z/OS 3.1 IBM Education Assistant

Solution Name: Member Generation Enhancements

Solution Element(s): ISPF

July 2023

Agenda

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Trademarks

- See url http://www.ibm.com/legal/copytrade.shtml for a list of trademarks.
- Additional Trademarks:
  - None

Objective

The main objective is to increase both the access and visibility to the Member Generation functionality. The existing support has the following limitations:

- Currently, the only way to access a non-current generation DS member is through the prompt field which is available via the member list panel via Utilities (option 3). This is very limiting and not always convenient.
- Currently, the only way to know how many non-current generations exist for a DS is to display the DS member information panel. This panel displays the total number of non-current generations. However, it does not show what generations are available or provide a mechanism to edit or view the generation directly.
- Access to non-current generations through ISPF services is not available.
- This is to address a subset of Idea ZOS-I-1565 “Full ISPF Support for PDSE V2 Generations”.

Overview

- Who (Audience)
  - System administrators
- What (Solution)
  1. Ability to specify a generation of a member (using either an absolute or relative generation number) on primary options 1 (View) and 2 (Edit)
  2. Ability to specify a generation of a member (using either an absolute or relative generation number) when using the following Browse and Edit primary commands: BROWSE, EDIT and VIEW
  3. Ability to obtain more specific generation-related error information when using ISPF services BROWSE, EDIT, and VIEW
  4. Ability to obtain non-current generation information for a member using ISPF services LMMDISP, LMMFIND, and LMMLIST
  5. Ability to access generations via a generation list similar to a data set member list
- Wow (Benefit / Value, Need Addressed)
  - Improve Members Generation access and visibility in many areas

Background Information 1 of 6

- DFSMS shipped PDSE V2 Member Generations as an APAR to z/OS V2R1
- At that time, ISPF shipped an APAR to provide limited support for PDSE MG:
  - 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
  - Support in edit for SAVE NEWGEN/NOGEN
  - Limited support on ISPF services: DSINFO (return #), LMDLIST (return #), EDIT, VIEW, BROWSE
- In V2R5, we provided improved visibility to member generations information in Edit, View, and Browse, and added member generation information to the member info panel.

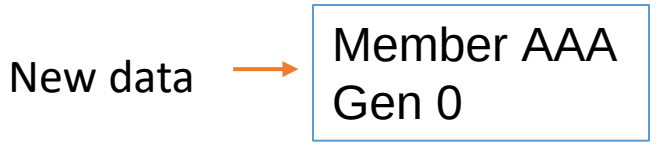
Background Information 2 of 6

- When a PDSE V2 data set is allocated, the number of generations to be kept for members in the data set can be specified
  - Maximum value determined by DFSMS start option MAXGENS_LIMIT
- The current version of a member is referred to as the “current generation”
  - Identified as Generation 0
- Previous versions of a member are referred to as “non-current generations”
  - Identified using either:
    - absolute generation numbers (Generation 1, 2, 3, etc.)
    - relative generation numbers (Generation -1, -2, -3, etc)

