OpenVMS Utilities update

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DCL Products

Acne Healing System
AHA Oily and Acne Solution 8
AHA Revitalizing Cleanser 4
AHA Revitalizing Gel HP20
AHA Revitalizing Gel MP15

AHA Revitalizing Lotion 10
AHA Revitalizing Lotion HP20
AHA Revitalizing Lotion MP15
Alpha Beta Acne Gel Treatment
Beta Hydroxy Acne Cleanser

B-Prox 10 Wash
C Scape Serum
Clay Mint Mask
Dry Skin Hand & Body Lotion
Facial Moisturizing Cream

Glycolic Acid Pads 20%
Hair Repair Shampoo
High Potency Body Moisturizer
High Potency C Scape Serum 25
Hydrating Treatment Mask

Light Textured Moisturizer
Neutral Cleansing Bar
Non-Drying Cleansing Lotion
Nourishing Eye Gel
Oil-Free Ultra Light Hydrator

Platinum Series Balancing Cleanser
Platinum Series Essential Skin Protection SPF 30+
Platinum Series Eye Refining Matrix
Platinum Series Hydrating Serum
Platinum Series Skin Renewal Complex

Platinum Series Vitamin Infusion
Profoundly Effective A
Salicylic Acid Shampoo
Super Rich Eye Cream
T-Shampoo

Ultra Gentle Eye Cream
Wash Off Cleansing Lotion
Zoma Shampoo

The Category is: **DCL**

Next Page
DCL has 38 items

Sort DCL results by: **Manufacturer** ▲ / **Price** ▲ / **Product**

Featured Products:

Show ALL Specials

Glytone
Acne Treatment Toner

Sale Price: $8.50
Reg. Price: $9.50

Skin Again

Agenda

- **V8.2 new features**

- V8.3 new features

OpenVMS I64 port

- Very few issues seen during the port

- DCL changed to run two threads using common threading package
  - Context switch
  - MACRO64 module has been ported to IAS

I64 port - Expression concatenation

X = a + b + c + d   a="a", b="b", c="c", d="d"

Old Algorithm   ## New Algorithm

SP-9 → d
       c
       b
       a

SP-5 → c
       b
       a   SP-4 → d
       b   c
       a   b
SP on entry →   a

EDCL phase I (V7.3-2)

- Command length increased to 4096 bytes
  - 8192 bytes using the hyphen sign

- Symbol size increased to 8192 bytes
  - Large symbols can now be displayed

- The Recall buffer was modified to support long commands
  - CLUE PROC/RECALL modified as well

- WRITE & READ buffers increased to support 8192 length records

- Supervisor stack increased to 128KB (was 32KB)
- **Full support in command procedures/interactive commands/applications**

EDCL phase II – Extended token support (V8.2)

- EDCL Phase II increases the token size from 255 bytes to 4000 bytes

- Extended tokens allow file specifications to exceed 255 characters
  - Applications should be modified to use RMS NAML

- DCL has been modified to support long file names
  - DCL OPEN
  - Command procedures
  - Redirection of SYS$OUTPUT
  - RECALL/OUTPUT, RECALL/INPUT
  - F$FILE

- SET PROCESS/TOKEN={TRADITIONAL | EXTENDED}
  - JPI$_TOKEN

- OpenVMS Guide for Supporting Extended DCL

SEARCH

- Three new qualifiers added
  - /WILDCARD_MATCHING
    - Supports wildcard searches
  - /LIMIT
    - Limits the number of matches displayed
  - /SKIP
    - Skips the first n matches

- Let's look at few examples

```
IPL31> type test.txt
first line
second line
third line
fourth line
fifth line
sixth line
```

SEARCH……examples

Wildcards search

```
IPL31>  sea test.txt "c%n"

%SEARCH-I-NOMATCHES, no strings matched

IPL31>  sea test.txt "c%n"/wil

second line
```

Skip the first 3 matches and display only 2 matches

```
IPL31>  sea test.txt line/limit=2/skip=3

fourth line

fifth line
```

SEARCH……examples

The new qualifier may be used to type a file from the middle, Here is an example of typing the file starting from the 4th line....

```
IPL31>  search test.txt/skip=3/match=nor
  "nonexistancestring"
fourth line
fifth line
sixth line
```

SHOW SYSTEM/IMAGE

- /IMAGE displays the name of the current image being executed by the process
  - JPI$_IMAGNAME

- May be used on remote systems running previous versions of VMS
  - SHOW SYSTEM/NODE=FOO /IMAGE

- May be combined with any existing qualifier
  - SHOW SYSTEM/IMAGE/INTER to get list of images being executed by all the interactive users on the system

SHOW SYSTEM/IMAGE

```
IPL31> show sys/image
OpenVMS XAAU-T3Z  on node IPL31  17-MAY-2004 10:36:18.28  Uptime  0 00:33:20
  Pid     Process Name     State   Pri     I/O        CPU        Page flts   Pages
23E00401 SWAPPER           HIB     16        0    0 00:00:06.26         0        0
23E00407 CLUSTER_SERVER    HIB     14       12    0 00:00:00.02       149      209
         $5$DKA0:[SYS0.SYSCOMMON.][SYSEXE]CSP.EXE;1
23E00408 SHADOW_SERVER     HIB      5        6    0 00:00:00.06       338      256
         $5$DKA0:[SYS0.SYSCOMMON.][SYSEXE]SHADOW_SERVER.EXE;1
23E00409 CONFIGURE         HIB      8       15    0 00:00:00.01       118      130
         $5$DKA0:[SYS0.SYSCOMMON.][SYSEXE]CONFIGURE.EXE;1
23E0040A USB$UCM_SERVER    HIB      4      156    0 00:00:00.31       490      493
         $5$DKA0:[SYS0.SYSCOMMON.][SYSEXE]USB$UCM_SERVER.EXE;1
23E0040B LANACP            HIB     14       59    0 00:00:00.10       418      265
         $5$DKA0:[SYS0.SYSCOMMON.][SYSEXE]LANACP.EXE;1
23E0040C FASTPATH_SERVER   HIB     10        8    0 00:00:00.05       350      256
         $5$DKA0:[SYS0.SYSCOMMON.][SYSEXE]FASTPATH_SERVER.EXE;1
23E0040D IPCACP            HIB     10        9    0 00:00:00.02       121      173
         $5$DKA0:[SYS0.SYSCOMMON.][SYSEXE]IPCACP.EXE;1
23E0040E ERRFMT            HIB      7      121    0 00:00:00.12       364      418
         $5$DKA0:[SYS0.SYSCOMMON.][SYSEXE]ERRFMT.EXE;1
23E0040F CACHE_SERVER      HIB     16        2    0 00:00:00.01        94      128
         $5$DKA0:[SYS0.SYSCOMMON.][SYSEXE]FILESERV.EXE
23E00410 OPCOM             HIB      6       49    0 00:00:00.03       183      150
         $5$DKA0:[SYS0.SYSCOMMON.][SYSEXE]OPCOM.EXE
23E00411 AUDIT_SERVER      HIB      8       60    0 00:00:00.08       265      265
         $5$DKA0:[SYS0.SYSCOMMON.][SYSEXE]AUDIT_SERVER.EXE;1
23E00412 JOB_CONTROL       HIB      8       51    0 00:00:00.05       157      239
         $5$DKA0:[SYS0.SYSCOMMON.][SYSEXE]JBC$JOB_CONTROL.EXE;1
23E00414 QUEUE_MANAGER     HIB      8       80    0 00:00:00.07       244      338
```

