File created: 16-Apr-2018 23:05:10 **{DSK}<Users>kaplan>Local>medley3.5>lispcore>sources>TIME.;3**

changes to: (IL:FUNCTIONS %PRINT-TIMING-INFO)

previous date: 5-Jan-93 02:34:56 {DSK}<Users>kaplan>Local>medley3.5>lispcore>sources>TIME.;1

Read Table: XCL

Package: LISP

Format: XCCS


```
(IL:RPAQQ IL:TIMECOMS
          ((IL:STRUCTURES STATS-OBJECT)
           (IL:FUNCTIONS %COPY-TIME-STATS %STATS-OBJECT-DIFFERENCE)
           (IL:FUNCTIONS %GET-TIMING-INFO TIME-CALL TIME)
           (IL:FUNCTIONS %CAPTURE-COUNTERS-BEFORE %CAPTURE-COUNTERS-AFTER TIME-FORMAT %PRINT-TIMING-ITEM
                  %PRINT-TIMING-INFO)
           (IL:DECLARE\: IL:DONTCOPY IL:DOEVAL@COMPILE (IL:FUNCTIONS %CAPTURE-BEFORE-STATS %CAPTURE-AFTER-STATS
                                                              %MOVE-FIXP-FIELD))
           (IL:SPECIAL-FORMS TIME)
           (IL:COMMANDS "TIME")
           ;; Interlisp Timeall function
           (IL:FNS IL:TIMEALL)
           ;; file package stuff
           (IL:PROP IL:FILETYPE TIME)
           (IL:PROP IL:MAKEFILE-ENVIRONMENT TIME)
           (IL:DECLARE\: IL:DONTEVAL@LOAD IL:DOEVAL@COMPILE IL:DONTCOPY (IL:LOCALVARS . T))
           (IL:DECLARE\: IL:DONTEVAL@LOAD IL:DOEVAL@COMPILE IL:DONTCOPY IL:COMPILERVARS (IL:ADDVARS (IL:NLAMA)
                                                                                                 (IL:NLAML
                                                                                                        IL:TIMEALL
                                                                                                        )
                                                                                                 (IL:LAMA)))))

(DEFSTRUCT (STATS-OBJECT (:TYPE LIST)
                         (:COPIER NIL)
                         (:PREDICATE NIL))
   (ELAPSED-TIME (IL:CLOCK 0))
   (TIME-BLOCK (IL:|create| IL:MISCSTATS))
   (DATA-COUNTERS (MAKE-ARRAY (1+ IL:|\\MaxTypeNumber|)
                              :ELEMENT-TYPE
                              '(SIGNED-BYTE 32)
                              :INITIAL-ELEMENT 0))
   DATATYPES)

(DEFUN %COPY-TIME-STATS (REFERENCE-BLOCK DESTINATION-BLOCK)
    ;; Copies various fields from one miscstats block to another. Both reference-block and destination-block should be unboxed hunks (made by
    ;; (IL:create IL:miscstats)), but IL:\\miscstats is also a valid value for reference-block
    (%MOVE-FIXP-FIELD (IL:MISCSTATS IL:SWAPWAITTIME)
