(E)JES Update

Edward E. Jaffe
Phoenix Software International

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(E)JES Update Summary

- ## The last (E)JES Update was March 2009 at SHARE in Austin (V4R6). Much has happened in those three years!

V4R7: New Customer Application Infrastructure; New resubmit (.S command) CAI plug-in; New // block commands; New parametrized internal security (EJESPSEC); New JES2 Spool Offloader display; Normalized zIIP/zAAP values on ACTIVITY; Accumulate preemptible home time on ACTIVITY; New 'Prom' column on ACTIVITY; New JobName & JobId print extract parameters; Enhanced JES2 LINE command filtering; New high-performance (pipeline friendly) data gathering routines; Increased zIIP eligibility for JES2; Threadsafe EJESCICI using OPENAPI; LPA-eligible EJESCICS; Job Owner added to user exit "fast access" fields; Handle new SPLADDR records in JES3 JESJCLIN; TP Monitor REXX support; $$LOGON REXX in TP Monitor.

V4R8: JES3 Output Descriptor modify; Exception columns; Extended submitter NOTIFY; New SELECT command numerics and ranges; New SELECT command LINECMD; New RowNum column; New OPERLOG message attributes; Work-dependent enclaves; CRDELAY in batch scripts; EAV data set and SPOOL support; New EAV column on SPVVOL; LoCylTrk and HiCylTrk for EAV on SPVOL; New z/OS UNIX componentry; New Java API; New z/OS UNIX file extract; New DASD Extract Data Set Type & Extended Attr; Extract BLKS, TRKS, CYLS, BY, KB, MB; New ThruPut Manager interface; New 'MbrAff' column on JES2 CLASS panel; MQTR support for JES2 dump panels & reports; 'Parameter' field overtypeable in HCHECK; PUBSCLS used for selection; New SAFTRACE invocation keyword; API enumeration stop time; 19% CPU reduction for SPOOL I/O; New REXX samples; TP Monitor password phrase support; PADCHAR(/) in all internal security samples.

V5R1: Require z/Architecture; Pop-up input window; LOG NEXT & PREV H, M, S and D; HCHECK extract messages; HCHECK history; Address book for .M CAI plug-in; NJE, sockets and XMITIP for .M CAI plug-in; ISPF viewers sensitive to record format; Pattern Utility unconditional matching; Sysplex-wide ACTIVITY; ACTIVITY drill-down from STATUS et al; Group work-dependent enclaves; Support JES2 SPOOL migration; Support more than 64 CPUs; Multiline messages on Message Summary; ACCEPT command on CONFIRM screen; Sortable titles turquoise; New JOBRC support; Spin-ANY data set support; Add PRTATTRS and COPYCNT to OUTDESC; Enhance ISFCALLS emulation to z/OS 1.13 level; Support ISFGET, ISFLOG and ISFSLASH; Audit SWB Modification; New JES2 SPVOL 'DJ' line command; New JESPlex 'CASStat' column; New HCHECK 'REXXin' and 'REXXout' columns; Settings Notices syntax highlighting; New JES2 SYSLOG retained action messages; New ENCLAVES Prom and zAAP-, zACP-, zIIP- and zICP- time columns; Sysplex system slot number appended to default console name in EJESUX10; Auto Reply support on SYSREQ; PF keys restructure; Rename DSN command to DDN; DSCT avoidance in JES2; Push sitewide installation defaults; Remove WLM compatibility mode support; Remove limitation on POOLSIZ parameter; TP Monitor system search for modules; TP Monitor TSO foreground support; Userid & SXID mask character compression; Use CEC permanent capacity if available; Separate out z/OS UNIX FMID; Download service via HTTP and cURL, Use uncaptured UCBs and XTIOT.

Compatibility Matrix

Operating System	V5R2 09/12*	V5R1 09/11	V4R8 09/10	V4R7 09/09
z/OS 1.13	JES2/JES3	JES2/JES3	JES3	JES3
z/OS 1.12	JES2/JES3	JES2/JES3	JES2/JES3	JES3
z/OS 1.11	JES2/JES3	JES2/JES3	JES2/JES3	JES2/JES3
z/OS 1.10	JES2/JES3	JES2/JES3	JES2/JES3	JES2/JES3
z/OS 1.9	JES2/JES3	JES2/JES3	JES2/JES3	JES2/JES3
z/OS 1.8	JES2/JES3	JES2/JES3	JES2/JES3	JES2/JES3
z/OS 1.7	JES2/JES3	JES2/JES3	JES2/JES3	JES2/JES3
z/OS 1.6		JES2/JES3	JES2/JES3	JES2/JES3
z/OS 1.5			JES2/JES3	JES2/JES3
z/OS 1.4				JES2/JES3

- Only V5 releases support z/OS 1.13 JES2. All four releases shown support z/OS 1.13 JES3.

- V5R2 GA is *expected* in September 2012.

- V4 releases still support ESA/390 architecture.

- V4R7 will be stabilized at the end of this month (March 2012).

V4R7 Highlights

Customer Application Infrastructure

- Replaced the old Extract Post-Processor Package.
  - EPPP is still delivered for customers that need it.
- Supported code rather than just 'samples'.
- Implemented in REXX instead of CLIST.
  - Original CLIST call structure maintained to allow customer-written CLISTs to still be used. Recommend transition to new REXX-based utilities.
- REXX implementation allows plug-ins to leverage the EJESREXX API.
- New SEJEEXEC library concatenated to SYSEXEC (or SYSPROC).

Customer Application Infrastructure

- The screen shot below shows the delivered CAI plug-ins.
- DX (IPCMDUMP) is my own REXX used to extract a SYSMDUMP from a job and add it to my IPCS inventory.

```
 Jobs   Resources   Devices   Tools   Filter   View   Options   Help
                                                                           _____
S                                                                          of 885
C    File                                                                  > PAGE
C                        Customer Applications        Row 1 to 6 of 6      ords
—   Command ===> _                                   Scroll ===> PAGE     ————————>
.                                                                               73
    I - Insert new entry             Overtype existing                    422,228
    D - Delete existing entry        entries to update                        115
    S - Select existing entry        them.                                  4,796
                                                                                 0
        Cmd-Key    Exec-Name    Comment                                         75
    __    F        EJES#RF      TCP/IP FTP PUT a Report Object                   75
    __    M        EJES#RM      TCP/IP SMTP (e-mail) a Report Object             72
    __    X        EJES#RX      TSO XMIT a Report Object                         72
    __    R        EJES#RR      TSO Receive a Spool Data Set                    115
    __    S        EJES#RS      Resubmit Job Without Editing                  2,154
    __    DX       IPCMDUMP     Extract and process SYSMDUMP with IPCS          27
    *********************** Bottom of data ***************************          440
     F1=Help       F3=Exit      F10=Actions  F12=Cancel                        27
                                                                               504
    DROURK3   T0099553 QUEUED      PRINT          1 278      CC 0000           33
    DROURK3   T0099550 QUEUED      PRINT          1 277      CC 0000           32
```

Parametrized Internal Security

- Replaces the EJESUM2 and EJESUM3 macros with blank-delimited, keyword-based parmlib members that define internal security policies.
- Policy loaded using EJESPSEC TSO/E command.
- Parameters accessed using z/OS IEFPRMLB service.
- Changes takes effect immediately for all new sessions.
- Policy can be backed out if something goes wrong.
- Fall-back to EJESUM2/EJESUM3 if no policy loaded.
- One member can define policies for multiple environments.
  - Selection by WHEN keywords in the specifications.
- REXX utility exists to convert EJESUM2/EJESUM3 specifications to EJESPSEC input format.

ISPF Block Command Compatibility

- (E)JES always had block command support. A single '=' line command copied overtyped from a previous line; a double '==' copied overtypes from a previous line to all intervening lines.

