# Debugging ABAP Program

**By**

**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**

**Topic Covered :**

1. What is ABAP Debugging?
2. Important transaction code in ABAP Debugging
3. Breakpoints
4. Debugging Screen
5. Watchpoints
6. Changing Variable Values
7. Real time Debugging :
    a) Debugging pop up screen
    b) Debugging of Enhancement
    c) Debugging an error message

## 1. What is ABAP Debugging?

Debugging is when you stop a program or transaction at a certain point, so you can walk step by step through the ABAP programming to see where an error occurs.

But as functional consultant you need basic ABAP skills to be able to do this, Most good functional consultants will have basic debugging skills and this is very very important because it reduces the excessive independence to ABAP teams.

Most of the time, part of our workload is to resolve errors that occur during the execution of certain transactions. However, if these errors message cannot be resolved by setting up the master data or transactional data (i.e.: error message without any meaning) you need to access the program in debug mode (by typing "/h" in the transaction bar and then executing the transaction), which will allow us to analyze the program and see where the problem lies, and thus save time.

# Debugging ABAP Program

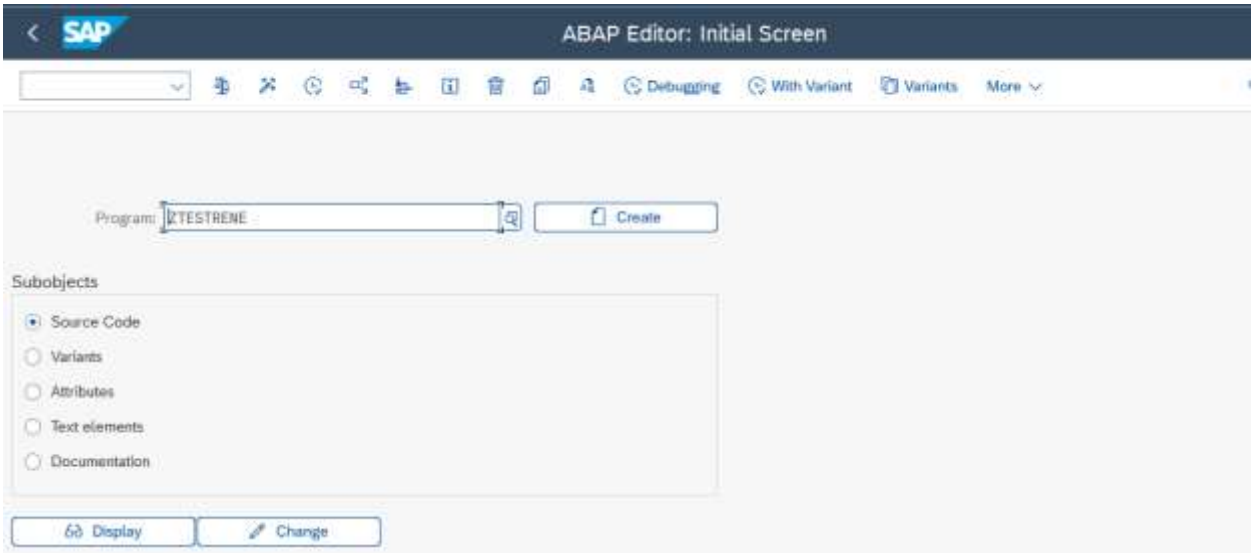
**By**

**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**

## 2. Important transaction code in ABAP Debugging :

Here we have two important transaction code: SE38/SE37

SE38: is a transaction code that allows you to display/change/create ABAP Program.




SE37: is a transaction code that allows you to display/change/create Function Module.

**Function Modules**: are set of codes that can be reused by others programs and FM can be executed independently.

Let's take an example: Function Module: (**SD_ROUTE_DETERMINATION**)

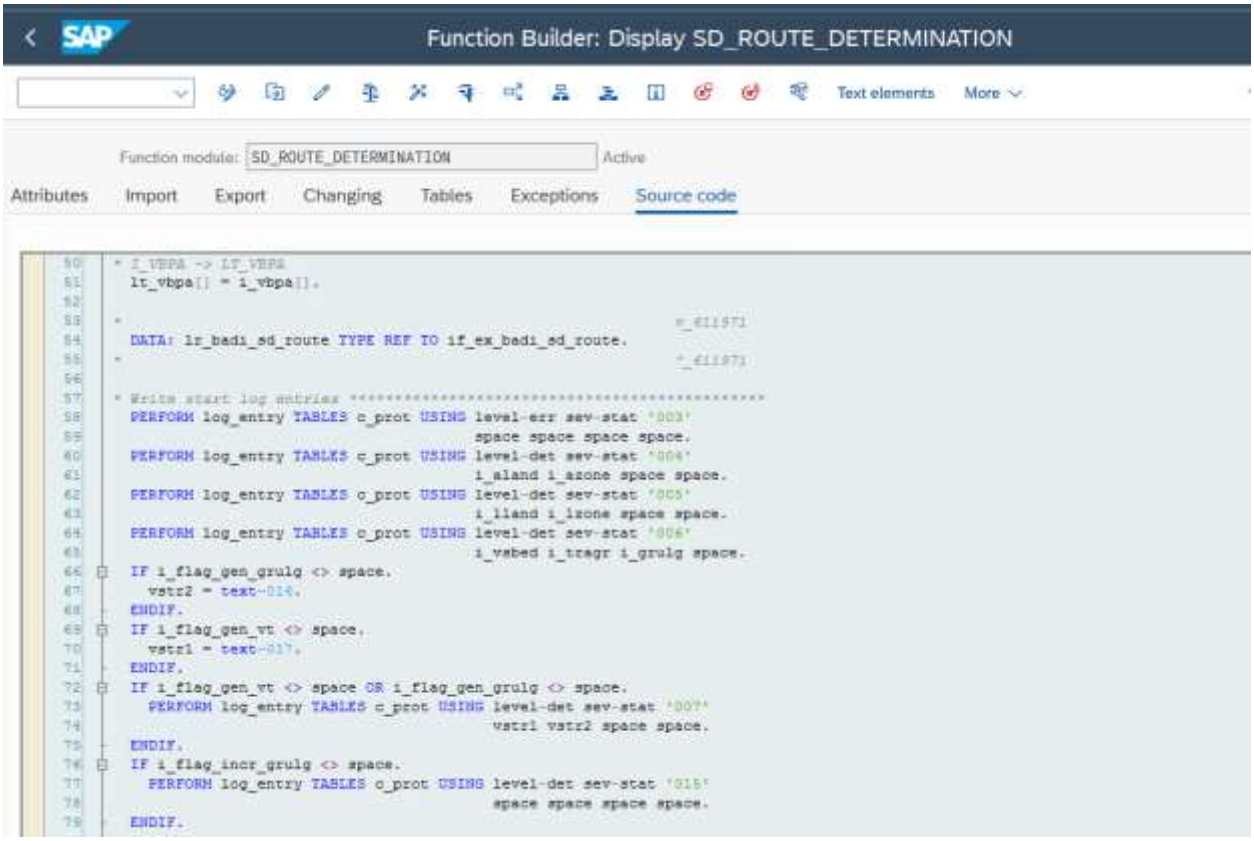
This FM is used for the logic of route determination

Now let's open this FM with help of the SE37 transaction code

# Debugging ABAP Program

**By**

**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**




## 3. Breakpoints

In ABAP debugging, the notion of breakpoint is a very important notion because the breakpoint is used to interrupt the processing of the program and launch the debugger.

When you are in the ABAP editor (SE38) the two breakpoint icons are displayed at the top of the page

Left session breakpoint and right external breakpoint

To set a breakpoint in an ABAP program, simply select the line of executable code and click on one of the icons above.

# Debugging ABAP Program

**By**

**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**

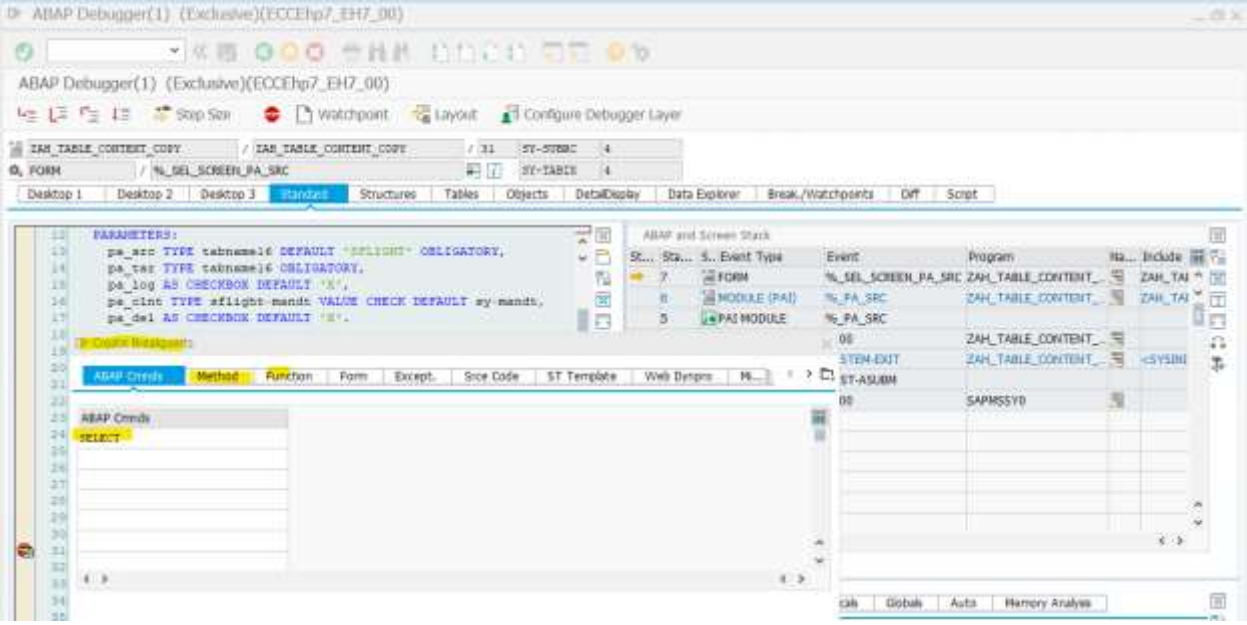
Now let's discuss the meaning <<Session breakpoint>> and <<external breakpoint>>

**Session Breakpoint:** Specific to a particular ABAP user session. If the user session is ended (log off sap system) all session breakpoints get deleted.

