```
NNN         NNN  EEEEEEEEEEEEEEE   TTTTTTTTTTTTTTT     AAAAAAAAA        CCCCCCCCCCCC  PPPPPPPPPPPP
NNN         NNN  EEEEEEEEEEEEEEE   TTTTTTTTTTTTTTT     AAAAAAAAA        CCCCCCCCCCCC  PPPPPPPPPPPP
NNN         NNN  EEEEEEEEEEEEEEE   TTTTTTTTTTTTTTT     AAAAAAAAA        CCCCCCCCCCCC  PPPPPPPPPPPP
NNN         NNN  EEE                     TTT        AAA         AAA  CCC              PPP         PPP
NNN         NNN  EEE                     TTT        AAA         AAA  CCC              PPP         PPP
NNN         NNN  EEE                     TTT        AAA         AAA  CCC              PPP         PPP
NNNNNN      NNN  EEE                     TTT        AAA         AAA  CCC              PPP         PPP
NNNNNN      NNN  EEE                     TTT        AAA         AAA  CCC              PPP         PPP
NNNNNN      NNN  EEE                     TTT        AAA         AAA  CCC              PPP         PPP
NNN   NNN   NNN  EEEEEEEEEEEE            TTT        AAA         AAA  CCC              PPPPPPPPPPPP
NNN   NNN   NNN  EEEEEEEEEEEE            TTT        AAA         AAA  CCC              PPPPPPPPPPPP
NNN   NNN   NNN  EEEEEEEEEEEE            TTT        AAA         AAA  CCC              PPPPPPPPPPPP
NNN      NNNNNN  EEE                     TTT        AAAAAAAAAAAAAAA  CCC              PPP
NNN      NNNNNN  EEE                     TTT        AAAAAAAAAAAAAAA  CCC              PPP
NNN      NNNNNN  EEE                     TTT        AAAAAAAAAAAAAAA  CCC              PPP
NNN         NNN  EEE                     TTT        AAA         AAA  CCC              PPP
NNN         NNN  EEE                     TTT        AAA         AAA  CCC              PPP
NNN         NNN  EEE                     TTT        AAA         AAA  CCC              PPP
NNN         NNN  EEEEEEEEEEEEEEE         TTT        AAA         AAA     CCCCCCCCCCCC  PPP
NNN         NNN  EEEEEEEEEEEEEEE         TTT        AAA         AAA     CCCCCCCCCCCC  PPP
NNN         NNN  EEEEEEEEEEEEEEE         TTT        AAA         AAA     CCCCCCCCCCCC  PPP
```

```
**FILE**ID**NETCNF                                        D  4

NN        NN EEEEEEEEEE TTTTTTTTTT     CCCCCCCC NN        NN FFFFFFFFFF
NN        NN EEEEEEEEEE TTTTTTTTTT     CCCCCCCC NN        NN FFFFFFFFFF
NN        NN EE             TT       CC         NN        NN FF
NN        NN EE             TT       CC         NN        NN FF
NNNN      NN EE             TT       CC         NNNN      NN FF
NNNN      NN EE             TT       CC         NNNN      NN FF
NN  NN    NN EEEEEEEE       TT       CC         NN  NN    NN FFFFFFFF
NN  NN    NN EEEEEEEE       TT       CC         NN  NN    NN FFFFFFFF
NN    NNNN   EE             TT       CC         NN    NNNN   FF
NN    NNNN   EE             TT       CC         NN    NNNN   FF
NN        NN EE             TT       CC         NN        NN FF               ....
NN        NN EE             TT       CC         NN        NN FF               ....
NN        NN EEEEEEEEEE     TT         CCCCCCCC NN        NN FF               ....
NN        NN EEEEEEEEEE     TT         CCCCCCCC NN        NN FF               ....

LL              IIIIII     SSSSSSSS
LL              IIIIII     SSSSSSSS
LL                II     SS
LL                II     SS
LL                II     SS
LL                II     SS
LL                II       SSSSSS
LL                II       SSSSSS
LL                II             SS
LL                II             SS
LL                II             SS
LL                II             SS
LLLLLLLLLL      IIIIII   SSSSSSSS
LLLLLLLLLL      IIIIII   SSSSSSSS
```

NET
V04

Table of contents

NET
V04

```
0000            .TITLE  NETCNF  - Configuration data base access routines
0000            .IDENT  'V04-000'
0000            .DEFAULT DISPLACEMENT,WORD
0000
0000    ;****************************************************************************
0000    ;*                                                                          *
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0000    ;*                                                                          *
0000    ;*                                                                          *
0000    ;****************************************************************************
0000    ;
0000    ;
0000    ; FACILITY:     NETWORK ACP
0000    ;
0000    ; ABSTRACT:
0000    ;               This module provides access to the NETACP configuration
0000    ;               database.
0000    ;
0000    ; ENVIRONMENT:
0000    ;               Kernel mode
0000    ;
0000    ; AUTHOR:       A.Eldridge      14-JAN-80
0000    ;
0000    ; MODIFIED BY:
0000    ;
0000    ;       V011    RNG0011         Rod Gamache             16-Mar-1984
0000    ;               Fix routine that calls action routines to not clobber the
0000    ;               return status in R0.
0000    ;
0000    ;       V010    RNG0010         Rod Gamache             7-Feb-1984
0000    ;               Fix return from GET_FIELD for register descriptor to be
0000    ;               zero on error returns.
0000    ;               Fix possible stack problem with CNF$DELETE routine.
0000    ;
0000    ;       V009    TMH0009         Tim Halvorsen           17-May-1983
0000    ;               Fix bug in GET_FIELD and COMPARE_ACT which assumes that
0000    ;               the field is a longword, and picks up the value before
0000    ;               it finds out it may be a "bit".  If the bit number is
0000    ;               high enough, this may cause a spurious reference off the
0000    ;               end of the structure, and if the next page is a null page,
0000    ;               the system will crash.
```

```
0000  ;
0000  ;        V008    RNG0008         Rod Gamache             29-Mar-1983
0000  ;                Add code to support binary balanced trees for the NDI
0000  ;                database.
0000  ;
0000  ;        V007    TMH0007         Tim Halvorsen           05-Nov-1982
0000  ;                Add concept of action routines which can both read and
0000  ;                write a parameter (in addition to the existing concept of
0000  ;                action routines which only read a parameter).
0000  ;
0000  ;        V006    TMH0006         Tim Halvorsen           02-Jul-1982
0000  ;                Modify routine which stores a string parameter when
0000  ;                one already exists, so that, if the string is equal
0000  ;                to, or less than the size of the original string, then
0000  ;                the space is simply reused, rather than returning
0000  ;                an error.  This is needed because NI datalink drivers
0000  ;                now deal more with string parameters (NI addresses).
0000  ;                Enhance CNF$VERIFY so that it properly detects a
0000  ;                parameter which is not in the semantic table, but
0000  ;                is within the range of allowable indicies (a hole
0000  ;                in the table).
0000  ;
0000  ;        V005    TMH0005         Tim Halvorsen           16-Jun-1982
0000  ;                Add code to handle new type of field access control
0000  ;                called "no external read or write access" (ACC_NE).
0000  ;                Add $DYNDEF definition.
0000  ;
0000  ;        V004    TMH0004         Tim Halvorsen           04-Apr-1982
0000  ;                Remove spurious instruction and label.
0000  ;                Special case NFB$C_WILDCARD as a search field ID in
0000  ;                KEY_SRCH, in order to remove extra code in CTLALL.
0000  ;                Replace call to NET$APPLY_DFLT with a call to a CNR
0000  ;                specific action routine to apply the default values.
0000  ;                Return BADPARAM from GET_DSC if read access not allowed,
0000  ;                rather than returning a zero.
0000  ;                Make CNF$INIT a local routine, since it is not called by
0000  ;                any other module.
0000  ;                Modify calling sequence to field action routines, so that
0000  ;                a scratch buffer is automatically allocated here before
0000  ;                calling the routine, to avoid the expense of having each
0000  ;                routine do it.  In addition, all registers are automatically
0000  ;                saved over an action routine call.
0000  ;                Remove CNF$GET_ADDR routine, as it is no longer called
0000  ;                by anyone as a result of the action routine changes.
0000  ;                Add routine to search given a list of search keys.
0000  ;                Remove code to support FNDNEXT operator.
0000  ;                Fix FNDMIN and FNDMAX support so that it correctly
0000  ;                returns the matched CNF in R10.
0000  ;                Rename CNF$T_MASK to CNF$L_MASK.
0000  ;                Rename CNR$T_SEM_TAB to CNR$L_SEM_TAB.
0000  ;                Make default word addressing mode and remove all
0000  ;                explicit addressing mode specifiers.
0000  ;                Use SETBIT and CLRBIT macros where ever possible.
0000  ;
0000  ;        V003    TMH0003         Tim Halvorsen           25-Mar-1982
0000  ;                Fix routine which compresses a CNF block to correctly
0000  ;                initialize the amount of space used for strings, to
```

```
                        0000  ;               prevent a continual increase in the block size for
                        0000  ;               each block compression.
                        0000  ;
                        0000  ;       V02-002 ADE0050         A.Eldridge              19-Jan-1982
                        0000  ;               Added call to NET$APPLY_DFLT which applies default values
                        0000  ;               to selected CNF parameters when an entry is about to
                        0000  ;               inserted into the database.
                        0000  ;
                        0000  ;       V02-001 ADE0007         A.Eldridge
                        0000  ;               General cleanup.
                        0000  ;--
```

```
                    0000            .SBTTL  Declarations
                    0000    ;
                    0000    ; INCLUDE FILES:
                    0000    ;
                    0000            $DYNDEF                         ; Dynamic structure types
                    0000
                    0000            $CNRDEF                         ; Configuration Root Block
                    0000            $CNFDEF                         ; Configuration Data Block
                    0000            $NETSYMDEF                      ; Miscellaneous symbol definitions
                    0000            $NFBDEF                         ; ACP control QIO definitions
                    0000
                    0000
                    0000    ;
                    0000    ; EQUATED SYMBOLS:
                    0000    ;
        00000000    0000    STR_OFF = 0             ; String descriptor string self-relative offset
        00000002    0000    STR_LNG = 2             ; String descriptor string size
                    0000
                    0000
        0000044C    0000    TMP_LTH =  1100                         ; Length of temp buffer
                    0000
                    0000    ;
                    0000    ; OWN STORAGE
                    0000    ;
                    0000
            00000000    0000            .PSECT  NET_PURE,NOWRT,NOEXE,LONG
                    0000
                    0000
        0000044C    0000    TMPBUF_DESC::   .LONG   TMP_LTH         ; Descriptor of TMP_BUF for external use
        00000004'   0004                    .ADDRESS TMP_BUF
                    0008
            00000000    0000            .PSECT  NET_IMPURE,WRT,NOEXE
                    0000
        00000004    0000    SELECT_CNF:     .BLKL   1               ; Currently selected min/max CNF
        0000000C    0004    SELECT_VALUE:   .BLKL   2               ; Min/max value assoc. with SELECT_CNF
                    000C
              00    000C    TMP_B_FLAGS:    .BYTE   0               ; Buffer flags
        00000000    000D    TMP_V_VAL = 0                           ; 1 if TMP_VAL in use, else 0
        00000001    000D    TMP_V_BUF = 1                           ; 1 if buffer in use, else 0
                    000D
            00000000    0000            .PSECT  TABLES_IMPURE,WRT,NOEXE,GBL
                    0000
        00000000    0000    TMP_VAL:        .LONG   0               ; Tmp storage for returned value
                    0004                                            ; and for "short" decriptor of TMP_BUF
                    0004                                            ; when returning strings
                    0004
        00000450    0004    TMP_BUF:        .BLKB   TMP_LTH         ; Buffer for returning strings
                    0450    TMP_BUF_END:                            ; Address of first byte past buffer
        00000000    0450                    .LONG   0               ; Leave an extra longword
                    0454
            00000000    0000            .PSECT  NET_CODE,NOWRT,EXE
```

```
                  0000   179          .SBTTL  CNF$PRE_SHOW - Pre-SHOW processing
                  0000   180  ;+
                  0000   181  ; CNF$PRE_SHOW  - Pre-process CNF for a "show" QIO
                  0000   182  ;
                  0000   183  ; Dispatch to database specific action routine to pre-process a CNF entry
                  0000   184  ; before a "show" QIO is processed for that entry.
                  0000   185  ;
                  0000   186  ; INPUTS:         R11     CNR pointer
                  0000   187  ;                 R10     CNF pointer
                  0000   188  ;                 R9-R7   Scratch
                  0000   189  ;                 R5-R0   Scratch
                  0000   190  ;
                  0000   191  ; OUTPUTS:        R11,R10 Preserved
                  0000   192  ;                 R6      Preserved
                  0000   193  ;
                  0000   194  ;                 All other regs are clobbered.
                  0000   195  ;-
                  0000   196  CNF$PRE_SHOW::                                  ; "Show" QIO pre-processing
          56   DD 0000   197          PUSHL   R6                              ; Save reg
       1C BB   i6 0002   198          JSB     @CNR$L_ACT_SHOW(R11)            ; Call action routine
          56 8ED0 0005   199          POPL    R6                              ; Restore reg
             05   0008   200          RSB                                     ; Done
```

```
                 0009              .SBTTL  CNF$PRE_QIO - Pre-QIO processing
                 0009      ;+
                 0009      ; CNF$PRE_QIO    - Pre-process database to prepare it for a QIO
                 0009      ;
                 0009      ; Dispatch to database specific action routine to pre-process a CNF entry
                 0009      ; before a "show" QIO is processed for that entry.
                 0009      ;
                 0009      ; INPUTS:           R11     CNR pointer
                 0009      ;
                 0009      ; OUTPUTS:          R11     Unchanged
                 0009      ;                   R0      SS$_...   (may return this code as QIO status if low
                 0009      ;                                        bit is clear)
                 0009      ;
                 0009      ;                   All other regs are preserved
                 0009      ;
                 0009      ;-
                 0009      CNF$PRE_QIO::                                      ; QIO pre-processing for database
                 0009
03FE 8F   BB     0009              PUSHR   #^M<R1,R2,R3,R4,R5,R6,R7,R8,R9> ; Save regs
  18 BB   16     000D              JSB     @CNR$L_ACT_QIO(R11)             ; Setup database
03FE 8F   BA     0010              POPR    #^M<R1,R2,R3,R4,R5,R6,R7,R8,R9> ; Restore regs
          05     0014              RSB                                     ; Done
```

```
                          0015           .SBTTL  CNF$DELETE - Delete a CNF entry
                          0015      ;+
                          0015      ; CNF$DELETE       - Attempt to delete CNF entry
                          0015      ;
                          0015      ; The CNF is checked to see if it is delete-able.  If so, it is marked
                          0015      ; temporary.  If the CNF$V_FLG_ACP bit is set then the CNF does not exist in
                          0015      ; the linked list portion of the database and the operation is considered to
                          0015      ; be a no-op (these CNF's are sometimes referred to as ''phantom'' CNF's and
                          0015      ; are used to reference things known to NETACP but never inserted into the
                          0015      ; database: for instance, a node which was never defined but which is
                          0015      ; reachable by the Transport layer).
