ISPF Hidden Treasures and New Features: Parts 1 and 2

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ISPF and z/OS Communications Server Design

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Agenda

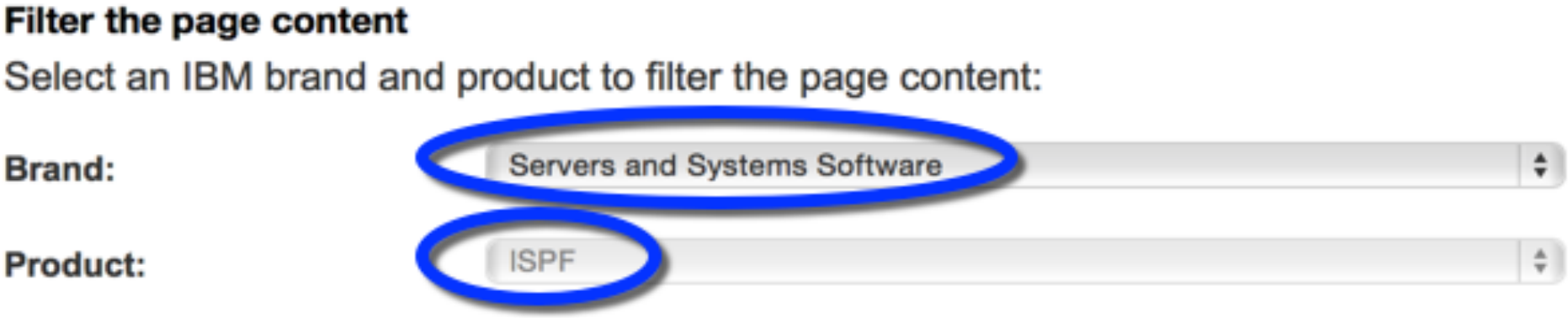
- Notes
- Dataset list enhancements
- Member list and scroll enhancements
- Edit enhancements
- PDSE V2 member generations
- UNIX directory list
- Multiple screens
- z/OS V2R2 ISPF enhancements
- Appendix

ISPF Hidden Treasures & New Features - Notes

- This presentation will be a mixture of charts and live demo.
  - Part 1 and the first part of Part 2 will cover hidden treasures in ISPF, with a focus on more recent features (V2R1).
  - Part 2 will also include a preview of the ISPF new features in z/OS V2R2.
- The demo will be performed on a V2R2 development system from our Raleigh lab.
  - Expect the unexpected!

ISPF Hidden Treasures & New Features – Notes …

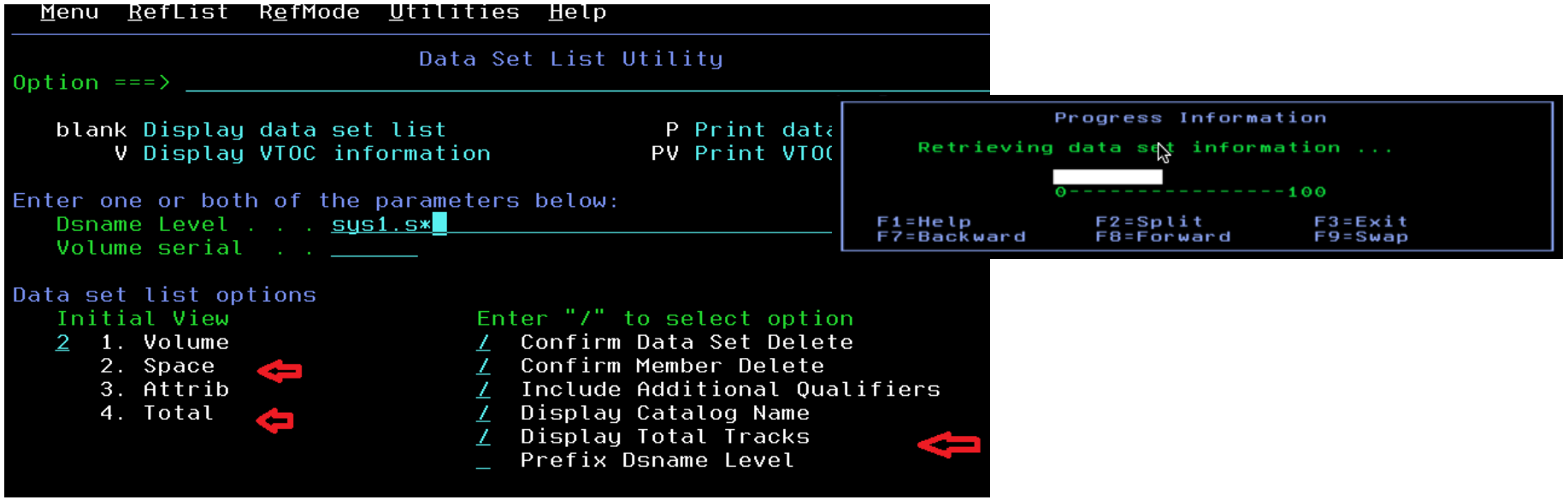
- Speaking of new features, by now most of you should be familiar with the RFE (Request for Enhancements) process for submitting and voting on requirements against ISPF, z/OS, and many other IBM products.
  - We are in the very early stages of planning for the next release (V2R2+). So, now is the time to vote and/or let us know of any new requirements.
  - Go to: https://www.ibm.com/developerworks/rfe/
  - Select Brand = Servers and Systems Software, and Product = ISPF



Dataset List Enhancements

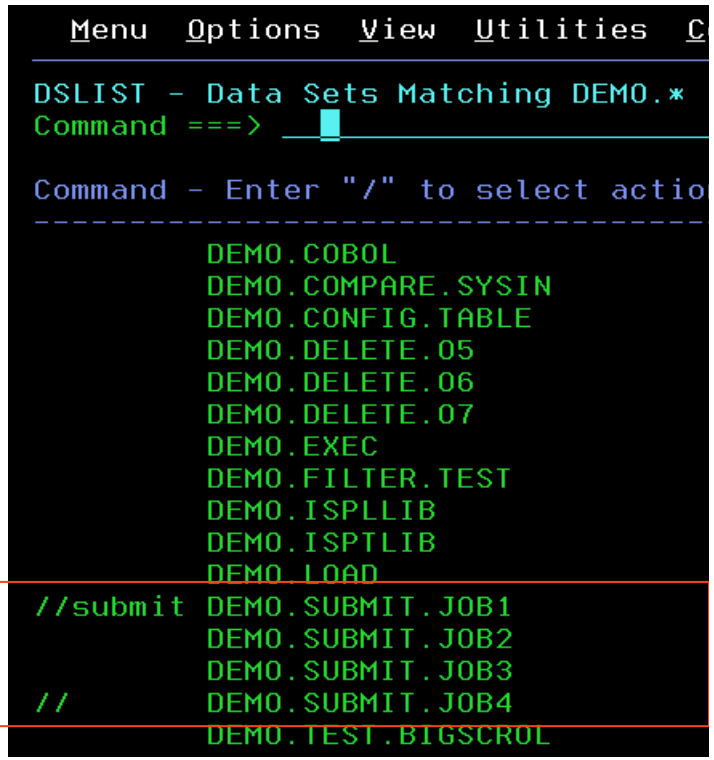
Data Set List Enhancements

- **Display Total Tracks Value (z/OS 1.9)**
  - Display Total Tracks option added to the Data Set List Utility entry panel
  - If selected, an additional header line showing the total tracks used by the data sets is displayed with the **Space** and **Total** views
  - Pop-up window showing data collection progress displayed when calculating total tracks for a list of 50 or more data sets



Data Set List Enhancements

- ***Block Line Commands (z/OS 1.10)***
  - Allows Data Set List line commands to be entered in blocks
  - A block of line commands is marked by entering two forward slash characters (//) at the start and end of the block
  - The required line command is entered on the first or last line of the block, immediately following the two forward slash characters
  - All line commands, including TSO commands, Clists and REXX execs can be executed as block commands



Data Set List Enhancements ...

- **Allocate Line Command (z/OS 1.13)**
  - New **AL** line command can be used to allocate a new data set
  - New data set name can be specified with the **AL** line command
  - When **AL** is entered against an existing data set the user has the option to:
    - Create the data set using the attributes of the existing data set
    - Specify the attributes of the data set on the Allocate New Data Set panel
  - If **AL** is entered against a deleted data set and a name is not specified ISPF will use the name of the deleted data set

- **Display z/OS UNIX Directory List (z/OS 2.1)**
  - Entering a valid UNIX path name in the Dsname Level field will result in the display of a z/OS UNIX Directory List

Member List and Scroll Enhancements

Member List Enhancements

- **FILTER command (z/OS 1.8)**
  - Filter by column name
  - Used to display only those members having an attribute matching a specified value
    - Syntax: **FILTER [*field operator value*]**
      field member list column name
      operator EQ, NE, LE, LT, GE, or GT
      value the comparison value
    - Two ways to issue- 1) Enter just **Filter** and use the menu (easy for remembering) 2) Issue the command, ex: **Filter size GT 1000**
  - Member List **SRCHFOR** command enhanced to use **FILTER** function to optionally display only those members containing the **SRCHFOR** string
- **Member count > 99999 (z/OS 2.1)**
  - Member count fields on the member list panels have been expanded to 7 digits
  - Provide accurate member count values for partitioned data sets with more than 99999 members

Scroll Amounts > 9999 (z/OS 2.1)

- **Support provided for the input of scroll amounts up to 9,999,999**
  - **Note**: The scroll fields on panels have not been changed to support the display and input of scroll amounts greater than 9999

Scroll Amounts > 9999 (z/OS 2.1) cont…

- **Don't forget to update your Configuration Table to support the larger scroll amounts!**

ispcconf

```
                        Modify ISPF Sitewide Defaults
Command ===>
                                                                More:    - +
 /  Show Pfkeys                                  _  Reset Show Pfkeys
                                                 _  Reset LOG Data Set Process Option
 Select Option 7.1 Dialog Test Panel             _  Reset LIST Data Set Process Option
 1  1. ISPYFP                                    _  Reset Command Line Placement
    2. ISPYFPA
    3. ISPYFPB

 Command Line Placement                       PRINTDS Option
 1  1. Bottom                                 1  1. DEST
    2. Asis                                      2. WRITER

 Scroll Defaults                              Status Area Default
 1  1. PAGE                                   2  1. Calendar
    2. HALF                                      2. Session
    3. MAX                                       3. Function Keys
    4. CSR                                       4. User Point and Shoot
    5. DATA                                      5. None

                                              Reset flags
 Minimum Scroll Value   0                     /  Reset Scroll Values
 Maximum Scroll Value   9999999
```

Edit Enhancements

Edit Enhancements

- **Edit Line Commands for HEX Display (z/OS 1.11)**
  - New edit line commands to display selected lines in hexadecimal format:

    HX display a single line in hexadecimal format

    HXX display a block of lines in hexadecimal format

  - The **HX** and **HXX** line commands act as a toggle by switching a line's display format between normal and hexadecimal format

Edit Enhancements …

- **COMPARE Command Enhancements**
  - New VOL keyword (z/OS 2.1)
    - VOL keyword is used to specify the volser for the volume on which the target data set resides

      Syntax: **`VOL(volser)`**
    - Allows comparison against an uncataloged data set