DIRECTORY/SELECT=VERSION

- DIR/SELECT=VERSION=MIN=xxx
- DIR/SELECT=VERSION=MAX=yyy

$ dir/sele=ver=(min=75,max=80)

```
Directory SYS$SYSROOT:[SYSMGR]

DECW$SERVER_0_ERROR.LOG;77          DECW$SERVER_0_ERROR.LOG;76
OPERATOR.LOG;75

Total of 3 files.
```

- Useful tool for detecting files approaching the maximum version limit
- $ dir sys$sysdevice:[000000...]*.* /sele=ver=min=32000

SHOW FASTPATH

- Displays fastpath port assignment and usage
  - Supported qualifiers - /CPU and /OUT

```
meat> sh fast/cpu=(8,5)
Fast Path preferred CPUs on MEAT 17-MAY-2004 04:52:40.64
Compaq AlphaServer GS140 6/525 with 6 CPUs


Device:              Fastpath CPU:
PKA0                      8
PKD0                      5
EWA0                      8
EWD0                      5


OpenVMS TCP/IP is currently running on CPU 8
OpenVMS Lock Manager is currently running on CPU 5
```

SHOW FASTPATH

```
meat> show fast
Fast Path preferred CPUs on MEAT 17-MAY-2004 08:27:44.86
Compaq AlphaServer GS140 6/525 with 6 CPUs


Device:            Fastpath CPU:
PGA0                     9
PNA0                     4
PEA0                     6
PKA0                     8
PKB0                     7
PKC0                     6
PKD0                     5
PKE0                     4
EBA0                     7
EWA0                     8
EWB0                     7
EWC0                     6
EWD0                     5
EWE0                     9


OpenVMS TCP/IP is currently running on CPU 8
OpenVMS Lock Manager is currently running on CPU 5
meat>
```

Clusterwide logical names

- SHOW LOGICAL/CLUSTER
  - Displays all the logical names under the LNM$CLUSTER table.
  - The /full qualifier parses the clusterwide bit in LNMB$L_FLAGS

- DEFINE/CLUSTER_SYSTEM and ASSIGN/CLUSTER_SYSTEM
  - Defines a logical name in the LNM$SYSCLUSTER table

- DEASSGIN/CLUSTER_SYSTEM
  - Deassigns a logical name from the LNM$SYSCLUSTER table

COPY

- CTRL-T AST routine has been added to the copy utility
  - Displays the progress of a COPY operation

```
$ copy sys$system:sysdump.dmp [] /log
 Copying: SYS$SYSROOT:[SYSEXE]SYSDUMP.DMP;1 (0% completed)
         2032 blocks copied of 375777
 Copying: SYS$SYSROOT:[SYSEXE]SYSDUMP.DMP;1 (3% completed)
         11938 blocks copied of 375777
 Copying: SYS$SYSROOT:[SYSEXE]SYSDUMP.DMP;1 (8% completed)
         32766 blocks copied of 375777
```

DELETE / PURGE

- CTRL-T AST routine has been added to delete and purge
  - Displays the file currently being deleted
  - If /GRAND specified, the total number of blocks/bytes deleted are also displayed

```
IPL31> del SYS$SYSDEVICE:[TEST]*.*;*
IPL31::_TNA3: 15:19:20 DELETE    CPU=00:00:08.44 PF=1359 IO=31790 MEM=231
 Deleting: SYS$SYSDEVICE:[TEST]DECW$SERVER_MAIN.EXE;1
IPL31::_TNA3: 15:19:23 DELETE    CPU=00:00:08.53 PF=1367 IO=32118 MEM=239
 Deleting: SYS$SYSDEVICE:[TEST]NICONFIG.EXE;1

IPL31> del SYS$SYSDEVICE:[TEST]*.*;*/grand
IPL31::_TNA3: 15:20:21 DELETE    CPU=00:00:10.35 PF=1628 IO=38407 MEM=207
 Deleting: SYS$SYSDEVICE:[TEST]CMS$DW.EXE;1
          75651 total blocks deleted
```

CREATE & DELETE /MAILBOX

- Added support for creating a temporary and permanent mailboxes from DCL

- The following qualifiers are supported for creating a mailbox from DCL
  - /MAILBOX
  - /PERMANENT (default is NOPERMANENT)
  - /MESSAGE_SIZE
  - /BUFFER_SIZE
  - /PROTECTION
  - /LOG

- The /MAILBOX qualifier has been added to DELETE
  - DELETE/MAILBOX only marks the mailbox for deletion, the actual deletion of the device will occur when the reference count will drop to 0.