                          0015      ;
                          0015      ;
                          0015      ; INPUTS:          R11         CNR pointer
                          0015      ;                  R10         CNF pointer
                          0015      ;
                          0015      ; OUTPUTS:         R0          SS$_WRITLCK if the item was not delete-able
                          0015      ;                              SS$_NORMAL  otherwise
                          0015      ;
                          0015      ;                  All other regs are preserved.
                          0015      ;-
                          0015      CNF$DELETE::                                            ; Mark CNF for delete
      03BE 8F       BB    0015               PUSHR   #^M<R1,R2,R3,R4,R5,R7,R8,R9>           ; Save regs
   7E 0000'8F       3C    0019               MOVZWL  #SS$_WRITLCK,-(SP)                     ; Assume not delete-able
15 0B AA    02      E0    001E               BBS     #CNF$V_FLG_ACP,CNF$B_FLG(R10),30$; If BS then this is a no-op
      5B    5A      D1    0023               CMPL    R10,R11                                ; Is the CNF actually the CNR?
            13      13    0026               BEQL    50$                                    ; If EQL then cannot delete
         28 BB      16    0028               JSB     @CNR$L_ACT_DELETE(R11)                 ; Call action routine for
                          002B                                                              ; special processing
         0D 50      E9    002B               BLBC    R0,50$                                 ; If LBC then cannot delete it
                          002E      10$:     SETBIT  CNF$V_FLG_DELETE,CNF$B_FLG(R10)       ; Mark it for delete
                          0032               SETBIT  NET$V_PURGE,NET$GL_FLAGS               ; Remember to purge the database
      6E    00'     D0    0038      30$:     MOVL    S^#SS$_NORMAL,(SP)                     ; Overlay status code
      03BF 8F       BA    003B      50$:     POPR    #^M<R0,R1,R2,R3,R4,R5,R7,R8,R9> ; Restore regs
            05            003F               RSB
```

```
                    0040         .SBTTL  CNF$PURGE - Drain CNF entries marked for delete
                    0040   ;+
                    0040   ; CNF$PURGE       - Drain temporary entries from CNF queue
                    0040   ;
                    0040   ; The CNF is queue is scanned, starting at the root, and all CNFs which
                    0040   ; are marked temporary are deleted.
                    0040   ;
                    0040   ;
                    0040   ; INPUTS:         R11     CNR pointer
                    0040   ;
                    0040   ; OUTPUTS:        All regs are preserved.
                    0040   ;
                    0040   ;-
                    0040   CNF$PURGE::                                     ; Deallocate all temporary CNFs
     2C BB   16     0040            JSB     @CNR$L_ACT_REMOVE(R11)          ; Call action routine to do work
             05     0043            RSB
```

```
                          0044              .SBTTL  CNF$INSERT - Insert/Replace a CNF entry
                          0044      ;+
                          0044      ; CNF$INSERT      - Insert/Replace a database CNF entry
                          0044      ;
                          0044      ; Build a copy of the new CNF from the process pool and insert it into
                          0044      ; the database.
                          0044      ;
                          0044      ; NOTE:
                          0044      ;               ***  The database scan co-routine dialogue  ***
                          0044      ;               ***  below must be abortable via a RET.     ***
                          0044      ;
                          0044      ; INPUT:                 R11     CNR pointer
                          0044      ;                        R10     Points to the utility buffer with new image in it
                          0044      ;                        R6      Pointes to old CNF entry if any
                          0044      ;
                          0044      ; OUTPUT:                R11     CNR pointer
                          0044      ;                        R10     Points to new CNF if successful
                          0044      ;                                Contains original R6 otherwise
                          0044      ;                        R9      Field i.d. which qualifies the error code in R0
                          0044      ;                        R0      Status
                          0044      ;
                          0044      ;                        All other regs contain garbage
                          0044      ;-
                          0044      CNF$INSERT::                                    ; Insert/Replace a database entry
          0000'CF    DD   0044              PUSHL   NET$GL_FLAGS                    ; Save current flags
                          0048              SETBIT  NET$V_INTRNL,NET$GL_FLAGS ; Setup for "internal" access
                          004E              ;
                          004E              ;   Apply default values to selected parameters
                          004E              ;
               56    DD   004E              PUSHL   R6                              ; Save reg
            20 BB    16   0050              JSB     @CNR$L_ACT_DFLT(R11)            ; Call action routine
               56  8ED0   0053              POPL    R6                              ; Restore reg
            1E 50    E9   0056              BLBC    R0,17$                          ; If LBC then error encountered
                          0059              ;
                          0059              ;   Make sure all required fields are active
                          0059              ;
    52    0080 CB    9E   0059              MOVAB   CNR$L_VEC_MAND(R11),R2          ; Get pointer to list of field i.d.s
       59      82    D0   005E      10$:    MOVL    (R2)+,R9                        ; Get next field i.d.
               17    13   0061              BEQL    20$                             ; If EQL then done
             06CB    30   0063              BSBW    GET_DSC_1                       ; Get descriptor of field
       03 63   0E    E1   0066              BBC     #CNR$V_SEM_RT,(R3),15$          ; Br if "real" CNF field
             060B    30   006A              BSBW    GET_RT_FIELD                    ; Else get the info from action routine
    EC 18 AA   55    E0   006D      15$:    BBS     R5,CNF$L_MASK(R10),10$          ; If BS then field is active
    50    0000'8F    3C   0072              MOVZWL  #SS$_INSFARG,R0                 ; Setup error status
             0070    31   0077      17$:    BRW     40$                             ; Take common exit
                          007A      20$:    ;
                          007A              ;   Build a list of all parameters required to be unique and scan the
                          007A              ;   database to see if they are in fact unique.  This list is built in
                          007A              ;   the CNF pointed to by R10 since this is expected to be the utility
                          007A              ;   buffer and should be large enough (this eliminates the need for
                          007A              ;   another rather large buffer).
                          007A              ;
    52     0C AA     3C   007A              MOVZWL  CNF$W_OFF_FREE(R10),R2  ; Get self-relative offset
    53   0C AA42     9E   007E              MOVAB   CNF$W_OFF_FREE(R10)[R2],R3 ; Get ptr to free space
       55      53    D0   0083              MOVL    R3,R5                           ; Save copy of pointer
    52     0E AA     3C   0086              MOVZWL  CNF$W_SIZ_FREE(R10),R2  ; Get amount of free space
    52     04        A2   008A              SUBW    #4,R2                           ; Account for end of list flag
```

```
              31   19 008D         BLSS     32$                   ; If LSS then no space left
 54     00E4 CB    9E 008F         MOVAB    CNR$L_VEC_UNIQ(R11),R4 ; Get pointer to list of field i.d.s
          63 00    D0 0094  30$:   MOVL     #0,(R3)               ; Mark end of list
          59 84    D0 0097         MOVL     (R4)+,R9              ; Get next field i.d.
             2B    13 009A         BEQL     35$                   ; If EQL then at end of list
           0383    30 009C         BSBW     CNF$GET_FIELD         ; Get the field value
          F2 50    E9 009F         BLBC     R0,30$                ; If not active then ignore it
       52    0C    A2 00A2         SUBW     #12,R2                ; Need 12 more bytes
             19    19 00A5         BLSS     32$                   ; If LSS the no space left
           0064    30 00A7         BSBW     SPCSCAN               ; Try to do a special scan of key
       08 50 01    E0 00AA         BBS      #1,R0,31$             ; Br if key recognized
          83 59    D0 00AE         MOVL     R9,(R3)+              ; Else, Enter field i.d.
          83 57    7D 00B1         MOVQ     R7,(R3)+              ; Enter field value/descriptor
             DE    11 00B4         BRB      30$                   ; Loop
                      00B6  31$:   ;
                      00B6         ;  Special lookup routine recognized the key, check status
                      00B6         ;
                      00B6         ;       R0 = Bit 0: Set if CNF found with key, else clear.
                      00B6         ;            Bit 1: Set if key is recogized, else clear.
                      00B6         ;
          DB 50    E9 00B6         BLBC     R0,30$                ; Loop, if okay
 50     0000'8F    3C 00B9         MOVZWL   #SS$_DEVACTIVE,R0     ; Else, setup error return code
             2A    11 00BE         BRB      40$                   ; Take common exit
 50     0000'8F    3C 00C0  32$:   MOVZWL   #SS$_INSFMEM,R0       ; Setup status code
             23    11 00C5         BRB      40$                   ; Take common exit
                      00C7
       00000004       00C7  35$:   DLIST = 4                      ; Offset for dynamic field lis pointer
       00000008       00C7         SLIST = 8                      ; Offset for static field list pointer
                      00C7         PUSHQ    R4                    ; Dynamic pointer is garbage,
                      00CA                                        ; Static pointer is in R5
       29'AF 02    FB 00CA         CALLS    #2,B^SCAN             ; Scan for field already in use
          19 50    E9 00CE         BLBC     R0,40$                ; If LBC then something's not unique
                      00D1         ;
                      00D1         ; Create a copy of the new CNF
                      00D1         ;
           00CC    30 00D1         BSBW     CNF$CLONE             ; Create a copy - clone returns in R10
          13 50    E9 00D4         BLBC     R0,40$                ; If LBC then error
        0C40 8F    BB 00D7         PUSHR    #^M<R6,R10,R11>       ; Save critical regs
          24 BB    16 00DB         JSB      @CNR$L_ACT_INSERT(R11) ; Perform any pre-insertion processing
        0C40 8F    BA 00DE         POPR     #^M<R6,R10,R11>       ; Restore regs
          0A 50    E8 00E2         BLBS     R0,45$                ; If LBS then successful
 0000'DF    6A     0E 00E5         INSQUE   (R10),@NET$GQ_TMP_BUF ; Else queue "new" CNF for deallocation
                      00EA  40$:   ;
                      00EA         ;  Since the insert operation has failed, copy the old CNF pointer to
                      00EA         ;  R10 since R10 is used to return the CNF representing this entry
                      00EA         ;  which is linked into the database regardless of the success or
                      00EA         ;  failure of the attmepted insertion.  R10 will return the value
                      00EA         ;  zero if there was no old CNF pointer.
                      00EA         ;
       5A    56    D0 00EA         MOVL     R6,R10                ; Copy the "old" CNF pointer
             0B    11 00ED         BRB      70$                   ; Take common exit
                      00EF  45$:   ;
                      00EF         ;  Insert the new CNF into the database
                      00EF         ;
        0C40 8F    BB 00EF         PUSHR    #^M<R6,R10,R11>       ; Save critical regs
          34 BB    16 00F3         JSB      @CNR$L_INSERT(R11)    ; Perform the insertion
        0C40 8F    BA 00F6         POPR     #^M<R6,R10,R11>       ; Restore regs
```

```
   0000'CF 8ED0  00FA  70$:    POPL    NET$GL_FLAGS                 ; Restore flags
      0B 50   E9  00FF         BLBC    R0,80$                       ; If LBC then error
         01   E1  0102         BBC     #CNF$V_FLG_DELETE,-          ; If BC then no need to delete new
   06 0B AA       0104                 CNF$B_FLG(R10),80$           ; entry
                  0107         SETBIT  NET$V_PURGE,-                ; Else remember to purge it from the
                  0107                 NET$GL_FLAGS                 ; database
              05  010D  80$:   RSB                                  ; Done
                  010E
                  010E
                  010E
                  010E
                  010E  SPCSCAN:                                    ; Try to do special scan of database
                  010E
                  010E         ;    The special lookup routine will be called to try to do a
                  010E         ;    "quick" lookup of the CNF, given the current key. If the
                  010E         ;    key is not recognized then bit 1 of R0 is returned clear.
                  010E         ;    If the CNF is found, then the low bit of R0 is set, else
                  010E         ;    it is clear.
                  010E         ;
                  010E         ;    If the key is not recognized, then the key is inserted into
                  010E         ;    the key list for the long scan routine to check.
                  010E         ;
         5A   DD  010E         PUSHL   R10                          ; Save regs
         5A   D4  0110         CLRL    R10                          ; Start from beginning
      38 BB   16  0112         JSB     @CNR$L_SPCSCAN(R11)          ; Check for quick lookup of key
   0C 50 01   E1  0115         BBC     #1,R0,40$                    ; Br if key not recognized
                  0119         ;
                  0119         ;    Special lookup routine recognized the key, check status
                  0119         ;
                  0119         ;        R0 = Bit 0: Set if CNF found with key, else clear.
                  0119         ;             Bit 1: Set if key is recogized, else clear.
                  0119         ;
      09 50   E9  0119         BLBC    R0,40$                       ; Br if not found, okay
   56    5A   D1  011C         CMPL    R10,R6                       ; Else, is this the same CNF?
         04   12  011F         BNEQ    40$                          ; Br if no, bad CNF
                  0121         CLRBIT  #0,R0                        ; Else, indicate okay
      5A 8ED0     0125  40$:   POPL    R10                          ; Restore regs
         05       0128         RSB                                  ; Take common exit
                  0129
                  0129
                  0129
                  0129
                  0129  ;
                  0129  ;  Make sure those fields whose value should be unique are unique
                  0129  ;
            0400  0129  SCAN:  .WORD   ^M<R10>                      ;
                  012B  ;
                  012B  ;    Check if argument list is empty
                  012B  ;
         50   D4  012B         CLRL    R0                           ; Assume success, low bit flipped below
      04 BC   D5  012D         TSTL    @DLIST(AP)                   ; Empty argument list?
         34   13  0130         BEQL    105$                         ; Br if yes, return immediately
                  0132
   52    00   D0  0132         MOVL    #NFB$C_OP_EQL,R2             ; Get action routine index
   5A    5B   D0  0135         MOVL    R11,R10                      ; Start at begining of list
      30 BB   16  0138         JSB     @CNR$L_SCANNER(R11)          ; Call scanner to prepare scan
                  013B  60$:   ;
```

```
                            013B            ;       Get next CNF block
                            013B            ;
           50    00    D0   013B            MOVL    #CNF$_ADVANCE,R0           ; Say "Give me the next CNF"
                 9E    16   013E            JSB     @(SP)+                     ; Tell co-routine, he calls us back
                            0140                                               ; with a JSB @(SP)+ and status in R0
              23 50    E9   0140            BLBC    R0,100$                    ; If LBC there was none
           56    5A    D1   0143            CMPL    R10,R6                     ; Is this the CNF being replaced?
                 F3    13   0146            BEQL    60$                        ; If EQL yes, ignore it
    04 AC     08 AC    D0   0148            MOVL    SLIST(AP),DLIST(AP)        ; Start at the top of parameter list
                            014D     70$:   ;
                            014D            ;       See if any fields in the list match the any of the fields in the
                            014D            ;       CNF already in the database.
                            014D            ;
           50 04 AC    D0   014D            MOVL    DLIST(AP),R0               ; Get pointer to next parameter
           59    80    D0   0151            MOVL    (R0)+,R9                   ; Get parameter i.d.