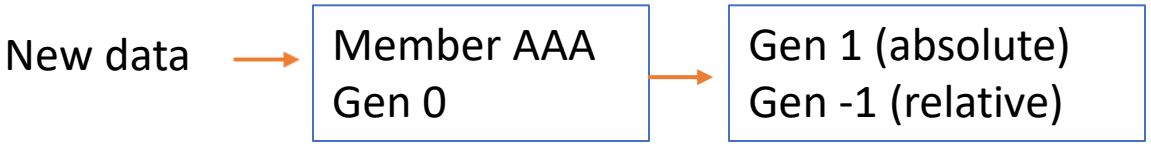
Background Information 3 of 6

Creating/Savings Generations

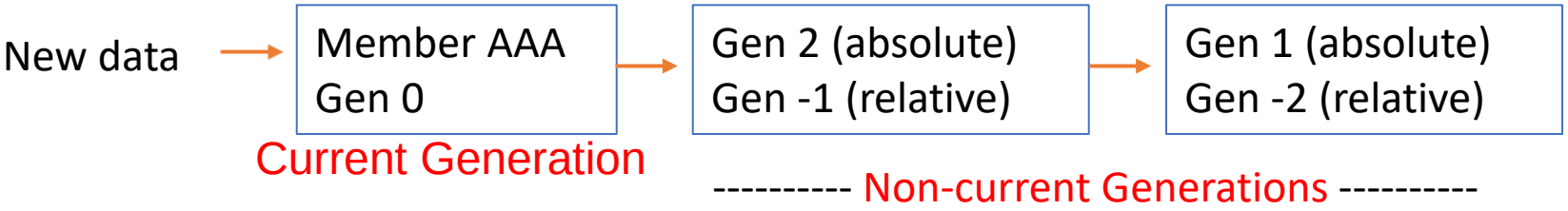
- After first save of member AAA:



- After second save of member AAA:



- After third save of member AAA:

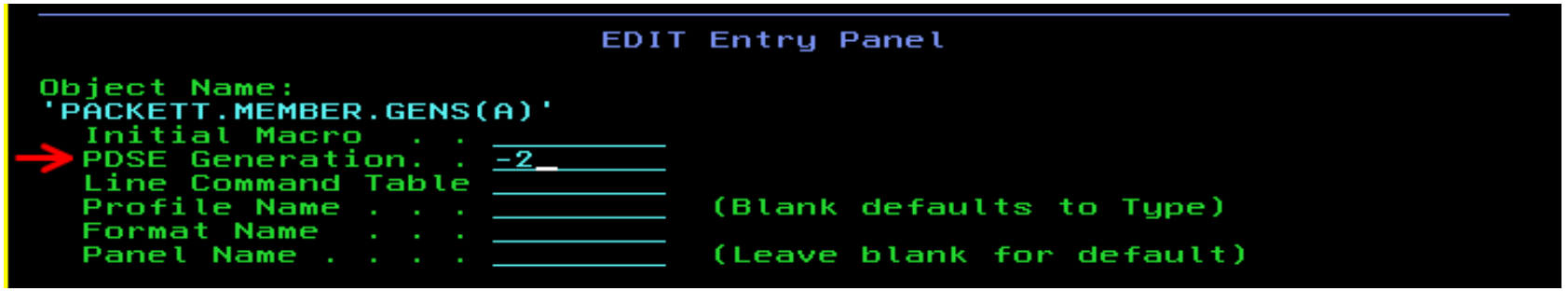


Background Information 4 of 6

- Relative and Absolute generation number ranges:
  - If 50 generations are being kept for the members in a data set
    - After 50 generations have been saved for a member, future saves result in the removal of the oldest saved generation
    - Relative generation numbers are always in the range -1 to -50
    - Absolute generations numbers slide:
      - First 50 generations saved are in absolute range 1 to 50
      - After next save, saved generations are in absolute range 2 to 51
      - After next save, saved generations are in absolute range 3 to 52
      - It becomes difficult to know the current absolute range

Background Information 5 of 6

- Accessing member generations for ISPF Edit, View, and Browse:
  - To access the current generation:
    - Specify no generation number
    - Specify 0 as generation number on Edit/View/Browse Entry panel
  - To access non-current generations:
    - Specify n (absolute generation number) on Edit/View/Browse Entry panel
    - Specify -n (relative generation number) on Edit/View/Browse Entry panel