CREATE & DELETE /MAILBOX

```
$ create/mailbox/message=1024/buffer=2047/perm/log my_mbx
%CREATE-I-CREATED, MBA40: created
$ show log my_mbx
   "MY_MBX" = "MBA40:" (LNM$SYSTEM_TABLE)
$ show dev mba40/full

Device MBA40:, device type local memory mailbox, is online, record-oriented
    device, shareable, mailbox device.

    Error count                     0    Operations completed                0
    Owner process                  ""    Owner UIC                    [SYSTEM]
    Owner process ID         00000000    Dev Prot    S:RWPL,O:RWPL,G:RWPL,W:RWPL
    Reference count                 0    Default buffer size             1024

$ del/mail mba40 /log
%DELETE-I-MBXDEL, Mailbox MBA40 has been marked for deletion
$ show dev mba40
%SYSTEM-W-NOSUCHDEV, no such device available
$
```

WRITE /NOWAIT

- Writing to a mailbox resulted in a hang (waiting for a reader)

- When the /NOWAIT qualifier is specified, the $PUT service uses the IO$M_NOW modifier
  - The operation completes immediately instead of synchronizing with another reader of the mailbox

- If the QIO server was still alive we could have implemented ICC and not only IPC in DCL ☺

SHOW DEV/FULL

```
$ show dev dsa0/full

Disk DSA0:, device type Generic SCSI disk, is online, mounted, file-oriented
    device, shareable, available to cluster, error logging is enabled, device
    supports bitmaps (no bitmaps active).


    Error count                      0    Operations completed             52
    Owner process                   ""    Owner UIC                 [SYSTEM]
    Owner process ID          00000000    Dev Prot      S:RWPL,O:RWPL,G:R,W
    Reference count                  1    Default buffer size             512
    Total size                 16.95GB    Sectors per track               254
    Total cylinders               7001    Tracks per cylinder              20
    Logical Volume Size        16.95GB    Expansion Size Limit         1.00TB

    Volume label          "MIKAXPSYS"    Relative volume number            0
    Cluster size                     9    Transaction count                 1
    Free space                 12.90GB    Maximum files allowed        419004
    Extend quantity                  5    Mount count                       3
    Mount status               System    Cache name        "_$5$DKA0:XQPCACHE"
    Extent cache size               64    Maximum blocks in extent cache  2705832
    File ID cache size              64    Blocks in extent cache            0
    Quota cache size                 0    Maximum buffers in FCP cache   2604
    Volume owner UIC             [1,1]    Vol Prot     S:RWCD,O:RWCD,G:RWCD,W:RWCD
```

OpenVMS V8.2 MONITOR

- **MONITOR changes for OpenVMS V8.2**

  - Did you know that MONITOR was written in VAX PL/I ?

  - Did you know that MONITOR is a VESTed image on OpenVMS Alpha – even on V7.3-2?

  - Did you know that too many users of MONITOR can impact system performance?
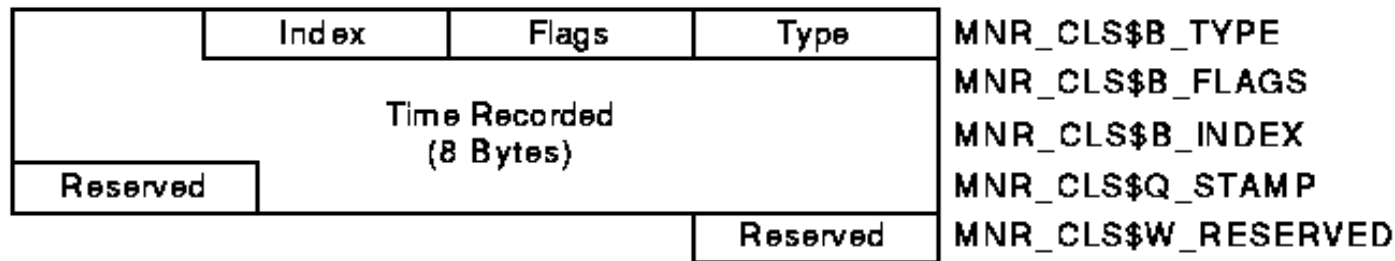
MONITOR Updates

- The VAX PL/1 code has been converted to C.
  - Monitor now runs Native on both OpenVMS Alpha and IPF with V8.2

- A number of Performance enhancements have been made

- A few fixes have been made
  - seeing an average higher than a max
  - seeing more than 100%

- Added a CUR display for MONITOR SYSTEM
  - Current processes used to be listed as "Other"

Monitor Data Alignment

- The internal data buffers and output file records used by MONITOR were designed when it was more important to save a byte

- A 13 byte header preceded each record

Index	Flags	Type	MNR_CLS$B_TYPE
			MNR_CLS$B_FLAGS
Time Recorded (8 Bytes)			MNR_CLS$B_INDEX
			MNR_CLS$Q_STAMP
Reserved			
		Reserved	MNR_CLS$W_RESERVED

ZK-1983-GE

- This left the data following the header unaligned
- If the data consisted of 20 longwords, an alignment fault would often occur on each item

Alignment Updates

- To resolve this issue, the header has been increased to 16 bytes

- In addition, three other records had poor alignment and were corrected.

- These changes impact the output record format of monitor and the format of data passed to other nodes in the cluster

- The MONITOR utility on V8.2 can understand pre V8.2 formats when reading recorded data or when monitoring pre V8.2 nodes within the cluster.

- However, pre V8.2 nodes DO NOT understand the new format
  - Pre V8.2 nodes can not read recorded data files from V8.2 nodes
  - Pre V8.2 nodes can not interactivity monitor V8.2 nodes in the same cluster

MONITOR_CONVERT

- We have provided a utility that allows V8.2 format MONITOR data files to be converted back to the prior format.

- The image and source is available in SYS$EXAMPLES:
  - MONITOR_CONVERT.C
  - MONITOR_CONVERT.EXE

  - Usage:
    - $ define monitor_convert sys$examples:monitor_convert
    - $ mc monitor_convert <input-file> <output-file>

F$LICENSE

- Returns TRUE if the product is licensed to run on the current node
  - Supported only for DEC/CPQ/HP products
- On OpenVMS I64, the lexical function searches the Operating Environment database as well
- Used by VMSINSTAL.COM
  - On I64 logical names are not the way to determine PAK existence
- Additional item codes may be added in the future (units loaded…)

```
IPL31> show licen openvms-i64-mcoe

Active licenses on node IPL31:

------- Product ID --------    ---- Rating ----- -- Version --
Product             Producer    Units PPL   Activ Version Release    Termination
OPENVMS-I64-MCOE    HP             10  1      0     0.0  (none)      (none)
IPL31> write sys$output f$license("vmscluster")
TRUE
IPL31> write sys$output f$license("unknown")
FALSE
IPL31>
```

F$FID_TO_NAME

- Converts file id to file specification using LIB$FID_TO_NAME

- Accepts two arguments, device name and file id
  - The fid may be provided with or without brackets