                 E5    13   0154            BEQL    60$                        ; If EQL then done with this CNF block
           57    80    7D   0156            MOVQ    (R0)+,R7                   ; Get parameter value/descriptor
        04 AC    50    D0   0159            MOVL    R0,DLIST(AP)               ; Store pointer
               05D1    30   015D            BSBW    GET_DSC_1                  ; Get field semantics
               01E4    30   0160            BSBW    COMPARE                    ; Make field comparison
              E7 50    E9   0163            BLBC    R0,70$                     ; If no match, loop on next field
                            0166
                            0166     100$:  ;
                            0166            ;       We are done.  The RET instruction aborts the scanner co-routine.
                            0166            ;
        05 50    00    E3   0166     105$:  BBCS    #0,R0,110$                 ; If BC in R0 then no unique field
                            016A                                               ; violations were detected
     50    0000'8F     3C   016A            MOVZWL  #SS$_DEVACTIVE,R0          ; Indicate unique field violation
                       04   016F     110$:  RET                                ; Return status in R0
```

```
                             0170              .SBTTL  CNF$COPY - Copy a CNF to another
                             0170       ;+
                             0170       ; CNF$COPY          - Copy one CNF entry into another
                             0170       ;
                             0170       ; The contents of a source CNF block are copied to the destination CNF block.
                             0170       ; No string storage compression takes place, but any additional storage space
                             0170       ; in the destination CNF block are reflected in its CNF$W_SIZ_FREE field.
                             0170       ;
                             0170       ; INPUTS:           R11     CNR pointer
                             0170       ;                   R10     Destination CNF pointer
                             0170       ;                   R8      Source CNF pointer
                             0170       ;
                             0170       ; OUTPUTS:          R0      SS$_NORMAL  if successful
                             0170       ;                           SS$_INSFMEM if destination CNF is too small
                             0170       ;
                             0170       ;                   All other registers are preserved.
                             0170       ;-
                             0170       CNF$COPY::
            007E 8F      BB  0170               PUSHR   #^M<R1,R2,R3,R4,R5,R6>         ; Save regs
     50     0000'8F      3C  0174               MOVZWL  #SS$_INSFMEM,R0                ; Assume destination CNF is too small
        56    08 AA      3C  0179               MOVZWL  CNF$W_SIZE(R10),R6             ; Save size of target CNF
        08 AA    56      B1  017D               CMPW    R6,CNF$W_SIZE(R8)              ; Is it big enough?
                 18      1F  0181               BLSSU   10$                            ; If LSS then too small
     6A    68    08 A8   28  0183               MOVC3   CNF$W_SIZE(R8),(R8),(R10)      ; Copy CNF
        08 AA    56      B0  0188               MOVW    R6,CNF$W_SIZE(R10)             ; Restore original size
        56    08 A8      A2  018C               SUBW    CNF$W_SIZE(R8),R6              ; Get difference in size
        0E AA    56      A0  0190               ADDW    R6,CNF$W_SIZ_FREE(R10)         ; Update the amount of free space
                         8A  0194               BICB    #CNF$M_FLG_CNR!-               ; Block is not a CNR
                             0195                        CNF$M_FLG_DELETE!-            ; Block is a temporary CNF or marked for d
                             0195                        CNF$M_FLG_ACP,-               ; Block is a catch-all used by the ACP
        0B AA    07          0195                        CNF$B_FLG(R10)                ; Init flags
           50    00'     D0  0198               MOVL    S^#SS$_NORMAL,R0               ; Indicate success
            007E 8F      BA  019B       10$:    POPR    #^M<R1,R2,R3,R4,R5,R6>         ; Restore regs
                 05          019F               RSB                                    ; Done
```

```
                         01A0               .SBTTL  CNF$CLONE - Compress a CNF entry
                         01A0   ;+
                         01A0   ; CNF$CLONE        - Create a compressed version of a CNF entry
                         01A0   ;
                         01A0   ; A resultant CNF block is allocated and initialized.  The contents of a source
                         01A0   ; CNF block are copied to it such that the string storage space is
                         01A0   ; unfragmented.
                         01A0   ;
                         01A0   ; INPUTS:           R11     CNR pointer
                         01A0   ;                   R10     Source CNF pointer -- usually utility buffer
                         01A0   ;
                         01A0   ; OUTPUTS:          R10     New CNF address -- the old R10 value is lost
                         01A0   ;                   R0      SS$_NORMAL  if successful
                         01A0   ;                           SS$_INSFMEM otherwise
                         01A0   ;
                         01A0   ;                   All other registers are preserved.
                         01A0   ;-
                         01A0   CNF$CLONE::                                     ; Create a compressed copy of a CNF
           007E 8F   BB  01A0           PUSHR   #^M<R1,R2,R3,R4,R5,R6>  ; Save regs
             56 5A   D0  01A4           MOVL    R10,R6                  ; Save a pointer to the old CNF
                         01A7           ;
                         01A7           ;       Allocate new CNF block and initialize its fixed portion
                         01A7           ;
      50   0000'8F   3C  01A7           MOVZWL  #SS$_INSFMEM,R0         ; Assume destination CNF is too small
                5A   D4  01AC           CLRL    R10                     ; Zero pointer to the new CNF
        51   0C AB   3C  01AE           MOVZWL  CNR$W_SIZ_CNF(R11),R1   ; Get minimum block size
        51   10 A6   A0  01B2           ADDW    CNF$W_SIZ_USED(R6),R1   ; Add in string space used
                23   1D  01B6           BVS     10$                     ; If VS the >65K
             FE45'   30  01B8           BSBW    NET$ALLOCATE            ; Allocate block from ACP pool
             5A 50   E9  01BB           BLBC    R0,100$                 ; Br on error
             5A 52   D0  01BE           MOVL    R2,R10                  ; Copy block pointer
                51   DD  01C1           PUSHL   R1                      ; Save size
             0C AB   2C  01C3           MOVC5   CNR$W_SIZ_CNF(R11),-    ; Copy the fixed portion of the block
     62   51   00    66  01C6                   (R6),#0,R1,(R2)         ; and zero the remainder
        08 AA   8E   F7  01CA           CVTLW   (SP)+,CNF$W_SIZE(R10)   ; Store size for deallocation
                8A       01CE           BICB    #CNF$M_FLG_CNR!-        ; Block is not a CNR
                         01CF                    CNF$M_FLG_DELETE!-     ; Block is a temporary CNF or marked for del
                         01CF                    CNF$M_FLG_ACP,-        ; Block is a catch-all used by the ACP
        0B AA   07       01CF                    CNF$B_FLG(R10)         ; Init flags
              005F   30  01D2           BSBW    CNF$INIT                ; Init remainder of CNF
        55   0E AB   3C  01D5           MOVZWL  CNR$W_MAX_INX(R11),R5   ; Get max field index
                37   11  01D9           BRB     40$                     ; Jump to the end of the loop
                         01DB   10$:    ;
                         01DB           ;       Find the next string field
                         01DB           ;
   53   0128 CB45    DE  01DB           MOVAL   CNR$L_SEM_TAB(R11)[R5],R3 ; Get address of field semantics
                08   ED  01E1           CMPZV   #CNR$V_SEM_TYP,-        ; Is it for strings ?
           63   03       01E3                   #CNR$S_SEM_TYP,(R3),-   ;
                04       01E5                   #CNR$C_SEM_STR          ;
                2A   12  01E6           BNEQ    40$                     ; If not branch to try next field
                         01E8           ;
                         01E8           ;       Move the string if its active.  Clear the mask bit before the call
                         01E8           ;       to PUT_STR so that the CNF$W_SIZ_USED is not erroneously updated.
                         01E8           ;
     25 18 AA   55   E5  01E8           BBCC    R5,CNF$L_MASK(R10),40$  ; Br if field is not active
        21 63   0E   E0  01ED           BBS     #CNR$V_SEM_RT,(R3),40$  ; Br if "field" is actually a routine
                00   EF  01F1           EXTZV   #CNR$V_SEM_OFF,-        ; Get byte offset from top of
      51  63   08      01F3                  #CNR$S_SEM_OFF,(R3),R1   ; CNF to the field
      50  51   56  C1  01F6          ADDL3   R6,R1,R0                 ; Get source CNF field address
          51   5A  C0  01FA          ADDL    R10,R1                   ; Get dest.  CNF field address
                       01FD          ;
                       01FD          ;   Move the string to the new CNF
                       01FD          ;
          58   60  3C  01FD          MOVZWL  STR_OFF(R0),R8           ; Get self-relative offset to string
          58   50  C0  0200          ADDL    R0,R8                    ; Make it a pointer
        57   02 A0  3C  0203          MOVZWL  STR_LNG(R0),R7           ; Get its size
            03B3   30  0207          BSBW    PUT_STR                  ; Store it
            0B 50  E9  020A          BLBC    R0,T00$                  ; If LBC then error
    00 18 AA   55  E2  020D          BBSS    R5,CNF$L_MASK(R10),40$   ; Mark the field valid
            C6 55  F4  0212  40$:    SOBGEQ  R5,10$                   ; Loop for each field
                       0215          ;
                       0215          ;   Done
                       0215          ;
          50   00' 3C  0215          MOVZWL  S^#SS$_NORMAL,R0         ; Indicate success
          007E 8F  BA  0218  100$:   POPR    #^M<R1,R2,R3,R4,R5,R6>   ; Restore regs
                   05  021C          RSB
```

```
                              021D          .SBTTL  CNF$INIT - Initialize CNF entry
                              021D   ;+
                              021D   ; CNF$INIT          - Initialize CNF entry
                              021D   ; CNF$INIT_UTL      - Initialize the utility buffer as a CNF entry
                              021D   ;
                              021D   ; A CNF block is initialized.
                              021D   ;
                              021D   ; INPUTS:           R11      CNR pointer
                              021D   ;                   R10      If CNF$INIT then ptr to CNF block to be initialized.
                              021D   ;                            If CNF$INIT_UTL then scratch
                              021D   ;
                              021D   ; OUTPUTS:          R10      If CNF$INIT then unchanged.
                              021D   ;                            If CNF$INIT_UTL then ptr to utility buffer
                              021D   ;                   R0       SS$_NORMAL  if successful
                              021D   ;                            SS$_INSFMEM if CNF block is too small
                              021D   ;
                              021D   ;                   All other registers are preserved.
                              021D   ;-
                              021D   CNF$INIT_UTL::                              ; Init utility buffer as a CNF BLOCK
     5A    0000'CF      D0    021D           MOVL    NET$GL_UTLBUF,R10           ; Point to the utility buffer
           1000 8F      B0    0222           MOVW    #NET$C_UTLBUFSIZ,-          ; Setup its size
              08 AA           0226                   CNF$W_SIZE(R10)
                              0228
                              0228           ASSUME  CNR$C_MAX_INX  EQ  95       ; One bit in mask for each parameter
                              0228                                               ; index (95 (zero indexed) => 3 lwords)
              18 AA     7C    0228           CLRQ    CNF$L_MASK(R10)             ; Clear first 2 mask longwords
              20 AA     D4    022B           CLRL    CNF$L_MASK+8(R10)           ; Clear third mask longword
              12 AA     B4    022E           CLRW    CNF$W_ID(R10)               ; Init CNF i.d. data
              0B AA     94    0231           CLRB    CNF$B_FLG(R10)              ; Zero all flags
                              0234
                              0234
                              0234   CNF$INIT::                                  ; Initialize a CNF block
     50    0000'8F      3C    0234           MOVZWL  #SS$_INSFMEM,R0             ; Assume error
              0C AB     B1    0239           CMPW    CNR$W_SIZ_CNF(R11),-        ; Is block big enough ?
              08 AA           023C                   CNF$W_SIZE(R10)             ;
                 17     1A    023E           BGTRU   10$                         ; If GTRU then CNF is too small
                 17     90    0240           MOVB    #DYN$C_NET,-                ;
              0A AA           0242                   CNF$B_TYPE(R10)             ; Enter type
              10 AA     B4    0244           CLRW    CNF$W_SIZ_USED(R10)         ; Init free spaced used for strings
                 0C     A3    0247           SUBW3   #CNF$W_OFF_FREE,-           ; Setup self-relative offset to free
              0C AB           0249                   CNR$W_SIZ_CNF(R11),-        ; space
              0C AA           024B                   CNF$W_OFF_FREE(R10)         ;
              0C AB     A3    024D           SUBW3   CNR$W_SIZ_CNF(R11),-        ; Setup amount of free space available
              08 AA           0250                   CNF$W_SIZE(R10),-           ;
              0E AA           0252                   CNF$W_SIZ_FREE(R10)         ;
     50         00'     D0    0254           MOVL    S^#SS$_NORMAL,R0            ; Indicate success
                        05    0257   10$:    RSB
```

```
                     0258             .SBTTL  CNF$KEY_SEARCH - Search for selected CNFs
                     0258     ;+
                     0258     ; CNF$KEY_SRCH_EX  - External find CNF via match of supplied parameter
                     0258     ; CNF$KEY_SEARCH   - Internal find CNF via match of supplied parameter
                     0258     ;
                     0258     ; The CNF list is search until a block is found in which the supplied key
                     0258     ; matches the appropriate field.  A match is determined by dispatching to the
                     0258     ; compare routine identified by R1.
                     0258     ;
                     0258     ; If R10 is zero on input then the search begins at the CNR (root), else R10
                     0258     ; is assumed to be the address of a CNF and the search begins with the CNF
                     0258     ; following the R10 CNF.
                     0258     ;
                     0258     ; INPUTS:         R11 = CNR address
                     0258     ;                 R10 = CNF address or zero
                     0258     ;                 R9  = FLD # in bits 0-15, Mask ID in bits 16-23
                     0258     ;                       (or NFB$C_WILDCARD to match any CNF entry)
                     0258     ;                 R8  = Key value if bit, byte, word, or longword parameter type
                     0258     ;                       Key pointer if key is a string
                     0258     ;                 R7  = Key length if key is a string
                     0258     ;                 R1  = Search function
                     0258     ;                 R0  = Error code to be returned if CNF is not found
                     0258     ;
                     0258     ;                 R7/R8 are not supplied if R1 = NFB$C_OP_FNDMIN or FNDMAX.