Background Information 6 of 6

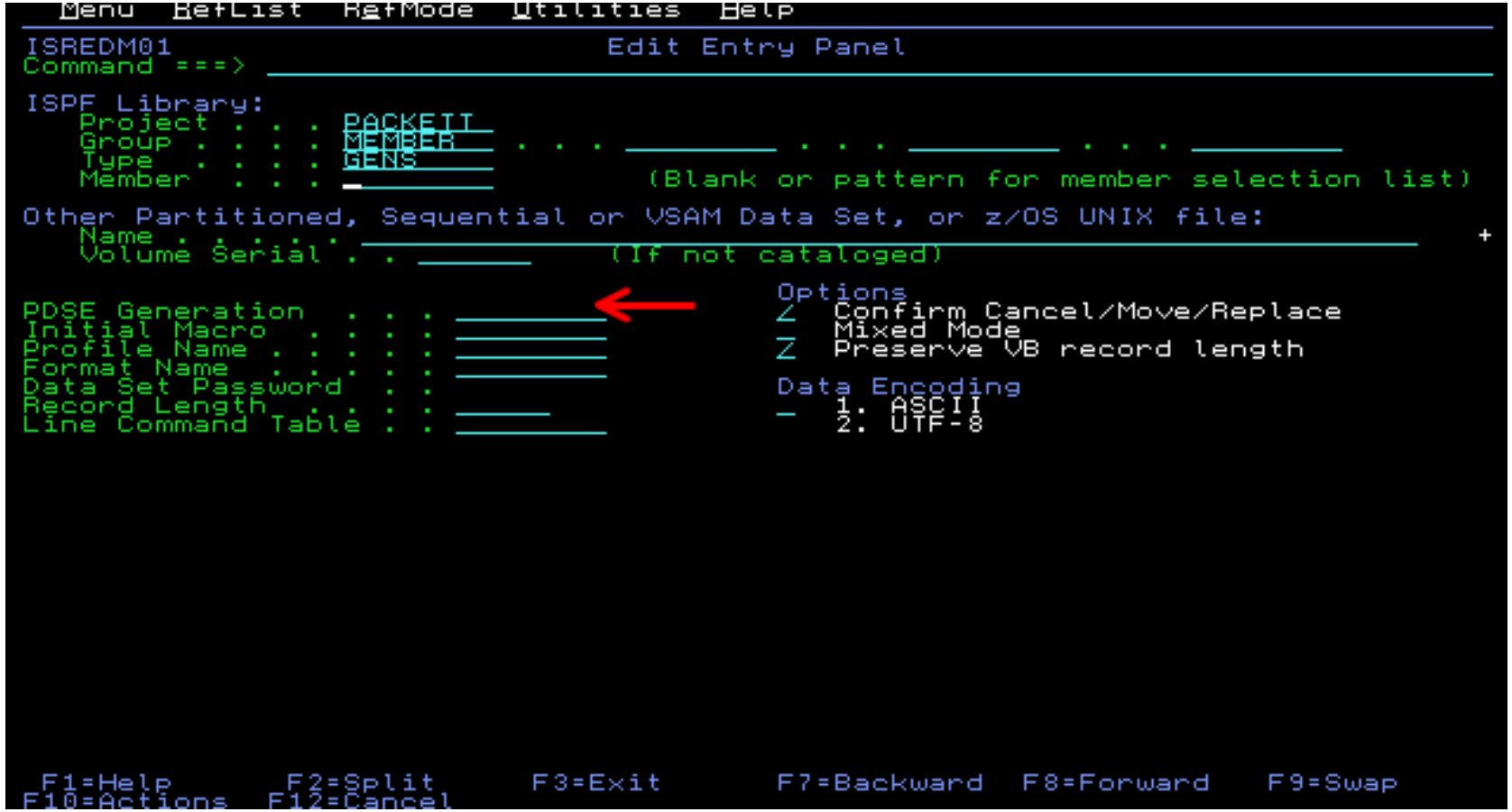
- ISPF Edit SAVE Command – **NEWGEN** and **NOGEN** parameters:
  - **NEWGEN**
    - Saves the edit data in a new generation. This new generation becomes the current generation, also known as generation zero. The generation being edited is left unchanged. This is the default behavior when editing the current generation.
  - **NOGEN**
    - Saves the edit data to the same generation that is being edited. This is the default behavior when editing a non-current generation.

  - Note: The default SAVE behavior when editing a non-current member generation can be changed in the ISPF site configuration table.

Usage & Invocation (Solution 1)

Primary Options 1 (Browse/View) and 2 Edit

- The Edit, View, and Browse panels will be updated to allow the specification of a PDSE generation. Both absolute and relative generation numbers will be supported in the PDSE Generation field.



Usage & Invocation (Solution 2)

Browse, Edit and View Primary Commands

- The Edit, View, and Browse primary commands will be updated to allow the specification of a PDSE generation (using either an absolute or relative generation number). Each of the primary commands BROWSE, EDIT, and VIEW will be updated as indicated in the syntax diagrams below. Support will be added for the specification of a generation when a member name is also specified on the command. Specification of a generation will be done by including the keyword GEN and the generation number after the member name on the command. Both absolute and relative generation numbers will be supported.