- LIB$FID_TO_NAME has been modified to support wild operations

```
$ write sys$output f$fid_to_name("sys$sysdevice","(2901,33,0)")
DISK$BLUSKY_XA77:[VMS$COMMON.SYSEXE]SHOW.EXE;1

$ write sys$output f$fid("$1$dkc600","(9232,0,0)")
PEPTO:[GUY]LOGIN.COM;29

IPL31> write sys$output f$fid("sys$login",f$file("sys$login:sda.init","fid"))
PEPTO:[GUY]SDA.INIT;2
```

Better MULTIPATH support

- New lexical function F$MULTIPATH

  - **Functionality equivalent to SYS$DEVICE_PATH_SCAN**
  - **Returns the displayable pathname for a given device**
  - **Can be used to return all displayable paths**
  - **Currently accepts only one item code – MP_PATHNAME**

- Optional PATHNAME argument added to $GETDVI and F$GETDVI

```
$ write sys$output -

_ f$getdvi("$1$dga100","errcnt","PGB0.5000-1FE1-0000-0AF4")

0
```

System Service Logging

- Mechanism to record information about system service activity for:
  - Exec and kernel mode services
  - Execlet and privileged shareable image services
  - a specific process

- Main goal is to aid in troubleshooting

- Information that's recorded
  - Service identification, Caller of the service request – image and offset, Access mode of requestor, Service arguments, Time stamp, & Completion status

- Display logged information via DCL command ANALYZE/SSL <file>

System Service Logging

- ANALYZE/SSLOG allows filtering the report by
  - Access mode
  - Completion status
  - System service name
  - Image name

```
IPL31> ty ssl.com
$ inner=0
$ define sys$output nla0:
$ loop1:
$ if inner .gt. 2000 then goto end_loop1
$ write sys$output f$fid("pepto","(9232,24,0)")
$ dloop=F$FAO("Inner loop count is !SL !/",inner)
$ goto loop1
$ end_loop1:
$ deass sys$output
$ exit
```

ANALYZE/SSLOG/STAT

```
IPL31> ana/ssl/stat


START   version: 1.1 process: 26800426 GUY                !24-NOV-2004 12:43:52.54
        username: GUY                          node: IPL31   platform: IA64
        buffer count: 6    size: 65024   start_flags:  00000003
```

Service	Count	User	Super	Exec	Kernel	Rate/sec
SYS$RMS_GET	185874	0	185874	0	0	939.7
SYS$$ENQ	111680	0	0	1	111679	564.6
SYS$$DEQ	109722	0	0	1	109721	554.7
SYS$$QIO	76406	0	36996	36622	2788	386.3
SYS$RMS_FIND	37180	0	37180	0	0	188.0
SYS$PERSONA_EXTENSION_LOOKUP	37146	0	0	0	37146	187.8
SYS$GETDVI	37018	0	37000	18	0	187.1
SYS$ASSIGN_LOCAL	36970	0	36952	18	0	186.9
SYS$FILESCAN	36856	0	36856	0	0	186.3
SYS$CLRAST_INTERNAL	36837	0	0	36837	0	186.2
SYS$DASSGN	36801	0	36778	10	13	186.1
SYS$$TRNLNM	36765	0	36699	66	0	185.9
SYS$DCLAST	36729	0	0	36729	0	185.7
SYS$RMS_PUT	36669	0	36669	0	0	185.4
SYS$SYNCH_INT	326	0	326	0	0	1.6
SYS$CRMPSC_FILE_64	32	0	0	32	0	0.2
SYS$MGBLSC_64	25	0	0	25	0	0.1
SYS$CMKRNL	18	0	0	18	0	0.1
SYS$SETPRT_64	12	0	0	12	0	0.1

ANALYZE/SSLOG/SELECT=ACCESS

```
IPL31> ana/ssl/stat/select=access=user


START   version: 1.1 process: 26800426 GUY                !24-NOV-2004 12:43:52.54
        username: GUY                           node: IPL31   platform: IA64
        buffer count: 6    size: 65024   start_flags:  00000003
Service                          Count      User      Super      Exec      Kernel      Rate/sec
--------                         ------    ------     ------    ------     ------      --------
SYS$EXPREG                          3         3          0         0          0          0.0
SYS$GETJPI                          2         2          0         0          0          0.0
SYS$SET_PROCESS_PROPERTIESW         1         1          0         0          0          0.0
SYS$SETEXV                          1         1          0         0          0          0.0
SYS$IMGACT                          1         1          0         0          0          0.0
SYS$GETSYI                          1         1          0         0          0          0.0
SYS$EXIT_INT                        1         1          0         0          0          0.0


IPL31>ana/ssl/select=access=user     ! Looking at all the entries


SYS$GETSYI                               sts: 00000001   acmode: U    !12:47:10.34
        image:                   SYSTEM_PRIMITIVES_MIN+00199920   argct: 07
        arg  1:0000000000000080  2:0000000000000000  3:0000000000000000
        arg  4:000000007ad178b0  5:000000007ad178c0  6:0000000000000000
        arg  7:0000000000000000
         entry number: 0065CF6A    number at completion: 0065CF6A
```

ANALYZE/SSLOG/SELECT=STATUS

```
IPL31> exit %x1bc
%SYSTEM-F-NOLOGNAM, no logical name match
```

```
IPL31> ana/ssl/stat/sele=status=1bc
```

```
START   version: 1.1 process: 26800426 GUY              !24-NOV-2004 12:43:52.54
        username: GUY                           node: IPL31   platform: IA64
        buffer count: 6    size: 65024    start_flags:  00000003
Service                          Count     User     Super     Exec     Kernel    Rate/sec
--------                         ------    ------   ------    ------    ------    --------
SYS$$TRNLNM                         23        0        1        22        0        0.1
```

- **Selecting by system service name**

```
IPL31> ana/ssl/stat/sele=sysser=sys$getdvi
```

```
START   version: 1.1 process: 26800426 GUY              !24-NOV-2004 12:43:52.54
        username: GUY                           node: IPL31   platform: IA64
        buffer count: 6    size: 65024    start_flags:  00000003
Service                          Count     User     Super     Exec     Kernel    Rate/sec
--------                         ------    ------   ------    ------    ------    --------
SYS$GETDVI                        37018       0      37000       18        0       187.1
```

ANALYZE/SSLOG/SELECT=IMAGE

```
IPL31> ana/ssl/stat/select=image=dcl


START   version: 1.1 process: 26800426 GUY                !24-NOV-2004 12:43:52.54
        username: GUY                           node: IPL31   platform: IA64
        buffer count: 6    size: 65024   start_flags:  00000003
```