           DESTINATION-BLOCK REFERENCE-BLOCK)
    (%MOVE-FIXP-FIELD (IL:MISCSTATS IL:GCTIME)
           DESTINATION-BLOCK REFERENCE-BLOCK)
    (%MOVE-FIXP-FIELD (IL:MISCSTATS IL:PAGEFAULTS)
           DESTINATION-BLOCK REFERENCE-BLOCK)
    (%MOVE-FIXP-FIELD (IL:MISCSTATS IL:SWAPWRITES)
           DESTINATION-BLOCK REFERENCE-BLOCK)
    (%MOVE-FIXP-FIELD (IL:MISCSTATS IL:TOTALTIME)
           DESTINATION-BLOCK REFERENCE-BLOCK)
    (%MOVE-FIXP-FIELD (IL:MISCSTATS IL:DISKIOTIME)
           DESTINATION-BLOCK REFERENCE-BLOCK)
    (%MOVE-FIXP-FIELD (IL:MISCSTATS IL:NETIOTIME)
           DESTINATION-BLOCK REFERENCE-BLOCK)
    (%MOVE-FIXP-FIELD (IL:MISCSTATS IL:DISKOPS)
           DESTINATION-BLOCK REFERENCE-BLOCK)
   DESTINATION-BLOCK)

(DEFUN %STATS-OBJECT-DIFFERENCE (BEFORE AFTER)
    ;; puts the differences between the stat-object after and  stat-object before back into after.
    (LET ((BEFORE-DATA-COUNTERS (STATS-OBJECT-DATA-COUNTERS BEFORE))
          (BEFORE-TIME-BLOCK (STATS-OBJECT-TIME-BLOCK BEFORE))
          (AFTER-DATA-COUNTERS (STATS-OBJECT-DATA-COUNTERS AFTER))
          (AFTER-TIME-BLOCK (STATS-OBJECT-TIME-BLOCK AFTER)))
         (DOTIMES (I (LENGTH BEFORE-DATA-COUNTERS))
             (DECF (AREF AFTER-DATA-COUNTERS I)
                   (AREF BEFORE-DATA-COUNTERS I)))
         (DECF (STATS-OBJECT-ELAPSED-TIME AFTER)
               (STATS-OBJECT-ELAPSED-TIME BEFORE))
         (DECF (IL:|fetch| (IL:MISCSTATS IL:SWAPWAITTIME) IL:|of| AFTER-TIME-BLOCK)
               (IL:|fetch| (IL:MISCSTATS IL:SWAPWAITTIME) IL:|of| BEFORE-TIME-BLOCK))
```

```
        (DECF (IL:|fetch| (IL:MISCSTATS IL:GCTIME) IL:|of| AFTER-TIME-BLOCK)
              (IL:|fetch| (IL:MISCSTATS IL:GCTIME) IL:|of| BEFORE-TIME-BLOCK))
        (DECF (IL:|fetch| (IL:MISCSTATS IL:DISKIOTIME) IL:|of| AFTER-TIME-BLOCK)
              (IL:|fetch| (IL:MISCSTATS IL:DISKIOTIME) IL:|of| BEFORE-TIME-BLOCK))
        (DECF (IL:|fetch| (IL:MISCSTATS IL:PAGEFAULTS) IL:|of| AFTER-TIME-BLOCK)
              (IL:|fetch| (IL:MISCSTATS IL:PAGEFAULTS) IL:|of| BEFORE-TIME-BLOCK))
        (DECF (IL:|fetch| (IL:MISCSTATS IL:SWAPWRITES) IL:|of| AFTER-TIME-BLOCK)
              (IL:|fetch| (IL:MISCSTATS IL:SWAPWRITES) IL:|of| BEFORE-TIME-BLOCK))
        (DECF (IL:|fetch| (IL:MISCSTATS IL:DISKOPS) IL:|of| AFTER-TIME-BLOCK)
              (IL:|fetch| (IL:MISCSTATS IL:DISKOPS) IL:|of| BEFORE-TIME-BLOCK))
       AFTER))
```

```
(DEFUN %GET-TIMING-INFO (TIMED-FUNCTION TIME-BEFORE TIME-AFTER &OPTIONAL (REPEAT 1))
```