- ISPF added block command support where you must prefix your first line command with // and place // at the end of the range. To maintain ISPF compatibility, (E)JES now supports this method of entering block commands as well as the original method.

```
Cmd  JobName   JobID     Status    Process        Cmd  JobName   JobID     Status    Process
____ _____  _____  _____/_____          ____ _____  _____  _____/_____
//c  COPYEJES  J0281883  W-OUTPUT  OUTSERV         c    COPYEJES  J0281883  W-OUTPUT  OUTSERV
     EJES40    J0281835  W-OUTPUT  OUTSERV              EJES40    J0281835  W-OUTPUT  OUTSERV
     EJES50    J0281836  W-OUTPUT  OUTSERV              EJES50    J0281836  W-OUTPUT  OUTSERV
     EJES23    J0281833  W-OUTPUT  OUTSERV              EJES23    J0281833  W-OUTPUT  OUTSERV
     EJES30    J0281834  W-OUTPUT  OUTSERV              EJES30    J0281834  W-OUTPUT  OUTSERV
     EJES10    J0281829  W-OUTPUT  OUTSERV              EJES10    J0281829  W-OUTPUT  OUTSERV
     EJES20    J0281830  W-OUTPUT  OUTSERV              EJES20    J0281830  W-OUTPUT  OUTSERV
     EJES21    J0281831  W-OUTPUT  OUTSERV              EJES21    J0281831  W-OUTPUT  OUTSERV
     EJES22    J0281832  W-OUTPUT  OUTSERV              EJES22    J0281832  W-OUTPUT  OUTSERV
//   EJES00    J0281828  W-OUTPUT  OUTSERV         ==   EJES00    J0281828  W-OUTPUT  OUTSERV
```

Copy Jobname/Jobid For Sysout Extract

- Previous to this support, all output created by extract to sysout was identified with the jobname and jobid of the address space where (E)JES was executing, e.g. your TSO/E userid.

- A user may now specify that the jobname/jobid values should be copied from the data source. This allows you to reprint a job using its original job name and job number.

```
Copy count     ===>          (1 to 255)
Node ID        ===>          (Primary destination)
Remote ID      ===>          (Remote User ID at destination node)
ExtWtr name    ===>          (Writer name or INTRDR for submit)
Forms ID       ===>
FCB ID         ===>
UCS ID         ===>
Record format  ===>          ('*' to derive from data)
Record length  ===>
Output ref.    ===>          ('*' to create a Dynamic Output Descriptor)
Page eject     ===> NO       (YES or NO to force eject for each dataset)
Header pages   ===> NO       (YES, NO, or JOB to create header pages)
Copy Job info  ===> NO       (YES or NO to copy source job name and ID)

Use HELP command for help; Use END command to cancel extract.
```

2012

High Performance Routines

- In an earlier release, a high performance routine (HPR) facility was developed to make (E)JES code execute faster while accessing data in JES control blocks. HPRs:
  - Have a shorter instruction path length.
  - Avoid delays in modern processor instruction pipelines.
  - Measured performance difference on z9 was about 3x!
- Before V4R7, HPRs were implemented in about half of the JES2 access routines (the most important ones) and none of the JES3 access routines.
  - The JES3 routines had been previously optimized using another technique that was less effective than HPR.
- As of V4R7, 100% of eligible routines for both JESes use the HPR facility. <u>They run FAST</u>! ☺

CICS Enhancements

- EJESCICI was enhanced to use the CICS OPENAPI.
  - CONCURRENCY(THREADSAFE) on DEFINE PROGRAM.
  - Open TCB used instead of the Quasi-Reentrant (QR) TCB.
  - Eliminates task switching to avoid implied WAITs.
- All CICS-related processing and storage is AMODE(31).
- New requirement for LPA residency of EJESCICS.
  - Security/integrity consideration.
  - LPA=YES required in SIT (CICS startup) parameters.
  - USALPACOPY(YES) on DEFINE PROGRAM statements.
- CICS macro-based definitions no longer distributed.

Other V4R7 Enhancements of Note

- Nearly all JES2 data access path length now eligible for zIIP redirection.

- TP Monitor LOGON exit issues the EJES command when a user logs on to the TP Monitor—eliminating the need to press a function key to enter (E)JES.

V4R8 Highlights

RowNum Administrative Column

- V4R8 introduced the new RowNum column, an administrative column that optionally follows the Cmd column located at the extreme left side of a tabular display.

- This new column simply displays the number of the row. Big deal. Right? Reserve judgment until you see how it can be used with the SELECT command enhancements.

- ROWNUM ON|OFF enables/disables this feature.

- You don't directly control the width of the RowNum column. It is automatically sized to three, six, or eleven characters, depending on the total number of rows in the display.

Select Command Enhancements

- The SELECT command was enhanced in two ways:
    - In addition to the existing support for mask comparisons, you may now specify a row number or range of row numbers against which the line command will be issued.
    - You may now use the SELECT command to establish the default line command to be used when not specified on the SELECT command. Previously, that value could be set only by the CURSOR SELECT command or via the **Set cursor retention and selection...** dialog, accessed from the Options pull-down under ISPF.
- When specifying a row number or range of row numbers, the SELECT command itself is optional.

Select Command Enhancements

Exception Columns

- The color and highlighting of several tabular columns is modified depending on the value being formatted. The intent is to make these columns stand out to the user if they indicate errors.

- By default, the modified appearance is yellow and high-intensity. However, this may be customized by the user.

- The columns eligible for this treatment and the values considered to be exceptions are shown in the table below:

Column	Applicable Display(s)	Exception Value
MaxComp	Job and group oriented displays	Anything other than blank or CC 0000
Result	Health Checker	Any value greater than zero
Status	Health Checker	Any **Result** greater than zero.

Exception Columns


```
    Jobs   Resources  Devices   Tools   Filter   View   Options   Help
──────────────────────────────────────────────────────────────────────────────
 STATUS    2,727S   0X    120W    302H    0T    33,311 Records          Row 1 of 422
 Command ===> _                                                    Scroll ===> PAGE
 Cmd Row  JobName   JobID     Status        Queue   AMbr  C JP  Pos  WPos MaxComp Records
 ─────────────────────/──────────────────────────────_───────────────────────────>
      1    EJES$APP J0119408 QUEUED        PRINT          A 1   2T        AB S913 277,946
      2    EJES$LDL J0119405 QUEUED        PRINT          A 1   2T        CC 0000     990
      3    EJES$LDL J0119404 QUEUED        PRINT          A 1   2T        CC 0020     373
      4    EDJX2    T0119401 QUEUED        PRINT            1   2T        AB S622   3,095
      5    EDJXADM  T0118707 QUEUED        PRINT            1   2T        CC 0000      25
      6    EDJXADM  T0117763 QUEUED        PRINT            1   2T        CC 0000      22
      7    EJES$PDL J0117761 QUEUED        PRINT          A 1   2T        CC 0000     184
      8    EJES$PDL J0117760 QUEUED        PRINT          A 1   2T        CC 0002     141
      9    EDJXADM  T0117755 QUEUED        PRINT            1   2T        CC 0000      32
     10    EDJXADM  T0116639 QUEUED        PRINT            1   2T        AB S622     342
     11    MACREN   J0116638 QUEUED        PRINT          R 1   2T        CC 0000     326
     12    MACDEL   J0116637 QUEUED        PRINT          R 1   2T        CC 0000     326
     13    MACCOPY  J0116636 QUEUED        PRINT          R 1   2T        CC 0004     264
     14    SMPOREC  J0116634 QUEUED        PRINT          A 1   2T        CC 0000  50,753
     15    EDJXADM  T0116633 QUEUED        PRINT            1   2T        CC 0000      30
     16    BUILDMCS J0114930 QUEUED        PRINT          A 1   821       CC 0000     326
     17    EDJXADM  T0114929 QUEUED        PRINT            1   822       CC 0000      24
     18    EDJX1    T0114928 QUEUED        PRINT            1   823       CC 0000      27
     19    EDJXADM  T0114927 QUEUED        PRINT            1   820       CC 0000      22
     20    BUILDMCS J0114926 QUEUED        PRINT          A 1   818       CC 0000     323
     21    ANRACCEP J0114924 QUEUED        PRINT          A 1   817       CC 0000   1,147
     22    ANRACCCK J0114923 QUEUED        PRINT          A 1   816       CC 0000     801
     23    ANRACCCK J0114922 QUEUED        PRINT          A 1   815       CC 0012     820
     24    ANRACCCK J0114921 QUEUED        PRINT          A 1   814       CC 0012     820
  F1=Help     F3=Exit     F4=Prompt   F5=Rfind    F6=Book      F7=Up       F8=Down
  F9=Swap    F10=Left    F11=Right   F12=Cancel
```