**External Breakpoint:** They are applied to the current user session as well as future user sessions.

The other thing to remember here is that you can put a breakpoint on almost anything, for example if you think your problem is with specific ABAP statements ( IF.....ENDIF, SELECT, LOOP ); function modules or methods .

For that you have to go to the breakpoint creation menu



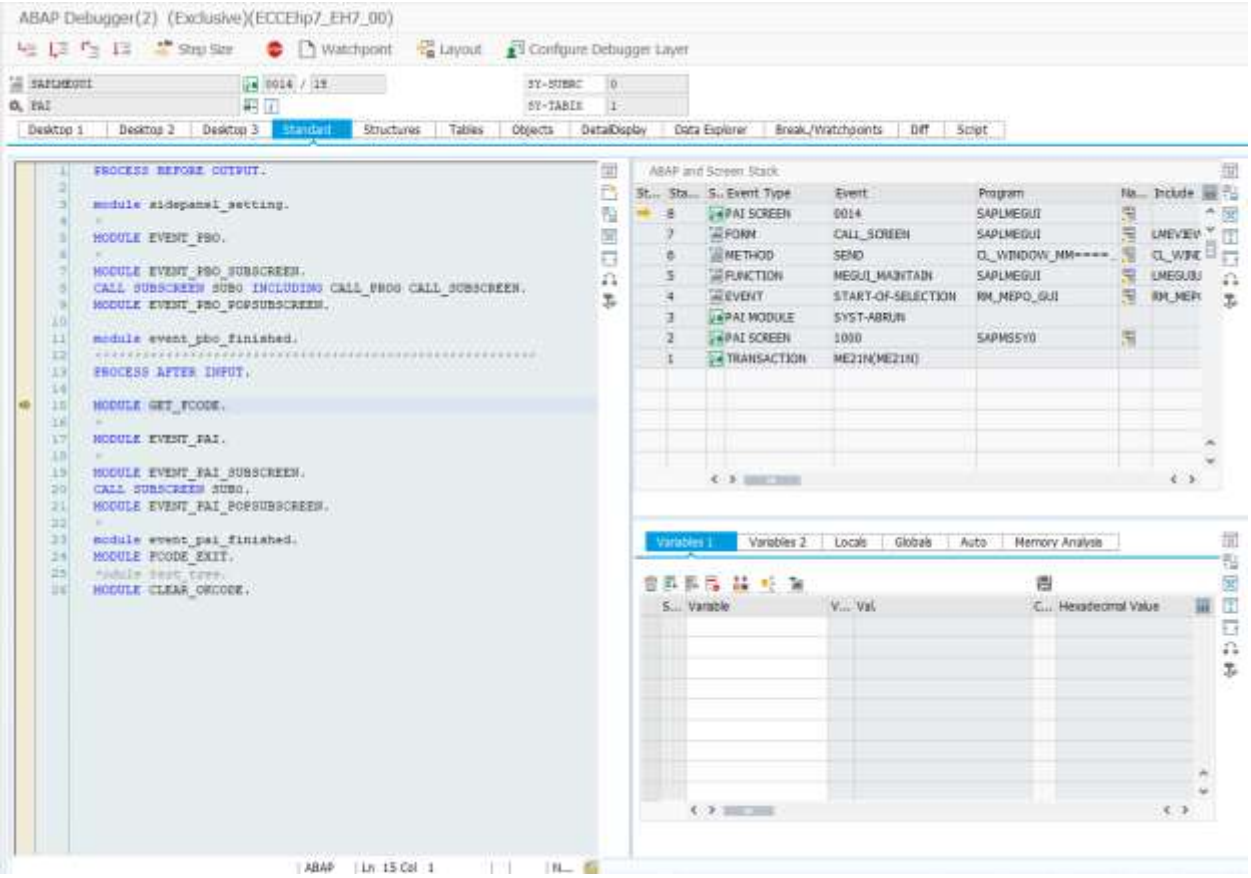

**Important:** An ABAP program can contain hundreds or even thousands of lines of code, so it is impossible to go through the program line by line to find the problem. It is therefore essential to master the use of breakpoints because if you think the problem is at a certain level in your program, you can simply place your

breakpoint at that level and SAP will stop processing the program at that level and run the debugger.

## 4. Debbuging Screen

To explain the debugging screen, I will use the transaction (ME21N), typing "/h" in the transaction bar, then running the transaction. This will allow us to access the program in debug mode.

You will probably see the screen below



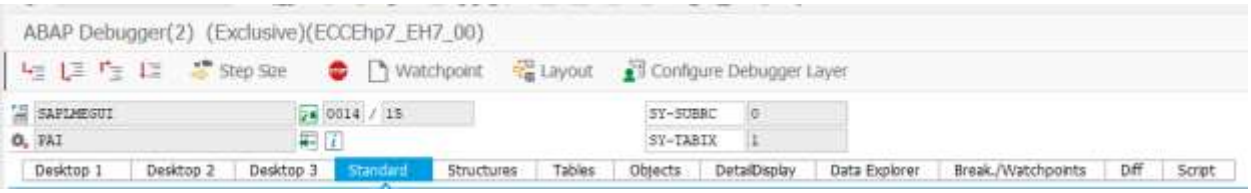

Let us discuss this section by section

# Debugging ABAP Program

**By**

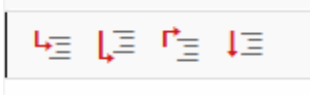
**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**

At the top of the debugging screen




Here you can easily read the name of the program and also see the event being processed (function/method).

To take the process forward step by step you can use the icon strip:



Now let us discuss one by one:

 (The F5 key): Allows you to execute the code line by line

 (The F6 key): This icon allows you to execute the code line by line without going into the code portions called via MF / routine / other programs.

 (The F7 key): if you are inside of MF or method or perform it will take you out of that module and return to the main program.

 (The F8 key): Allows the code to be executed in one go until the next breakpoint set if any otherwise the debugging is switched off and the program is executed completely.

SYST structure:

| | |
|---|---|
| SY-SUBRC | 0 |
| SY-TABIX | 1 |

Structure fed and updated throughout the processing.

# Debugging ABAP Program

**By**

**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**

We will see here 2 important SYST structures:

SY-SUBRC: is SAP ABAP system field and contains a return code of ABAP statements. This value is used to determine the status of the execution of an ABAP statement.

**Important:** if SY-SUBRC is 0 the ABAP statement has been executed successfully if the value is different from 0 then the statement has raised an error or warning.

SY-TABIX: returns the number of the current line in a processing loop

## 5. Watch-Points

Can be set on a variable you want to monitor to stop program execution when the contents of that variable change, but only you need to ensure that the variable is declared globally in a program

What's even more interesting about watchpoints is that you can set them to fire when specific conditions are met (for example, you give your variable a fixed value) instead of firing every time the variable changes, because your variable may change at several places in the program.

Most of the time, an internal table contains thousands of rows and if we need to debug a particular row, for example the item number which is in the 300th row of an internal table, knowing that this internal table contains more than 10,000 rows in this case, it is very difficult, if not impossible, to debug an internal table row by row to reach this particular row.

In order to save time, it is sufficient to define a watchpoint for the particular value of a field or variable.

How to use a watchpoints? Let’s take 2 scenarios:

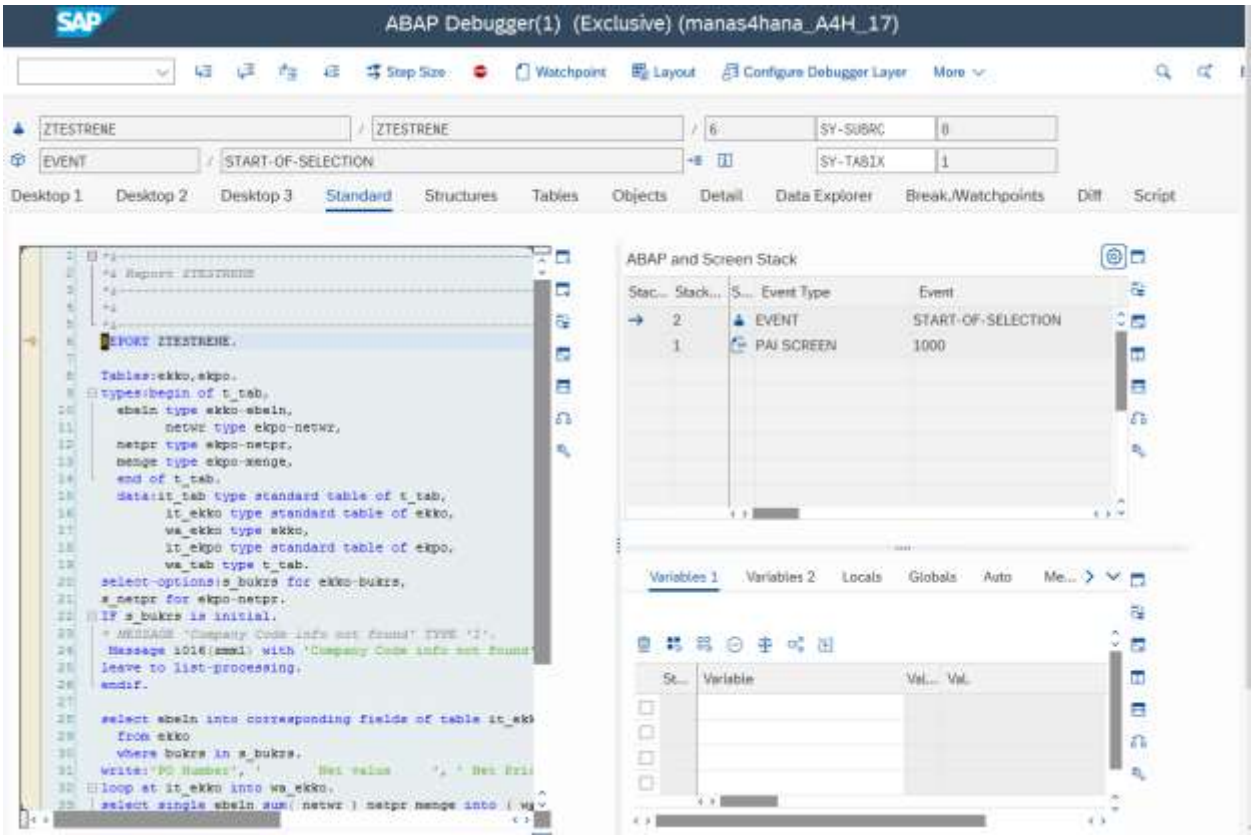
# Debugging ABAP Program

**By**

**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**

**Scenario 1:** in our custom program we want to see the behavior of one particular variable we will ask SAP to stop the program when it reaches this variable for achieve our goal we will use watchpoints let's see how

