

Troubleshooting Your ABAP Programs: Using Coverage Analyzer



Applies to:

Web AS 6.10 and above versions. For more information, visit the [ABAP homepage](#).

Summary

This tutorial helps you understand the usage of Coverage Analyzer; to analyze and monitor processing blocks such as reports, subroutines, function-modules and methods. This succinctly demonstrates the features of Coverage Analyzer, which facilitate developer to enter the number of calls separately according to periods, users and functional areas.

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Concept

Coverage Analyzer is a very powerful runtime analysis tool provided by SAP that enables an ABAP developer to monitor processing blocks such as reports, subroutines, function-modules and methods.

Powerful filtering system in Coverage Analyzer facilitates developer to enter the number of calls separately according to periods, users and functional areas.

In a nut-shell; Coverage Analyzer is a function for monitoring the system-wide execution of ABAP programs; It enables the success of test activities to be assessed for quality checks.

It also provides an overview of the use of programs for development purposes.

Developer can use this tool to trace programs for development purpose and Quality Manager can use this tool to check system performance for quality assurance.

It helps carry out a range of Administration Settings and the Monitoring Activity. Moreover it helps get summarized information of number of program executions, number of runtime errors, number of program resets. Fascinatingly, the results can be formatted separately according to user-group; each user-group can contain any number of users under one test key.

Broadly, functions of Coverage Analyzer are classified into two;

1. Administration Settings

- On/Off.
- Test Groups.
- Registrations.
- Reset.
- Settings.
- Monitor.
- Consistency Checks.

2. Display

- Global.
- Detail.

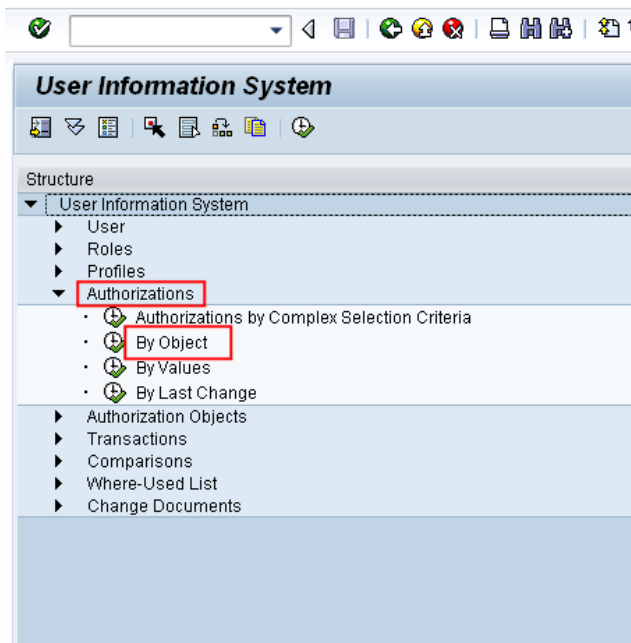
A simple exercise will help us easily understand Coverage Analyzer, rather simply going through documentation.

In order to make use of Coverage Analyzer, user has to have an appropriate role. To check user authorization;

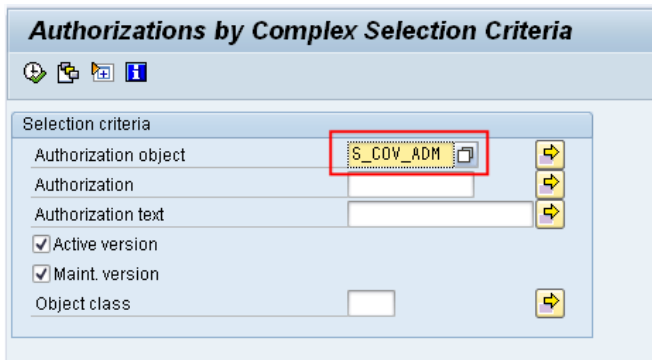
Call up transaction SUIM (User Information System).

Expand Authorizations node.

Choose By Object and execute it (press F8).



Check the presence of authorization object S_COV_ADM in the system.




Authorizations by Complex Selection Criteria

Change documents Documentation ▲ ▼ [User Icon] [Search Icon] [Print Icon] [Filter Icon] [Grid Icon] [Table Icon] [File...] [Edit Icon]

Object	Authorization	Text	Type	Version	Changed by	Date	Time
S_COV_ADM	&_SAP_ALL	Generated authorization for profile SAP_ALL	G Generated	A Active versn	DDIC	07.07.2009	11:59:54
S_COV_ADM	T-ES55070700	Coverage Analyzer: Administration	G Generated	A Active versn	ATHAKORE	25.06.2009	02:23:09
S_COV_ADM	T-ES55071600	Coverage Analyzer: Administration	G Generated	A Active versn	ATHAKORE	29.07.2009	21:45:33
S_COV_ADM	Z.ADM950__00	Coverage Analyzer: Administration	G Generated	A Active versn	GATLING	02.05.2003	16:26:06



Confirm the where-used list for profiles using  icon or Ctrl+Shift+F11.

Authorizations by Complex Selection Criteria			
Profile	Text	Type	Version
&_SAP_ALL_13	Generated partial profile for SAP_ALL	S Sgle profile	A Active versn
ERP_BASIC6	Generated partial profile for R/3_BASIC	S Sgle profile	A Active versn
R3_BASIC6	Generated partial profile for R/3_BASIC	S Sgle profile	A Active versn
T-ES55070713	Profile for role ZALL_DEV_NONBASIS	S Sgle profile	A Active versn
T-ES5507167	Profile for role ZALL_DEV_NONBASIS_NEW	S Sgle profile	A Active versn
Z:ADM950__7	Profile for role T_ADM950_SUPER_USER	S Sgle profile	A Active versn
SAP_ALL	All SAP System authorizations	C Comp.profi	A Active versn
ERP_BASIC	All Application Authorizations (incl. necessary Syst. Auth.)	C Comp.profi	A Active versn
R3_BASIC	All Application Authorizations (incl. necessary Syst. Auth.)	C Comp.profi	A Active versn
R3_BASIC_MOI	All Application - w/o Transport Management (ERP* user)	C Comp.profi	A Active versn

