

SP/Triggers/Views Analyzer

The Stored Procedure/Trigger/Views Analyzer can be found in the [IBExpert Tools menu](#). (This feature is unfortunately not included in the [free IBExpert Personal Edition](#).)

It allows the user to view and analyze how the database performs individual operations/statements in a [stored procedure](#), [trigger](#) or [view](#). For example, certain indices perhaps may not be used by the database server as the statistics are too high; this can be solved simply by using the [IBExpert Database menu](#) item [Recompute selectivity of all indices](#) to update the selectivity. Or when backing up an older InterBase® version and restoring to a new Firebird/InterBase® version, the procedures and triggers appear not to work as it is often necessary to first [Recompile all stored procedures and triggers](#) (also found in the [IBExpert Database menu](#)).

The screenshot shows the SP/Triggers Analyzer window. At the top, there's a toolbar with icons for database selection, filtering, and analysis. Below the toolbar, there's a table with columns: SP/Trigger, SP/Trigger Name, Operation, Table/View, Statement, Expected Plan, Compatibility, and Compiler warnings. The table lists various database objects like PROCEDURE, TRIGGER, and VIEW, along with their names, operations, and the tables/views they interact with. Some rows are highlighted in red, indicating issues or warnings. Below the table, there's a section for the 'Statement' and 'Expected Plan' of the selected object. The 'Statement' section shows the SQL code for the selected object, and the 'Expected Plan' section shows the execution plan generated by the database.

SP/Trigger	SP/Trigger Name	Operation	Table/View	Statement	Expected Plan	Compatibility	Compiler warnings
Procedure	ORG_CHART	Select	DEPARTMENT	FOR SELECT h.department,	JOIN (D ORDER RDB\$PRIMARY5, H		
Procedure	ORG_CHART	Select	DEPARTMENT	FOR SELECT h.department,	JOIN (D ORDER RDB\$PRIMARY5, H		
* Procedure	ORG_CHART	Select	EMPLOYEE	SELECT full_name, job_code	(EMPLOYEE INDEX (RDB\$PRIMARY7))	Possible	
Procedure	ORG_CHART	Select	EMPLOYEE	SELECT COUNT(emp_no)	(EMPLOYEE INDEX (RDB\$FOREIGN8))		
* Procedure	SHIP_ORDER						5 warning(s)
Procedure	SHIP_ORDER	Select	SALES	SELECT s.order_status, c.on_hold,	JOIN (S INDEX (RDB\$PRIMARY24), C		
Procedure	SHIP_ORDER	Select	CUSTOMER	SELECT s.order_status, c.on_hold,	JOIN (S INDEX (RDB\$PRIMARY24), C		
Procedure	SHIP_ORDER	Select	SALES	FOR SELECT po_number	(SALES INDEX (SALESTATX,		
Procedure	SHIP_ORDER	Update	CUSTOMER	UPDATE customer	(CUSTOMER INDEX		
Procedure	SHIP_ORDER	Update	SALES	UPDATE sales	(SALES INDEX (RDB\$PRIMARY24))		
Procedure	SHOW_LANGS	Select	JOB	SELECT language_req[i] FROM job	Unavailable:		
Procedure	SUB_TOT_BUD...	Select	DEPARTMENT	SELECT SUM(budget), AVG(budget),	(DEPARTMENT INDEX		
* Procedure	TBLSTATS	Select	RDB\$RELATIONS	for	(R NATURAL)		
Trigger	SAVE_SALARY_...	Insert	SALARY_HISTORY	INSERT INTO salary_history			
* View	PHONE_LIST	Select	EMPLOYEE		JOIN (DEPARTMENT NATURAL,		
* View	PHONE_LIST	Select	DEPARTMENT		JOIN (DEPARTMENT NATURAL,		

Statement:

```

SELECT
  emp_no, first_name, last_name, phone_ext, location, phone_no
FROM employee, department
WHERE employee.dept_no = department.dept_no