                     0258     ;
                     0258     ; OUTPUTS:        R10 = Address of matching CNF if search is successful, else 0
                     0258     ;                 R1  = Garbage
                     0258     ;                 R0  = Low bit set if search is successful
                     0258     ;                       Unchanged otherwise (SS$_ENDOFFILE if entered with LBS)
                     0258     ;
                     0258     ;                 All other registers are preserved
                     0258     ;
                     0258     ;-
                     0258     CNF$KEY_SRCH_EX::                                        ; Locate CNF via key
         7E     D4   0258             CLRL    -(SP)                                    ; Terminate key list
   7E    57     7D   025A             MOVQ    R7,-(SP)                                 ; Store key value
         51     DD   025D             PUSHL   R1                                       ; Store type of comparison
         59     DD   025F             PUSHL   R9                                       ; Store field ID
   51    5E     D0   0261             MOVL    SP,R1                                    ; Set address of key list
         16     10   0264             BSBB    CNF$SEARCH_EX                            ; Call external search routine
   5E    14     C0   0266             ADDL    #5*4,SP                                  ; Cleanup key list
                05   0269             RSB
                     026A
                     026A     CNF$KEY_SEARCH::                                         ; Locate CNF via key
         7E     D4   026A             CLRL    -(SP)                                    ; Terminate key list
   7E    57     7D   026C             MOVQ    R7,-(SP)                                 ; Store key value
         51     DD   026F             PUSHL   R1                                       ; Store type of comparison
         59     DD   0271             PUSHL   R9                                       ; Store field ID
   51    5E     D0   0273             MOVL    SP,R1                                    ; Set address of key list
         10     10   0276             BSBB    CNF$SEARCH                               ; Call internal search routine
   5E    14     C0   0278             ADDL    #5*4,SP                                  ; Cleanup key list
                05   027B             RSB
```

```
027C            .SBTTL  CNF$SEARCH - Search for CNFs by list of keys
027C      ;+
027C      ; CNF$SEARCH_EX  - External find CNF via match of supplied list of keys
027C      ; CNF$SEARCH     - Internal find CNF via match of supplied list of keys
027C      ;
027C      ; The CNF list is searched until a block is found in which the supplied list
027C      ; of search keys matches the appropriate fields.  The list of keys supplies
027C      ; the field IDs to be compared, the type of comparision for each field, and
027C      ; the actual key value.  The CNF is matched if all of the search keys match
027C      ; the appropriate fields in the CNF (AND-type search).
027C      ;
027C      ; If R10 is zero on input then the search starts at the beginning.  Else R10
027C      ; is assumed to be the address of a CNF and the search begins with the CNF
027C      ; following the R10 CNF.
027C      ;
027C      ;
027C      ; To optimize the search of a database, if there is only one key and the
027C      ; operator is EQL then we will call a special SCAN routine to try to optimize
027C      ; lookups.
027C      ;
027C      ;
027C      ; Inputs:
027C      ;
027C      ;       R11 = CNR address
027C      ;       R10 = Starting CNF address, or zero
027C      ;       R0  = Error code to be returned if CNF is not found
027C      ;       R1  = Address of a list of search keys:
027C      ;
027C      ;                       +--------------------------+
027C      ;                       |      First field ID      |
027C      ;                       +--------------------------+
027C      ;                       |    Type of comparison    |    (NFB$C_OP_xxx)
027C      ;                       +--------------------------+
027C      ;                       |     Search key value     |    (8 bytes)
027C      ;                       | (descriptor or longword) |
027C      ;                       +==========================+
027C      ;                       |     Second field ID      |
027C      ;                       +--------------------------+
027C      ;                       |    Type of comparison    |
027C      ;                       +--------------------------+
027C      ;                       |   Secondary key value    |
027C      ;                       | (descriptor or longword) |
027C      ;                       +==========================+
027C      ;                       |            .             |    (repeat for each key)
027C      ;                       |            .             |
027C      ;                       |            .             |
027C      ;                       +==========================+
027C      ;                       |            0             |    (terminates list)
027C      ;                       +--------------------------+
027C      ;
027C      ;       If the FNDMIN, FNDMAX or FNDPOS operators are used, then only
027C      ;       one search key is allowed.
027C      ;
027C      ;       The key value quadword in the key list is ignored when used with
027C      ;       the FNDMIN or FNDMAX operators.
027C      ;
027C      ; Outputs:
```

```
                        027C     ;
                        027C     ;              R11 = Address of CNR
                        027C     ;              R10 = Address of matching CNF if search is successful, else 0
                        027C     ;              R0  = Low bit set if search is successful
                        027C     ;                    Unchanged otherwise (SS$_ENDOFFILE if entered with LBS)
                        027C     ;
                        027C     ;              All registers are preserved.
                        027C     ;-
                        027C     CNF$SEARCH_EX::                                ; Locate CNF via list of keys
        0000'CF    DD   027C             PUSHL   NET$GL_FLAGS                   ; Save current flags
                        0280             CLRBIT  NET$V_INTRNL,NET$GL_FLAGS      ; Indicate external access rights
             0A    11   0286             BRB     SEARCH
                        0288
                        0288     CNF$SEARCH::                                   ; Locate CNF via list of keys
        0000'CF    DD   0288             PUSHL   NET$GL_FLAGS                   ; Save current flags
                        028C             SETBIT  NET$V_INTRNL,NET$GL_FLAGS      ; Indicate internal access rights
                        0292
                        0292     SEARCH:
                        0292             SETBIT  NET$V_READ,NET$GL_FLAGS        ; Access will be for read only
          05 50    E9   0298             BLBC    R0,10$                         ; Invalid error code if LBS
   50   0000'8F    3C   029B             MOVZWL  #SS$_ENDOFFILE,R0              ; Make it a valid error code
        03FF 8F    BB   02A0     10$:    PUSHR   #^M<R0,R1,R2,R3,R4,R5,R6,R7,R8,R9> ; Save regs and default error sta
                        02A4             ;
                        02A4             ;  If there is only one key, and that operator is EQL then
                        02A4             ;  we will call the special scan routine. OR if there are two
                        02A4             ;  search keys and the second is a WILDCARD.
                        02A4             ;
     04 A1    00   D1   02A4             CMPL    #NFB$C_OP_EQL,4(R1)            ; Is this an equals operation?
              28   12   02A8             BNEQ    15$                            ; Br if not, general scan
        10 A1      D5   02AA             TSTL    16(R1)                         ; Only one search key?
              0B   13   02AD             BEQL    13$                            ; Br if yes, do special lookup
     10 A1    01   D1   02AF             CMPL    #NFB$C_WILDCARD,16(R1)         ; Is the second a wildcard?
              1D   12   02B3             BNEQ    15$                            ; Br if not
        20 A1      D5   02B5             TSTL    32(R1)                         ; Is this the end?
              18   12   02B8             BNEQ    15$                            ; Br if not, do complete lookup
        59    61   D0   02BA     13$:    MOVL    (R1),R9                        ; Get the search field ID
     57    08 A1   7D   02BD             MOVQ    8(R1),R7                       ; Get the search key value/desc.
              51   DD   02C1             PUSHL   R1                             ; Save address of key list
        38 BB      16   02C3             JSB     @CNR$L_SPCSCAN(R11)            ; Else, do special scan
              51 8ED0   02C6             POPL    R1                             ; Restore address of key list
     05 50    01   E1   02C9             BBC     #1,R0,15$                      ; Br if the key not recognized
        6A 50      E8   02CD             BLBS    R0,79$                         ; Br on success, else fall thru
           6B      11   02D0             BRB     80$                            ; Else, return error
        56    51   D0   02D2     15$:    MOVL    R1,R6                          ; Copy address of key list
                        02D5             ;
                        02D5             ;  Call co-routine to prepare for scan
                        02D5             ;
        30 BB      16   02D5             JSB     @CNR$L_SCANNER(R11)            ; Initialize scanner co-routine
                        02D8             ;
                        02D8             ;  Initialize min/max selection storage (OP_FNDMIN or OP_FNDMAX only)
                        02D8             ;
        0000'CF    D4   02D8             CLRL    SELECT_CNF                     ; Indicate no CNF matched
        0004'CF    D4   02DC             CLRL    SELECT_VALUE                   ; Make current min/max a null string
   0008'CF    01   CE   02E0             MNEGL   #1,SELECT_VALUE+4              ; Make current min/max infinity
                        02E5             ;
                        02E5             ;  Skip to the next CNF
                        02E5             ;
        50  00    9A  02E5  20$:   MOVZBL  #CNF$_ADVANCE,R0          ; Say "Give me the next CNF"
            9E    16  02E8         JSB     @(SP)+                    ; Tell co-routine, he calls us back
                      02EA                                           ; with a JSB @(SP)+ and status in R0
        28  50    E9  02EA         BLBC    R0,70$                    ; If LBC there was none
                      02ED   ;
                      02ED   ;   Using the list of keys, compare each of the key values with the
                      02ED   ;   corresponding fields in the CNF to determine if the CNF matches.
                      02ED   ;
        52  56    D0  02ED         MOVL    R6,R2                     ; Pick up original keylist pointer
        59  82    D0  02F0  25$:   MOVL    (R2)+,R9                  ; Get next search field ID
            37    13  02F3         BEQL    60$                       ; If none left, then we matched!
            82    D5  02F5         TSTL    (R2)+                     ; Skip type of comparison for now
        57  82    7D  02F7         MOVQ    (R2)+,R7                  ; Get search key value
        01  59    D1  02FA         CMPL    R9,#NFB$C_WILDCARD        ; Wildcard search key?
            F1    13  02FD         BEQL    25$                       ; If so, then match this field
          03D7    30  02FF         BSBW    GET_DSC                   ; On return:
        10  50    E9  0302         BLBC    R0,70$                    ;   R10 = addr of CNF ptr
                      0305                                           ;   R5  = bit offset to bit from the
                      0305                                           ;         top of mask vector
                      0305                                           ;   R4  = offset to parameter from top
                      0305                                           ;         of CNF, or routine address
                      0305                                           ;   R3  = ptr to field semantics
                      0305                                           ;   R0  = LBS if successful
            52    DD  0305         PUSHL   R2                        ; Save pointer into key list
    52  F4  A2    D0  0307         MOVL    -12(R2),R2                ; Get type of comparison for this key
            3A    10  030B         BSBB    COMPARE                   ; Make field comparison
        52  8ED0      030D         POPL    R2                        ; Restore key list pointer
        D2  50    E9  0310         BLBC    R0,20$                    ; If key doesn't match, skip this CNF
            DB    11  0313         BRB     25$                       ; If it does match, compare next field
                      0315   ;
                      0315   ;   We could not match any CNFs.  Return default error to caller.
                      0315   ;
                      0315  70$:   $DISPATCH 4(R6),<-                ; Are we searching for min/max CNF?
                      0315             <NFB$C_OP_FNDMIN, 75$>-       ; Branch if so
                      0315             <NFB$C_OP_FNDMAX, 75$>>
        50  02    9A  031E  72$:   MOVZBL  #CNF$_QUIT,R0             ; Say "I quit without finding CNF"
            9E    16  0321         JSB     @(SP)+                    ; Tell co-routine, returns clean stack
            18    11  0323         BRB     80$                       ; Exit
                      0325   ;
                      0325   ;   We have completed a full scan of the database for the operator
                      0325   ;   functions NFB$C_OP_FNDMIN or NFB$C_OP_FNDMAX.  Now return the
                      0325   ;   CNF which was determined to have the minimum or maximum value.
                      0325   ;
  5A   0000'CF    D0  0325  75$:   MOVL    SELECT_CNF,R10            ; Return selected CNF
            F2    13  032A         BEQL    72$                       ; If none, return failure
                      032C   ;
                      032C   ;   We have matched a CNF.  Return it to the caller.
                      032C   ;
        50  03    D0  032C  60$:   MOVL    #CNF$_TAKE_CURR,R0        ; Say "I want this one"
    06  04  A6    D1  032F         CMPL    4(R6),#NFB$C_OP_FNDPOS    ; Are we searching for position?
            03    12  0333         BNEQ    65$                       ; If NEQ then no
        50  01    D0  0335         MOVL    S^#CNF$_TAKE_PREV,R0      ; Say "I want the previous block"
            9E    16  0338  65$:   JSB     @(SP)+                    ; Tell co-routine, returns clean stack
        6E  00'   D0  033A  79$:   MOVL    S^#SS$_NORMAL,(SP)        ; Setup success status code
      03FF  8F    BA  033D  80$:   POPR    #^M<R0,R1,R2,R3,R4,R5,R6,R7,R8,R9> ; Restore regs
    0000'CF 8ED0      0341         POPL    NET$GL_FLAGS              ; Restore flags
            05        0346         RSB
```

```
                    0347        .SBTTL  COMPARE - Compare CNF against keys
                    0347  ;+
                    0347  ; COMPARE - Compare CNF against a key value
                    0347  ;
                    0347  ; Inputs:
                    0347  ;
                    0347  ;       R10 = Address of CNF
                    0347  ;       R7/R8 = Key value
                    0347  ;       R5  = Bit offset to "valid" bit from the top of mask vector
                    0347  ;       R4  = Offset into CNF for parameter data
                    0347  ;       R3  = Pointer to field semantics
                    0347  ;       R2  = Type of comparison
                    0347  ;
                    0347  ; Outputs:
                    0347  ;
                    0347  ;       R0  = True if matched, else false.
                    0347  ;-
                    0347
                    0347  COMPARE:
                    0347          ;
                    0347          ;     The "BSBB COMPARE_ACT"  cannot be called to setup the condition
                    0347          ;     codes prior to the dispatch since the $DISPATCH macro expansion
                    0347          ;     includes a CASE instruction which modifies the condition codes.