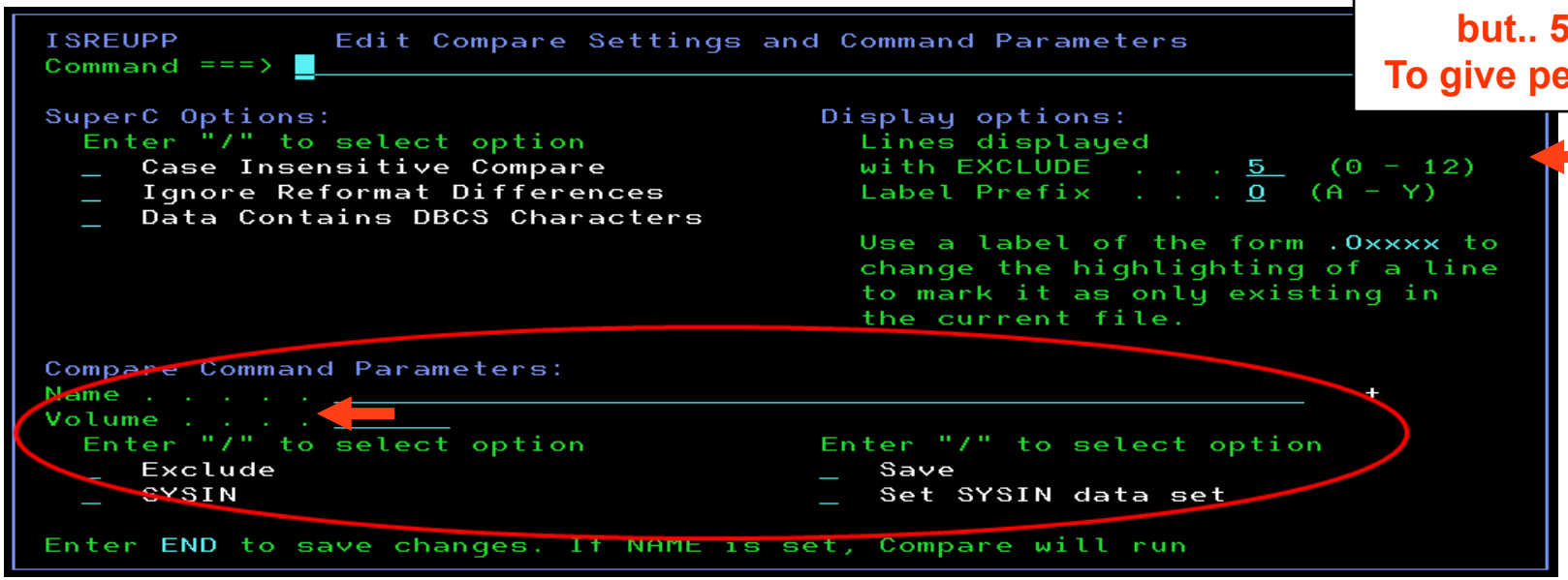
Ex: COMPARE 'DEMO.PARMLIB' VOL(CPDLB3) X

(compare and exclude lines that are the same)

COMPARE Command Enhancements

- Enhanced COMPARE Settings Panel (z/OS 2.1)
  - Edit member and just issue “Compare” to launch the settings panel
  - COMPARE Settings Panel changed to allow specification of command parameters
    - Addresses problem where COMPARE command is too long for the command field
  - For easier viewing: Use “**Exclude**” option to exclude lines that are the same and the exclude ‘**Display** option’ allows for displaying a few lines around the change for perspective..

Ex: Exclude all but.. 5 lines To give perspective



Edit Enhancements …

- **Regular Expressions for FIND/CHANGE (z/OS 2.1)**
  - FIND, CHANGE, and SEEK commands enhanced to allow the search string to be defined using a regular expression
  - Regular expression is specified as a quoted string preceded or followed by the letter “R”

```
e.g. FIND r'l[ai]ne' word
- will find the words lane and line
```

Edit Enhancements. . .

- **Regular Expressions for FIND/CHANGE (z/OS 2.1)**
  - Special symbols for regular expressions

```
. (Period)   - matches any one character
                 e.g. d.g matches "dig", "dug", and "dog", but not "dg"

* (Asterisk) - matches zero or more instances of the previous character
                 e.g. he*ath matches "hath" and "heath"

+ (Plus)              - matches one or more instances of the previous character
                        e.g. south+ern matches "southern", but not "soutern"

[string]              - matches any one of the characters in string
                        e.g. d[iu]g matches "dig" and "dug", but not "dog"

[ch1-ch2]             - matches any of the characters in the range between ch1
and ch2
                        e.g. m[a-z]p matches "map" and "mop", but not "m9p"

[^string]             - matches any character other than those in string
                        e.g. d[^iu]g matches "dog", but not "dig" or "dug"
```

Edit Enhancements …

Expandable Command Field (z/OS 2.1)

- The command field on the ISPF-supplied edit display panels is changed to an expandable field
  - Supports the input of edit primary commands that would otherwise be too long for the command field
- The ZEXPAND command is used to display a pop-up window with the command input field expanded to a length of 255 characters
  - PF4 is set to invoke the ZEXPAND command in the ISPF-supplied edit keylists

  - **NOTE**: The pop-up window is only for edit primary command, use the CMDE command for other (e.g. TSO) commands

Edit Enhancements …

- **HILITE Enhancement – lower case characters in JCL (z/OS 2.1)**

  - The edit HILITE command is changed to display in reverse video lower case characters invalidly used in JCL

```
 File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
ISREDDE2    VANDYKE.JCLLIB(FTPDT) - 01.01                Columns 00001 00080
Command ===>                                              Scroll ===> CSR
****** ********************************* Top of Data ***********************************
000001 //VANDYKEF JOB (#ACCT),'PETER',
000002 //           MSGLEVEL=(1,1),MSGCLASS=X,CLASS=A,REGION=4M,
000003 //           NOTIFY=&SYSUID
000004 //*
000005 //ALLOC      EXEC PGM=IEFBR14
000006 //DDF1       DD   DSN=vandyke.HSD1110.F1.XMI
000007 //COPY       EXEC PGM=FTP
000008 //SYSFTPD    DD   DISP=SHR,DSN=HANKO.PDSCNTL(FTPSDATA)
000009 //sysin      DD   *
000010 192.168.128.222
000011 xxxxxxxxx yyyyyyy
000012 bin
000013 cd "C:\SCLM Suite\FTP downloads for Boulder\SCLM DT"
000014 put 'IBM.HSD1110.F1.XMI' HSD1110.F1BIN
000015 put 'IBM.HSD1110.F2.XMI' HSD1110.F2BIN
000016 put 'IBM.HSD1110.F3.XMI' HSD1110.F3BIN
000017 put 'IBM.HSD1110.F4.XMI' HSD1110.F4BIN
000018 put 'IBM.HSD1110.F5.XMI' HSD1110.F5BIN
000019 put 'IBM.HSD1110.SMPMCS.XMI' HSD1110.MCSBIN
000020 quit
000021 /*
000022 //OUTPUT     DD   SYSOUT=*
****** ******************************** Bottom of Data ********************************
```

PDSE V2 Member Generations

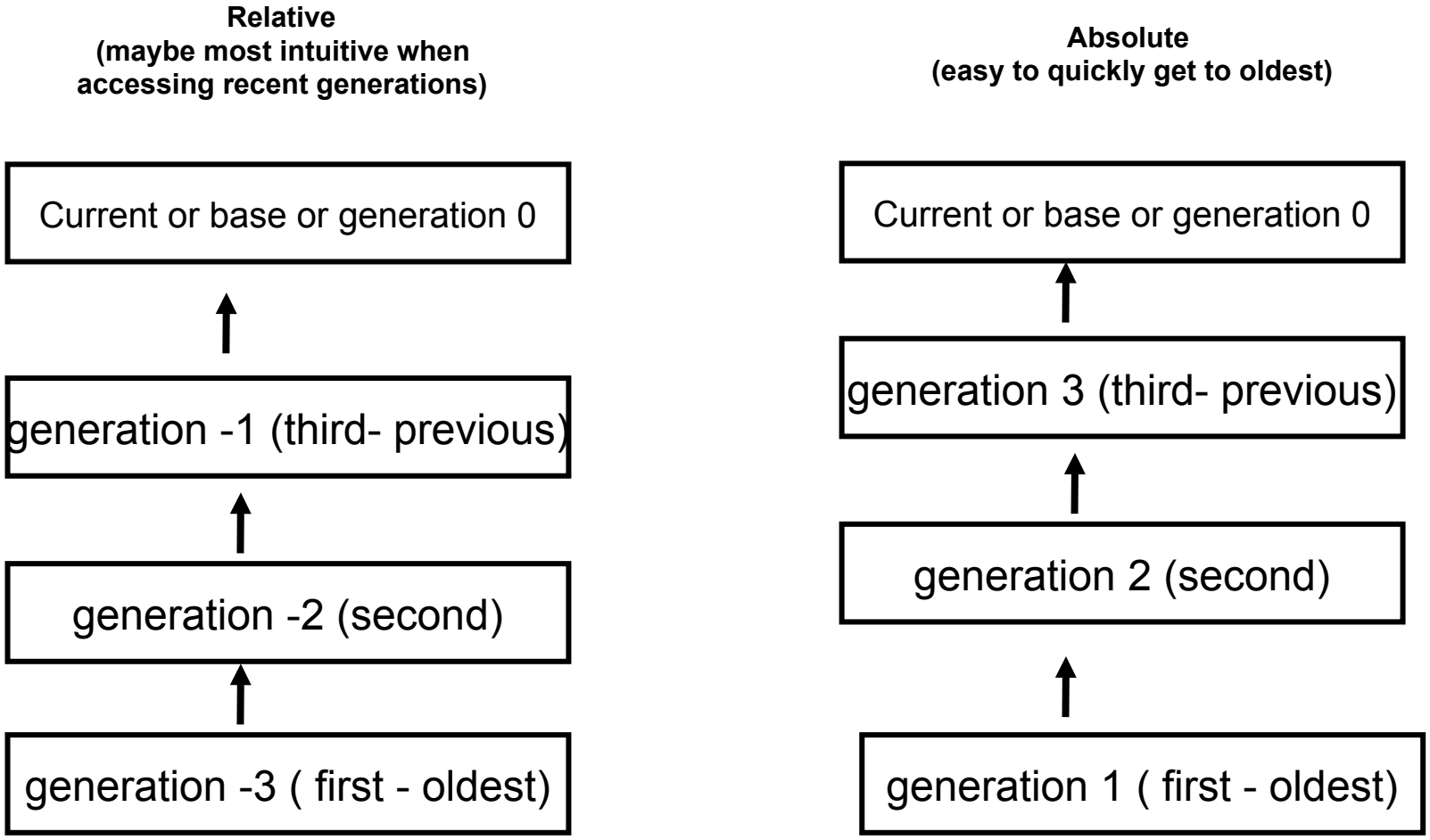
PDSE V2 Member Generations (z/OS V2R1 +)

- ISPF provided support for PDSE Version 2 Member Generations included with DFSMS APAR **OA42358**
  - Requires ISPF APARs **OA42247** and **OA42248**.
  - DFSMS parmlib member IGDSMSxx, MAXGENS_LIMIT setting

- Provides the ability to work with previous generations of a member.
  - *Current ISPF Support:*
    - Data set allocation (ex: option 3.2) provides the ability to specify the maximum generations
    - Data set information includes the maximum number of generations in the data set
    - DSList member display using the “prompt” allows a user to specify the generation to edit or browse
      - *Generation 0 (zero) is the “current” generation*
    - Support in edit for SAVE NEWGEN/NOGEN
    - Limited support on ISPF services: DSINFO (return #), LMDLIST (return #), EDIT,VIEW, BROWSE
  - ***Fyi…Data set Commander V8R1*** *product provides robust support for managing member generations!*

PDSE V2 Member Generations ...