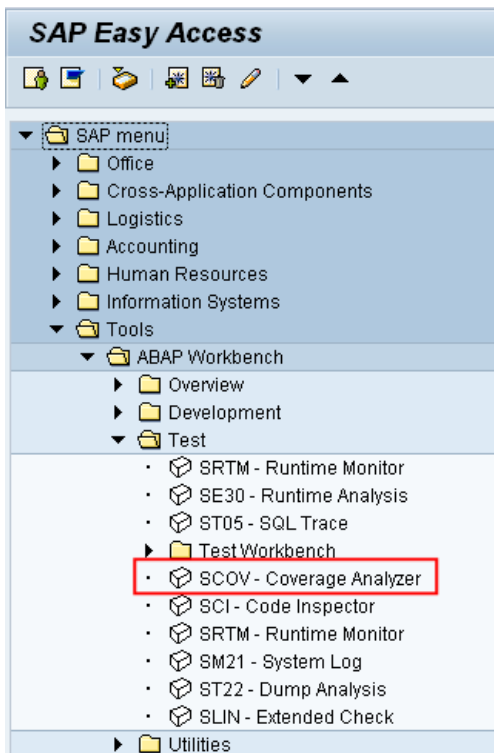
Once user authorization is checked to have absolute access to SCOV (Coverage Analyzer) transaction; user can proceed further. If a role is not assigned to a user, Basis consultant has to be consulted in this regards.

In fact, a tip to be remembered is that Coverage Analyzer tool should be used on weekends or in the evening, when all users and packages are on loose ends. Since backup server collects data from all the servers including local and remote; system needs all packages and users to be in the passive mode.

Start of Navigation

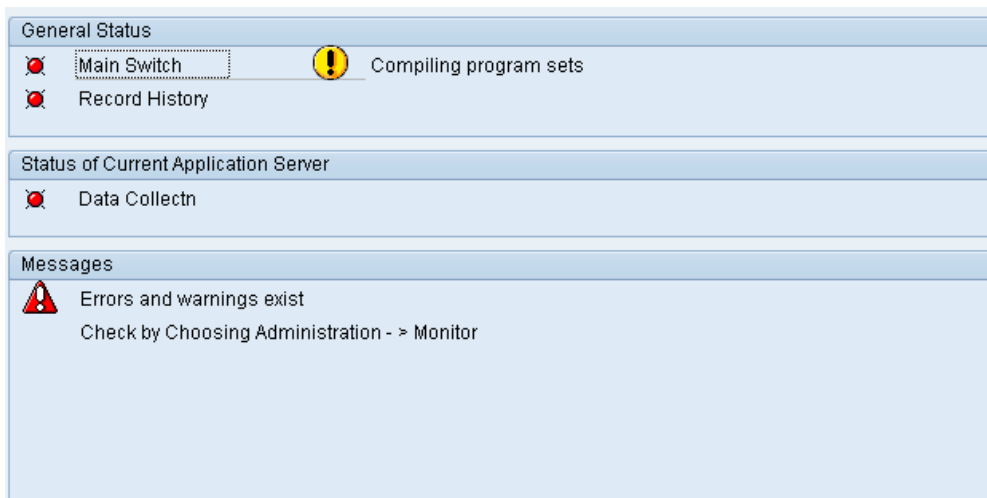
Let's start up with a simple example to understand Coverage Analyzer in a better way:

Call up the transaction SCOV or navigate through SAP Easy Access->SAP Menu->Tools->ABAP Workbench->Test->SCOV (Coverage Analyzer).

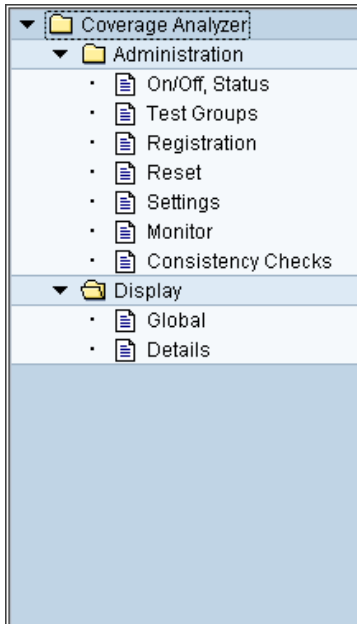


Administration Settings

General Status of the system is shown on the right hand pane of the window;

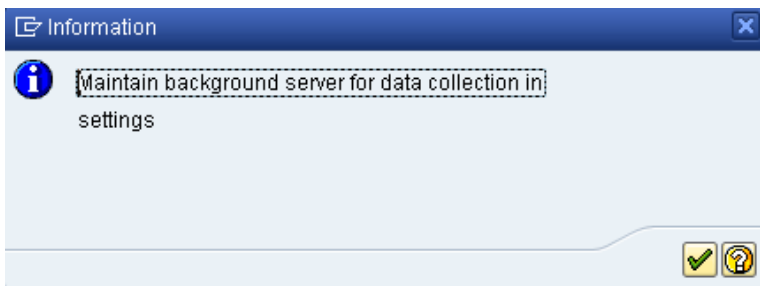


Coverage Analyzer administration includes all of the functions required for carrying out settings and checks.



Administration and Display nodes are shown on the left pane of the window.

Before the Coverage Analyzer being switched on, settings have to be maintained for backup server and filters are to be set. Having not made settings for backup server, if Coverage Analyzer is started, it simply throws out an information message to maintain background server for data collection.



So, Administration settings are to be done before starting up the Coverage Analyzer.

Settings

Expand Administration node, select Settings;

Settings function is used to set the parameters for the Global and Detail views, and to filter the programs to be checked via the package.

In order to make settings, switch settings to Change Mode (Cntrl+F1).

Tip to remember: A program is regarded as tested if the following conditions are fulfilled;

- Count1 Absolute Value > 0.
- Count2 Absolute Value > 0.
- RABAX2 Absolute Value = 0.
- Unicode Check = 1.