                    0347          ;
                    0347
                    0347          $DISPATCH  R2,<-
                    0347
                    0347                  <NFB$C_OP_EQL,     KEY_EQL>  -; Match if EQL
                    0347                  <NFB$C_OP_NEQ,     KEY_NEQ>  -; Match if KEY NEQ  CNF field
                    0347                  <NFB$C_OP_GTRU,    KEY_GTRU> -; Match if KEY GTRU CNF field
                    0347                  <NFB$C_OP_LSSU,    KEY_LSSU> -; Match if KEY LSSU CNF field
                    0347                  <NFB$C_OP_FNDMIN, KEY_MIN>   -; Find the minimum KEY value
                    0347                  <NFB$C_OP_FNDMAX, KEY_MAX>   -; Find the maximum KEY value
                    0347                  <NFB$C_OP_FNDPOS, KEY_LSSU> -; Match if KEY LSSU CNF field
                    0347          >
                    0359          BUG_CHECK     NETNOSTATE,FATAL   ; Index is unknown
                    035D
          3B   10   035D  KEY_EQL:         BSBB    COMPARE_ACT       ; Compare the fields
          35   13   035F                   BEQL    MATCH             ; Br if KEY is EQL CNF field
          30   11   0361                   BRB     NO_MA
                    0363
          35   10   0363  KEY_NEQ:         BSBB    COMPARE_ACT       ; Compare the fields
          2F   12   0365                   BNEQ    MATCH             ; Br if KEY is EQL CNF field
          2A   11   0367                   BRB     NO_MA
                    0369
          2F   10   0369  KEY_GTRU:        BSBB    COMPARE_ACT       ; Compare the fields
          29   1A   036B                   BGTRU   MATCH             ; Br if KEY is GTRU CNF field
          24   11   036D                   BRB     NO_MA
                    036F
          29   10   036F  KEY_LSSU:        BSBB    COMPARE_ACT       ; Compare the fields
          23   1F   0371                   BLSSU   MATCH             ; Br if KEY is LSSU CNF field
          1E   11   0373                   BRB     NO_MA
                    0375
57   0004'CF   7D   0375  KEY_MAX:         MOVQ    SELECT_VALUE,R7 ; Get the current min/max value
          1E   10   037A                   BSBB    COMPARE_ACT       ; Compare the fields
          15   1E   037C                   BGEQU   NO_MA             ; If GEQU current KEY is still maximum
          09   11   037E                   BRB     UPD               ; Else update to new max value
```

```
                          0380
      57   0004'CF    7D  0380 KEY_MIN:         MOVQ    SELECT_VALUE,R7 ; Get the current min/max value
                 13   10  0385                  BSBB    COMPARE_ACT     ; Compare the fields
                 0A   1B  0387                  BLEQU   NO_MA           ; If LEQU current KEY is still minimum
                          0389
 0000'CF         5A   D0  0389 UPD:             MOVL    R10,SELECT_CNF  ; Update the current matched CNF
 0004'CF         50   7D  038E                  MOVQ    R0,SELECT_VALUE ; Update the current KEY value
                          0393
            50   94       0393 NO_MA:           CLRB    R0              ; Indicate the search is to continue
                 05       0395                  RSB
                          0396
      50    01   90       0396 MATCH:           MOVB    #1,R0           ; Indicate search is over
                 05       0399                  RSB
                          039A
                          039A
                          039A ;
                          039A ;    Action routines for comparisons
                          039A ;
                          039A COMPARE_ACT:                                    ;
      10 63      0E   E0  039A          BBS     #CNR$V_SEM_RT,(R3),20$  ; If action routine, call it now
                 08   ED  039E          CMPZV   #CNR$V_SEM_TYP,-        ; If data resides in bitmask in CNF,
    00    63     03       03A0                  #CNR$S_SEM_TYP,(R3),#CNR$C_SEM_BIT
                 0C   13  03A3          BEQL    30$                     ; Then skip the following.  else,
    51    54     5A   C1  03A5          ADDL3   R10,R4,R1               ; Get address of descriptor
          51     61   D0  03A9          MOVL    (R1),R1                 ; Pick up a longword of data
                 03   11  03AC          BRB     30$
            02C7      30  03AE 20$:     BSBW    GET_RT_FIELD            ; Else go get the info, return with:
                          03B1                                          ;  R1 = address of longword str desc,
                          03B1                                          ;       or binary value
                          03B1                                          ;  R0 = LBS if and only if success
  57 18 AA       55   E1  03B1 30$:     BBC     R5,CNF$L_MASK(R10),210$ ; Br if field is invalid
                 08   EF  03B6          EXTZV   #CNR$V_SEM_TYP,-        ; Get parameter type
    7E    63     03       03B8                  #CNR$S_SEM_TYP,(R3),-(SP)
                          03BB          $DISPATCH  (SP)+,TYPE=L,<-      ; Dispatch by paramater type
                          03BB
                          03BB                  <CNR$C_SEM_B,   100$>,- ; Byte
                          03BB                  <CNR$C_SEM_W,   110$>,- ; Word
                          03BB                  <CNR$C_SEM_L,   150$>,- ; Longword
                          03BB                  <CNR$C_SEM_BIT, 130$>,- ; Bit
                          03BB                  <CNR$C_SEM_STR, 160$>,- ; String descriptor
                          03BB          >
                          03C9          BUG_CHECK NETNOSTATE,FATAL      ; Type is undefined
                          03CD
          51     51   9A  03CD 100$:    MOVZBL  R1,R1                   ; Get field
                 15   11  03D0          BRB     150$                    ;
          51     51   3C  03D2 110$:    MOVZWL  R1,R1                   ; Get field
                 10   11  03D5          BRB     150$                    ;
       07 63     0E   E1  03D7 130$:    BBC     #CNR$V_SEM_RT,(R3),140$ ; Br if "real" CNF field
 51   51   01    00   EF  03DB          EXTZV   #0,#1,R1,RT             ; Else get low bit of value setup by
                          03E0                                          ; action routine
                 05   11  03E0          BRB     150$                    ; Continue
 51   6A   01    54   EF  03E2 140$:    EXTZV   R4,#1,(R10),R1          ; Get the bit value
          51     58   D1  03E7 150$:    CMPL    R8,R1                   ; Setup condition codes
                 20   11  03EA          BRB     200$                    ; Dispatch
                          03EC
       04 63     0E   E0  03EC 160$:    BBS     #CNR$V_SEM_RT,(R3),165$ ; If real string,
    51    54     5A   C1  03F0          ADDL3   R10,R4,R1               ; Get address of descriptor in CNF
```

```
                                   03F4  165$:   PUSHQ   R2                          ; Save regs
               50   02 A1    3C    03F7          MOVZWL  STR_LNG(R1),R0              ; Get string length
                    52 61    3C    03FB          MOVZWL  STR_OFF(R1),R2              ; Get offset to string
                    51 52    C0    03FE          ADDL    R2,R1                       ; Get string pointer
                                   0401          PUSHQ   R0                          ; Save descriptor
  61    50    00    68 57    2D    0404          CMPC5   R7,(R8),#0,R0,(R1)          ; Setup condition codes
                       0F    BA    040A          POPR    #^M<R0,R1,R2,R3>            ; Doesn't affect condition codes
                             05    040C  200$:   RSB
                                   040D
                                   040D  210$:   CLRBIT  #0,R0                       ; Indicate no match
                       8E    D5    0411          TSTL    (SP)+                       ; Pop caller's address
                             05    0413          RSB                                 ; Return to caller's caller
```

```
                        0414            .SBTTL  CNF$GET_FIELD - Get field from CNF entry
                        0414    ;+
                        0414    ; CNF$GET_FLD_EX - External get zero extended value or descriptor of CNF field
                        0414    ; CNF$GET_FIELD  - Internal get zero extended value or descriptor of CNF field
                        0414    ;
                        0414    ; INPUTS:               R11     Address of CNR
                        0414    ;                       R10     Address of CNF
                        0414    ;                       R9      FLD # in bits 0:15, Mask I.D. in bits 16:23
                        0414    ;                       R0      Error code to be returned if field not active
                        0414    ;
                        0414    ; OUTPUTS:              R9      Unmodified
                        0414    ;                       R8      Parameter value if type bit, byte, word, or longword
                        0414    ;                               Pointer to string if type string
                        0414    ;                       R7      Size of string if type string
                        0414    ;                       R0      Low bit set if field was active
                        0414    ;                               Unchanged otherwise (0 if entered with LBS)
                        0414    ;
                        0414    ;                       NOTE:   R7 and R8 are zeroed at the start of the
                        0414    ;                               routine.  If the routine returns with LBC in R0
                        0414    ;                               then R7 and R8 will equal zero implying a null
                        0414    ;                               field.
                        0414    ;-
                        0414    CNF$GET_FLD_EX::                                        ; Get CNF field
       0000'CF    DD    0414            PUSHL   NET$GL_FLAGS                    ; Save current flags
                        0418            CLRBIT  NET$V_INTRNL,NET$GL_FLAGS       ; Indicate external access rights
            50    D4    041E            CLRL    R0                              ; No pre-set error code
            0A    11    0420            BRB     GETFLD                          ; Continue
                        0422
                        0422    CNF$GET_FIELD::                                 ; Get CNF field
       0000'CF    DD    0422            PUSHL   NET$GL_FLAGS                    ; Save current flags
                        0426            SETBIT  NET$V_INTRNL,NET$GL_FLAGS       ; Indicate internal access rights
                        042C
                        042C    GETFLD: SETBIT  NET$V_READ,NET$GL_FLAGS         ; Indicate read access intended
         02 50    E9    0432            BLBC    R0,10$                          ; Br if valid error code
            50    D4    0435            CLRL    R0                              ; Else make it valid
            3F    BB    0437    10$:    PUSHR   #^M<R0,R1,R2,R3,R4,R5>          ; Save regs
            57    7C    0439            CLRQ    R7                              ; Zero value/descriptor
          029B    30    043B            BSBW    GET_DSC                         ; Get description of field
         02 50    E9    043E            BLBC    R0,40$                          ; If LBC then no field
            12    10    0441            BSBB    GET                             ; Get the field value
         04 50    E8    0443    40$:    BLBS    R0,50$                          ; If LBS then success
            6E    D5    0446            TSTL    (SP)                            ; Has caller pre-set the error code?
            03    12    0448            BNEQ    60$                             ; If NEQ then yes
      6E    50    3C    044A    50$:    MOVZWL  R0,(SP)                         ; Reset the return status
            3F    BA    044D    60$:    POPR    #^M<R0,R1,R2,R3,R4,R5>          ; Restore regs, restore R0
       0000'CF  8ED0    044F            POPL    NET$GL_FLAGS                    ; Restore flags
                  05    0454            RSB
                        0455
                        0455    ;
                        0455    ;  Get Field action routines
                        0455    ;
   10 63    0E    E0    0455    GET:    BBS     #CNR$V_SEM_RT,(R3),10$          ; If action routine, call it now
            08    ED    0459            CMPZV   #CNR$V_SEM_TYP,-                ; If data resides in bitmask in CNF,
 00   63    03          045B                    #CNR$S_SEM_TYP,(R3),#CNR$C_SEM_BIT
            0C    13    045E            BEQL    20$                             ; Then skip the following.  else,
 51   54    5A    C1    0460            ADDL3   R10,R4,R1                       ; Get pointer to parameter
      51    61    D0    0464            MOVL    (R1),R1                         ; Get a longword of data from CNF
```

```
                                                        D  6
NETCNF                     - Configuration data base access routine 16-SEP-1984 01:12:45  VAX/VMS Macro V04-00        Page  25
V04-000                    CNF$GET_FIELD - Get field from CNF entry  5-SEP-1984 02:17:52  [NETACP.SRC]NETCNF.MAR;1         (14)

                03  11  0467           BRB     20$
              020C  30  0469  10$:     BSBW    GET_RT_FIELD                    ; Else go get the info, return with:
                        046C                                                   ;  R1 = address of longword str desc
                        046C                                                   ;       or binary value
                        046C                                                   ;  R0 = LBS if and only if success
     4E 18 AA   55  E1  046C  20$:     BBC     R5,CNF$L_MASK(R10),170$         ; Br if CNF field is invalid
                08  EF  0471           EXTZV   #CNR$V_SEM_TYP,-                ; Get parameter type
        7E  63  03      0473                   #CNR$S_SEM_TYP,(R3),-(SP)
                        0476           $DISPATCH  (SP)+,TYPE=L,<-              ; Dispatch by paramater type
                        0476
                        0476                   <CNR$C_SEM_BIT, 100$>,-         ; Bit
                        0476                   <CNR$C_SEM_B,   110$>,-         ; Byte
                        0476                   <CNR$C_SEM_W,   120$>,-         ; Word
                        0476                   <CNR$C_SEM_L,   140$>,-         ; Longword
                        0476                   <CNR$C_SEM_STR, 130$>,-         ; String descriptor
                        0476           >
                        0484           BUG_CHECK NETNOSTATE,FATAL              ; Bug if type is unknown
                        0488
        07 63   0E  E1  0488  100$:    BBC     #CNR$V_SEM_RT,(R3),105$         ; Br if "real" CNF field
   58   51  01  00  EF  048C           EXTZV   #0,#1,R1,R8                     ; Else get low bit of value setup by
                        0491                                                   ; action routine
                28  11  0491           BRB     150$                            ; Continue
   58   6A  01  54  EF  0493  105$:    EXTZV   R4,#1,(R10),R8                  ; Get the bit value
                21  11  0498           BRB     150$
            58  51  9A  049A  110$:    MOVZBL  R1,R8                           ; Get byte parameter
                1C  11  049D           BRB     150$                            ;
            58  51  3C  049F  120$:    MOVZWL  R1,R8                           ; Get word parameter
                17  11  04A2           BRB     150$                            ;
            58  51  D0  04A4  140$:    MOVL    R1,R8                           ; Get longword parameter
                12  11  04A7           BRB     150$                            ;
        18 63   0E  E0  04A9  130$:    BBS     #CNR$V_SEM_RT,(R3),180$         ; Br if the string was obtained from
        51  54  5A  C1  04AD           ADDL3   R10,R4,R1                       ;   an action routine
            58  61  3C  04B1           MOVZWL  STR_OFF(R1),R8                  ; Get offset to string
            58  51  C0  04B4           ADDL    R1,R8                           ; Get pointer to string
        57  02  A1  3C  04B7           MOVZWL  STR_LNG(R1),R7                  ; Get size of string
            50  01  90  04BB  150$:    MOVB    #1,R0                           ; Indicate field is valid
                    05  04BE  160$:    RSB
                        04BF  170$:    CLRBIT  #0,R0                           ; Indicate field is invalid
                F9  11  04C3           BRB     160$                            ; And leave
                        04C5
                        04C5           ;
                        04C5           ;    The string was obtained from an action routine and is hence sitting
                        04C5           ;    in the common action routine buffer.  Since this buffer is in
                        04C5           ;    jeapordy of being re-used, it is necessary to allocate a temporary
                        04C5           ;    buffer and move the string to it.  This buffer is inserted on the
                        04C5           ;    NET$GQ_TMP_BUF queue -- all buffers on this queue are deallocated
                        04C5           ;    eventually by one of the higher level routines.
                        04C5           ;
            57  51  D0  04C5  180$:    MOVL    R1,R7                           ; Copy the string descriptor address
        51  02  A1  3C  04C8           MOVZWL  STR_LNG(R1),R1                  ; Get the string length
            51  0C  C0  04CC           ADDL    #12,R1                          ; Copy size of buffer header
             FB2E'  30  04CF           BSBW    NET$ALLOCATE                    ; Allocate the buffer from the ACP pool
            21  50  E9  04D2           BLBC    R0,200$                         ; Br on error
      0000'DF   62  0E  04D5           INSQUE  (R2),@NET$GQ_TMP_BUF            ; Insert buffer on tmp_buf queue.
         08 A2  51  B0  04DA           MOVW    R1,CNR$W_SIZE(R2)               ; Store size for deallocation.
            52  0C  C0  04DE           ADDL    #12,R2                          ; Point to string storage area
            58  52  D0  04E1           MOVL    R2,R8                           ; Make copy for return
```

```
              51    67    3C  04E4   1105              MOVZWL  STR_OFF(R7),R1          ; Get self-relative offset
              51    57    C0  04E7   1106              ADDL    R7,R1                   ; Make it a pointer
          57     02 A7    3C  04EA   1107              MOVZWL  STR_LNG(R7),R7          ; Get size for return
       68    61     57    28  04EE   1108              MOVC3   R7,(R1),(R8)            ; Move the string
              50    01    D0  04F2   1109              MOVL    #1,R0                   ; Set success
                          05  04F5   1110  190$:       RSB
                              04F6   1111
                    57    7C  04F6   1112  200$:       CLRQ    R7                      ; Zero R7, R8 on error
                    FB    11  04F8   1113              BRB     190$                    ; And exit
                              04FA   1114
```

```
                     04FA         .SBTTL  CNF$PUT_FIELD - Store field into CNF entry
                     04FA  ;+
                     04FA  ; CNF$PUT_FLD_EX - External insert CNF field
                     04FA  ; CNF$PUT_FIELD  - Internal insert CNF field
                     04FA  ;
                     04FA  ;
                     04FA  ; INPUTS:        R11     Address of CNR
                     04FA  ;                R10     Address of CNF
                     04FA  ;                R9      FLD # in bits 0:15, Mask I.D. in bits 16:23
                     04FA  ;                R8      Parameter value if type byte, word, or longword
                     04FA  ;                        Pointer to string if type string
                     04FA  ;                R7      Size of string if type string
                     04FA  ;                R0      Error code to be returned upon failure
                     04FA  ;
                     04FA  ; OUTPUTS:       R0      Low bit set if successful
                     04FA  ;                        Unchanged otherwise (0 if entered with LBS)
                     04FA  ;
                     04FA  ;-
                     04FA  CNF$PUT_FLD_EX::                                  ; Store CNF field
        0000'CF  DD  04FA          PUSHL   NET$GL_FLAGS                      ; Save current flags
                     04FE          CLRBIT  NET$V_INTRNL,NET$GL_FLAGS ; Indicate external access
             0F  11  0504          BRB     PUTFLD_1                          ; No pre-set error code
                     0506
                     0506  CNF$PUT_FIELD::                                   ; Store CNF field
        0000'CF  DD  0506          PUSHL   NET$GL_FLAGS                      ; Save current flags
                     050A          SETBIT  NET$V_INTRNL,NET$GL_FLAGS ; Indicate external access
          02 50  E9  0510          BLBC    R0,PUTFLD_1                       ; Br if valid error code
             50  D4  0513  PUTFLD: CLRL    R0                                ; No pre-set error code
                     0515  PUTFLD_1:
                     0515          CLRBIT  NET$V_READ,NET$GL_FLAGS ; Indicate write access
             3F  BB  051B          PUSHR   #^M<R0,R1,R2,R3,R4,R5>            ; Save regs
           01B9  30  051D          BSBW    GET_DSC                           ; Get description of field
          02 50  E9  0520          BLBC    R0,40$                            ; If LBC then no field
             12  10  0523          BSBB    PUT                               ; Store the field
          04 50  E8  0525  40$:    BLBS    R0,50$                            ; If LBS then success
             6E  D5  0528          TSTL    (SP)                              ; Has caller pre-set the error code?