- Two ways to interact with generations, specifying



Example with 3 Generations

Working with Member Generations

- Can edit any generation and specify
  "Save **Newgen**"
  - Newly saved member will become generation 0 (base).

- Can edit the base generation and specify
  "Save **Nogen**"
  - Newly saved member is changed but no new generation is created.

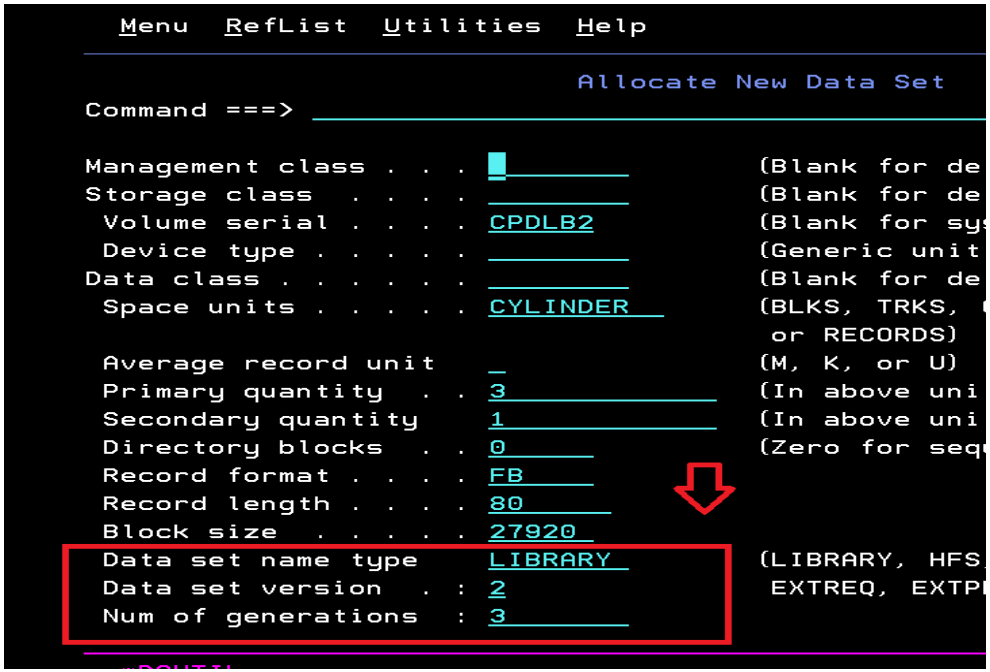
- Rename – causes ISPF to delete all generations except base.

- Delete – Deletes all generations.

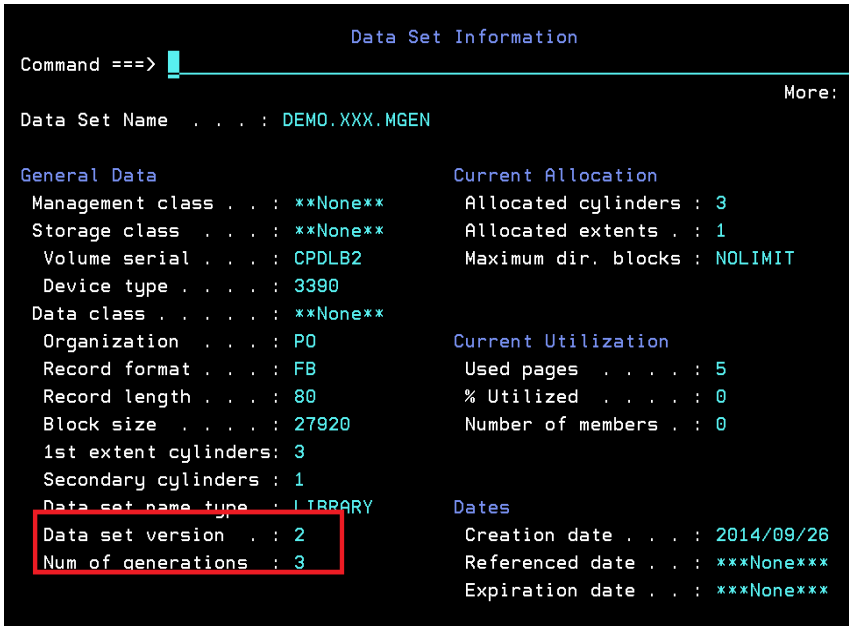
- Copy with generations is not supported.

PDSE V2 Member Generations Display Examples

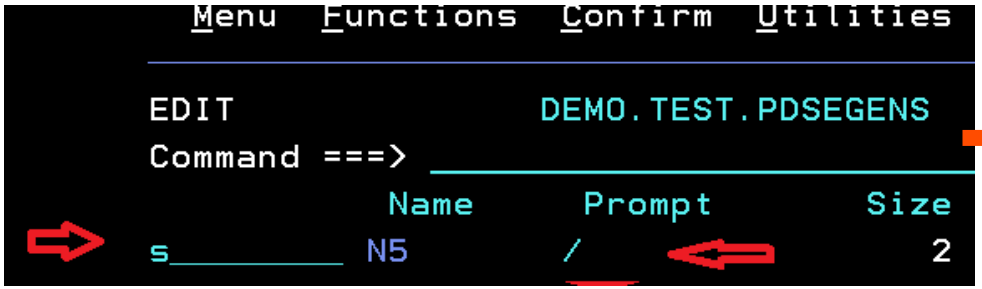
Allocate 3.2

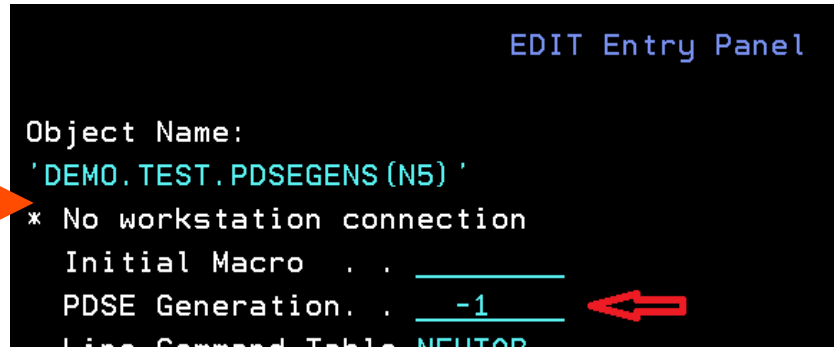


Dataset Information



Editing a generation





Unix Directory List

z/OS UNIX Directory List Utility …

- **z/OS UNIX directory list can be displayed using…. Several ways!**
  - ISPF option 3.17
    - z/OS UNIX Directory List Utility
  - ISPF options 1 & 2 (z/OS 1.9)
    - Enter a directory path name in the “Other” name field
  - UDLIST command (z/OS 1.10)
    - System command used to display a directory list from any command field
    - Lower case path name support added with z/OS 2.1
  - ISPF option 3.4 (z/OS 2.1)
    - Enter a directory path name in the “Dsname Level” field
  - DIRLIST service (z/OS 1.10)
    - Programming API available for programs wanting a directory list display

z/OS UNIX Directory List Utility (z/OS 1.8)

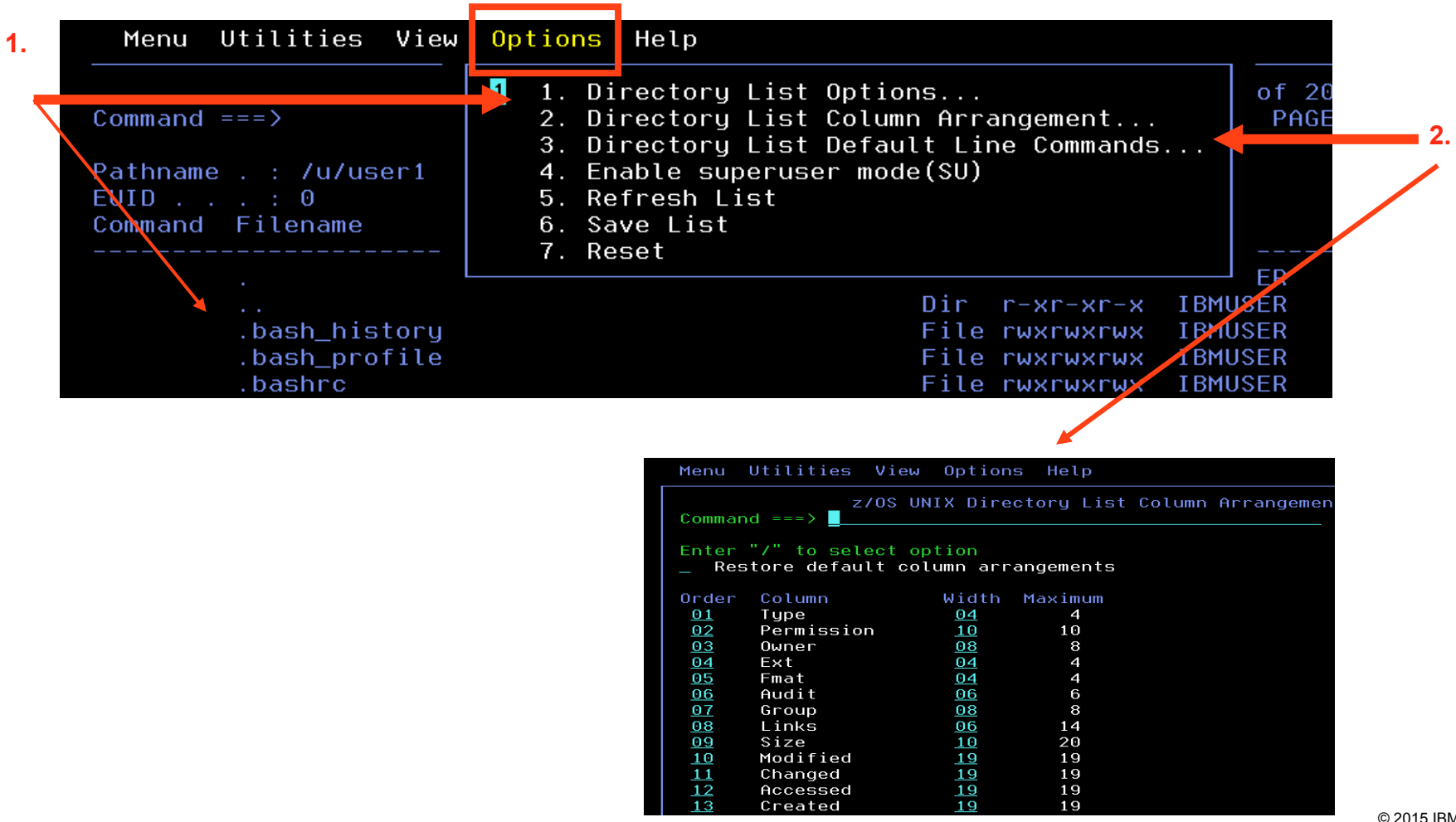
- **Displays a list of files in a z/OS UNIX directory**
- **Provides some of the functions supported by the ISHELL utility**

```
  Menu  RefList  RefMode  Utilities  Options  Help
ISRUULP                    z/OS UNIX Directory List Utility
Option ===>

   blank Display directory list                   P Print directory list

   Pathname . . . /u/vandyke                                                  +

Enter "/" to select option
/  Confirm File Delete
/  Confirm Non-empty Directory Delete

When the directory list is displayed, enter either:
  "/" on the directory list line command field for the command prompt pop-up,
  an ISPF line command, the name of a TSO command, CLIST, or REXX exec, or
  "=" to execute the previous command.
```

```
  Menu  Utilities  View  Options  Help
ISRUUDL0                    z/OS UNIX Directory List              Row 1 to 14 of 288
Command ===>                                                      Scroll ===> CSR

Pathname . : /u/vandyke
EUID . . . : 0
Command   Filename        Message          Type Modified               Permission
-------------------------------------------------------------------------------
          .                                Dir  2013/06/11 13:26:21 rwxrwxrwx
          ..                               Dir  2013/06/11 07:03:20 rwxrwxrwx
          .ishell-reflist                  File 2008/11/05 15:35:34 r--------
          .profile                         File 2013/03/07 13:29:52 rwx---r--
          .profpaul                        File 2008/06/08 12:42:48 rwxrwxrwx
          .setup                           File 2013/03/07 13:53:51 rwx------
          .sh_history                      File 2013/05/17 11:08:32 rw-------
```