Go to se38 and open your program in debug mode

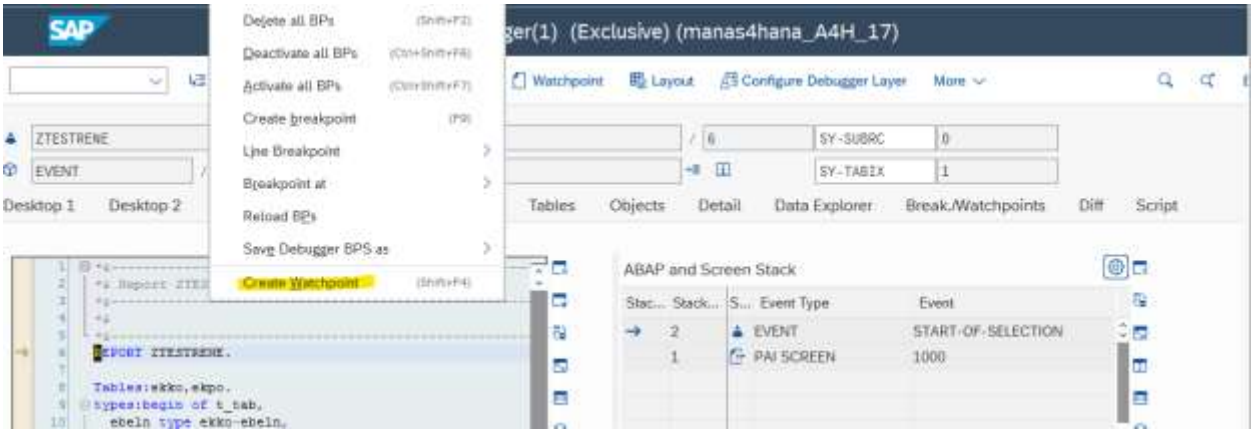



Create watchpoint

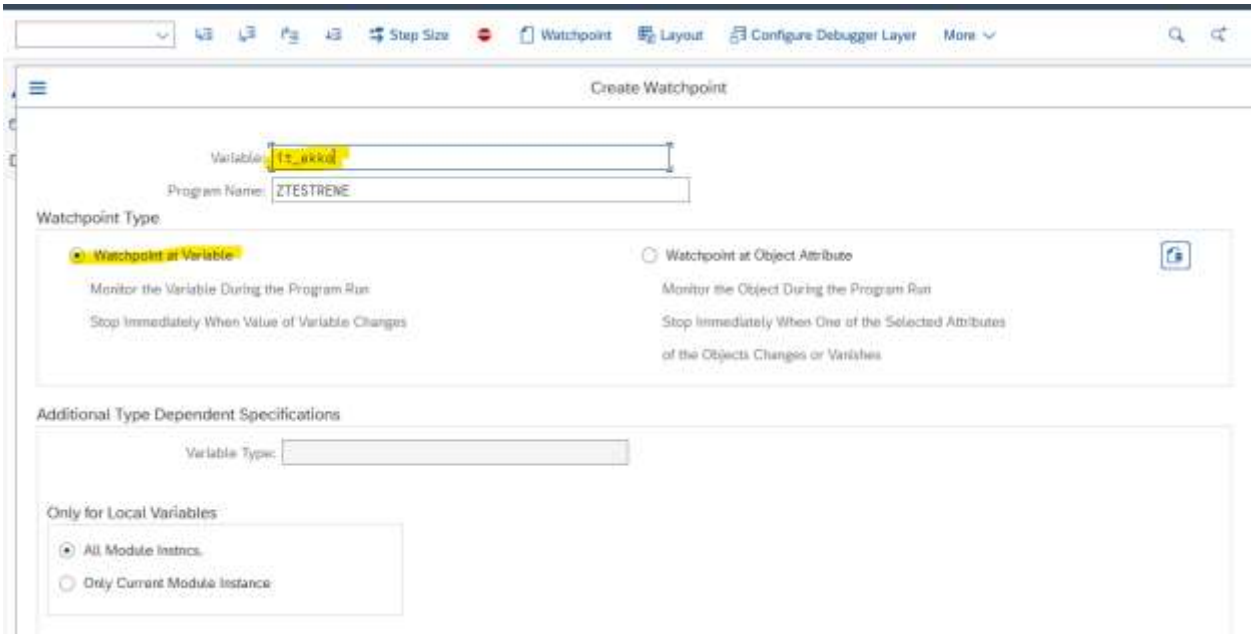
# Debugging ABAP Program

**By**

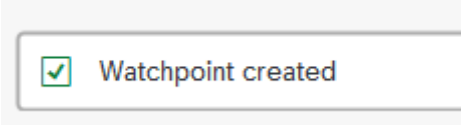
**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**




Put the name of variable you want to check and click on the green button




You will get this message

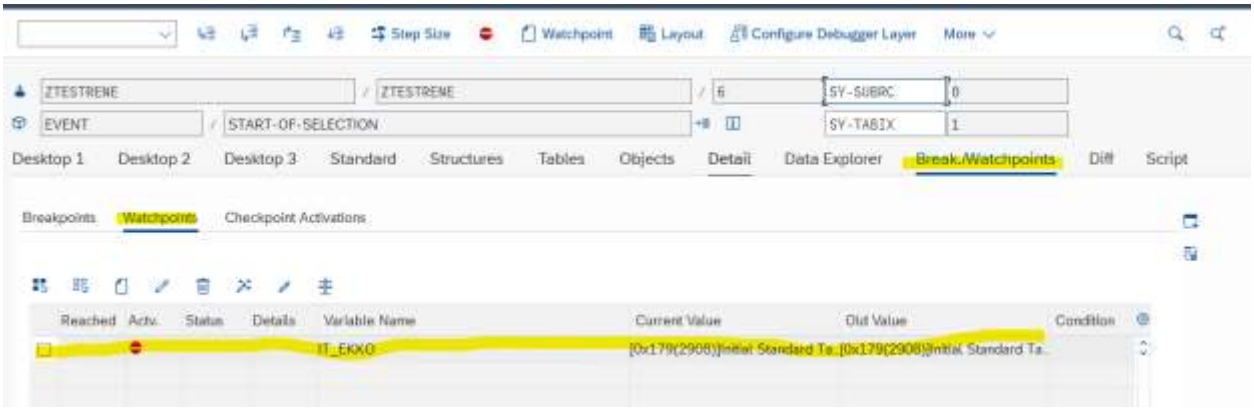



You can also check in watchpoints tab

# Debugging ABAP Program

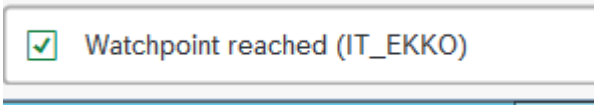
**By**

**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**




And execute the program (F8)