```

Expected Plan:

```

JOIN (DEPARTMENT NATURAL, EMPLOYEE INDEX (RDB$FOREIGN8))

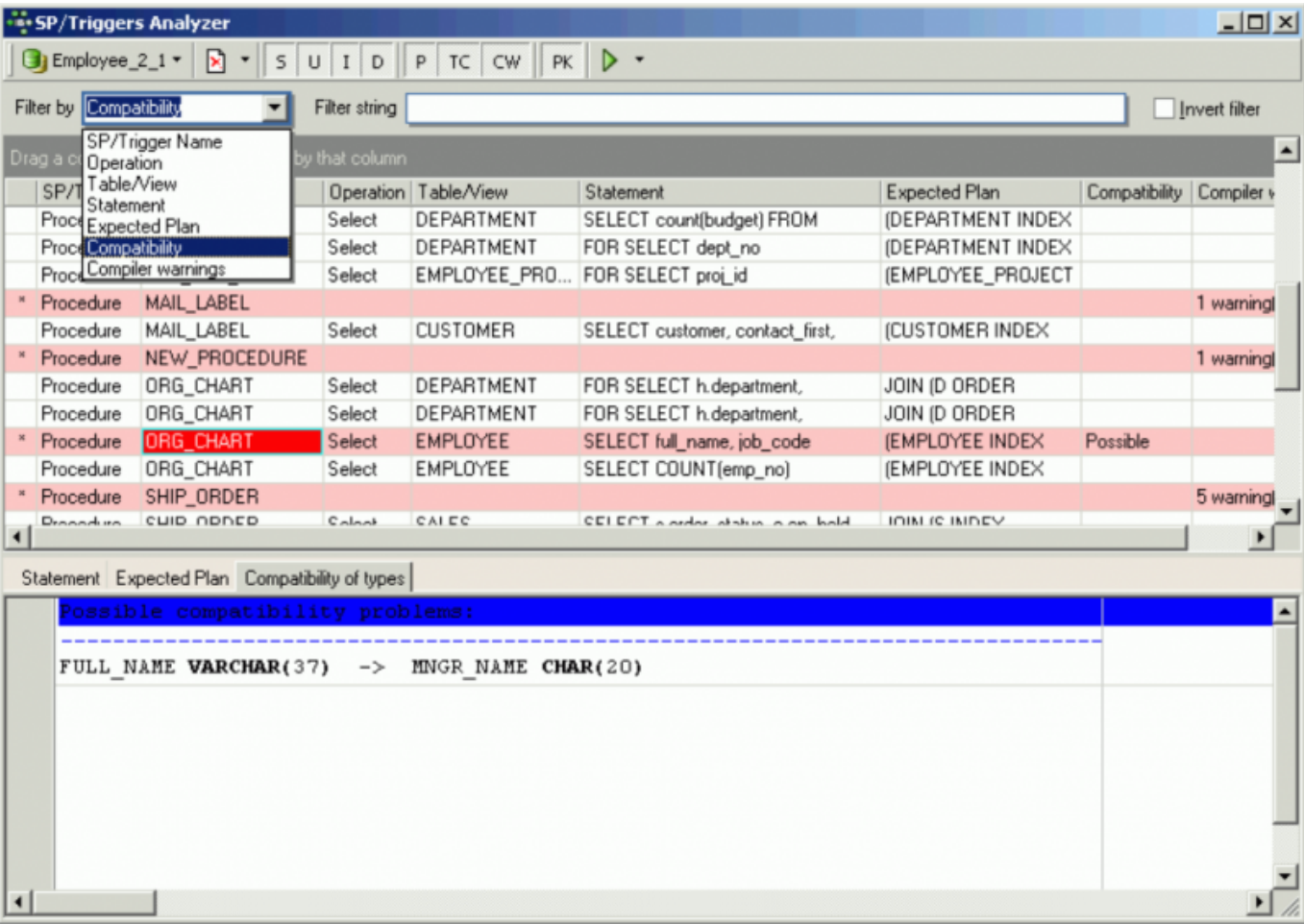
```

The database to be analyzed can be selected from the drop-down list of all *connected databases* (the first toolbar item). By clicking on the [Start Analyzing icon](#), it loads all stored procedures and triggers for the active database.

They are all automatically analyzed, i.e. each procedure/trigger is split up into its individual statements (the first SQL row is displayed in the *Statement* column; the full code is displayed in the lower *Statement* window). All statements with any sort of problems (no index, compiler warning etc.) are highlighted, and need looking at more closely.