Service	Count	User	Super	Exec	Kernel	Rate/sec
SYS$FILESCAN	36856	0	36856	0	0	186.3
SYS$DASSGN	36778	0	36778	0	0	185.9
SYS$DCLEXH	1	0	1	0	0	0.0
SYS$IMGACT	1	0	1	0	0	0.0
SYS$SETEXV	1	1	0	0	0	0.0
SYS$RMSRUNDWN	1	0	1	0	0	0.0

System Service Logging at work

- When we started using ANALYZE/SSLOG internally we found some interesting "features"..

```
BLUSKY> ty loop.com
$ start=f$time()
$ i=25000
$ loop:
$ if i .eq. 0 then goto exit
$ i=i-1
$ goto loop
$ exit:
$ end=f$time()
$ write sys$output f$delta(start,end)
```

```
 Alpha personal workstation without the fix

BLUSKY> @loop
0 00:00:06.61


Same system with the new DCL image:

BLUSKY> @loop
 0 00:00:04.70
```

SET / SHOW IMAGE

- SET IMAGE modifies or restores the image attributes of an OpenVMS ELF image file (but will work from Alpha or I64)
  - /RESTORE – Restores the original image attributes
  - /SUCCESS – Modifies the image link completion code value to success
  - /FLAGS – image attribute flags to modify
    - CALL_DEBUG, DBG_IN_DSF, DBG_IN_IMG, EXE_INIT, IMGSTA, INITIALIZE, MAIN, MKTHREADS, NOP0BUFS, P0IMAGE, TBK_IN_DSF, TBK_IN_IMG, UPCALLS

```
IPL31> show image hello
Show Image Version 1.2                                    2-OCT-2004 13:00:46.70
$1$DKC600:[GUY]HELLO.EXE;11
This is an OpenVMS IA64 (Elf format) executable image file


Image Identification Information


                    Image name: HELLO
      Global Symbol Table name: HELLO
     Image file identification: V1.0
    Image build identification: <unavailable>
           Link identification: Linker I02-14
               Link Date/Time:  2-OCT-2004 12:48:03.39
             Patch Date/Time: Never
       Manipulation Date/Time:  2-OCT-2004 13:00:42.21
      Image Dynamic Data Version: 1.2


Image Completion Code Value: SUCCESS   State: Original


Image Link Flags state: Manipulated


    Current Image Flags         Original Link Flags
    -------------------         -------------------
    IMGSTA                      IMGSTA
    TBK_IN_IMG                  MAIN
                                TBK_IN_IMG


    Image Link Flag   Description
    ---------------   -------------------------------------
    IMGSTA          : Call SYS$IMGSTA
    MAIN           : Image has main transfer
    TBK_IN_IMG     : Traceback records in image file
```

COPY / BLOCK_SIZE

- ## COPY/BLOCK_SIZE
  - V8.2 default buffer size used by copy has been set to 124 blocks
    - V7.3-2 it was 127 blocks
    - Pre V7.3-2 – 64 blocks
  - having the clustersize/LBN offsets be a mulitiple of 4 can assist in the optimal behavior of larger writes.
  - Performing I/Os in multiple of 4 has been proven to assist as well.
  - COPY/BLOCK_SIZE allows overriding the default block size used by copy

TRACEBACK

- Traceback information was not being displayed for resident images
  - Oracle blackmailed us to get it working ☺
- The new trace image available for V7.3-1 and V7.3-2

- With the completion of this change, Oracle will now support installing the main Oracle image resident
  - Requires a new Linker for V7.3-1
  - Significant performance improvement for Oracle users
  - V8.2 - DISMNTSHR is now installed with /SHARE=ADDRESS

Symbolic links support

- CREATE/SYMLINK
  - cre/sym="/vms$common/sysexe/dcl.exe" dcl_link.txt

- SET/SHOW ROOT
  - `/SYSTEM`
  - `/PROCESS`

- SET DEFAULT now supports POSIX pathnames

```
$ set def "^UP^/sys0/syslib"
$ show def
DISK$MAINLINE:[SYS0.SYSLIB]
```

Symbolic links support

- New Lexical functions
  - F$READLINK

    ```
    IPL31> write sys$output f$readlink("link.txt")
    /login.com
    ```

  - F$SYMLINK_ATTRIBUTES
    - Built as a wrapper around F$FILE_ATTRIBUTES
    - Accepts the same item codes as F$FILE
    - Operates on the symbolic link instead of following it

- New flag added to LIB$FIND_FILE
  - LIB$M_OPEN_SPECIAL

Symbolic links support

- DIRECTORY
  - DIR/FULL displays the link contents
  - If any file attribute requested, the contents of the link is also displayed

```
IPL31> dir/dat


Directory $1$DKC600:[TOPAZ.SYMLINK_TEST]


A.A;1                      24-NOV-2004 14:26:34.07
B.B;1                      24-NOV-2004 14:26:36.46
LINK.TXT;1 -> /login.com
                           16-OCT-2004 18:20:28.13
Z.Z;1                      24-NOV-2004 14:26:39.90


Total of 4 files.
```

General Enhancements (1 OF 3)

- The PATCH utility has been ported to Alpha and I64
  - Currently only absolute mode supported
  - On I64 the patching time is recorded in the image header or in the object header.
  - ANALYZE/IMAGE and SHOW IMAGE display the patch time

- Phantom process holding tape drive problem finally fixed.
  - The fix is also available in VMS732_MOUNT96-V0100

- BACKUP/PHYSICAL does not require disks to be identical in size.