And finally you will get this confirmation message



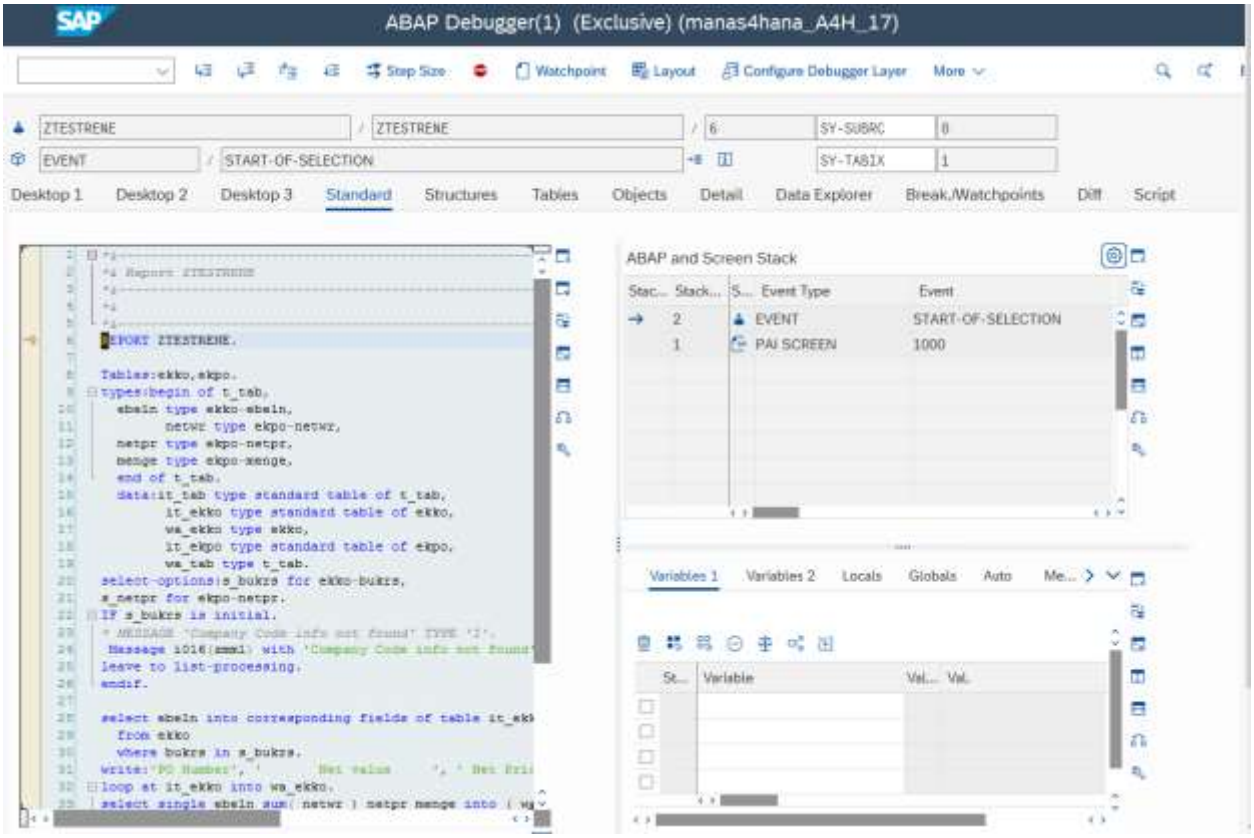

**Scenario 2:** For example, there are 386 entries in the internal table. Let's see how to analyse the 227th record, i.e. the PO number "4500001592".

Go to se38 and open your program in debug mode

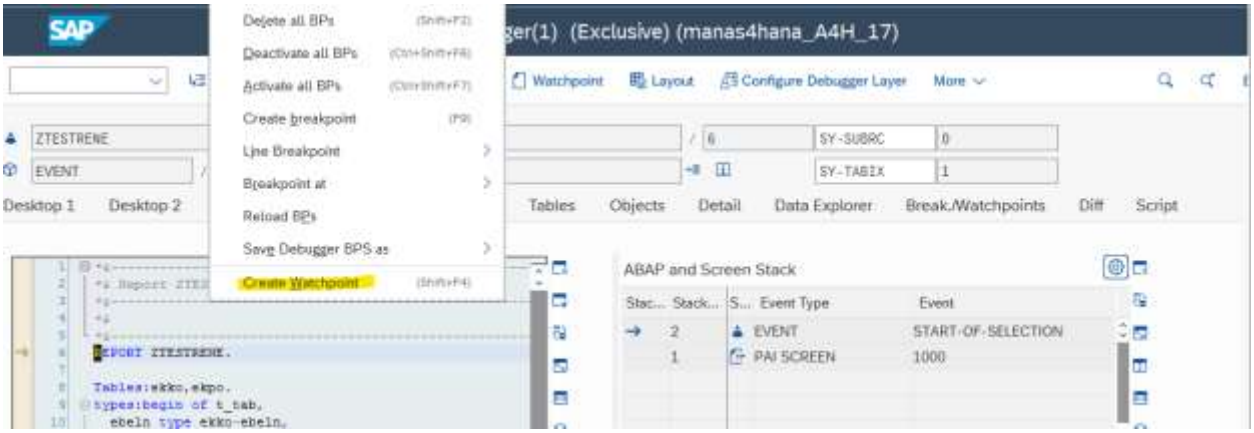
# Debugging ABAP Program

**By**

**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**




Create watchpoint

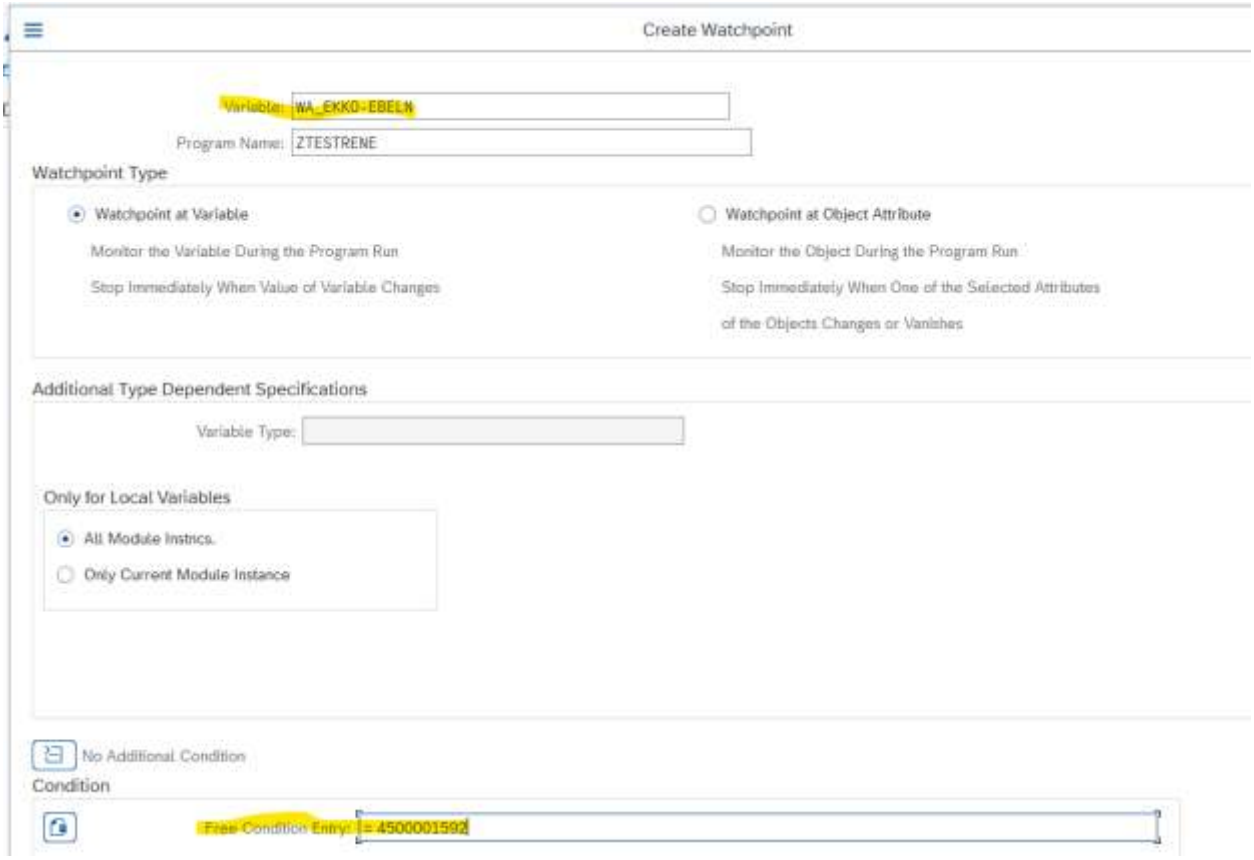



Because we want to see a particular value, we will create a watchpoint but this time our variable will be a 'work area' with the field corresponding to our value.

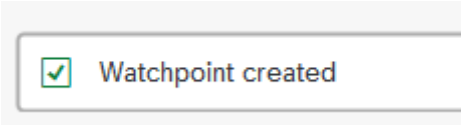
# Debugging ABAP Program

**By**

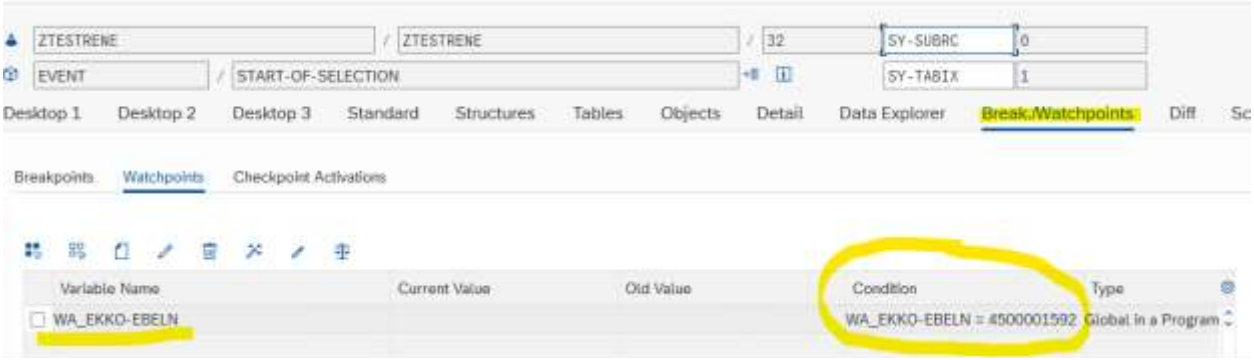
**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**




You will get this message

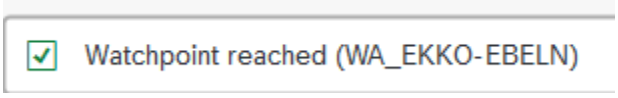


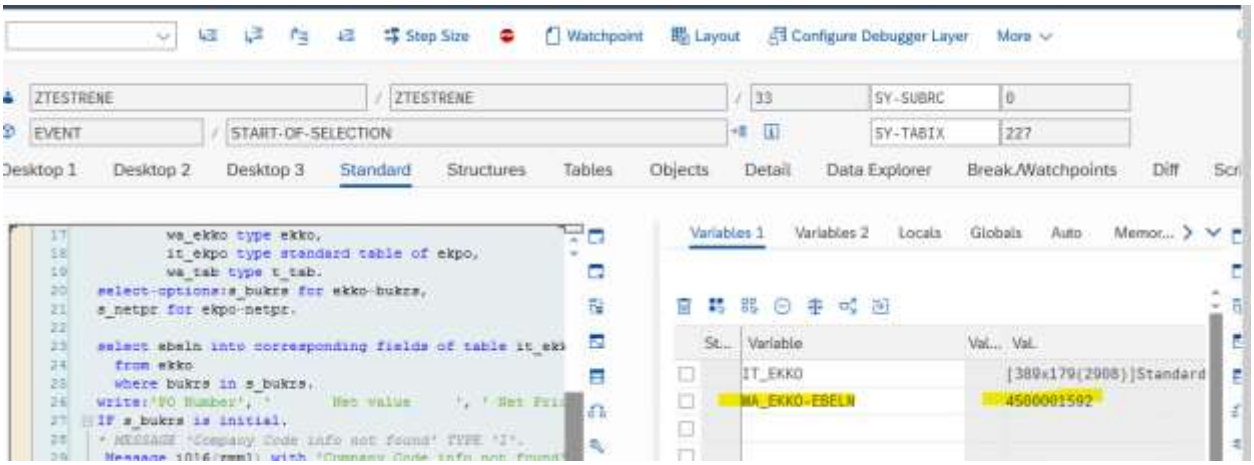

You can also check in watchpoints tab



And execute the program (F8)

And finally you will get this confirmation message




## 6. Changing Variable Values:

One of the important features of the SAP debugger is the ability to change the values of variables "on the fly".