JES3 Output Descriptor Modify

- Use **A** line command on OUTDESC display to access. Make changes as needed and press <Enter>.

```
 Jobs   Resources   Devices   Tools   Filter   View   Options   Help

OUTDESCM LISTC      J0282877     MODIFY DD=..SYSPRINT             Row 1 of 171
Command ===>                                                  Scroll ===> PAGE
Cmd Field          Value
─────────────────/──────────────────────────────────────────────────────────>
     ADDRESS       831 Parkview Drive North
     ADDRESS       El Segundo, CA 90245
     ADDRESS
     ADDRESS
     AFPPARMS
     AFPSTATS
     BUILDING      Headquarters
     BURST
     CKPTLINE
     CKPTPAGE
     CKPTSEC
     COLORMAP
     COMPACT
     COMSETUP
     COPYCNT
     DEPT          Research & Development_
     DEST
     FORMDEF
     FORMLEN
     FSSDATA
     INTRAY
     MAILBCC       edjaffe@phoenixsoftware.com
```

Operlog Message Attributes

- Formats messages using original 3270 attributes. Toggle this setting using the **LOGATTR** command, the Options panel, or the **Set log options...** pull-down under ISPF.

```
OPERLOG    PHXHQ                                              2012/02/20
Command ===>  _                                      Scroll ===> PAGE
Current Find Text:
<--3----+----4----+----5----+----6----+----7----+----8----+----9----+--10----+>
 09:15:36.84 DFS         00000090   IOEX18217I Sharename FRED2 on device /dev/ufs105
 09:15:36.89 DFS         00000090   IOEX18217I Sharename PHX_KEY101 on device /dev/u
             517 00000090   successfully.
 09:15:37.14 DFS         00000090   IOEP01100I DFS daemon EXPORT has stopped.
 09:15:37.17 C1CONDOR 00000090   IGA030I: OPEN FAILURE, DDNAME=GAVLOG, FILE DISAB
 09:15:37.37 CICSA       00000090   +DFHAP1211I CICA1 Language Environment initializ
 09:15:37.80 C1CONDOR 00000090   IGA052I: THE SPECIFIED APPLID IS CURRENTLY BEING
 09:15:37.80 C1CONDOR 00000090   *1254 IGA053I: PHXT1      WAS REJECTED, ENTER ANOTH
 09:15:38.14 CICSA       00000090   +DFHWB1007 CICA1 Initializing CICS Web environme
 09:15:38.92 CICSA       00000090   +DFHWB1008 CICA1 CICS Web environment initializa
 09:15:39.24 CICSA       00000090   +DFHEC1006I CICA1 Event processing status is STA
 09:15:39.50 INTERNAL 00000290   F VTAM,USERVAR,ID=CICA,VALUE=CICA1
 09:15:39.54 INTERNAL 00000090   IST097I MODIFY ACCEPTED
 09:15:39.56 INTERNAL 00000090   IST1283I MODIFY USERVAR COMMAND COMPLETE 610
             610 00000090   IST813I USERVAR CICA CHANGED FROM CICA1 TO CICA1
             610 00000090   IST314I END
 09:15:39.59 CICSA       00000090   +DFHSJ0102I CICA1 SJ domain initialization has e
 09:15:39.60 CICSA       00000090   +DFHEJ0102 CICA1 Enterprise Java domain initiali
 09:15:39.62 CICSA       00000090   +DFHSI1517 CICA1 Control is being given to CICS.
 09:15:39.62 CICSA       00000090   +DFHDH0101I CICA1 Document domain initialization
 09:15:46.01 C4CONDOR 00000090   IGA009I: PHOENIX (RELEASE 20.1) IS WAITING FOR W
```

z/OS UNIX File Extract

- Extract any scrollable data to a z/OS UNIX file. You may create new, overlay, or append to existing files.

```
RCVMAINT J0160773                 Extract Parameters                Z/OS UNIX
Command ===> _

For Extract to z/OS UNIX File System:
    Path name       ===> /u/edjx2



    Path option     ===> NEW          (NEW, REPLACE, APPEND)
    File data       ===> TEXT         (TEXT, BINARY, or blank)
    Page eject      ===> NO           (YES or NO to force eject for each dataset)
    Record format ===>                ('*' to derive from data)
    Record length ===>
    Owner perms     ===> RW           (R, RW, or blank)
```

```
PATHSEL   /u/edjx1                                             Row 1 of 17
Command ===>                                              Scroll ===> PAGE
Cmd Type Permission Owner      Group      FileName
___ ____/_____>
    Dir   drwx------ EDJX1      DEV        .
    Dir   dr-xr-xr-x WEBADM     TTY        ..
    File  -rw------- EDJX1      DEV        .bash_history
    File  -rw------- EDJX1      DEV        .sh_history
    Dir   drwxr-xr-x EDJX1      DEV        .ssh
_         ┌──────── Line Commands ────────┐      ubs assembly
          │ L    Select file or directory │      ev
          │ N    Prompt for new file or directory │  port.CSV
          │ S    Select file or directory │      port1.xls
          └──────────────────────────────┘      port1.CSV
```

Other Extract Enhancements

- DASD space units are now in tracks, cylinders, records, blocks, bytes, kilobytes or megabytes.

- DASD data set type is now LIB (a PDSE), PDS, BASIC, LARGE, EXTP (extended preferred), EXTR (extended required), or blank (unspecified).

- DASD extended attributes now allow extract data sets to be made eligible for EAV residency. (EATTR=OPT)

```
For New DASD Dataset to be Created:
    Management class ===>              (Blank for default management class)
    Storage class    ===>              (Blank for default storage class)
        Volume serial ===>
        Unit name     ===>             (Blank for default unit)
    Data class       ===>              (Blank for default data class)
   ★Space units      ===>             (REC, BLK, TRK, CYL, B, KB, MB, or blank)
    Primary qty      ===>             (In above units)
    Secondary qty    ===>             (In above units)
    Record format    ===>             ('*' to derive from data)
    Record length    ===>
    Block size       ===>
    Expiration       ===>             (YYYY/MM/DD, YYYY.DDD, or DDDD for RETPD)
   ★Data set type    ===>             (LIB, PDS, BASIC, LARGE, EXTP, EXTR, blank)
    Extended attr    ===>             (NO, OPT or blank)
```

Java Application Programming Interface

- Provide unauthorized-program access from the Java Language to the programming facilities available through the (E)JES API.

- Complements existing APIs for REXX and procedural languages (HLASM, C/C++, COBOL, PL/I, etc.).

- Provided Javadoc documents all available classes and their members.

- Authored in Java with C++ JNI routines leveraging EJESAPI and EJESAPI4 for procedural languages.

- Eligible for zAAP or zIIP redirection when the Java code is running and for zIIP redirection when the core (E)JES code is running.

Java to Create CSV File Showing Top 20 Spool Consumers

```
000001  import java.util.*;
000002  import com.phoenixsoftware.ejes.*;
000003  import static com.phoenixsoftware.ejes.EjesApi.Column;
000004  public class sample01 {
000005      static final int MAX_TOP = 20;
000006      public static void main( String[] args ) {
000007          Map<String,Column> cm = new HashMap<String,Column>();
000008          Map<String,Long> map = new HashMap<String,Long>();
000009          String key = null;
000010          Long value = null;
000011          /* Request enumeration of STATUS display */
000012          EjesApi api = new EjesApi( "sres;st", 100 );
000013          if ( api.returnCode <= 4 ) {
000014              String [] columnList = { "OWNER", "RECORDS" };
000015              while ( api.returnCode <= 4 ) {
000016                  Column[][] tabular = api.enumerateColumns( columnList );
000017                  /* Calculate sum of all records per user */
000018                  if ( tabular != null ) {
000019                      for ( Column[] row : tabular ) {
000020                          for ( Column col : row )
000021                              cm.put( col.columnName, col );
000022                          key = cm.get("OWNER").columnText;
000023                          value = cm.get("RECORDS").columnValue;
000024                          Long r = map.get( key );
000025                          map.put( key, r == null ? value : r + value );
000026                      }
000027                  }
000028                  /* Get next enumeration set */
000029                  if ( api.returnCode != 0 )
000030                      break;
000031                  api.runCommand( "" );
000032              }
000033              /* Create sortable string List */
000034              List<String> list = new ArrayList<String>(map.size());
000035              Iterator<Map.Entry<String,Long>> m = map.entrySet().iterator
000036              while ( m.hasNext() ) {
000037                  Map.Entry<String,Long> entry = m.next();
000038                  Formatter f = new Formatter();
000039                  f.format( "%,25d %-10.10s", entry.getValue(), entry.getK
000040                  list.add( f.toString() );
000041              }
000042              Collections.sort( list, Collections.reverseOrder() );
000043              /* Output top spool users */
000044              ListIterator<String> i = list.listIterator();
000045              System.out.printf( "%-10.10s %25.25s\n", "Owner", "Records"
000046              for ( int n = 0 ; n < MAX_TOP && i.hasNext() ; n++ ) {
000047                  String s = i.next();
000048                  System.out.printf( "%-10.10s ", s.substring(26).trim() )
000049                  System.out.printf( "%25.25s\n", s.substring( 0, 25 ).tri
000050              }
000051          }
000052          api.free();
000053  }
```