Condition for 'Processing block tested'			
Accum. Executions	<input type="text" value="0"/>	to	<input type="text"/>
Current Executions (Absolute	<input type="text" value="0"/>	to	<input type="text"/>
Accumulat. Errors	<input type="text" value="0"/>	to	<input type="text"/>
Current Errors	<input type="text" value="0"/>	to	<input type="text"/>
Accumulated Changes (Absolut	<input type="text" value="0"/>	to	<input type="text"/>
Unicode Check (1=ON/0=OFF)	<input checked="" type="checkbox"/>	to	<input type="text"/>

Count1 and RABAX1 indicate the number of programs executed and runtime errors since the Coverage Analyzer was started.

Count2 and RABAX2 indicate the number of programs executed and runtime errors since the last reset.

Further, assign package to be used during analysis. When a package is pre-selected, the evaluation for the Global view is only performed for this package. If this restriction is not applied, all of the programs are included together with those from local packages (\$) and programs generated locally without packages ().

Packages Included When History Is First Created			
Package	<input type="text" value="\$*"/>	to	<input type="text"/>
Transport Layer	<input type="text"/>	to	<input type="text"/>

If ABAP programs with a set Unicode flag are only to be traced by the Coverage Analyzer, then select Unicode checkbox. Checking Unicode is to mark it as 'X', else leave it unattended.

Trace only programs with set Unicode flag	Trace only programs with set Unicode flag
Only trace Unicode program <input checked="" type="checkbox"/>	Only trace Unicode program <input type="checkbox"/>

It's optional to set the lights; lights provide a visual means of representing the status of the results for the degree of coverage in the Global and Detail views.

Lights are set by default, which can be set according to developer's way of analysis.

RED 0 LT 33 %

YELLOW 33 LT 66 %

GREEN 66 LE 100%

Light Settings: Coverage Evaluation	
Red light for less than (%)	<input type="text" value="33.300000"/>
Green light for more than (%)	<input type="text" value="66.600000"/>

Further, Monitor Settings have to be done, which includes setting Trace Level and Maximum Entries Log and Maximum Entries Data Monitor.

There are 4 different trace levels (1-4), the higher the trace level, the more information is drawn for debugging.

Monitor Settings	
Trace Level	<input type="text" value="3"/>
Maximum Entries Log	<input type="text" value="100"/>
Maximum Entries Data Monitor	<input type="text" value="200"/>

Tip: The values for Maximum Entries Log and Maximum Entries Data Monitor limit the lines displayed for the General Log and Monitor Data Volumes in the monitor function.

The defaulted lines for log file are 100 and for data volume are 200.

Background server has to be specified, where precisely data is to be collected. Moreover, the period for which background job has to be repeated is also to be specified.

The defaulted value for Data Collection: Period (Min) is 30 mins, which can be modified based on developer's way of analysis. In this case, current server is specified as Background server.

Background Job for Triggering Data Collection	
Data Collection: Bckgrd Server	YHSAPX05_R3X_00
Data Collection: Period (Min)	45

Further, Summarization function facilitates checking the same processing blocks in several systems simultaneously.

Tip to remember: The results from the individual systems are local and those from the remote systems are summarized.

Local Degree of coverage LE 100%.

Summarized degree of coverage LE 100%.

Local Degree of coverage GE Summarized degree of coverage.

To determine RFC connection with current server, call up transaction SM59->RFC Destinations->R/3 Connections->E6SCLNT900.

Desired RFC connections in Summarize coverage results can be specified; moreover period and start time for summarize data can also be specified.

Summarize coverage results	
Summarization: Backgrnd Server	YHSAPX05_R3X_00
Summarization: Period (Days)	1
Summarization: Start Time	15:00:00
Remote Connections	E6SCLNT900 to <input type="text"/>

Finally, save the Settings.

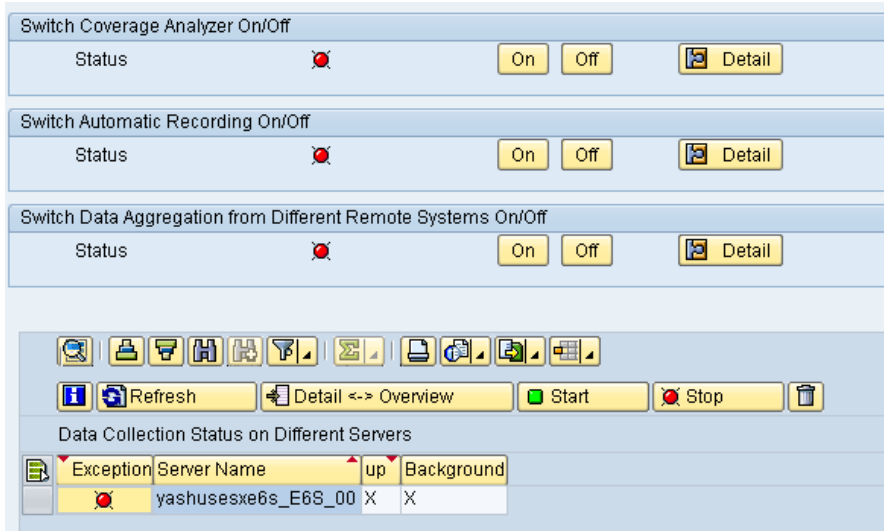
Switching On/Off

Choose On/Off, Status in the Administration node and start up the Coverage Analyzer.

Switch Coverage Analyzer On/Off: This displays the number of programs that have been initialized.