The [indices](#) used for each operation are displayed in the right-hand *Expected Plan* column; details are displayed in a tree form in the lower *Expected Plan* window. Possible compatibility problems are

indicated in the *Compatibility* column with details in the *Compatibility of Types* window below:



The last column displays compiler warnings, again with details in the lower window (see illustration below).

The user can specify exactly what he would like to analyze by deactivating or activating the toolbar icons ([SP/Triggers/Views Analyzer toolbar](#)):

S	All SELECT statements are selected, analyzed and displayed.
U	All UPDATE statements are selected, analyzed and displayed.
I	All INSERT statements are selected, analyzed and displayed.
D	All DELETE statements are selected, analyzed and displayed.
P	Analysis of plans and indices.
TC	Analysis of the compatibility of types of return values and variables for SELECT...INTO and OR SELECT...INTO statements.
CW	Displays all compiler warnings.
PK	Checks primary keys.

	SP/Trigger	SP/Trigger Name	Operation	Table/View	Statement	Expected Plan	Compatibility	Compiler warn
*	Procedure	ADD_EMP_PROJ						1 warning(s)
*	Procedure	DELETE_EMPLOYEE						2 warning(s)
*	Procedure	NEW_PROCEDURE						1 warning(s)
*	Procedure	SHIP_ORDER						5 warning(s)

#	Type	Text
1	Warning	Pointless SUSPEND - no output parameters
2	Warning	Pointless SUSPEND - no output parameters
3	Warning	Pointless SUSPEND - no output parameters
4	Warning	Pointless SUSPEND - no output parameters
5	Warning	Value assigned to 'ANY_PO' never used

The analysis results can be filtered by the criteria listed in the drop-down *Filter* by list:

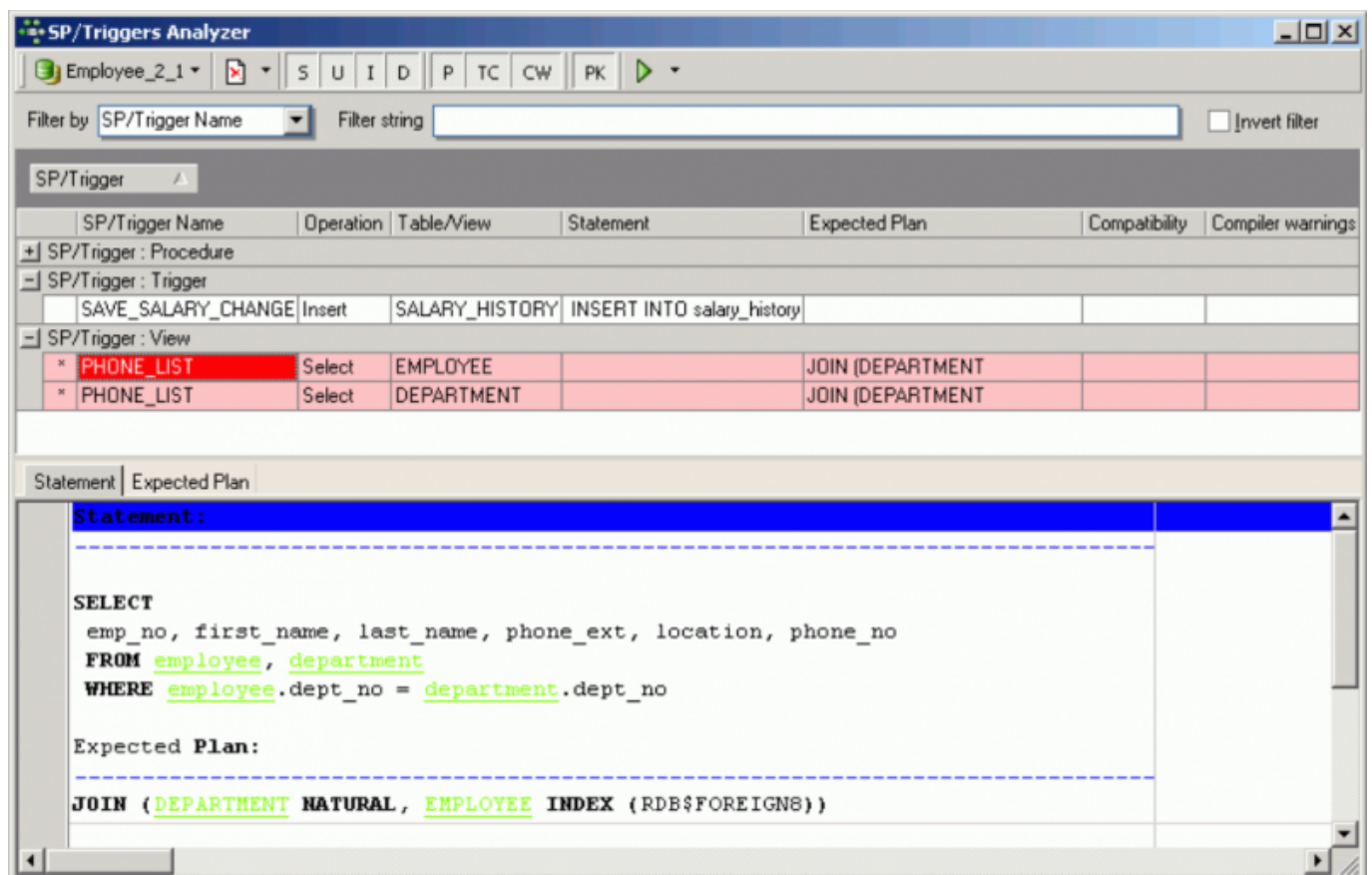
- **SP/Trigger name**
- **Operation**
- **Table View**
- **Statement**
- **Expected Plan**
- **Compatibility**
- **Compiler warnings**