z/OS UNIX Directory List Utility - Options Menu

- Option 1 - Adjust size of the filename column
- Option2 – Tailor column arrangement



- **At Option 3.17 - Filtering the display of z/OS UNIX path names (z/OS 2.1)**

  - Support is added to allow the following global or pattern-matching characters to be specified in a path name entered for a z/OS UNIX Directory List display:

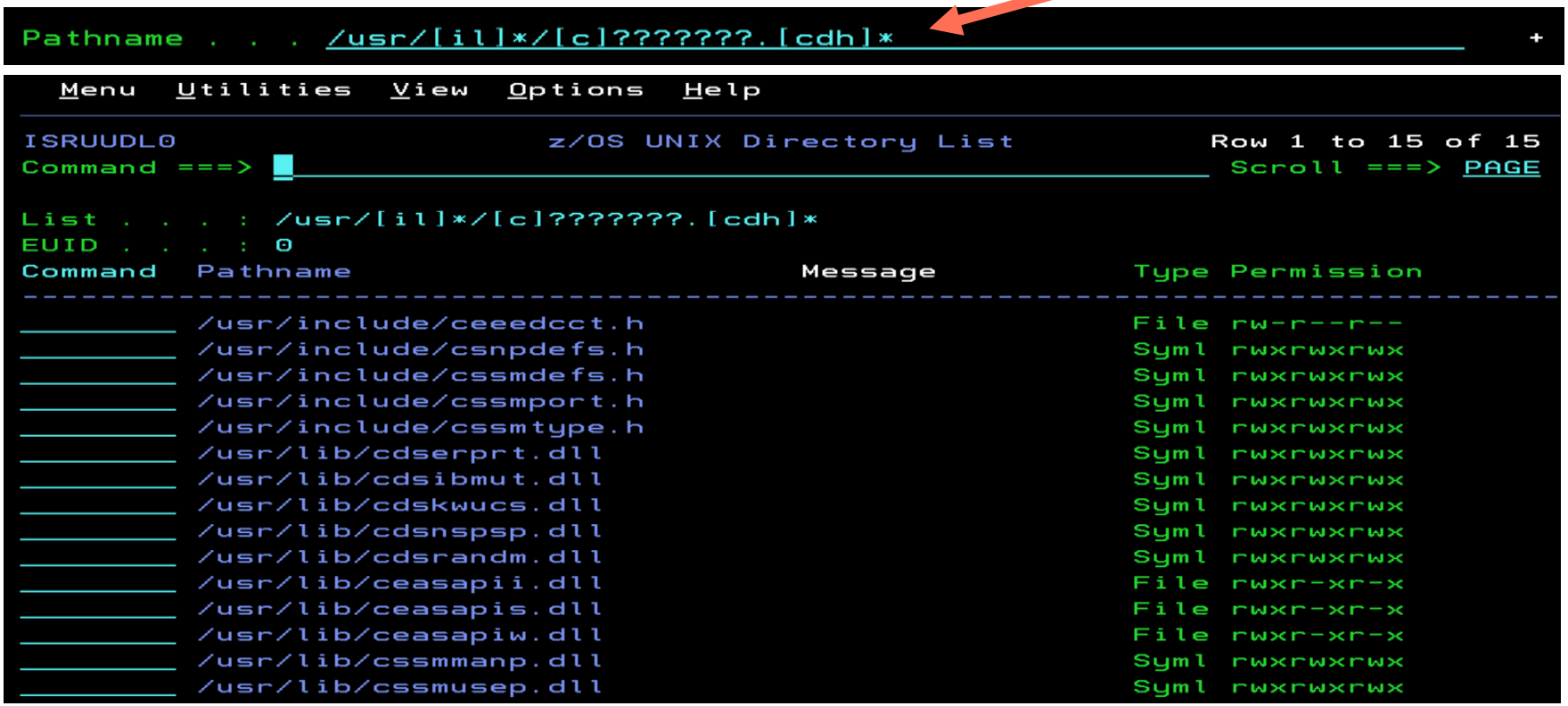
```
?                match any single character
* (asterisk)     match multiple characters
[                open a set of single characters
]                close the set of single characters. Each
                 character in the set can match a single
                 character at the position specified.
```

  - ISPF builds a list consisting of files and directories with path names that match the specified pattern

  - This support is available for all ISPF functions that can be used to display a z/OS UNIX directory list

z/OS UNIX Directory List Utility ...

- **Filtering of z/OS UNIX path names (z/OS 2.1)**
  - **Example**: List from the sub-directories in /usr all entries that have a first character of i or l all files with an 8 character name starting with c and an extension beginning with c, d, or h



z/OS UNIX Directory List Utility …

- **Primary commands available:**
  - **EDIT** - edit a file in the current directory
  - **FIND** - find a string within a filename
  - **LEFT** - scroll the directory list columns to the left
  - **LOCATE** - locate a directory list entry based on the sort order
  - **REFRESH** - redisplay directory list with any changes that have occurred
  - **RESET** - redisplay list removing line commands and messages
  - **RIGHT** - scroll the directory list columns to the right
  - **SAVE** - write the directory list data to a data set
  - **SORT** - sort the directory list by the specified fields

- **New with z/OS 2.1:**
  - **FILTER** - filter the list using a file name pattern
  - **SRCHFOR** - search for string in regular files in the list
    - Similar to the **DSLIST** and member list **SRCHFOR** commands
    - Support for ASCII search strings

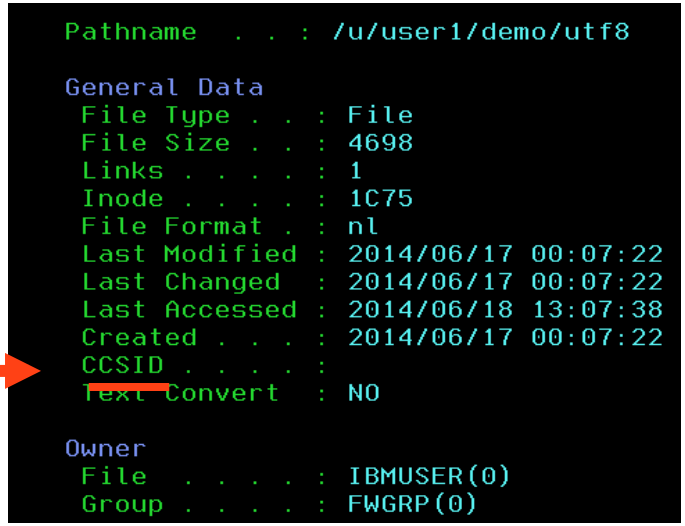
z/OS UNIX Directory List Utility ...

- **Line commands available:**
  - **E** - Edit a file
  - **B** - Browse a file
  - **N** - Create a new file
  - **L** - List a directory
  - **D** - Delete a file
  - **R** - Rename a file
  - **V** - View a file (z/OS 1.9)
  - **EA** - ASCII edit (z/OS 1.9)
  - **VA** - ASCII view (z/OS 1.9)
  - **RA** - REFLIST add (z/OS 1.10)
  - **FS** - File system (z/OS 1.11)
  - **MA** - Modify ACL (z/OS 1.13)
  - **CO** - Copy data out
  - **CI** - Copy data in
  - **I** - Display attributes
  - **MM** - Modify mode fields
  - **MX** - Modify extended attributes
  - **X** - Execute a command
  - **MO** - Modify owner (z/OS 1.11)
  - **MG** - Modify group (z/OS 1.11)
  - **MF** - Modify format (z/OS 1.11)
  - **UA** - User auditing (z/OS 1.11)
  - **AA** - Auditor auditing (z/OS 1.11)

z/OS UNIX Directory List Utility …

- **Line commands available for ASCII and Unicode:**
  - **New with z/OS 2.1:**

Not “tagged”