Result After Opening CSV File With OpenOffice.org and Inserting a Chart
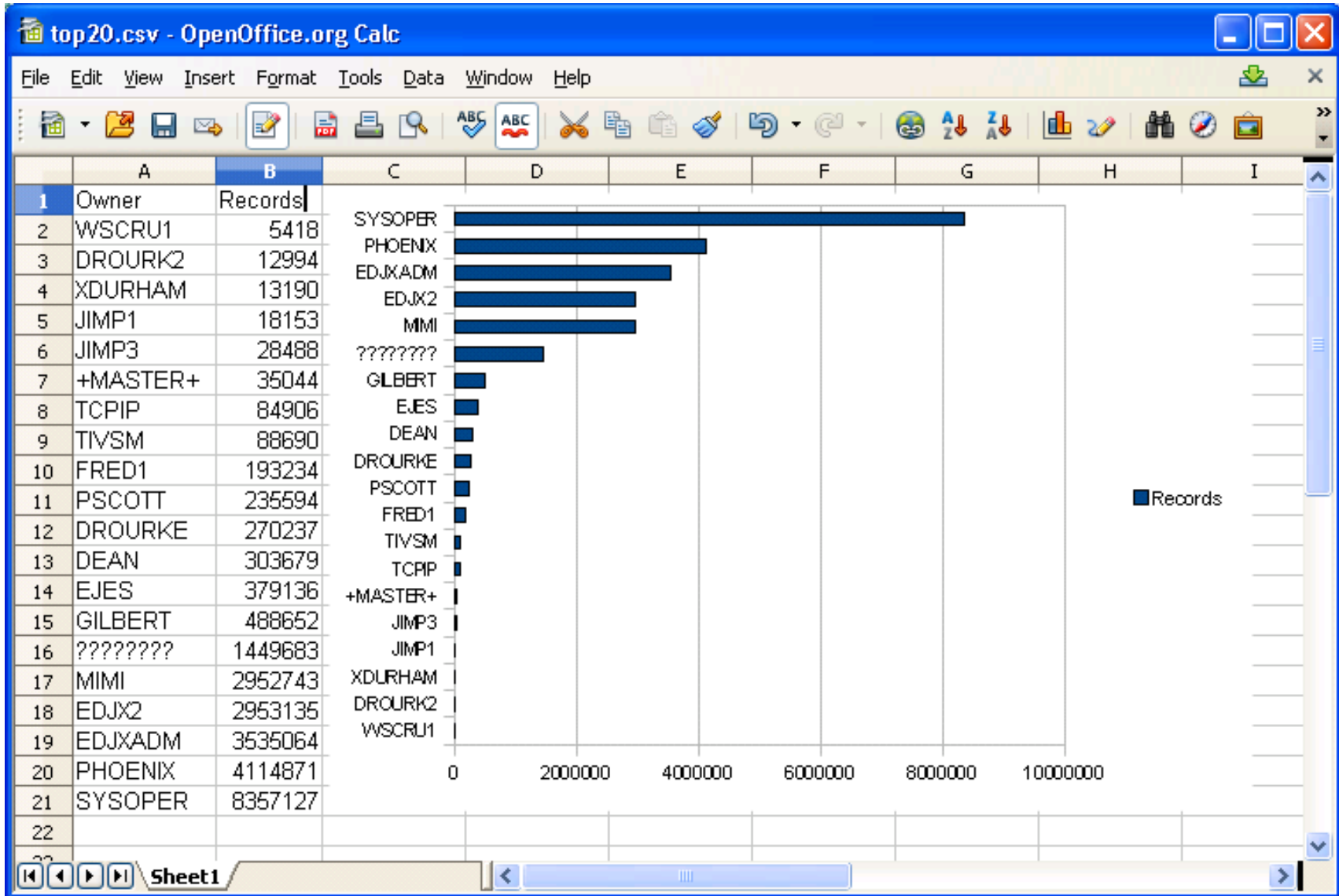
Java Sample Modified to Use Krysalis jCharts Under z/OS Apache Tomcat
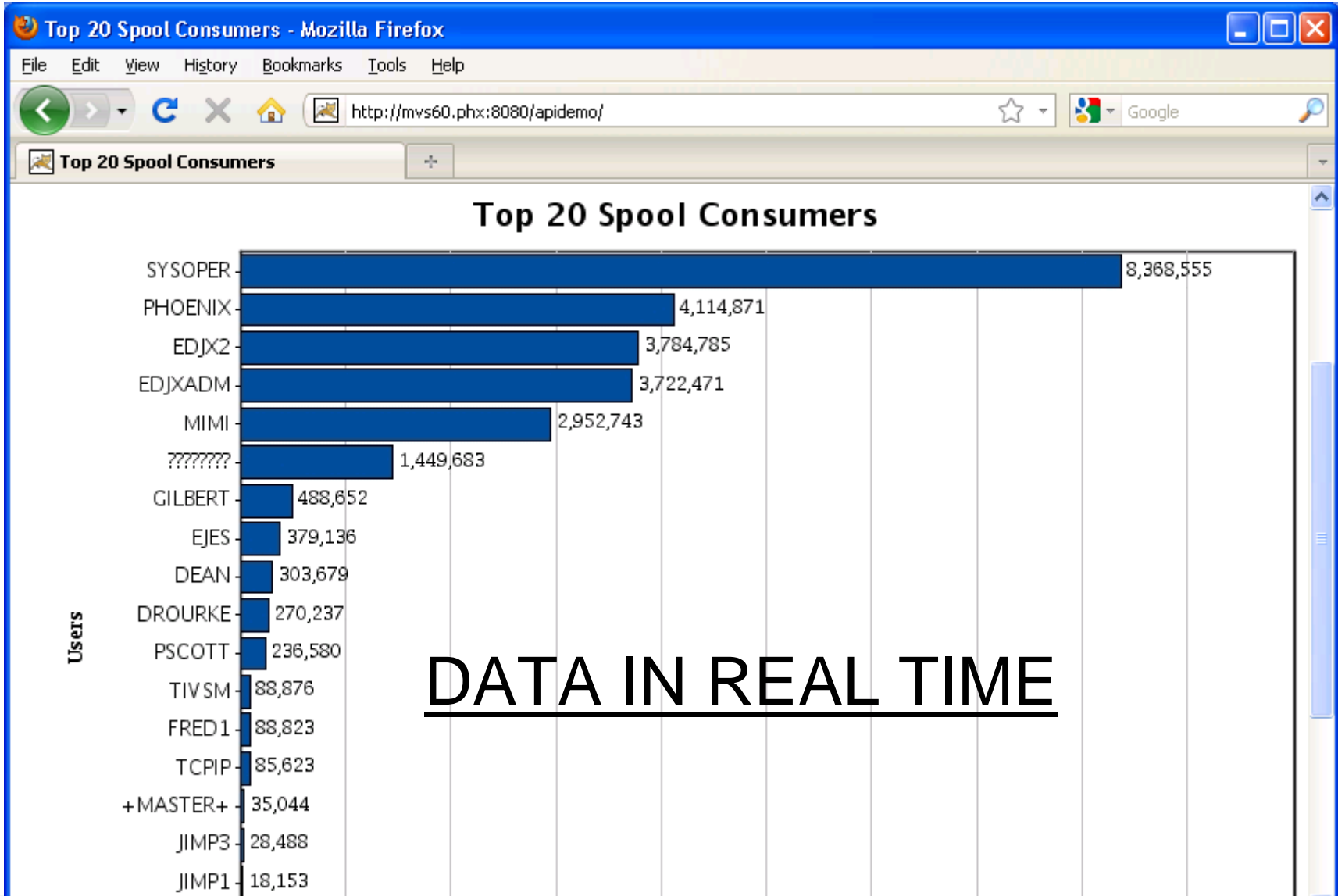
Other V4R8 Enhancements of Note

- Parameters column on HCHECK now overtypeable.