;; Side-effects TIME-BEFORE and TIME-AFTER. Returns the value (or values of TIMED-FUNCTION, and the timing-info in TIME-AFTER.

```
   (LET ((VALUES NIL))
        (%CAPTURE-BEFORE-STATS TIME-BEFORE)
        (DOTIMES (I (1- REPEAT))
            (FUNCALL TIMED-FUNCTION))
        (SETQ VALUES (MULTIPLE-VALUE-LIST (FUNCALL TIMED-FUNCTION)))
        (%CAPTURE-AFTER-STATS TIME-AFTER)
        (%STATS-OBJECT-DIFFERENCE TIME-BEFORE TIME-AFTER)
        (VALUES-LIST VALUES)))
```

```
(DEFUN TIME-CALL (TIMED-FUNCTION &KEY (OUTPUT *TRACE-OUTPUT*)
                          (TIMED-FORM NIL TIMED-FORM-P)
                          (DATA-TYPES (IL:DATATYPES))
                          (REPEAT 1))
   (LET ((VALUES NIL)
         (TIME-BEFORE (MAKE-STATS-OBJECT))
         (TIME-AFTER (MAKE-STATS-OBJECT))
         (TIME-DO-NOTHING (MAKE-STATS-OBJECT)))
```

;; Calibrate

```
        (%GET-TIMING-INFO #'(LAMBDA NIL NIL)
              TIME-BEFORE TIME-DO-NOTHING)
        (SETQ VALUES (MULTIPLE-VALUE-LIST (%GET-TIMING-INFO TIMED-FUNCTION TIME-BEFORE TIME-AFTER REPEAT)))
        (%STATS-OBJECT-DIFFERENCE TIME-DO-NOTHING TIME-AFTER)
        (IF TIMED-FORM-P (TIME-FORMAT OUTPUT "Timing for ~[~;~:;~:* ~D x~]:~20T ~S~&" REPEAT TIMED-FORM))
        (%PRINT-TIMING-ITEM OUTPUT "Elapsed time" (STATS-OBJECT-ELAPSED-TIME TIME-AFTER)
              T T)
        (%PRINT-TIMING-INFO OUTPUT TIME-AFTER DATA-TYPES)
        (VALUES-LIST VALUES)))
```

```
(DEFMACRO TIME (TIMED-FORM &REST KEYWORDS)
   `(TIME-CALL #'(LAMBDA NIL ,TIMED-FORM)
           :TIMED-FORM
           ',TIMED-FORM
           ,@KEYWORDS))
```

```
(DEFUN %CAPTURE-COUNTERS-BEFORE (VECTOR)
```

;; Record box count for all known datatypes before timing. Note, IL:BOXCOUNT may create fixp's, so count down, so the FIXP count is recorded last

```
   (DO ((I (1- (LENGTH VECTOR))
           (1- I)))
       ((< I 0)
        VECTOR)
     (SETF (AREF VECTOR I)
           (IL:BOXCOUNT I))))
```

```
(DEFUN %CAPTURE-COUNTERS-AFTER (VECTOR)
```