             03  12  052A          BNEQ    60$                               ; If NEQ then yes
          6E 50  3C  052C  50$:    MOVZWL  R0,(SP)                           ; Reset the return status
             3F  BA  052F  60$:    POPR    #^M<R0,R1,R2,R3,R4,R5>            ; Restore regs, restore R0
        0000'CF 8ED0 0531          POPL    NET$GL_FLAGS                      ; Restore flags
                 05  0536          RSB
                     0537  ;
                     0537  ;  Put Field action routines
                     0537  ;
                     0537  PUT:
             08  EF  0537          EXTZV   #CNR$V_SEM_TYP,-                  ; Get parameter type
       50 63 03      0539                  #CNR$S_SEM_TYP,(R3),R0            ;
          04 50  D1  053C          CMPL    R0,#CNR$C_SEM_STR                 ; String?
             12  12  053F          BNEQ    50$                               ; If NEQ no, br to check value range
             10  ED  0541          CMPZV   #CNR$V_SEM_SMX,-                  ; Range check required?
       00 63 0C      0543                  #CNR$S_SEM_SMX,(R3),#0            ;
             07  13  0546          BEQL    40$                               ; If EQL then no
             10  ED  0548          CMPZV   #CNR$V_SEM_SMX,-                  ; String length within range?
       57 63 0C      054A                  #CNR$S_SEM_SMX,(R3),R7            ;
             1F  1F  054D          BLSSU   80$                               ; If LSSU then out of range
             57  D5  054F  40$:    TSTL    R7                                ; Is string null?
             15  11  0551          BRB     70$                               ; Continue in commone
          50      03  D1  0553  50$:     CMPL    #CNR$C_SEM_L,R0              ; Longword value ?
                  0E  13  0556           BEQL    60$                          ; If EQL skip range check
                  10  ED  0558           CMPZV   #CNR$V_SEM_MAX,-             ; Range check required?
      00  63      10      055A                   #CNR$S_SEM_MAX,(R3),#0       ;
                  07  13  055D           BEQL    60$                          ; If EQL then no
                  10  ED  055F           CMPZV   #CNR$V_SEM_MAX,-             ; Within range?
      58  63      10      0561                   #CNR$S_SEM_MAX,(R3),R8       ;
                  08  1F  0564           BLSSU   80$                          ; If LSSU then param value too large
                  58  D5  0566  60$:     TSTL    R8                           ; Is the value zero ?
                  0A  12  0568  70$:     BNEQ    90$                          ; If not continue
           06 63  0F  E0  056A           BBS     #CNR$V_SEM_Z,(R3),90$        ; If BS then zero is okay
          50  0000'8F  3C 056E  80$:     MOVZWL  #SS$_BADPARAM,R0             ; Indicate bad parameter value
                      05  0573           RSB                                  ; Return status in R0
                          0574
      51  54      5A  C1  0574  90$:     ADDL3   R10,R4,R1                    ; Get pointer to parameter
        08 63     0E  E1  0578           BBC     #CNR$V_SEM_RT,(R3),95$       ; Br if not action routine
              0148    30  057C           BSBW    PUT_RT_FIELD                 ; Call action routine
             3A 50    E9  057F           BLBC    R0,170$                      ; If error, do not mark as "set"
                  30  11  0582           BRB     150$                         ; Else, mark as "set" and exit
                          0584
                          0584  95$:     $DISPATCH  R0,<-                     ; Dispatch by paramater type
                          0584
                          0584                   <CNR$C_SEM_BIT, 100$>,-      ; Bit
                          0584                   <CNR$C_SEM_B,   110$>,-      ; Byte
                          0584                   <CNR$C_SEM_W,   120$>,-      ; Word
                          0584                   <CNR$C_SEM_L,   130$>,-      ; Longword
                          0584                   <CNR$C_SEM_STR, 140$>,-      ; String descriptor
                          0584           >
                          0592           BUG_CHECK NETNOSTATE,FATAL           ; Bug if type is unknown
              51  5A  C2  0596  100$:    SUBL    R10,R1                       ; Subtract out CNF address
  6A   01     51  58  F0  0599           INSV    R8,R1,#1,(R10)               ; Insert bit value
                  14  11  059E           BRB     150$                         ;
              61  58  90  05A0  110$:    MOVB    R8,(R1)                      ; Insert byte parameter
                  0F  11  05A3           BRB     150$                         ;
              61  58  B0  05A5  120$:    MOVW    R8,(R1)                      ; Insert word parameter
                  0A  11  05A8           BRB     150$                         ;
              61  58  D0  05AA  130$:    MOVL    R8,(R1)                      ; Insert longword parameter
                  05  11  05AD           BRB     150$                         ;
                  0C  10  05AF  140$:    BSBB    PUT_STR                      ; Insert the string
               08 50  E9  05B1           BLBC    R0,170$                      ; If LBC then didn't fit
              50  01  90  05B4  150$:    MOVB    #1,R0                        ; Indicate success
     00 18 AA     55  E2  05B7           BBSS    R5,CNF$L_MASK(R10),170$      ; Mark field valid
                      05  05BC  170$:    RSB
                          05BD
                          05BD
                          05BD  PUT_STR:                                      ; Insert string into CNF block
                          05BD           ;
                          05BD           ;   If the new string is less than or equal to the size of the new
                          05BD           ;   string, then simply re-use the space.  This is needed to make
                          05BD           ;   is simple to store fixed size strings, such as NI addresses,
                          05BD           ;   without having to generate a new CNF block, when the SIZ_FREE
                          05BD           ;   is exhausted.  Any waste holes for unequal strings will be wasted.
                          05BD           ;
                          05BD           ;   If string is already active then subtract its size from
                          05BD           ;   CNF$W_SIZ_USED before storing the string.  Store the string and
                          05BD           ;   update CNF$W_SIZ_USED and CNF$W_SIZ_FREE to account for storage
                          05BD           ;   taken.
```

```
                              05BD        ;
                              05BD        ;       INPUTS:         R10 = CNF block pointer
                              05BD        ;                       R8  = Pointer to string
                              05BD        ;                       R7  = Length of string
                              05BD        ;                       R5  = Bit offset from CNF mask to field active flag
                              05BD        ;                       R1  = Address of CNF string descriptor
                              05BD        ;                       R0  = Scratch
                              05BD        ;
                              05BD        ;       OUTPUTS:        R1  = Garbage
                              05BD        ;                       R0  = SS$_NORMAL  if successful
                              05BD        ;                             SS$_INSFMEM otherwise
                              05BD        ;
                 3C     BB    05BD              PUSHR   #^M<R2,R3,R4,R5>                ; Save regs
                              05BF        ;
                              05BF        ;       If the new string is less than, or equal to, the size of the
                              05BF        ;       original string, then simply re-use its space (wasting any
                              05BF        ;       excess), and modify the length of the parameter.  This is done
                              05BF        ;       to make replacement of fixed size strings easy.
                              05BF        ;
   17 18 AA      55     E1    05BF              BBC     R5,CNF$L_MASK(R10),20$          ; If BC then field currently inactive
      02 A1      57     B1    05C4              CMPW    R7,STR_LNG(R1)                  ; Equal or less space than original?
         11             1A    05C8              BGTRU   20$                             ; If not, then allocate new space
50    02 A1      57     A3    05CA              SUBW3   R7,STR_LNG(R1),R0               ; Compute difference in sizes
      10 AA      50     A2    05CF              SUBW    R0,CNF$W_SIZ_USED(R10)          ; Adjust string space taken
         53      61     3C    05D3              MOVZWL  STR_OFF(R1),R3                  ; Get offset to original string
         53      51     C0    05D6              ADDL    R1,R3                           ; Get pointer to string space
                 2F     11    05D9              BRB     50$                             ; Move the string, and exit
                              05DB        ;
                              05DB        ;       We cannot re-use the space of the original string.  Deallocate
                              05DB        ;       the space used by the original string, if any (wasting it), and
                              05DB        ;       allocate some new space at the end of the block.
                              05DB        ;
  50    0000'8F         3C    05DB  20$:        MOVZWL  #SS$_INSFMEM,R0                 ; Assume no space left
      0E AA      57     B1    05E0              CMPW    R7,CNF$W_SIZ_FREE(R10)          ; Enough free space left ?
                 2F     1A    05E4              BGTRU   90$                             ; If GTRU then no
     53     0C AA       9E    05E6              MOVAB   CNF$W_OFF_FREE(R10),R3          ; Prepare to calc. ptr
         52      63     3C    05EA              MOVZWL  (R3),R2                         ; Get offset to free space
         53      52     C0    05ED              ADDL2   R2,R3                           ; Calculate ptr to free space
                              05F0              ASSUME  STR_OFF EQ 0
   61    53      51     A3    05F0              SUBW3   R1,R3,STR_OFF(R1)               ; Enter self-relative offset
   05 18 AA      55     E1    05F4              BBC     R5,CNF$L_MASK(R10),30$          ; If BC then field currently inactive
         02 A1          A2    05F9              SUBW    STR_LNG(R1),-                   ; Adjust space used (note that we are
            10 AA             05FC                              CNF$W_SIZ_USED(R10); return it to CNF$W_SIZ_FREE)
      0E AA      57     A2    05FE  30$:        SUBW    R7,CNF$W_SIZ_FREE(R10)          ; Account for space taken
      10 AA      57     A0    0602              ADDW    R7,CNF$W_SIZ_USED(R10)          ; Account for space taken
      0C AA      57     A0    0606              ADDW    R7,CNF$W_OFF_FREE(R10)          ; Advance free space offset
      02 A1      57     B0    060A  50$:        MOVW    R7,STR_LNG(R1)                  ; Enter string size
   63    68      57     28    060E              MOVC3   R7,(R8),(R3)                    ; Move it
         50      00'    D0    0612              MOVL    S^#SS$_NORMAL,R0                ; Indicate success
                 3C     BA    0615  90$:        POPR    #^M<R2,R3,R4,R5>                ; Restore regs
                        05    0617              RSB
                        0618            .SBTTL  CNF$CLR_FIELD - Clear a CNF field
                        0618    ;+
                        0618    ; CNF$CLR_FLD_EX - External clear CNF field
                        0618    ; CNF$CLR_FIELD  - Internal clear CNF field
                        0618    ;
                        0618    ; INPUTS:               R11     CNR pointer
                        0618    ;                       R10     CNF pointer (CNF$CLEAR only)
                        0618    ;                       R9      Field i.d.
                        0618    ;
                        0618    ; OUTPUTS:              R0      LBS if successful, LBC otherwise
                        0618    ;
                        0618    ;                       All other registers are preserved.
                        0618    ;-
                        0618    CNF$CLR_FLD_EX::                                        ; Clear bit in CNF mask
        0000'CF     DD  0618            PUSHL   NET$GL_FLAGS                    ; Save current flags
                        061C            CLRBIT  NET$V_INTRNL,NET$GL_FLAGS       ; Indicate external access
             0A     11  0622            BRB     CLRFLD
                        0624
                        0624    CNF$CLR_FIELD::                                         ; Clear CNF field
        0000'CF     DD  0624            PUSHL   NET$GL_FLAGS                    ; Save current flags
                        0628            SETBIT  NET$V_INTRNL,NET$GL_FLAGS       ; Indicate external access
                        062E
                        062E    CLRFLD: CLRBIT  NET$V_READ,NET$GL_FLAGS         ; Indicate write access
          02 50     E9  0634            BLBC    R0,5$                           ; Br if valid error code
             50     D4  0637            CLRL    R0                              ; Else make it valid
             3F     BB  0639    5$:     PUSHR   #^M<R0,R1,R2,R3,R4,R5>          ; Save regs
           009B     30  063B            BSBW    GET_DSC                         ; Get field semantics
          1D 50     E9  063E            BLBC    R0,10$                          ; Br if not defined
    18 18 AA 55     E5  0641            BBCC    R5,CNF$L_MASK(R10),10$          ; Clear the bit
       14 63 0E     E0  0646            BBS     #CNR$V_SEM_RT,(R3),10$          ; Br if "field" is an action routine
             08     ED  064A            CMPZV   #CNR$V_SEM_TYP,-                ; Is this a string field ?
          63 03         064C                    #CNR$S_SEM_TYP,(R3),-           ;
             04         064E                    #CNR$C_SEM_STR
             0D     12  064F            BNEQ    10$                             ; If NEQ no, we're done
             00     EF  0651            EXTZV   #CNR$V_SEM_OFF,-                ; Get offset from top of CNF to field
       52 63 08         0653                    #CNR$S_SEM_OFF,(R3),R2          ;
          52 5A     C0  0656            ADDL    R10,R2                          ; Make it a pointer
          02 A2     A2  0659            SUBW    STR_LNG(R2),-                   ; Update amount of space used
          10 AA         065C                    CNF$W_SIZ_USED(R10)             ;
          04 50     E8  065E    10$:    BLBS    R0,20$                          ; If LBS then success
             6E     D5  0661            TSTL    (SP)                            ; Has caller pre-set the error code?
             03     12  0663            BNEQ    30$                             ; If NEQ then yes
          6E 50     3C  0665    20$:    MOVZWL  R0,(SP)                         ; Reset the return status
             3F     BA  0668    30$:    POPR    #^M<R0,R1,R2,R3,R4,R5>          ; Restore regs
        0000'CF   8ED0  066A            POPL    NET$GL_FLAGS                    ; Restore flags
             05         066F            RSB
```

```
                  0670         .SBTTL  CNF$VERIFY - Check if field exists
                  0670  ;+
                  0670  ; CNF$VERIFY  - See if field semantics are defined
                  0670  ;
                  0670  ; INPUTS:       R11     CNR pointer
                  0670  ;               R10     CNF pointer
                  0670  ;               R9      Field i.d.