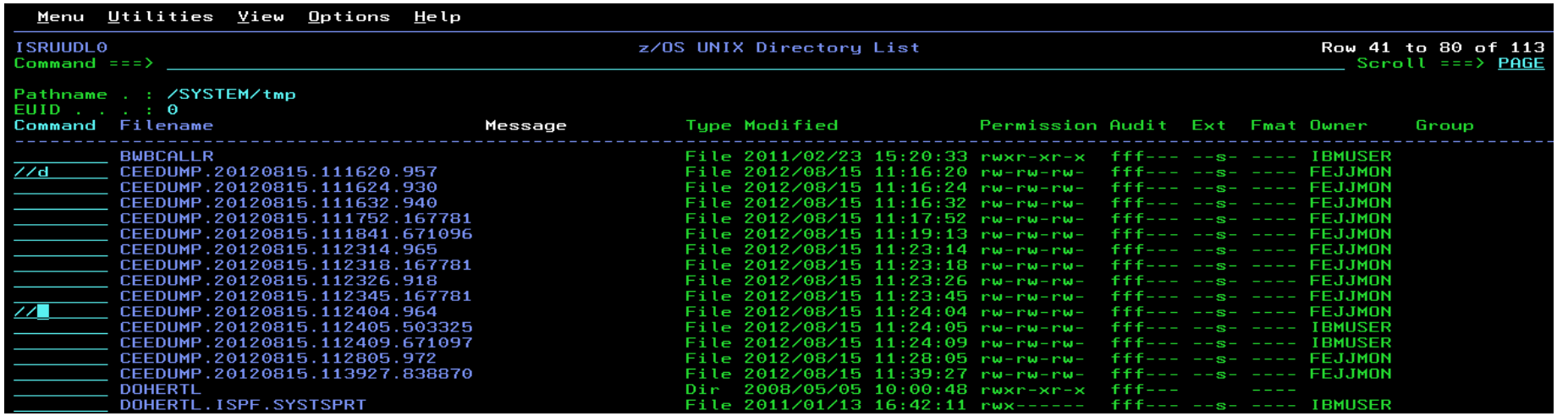


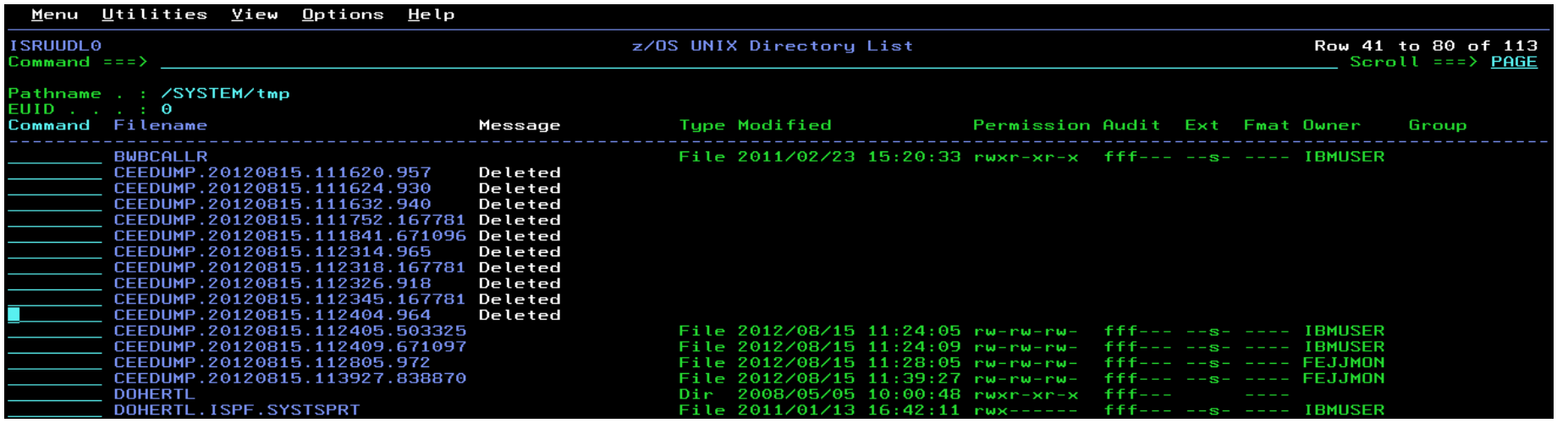
- **Require if the file is not “tagged” with CCSID**
  - **EU** - Unicode edit
  - **VU** - Unicode view
    - The **E** and **V** line commands will provide the same functions if the file is tagged with CCSID 1208

- **Block Line Commands (z/OS 2.1)**
  - Allows the same line command to be executed against multiple files at once
  - Implementation is similar to the block line command support in the ISPF Data Set List Utility (ISPF option 3.4)
  - The start and end of the block is indicated by the user typing 2 forward slash (**//**) characters in the line command fields for the start and end of the block
  - The line command must immediately follow the 2 forward slashes at either the start or end of the block
  - All line commands, including z/OS UNIX commands, TSO commands, CLISTs and REXX execs can be invoked as block commands

z/OS UNIX Directory List Utility …

- **Block Line Commands (z/OS 2.1)**





Running z/OS UNIX Commands

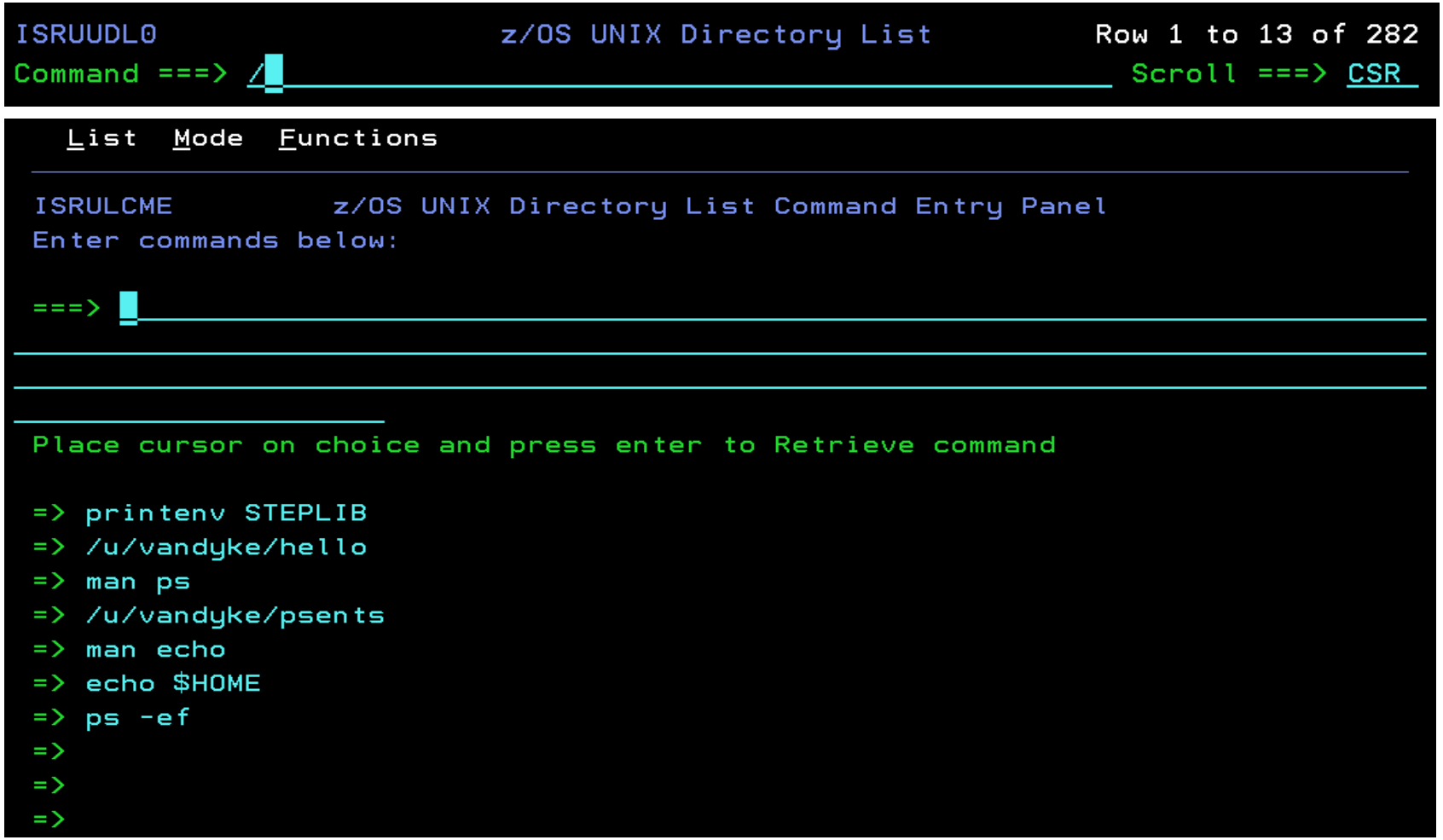
- z/OS UNIX command can be entered in the command field on the directory list panel (z/OS 1.11)
  - Directory list option “Enter z/OS UNIX commands in Command field” must be selected
  - Output to stdout and stderr captured and displayed using the browse function

- z/OS UNIX Command Shell (z/OS 2.1)
  - Provides the ability to enter, save and retrieve z/OS UNIX commands
  - Works in a similar way to the ISPF Command Shell (ISPF option 6)
  - Invoked by entering a / (forward slash) in the primary command field of the z/OS UNIX Directory List panel
    - A 255 character length command field is provided for long z/OS UNIX and TSO commands
    - a list of point-and-shoot fields showing the last 10 z/OS UNIX commands entered
    - user can control retrieval from and updates to the list

- z/OS UNIX Command output mode (z/OS 2.1)
  - Option available to display command output using either browse or view

z/OS UNIX Directory List Utility …

- **Running z/OS UNIX Commands**



Multiple Screens

Using Multiple Screens

- **ISPF allows up to 32 synchronously multi-tasking screens under one ISPF session**

- **Create new logical screens using:**
  - SPLIT [NEW] command
    - reposition horizontal line separating 2 screens on 3270 display
    - new logical screen created when NEW specified
  - START command
    - creates new logical screen with different "initial dialog“

```
START PANEL(panel)|PGM(program)|CMD(command)
[select_parameters]
| ISPF_command
| primary_option_menu_option
```

- **Navigate screens using:**
  - SWAP [LIST | PREV | NEXT | *screen name* | *n*] command
  - ISPF Task List panel (invoked using SWAP LIST command)

- **SWAPBAR (z/OS 1.10)**
  - Simplifies the task of swapping between ISPF logical screens
  - Displays at the bottom of the physical screen point-and-shoot fields associated with each logical screen for the session

    - 

      Tip: Customize your terminal emulator to make the action of clicking the mouse simulate:
      1) Placing the cursor
      2) Pressing the ENTER key

      Ex: with PCOMM from “File” pull-down, go to “Edit”->”Preferences”->”Mouse” select “Customize”. From “File” select “Customize Macro/Script”. Program the Right mouse button to simulate “Mouse Position” and then “Enter”.

  - Enabled using the SWAPBAR system command
    - **Format of the SWAPBAR display can be customized (z/OS 2.1)**

      Syntax: **`SWAPBAR [/|ON|OFF]`**

Using Multiple Screens …

- **Multiple Screens at ISPF Invocation (z/OS 2.1)**
  - Allows a user to define a set of logical screens that are automatically created when ISPF is invoked
  - ISPF profile variable (7.3) is used to define a series of commands to start ISPF logical screens at ISPF invocation
    - Variable must contain the identifier ISPF, followed by the command delimiter then the command stack used to start the logical screens

```
___ MYSTART  P   ISPF;2;START 3.4;START 10;START S;LOG;SWAP 1
```

