSED-STRUCTURE STRUCTURE-NAME))
    NAMES)
    (SETQ NAMES (PS-ALL-SLOT-NAMES PS))
    (IF DONT-COPY
      NAMES
      (COPY-LIST NAMES))))

```

:: For reading

```

(DEFUN IL:CREATE-STRUCTURE (STRUCTURE-FORM)
  (APPLY (STRUCTURE-CONSTRUCTOR (CAR STRUCTURE-FORM))
    (XCL:WITH-COLLECTION (DO ((TAIL (CDR STRUCTURE-FORM)
      (CDDR TAIL)))
      ((NULL TAIL))
      (XCL:COLLECT (IL:MAKE-KEYWORD (CAR TAIL)))
      (XCL:COLLECT (CADR TAIL))))))

```

```

(DEFUN STRUCTURE-CONSTRUCTOR (STRUCTURE-NAME)
  (OR (GET STRUCTURE-NAME 'IL:STRUCTURE-CONSTRUCTOR)
    (LET* ((PS (PARSED-STRUCTURE STRUCTURE-NAME))
      (CONSTRUCTOR (PS-STANDARD-CONSTRUCTOR PS)))
      (OR CONSTRUCTOR (ERROR "~S is a structure with no standard constructor." (PS-NAME PS)))))

```

```

(IL:PUTPROPS IL:DEFSTRUCT-RUN-TIME IL:FILETYPE COMPILE-FILE)

```

```

(IL:PUTPROPS IL:DEFSTRUCT-RUN-TIME IL:MAKEFILE-ENVIRONMENT (:READTABLE "XCL" :PACKAGE "LISP"))

```

```

(IL:DECLARE\ : IL:DONTEVAL@LOAD IL:DOEVAL@COMPILE IL:DONTCOPY IL:COMPILERVERS

```

```

(IL:ADDTOVAR IL:NLAMA )

```

```

(IL:ADDTOVAR IL:NLAML )

```

```

(IL:ADDTOVAR IL:LAMA )
)

```

```

(IL:PUTPROPS IL:DEFSTRUCT-RUN-TIME IL:COPYRIGHT ("Venue & Xerox Corporation" 1986 1987 1988 1990 1993))

```

FUNCTION INDEX

SI::%STRUCTURE-DECLARE-DATATYPE ..1	ESTABLISH-SETFS-AND-OPTIMIZERS ...2	SET-PARSED-STRUCTURE1
CACHE-SETF-INFO3	GET-PS-FROM-ACCESSOR2	STRUCTURE-CONSTRUCTOR4
IL:CREATE-STRUCTURE4	GET-PS-FROM-PREDICATE3	STRUCTURE-SLOT-NAMES4
DEFAULT-STRUCTURE-PRINTER3	GET-SLOT-DESCRIPTOR-FROM-PS3	
ESTABLISH-PREDICATE2	PRINT-STRUCTURE-INSTANCE3	

VARIABLE INDEX

DEFSTRUCT-INFO-CACHE2	*PARSED-DEFSTRUCTS*1	XCL:*PRINT-STRUCTURE*3
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PROPERTY INDEX

IL:DEFSTRUCT-RUN-TIME4

SETF INDEX

PARSED-STRUCTURE1

MACRO INDEX

PARSED-STRUCTURE1