and supplemented by the user-specified filter string to the right, to search for specific objects, operations or problems. This filter can even be inverted (check box option on the right).

As with all IBE expert grids the contents can be sorted by clicking on the desired column header (e.g. sort according to *Name*, *Table/View*, *statement* etc.). By clicking on the left-hand column header (the unnamed column to the left of the *SP/Trigger* column), the red highlighted objects (i.e. those with any sorts of problem that need looking at more closely) are grouped together.

The [Procedure](#), [Trigger](#), [Table](#) or [View](#) editors can be quickly started by double-clicking on a selected [field](#), allowing the user for example, to quickly and easily insert an [index](#).

Column headers can also be dragged to the gray area below the toolbar, to group by the column selected:



The above illustration displays all stored procedures and triggers grouped by the procedure or trigger name. By clicking '+' or '-', or double-clicking on the list name, the individual operations can be easily blended in or out.

It is also possible to group by more than one criteria:

The screenshot shows the SP/Triggers Analyzer tool. The top window displays a tree view of database objects. The bottom window shows the SQL statement and expected plan for a selected operation.

SP/Trigger Name	Statement	Expected Plan	Compati...	Compiler warnings
SP/Trigger : Procedure				
+ Table/View :				
- Table/View : CUSTOMER				
- Operation : Select				
MAIL_LABEL	SELECT customer, contact_first,	(CUSTOMER INDEX		
SHIP_ORDER	SELECT s.order_status, c.on_hold,	JOIN (S INDEX (RDB\$PRIMARY24), C		
+ Operation : Update				
+ Table/View : DEPARTMENT				
+ Table/View : EMPLOYEE				
- Table/View : EMPLOYEE_PROJECT				
- Operation : Delete				
DELETE_EMPLOYEE	DELETE FROM employee_project	(EMPLOYEE_PROJECT INDEX		
- Operation : Insert				
ADD_EMP_PROJ	INSERT INTO employee_project			
- Operation : Select				
GET_EMP_PROJ	FOR SELECT proj_id	(EMPLOYEE_PROJECT INDEX		
+ Table/View : JOB				

Statement | Expected Plan

Statement:

```
DELETE FROM employee_project
WHERE emp_no = :emp_num;
```

Expected Plan:

```
(EMPLOYEE_PROJECT INDEX (RDB$FOREIGN15))
```

The lower window displays the SQL text for a selected operation on the Statement page. The statements can easily be copied and inserted into a text editor or the IBExpert [SQL Editor](#), using the context-sensitive right-click menu (please refer to the [SQL Editor Menu](#) for further details).

In case it is of interest, the SP/Triggers/Views Analyzer was realized using the Developer Express component.

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