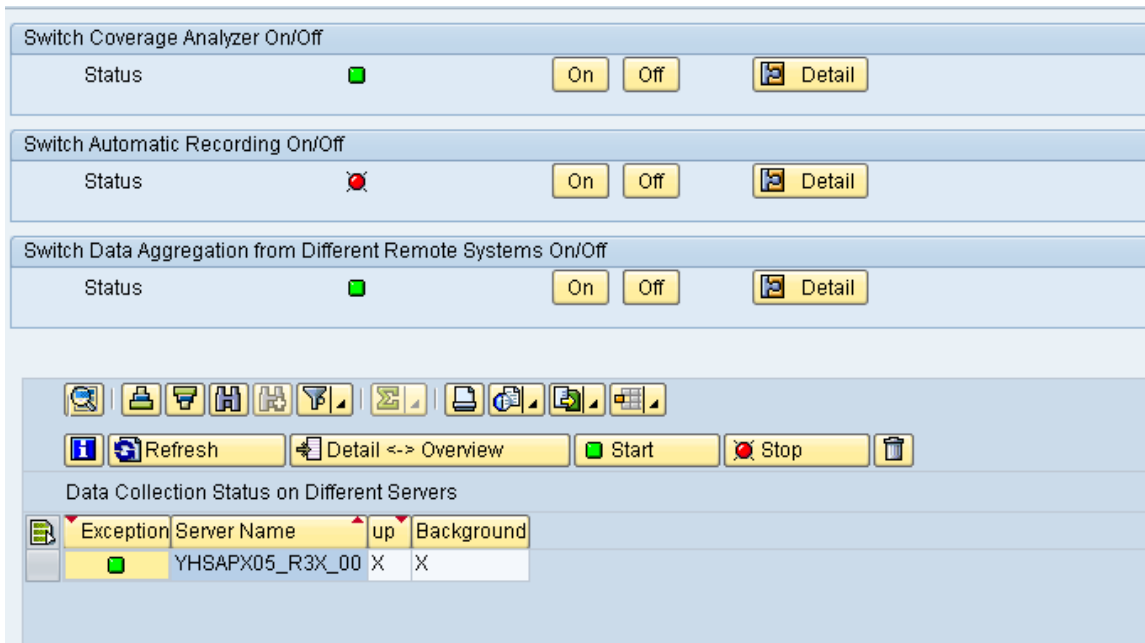
Switch Automatic Recordings On/Off: This displays the automatic recording period and the version number for the Global view.

Switch Data Aggregations from Different Remote Systems: This displays background server and all of the other systems whose results are used for Data-aggregation.



If the server is in switched-off mode exception shows **RED** signal, **GREEN** signifies server to be in switched-on mode and **YELLOW** represents either RFC problem or database and shared memory inconsistency.

In this case, we'll proceed without switching on Switch Automatic Recording On/Off.



The servers which are actually running are shown as flagged up.

Creation of Test-Groups

Test-Groups are made to summarize and display the results of the Coverage Analyzer for a particular set of users under one generic key/heading.

Tip to remember: Test-groups should not be created more than 10. Moreover, only users assigned a role with the authorization object S_COV_ADM are allowed to define group.

Two pre-defined Test-groups are always available;

ALL – Coverage results summarized for all test groups on the local system.

COND – Coverage results on the local system as well as remote system.

In this case, we create a test-group.

To create a test-group; switch on the Change Mode, click Append Row icon provided in the application toolbar.



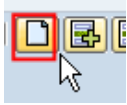
Define a Test-group following Y/Z naming convention; then save it.



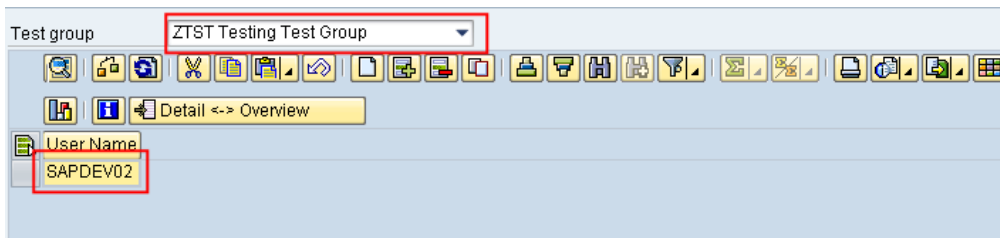
Assigning Users to Test-group

Next step is to assign users to the just-made test-group.

To assign Users to a test-group; switch on the Change Mode, click Append Row icon provided in the application tool-bar.



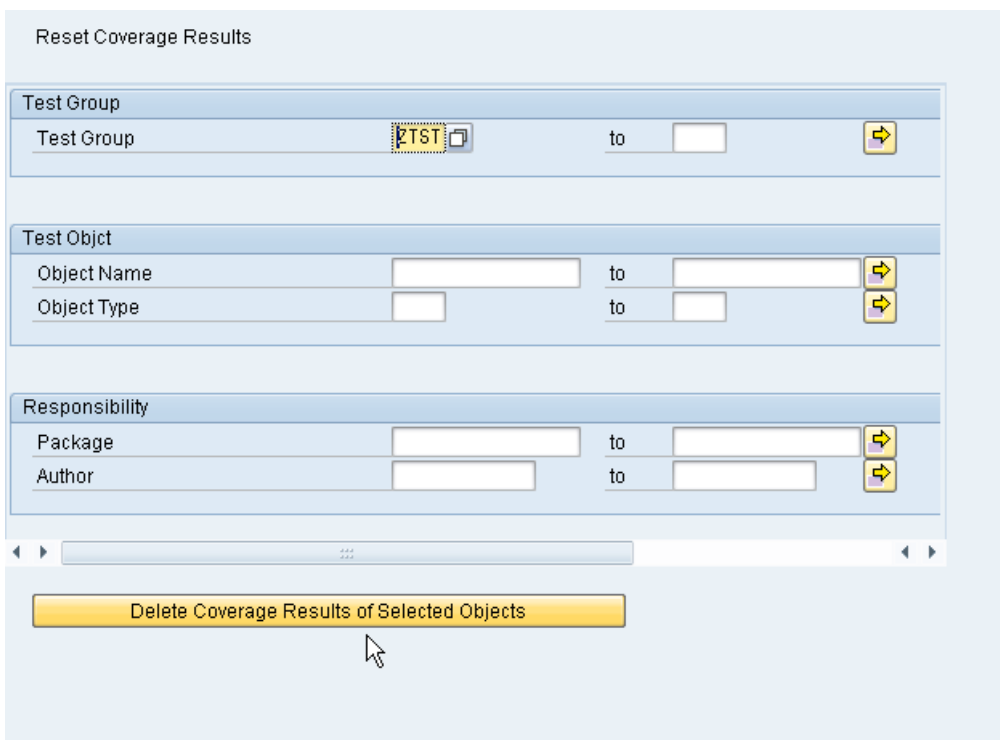
Select desired test-group for which users have to be assigned; in this case we assign SAPDEV02 as user to test-group ZTST.