    - The variable name is specified as an option with the ISPF or ISPSTART command

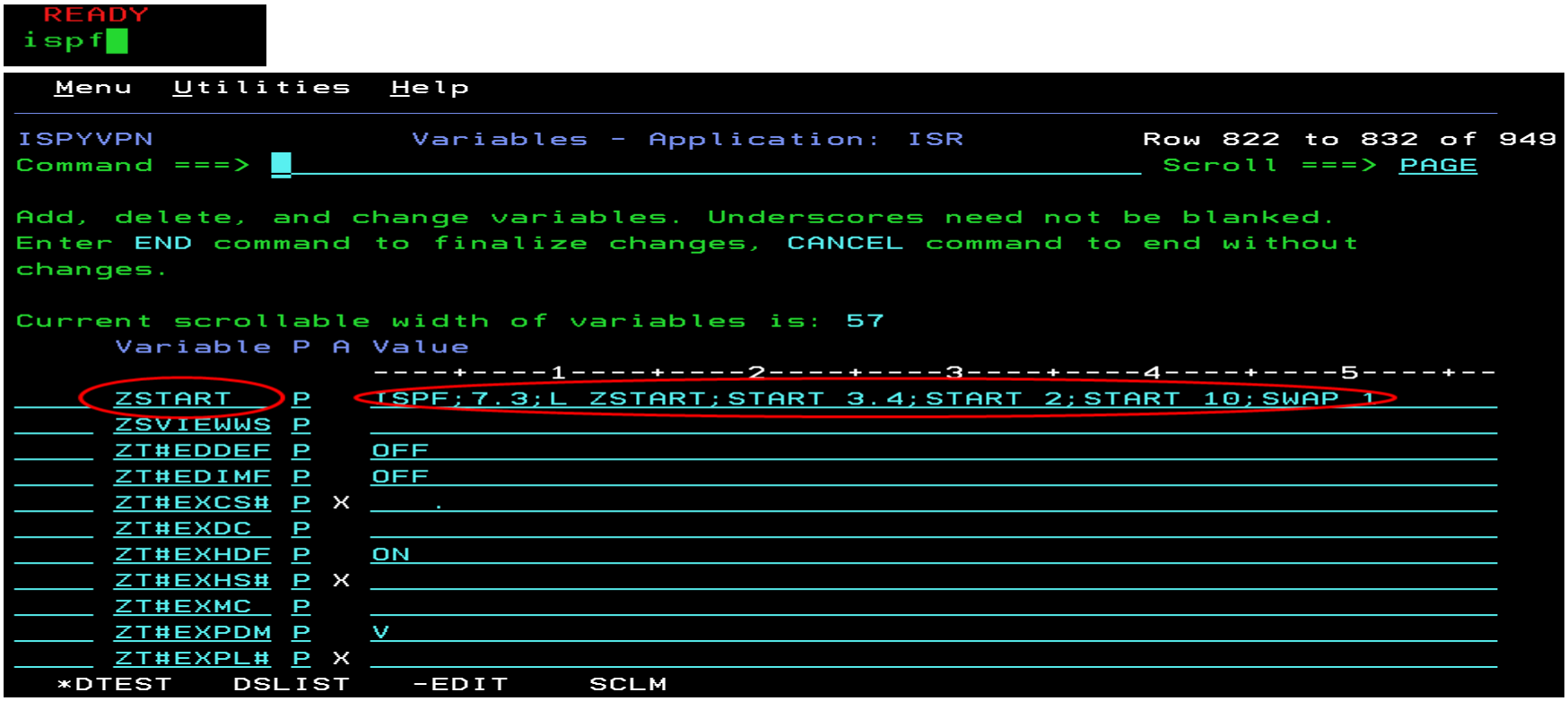
      Syntax: `ISPF MYSTART or`
      `ISPSTART PANEL(ISR@PRIM) NEWAPPL(ISR) OPT(MYSTART)`

      – Screen 1 – ISPF option 2 (edit), Screen 2 – ISPF option 3.4 (DSLIST), Screen 3 – ISPF option 10 (SCLM), Screen 4 – SDSF Log panel (assuming S is the option for SDSF on the primary menu)
      – **SWAP** command is used to make the edit panel the initial screen displayed when ISPF is invoked

Using Multiple Screens …

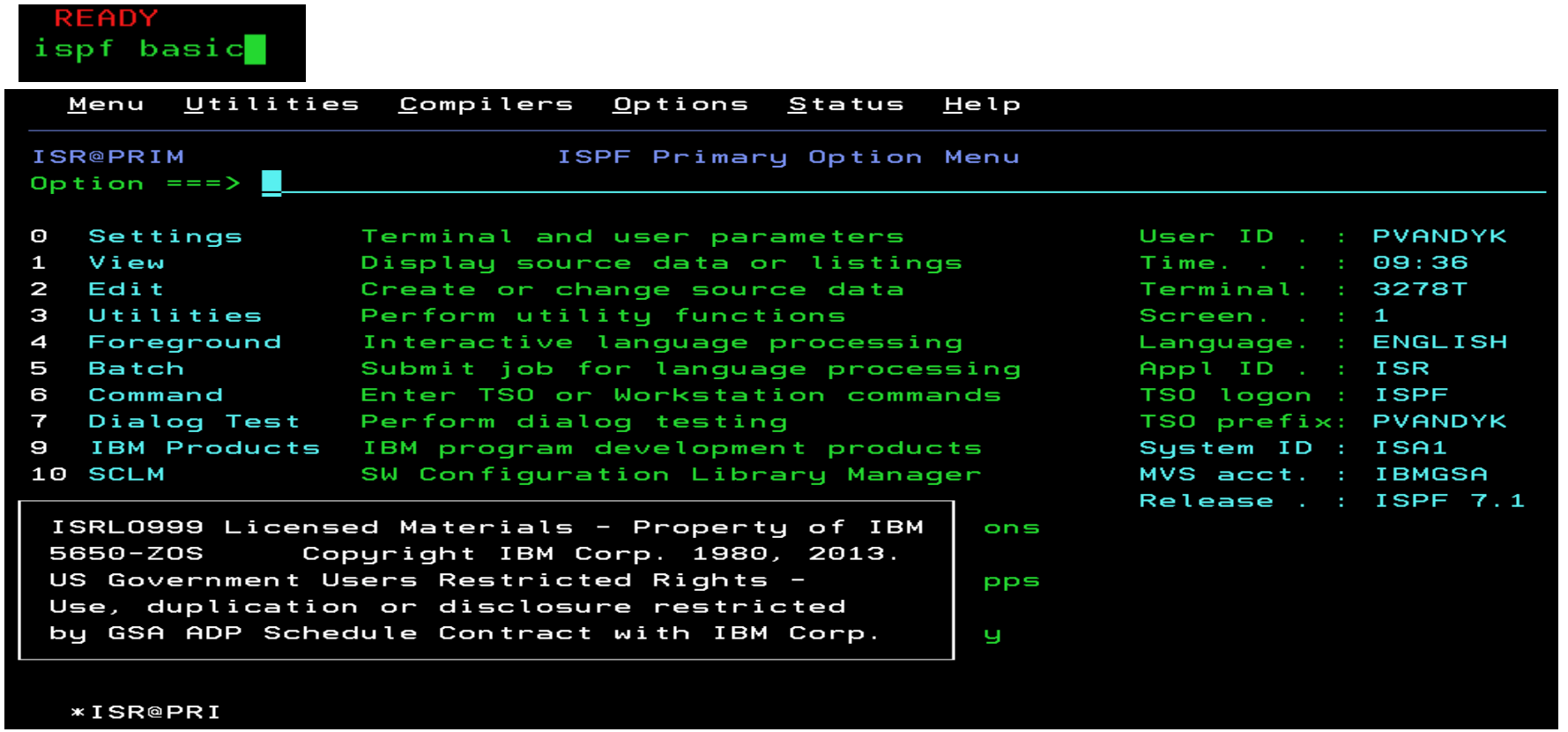
- **Multiple Screens at ISPF Invocation (z/OS 2.1)**
  - If a variable name is not specified with ISPF/ISPSTART default profile variable ZSTART is used for the initial command stack
    - If ZSTART is not found or does not contain the **ISPF** identifier then ISPF starts normally

Option 7.3



Using Multiple Screens …

- **Multiple Screens at ISPF Invocation (z/OS 2.1)**
  - New BASIC keyword for ISPF/ISPSTART command can be used to start ISPF normally at the primary panel



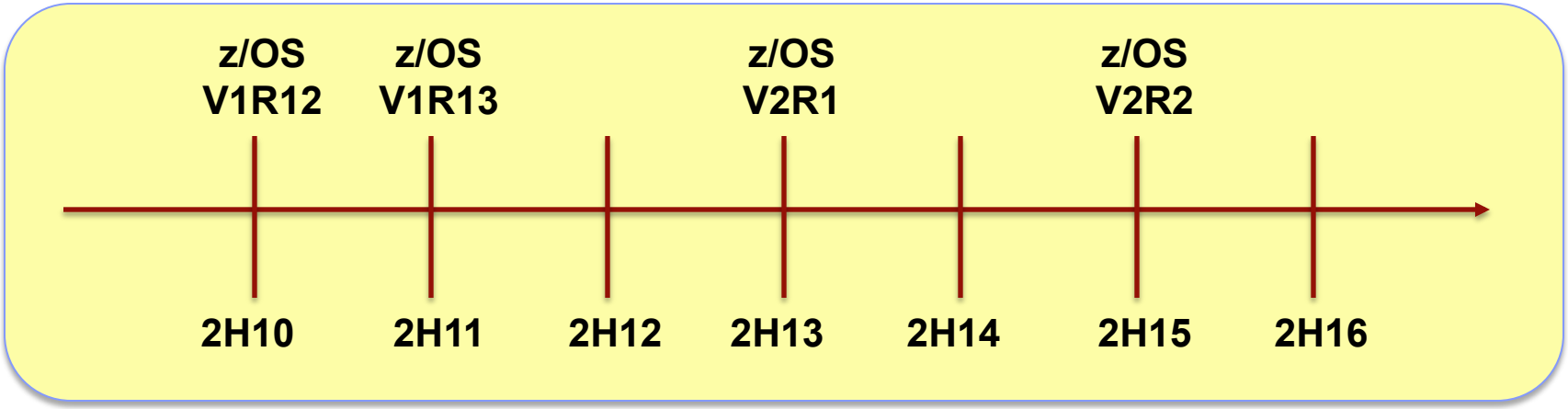
- **=XALL Command (z/OS 2.1)**
  - Provided to help terminate all logical screens with one command
    - =X command propagated to every logical session to terminate each application that supports =X
    - If =X not supported termination process halts on that logical screen
      - Once that logical screen is terminated **=XALL** processing can be continued for each remaining logical screen

z/OS V2R2 ISPF Enhancements

z/OS V2R2 ISPF Disclaimer

- Plans for z/OS ISPF are subject to change prior to general availability.
- Information provided in this section may not reflect what is actually shipped by z/OS ISPF.
- This section includes an early overview of selected future ISPF enhancements.

Plans may change before GA of z/OS V2R2



Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only.

- z/OS V2.1 is the last release to include the IBM HTTP Server Powered by Domino® (IHS powered by Domino).
  - IBM recommends that customers migrate to the IBM HTTP Server Powered by Apache. This is provided as part of the z/OS Ported Tools.
  - ISPF documents in ISPF Planning and Customizing how the TSO/ISPF Client Gateway APIs (which provide for remote access to TSO/ISPF) can be used with the IBM HTTP Server Powered by Domino. Sample function which uses the Gateway is also provided.
- V2R2 removes samples and documentation specific to the IBM HTTP Server Powered by Domino, and provides updated documentation and samples that allow IHS Powered by Apache to use the gateway.
  - ISPF Planning and Customizing documents how the TSO/ISPF Client Gateway APIs (which provide for remote access to TSO/ISPF) can be used with the IBM HTTP Server Powered by Apache.

Remove BookManager/Build from ISPF z/OS Applications menu

- z/OS V2R1 was the last release for the BookManager Build Optional Feature.
  - Official statements of direction provided in 2013.
  - Access to BookManager Build application provided under Primary options menu 13 (z/OS User) option 1
  - BookManager Build is no longer provided by IBM as of z/OS V2R2.
- V2R2 ISPF removes option 13.1

Removal of extraneous commands from the ISPF TSO command table

- Even though the TSO Data Utilities product is no longer supported, there are six commands related to that product that still exist in ISPTCM:
  - COPY, FORM, FORMAT, LIST, MERGE, and PASCALVS
- In V2R2, these six commands have been removed.

DTL compiler enhancement to use the system variable ZISPFRC

- The final return code from the DTL compiler needs to be available to influence the JCL step return codes.
- In V2R2, the final return code from the DTL compiler is stored into the ISPF shared pool variable ZISPFRC.
  - Allows a batch invocation of ISPDTLC to be aware of the success/failure of the DTL compilation

- In V2R1, the ISPSTART command was enhanced to provide support for an initial command stack
  - Command stack is processed as though entered on the first panel
  - One way to control the use of an initial command stack is by using the OPT parameter.