- Support for work-dependent enclaves on ENCLAVE.

- Full EAV support for SPOOL access as well new EAV column and displaying LoCylTrk and HiCylTrk on SPVOL in EAV format.

- Interface to provide **Queue** and **Status** columns from Thruput Manager® for customers that use this product.

- **MbrAff** column on JES2 CLASS display.

- TP Monitor password phrase support.

- Performance enhancements with new hardware-assisted sort and other significant path length reductions.

V5R1 Highlights

Pop-up Input Window

- Previously, an overtypeable column had to be defined and displayable as wide as any input to be placed into it.

- The new pop-up input window provides space for up to 126 characters to be input into any overtypeable field.

- To activate the pop-up input window, place your cursor on the column to be overtyped and press the Prompt key (usually F4).


```
Cmd  JobName    JobID      IP PrMode     Forms      FCB   UCS   Flsh ExtWtr    Device
<──  ────────── ────────── /──            ─────────  ───── ───── ──── ──────    ──────
     DOWNPLEX   S0100370 N                         ── Long Overtype ──
     PSCODEST   J0095800 N      Overtype data for column: PrMode
     ROURSWB    J0095753 N
                         N      ==>  LINE
                         N
                         N
                         N
                         N        F3=Cancel
     EDJXADM3   S0071090 N
                         N   LINE       STD        ****  ****  ****
                         N   LINE       STD        ****  ****  ****
                         N   LINE       STD        ****  ****  ****
                         N   LINE       STD        ****  ****  ****
```

Sysplex-wide Activity Display Scope

- Previously, ACTIVITY was always JESplex-wide. That is now the default value specified with ACPLEX JES.

- JESplex-wide information can be obtained using RMF, CMF or native (E)JES facilities.

- The new ACPLEX SYS value indicates a sysplex-wide scope. This scope depends entirely on RMF Sysplex Data Gathering Services, even for the current system's data. Sysplex-wide data cannot be obtained using CMF or native (E)JES facilities.

```
ACTIVITY MVS70   Paging 0  SIO 22   CPU 43   zIIP 2               Row 7 of 418
Command ===> _                                             Scroll ===> PAGE
FILTER=MaskChar=*%,AcPlex=JES,SysName=*,PSelect=(Type=ALL),XSelect=(),Filter=()
OPTION=CRDelay=1,Cursor=(Retain=ON,Select=OFF),Confirm=ON,DateFmt=YYYY/MM/DD,
OPTION=NumChar=',.',OvrType=ON,SelCmd=S,Snap=ON,TopSel=OFF,XSelect=NOSAVE
VIEW=Arrange=DEFAULT,Detail=MIN,Sort=TIME/D,TopFind=OFF
Cmd JobName  StepName ProcStep JobID     ASID Pos DP Real   Paging ExCP    CPU%
─── ───────/──────── ──────── ─────     ──── ─── ── ───── ─────── ───────/──>
    EJESC480 EJESC480 EJESCAS  S0282774 006F N/S F6   136MB     .00     .00     .00
    EJESC480 EJESC480 EJESCAS  S0282773 013D N/S F6     9MB     .00     .00     .08
    EJESC510 EJESC510 EJESCAS  S0120597 0030 N/S F6     1MB     .00     .00     .00
```

Enhancements to Enclaves Display

- The following columns were added:

Default Title	Description	Overtype
Prom	Promoted address space indicator.	No
zAAP-Time	CPU time consumed on zAAP processors	No
zACP-Time	GCP time consumed by zAAP-eligible work	No
zIIP-Time	CPU time consumed on zIIP processors	No
zICP-Time	GCP time consumed by zIIP-eligible work	Yes

- The following line command was added:

Command	Function
W	Recursively invoke **Enclaves** display for work-dependent enclave.

```
ENCLAVE   PHXHQ(MVS70)                              ★            ★                    Row 1 of 16
Command ===>  _                                                              Scroll ===> PAGE
Cmd Token                 User        CPU-Time  zIIP-Time  zICP-Time SrvClass Workload Re
<-------------------------/-----------------------------------------------------------------→
    00000040000000BC EJES        00:14.47  00:14.45  00:00.01  SERVER1  SERVER
    0000002000000001             00:00.00  00:00.00  00:00.00  SYSTEM   SYSTEM
    0000002400000002             00:00.00  00:00.00  00:00.00  SYSSTC   SYSTEM
    00000028000000B9 PHOENIX     00:08.11  00:07.46  00:00.64  SERVER3  SERVER
    00000034000000BA EJES        00:36.75  00:36.65  00:00.10  SERVER1  SERVER
    0000002C00000004 EJES        00:43.28  00:43.10  00:00.18  SERVER1  SERVER
    00000030000000BB EJES        00:25.22  00:25.14  00:00.07  SERVER1  SERVER
```

Enhancements to Health Checker Display

- The following columns were added:

Default Title	Description	Overtype
RexxIn	REXX input data set name	No
RexxOut	REXX output data set name	No
LogStream	Name of the logstream used to record checks.	No

- The following line commands were added:

Command	Function
En	Extract health check messages to any extract target.
L	Invoke long Health Check History for selected check.
P#	Extract health check messages to Print 1 or Print 2.
S	Invoke short Health Check History for selected check.

New Health Check History Display

- Run history of a selected check.

- Either short history (up to 10 rows) or the complete long history (from the log stream).

- Browse and extract messages from any check iteration.

```
HCHKHIST MVS60 ASM_LOCAL_SLOT_USAGE/IBMASM            Row 1 of 10
Command ===> _                                        Scroll ===> PAGE
Cmd Run  Status             Result Diag1    Diag2    RunDate    RunTime
___ ____ _____  _____ _____ _____ _____ _____
      64 SUCCESSFUL              0 00000000 00000000 2012/02/20 17:22:08
      63 SUCCESSFUL              0 00000000 00000000 2012/02/20 16:52:08
      62 SUCCESSFUL              0 00000000 00000000 2012/02/20 16:22:08
      61 SUCCESSFUL              0 00000000 00000000 2012/02/20 15:52:08
      60 SUCCESSFUL              0 00000000 00000000 2012/02/20 15:22:08
      59 SUCCESSFUL              0 00000000 00000000 2012/02/20 14:52:08
      58 SUCCESSFUL              0 00000000 00000000 2012/02/20 14:22:08
      57 SUCCESSFUL              0 00000000 00000000 2012/02/20 13:52:08
      56 SUCCESSFUL              0 00000000 00000000 2012/02/20 13:22:08
      55 SUCCESSFUL              0 00000000 00000000 2012/02/20 12:52:08
********************************** Bottom of Data ***********************************
```

Action Messages on JES2 Syslog Browser

- Previously this support existed for JES3 only.

Programmable API Enhancements

- The new SDSALLOC and SDSFREE commands will allocate and free the data sets shown on Syslog browser.

  - Previously, the only way to get SDSB allocation for Syslog data sets was to access SYSLOG as an ordinary job.