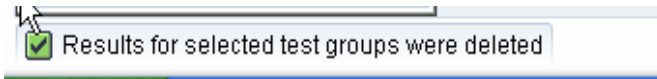
Tip: A test-group can contain any number of users, for example, all HR developers in one group. That makes filtering pretty easy. Moreover, comparison of performance of test-groups can be done in Global view.

Resetting previous analyses

An optional function to be done is Reset; explicitly this function is intended for situations in which the results of the previous analyses are no longer required. It resets all the counters of the Coverage Analyzer to 0 for all the programs of a selected group.



Further more, implicit reset is carried out automatically as soon as the flow or the data of a program changes. After successful reset, an information message is popped-up;



Checking Consistencies

Consistency check has to be done for all the servers including remote ones, before proceeding to actual analysis;



Check Status of All Servers checks whether the status in the shared memory matches the status in the database.

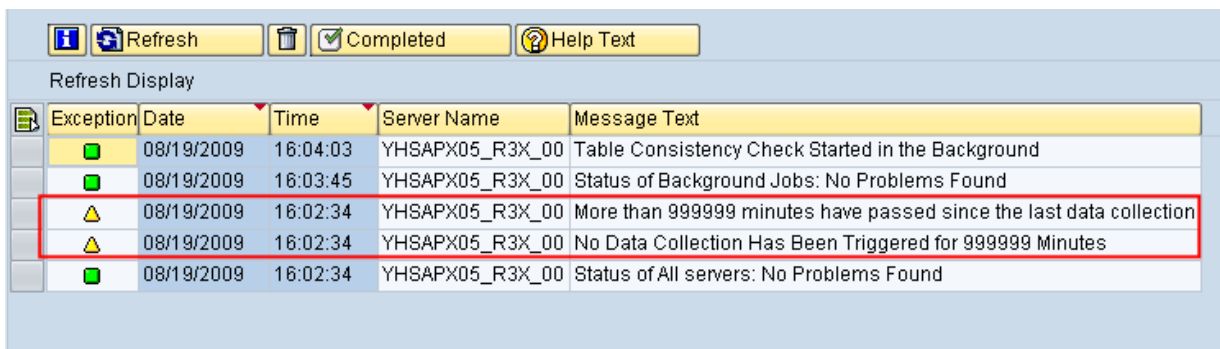
Check Status of Background Jobs checks whether all the batch jobs of the Coverage Analyzer are activated. If this is not the case, the batch jobs are all rescheduled by means of the Repair function.

Check Table Consistency (Long Runtime) may become inconsistent if the Coverage Analyzer fails on an application server due to system error.

Repair function also bridges the gap between activating and generating a program.

So, in order to check inconsistencies, check the types of inconsistencies accordingly and Execute Checks, and then choose monitor to check for the inconsistency messages,

GREEN indicates Information message, **YELLOW** indicates Warning message and **RED** indicates Error message.



In the present case; no inconsistencies have been found while starting All Servers. In case, there arise any warning or error messages, those problems are to be fixed and then select particular row of the warning/error message and click Completed.

General Log gives general information, while Monitor Volume gives detailed information of started server.

Exception	Date	Time	Server Name	Message Text
	08/19/2009	16:04:03	YHSAPX05_R3X_00	Table Consistency Check Started in the Background
	08/19/2009	16:03:45	YHSAPX05_R3X_00	Status of Background Jobs: No Problems Found
	08/19/2009	16:02:34	YHSAPX05_R3X_00	More than 999999 minutes have passed since the last data collection
	08/19/2009	16:02:34	YHSAPX05_R3X_00	No Data Collection Has Been Triggered for 999999 Minutes
	08/19/2009	16:02:34	YHSAPX05_R3X_00	Status of All servers: No Problems Found

Once the warning is attended, select the row and hit Completed, which will going to turn yellow signal to green signal.

Exception	Date	Time	Server Name	Message Text
	08/19/2009	16:03:45	YHSAPX05_R3X_00	Status of Background Jobs: No Problems Found
	08/19/2009	16:02:34	YHSAPX05_R3X_00	More than 999999 minutes have passed since the last data collection
	08/19/2009	16:02:34	YHSAPX05_R3X_00	No Data Collection Has Been Triggered for 999999 Minutes
	08/19/2009	16:02:34	YHSAPX05_R3X_00	Status of All servers: No Problems Found

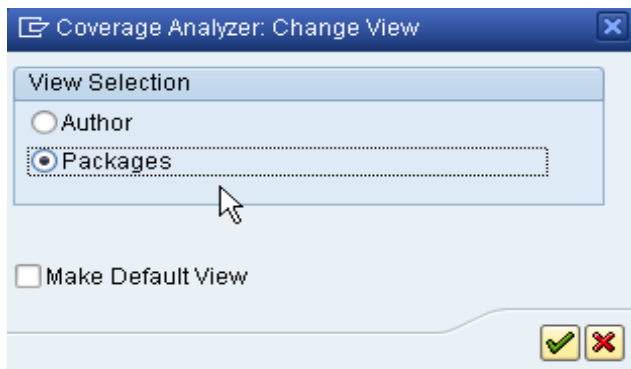
Tip: Every time inconsistencies are checked; General Log should be refreshed.