- There are issues with the OPT parameter specification
  - OPT(ZSTART) is not used as the default
  - Only upper-case values are accepted
  - There is no documentation for using the OPT parameter to control the use of an initial command stack

- V2R2 allows OPT(ZSTART) to be the default in cases where the OPT parameter can be specified, but is omitted.
  - The OPT parameter controls the use of the initial command stack
    - You can specify OPT(ZSTART) when an initial command stack is defined in profile variable ZSTART
    - You can specify OPT(*varname*) when an initial command stack is defined in profile variable *varname*
    - You can specify OPT(BASIC) to bypass processing of a defined ZSTART variable
    - If OPT parameter is omitted, OPT(ZSTART) is used as default
      - ISPSTART PANEL(), with the OPT parameter not specified
  - Mixed or lower case can be used when either the keyword BASIC or an initial command stack variable is specified on the OPT parameter.
- This provides better usability when specifying an initial command stack with ISPSTART
- Provides documentation for using the OPT parameter for controlling the use of an initial command stack

- In z/OS V1R13, new support was provided for user-defined line commands. These can be defined in an ISPF command table (option 3.16 can assist with defining)
  - EDIT and VIEW services supported passing a command table as a parameter.
  - EDIF (Edit Interface service) and VIIF (View Interface service) were not enhanced to support the passing of the user line command table.
- V2R2 allows for passing a new parameter: User Line Command Table
  - When invoking EDIF and VIIF services, the user line command table can now be passed as the last positional parameter.
  - The parameter is 9 characters (padded with blanks).

```
CALL ISPLINK ('VIIF','EDIFDSN','EDIFPROF','F',
                  80,RDRTN,CMDRTN,MYDATA,LINECMTAB);
```

CONTROL service enhancement for left and right scroll commands

- A command table can be used to indicate that a command should not be processed by ISPF, but instead should be passed to the dialog for processing
  - Indicated by using the PASSTHRU action in the command table
  - Using a command table to control the pass through of a command results in that command always being passed to the dialog for processing
  - Some dialogs need more granular control for the LEFT and RIGHT scroll commands than the command table provides
    - For example, only pass the LEFT and RIGHT scroll commands to the dialog while in help panels

CONTROL service enhancement for left and right scroll commands …

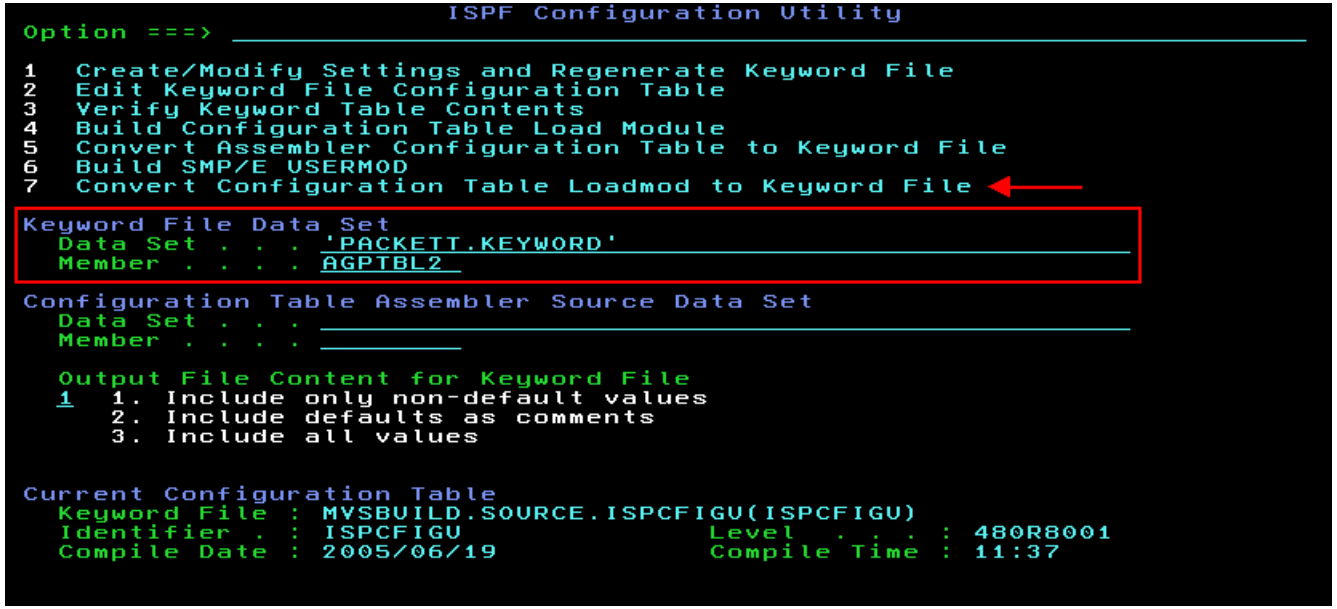
- V2R2 enhances the CONTROL service to allow for controlling the pass through of the LEFT and RIGHT scroll commands.
  - Allow the dialog to turn the pass through of these commands on and off as needed
  - Allow the dialog to query the current status of the pass through of these commands
  - Provides more granular control of pass through of the LEFT and RIGHT scroll commands
  - A new parameter is provided on the CONTROL service.

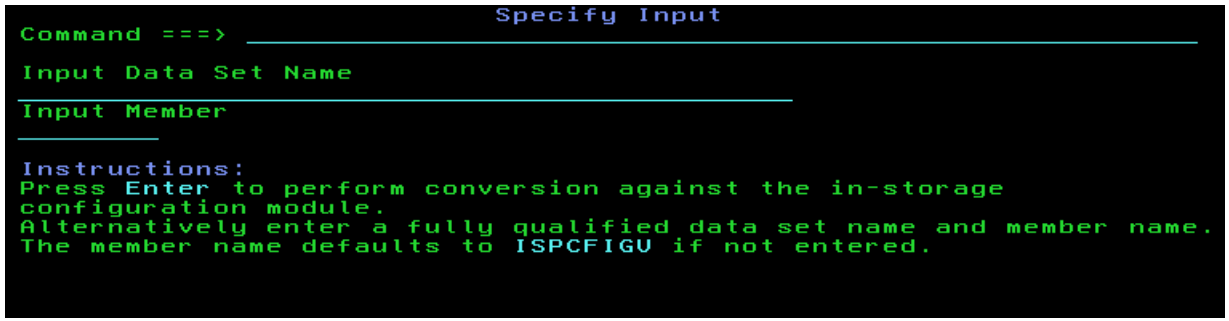
```
PASSTHRU cmd option
 where:
   cmd = LRSCROLL
   option is one of the following:
     PASON: LEFT and RIGHT scroll commands are passed to the dialog
     PASOFF: LEFT and RIGHT scroll commands not passed to the dialog
     PASQUERY: Query PASSTHRU status for LEFT & RIGHT scroll commands
```

ISPF configuration table

- An ISPF configuration load module can not be updated if the source keyword file is not available.
- In V2R2, the ISPF Configuration Utility (TSO ISPCCONF command) is enhanced to provide a method for converting the active configuration load module, or one residing in a data set, to a keyword file. (APAR OA42680)
  - From the ISPF Configuration Utility, select option 7
  - The generated keyword file can then be updated using existing option 1 or 2 of the ISPF Configuration Utility.
  - A configuration load module can then be built from the updated keyword file using existing option 4 of the ISPF Configuration Utility.
  - Added to z/OS V2R1 by APAR OA42680

ISPF configuration table …





Browse enhancement to increase the record number limit

- Prior to V2R2, the number of records that browse can process is limited to 99,999,999.
- V2R2 increases the number of records that browse can process to 2,147,483,646.
  - The browse LOCATE command is enhanced to increase the maximum line number value allowed.
  - The BRIF service uses the new limit when the caller passes a new parameter (EXTEND) and the READ routine is altered to accept record numbers up to the new maximum value.

Interactive ISPF Gateway

- The ISPF Gateway does not support a conversational mode of interaction between the remote client and TSO/ISPF.
  - For example, a REXX program that prompts for a response
- In V2R2, the ISPF Gateway API is enhanced to support conversational mode interaction.
  - Uses z/OS TSO CEA Address Space Services to create TSO address spaces and provide communication between the remote client and the address space.
- The ISPF Gateway can be used to run programs that are interactive, issuing TSO/ISPF conversational mode commands.

Interactive ISPF Gateway …

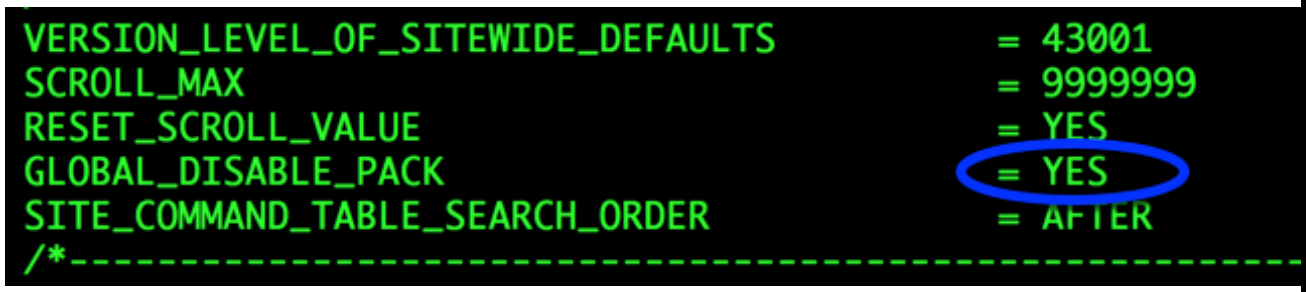
- No updates are necessary to programs exploiting the ISPF Gateway API unless you with to exploit the new conversational mode interaction capability.
- To exploit the new capability, the environment variable CGI_CEATSO must be set to TRUE, and the new API capabilities utilized as described in ISPF Planning and Customizing.
- More details in the appendix

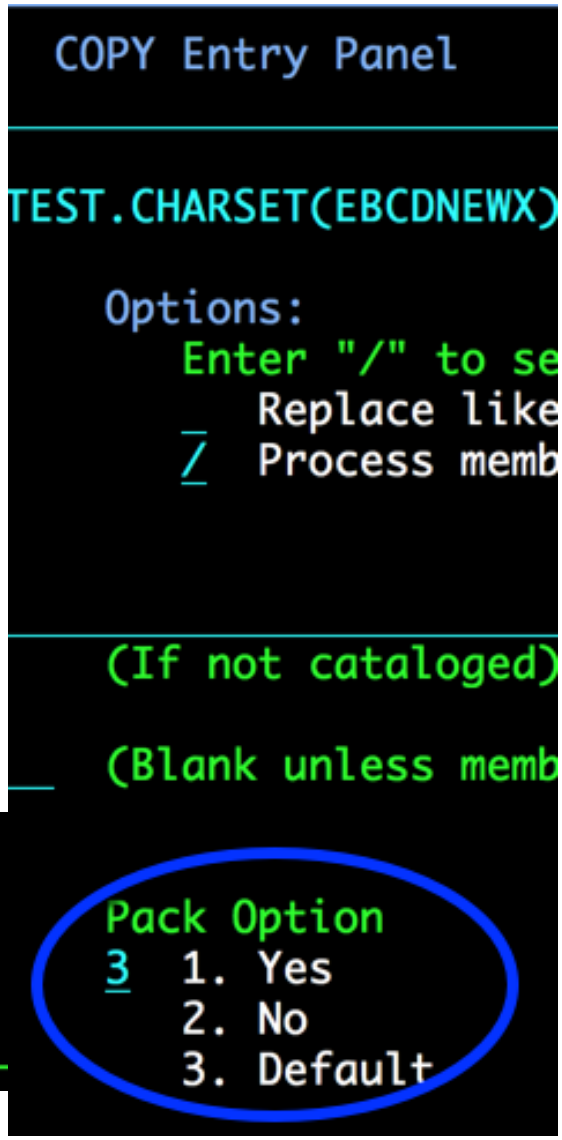
Global configuration option to define a default line command table