;; Record box count for all known datatypes after timing. Note, IL:BOXCOUNT may create fixp's, so count up, so the FIXP count is recorded first

```
   (DOTIMES (I (LENGTH VECTOR)
               VECTOR)
       (SETF (AREF VECTOR I)
             (IL:BOXCOUNT I))))
```

```
(DEFUN TIME-FORMAT (STREAM FORMAT-STRING &REST ARGS)
   (IF (EQ STREAM :EXEC)
       (APPLY 'XCL:EXEC-FORMAT FORMAT-STRING ARGS)
       (APPLY 'FORMAT STREAM FORMAT-STRING ARGS)))
```

```
(DEFUN %PRINT-TIMING-ITEM (STREAM STRING NUM TIME-P ALWAYS-P)
   (IF (OR ALWAYS-P (> NUM 0))
       (IF TIME-P
           (TIME-FORMAT STREAM "~&~A ~20,5T= ~9,3F seconds~&" STRING (MAX 0 (/ NUM 1000.0)))
           (TIME-FORMAT STREAM "~&~A ~20,5T= ~9D~&" STRING NUM))))
```

```
(DEFUN %PRINT-TIMING-INFO (STREAM STATS-OBJECT DATA-TYPES)
   (LET ((TIME-BLOCK (STATS-OBJECT-TIME-BLOCK STATS-OBJECT))
         (DATA-TYPE-INFO (LET ((DATA-COUNTER (STATS-OBJECT-DATA-COUNTERS STATS-OBJECT))
                               (RESULT NIL)
                               (RESULT-TAIL NIL)
                               CNT TYPE-NAME)
                              (DOTIMES (I (MIN (LENGTH DATA-COUNTER)
                                               (1+ IL:|\\MaxTypeNumber|))
                                           RESULT)
                                  (SETQ CNT (AREF DATA-COUNTER I))
                                  (WHEN (> CNT 0)
                                      (SETQ TYPE-NAME (IL:\\TYPENAMEFROMNUMBER I))
                                      (IF (MEMBER TYPE-NAME DATA-TYPES :TEST #'EQ)
                                          (IF RESULT
                                              (RPLACD RESULT-TAIL (SETQ RESULT-TAIL (LIST (LIST CNT TYPE-NAME)))
                                                      )
                                              (SETQ RESULT (SETQ RESULT-TAIL (LIST (LIST CNT TYPE-NAME))))))))))
         )
        (%PRINT-TIMING-ITEM STREAM "SWAP time" (IL:|fetch| (IL:MISCSTATS IL:SWAPWAITTIME) IL:|of| TIME-BLOCK)
               T NIL)
        (%PRINT-TIMING-ITEM STREAM "reclaim time" (IL:|fetch| (IL:MISCSTATS IL:GCTIME) IL:|of| TIME-BLOCK)
               T NIL)
        (%PRINT-TIMING-ITEM STREAM "Disk i/o time" (IL:|fetch| (IL:MISCSTATS IL:DISKIOTIME) IL:|of| TIME-BLOCK)
               T NIL)
        (%PRINT-TIMING-ITEM STREAM "net compute time" (- (STATS-OBJECT-ELAPSED-TIME STATS-OBJECT)
                                                         (IL:|fetch| (IL:MISCSTATS IL:SWAPWAITTIME) IL:|of| TIME-BLOCK
                                                                )
                                                         (IL:|fetch| (IL:MISCSTATS IL:GCTIME) IL:|of| TIME-BLOCK)
                                                         (IL:|fetch| (IL:MISCSTATS IL:DISKIOTIME) IL:|of| TIME-BLOCK)
                                                         (IL:|fetch| (IL:MISCSTATS IL:NETIOTIME) IL:|of| TIME-BLOCK))
               T T)
        (%PRINT-TIMING-ITEM STREAM "Page faults" (IL:|fetch| (IL:MISCSTATS IL:PAGEFAULTS) IL:|of| TIME-BLOCK)
               NIL)
        (%PRINT-TIMING-ITEM STREAM "Swap writes" (IL:|fetch| (IL:MISCSTATS IL:SWAPWRITES) IL:|of| TIME-BLOCK)
               NIL)
        (%PRINT-TIMING-ITEM STREAM "Disk operations" (IL:|fetch| (IL:MISCSTATS IL:DISKOPS) IL:|of| TIME-BLOCK)
               NIL)
        (IF DATA-TYPE-INFO (TIME-FORMAT STREAM "~&Storage allocated:~%~{~{~D ~A~}~^, ~}~&" DATA-TYPE-INFO))
        (TIME-FORMAT STREAM "~%")))

(IL:DECLARE\: IL:DONTCOPY IL:DOEVAL@COMPILE


(DEFMACRO %CAPTURE-BEFORE-STATS (STATS-OBJECT)
   ;; Capture machine state before timeing an evaluation. Note that ordering is important
   `(LET ((%$$STATS-OBJECT ,STATS-OBJECT))
         (%CAPTURE-COUNTERS-BEFORE (STATS-OBJECT-DATA-COUNTERS %$$STATS-OBJECT))