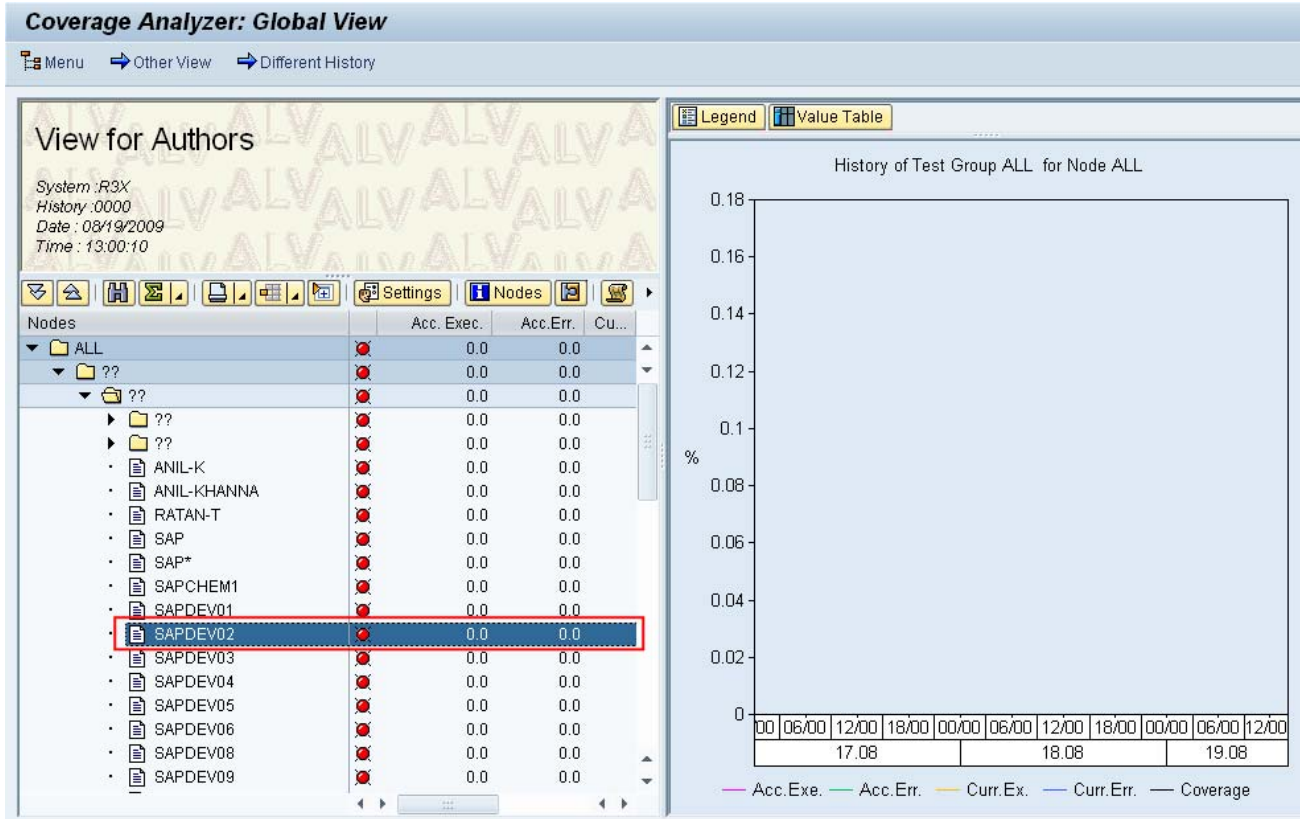
To select more than 1 message, keep Cntrl key pressed.

Global Display

Global display; gives coverage results at author or package level according to criteria you select under Settings. Global Display gives high-level view.

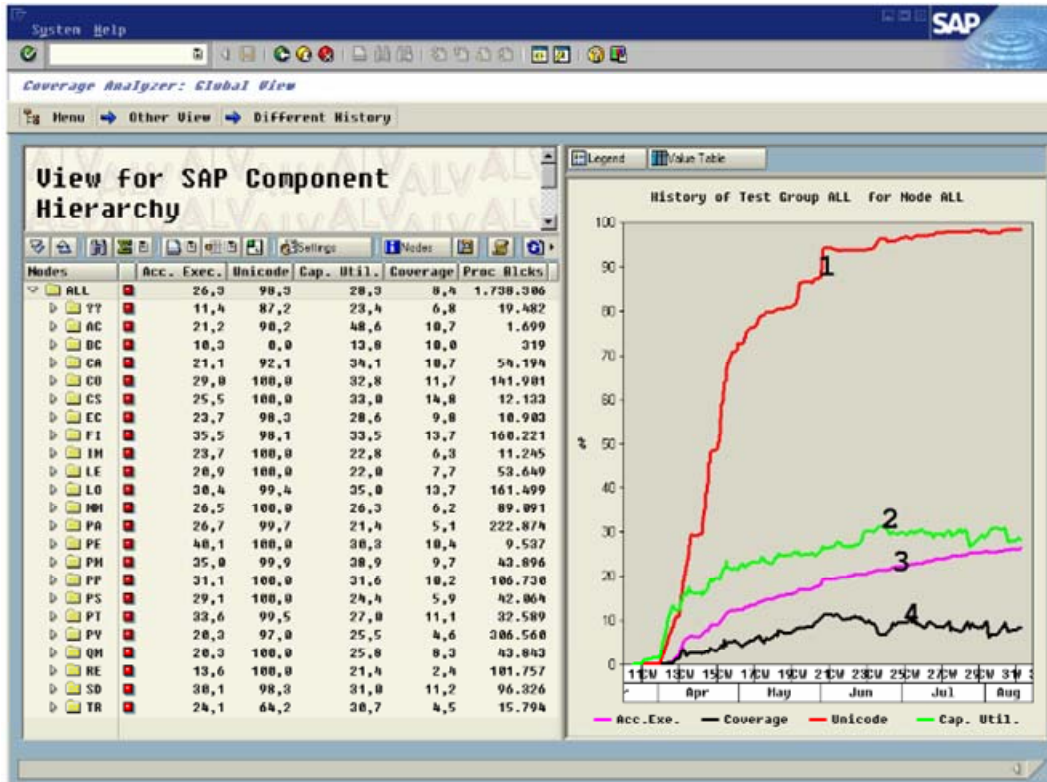
Views can be based on Author or Package. ALL signifies all the authors on local system based on view given and the COND (y/z test groups) signifies all the authors on both local and remote systems based on view given. If 'Other view' is selected as Package, then selection is done accordingly.