Sometimes, when we debug for testing purposes, we need to change the values of variables in order to test several scenarios or to see the behavior of the program.

And even during troubleshooting, changing the value of a particular variable can help solve the problem.

However, it is important to ensure that you have permission to do so, otherwise the system will not allow you to change a field. You should therefore contact the SAP security team to obtain the necessary permissions.

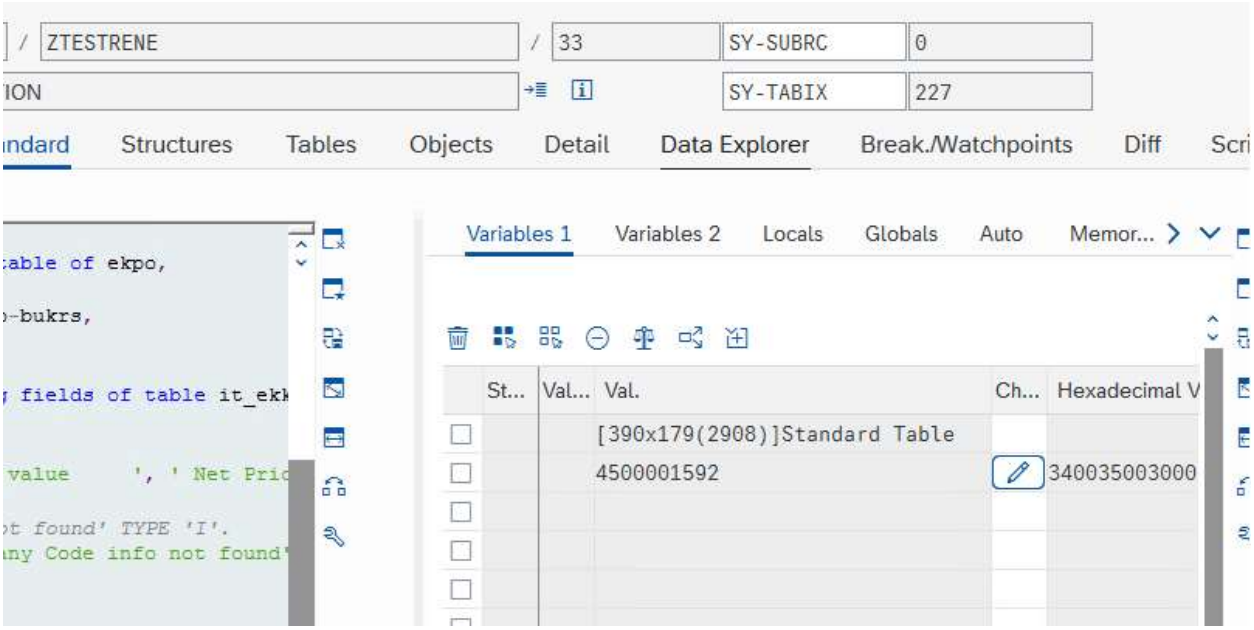
# Debugging ABAP Program

**By**

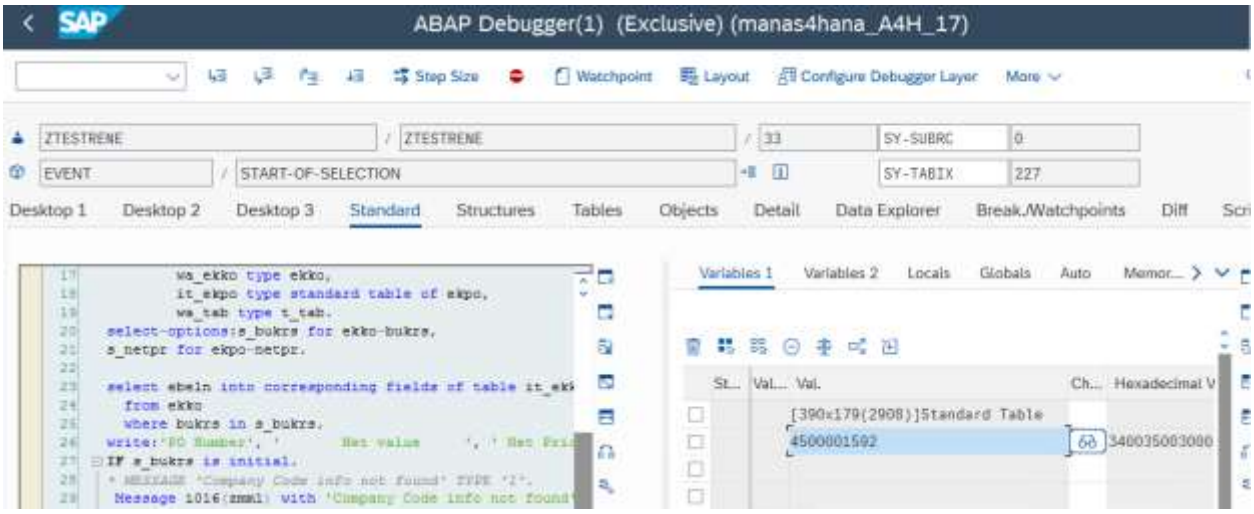
**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**

Let’s see how we can change the value

For the testing purpose we will change the PO number (from: 4500001592 to: 4500001630) to see the behavior of the program




Click to pencil icon to make the field editable

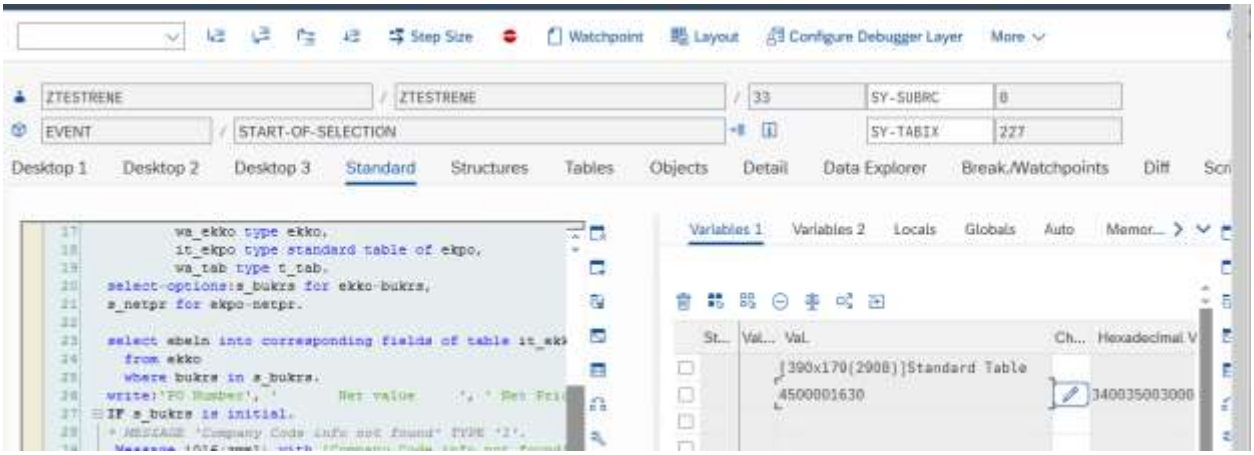



Now we can change the PO number easily

# Debugging ABAP Program

**By**

**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**



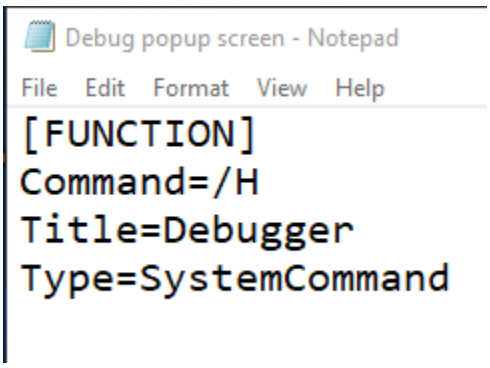

## 7. Real time Debbuging:

### a) Debbuging pop up screen:

In SAP we encounter pop-up screens every day, but there are scenarios where a pop-up screen needs to be debugged to find the exact cause of the error.

One of the most important difficulties is that command line debugging is not possible if pop-up screens appear: because you cannot edit /h

What you need to do is save the line of codes below to a text file on your laptop or desktop.



