



IBM Software Group

# WebSphere® Message Broker V6

## *Stored procedures*



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This presentation discusses enhancements to ESQL Stored Procedures.

## Agenda

- Enhancements to stored procedures
- Summary and references



This topic presents the Enhancements to Stored Procedures in WebSphere Message Broker Version 6. It concludes with a summary of the presentation and references.

## Section

# ***Enhancements to stored procedures***



This section discusses details of the Enhancements to Stored Procedures.

## Stored procedures

- CREATE FUNCTION and CREATE PROCEDURE statements have been unified
  - ▶ No performance difference between CREATE FUNCTION and CREATE PROCEDURE
  - ▶ Syntactically identical except for these minor differences:
    - For FUNCTION, LANGUAGE clause of DATABASE is not allowed
    - For FUNCTION, the direction indicator (IN, OUT, INOUT) is optional for each parameter



In WebSphere Message Broker Version 6, the CREATE FUNCTION and CREATE PROCEDURE statements have been unified. For most programming requirements, you can choose either statement, depending on your programming style preferences. Except for the minor syntax differences noted here, the broker processing for the CREATE FUNCTION and CREATE PROCEDURE is the same and thus there is no performance difference between the two.

If the routine type is FUNCTION, the LANGUAGE clause is not allowed. In addition, for FUNCTION, the parameter direction (IN, OUT, INOUT) is optional for each parameter. However, it is good programming practice to specify a parameter direction for all new routines of any type for documentation purposes.

## Return scalar values

- CREATE PROCEDURE
  - ▶ ReturnType: RETURNS *Data type*
  - ▶ Specifies the return of a single scalar value
  - ▶ Useful for retrieving return values from the invocation of database stored procedures



Version 6 now allows the CREATE PROCEDURE statement to support a return of a single scalar value. You specify the return of a single scalar value with the RETURNS data type parameter. The RETURNS parameter is useful for retrieving return values from the invocation of database stored procedures.

## Previous release result sets limitations

- CREATE PROCEDURE did not support result sets
- Required to use PASSTHRU with its limitations
  - ▶ Returned only one result set
  - ▶ Did not support OUT and INOUT parameter directions



In the previous release, the CREATE PROCEDURE did not support result sets at all. You had to use PASSTHRU, which could only retrieve a single result set and you could not specify OUT or INOUT parameter directions. Version 6 now allows better functionality for working with result sets.

## Retrieving multiple result sets

- CREATE PROCEDURE
  - ▶ ResultSet: DYNAMIC RESULT SETS *integer*
  - ▶ Use when a stored procedure returns multiple results sets
  - ▶ IN, OUT, INOUT parameter directions supported



Version 6 now allows the CREATE PROCEDURE statement to support the return of multiple result sets with the DYNAMIC RESULT SETS parameter. The integer you supply for the DYNAMIC RESULT SETS parameter indicates the number of result sets you want returned. In addition, the IN, OUT, and INOUT parameter directions are supported.





## Example – return single scalar

```
/* Declare a stored procedure representing a routine which returns  
a single scalar value as well as an out parameter */  
  
CREATE PROCEDURE myProc1( IN P1 INT, OUT P2 INT )  
LANGUAGE DATABASE  
RETURNS INTEGER  
EXTERNAL NAME "myschema.myproc";  
  
/* The following ESQL can be used to invoke the myProc1 Routine  
using procedure invocation syntax*/  
  
CALL myProc1( intVar1, intVar2 ) INTO intReturnVar3;  
  
/* The following ESQL can be used to invoke the myProc1 Routine  
using function invocation syntax*/  
  
SET intReturnVar3 = myProc1( intVar1, intVar2 );
```



Here is an example showing an ESQL CREATE PROCEDURE using the RETURNS INTEGER to retrieve the return value from a database stored procedure. Below that are two examples of invoking the procedure and receiving the return value.

## Example – return multiple results sets

```
/* Declare a stored procedure which returns 2 result sets  
as well as an out parameter */  
  
CREATE PROCEDURE myProc1( IN P1 INT, OUT P2 INT )  
LANGUAGE DATABASE  
DYNAMIC RESULT SETS 2  
EXTERNAL NAME "myschema.myproc";  
  
/* The following ESQL can be used to invoke myProc1  
using a field reference*/  
  
CALL myProc1( intVar1, intVar2, Environment.RetVal[], OutputRoot.XML.A[] )  
  
/* The following ESQL can be used to invoke myProc1  
using a reference variable*/  
  
CALL myProc1( intVar1, intVar2, myReferenceVariable.RetVal[], myRef2.B[] )
```

Here is an example showing an ESQL CREATE PROCEDURE using DYNAMIC RESULT SETS with IN and OUT parameter directions. Two examples of the CALL statement are shown in the lower portion of the slide. The first example shows a field reference receiving the result sets and the second shows a reference variable receiving the result sets.

## Section

# ***Summary and references***

The last portion of the presentation contains a summary and references.

## Summary

- CREATE FUNCTION and CREATE PROCEDURE statements have been unified
- CREATE PROCEDURE enhancements in V6
  - ▶ Support for RETURNS *data type*
    - Useful for retrieving return values from the invocation of database stored procedures
  - ▶ Support for DYNAMIC RESULT SETS *integer*
    - Allows multiple result sets to be returned
    - Support IN, OUT, INOUT direction parameters



In Version 6, the CREATE FUNCTION and CREATE PROCEDURE statements have been mostly unified, with only minor differences between the two routine types. CREATE PROCEDURE has been enhanced to support the return of a scalar return value from a stored procedure, which is useful for passing return values back to the ESQL caller. CREATE PROCEDURE now allows multiple result sets to be returned to the caller and allows the use of IN, OUT, and INOUT parameter directions.

## References

- WebSphere Message Broker library:

<http://www-306.ibm.com/software/integration/wbimessagebroker/library/>

- WebSphere Message Broker Information Center:

<http://publib.boulder.ibm.com/infocenter/wmbhelp/v6r0m0/index.jsp>

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