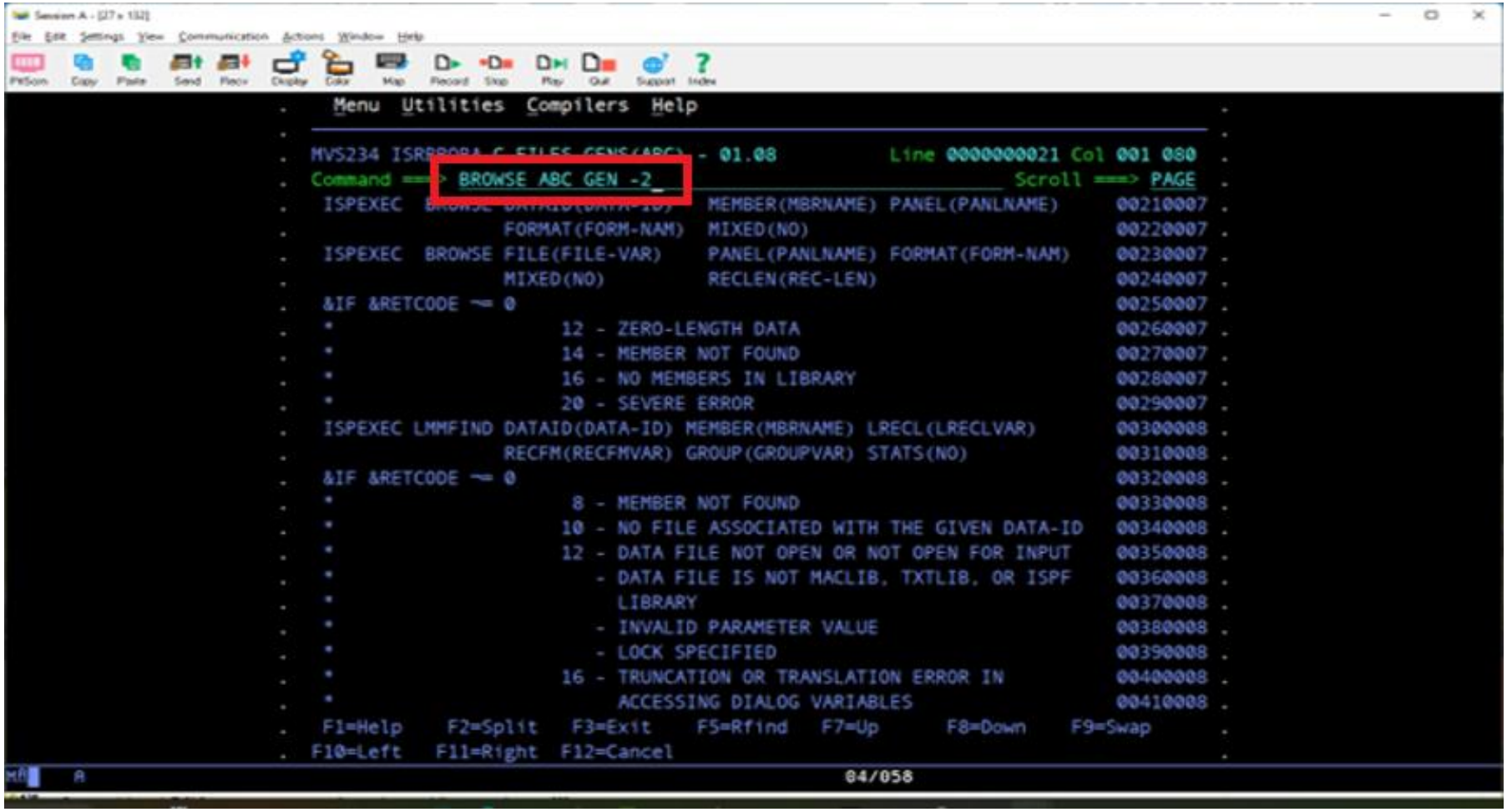
```
>>-BROWSE--+------------------------+-><
           +-member-+----------------+
                    +-GEN-generation-+

>>-EDIT----+------------------------+-><
           +-member-+----------------+
                    +-GEN-generation-+

>>-VIEW----+------------------------+-><
           +-member-+----------------+
                    +-GEN-generation-+
```

Usage & Invocation (Solution 2 continued)

- Below is an example of a Browse primary command to browse non-current generation (-2) of member ABC.