General Enhancements (2 OF 3)

- SHOW DEVICE – Allow combining /MULTIPATH and /MOUNT

```
meat> show dev/multi/mount

Device                    Device           Error          Current
 Name                     Status           Count   Paths    path
$1$DGA3800:      (MEAT)  Mounted              0    2/ 2  PGA0.5000-1FE1-0011-B15D
$1$DGA3810:      (MEAT)  Mounted              0    2/ 2  PGA0.5000-1FE1-0011-B15D
```

- SET PROTECTION – Disallow combining /PROTECTION and /DEVICE
  - This combination was not doing anything, now you get an error

General enhancements (3 OF 3)

- SET FILE / ATTRIBUTE
  - The following qualifiers have been added
  - Not documented but fully supported (will be documented with V8.3)
    - /ACCDATE
    - /ATTDATE
    - /BAKDATE
    - /CREDATE
    - /EXPDATE
    - /MODDATE
    - /REVDATE

- Encrypt is Free with V8.2
  - BACKUP/ENCRYPT may be used for creating encrypted savesets
  - Uses DESCBC encryption algorithm

New LMF features in V8.2-1

- Hard partition support

  - SHOW LICENSE/CHARGE now displays the maximum number of CPU sockets supported by the platform

```
$ sh lic/char
OpenVMS I64/LMF Charge Information for node SD00
This is an HP SD64A  (1.50GHz/6.0MB), with 8 CPUs active
This platform supports up to 64 CPU socket(s)
Type: PPL,   Units Required: 8  (I64 Per Processor)
```

- Units assignment tool

The units assignment tool

- The units assignment tool is designed to help customers distribute PPL licensing units across the cluster
  - Very useful when trying to create large configurations
  - The tool generates CSV file describing the current licensing environment across the cluster
  - The CSV file may be edited per the requirements of the customer
  - The tool can generate LMF scripts based on the content of the file
  - LMF$PPL_UNITS_ASSIGNMENT.COM

VMS82I_LMF-V0100

- The first LMF kit for integrity servers released July 2005

  - Rated INSTALL_1

  - Removes the requirement for SYSLCK privilege for various SHOW LICENSE operations

  - Adds support for the educational program

Agenda

Customizing CTRL-T output

- The output of the CTRL-T message may be customized

- The contents of the symbol DCL$CTRLT will be appended to the traditional CTRL-T output
  - Useable from applications / DCL
  - May be used for debugging applications
  - Display the name of current procedure being executed by DCL
  - ….and much more…

- Like every symbol, DCL$CTRLT may have different values in different procedure levels

```
IPL31> ty ctrlt_loop.com

$ inner=0
$ outer=0
$ loop:
$ loop1:
$ if inner .gt. 20000 then goto end_loop1
$ inner=inner+1
$ dcl$ctrlt=F$FAO("Inner loop count is !SL !/ Outer loop count is !SL",inner,outer)
$ goto loop1
$ end_loop1:
$ inner=0
$ outer=outer+1
$ goto loop

IPL31> @ctrlt_loop
IPL31::GUY 10:46:37   (DCL)    CPU=00:03:42.68 PF=13453 IO=6743 MEM=187
Inner loop count is 12306
Outer loop count is 0
IPL31::GUY 10:46:43   (DCL)    CPU=00:03:49.19 PF=13455 IO=6744 MEM=187
Inner loop count is 19200
Outer loop count is 2
```

Simple DCL procedure demonstrating
Customizing CTRL-T output

```
IPL31> ty ctrlt_looper.c

        #include <descrip>
        void main()
        {
        int counter=0;
        $DESCRIPTOR(sym_name,"dcl$ctrlt");
        static struct dsc$descriptor_s value_desc;
        char buffer[256]={0};

                value_desc.dsc$b_dtype = DSC$K_DTYPE_T;
                value_desc.dsc$b_class = DSC$K_CLASS_S;
                while (1){
                        counter++;
                        sprintf(buffer,"Counter is %d",counter);
                        value_desc.dsc$a_pointer = buffer;
                        value_desc.dsc$w_length =  strlen(buffer);
                        lib$set_symbol(&sym_name,&value_desc);
                }
        }
IPL31> r ctrlt_looper
IPL31::GUY 10:47:27 CTRLT_LOO CPU=00:03:53.26 PE
Counter is 216766
IPL31::GUY 10:47:28 CTRLT_LOO CPU=00:03:54.45 PE
Counter is 338429
```

Simple C program demonstrating
Customizing CTRL-T output

Customizing CTRL-T output

- Displaying the name of the current procedure

```
$!
$ if f$trnlnm("DCL$CTRLT_DEBUG") .NES. ""
$ then
$       dcl$ctrlt =  f$parse(f$environment("procedure"),,,"NAME") -
                  + f$parse(f$environment("procedure"),,,"TYPE")
$ endif
$
```

- With V8.3, when SYS$OUTPUT is redirected, CTRL-T output will still be displayed on the terminal.

Remote CTRL-T

- Introducing the concept of remote CTRL-T

  - CTRL-T can display standard CTRL-T information about remote processes.

  - Remote may be on a different system in the cluster

  - The symbol DCL$CTRLT_PID should contain the PID of the remote process

Remote CTRL-T

```
Running on node BLUSKY....hitting CTRL-T

$

BLUSKY::SYSTEM 17:40:55    (DCL)    CPU=00:00:00.16 PF=212 IO=98 MEM=146

$

$! Now define the new symbol

$!

$ dcl$ctrlt_pid="23800436"

$

$! Hit CTRL-T again

$!

IPL31::GUY 17:41:12 LOOPER    CPU=01:28:05.17 PF=2700 IO=594 MEM=322

$

IPL31::GUY 17:41:14 LOOPER    CPU=01:28:07.02 PF=2700 IO=594 MEM=322

$
```

BACKUP$_OPERSPEC

- When BACKUP requires the operator's intervention BACKUP$_OPERSPEC message is sent to the OPCOM.

- With several jobs running in parallel, it is not trivial identifying the job that made the request.

- BACKUP$_OPERSPEC has been modified to include process identification and target backup device

```
%%%%%%%%%%  OPCOM  27-JUN-2005 07:55:30.46  %%%%%%%%%%

Request 13, from user GUY on GODOWS

%BACKUP-I-OPERSPEC, specify option (QUIT or CONTINUE)

Requesting PID:000002B8, Target Device:_$1$DKB600
```

BACKUP / QUOTA

- Setting DIOLM to 8 improves the performance of new storage controllers (especially XP controllers)

- Setting DIOLM to 8 might be too low for other applications

- Creating separate account for BACKUP is not always feasible

- BACKUP/QUOTA=DIOLM=n will limit BACKUP to n outstanding I/Os

New Permanent DCL symbols

- On image rundown DCL populates $SEVERITY and $STATUS

- Added $FACILITY and $IDENT

```
$ exit   %x10911a02
$ show symbol $status
  $STATUS == "%X10911A02"
$ show symbol $facility
  $FACILITY == "%X00000091"
$ show symbol $ident
  $IDENT == "%X00000340"
$ show symbol $severity
  $SEVERITY == "2"
$
```

SHOW PROCESS

- SHOW PROCESS/CONTINUOUS now supports the 'Q' option….