- Use of the user Line Command Table was provided by specifying the table as a parameter to ISPF services Edit/View and on Edit/View entry panels. With V2R2, also provided on EDIF and VIIF.
  - Requires passing the table as a parameter or specifying on Edit/View entry panels
- V2R2 provides support for globally specifying a Line Command Table
  - A new setting, GLOBAL_LINE_COMMAND_TABLE, defines a line command table that will be active when not otherwise specified by the user or supplied as parameter on the edit/view service call.
  - Defined in Edit-related settings via GLOBAL_LINE_COMMAND_TABLE field

Global configuration option to disable the editor PACK operation

- The PACK command controls how data is stored.
  - There is no way to globally disable the Pack option.
    - If it is inadvertently set … oops!
- V2R2 provides the ability to globally disable the Pack option:
  - The PACK option for Move/Copy utility
  - The Edit Pack primary command
  - A new setting, GLOBAL_DISABLE_PACK, disables the pack operation used by the editor. Any currently packed data will be unpacked if saved. This option also disables PACK from having any effect with COPY and MOVE services.



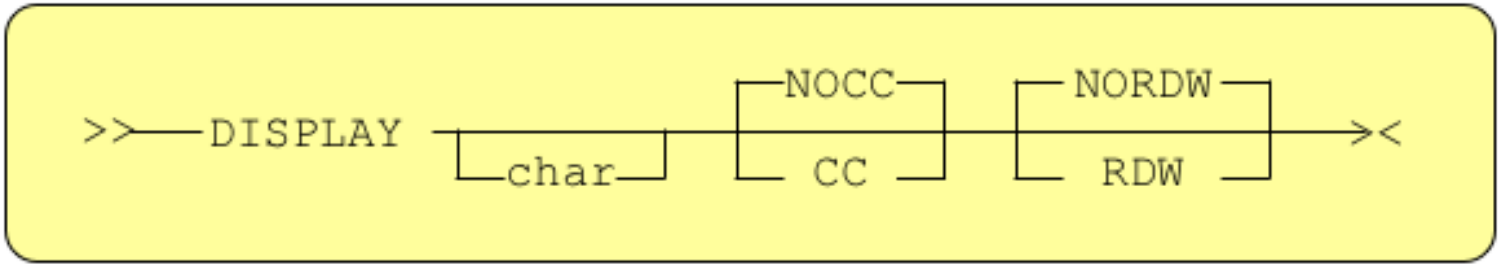


Browse enhancement to display the length of variable records

- The View (Primary option 1) Browse primary DISPLAY command allows for viewing data that would not normally be displayed.
  - For a dataset with variable length records (formats V or VB), users have requested the ability to display the record descriptor word (RDW).
    - The RDW is a 4-byte field describing the record. The first 2 bytes contain the length of the logical record (including the 4-byte RDW).
- V2R2 enhances the Browse primary DISPLAY command to optionally show the record descriptor word (RDW) for variable length records.
  - Allows visibility to the length of variable length records

Browse enhancement to display the length of variable records …

- In V2R2, the existing Browse primary DISPLAY command now has an RDW option:



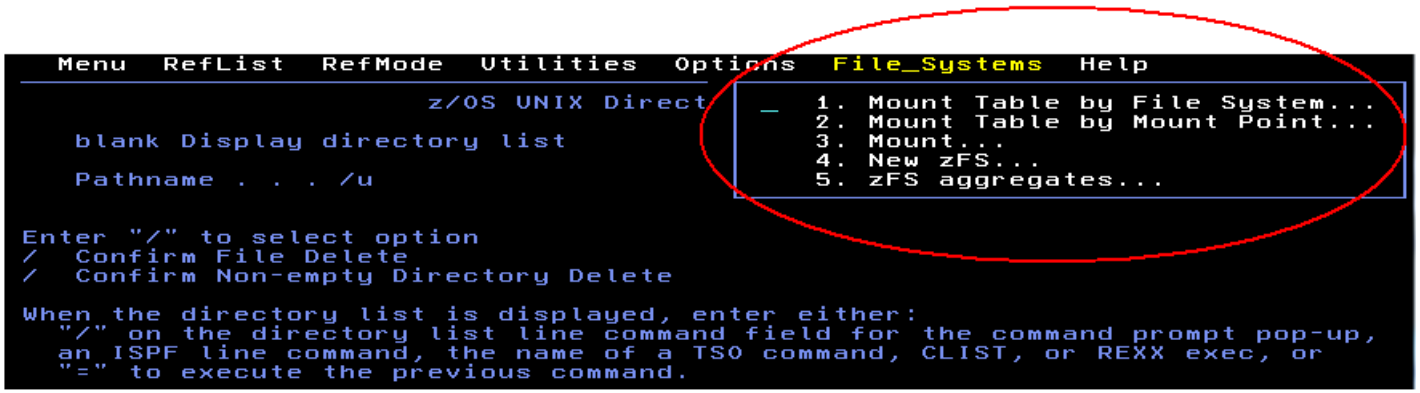
  - RDW: Display the record descriptor word. Hex mode is automatically turned on.
  - NORDW: The record descriptor word is removed from the display and hex mode is turned off. This is the default.

z/OS UNIX file system support in ISPF

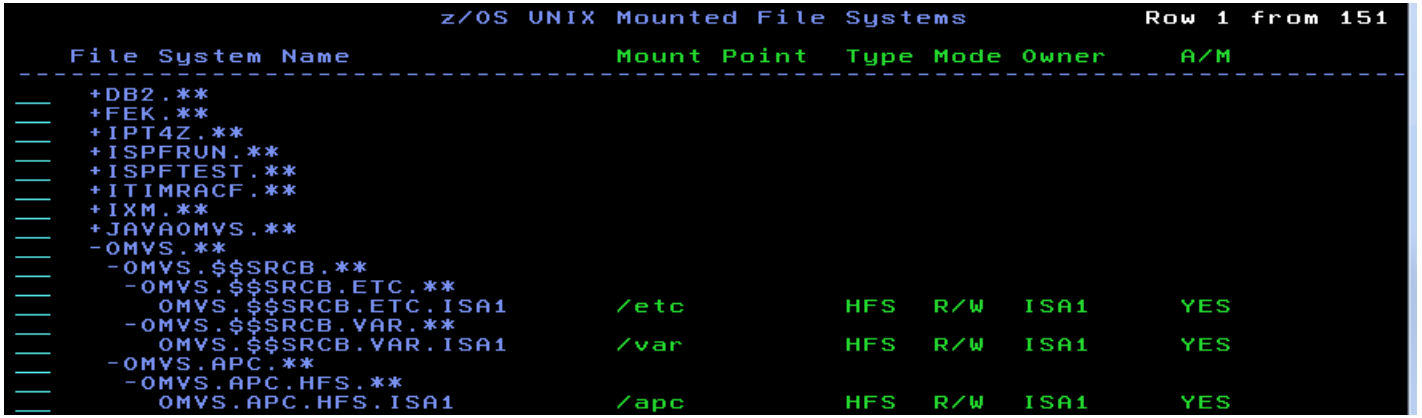
- There are multiple locations for working with UNIX file systems
  - The File_Systems pull-down menu in the UNIX System Services ISPF Shell (ISHELL)
  - ISPF option 3.17 (z/OS UNIX Directory List Utility)
- Usability issues exist when there are many file systems to be displayed and managed in ISHELL
- V2R2 adds the ISHELL file system functions to ISPF option 3.17
- Provide enhanced displays for mounted file systems
  - Lists ordered by either file system name or mount point name
  - Lists that can be expanded and collapsed to improve usability
- File system functions consolidated in single location
- Improved usability for mounted file systems displays

z/OS UNIX file system support in ISPF …

- A new “File Systems” menu is added under ISPF option 3.17



- List entries can expand/contract for access to files systems of interest



Appendix

Interactive ISPF Gateway (V2R2)

Interactive ISPF Gateway: API request types

- NEWTSO
  - Start a new TSO/E address space. Do not start ISPF.
- NEWTSOISPF
  - Start a new TSO/E address space. Start ISPF.
- RECONNTSO
  - Reconnect to a dormant TSO/E address space. Do not start ISPF.
- RECONNTSOISPF
  - Reconnect to a dormant TSO/E address space. Start ISPF.
- REUSE
  - Reuse a TSO/E address space for a new command.
- RESPOND
  - Respond to a prompt from a TSO/E address space.

Interactive ISPF Gateway: API request types …

- PING
  - Ping a TSO/E address space. Required every 15 minutes to keep the address space alive.
- ATTN
  - Send an attention interrupt to a TSO/E address space.
- DORMANT
  - Put a TSO/E address space in a dormant state. Activating a dormant address space is faster than starting a new address space.
- LOGOFF
  - Log off a TSO/E address space.
- CANCEL
  - Cancel a TSO/E address space.

Interactive ISPF Gateway: Example

- Input: `TSO EX 'TEST.EXEC(GWSVMULT)' &REQUEST=NEWTSOISPF`
  `&PROCNAME=ISPFPROC &ACCTNUM=IBMGSA &GROUPID=DEFAULT`
  `&REGIONSZ=2000000`

- Command to be issued: `TSO EX 'TEST.EXEC(GWSVMULT)'`

- Output:

```
<ISPINFO>
<ISPF>
Hello client, what's your name? **Output of TEST.EXEC(GWSVMULT)
</ISPF>
RC=0
</ISPINFO>
<SESSION-INFO>
<SESS>&VER=1&ASID=90&STOKEN=000001680000009D&INDEX=2
     &MSGQID=4456456 &TYPE=ISPF</SESS>   ** Address space
                                            identification
<TSOPROMPT>YES</TSOPROMPT> ** Indication that prompt was issued
  </SESSION-INFO>
```

Interactive ISPF Gateway: Example …

- Previous Output:
```
Hello client, what's your name?
<TSOPROMPT>YES</TSOPROMPT>
```

Input:
```
RESPONSE "JOHN" &REQUEST=RESPOND &VER=1 &ASID=90
&STOKEN=000001680000009D &INDEX=2 &MSGQID=4587528 &TYPE=ISPF
```

Response to prompt: `JOHN`

Output:
```
<ISPINFO>
<ISPF>
Hello JOHN                    ** Output from TEST.EXEC(GWSVSING)
 Enter a digit and I'll give you a word. Enter END to stop.
</ISPF>
RC=0
</ISPINFO>
<SESSION-INFO>
<TSOPROMPT>YES</TSOPROMPT> ** Indication that prompt was issued
</SESSION-INFO>
```