         (%COPY-TIME-STATS IL:\\MISCSTATS (STATS-OBJECT-TIME-BLOCK %$$STATS-OBJECT))
         (IL:CLOCK0 (STATS-OBJECT-ELAPSED-TIME %$$STATS-OBJECT))))


(DEFMACRO %CAPTURE-AFTER-STATS (STATS-OBJECT)
   `(LET ((%$$STATS-OBJECT ,STATS-OBJECT))
         (IL:CLOCK0 (STATS-OBJECT-ELAPSED-TIME %$$STATS-OBJECT))
         (%COPY-TIME-STATS IL:\\MISCSTATS (STATS-OBJECT-TIME-BLOCK %$$STATS-OBJECT))
         (%CAPTURE-COUNTERS-AFTER (STATS-OBJECT-DATA-COUNTERS %$$STATS-OBJECT))))


(DEFMACRO %MOVE-FIXP-FIELD (FIELD-NAME DEST SOURCE)
   `(IL:\\BLT (IL:LOCF (IL:FETCH ,FIELD-NAME IL:OF ,DEST))
          (IL:LOCF (IL:FETCH ,FIELD-NAME IL:OF ,SOURCE))
          2))
)


(XCL:DEFINE-SPECIAL-FORM TIME (TIMED-FORM &KEY (DATA-TYPES '(IL:DATATYPES))
                                               (REPEAT 1)
                                               (OUTPUT '*TRACE-OUTPUT*)
                                               &ENVIRONMENT ENV &AUX *EVALHOOK* *APPLYHOOK*)
   (TIME-CALL #'(LAMBDA NIL (EVAL TIMED-FORM ENV))
          :TIMED-FORM TIMED-FORM :DATA-TYPES (EVAL DATA-TYPES ENV)
          :REPEAT
          (EVAL REPEAT ENV)
          :OUTPUT
          (EVAL OUTPUT ENV)))


(XCL:DEFCOMMAND "TIME" (FORM &KEY (REPEAT 1)
                                  &ENVIRONMENT ENV) "Time evaluation of form, output here"
   (TIME-CALL #'(LAMBDA NIL (EVAL FORM ENV))
          :OUTPUT :EXEC :REPEAT (EVAL REPEAT ENV)))

;; Interlisp Timeall function

(IL:DEFINEQ
```

```
(IL:TIMEALL
  (IL:NLAMBDA (IL:TIMEFORM IL:NUMBEROFTIMES IL:TIMEWHAT IL:INTERPFLG)
                                                                    ; Edited 29-Jan-87 18:48 by jop

    ;; collects and prints stats on TIMEFORM.  TIMEWHAT indicates what to collect stats on: if T, all of the system times are collected;  if NIL, the
    ;; system times plus all data allocations are kept;  if a list, it should be a list of DATATYPES (or numbers) .

    (LET ((IL:DATATYPES (COND
                           ((NULL IL:TIMEWHAT)
                            (IL:DATATYPES))
                           ((EQ IL:TIMEWHAT T)
                            NIL)
                           (T (IL:for IL:X IL:inside IL:TIMEWHAT IL:bind IL:NAME
                                 IL:join (COND
                                             ((IL:SETQ IL:NAME (IL:DATATYPEP IL:X))
                                              (CONS IL:NAME))
                                             ((EQ IL:X 'TIME)
                                              NIL)
                                             (T (IL:|printout| T IL:X " is not a datatype." T)
                                                NIL))))))
          IL:VALUE)
         (OR (IL:NUMBERP IL:NUMBEROFTIMES)
             (IL:SETQ IL:NUMBEROFTIMES 1))
         (LET ((IL:STRF T)
               (IL:LCFIL NIL))
              (DECLARE (IL:SPECVARS IL:STRF IL:LCFIL))
              (IL:COMPILE1 'IL:TIMEDUMMYFUNCTION `(IL:LAMBDA NIL
                                                    ,IL:TIMEFORM))
              (TIME-CALL 'IL:TIMEDUMMYFUNCTION :OUTPUT (IL:GETSTREAM NIL 'IL:OUTPUT)
                     :TIMED-FORM IL:TIMEFORM :DATA-TYPES IL:DATATYPES :REPEAT IL:NUMBEROFTIMES)))))

)

;; file package stuff

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

(IL:PUTPROPS TIME IL:MAKEFILE-ENVIRONMENT (:READTABLE "XCL" :PACKAGE "CL"))

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

(IL:DECLARE\: IL:DOEVAL@COMPILE IL:DONTCOPY

(IL:LOCALVARS . T)
)
)

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

(IL:ADDTOVAR IL:NLAMA )

(IL:ADDTOVAR IL:NLAML IL:TIMEALL)

(IL:ADDTOVAR IL:LAMA )
)

(IL:PUTPROPS TIME IL:COPYRIGHT ("Venue & Xerox Corporation" 1986 1987 1988 1990 1993 2018))
```

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