Usage & Invocation (Solution 3)

Expanded Service Return Codes

- ISPF services BROWSE, EDIT, and VIEW will be updated to provide more specific generation-related error information.
- In V2R5, the Browse, Edit, and View processing of a member generation from the member list was enhanced to provide more specific messaging when the generation was not found.
- The goal of this enhancement is for the ISPF services BROWSE, EDIT and VIEW to provide error information that is consistent with what was added in V2R5 to the Browse, Edit, and View of a member generation from the member list.
- Example of additional return codes for a Browse service failure when the Member/Generation does not exist.
  - In V2R5, this would yield:
    - **RC 14 – Member or generation (if specified) not found**
  - In V3R1 the same error will return one of three return codes:
    - **RC13 - The specified generation of the member was not found in the specified data sets**
    - **RC 14 – Member not found**
    - **RC 15 - A non-current generation was specified. None of the specified data sets are PDSE version 2 data sets that are configured for member generations.**

Usage & Invocation (Solution 4)

Generation Info Using Services

- ISPF services LMMDISP, LMMFIND, and LMMLIST will be updated to provide non-current generation information for a member. The goal is to provide data consistent with what was added to the Member Information panel in V2R5.
- When the parameter STATS(YES) is specified on these three services, the statistics for the member will be returned in a set of dialog variables. The set of dialog variables returned will be enhanced to include new variables containing information about the generations for the member. The dialog variables are:
  - **ZLGENS**

    Indicates whether the member is contained in a PDSE version 2 data set that is configured for member generations. The length is 3, and possible values are blanks or YES. If ZLGENS has a value of YES, variables ZLGMAX, ZLGSAV, ZLGNEW, and ZLGOLD contain values.
  - **ZLGMAX**

    If ZLGENS=YES, this 10-character variable contains the maximum number of non-current generations that can be saved for the member.
  - **ZLGSAV**

    If ZLGENS=YES, this 10-character variable contains the number of non-current generations that are saved for the member.
  - **ZLGNEW**

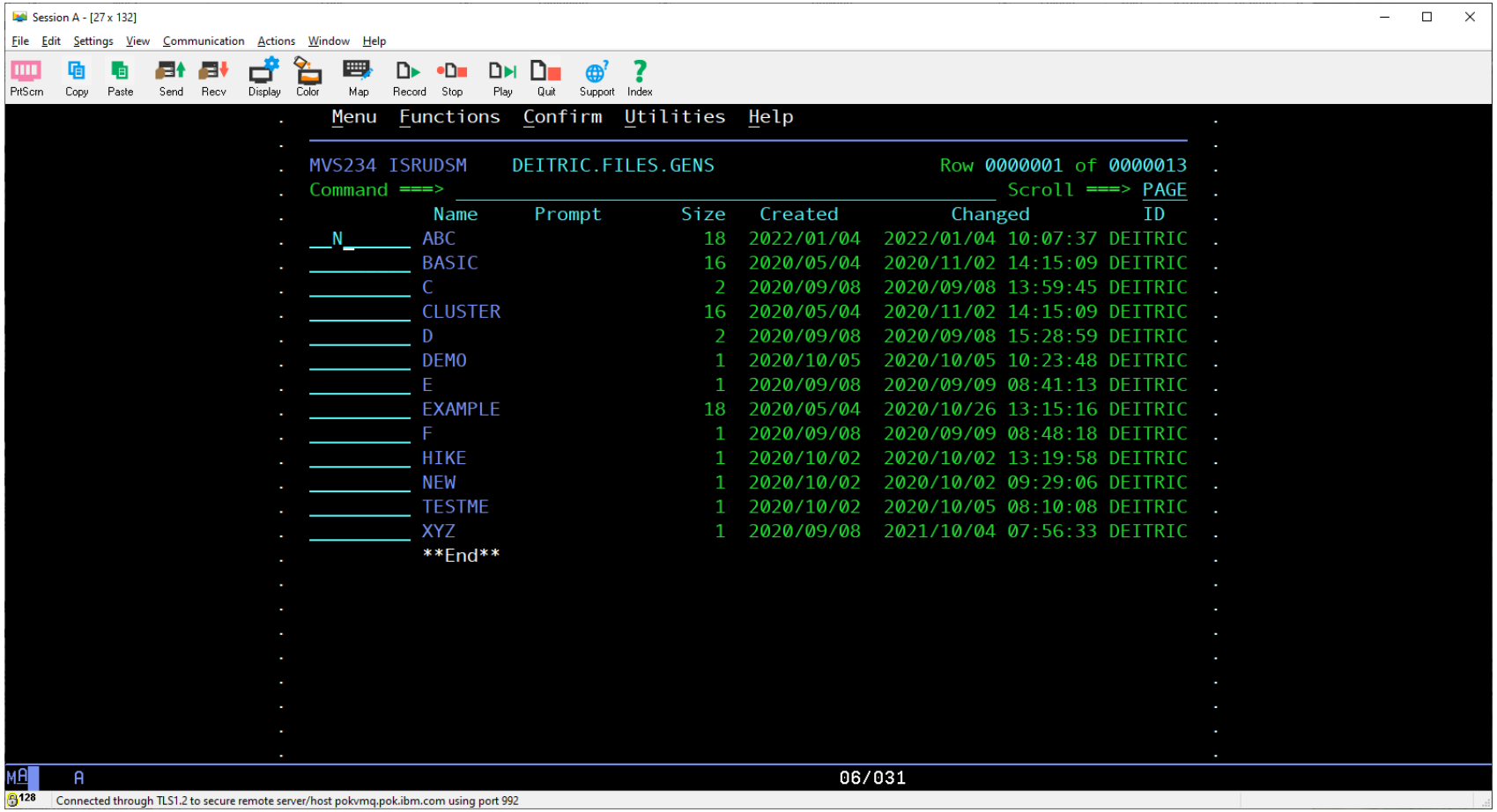
    If ZLGENS=YES, this 10-character variable contains the absolute generation number of the newest non-current generation that is saved.
  - **ZLGOLD**