- 'Q' = Quota

    - While the continuous display is running, it is now possible to hit 'Q' and dynamically monitor the process quotas

File   Edit   Terminal   Communication   Options   Macro   Script   Help
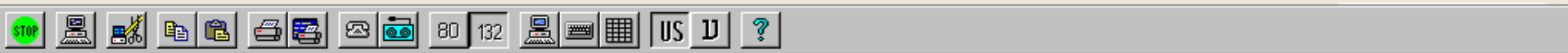
```
                    Process CIMSERVER                09:23:05



       State          LEF            Working set            6223


       PID            00000453       Page faults            5681


       UIC            [SYSTEM]       Event flags         C0000001
                                                         80000000


       # open files remaining        119/128            ( 92%)
       Direct I/O count/limit        100/100            (100%)
       Buffered I/O count/limit        99/100            ( 99%)
       BUFIO byte count/limit    250816/250816           (100%)
       ASTs remaining                 98/100            ( 98%)
       Timer entries remaining         15/16            ( 93%)
       PGFL quota count/limit      39671/43750          ( 90%)
       ENQ quota count/limit        2048/2048           (100%)


       VMS2$DKA600:[SYS0.SYSCOMMON.][WBEM_SERVICES]CIMSERVER.EXE;2
```

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12

| VT420-7 | 24:1 | Eng | Caps | Hold | On Line |

COPY

- V8.2 added the /BLOCK_SIZE qualifier
  - Default I/O size is 124 blocks
  - Maximum I/O size is 127 blocks

- V8.3 removes the I/O size limit
  - Copy has been modified to use RAB64
  - Can't exceed maximum I/O size supported by the port driver
  - Asynchronous I/O will improve performance even more (..but we have to leave something for the next release)
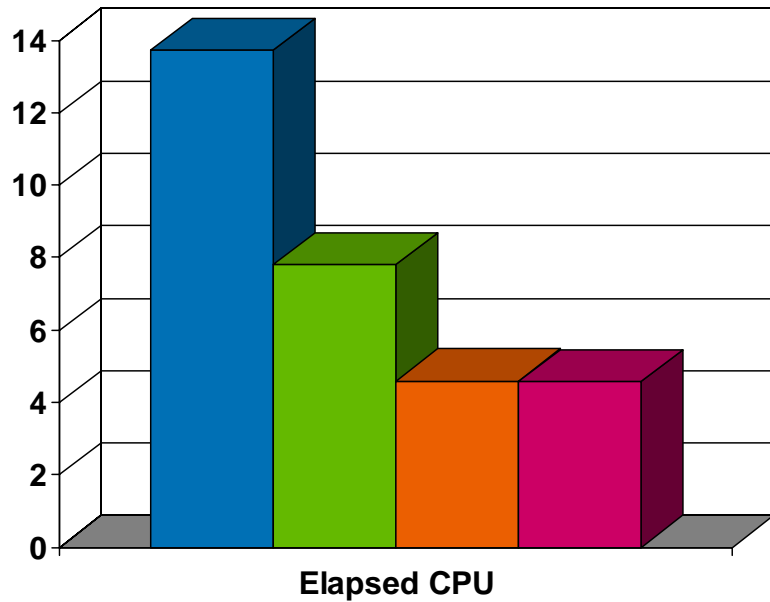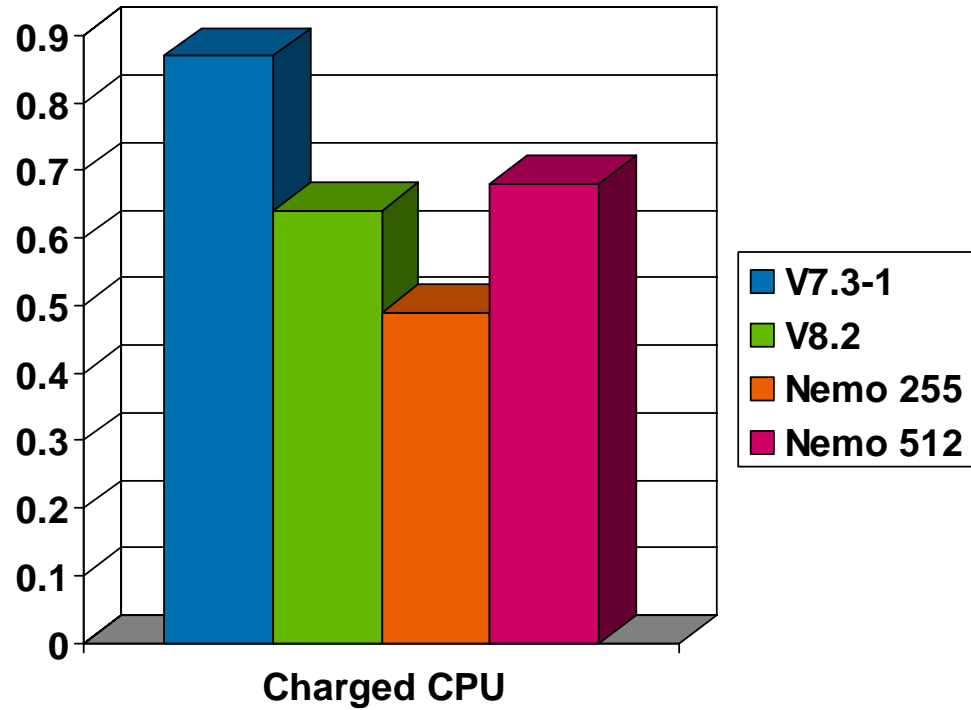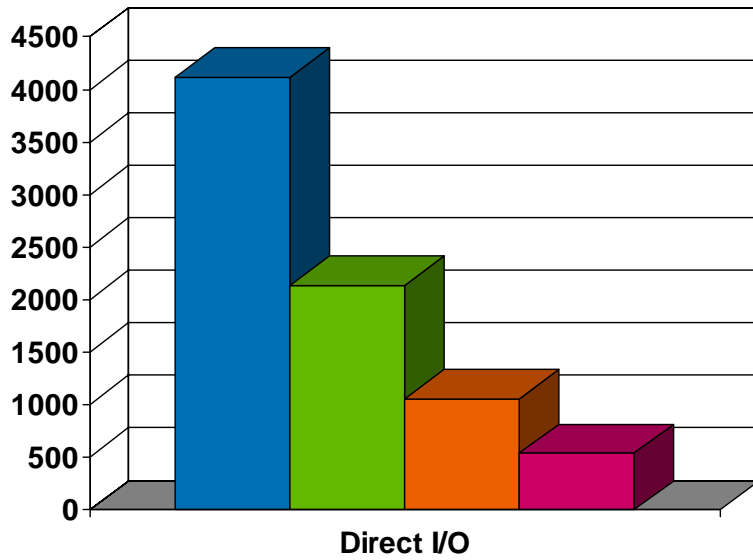
65MB file