- RECFM and LRECL for SDSB data sets are now surfaced to procedural language, REXX and Java APIs.

```
VIEW          SYS2.E510.SEJEMAC(EJESAPIA) - 01.00           Columns 00001 00072
Command ===> _                                              Scroll ===> CSR
000338 EJESApiSdsbEnt     DSECT  ,             SDSB table entry
000339 EJESApiSdsbDD      DS     CL8           DD name
000340 EJESApiSdsbLRECL   DS     H      Ver01 Logical record length from JFCB
000341 EJESApiSdsbDSNLn   DS     H            Length of data set name
000342 EJESApiSdsbDSN     DS     CL44         Data set name (blank padded)
000343 EJESApiSdsbEntLn0  EQU    *-EJESApiSdsbEnt Length of version 0 tbl entry
000344 EJESApiSdsbRfLn    DS     H      Ver01 Length of record format string
000345 EJESApiSdsbRfStr   DS     CL5    Ver01 Record format string (nul term'ed)
000346 EJESApiSdsbRECFM   DS     BL1    Ver01 Encoded record format from JFCB
000347 EJESApiSdsbRecfmU  EQU    B'11000000'  .RECFM=U
000348 EJESApiSdsbRecfmF  EQU    B'10000000'  .RECFM=F
000349 EJESApiSdsbRecfmV  EQU    B'01000000'  .RECFM=V
000350 EJESApiSdsbRecfmB  EQU    B'00010000'  .RECFM=?B
000351 EJESApiSdsbRecfmS  EQU    B'00001000'  .RECFM=?S
000352 EJESApiSdsbRecfmA  EQU    B'00000100'  .RECFM=?A
000353 EJESApiSdsbRecfmM  EQU    B'00000010'  .RECFM=?M
```

Email CAI Plug-in Enhancements

- Improved Transport Choices:
  - Previously, email could be delivered only via z/OS SMTP (or CSSMTP in z/OS 1.12 and higher).
  - Email can now also be delivered via direct sockets or a popular freeware utility called XMITIP.
  - You choose the email delivery mechanism via the **Transport** action bar item.
- Improved Address Book:
  - Pressing the Prompt key (F4) with the cursor positioned to an email address field on the dialog now invokes the address book.
  - Contacts can be manually added to or deleted from the address book.
  - If you activate the ISPF Workstation Agent (WSA), you can import a contact list from Microsoft Outlook, Mozilla Thunderbird or other popular email programs that run on your workstation.

Using Email CAI Plug-in

Using Email CAI Address Book Import

```
    Jobs    Resources    Devices    Tools    Filter    View    Options    Help

 STATUS    2,370S    4X    276W    5H    0T    16,912,660 Records        Row 152 of 285
 Command                                                                  ===> CSR
 Cmd  Row        File   Contacts   Transport                              mp   Recor
                                                                              ↓↓↓↓↓>
 .m   152                      E-Mail Parameters                          00     759
      153
      154        File
      155
      156
      157     Enter location and type of .CSV contacts file:
      158
      159     Host File:
      160        Name . . .  _____
      161
      162     Workstation File:
      163        Name . .    c:\junk\contacts.csv
      164
      165     Choose one of the following file formats:
      166        2  1. Outlook    2. Thunderbird
      167
      168     Options:
      169        /  Overlay existing entries
      170
      171     Press ENTER to import or END to exit.
      172      F1=Help        F3=Exit      F10=Actions   F12=Cancel
      173
      174   SHOPCINV J0209971 W-OUTPUT OUTSERV        1         2 CC 0000      439
      175   SMPCREC  J0195811 W-OUTPUT OUTSERV        1        14 CC 0000      428
      176   EJES$PRC J0208957 W-OUTPUT OUTSERV        1         2 CC 0000      426
  F1=Help    F3=Exit    F7=Up      F8=Down    F10=Left   F11=Right  F12=Cancel
 MA    D                                                                    24/016
```

Using Email CAI Address Book Import

```
    Jobs   Resources   Devices   Tools   Filter   View   Options   Help

 STATUS     2,370S   4X   276W   5H   0T   16,912,660 Records        Row 152 of 285
 Command                                                             ===> CSR
 Cmd Row      File   Contacts   Transport                            mp   Recor
                                                                          ↓↓↓↓↓>
 .m   152                      E-Mail Parameters                     00      759
      153
      154        File
      155
      156
      157     Enter  location  and  type  of  .CSV  contacts file:
      158
      159     Host File:
      160        Name  .  .  .
      161                            ┌───── Import Progress ─────┐
      162     Workstatio            │           33 %            │
      163        Name  .  .         │ ██████████                │
      164                           │            _              │
      165     Choose one           └───────────────────────────┘
      166        2   1. Outlook    2. Thunderbird
      167
      168     Options:
      169        / Overlay existing entries
      170
      171     Press ENTER to import or END to exit.
      172      F1=Help       F3=Exit       F10=Actions   F12=Cancel
      173
      174 SHOPCINV J0209971 W-OUTPUT  OUTSERV         1          2 CC 0000    439
      175 SMPCREC  J0195811 W-OUTPUT  OUTSERV         1         14 CC 0000    428
      176 EJES$PRC J0208957 W-OUTPUT  OUTSERV         1          2 CC 0000    426
  F1=Help    F3=Exit    F7=Up     F8=Down    F10=Left   F11=Right  F12=Cancel
 MA▮     D X ⌀                                                          19/044 a
```

Using Email CAI Address Book Import

```
   Jobs   Resources   Devices   Tools   Filter   View   Options   Help

 STATUS    2,370S   4X   276W   5H   0T   16,912,660 Records         Row 152 of 285
 Command                                                            ===> CSR
 Cmd Row        File   Contacts   Transport                         mp   Recor
                                                                         ↓↓↓↓↓>
 .m   152                    E-Mail Parameters                      00      759
      153
      154      File   Contacts
      155
      156    Address Book Entries                 Row 1,672 to 1,683 of 1,960
      157
      158    Command ===> _____
      159
      160      Last        First      E-Mail Address
      161      ──────────  ─────────  ─────────────────────────────────────
      162    s Scott       Paul       paulscott@phoenixsoftware.com
      163    _ Scott       Paul       paulscott@PhoenixSoftware.com
      164    _ Scott       Paul       paulscott@PHOENIXSOFTWARE.COM
      165    _ Scott       Paul       PaulScott@phoenixsoftware.com
      166    _ Scott       Paul A.    pscott@skycoast.us
      167    _ Scott       Paul A.    PaulScott@PhoenixSoftware.com
      168    _ Scott       Rob        rob.scott@RocketSoftware.com
      169    _ Scott       Rob        rob.scott@ROCKETSOFTWARE.COM
      170    _ Scott       Rob        RScott@rocketsoftware.com
      171    _ Scrima      Don        dscrima@gmail.com
      172    _ Seay        Paul       seay_pd@nns.com
      173    _ Seefeldt    Jerry      jms@newera.com
      174     F1=Help        F3=Exit      F10=Actions    F12=Cancel
      175

 INMX000I 0 message and 147 data records sent as 106 records to PHXHQ.SMTP
 INMX001I Transmission occurred on 02/03/2011 at 17:27:37.
 *** _
```

E-Mail Message With Job Attachment Successfully Received By Mail Client

Selective "Push" of Installation Defaults

- A new infrastructure was implemented to facilitate resetting all or part of end users' cross-session profile data. This allows administrators to "push" changes for selective profile fields out to users without requiring them to delete their profiles.

- New EJESPRS macro, used in EJESUX03, provides a standardized method of managing changes to profile data by using a serial number mechanism—numeric data "hardened" into the user's cross-session profile—to avoid unnecessary or disruptive updates.

- All existing popular modifications to EJESUX03, delivered in configuration member EJES$X03, were converted to use the new infrastructure.

Other V5R1 Enhancements of Note

- Require z/Architecture with the <u>long-displacement facility</u>.
- Support JES2 SPOOL Migration.
- Support JES3 Dynamic SPOOL Add.
- ISFCALLS enhancements from z/OS 1.10 through z/OS 1.13.
- More than 64 logical CPs,zIIPs and zAAPs per image.
- New ACTIVITY drill-down from job-oriented displays.
- JES2 restart after step completion, spin-ANY data set, and JOBRC.
- New Auto-Reply support on System Requests display.
- Enhanced LOG relative time navigation: (add minutes & seconds).
- Pattern Utility unconditional matching or "bracketing".
- Major performance enhancement for accessing JES2 sysout from spin-off jobs (e.g., APPC/MVS or z/OS UNIX). Requires checkpoint mode Z11. (Similar to JES3 processing that existed since OS/390 1.3.)
- Auditing of SWB Modify requests: (new EJES112 message).
- Function key rework: (F4=Prompt, F17=RFINDP and others).
- Service download via HTTP: (requires cURL from z/OS UNIX).