    If ZLGENS=YES, this 10-character variable contains the absolute generation number of the oldest non-current generation that is saved.

Usage & Invocation (Solution 5 page 1)

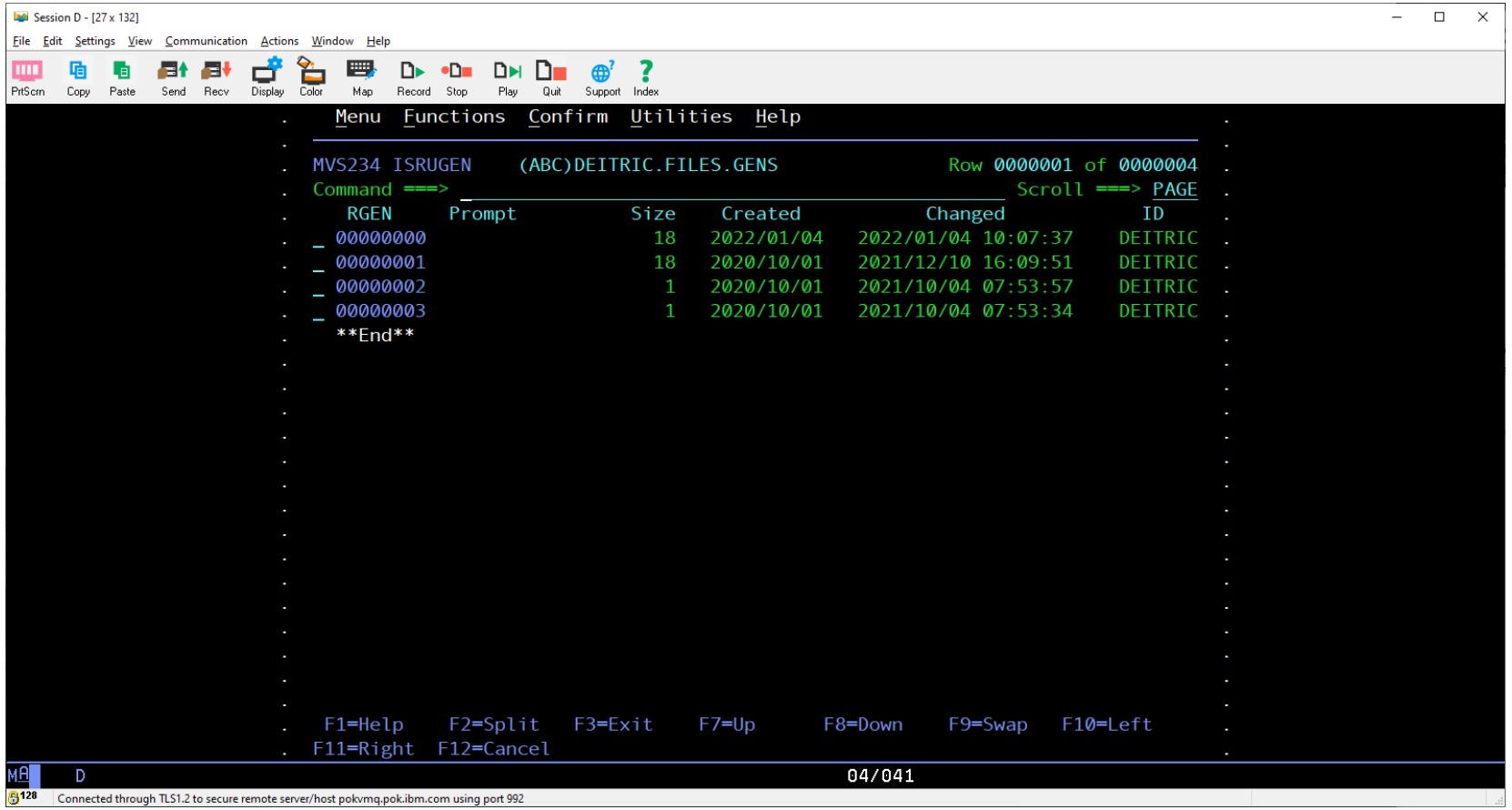
Member Generation List