DPWS/RZ29

DIFFERENCES

- DIFF/IGNORE=SPACE compresses multiple spaces and tabs down to one space before comparing

- /IGNORE=WHITE_SPACE removes all spaces and tabs before comparing

- In F$EDIT terminology, COMPRESS versus COLLAPSE

- Very useful when looking at code written by different people with different coding preferences

```
status = routine(a,b,c)
        Vs.
status = routine (a,b,c)
```

Lexical Functions

- ## F$LICENSE now supports 3rd party producers
  - Optional producer argument has been added, DEC/HP assumed if omitted.

  ```
  $ write sys$output f$license("PLI","KEDNOS")
  TRUE
  ```

- ## F$CUNITS – New lexical function
  - F$CUNITS (number to convert, from_units, to_units)
  - The first argument is limited to 32bits
  - Currently only knows how to convert blocks to bytes
  - What else do you need?

  ```
  $ write sys$output f$cunits(4432216,"blocks","bytes")
  2.11GB
  ```

Lexical Functions

- ## F$MATCH_WILD
  - Performs wildcard matching between candidate and pattern string
  - Returns TRUE if the strings match
  - Syntax
    - F$MATCH_WILD (CANDIDATE, PATTERN)

```
$ write sys$output f$match_wild ("This is a candidate","*c%%d*")
TRUE
$
```

SEARCH / STATISTICS

- SEARCH/STATISTICS now defines several DCL symbols with statistics information

```
Files searched:              125      Buffered I/O count:       602

Records searched:          15575      Direct I/O count:         135

Characters searched:      842598      Page faults:               36

Records matched:              45      Elapsed CPU time:  0 00:00:00.26

Lines printed:                97      Elapsed time:      0 00:00:02.87


$ sh sym search*

  SEARCH$CHARACTERS_SEARCHED = "842598"

  SEARCH$FILES_SEARCHED = "125"

  SEARCH$LINES_PRINTED = "97"

  SEARCH$RECORDS_MATCHED = "45"

  SEARCH$RECORDS_SEARCHED = "15575"
```

DIRECTORY & MAGTAPES

– To DIRECTORY….All blocks are created equal ☺

```
$ dir mkb100:[000000]/siz


        Directory MKB100:[]

        LEEHE.BCK;1              520KB
        TEST1.BCK;1             619KB
        TEST2.BCK;1             619KB
        TEST3.BCK;1              74KB


        Total of 4 files, 1.78MB

 $ dir mkb100:[000000]/siz


        Directory MKB100:[]

        LEEHE.BCK;1             8.13MB
        TEST1.BCK;1             9.67MB
        TEST2.BCK;1             9.67MB
        TEST3.BCK;1             9.17MB


        Total of 4 files, 36.65MB
```

General Enhancements (1 of 5)

- SYNCHRONIZE/TIME_OUT
  - Allows specifying the number of seconds to wait before terminating the SYNCH command

```
BLUSKY> submit looper
Job LOOPER (queue SYS$BATCH, entry 4) started on SYS$BATCH
BLUSKY> synch/entry=4/time_out=5
%QUEMAN-W-TMOEXP, timeout period expired
```

- New common qualifier keyword /SINCE=JOB_LOGIN
  - JOB_LOGIN is the login time of the master process in the job
  - PIPE creates a subprocess for each pipe segment therefore /since=login can't be used in a PIPE

```
IPL31> pipe dir/sin=login | sea sys$input test
%SEARCH-I-NOMATCHES, no strings matched
IPL31> pipe dir/sin=job_login | sea sys$input test
TEST.TXT;1
```

General Enhancements (2 of 5)

- Assure SET LOGIN/INTERACTIVE succeed during startup
  - No response from the console
  - No response for any interactive login attemp
    - Typically occurs when VMS$BASEENVIRON-050_VMS.COM terminated unexpectedly

- Case sensitivity support in cluster_config.com

- DEASSIGN/NOLOG
  - The completion status will be set to success even if the logical name does not exist (instead of %SYSTEM-F-NOLOG)
  - No output is being displayed

- Performance enhancement to SHOW DEVICE

- Maximum number of sub-processes raised to 32K

- Maximum size of the DCL prompt has been increased to 64 characters (was 32)
  - Allows fancier prompts using escape sequences

- Target account for LMF compliance reports may be controlled by setting

  LMF$COMPLIANCE_CONTACT_ACCOUNT

- AES encryption support in VMS BACKUP

- SET COMMAND/RMS_RELATED_CONTEXT

- READ/WAIT
  - Wait if the record is currently locked by another stream
  - May be combined with /TIME_OUT
  - Sets RAB$V_WAT

- READ/KEY/MATCH={LT|LE}
  - READ/KEY only supports finding matching records with value equal (EQ), greater (GT), or greater or equal (GE) than a key
  - The new keywords add support for finding matching records with value less (LT) or less equal (LE) than a key

General Enhancements (5 of 5)

- ANALYZE/SSLOG

  - Support has been added for selecting entries based on CPU, kernel thread and Pthread IDs.

- SEARCH/WILDCARD_MATCHING

  - Two new keywords RELAXED and STRICT

```
IPL31> ty test.txt
first line
second line
third line

IPL31> sea test.txt "l*n"/wild=relax          ! V8.2 behavior, realx may
                                                be omitted
first line
second line
third line
IPL31> sea test.txt "l*n"/wild=strict         ! Asterisks not appended
                                                match not found
%SEARCH-I-NOMATCHES, no strings matched
IPL31> sea test.txt "*l%n%"/wild=strict        ! Be a little more specific
                                                and match found
first line
second line
third line
```

V8.3 plans

- SHOW PROCESS/FILES/ID

- SHOW FILE/LOCK (temporary name)

- DELETE/TREE

- Callable COPY

- SHOW SYSTEM/DETACH

- Wildcards support in DELETE/SYMBOL

- CTRL-T routine for SET FILE

- User written lexical functions