V5R2 Preview

A Few V5R2 Enhancements

- Major performance improvement in Pattern Utility matching.
- Byte count on job and data set displays.
- Program name and step number on data set displays.
- Output CrDate/CrTime/Age columns wherever they are expected.
- Normalized CPU times on Enclaves display.
- MFORM support for EMCS console; also remove all MIGID support.
- Customized help windows for **Status** and **MaxComp** column values.
- Replace TMB with KMG scaling (possible migration issue—sorry).
- Fully-scrollable Long Command Processor with individual line delete, lock, clear and other functions.
- JES2 Sysout Classes display.
- DRM=YES|NO installation option: prevent DRM engagement.
- Downloadable license via HTTP and cURL: no need for web browser, email, copy/paste, etc.

DSSTAT Step Number, Program Name, Bytes, Create Date/Time and Age

```
DSSTAT    COPYEJES J0281883     7,651 Records                          Row 1 of 12
Command ===> _                                                  Scroll ===> PAGE
Cmd DDName     Step Program  C Destination      Records Lines  Pages Bytes    Pr
<---- ------/------ ------- - -----------      ------- -----  ----- -----    -->
    JESMSGLG                T EDJX2                 22     22      0  77,596
    JESJCL                  T EDJX2                294    294      0   4,084
    JESYSMSG                T EDJX2                543    543      0  81,680
    SYSPRINT     1 IEBCOPY  T EDJX2                186    186      0  12,252
    SYSPRINT     2 IEBCOPY  T EDJX2                 10     10      0   4,084
    SYSPRINT     3 HEWLH096 A EDJX2              4,138  4,138      0 151,108
    SYSPRINT     5 IEWBLINK T EDJX2                171    171      0   8,168
    SYSPRINT     7 IEWBLINK T EDJX2                169    169      0   8,168
    SYSPRINT     8 IEBCOPY  T EDJX2              1,219  1,219      0  81,680
    SYSPRINT     9 IEBCOPY  T EDJX2                760    760      0  53,092
    SYSPRINT    10 IEBCOPY  T EDJX2                 40     40      0   4,084
```

```
DSSTAT    COPYEJES J0281883     7,651 Records                          Row 1 of 12
Command ===> _                                                  Scroll ===> PAGE
Cmd DDName     CrDate      CrTime       Age           OutRef   PageDef FormDef IP
<---- ------/------ ------- ----------- ----------   ------   ------- ------- -->
    JESMSGLG 2012/02/17 22:28:39.49 03-17:49:03.61
    JESJCL   2012/02/17 22:28:39.50 03-17:49:03.61
    JESYSMSG 2012/02/17 22:28:39.50 03-17:49:03.61
    SYSPRINT 2012/02/17 22:28:39.50 03-17:49:03.61
    SYSPRINT 2012/02/17 22:28:39.50 03-17:49:03.61
    SYSPRINT 2012/02/17 22:28:39.50 03-17:49:03.61
    SYSPRINT 2012/02/17 22:28:39.50 03-17:49:03.61
    SYSPRINT 2012/02/17 22:28:39.50 03-17:49:03.61
    SYSPRINT 2012/02/17 22:28:39.50 03-17:49:03.61
    SYSPRINT 2012/02/17 22:28:39.50 03-17:49:03.61
    SYSPRINT 2012/02/17 22:28:39.50 03-17:49:03.61
    SYSPRINT 2012/02/17 22:28:39.50 03-17:49:03.61
```

Customized Column Help Windows

```
STATUS    3,229S   4X   606W   7H   1T   25,976,367 Records         Row 22 of 618
Command ===>                                          Scroll ===> PAGE
Cmd JobName    JID        Status      Proces  C JP  Pos  MaxComp Records  Pages    H-OS
_____/_____>
    COPYHFS    J0254403   W-OUTPUT    OUTSER  A  2       AB S722 999,142            0
    RCVMAINT   J0254474   W-OUTPUT    OUTSER  V        ─── ABEND S722 ───
    AMBLIST    J0254600   W-OUTPUT    OUTSER  Q        The job terminated because the
    EJESXPIR   J0254689   W-OUTPUT    OUTSER  A        output limits were exceeded.
    EJESX3G    J0254962   W-OUTPUT    OUTSER  A
    EJESX3U    J0254963   W-OUTPUT    OUTSER  R  4       CC 0016          76         0
```

```
STATUS    2,712S   463X  2,100W  307H  41T  11,662,109 Records      Row 314 of 2911
Command ===>                                          Scroll ===> CSR
Cmd JobName    JobID      Status      Queue   AMbr C JP  Pos WPos MaxComp Records Pag
_____/_____>
    LISTCAT8   J0038165   W-SCHENV    EXEC         A  9   1    1                   0
    LISTCAT8   J0038166        ──── W-SCHENV ────              2    2               0
    LISTCAT8   J0038167     Scheduling environment            3    3               0
    LISTCAT8   J0038168     not in proper state.              4    4               0
    LISTCAT8   J0038169                                       5    5               0
    LISTCAT8   J0038170   W-SCHENV    EXEC         A  9   6    6                   0
```

```
STATUS    2,712S   463X  2,100W  307H  41T  11,662,109 Records     Row 2890 of 2911
Command ===>                                          Scroll ===> CSR
Cmd JobName    JobID      Status      Queue   AMbr C JP  Pos WPos MaxComp Records Pag
_____/_____>
    CFZCIM     S0118526   QUEUED      PRINT         S  1   2K      AB SEC6         149
    SYSLOG     S0118514   QUEUED      PRINT        ─── ABEND SEC6 ───
    JES3       S0119129   QUEUED      PRINT        The job terminated due to an
    DROURK3    T0119371   QUEUED      PRINT        error that occurred in a z/OS UNIX
    DROURK3    T0119386   QUEUED      PRINT        Systems Services callable service.
    DROURK3    T0119399   QUEUED      PRINT        The reason code indicates why.
    EJES$LDL   J0119404   QUEUED      PRINT
    EJES$LDL   J0119405   QUEUED      PRINT         A  1   2K      CC 0000         990
```
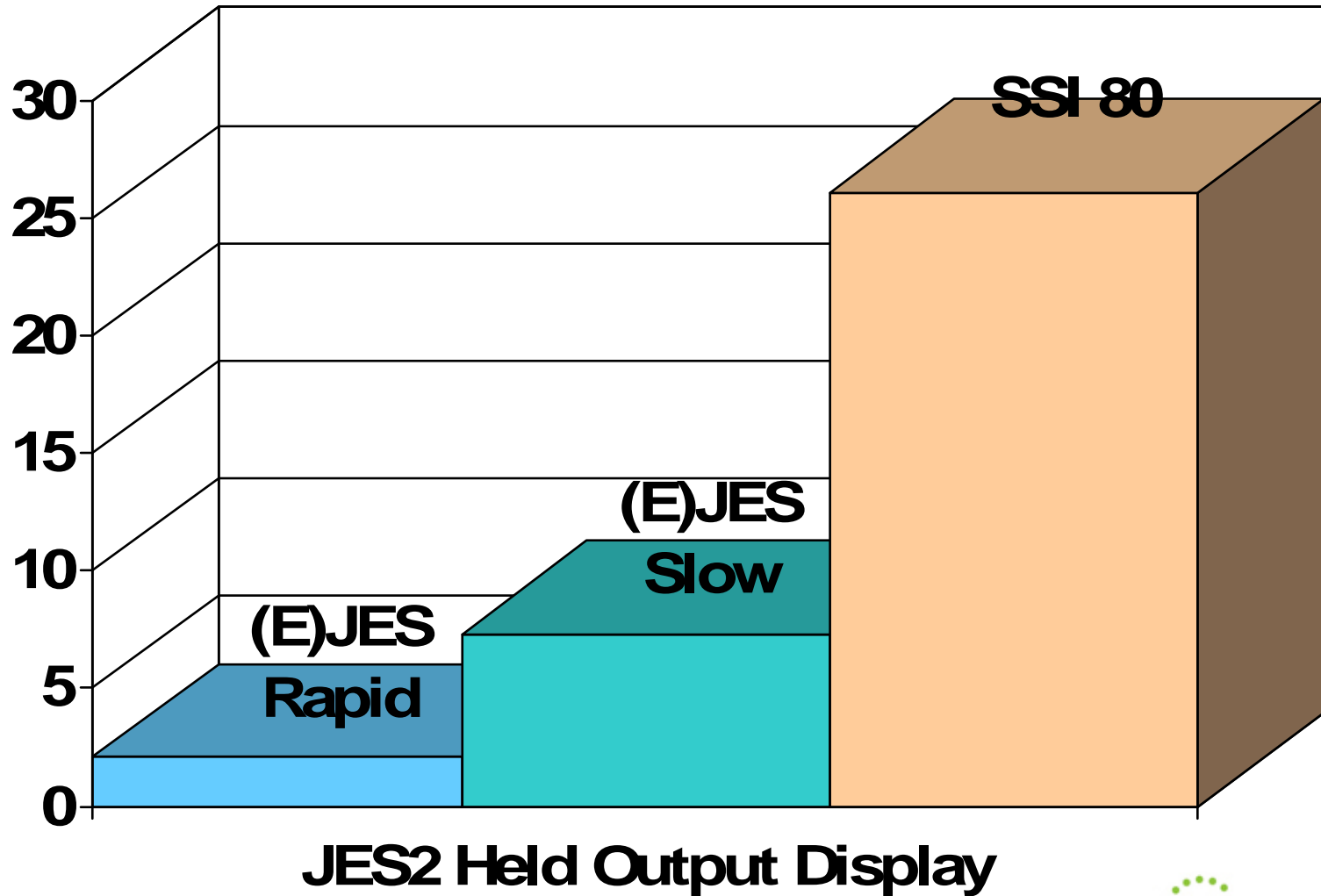
Performance Study