# Debugging ABAP Program

**By**

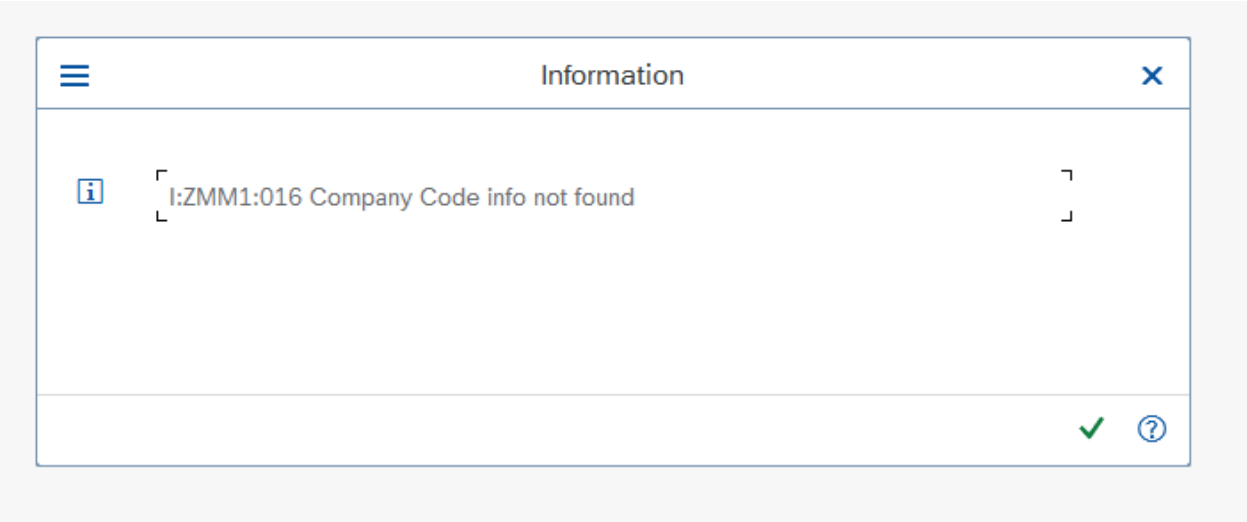
**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**

And when it's time to debug, just drag and drop the text file you saved on your desktop or laptop onto the pop-up screens.

Let’s take an example

During a transaction, we get this pop up screen here below

Our task now is to find out exactly which line of the ABAP code contains this error by debugging.

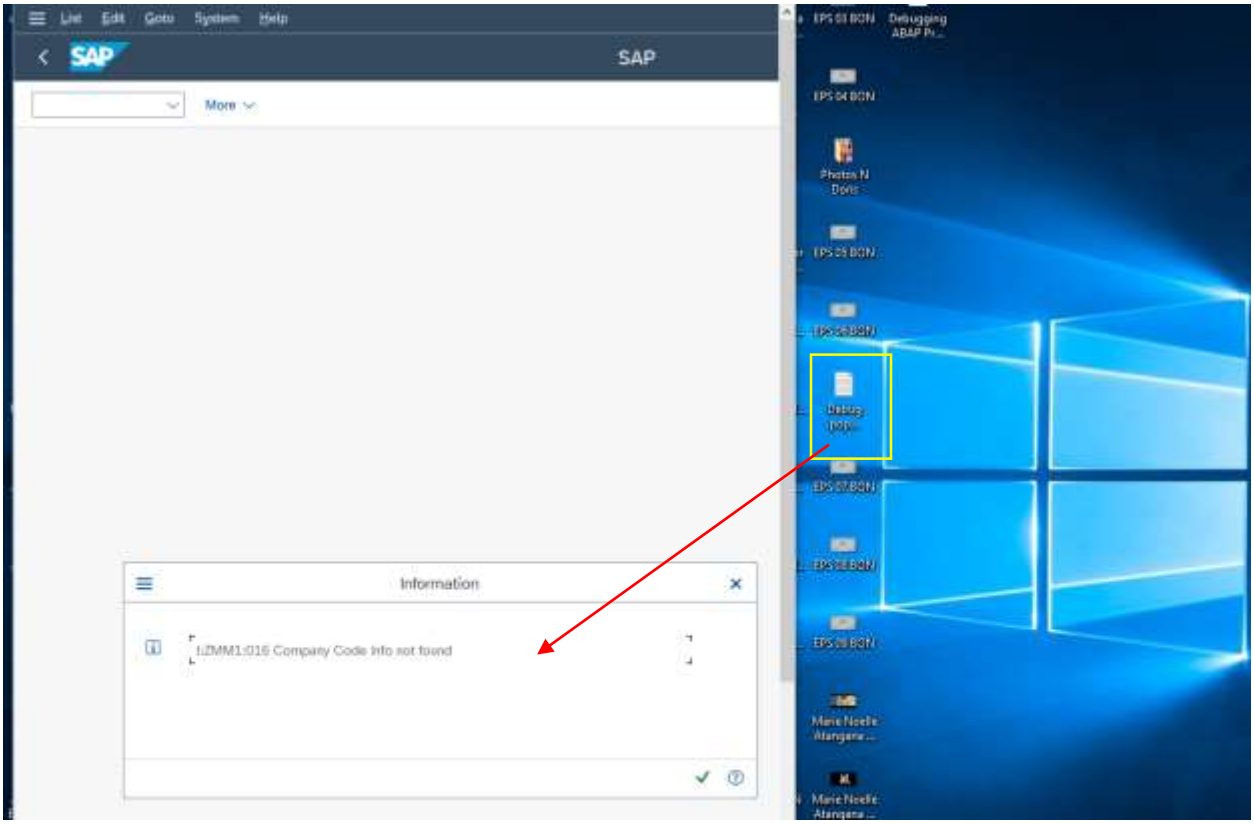



Just drag and drop the text file you saved on your desktop or laptop onto the pop-up screens.

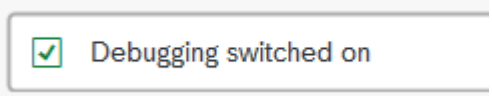
# Debugging ABAP Program

**By**

**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**




You will get this message



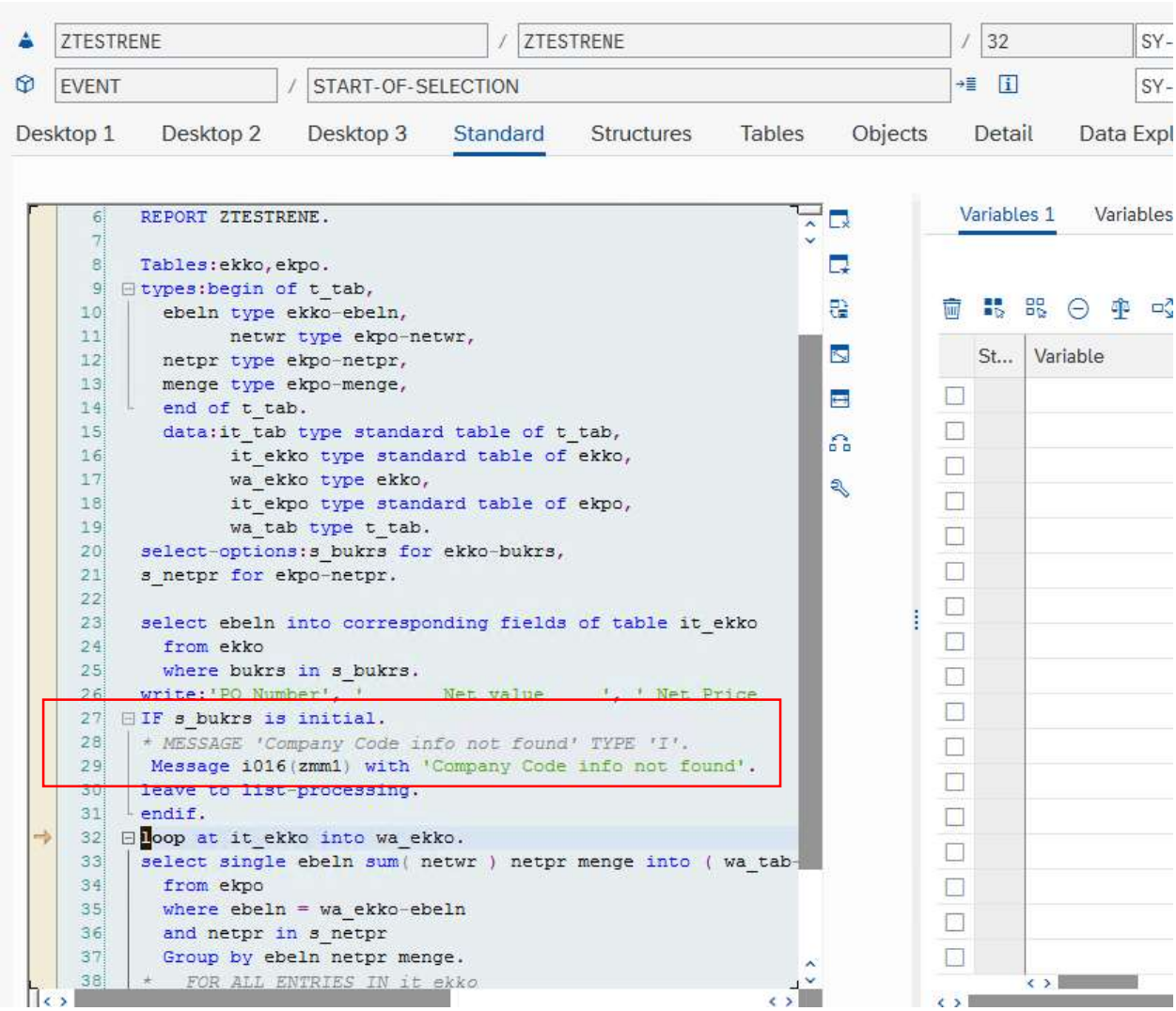

And click on the green button

The program will stop exactly at the point where this error occurs.

# Debugging ABAP Program

**By**

**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**




## b) Debugging of Enhancement

Before we talk about debugging enhancement let's see first what is enhancement and what is the purpose of enhancement?

**Enhancements:** enables customers/clients to add custom business functionality to sap standard software without changing at all the sap standard functionality (which is supposed to be unchanged).