- Through options 3.1 and 3.4 one can view a member list for a data set. To view the generation list for a single member the user can enter the new line command “N” as seen below:



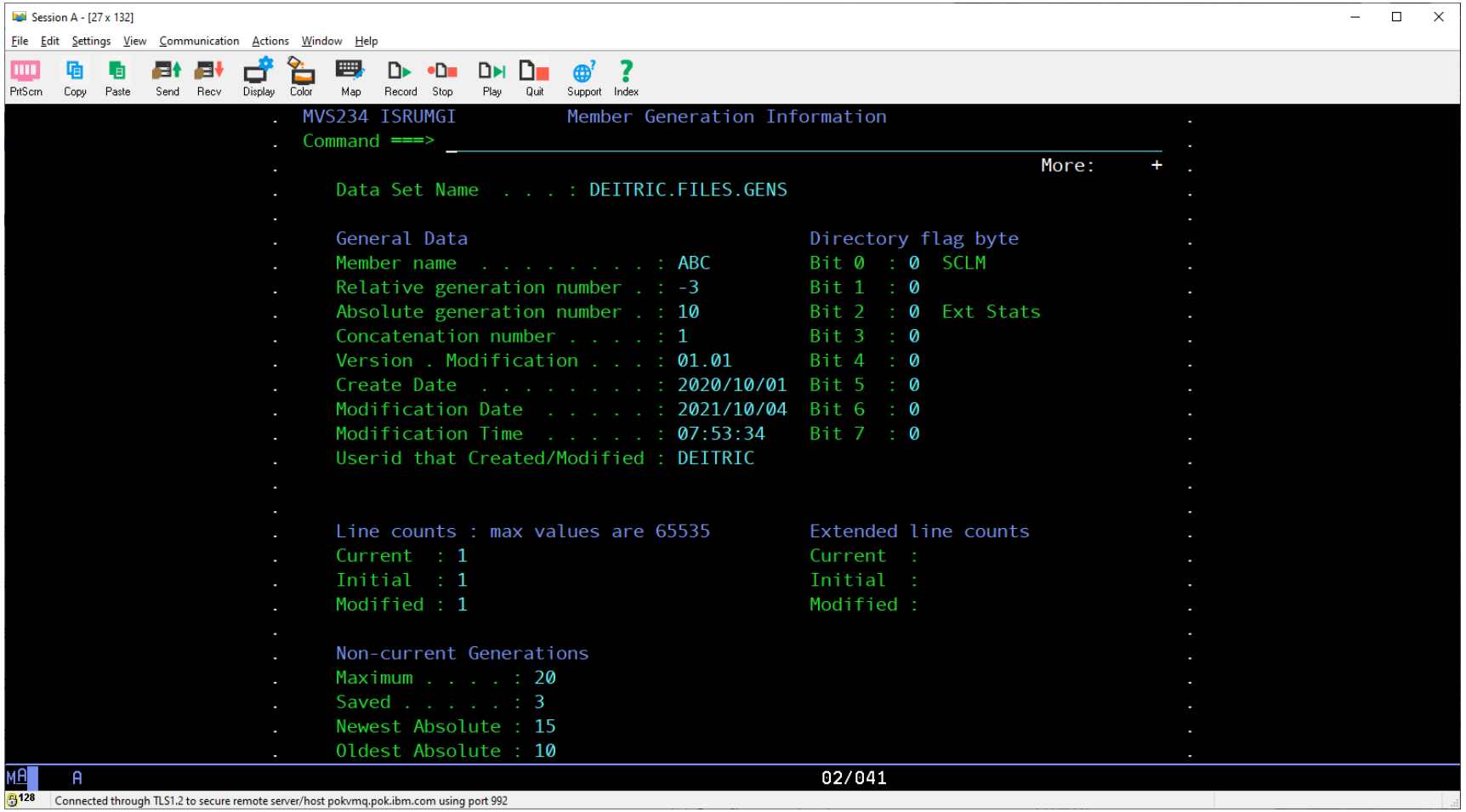
Usage & Invocation (Solution 5 page 2)