                  0670  ;
                  0670  ; OUTPUTS:      R0      LBS if successful, LBC otherwise
                  0670  ;
                  0670  ;               All other registers are preserved.
                  0670  ;-
                  0670  CNF$VERIFY::                          ; Are field semantics defined?
        3E   BB   0670         PUSHR   #^M<R1,R2,R3,R4,R5>    ; Save critical regs
      00BC   30   0672         BSBW    GET_DSC_1              ; Get field semantics
        3E   BA   0675  10$:   POPR    #^M<R1,R2,R3,R4,R5>    ; Restore regs
             05   0677         RSB
```

```
                        0678       .SBTTL  GET_RT_FIELD - Call action routine to get value
                        0678  ;+
                        0678  ; GET_RT_FIELD - Call action routine to get a parameter value
                        0678  ;
                        0678  ; Inputs:
                        0678  ;
                        0678  ;       R11 = Address of CNR
                        0678  ;       R10 = Address of CNF
                        0678  ;       R9 = Field ID
                        0678  ;       R5 = Bit offset from top of CNF mask vector to field presence flag
                        0678  ;       R4 = Address of action routine
                        0678  ;       R3 = Address of field semantics longword
                        0678  ;
                        0678  ; Outputs:
                        0678  ;
                        0678  ;       R0 = Status code
                        0678  ;       R1 = Address of longword "field value"
                        0678  ;               For binary values, longword binary value
                        0678  ;               For string values, address of word offset & word count
                        0678  ;
                        0678  ;       R2-R11 are preserved.
                        0678  ;
                        0678  ;
                        0678  ; The action routine is called with the following interface:
                        0678  ;
                        0678  ; Input to action routine:
                        0678  ;
                        0678  ;       R0 = 0, indicating parameter is to be read, not written.
                        0678  ;               (used only for those action routines that can do both).
                        0678  ;       R11 = Address of CNR
                        0678  ;       R10 = Address of CNF
                        0678  ;       R3 = Address of scratch buffer
                        0678  ;
                        0678  ; Output from action routine:
                        0678  ;
                        0678  ;       For string values, R3 points just beyond string in scratch buffer.
                        0678  ;       For binary values, R1 contains the value itself.
                        0678  ;
                        0678  ;       All registers (R2-R11) can be destroyed by action routine before
                        0678  ;       returning here.
                        0678  ;-
                        0678
                        0678 GET_RT_FIELD:
        0FFC 8F    BB   0678       PUSHR   #^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ; Save registers
             08    ED   067C       CMPZV   #CNR$V_SEM_TYP,-              ; String value?
 04     63   03         067E               #CNR$S_SEM_TYP,(R3),#CNR$C_SEM_STR
             06    13   0681       BEQL    50$                           ; Branch if so
                        0683
                        0683  ;
                        0683  ; Call action routine for binary value
                        0683  ;
                        0683
             50    D4   0683       CLRL    R0                            ; Indicate parameter to be read
             64    16   0685       JSB     (R4)                          ; Call action routine
             2F    11   0687       BRB     90$                           ; Return status in R0
                        0689
                        0689  ;
```

```
                                0689  1404 ; Call action routines for string
                                0689  1405 ;
                                0689  1406
       34 000C'CF      01   E2  0689  1407 50$:    BBSS    #TMP_V_BUF,TMP_B_FLAGS,100$ ; Allocate static buffer
      53    00000004'GF     9E  068F  1408         MOVAB   G^TMP_BUF,R3              ; Setup buffer pointer
                       50   D4  0696  1409         CLRL    R0                        ; Indicate parameter to be read
                       64   16  0698  1410         JSB     (R4)                      ; Call action routine
      51    00000000'GF     9E  069A  1411         MOVAB   G^TMP_VAL,R1              ; Point to descriptor storage
      52    00000004'GF     9E  06A1  1412         MOVAB   G^TMP_BUF,R2              ; Get original pointer
     02 A1     53      52   A3  06A8  1413         SUBW3   R2,R3,STR_LNG(R1)         ; Setup string size
          61   0004'8F      B0  06AD  1414         MOVW    #TMP_BUF-TMP_VAL,STR_OFF(R1) ; Setup string offset
       0B 000C'CF      01   E5  06B2  1415         BBCC    #TMP_V_BUF,TMP_B_FLAGS,100$ ; Deallocate static buffer
                                06B8  1416
                  0FFC 8F   BA  06B8  1417 90$:    POPR    #^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ; Restore registers
18 AA      01      55  50   F0  06BC  1418         INSV    R0,R5,#1,CNF$L_MASK(R10); Remember validity of field
                            05  06C2  1419         RSB                               ; Return status in R0
                                06C3  1420
                                06C3  1421 100$:   BUG_CHECK       NETNOSTATE,FATAL
```

```
                    06C7  1423          .SBTTL  PUT_RT_FIELD - Call action routine to store value
                    06C7  1424  ;+
                    06C7  1425  ; PUT_RT_FIELD - Call action routine to store a parameter value
                    06C7  1426  ;
                    06C7  1427  ; Inputs:
                    06C7  1428  ;
                    06C7  1429  ;       R11 = Address of CNR
                    06C7  1430  ;       R10 = Address of CNF
                    06C7  1431  ;       R9 = Field ID
                    06C7  1432  ;       R7/R8 = Parameter value
                    06C7  1433  ;       R5 = Bit offset from top of CNF mask vector to field presence flag
                    06C7  1434  ;       R4 = Address of action routine
                    06C7  1435  ;       R3 = Address of field semantics longword
                    06C7  1436  ;
                    06C7  1437  ; Outputs:
                    06C7  1438  ;
                    06C7  1439  ;       R0 = Status code
                    06C7  1440  ;
                    06C7  1441  ;       R2-R11 are preserved.
                    06C7  1442  ;
                    06C7  1443  ;
                    06C7  1444  ; The action routine is called with the following interface:
                    06C7  1445  ;
                    06C7  1446  ; Input to action routine:
                    06C7  1447  ;
                    06C7  1448  ;       R0 = 1, indicating parameter is to be written, not read.
                    06C7  1449  ;               (used only for those action routines that can do both).
                    06C7  1450  ;       R11 = Address of CNR
                    06C7  1451  ;       R10 = Address of CNF
                    06C7  1452  ;       R7/R8 = Parameter value (descriptor if string, else R8 = longword).
                    06C7  1453  ;
                    06C7  1454  ; Output from action routine:
                    06C7  1455  ;
                    06C7  1456  ;       R0 = True if parameter was stored, else false.
                    06C7  1457  ;
                    06C7  1458  ;       All registers (R2-R11) can be destroyed by action routine before
                    06C7  1459  ;       returning here.
                    06C7  1460  ;-
                    06C7  1461
                    06C7  1462 PUT_RT_FIELD:
OFFC 8F     BB      06C7  1463          PUSHR   #^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ; Save registers
50   01     D0      06CB  1464          MOVL    #1,R0                         ; Indicate parameter to be written
     64     16      06CE  1465          JSB     (R4)                          ; Call action routine
OFFC 8F     BA      06D0  1466          POPR    #^M<R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ; Restore registers
            05      06D4  1467          RSB                                   ; Return status in R0
                    06D5  1468
                    06D5  1469 100$:    BUG_CHECK       NETNOSTATE,FATAL
```

```
                          06D9          .SBTTL  GET_DSC - Get descriptor of CNF field
                          06D9      ;+
                          06D9      ; GET_DSC       - Get descriptor of CNF field and check access rights
                          06D9      ; GET_DSC_1     - Get descriptor of CNF field
                          06D9      ;
                          06D9      ; inputs:       R11  Address of CNR
                          06D9      ;               R9   FLD number in bits 0-15, mask id in bits 16-23
                          06D9      ;
                          06D9      ; outputs:      R11  Address of CNR
                          06D9      ;               R9   Unmodified
                          06D9      ;               R5   Bit offset from top of CNF mask vector to bit in R9
                          06D9      ;               R4   Byte offset from top of CNF to parameter or
                          06D9      ;                    pointer to action routine (depending upon semanitics)
                          06D9      ;               R3   Address of field semantics longword
                          06D9      ;               R0   LBS if successful
                          06D9      ;                    LBC otherwise
                          06D9      ;-
                          06D9      GET_DSC:                                        ; Get descriptor and check access rights
               56   10    06D9              BSBB    GET_DSC_1                       ; Get the descriptor
            4C 50   E9    06DB              BLBC    R0,50$                          ; Br on error
               0B   EF    06DE              EXTZV   #CNR$V_SEM_ACC,-                ; Get access protection
      50    63 03         06E0                      #CNR$S_SEM_ACC,(R3),R0          ;
               0A   E0    06E3              BBS     #NET$V_READ,-                   ; Br if read access is intended
       22 0000'CF         06E5                      NET$GL_FLAGS,20$                ;
                          06E9      ;
                          06E9      ;     Write access is intended.  The boolean equation for NOT allowing
                          06E9      ;     write access is:
                          06E9      ;                   -W = RO + (ER+NE)*(-INTRNL) + CW*LOCKED
                          06E9      ;
          01   50   91    06E9              CMPB    R0,#CNR$C_ACC_RO                ; Read only ?
               3D   13    06EC              BEQL    60$                             ; If EQL no access permitted
          04   50   91    06EE              CMPB    R0,#CNR$C_ACC_ER                ; External read only ?
               05   13    06F1              BEQL    8$                              ; If so, then check if external
          05   50   91    06F3              CMPB    R0,#CNR$C_ACC_NE                ; No external read or write access?
               06   12    06F6              BNEQ    10$                             ; If not, then continue
               09   E1    06F8      8$:     BBC     #NET$V_INTRNL,-                 ; If BC then not internal access
       2D 0000'CF         06FA                      NET$GL_FLAGS,60$                ;
          03   50   91    06FE      10$:    CMPB    R0,#CNR$C_ACC_CW                ; Is field conditionally writeable?
               1E   12    0701              BNEQ    30$                             ; If NEQ then access is allowed
               0B   E1    0703              BBC     #NET$V_CNFLCK,-                 ; If BC then okay to write the field
       18 0000'CF         0705                      NET$GL_FLAGS,30$                ;
               20   11    0709              BRB     60$                             ; Else cannot write it
                          070B      ;
                          070B      ;     Read access intended.  The boolean equation for allowable read
                          070B      ;     access is:
                          070B      ;             R = -(NE*-INTRNL) * (-WO + WO*INTRNL + WO*BYPASS)
                          070B      ;
               09   E0    070B      20$:    BBS     #NET$V_INTRNL,-                 ; Br if internally accessed
       10 0000'CF         070D                      NET$GL_FLAGS,30$                ;
          05   50   91    0711              CMPB    R0,#CNR$C_ACC_NE                ; No external read/write access?
               15   13    0714              BEQL    60$                             ; If not, then disallow access
               08   E0    0716              BBS     #NET$V_BYPASS,-                 ; Br if user has bypass privilege
       05 0000'CF         0718                      NET$GL_FLAGS,30$                ;
          02   50   91    071C              CMPB    R0,#CNR$C_ACC_WO                ; Is field "write-only"
               04   13    071F              BEQL    40$                             ; If EQL then no access allowed
          50   01   90    0721      30$:    MOVB    #1,R0                           ; Set success
                    05    0724              RSB                                     ;
```

```
                                0725
         50   0000'8F     3C    0725   40$:    MOVZWL  #SS$_BADPARAM,R0          ; No read access allowed
                          05    072A   50$:    RSB                               ;
                                072B
         50   0000'8F     3C    072B   60$:    MOVZWL  #SS$_WRITLCK,R0           ; No write access allowed
                          05    0730           RSB                               ;
                                0731
                                0731
                                0731
                                0731   GET_DSC_1:
            50    0A AB   9A    0731           MOVZBL  CNR$B_TYPE(R11),R0        ; Get database i.d.
    50   59   08    18    ED    0735           CMPZV   #NFB$V_DB,#NFB$S_DB,R9,R0 ; Is if for this database ?
                    24    12    073A           BNEQ    40$                       ; If NEQ then no
                                073C
                                073C           ASSUME  NFB$V_INX  EQ  0
                                073C           ASSUME  NFB$S_INX  EQ  16
                                073C
            55      59    3C    073C           MOVZWL  R9,R5                     ; Get field index
         0E AB      55    D1    073F           CMPL    R5,CNR$W_MAX_INX(R11)     ; Is it within range ?