# Debugging ABAP Program

**By**

**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**

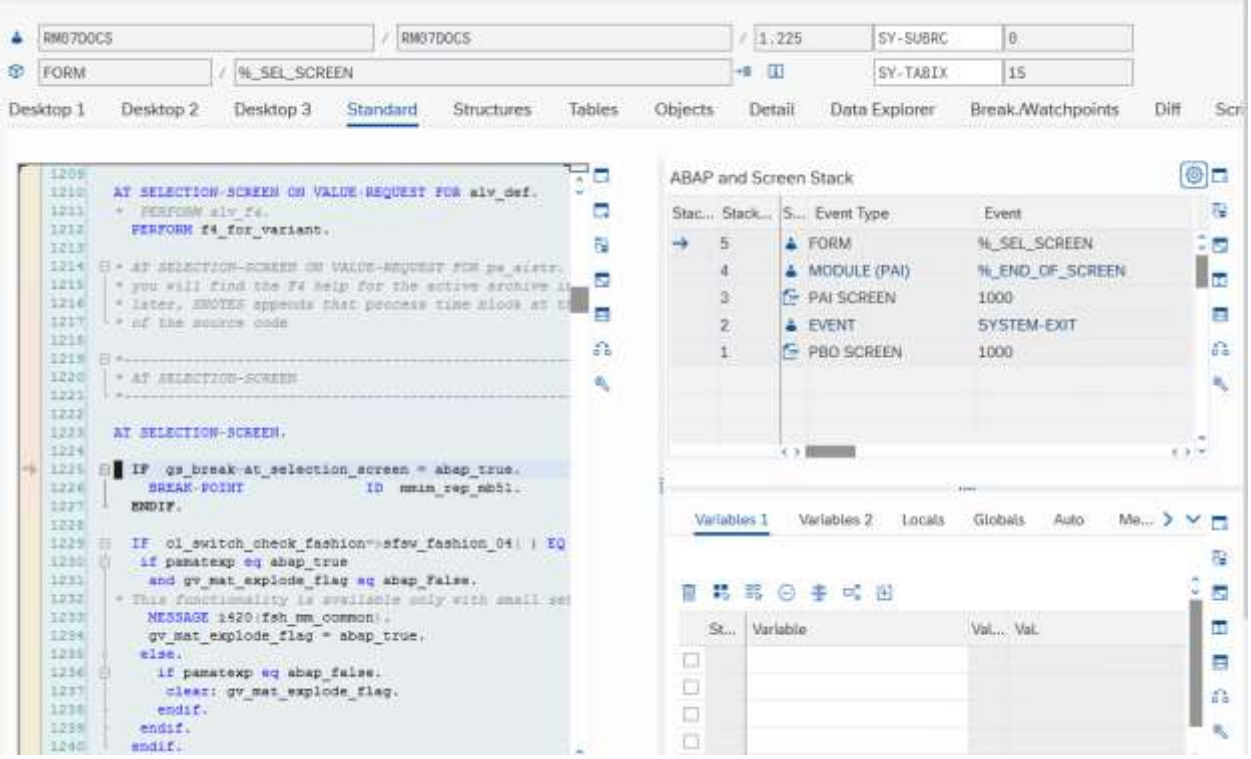
But to better manage the enhancements in the program and also to be sure not to change the standard functionality of the sap, the best thing to do is to copy a standard program and make the enhancements you want.

Now let's see how we can debugging enhancement

Two things you should keep in your mind before starting debugging enhancement:

- Icon snail : 
- And(the F5 key) button remember (The F5 key): Allows you to execute the code line by line

Go to se38 and open your program in debug mode



# Debugging ABAP Program

**By**

**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**

Identify the snail icon in the program as shown below

# Debugging ABAP Program

**By**

**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**

RM07DOCS / RM07DOCS

FORM / %_SEL_SCREEN

Desktop 1 | Desktop 2 | Desktop 3 | Standard | Structures | Tables

```
2161    IF  cl_change IS BOUND.
2162      CALL METHOD cl_change->is_active
2163        RECEIVING
2164          rv_active = lf_active.
2165    ENDIF.
2166
2167    IF lf_active = 'X'.
2168      TRY.
2169          list-longnum =
2170          /sappspro/cl_numbers=>lookup( list-ebeln ).
2171        CATCH /sappspro/cx_number_not_found.
2172  *             number does not exist.
2173      ENDTRY.
2174    ENDIF.
2175
2176  * Authorization for posting values company code level
2177    MOVE  abap_false          TO  lv_flag_no_cc_auth.
2178
2179    READ TABLE organ WITH KEY werks = list-werks BINARY
2180  ENHANCEMENT-SECTION     rm07docs_06 SPOTS es_rm07docs
2181    LOG-POINT ID /cwm/enh SUBKEY to_upper( sy-tcode &&
2182  * variable
2183    DATA: lv_fieldname   TYPE fieldname.
2184
2185  * fieldsymbol
2186    FIELD-SYMBOLS: <field>  TYPE any.
2187  * check on general authorizations to display values a
2188  * general auth.check - display values and prices in l
2189    CALL METHOD cl_sacf=>sacf_check_in_use
2190      EXPORTING
2191        id_name = 'MM_IM_VALUES'
2192      RECEIVING
2193        ed used = lv values chk.
```

ABAP | Ln 1225 Col 1 | NUM

# Debugging ABAP Program

**By**

**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**

With the (F5 key) you can start debbuging your enhancement step by step

Desktop 1 | Desktop 2 | Desktop 3 | Standard | Structures | Tables

```
2162        CALL METHOD cl_change->is_active
2163          RECEIVING
2164            rv_active = lf_active.
2165      ENDIF.
2166
2167      IF lf_active = 'X'.
2168        TRY.
2169            list-longnum =
2170            /sappspro/cl_numbers=>lookup( list-ebeln ).
2171          CATCH /sappspro/cx_number_not_found.
2172 *                number does not exist.
2173        ENDTRY.
2174      ENDIF.
2175
2176 * Authorization for posting values company code level
2177      MOVE  abap_false          TO  lv_flag_no_cc_auth.
2178
2179      READ TABLE organ WITH KEY werks = list-werks BINARY
2180      ENHANCEMENT-SECTION      rm07docs_06 SPOTS es_rm07docs
2181      LOG-POINT ID /cwm/enh SUBKEY to_upper( sy-tcode &&
2182 * variable
2183      DATA: lv_fieldname   TYPE fieldname.
2184
2185 * fieldsymbol
2186      FIELD-SYMBOLS: <field>  TYPE any.
2187 * check on general authorizations to display values a
2188 * general auth.check - display values and prices in l
2189      CALL METHOD cl_sacf=>sacf_check_in_use
2190        EXPORTING
2191          id_name = 'MM_IM_VALUES'
2192        RECEIVING
2193          ed_used = lv_values_chk.
2194      IF NOT lv_values_chk IS INITIAL.
```

# Debugging ABAP Program

**By**

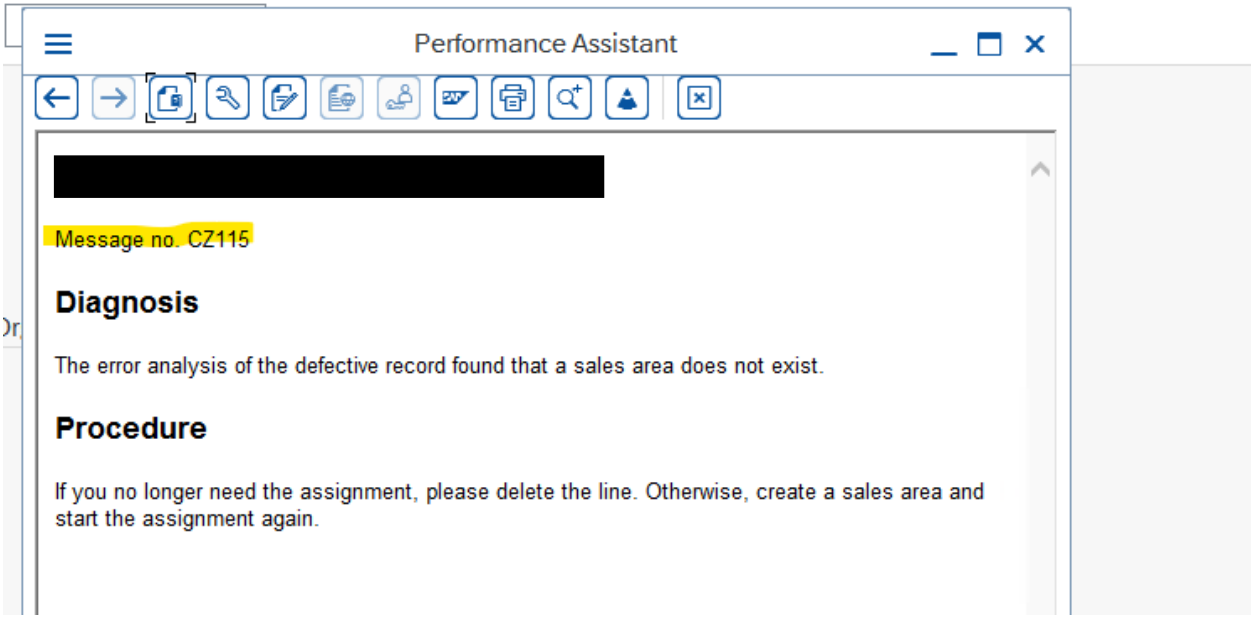
**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**

## c) Debugging an error message

As I explained earlier, in some cases SAP error messages are not useful, which means that we don't know what caused the error. In such a situation we have no choice, the only method of troubleshooting is debugging.