Note: Since Automatic Recordings were not switched on; percentage-based progress display over time cannot be seen for selected SAPDEV02 author.

Normally, Global display view gives Quality Managers to view the system, the following way;



Unicode:

This value indicates how many percent of the processing blocks have the Unicode flag set (the flag itself is set per program)

Capacity Utilization:

This value is computed as the ratio of used processing blocks to loaded processing blocks to loaded processing blocks.

Accumulated Executions (Percent)

This value indicates in percent how many processing blocks have been executed since the start of the Coverage Analyzer.

Tested processing blocks (Percent)


This value indicates in percent how many processing blocks have been executed in the actual version without runtime errors.

In the example above you can see that currently 98% of the processing blocks in the system belong to a program that has the Unicode flag set, 26% have been executed since start of the coverage analyzer, 9% have been executed in the active version without errors and the capacity utilization is 29%.

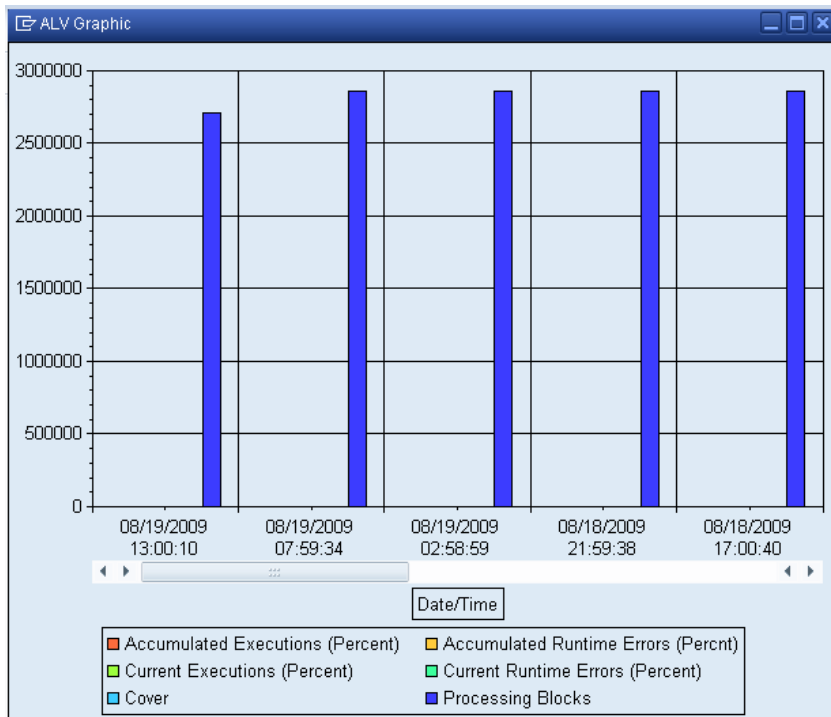
Exact Value Table can be viewed for author SAPDEV02; which displays number processing blocks for author SAPDEV02 on timely manner.

Value Table for History

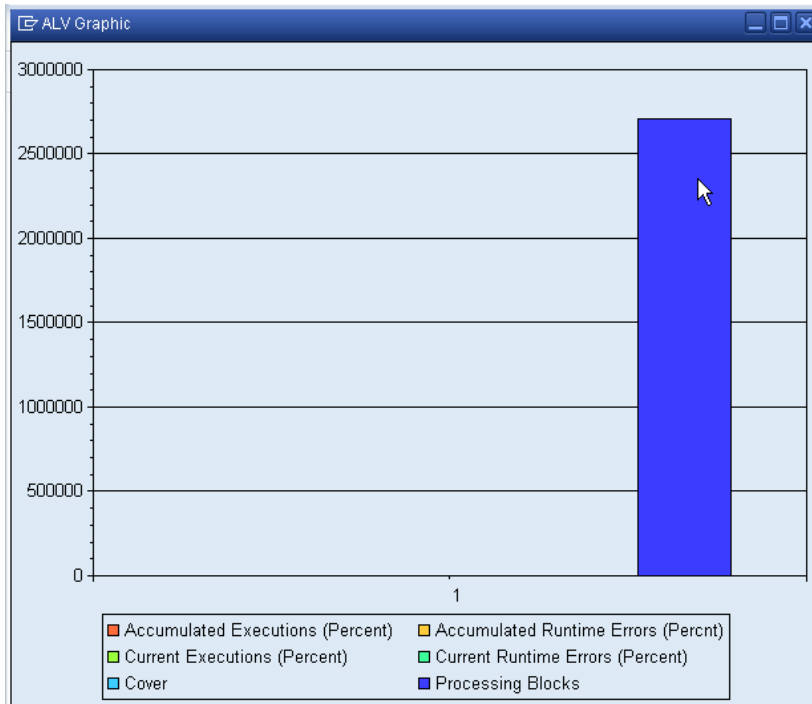
Date	Time	Acc. Exec.	Acc.Err.	Curr.Exec.	Curr.Err.	Coverage	Processing Blocks
08/19/2009	13:00:10	0.000000	0.000000	0.000000	0.000000	0.000000	2,710,797
08/19/2009	07:59:34	0.000000	0.000000	0.000000	0.000000	0.000000	2,863,326
08/19/2009	02:58:59	0.000000	0.000000	0.000000	0.000000	0.000000	2,863,326
08/18/2009	21:59:38	0.000000	0.000000	0.000000	0.000000	0.000000	2,863,326
08/18/2009	17:00:40	0.000000	0.000000	0.000000	0.000000	0.000000	2,863,313
08/18/2009	11:59:35	0.000000	0.000000	0.000000	0.000000	0.000000	2,863,287
08/18/2009	06:59:21	0.000000	0.000000	0.000000	0.000000	0.000000	2,863,281
08/18/2009	01:59:01	0.000000	0.000000	0.000000	0.000000	0.000000	2,863,281
08/17/2009	20:59:21	0.000000	0.000000	0.000000	0.000000	0.000000	2,863,281
08/17/2009	15:59:50	0.000000	0.000000	0.000000	0.000000	0.000000	2,863,250
08/17/2009	10:59:39	0.000000	0.000000	0.000000	0.000000	0.000000	2,863,219
08/17/2009	05:59:18	0.000000	0.000000	0.000000	0.000000	0.000000	2,863,219
08/17/2009	00:59:15	0.000000	0.000000	0.000000	0.000000	0.000000	2,863,219

Graphical view of the selected row can be seen using  icon; that displays graphical view of the individual date and all dates when no row is selected.