                    1B    1A    0743           BGTRU   40$                       ; If GTRU then out of range
      53   0128 CB45      DE    0745           MOVAL   CNR$L_SEM_TAB(R11)[R5],R3 ; Point to semantic longword
                    00    EF    074B           EXTZV   #CNR$V_SEM_OFF,-          ; Get byte offset to field from
         54    63   08          074D                   #CNR$S_SEM_OFF,(R3),R4    ; top of CNF (or routine index)
                    0E    13    0750           BEQL    40$                       ; Branch if no semantic entry
         06 63      0E    E1    0752           BBC     #CNR$V_SEM_RT,(R3),30$    ; Br if "field" is not a routine
            54      5B    C0    0756           ADDL    R11,R4                    ; Get address of pointer to routine
            54      64    D0    0759           MOVL    (R4),R4                   ; Get address of routine
            50      00'   D0    075C   30$:    MOVL    S^#SS$_NORMAL,R0          ; Indicate success
                          05    075F           RSB
                                0760
         50   0000'8F     3C    0760   40$:    MOVZWL  #SS$_BADPARAM,R0          ; Indicate illegal field ID
                          05    0765           RSB
                                0766
                                0766
                                0766   .END
```

```
ACP$C_STA_F                      = 00000004                    CNR$C_SEM_W                      = 00000002
ACP$C_STA_H                      = 00000005                    CNR$L_ACT_DELETE                 = 00000028
ACP$C_STA_I                      = 00000000                    CNR$L_ACT_DFLT                   = 00000020
ACP$C_STA_N                      = 00000001                    CNR$L_ACT_INSERT                 = 00000024
ACP$C_STA_R                      = 00000002                    CNR$L_ACT_QIO                    = 00000018
ACP$C_STA_S                      = 00000003                    CNR$L_ACT_REMOVE                 = 0000002C
BIT...                           = 00000006                    CNR$L_ACT_SHOW                   = 0000001C
BUG$_NETNOSTATE                    ********    X    05         CNR$L_INSERT                     = 00000034
CLRFLD                             0000062E R       05         CNR$L_SCANNER                    = 00000030
CNF$B_FLG                        = 0000000B                    CNR$L_SEM_TAB                    = 00000128
CNF$B_TYPE                       = 0000000A                    CNR$L_SPCSCAN                    = 00000038
CNF$CLONE                          000001A0 RG      05         CNR$L_VEC_MAND                   = 00000080
CNF$CLR_FIELD                      00000624 RG      05         CNR$L_VEC_UNIQ                   = 000000E4
CNF$CLR_FLD_EX                     00000618 RG      05         CNR$S_SEM_ACC                    = 00000003
CNF$COPY                           00000170 RG      05         CNR$S_SEM_MAX                    = 00000010
CNF$DELETE                         00000015 RG      05         CNR$S_SEM_OFF                    = 00000008
CNF$GET_FIELD                      00000422 RG      05         CNR$S_SEM_SMX                    = 0000000C
CNF$GET_FLD_EX                     00000414 RG      05         CNR$S_SEM_TYP                    = 00000003
CNF$INIT                           00000234 RG      05         CNR$V_SEM_ACC                    = 0000000B
CNF$INIT_UTL                       0000021D RG      05         CNR$V_SEM_MAX                    = 00000010
CNF$INSERT                         00000044 RG      05         CNR$V_SEM_OFF                    = 00000000
CNF$KEY_SEARCH                     0000026A RG      05         CNR$V_SEM_RT                     = 0000000E
CNF$KEY_SRCH_EX                    00000258 RG      05         CNR$V_SEM_SMX                    = 00000010
CNF$L_MASK                       = 00000018                    CNR$V_SEM_TYP                    = 00000008
CNF$M_FLG_ACP                    = 00000004                    CNR$V_SEM_Z                      = 0000000F
CNF$M_FLG_CNR                    = 00000001                    CNR$W_MAX_INX                    = 0000000E
CNF$M_FLG_DELETE                 = 00000002                    CNR$W_SIZE                       = 00000008
CNF$PRE_QIO                        00000009 RG      05         CNR$W_SIZ_CNF                    = 0000000C
CNF$PRE_SHOW                       00000000 RG      05         COMPARE                            00000347 R       05
CNF$PURGE                          00000040 RG      05         COMPARE_ACT                        0000039A R       05
CNF$PUT_FIELD                      00000506 RG      05         DLIST                            = 00000004
CNF$PUT_FLD_EX                     000004FA RG      05         DYN$C_NET                        = 00000017
CNF$SEARCH                         00000288 RG      05         GET                                00000455 R       05
CNF$SEARCH_EX                      0000027C RG      05         GETFLD                             0000042C R       05
CNF$VERIFY                         00000670 RG      05         GET_DSC                            000006D9 R       05
CNF$V_FLG_ACP                    = 00000002                    GET_DSC_1                          00000731 R       05
CNF$V_FLG_DELETE                 = 00000001                    GET_RT_FIELD                       00000678 R       05
CNF$W_ID                         = 00000012                    KEY_EQL                            0000035D R       05
CNF$W_OFF_FREE                   = 0000000C                    KEY_GTRU                           00000369 R       05
CNF$W_SIZE                       = 00000008                    KEY_LSSU                           0000036F R       05
CNF$W_SIZ_FREE                   = 0000000E                    KEY_MAX                            00000375 R       05
CNF$W_SIZ_USED                   = 00000010                    KEY_MIN                            00000380 R       05
CNF$_ADVANCE                     = 00000000                    KEY_NEQ                            00000363 R       05
CNF$_QUIT                        = 00000002                    MATCH                              00000396 R       05
CNF$_TAKE_CURR                   = 00000003                    NET$ALLOCATE                       ********    X    05
CNF$_TAKE_PREV                   = 00000001                    NET$C_ACT_TIMER                  = 0000001E
CNR$B_TYPE                       = 0000000A                    NET$C_EFN_ASYN                   = 00000002
CNR$C_ACC_CW                     = 00000003                    NET$C_EFN_WAIT                   = 00000001
CNR$C_ACC_ER                     = 00000004                    NET$C_IPL                        = 00000008
CNR$C_ACC_NE                     = 00000005                    NET$C_MAXACCFLD                  = 00000027
CNR$C_ACC_RO                     = 00000001                    NET$C_MAXLINNAM                  = 0000000F
CNR$C_ACC_WO                     = 00000002                    NET$C_MAXLNK                     = 000003FF
CNR$C_MAX_INX                    = 0000005F                    NET$C_MAXNODNAM                  = 00000006
CNR$C_SEM_B                      = 00000001                    NET$C_MAXOBJNAM                  = 0000000C
CNR$C_SEM_BIT                    = 00000000                    NET$C_MAX_AREAS                  = 0000003F
CNR$C_SEM_L                      = 00000003                    NET$C_MAX_LINES                  = 00000040
CNR$C_SEM_STR                    = 00000004                    NET$C_MAX_NCB                    = 0000006E
```

```
                                                               D  7
NETCNF                                  - Configuration data base access routine 16-SEP-1984 01:12:45  VAX/VMS Macro V04-00        Page  38
Symbol table                                                                      5-SEP-1984 02:17:52  [NETACP.SRC]NETCNF.MAR;1        (20)

NET$C_MAX_NODES                  = 000003FF                    TMP_BUF_END                        00000450 R      04
NET$C_MAX_OBJ                    = 000000FF                    TMP_B_FLAGS                        0000000C R      03
NET$C_MAX_WQE                    = 00000014                    TMP_LTH                          = 0000044C
NET$C_MINBUFSIZ                  = 000000C0                    TMP_VAL                            00000000 R      04
NET$C_TID_ACT                    = 00000003                    TMP_V_BUF                        = 00000001
NET$C_TID_RUS                    = 00000001                    TMP_V_VAL                        = 00000000
NET$C_TID_XRT                    = 00000002                    TR$C_MAXHDR                      = 0000001C
NET$C_TRCTL_CEL                  = 00000002                    TR$C_NI_ALLEND1                  = 040000AB
NET$C_TRCTL_OVR                  = 00000005                    TR$C_NI_ALLEND2                  = 00000000
NET$C_UTLBUFSIZ                  = 00001000                    TR$C_NI_ALLROU1                  = 030000AB
NET$GL_FLAGS                       ********    X    05         TR$C_NI_ALLROU2                  = 00000000
NET$GL_UTLBUF                      ********    X    05         TR$C_NI_PREFIX                   = 000400AA
NET$GQ_TMP_BUF                     ********    X    05         TR$C_NI_PROT                     = 00000360
NET$M_MAXLNKMSK                  = 000003FF                    TR$C_PRI_ECL                     = 0000001F
NET$V_BYPASS                     = 00000008                    TR$C_PRI_RTHRU                   = 0000001F
NET$V_CNFLCK                     = 0000000B                    UPD                                00000389 R      05
NET$V_INTRNL                     = 00000009                    _$$_                             = 000000EF
NET$V_PURGE                      = 0000000E
NET$V_READ                       = 0000000A
NFB$C_OP_EQL                     = 00000000
NFB$C_OP_FNDMAX                  = 00000005
NFB$C_OP_FNDMIN                  = 00000004
NFB$C_OP_FNDPOS                  = 00000006
NFB$C_OP_GTRU                    = 00000001
NFB$C_OP_LSSU                    = 00000002
NFB$C_OP_NEQ                     = 00000003
NFB$C_WILDCARD                   = 00000001
NFB$S_DB                         = 00000008
NFB$S_INX                        = 00000010
NFB$V_DB                         = 00000018
NFB$V_INX                        = 00000000
NO_MA                              00000393 R       05
NSP$C_EXT_LNK                    = 0000001E
NSP$C_MAXHDR                     = 00000009
PUT                                00000537 R       05
PUTFLD                             00000513 R       05
PUTFLD_1                           00000515 R       05
PUT_RT_FIELD                       000006C7 R       05
PUT_STR                            000005BD R       05
SCAN                               00000129 R       05
SEARCH                             00000292 R       05
SELECT_CNF                         00000000 R       03
SELECT_VALUE                       00000004 R       03
SIZ...                           = 00000001
SLIST                            = 00000008
SPCSCAN                            0000010E R       05
SS$_BADPARAM                       ********    X    05
SS$_DEVACTIVE                      ********    X    05
SS$_ENDOFFILE                      ********    X    05
SS$_INSFARG                        ********    X    05
SS$_INSFMEM                        ********    X    05
SS$_NORMAL                         ********    X    05
SS$_WRITLCK                        ********    X    05
STR_LNG                          = 00000002
STR_OFF                          = 00000000
TMPBUF_DESC                        00000000 RG      02
TMP_BUF                            00000004 R       04
```

```
                                    +----------------+
                                    ! Psect synopsis !
                                    +----------------+

PSECT name                 Allocation          PSECT No.  Attributes
----------                 ----------          ---------  ----------
.  ABS  .                  00000000  (     0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD   NOWRT NOVEC BYTE
$ABS$                      00000000  (     0.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD     WRT NOVEC BYTE
NET_PURE                   00000008  (     8.)  02 (  2.)  NOPIC   USR   CON   REL   LCL NOSHR NOEXE   RD   NOWRT NOVEC LONG
NET_IMPURE                 0000000D  (    13.)  03 (  3.)  NOPIC   USR   CON   REL   LCL NOSHR NOEXE   RD     WRT NOVEC BYTE
TABLES_IMPURE              00000454  (  1108.)  04 (  4.)  NOPIC   USR   CON   REL   GBL NOSHR NOEXE   RD     WRT NOVEC BYTE
NET_CODE                   00000766  (  1894.)  05 (  5.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD   NOWRT NOVEC BYTE

                                  +------------------------+
                                  ! Performance indicators !
                                  +------------------------+

Phase                     Page faults    CPU Time       Elapsed Time
-----                     -----------    --------       ------------
Initialization                    28     00:00:00.08    00:00:00.48
Command processing               131     00:00:00.97    00:00:03.24
Pass 1                           428     00:00:14.07    00:00:22.44
Symbol table sort                  0     00:00:01.29    00:00:01.42
Pass 2                           291     00:00:04.13    00:00:05.64
Symbol table output               23     00:00:00.18    00:00:00.18
Psect synopsis output              3     00:00:00.04    00:00:00.05
Cross-reference output             0     00:00:00.00    00:00:00.00
Assembler run totals             906     00:00:20.77    00:00:33.46

The working set limit was 2000 pages.
75794 bytes (149 pages) of virtual memory were used to buffer the intermediate code
There were 60 pages of symbol table space allocated to hold 879 non-local and 131 [illegible]ymbols.
1562 source lines were read in Pass 1, producing 27 object records in Pass 2.
29 pages of virtual memory were used to define 25 macros.

                                 +--------------------------+
                                 ! Macro library statistics !
                                 +--------------------------+

Macro library name                         Macros defined
------------------                         --------------
_$255$DUA28:[SHRLIB]NMALIBRY.MLB;1                0
_$255$DUA28:[SHRLIB]EVCDEF.MLB;1                  0
_$255$DUA28:[NETACP.OBJ]NETDRV.MLB;1              0
_$255$DUA28:[NETACP.OBJ]NET.MLB;1                 8
_$255$DUA28:[SYS.OBJ]LIB.MLB;1                    2
_$255$DUA28:[SYSLIB]STARLET.MLB;2                 6
TOTALS (all libraries)                           16

1008 GETS were required to define 16 macros.

There were no errors, warnings or information messages.

MACRO/LIS=LIS$:NETCNF/OBJ=OBJ$:NETCNF MSRC$:NETCNF/UPDATE=(ENH$:NETCNF)+EXECML$/LIB+LIB$:NET/LIB+LIB$:NETDRV/LIB+SHRLIB$:EVCDEF/LIB+
```

0274 AH-BT13A-SE
VAX/VMS V4.0

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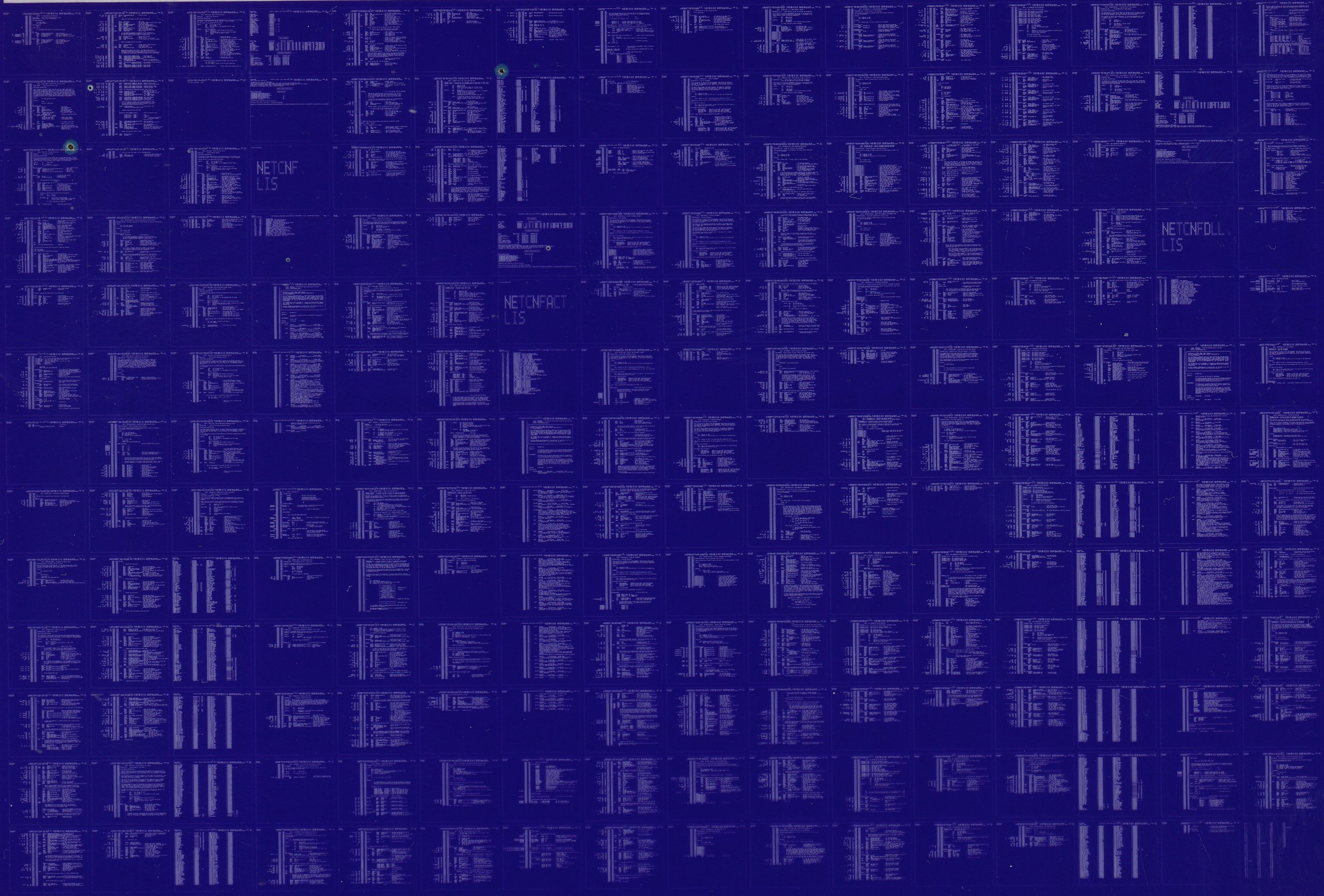

NETCNF
LIS

NETCNFDLL
LIS

NETCNFACT
LIS