Let’s see how we can debug error message

A user sends you this screenshot by email:



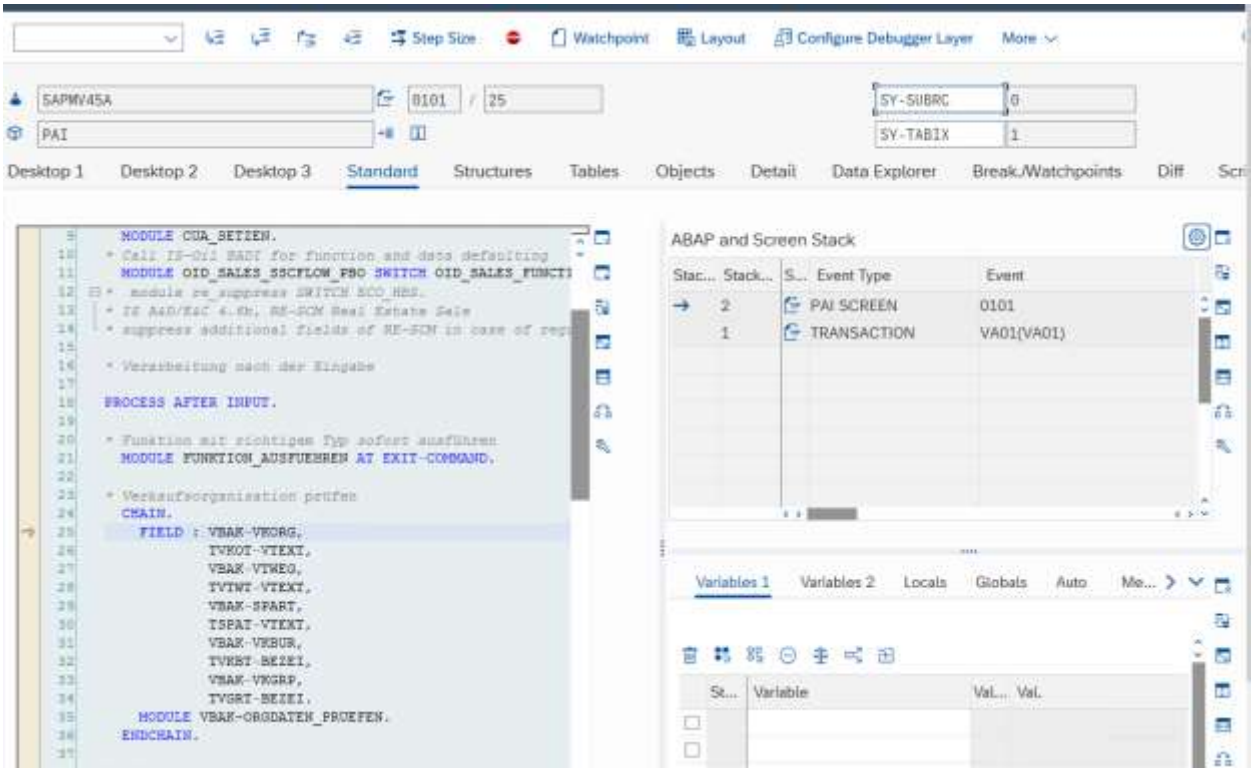

Our task now is to find out exactly which line of the ABAP code contains this error by debugging.

Open the program in debugging mode

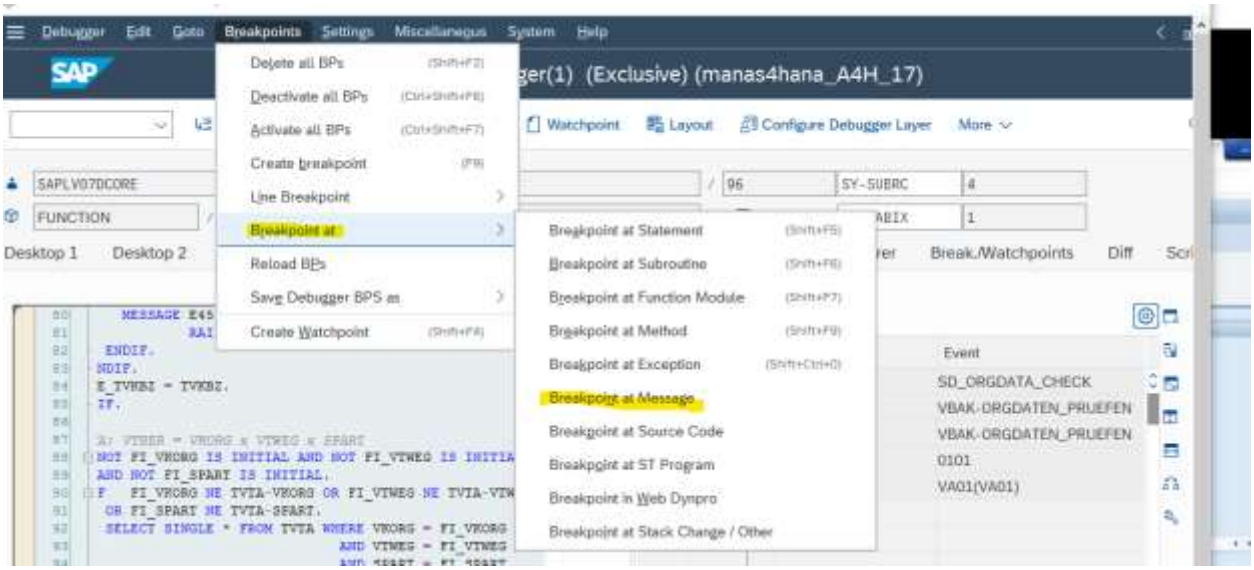
# Debugging ABAP Program

## By


## René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)


Go to breakpoint at message

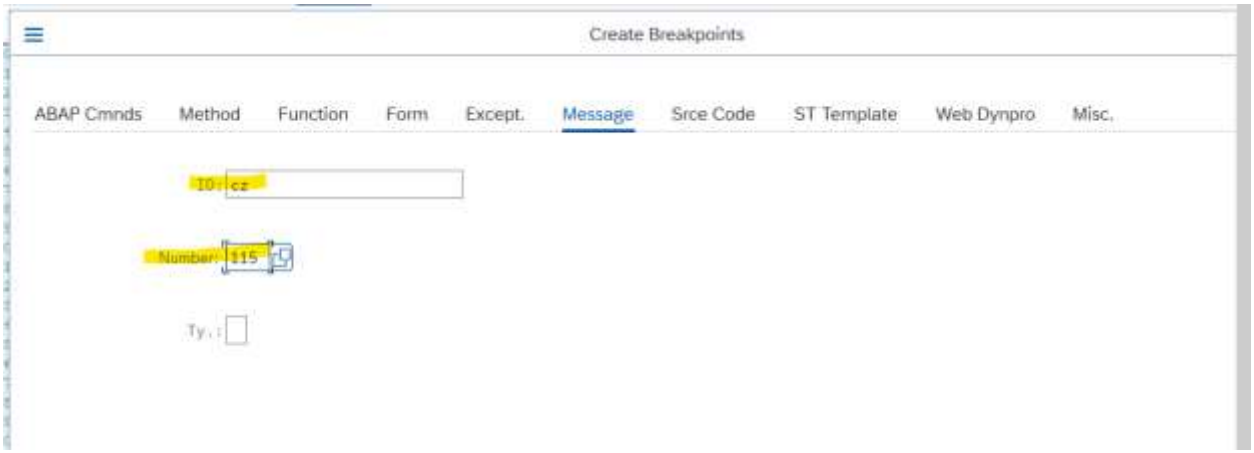


# Debugging ABAP Program

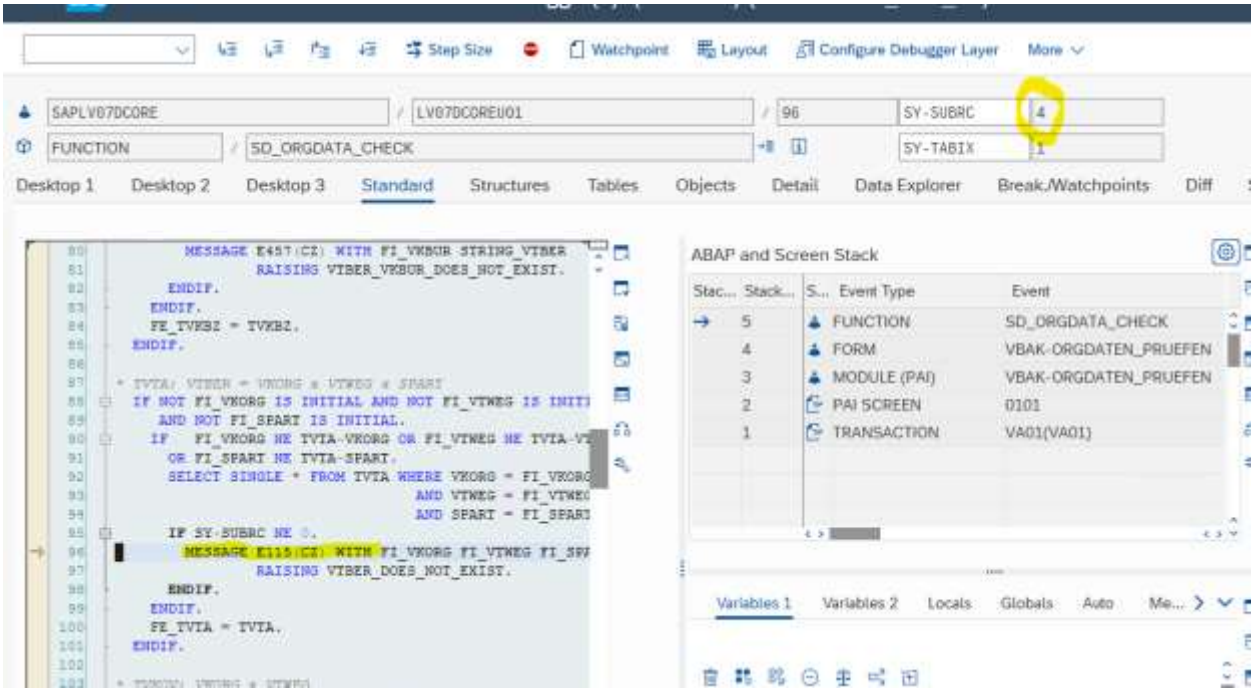
**By**

**René Rodrigue Efila Minkoulou (SAP S/4HANA MM/SD Consultant)**

Enter the information contained in the error message




And execute



As you can see above the program has stopped exactly at the point where this error occurs.

**Thank you**