All rows selected for graphical analysis;



Individual selection for graphical analysis;



Tip: Moreover, previous saved history can also be viewed for the specific user.

Details Display

Details display view; gives summarized and detailed results. Details display gives low-level view.

Strong filtering options allow user to select on what conditions results are to be displayed.

The screenshot shows the 'Details Display' window of the Coverage Analyzer. At the top, there are three tabs: 'Main Choice', 'Other Filter', and 'Settings'. Below the tabs are three main filter sections:

- Test Group:** A text field contains 'ZTST', followed by 'to' and an empty text field, and a yellow arrow button.
- Test Object:** Two rows. The first row has 'Object Name' followed by an empty text field, 'to', another empty text field, and a yellow arrow button. The second row has 'Object Type' followed by an empty text field, 'to', another empty text field, and a yellow arrow button.
- Responsibility:** Two rows. The first row has 'Package' followed by an empty text field, 'to', another empty text field, and a yellow arrow button. The second row has 'Author' followed by a dropdown menu showing 'SAPDEV02', 'to', another empty text field, and a yellow arrow button.

 At the bottom of the window, there is a horizontal scrollbar.

Conditions can be set for range of test-groups, packages and authors pertaining to those test-groups.

In the present example; test-group ZTST and Author SAPDEV02 is taken as single-value selection, which gives results pertaining to specified criteria. Moreover, other filters can also be set and settings should be done defining access via Package Object, Package and Author. Defaulted access-via is Program Object.

Access via

Program Object

Package

Author

Maximum number of program objects that can be selected

Maximum Number of Objects: 1,000

Display places with traffic lights

Red

Yellow

Green

Decimal Places to Be Displayed

Decimal Places: 1

Standard Setting

Hitting Standard Settings is going to reset all the values.

Once settings are done; hit execute button, that is going to get detailed information, including number of calls made to that particular object, number of processing blocks, load size in Kilo byte. Besides all the information given; double-clicking the object name will navigate to the particular program or executing block where exactly error has been found.

Exception	Obj.	Object Name	Cover	Proc Blcks	Load kByte	Calls	Variance	Pers.Resp.	Package
	FUGR	/1BCDWB/SF00000269	0.0	7	97	0	0.000000	SAPDEV02	
		/1BCDWB/SF00000271	0.0	7	97	0	0.000000	SAPDEV02	
		/1BCDWB/SF00000272	0.0	7	96	0	0.000000	SAPDEV02	
		/1BCDWB/SF00000274	0.0	7	106	0	0.000000	SAPDEV02	
		/1BCDWB/SF00000275	0.0	7	101	0	0.000000	SAPDEV02	
		/1BCDWB/SF00000277	0.0	7	95	0	0.000000	SAPDEV02	
		/1BCDWB/SF00000278	0.0	7	108	0	0.000000	SAPDEV02	
		/1BCDWB/SF00000279	0.0	7	93	0	0.000000	SAPDEV02	
		/1BCDWB/SF00000280	0.0	7	92	0	0.000000	SAPDEV02	
		/1BCDWB/SF00000281	0.0	7	92	0	0.000000	SAPDEV02	
		/1BCDWB/SF00000282	0.0	7	109	0	0.000000	SAPDEV02	

Processing Blocks

Exception	Type	Name	Class	Acc. Exec.	Acc. Err.	Acc. Chng.	Curr. Exec.	Curr. Err.
	FUNC	/1BCDWB/SF00000271		0	0	0	0	0
	METH	ADD	LCL_CALCULATION	0	0	0	0	0
		AVERAGE		0	0	0	0	0
		AVERAGE_CONSTR		0	0	0	0	0
		COLLECT		0	0	0	0	0
		COUNT		0	0	0	0	0
		INIT		0	0	0	0	0

Function Builder: Display /1BCDWB/SM00000271

Function module: **/1BCDWB/SM00000271** Active

Attributes | Import | Export | Changing | Tables | Exceptions | **Source code**

```

function /1bcdwb/sm00000271.
*-----
***Global Interface:
** IMPORTING
**   VALUE(/1BCDWB/DOCPARAMS) TYPE SFPDOCPARAMS OPTIONAL
**   REFERENCE(IT_SPFLI) TYPE SPFLI_TAB
**   REFERENCE(FLAG) TYPE CHAR1 OPTIONAL
** EXPORTING
**   VALUE(/1BCDWB/FORMOUTPUT) TYPE FPFORMOUTPUT
** EXCEPTIONS
**   USAGE_ERROR
**   SYSTEM_ERROR
**   INTERNAL_ERROR
**
*-----
type-pools: abap,
            sydes,
            cxfa.

data: %outpar      type sfpoutpar,
      %docpar     type sfpdocpar,
      %wb_form    type ref to if_fp_wb_form,
      %m_langu    type langu,
      %form       type ref to if_fp_form,
      %layout     type ref to if_fp_layout,
      %sfpxfpopt  type sfpxfpopt,
      %name       type fpname value 'ZDEMO_1075_TABLE2_F'.
    
```

Note: Current Executions = Program units currently used / Total no. of Program units.

Capacity Utilization = No. of Program units currently used / Loaded Program units.

Conclusion: Likewise, many such program executions, runtime errors and program resets can be easily traced using this powerful ABAP runtime analysis tool; Coverage Analyzer.

Related Content

For more information, visit the [ABAP homepage](#).

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