- Here is the generation list for member ABC in data set deitric.files.gens. The display is similar to a member list except that the member name is included in the title and the list is sorted by RGEN (Relative Generation number). The member name is displayed first because there is a character length limit on the panel, and we want to ensure the full member name is always displayed.



Usage & Invocation (Solution 5 page 3)

- Here is the information panel for a generation. This is the panel which you will see if you enter the line command “I” next to the generation. In this example it was done for generation -3.



Usage & Invocation (Solution 5 page 4)

- The following line commands are supported on a generation list:
  - B (browse generation)
  - D (delete generation)
  - E (edit generation)
  - I (display generation information)
  - P (print generation)
  - V (view generation
  - / (display action panel)

- The following primary commands are supported from the generation panel (ISRUGEN)
  - LOCATE, CONFIRM, and REFRESH
- The RGEN field on panel ISRUGEN is limited to 8 chars. As such, the display list supports from 0 to -99999999 generations. Technically a user can allocate up to 2 trillion generations for a member.
- The generation list does not support TSO commands as line commands and also does not support multiple line commands entered at the same time.

Interactions & Dependencies

- Software Dependencies
  - None
- Hardware Dependencies
  - None
- Exploiters
  - None

Upgrade & Coexistence Considerations

- To exploit this solution, all systems in the Plex must be at the new z/OS level: No
- List any toleration/coexistence APARs/PTFs: None
- Upgrade or coexistence concerns: None

Installation & Configuration

- None

Summary

- Accessibility and visibility for the member generation data set functionality has been greatly improved in various areas including direct access via options 1, 2, 3.1 and 3.4.
- Additional support has also been added to the Browse, Edit and View primary commands and services.
- Finally, member services LMMDISP, LMMFIND and LMMLIST have also been updated to yield non-current generation information.

Appendix

- z/OS ISPF Publications
  - **ISPF Dialog Developers Guide and Reference SC19-3619-60**
  - ISPF Dialog Tag Language Guide and Reference SC19-3620-60
  - **ISPF Edit and Edit Macros SC19-3621-60**
  - **ISPF Messages and Codes SC19-3622-60**
  - **ISPF Planning and Customization SC19-3623-60**
  - **ISPF Reference Summary SC19-3624-60**
  - ISPF SCLM Guide and Reference SC19-3625-60
  - ISPF Services Guide SC19-3626-60
  - **ISPF Users Guide Volume I SC19-3627-60**
  - **ISPF Users Guide Volume II SC19-3628-60**