Importance of a Performance Value-Add

- One key goal of any good ISV software product is to try to provide a value-add in the area of performance. This has been one of our primary areas of focus since 1978.

- Back then, there was no such thing as specialty engine offload. Writing well-performing code was the only way to save run-time "hard dollars" for customers.

  - There was/is also always the issue of increased user productivity through a rich feature set. Such gains, while substantial, are more difficult to quantify with benchmarks.

- CPU savings is our most important objective. WLC-style pricing makes this even more important today, especially for products that might run during the afternoon peak.

- I/O performance savings is a close second.

JES2 CPU Performance Quantified

- Competing products tend to rely on the most resource-intensive interface available: the JES-provided SSI 80.

- Our internal benchmark testing against the most readily-available JES2 SSI 80 exploiter showed it needed 3.5x as much CPU as (E)JES to refresh the JES2 HOLD display pressing <Enter> slowly, once every five seconds.

- Pressing <Enter> as rapidly as possible yielded a 12.5x CPU requirement!

- The benchmark was run on an idle 2098-D04 running z/OS 1.13.

JES2 CPU Performance Quantified: Between 3.5x and 12.5x

JES2 Held Output Display

JES3 CPU Performance Quantified

- JES3 benchmarking is slightly more difficult than JES2, because a *significant* amount of SSI 80 processing runs as high-priority work in the JES3 global address space.
- All JES3 activity must be quiesced (so that JES3 is waiting) and its CPU utilization carefully measured.
- Our internal benchmark testing against the most readily-available JES3 SSI 80 exploiter showed it needed 5.4x as much CPU as (E)JES to refresh the JES3 HOLD display.
- This includes both CPU consumed by the TSO user and CPU consumed by the high-priority JES3 address space.
- Rapidity of refreshes makes no difference for JES3.
- Like the previous test, the benchmark was run on an idle 2098-D04 running z/OS 1.13.

JES3 CPU Performance Quantified: 5.4x
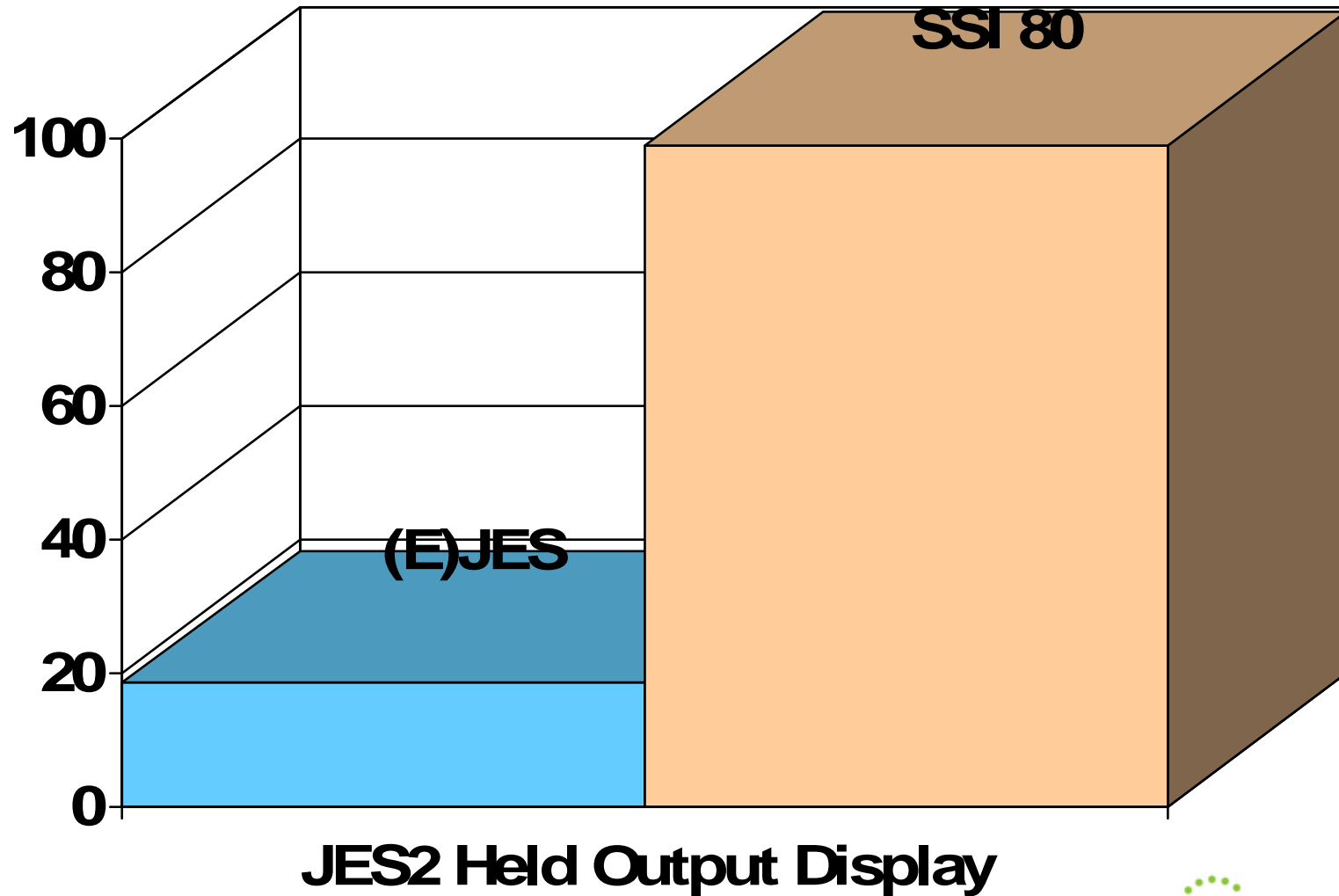
Performance Differences in Perspective

- The benchmark savings occur using apples-to-apples measurements with TCB-mode only, GCP execution.
- Customers with zIIP processors will observe an entirely different situation.
- Not only does (E)JES use far less CPU than any SSI 80 exploiter, but nearly all of it is eligible for redirection to zIIP.
- In the case of SSI 80, <u>none of the CPU resources are eligible for zIIP redirection</u>—even for customers with zIIP processors available.

```
JobName   CPU-Time ACPU-Time zIIP-Time GCP-Time zICP-Time
--------/-------- --------- --------- -------- ---------
JOEUSER  00:06.15 00:12.20  00:05.94  00:05.94 00:00.00  BEFORE
JOEUSER  00:07.16 00:29.12  00:21.71  00:06.91 00:00.00  AFTER      94%

JOEUSER  00:01.01 00:16.92  00:15.77  00:00.97 00:00.00  DIFFERENCE
```

Questions?