New Features Summary
Sybase® IQ 15.2

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Changes to the Sybase IQ 15.2 installer

Although interactive and silent installation procedures are identical, some Sybase® IQ options, option names, and file locations are different.

Sybase IQ 15.2 program group on Windows

Changes to the Sybase IQ 15.2 program group:

- Interactive SQL Java is now Interactive SQL.
- Sybase Central™ Java Edition is now Sybase Central.
- Interactive SQL Classic is no longer available as a program group option.

Interactive SQL Classic is available as an executable (*dbisqlc.exe*) in the *%IQDIR15%\bin<platform>* directory, where *<platform>* is the word size of your operating system (*32* or *64*).

Enhanced data access APIs

Sybase IQ 15.2 includes enhanced API support that you can use to build and deploy database applications. File locations depend on your operating system. See “Sybase IQ data access APIs” on page 10.

CIS performance enhancements

Sybase IQ uses Component Integration Services (CIS) to query tables on remote servers. Changes in Sybase IQ 15.2 allow queries with proxy tables or IN SYSTEM tables to execute significantly faster than earlier versions when the amount of IN SYSTEM or proxy table data is small compared to the IQ data.

ODBC driver manager

Sybase IQ now provides the *libdbod11* shared object, which can be used on all supported UNIX platforms as an ODBC driver manager.

See “Using the SQL Anywhere ODBC Driver Manager on Unix” in the SQL Anywhere® documentation at *SQL Anywhere 11.0.1 > SQL Anywhere Server – Programming > SQL Anywhere Data Access APIs > SQL Anywhere ODBC API > Building ODBC Applications*.

Performance and scalability enhancements

Full text searching

Note Users must have the Unstructured Data Analytics license to use the full text search functionality.

Full text searching increases the Sybase IQ ability to handle unstructured and semistructured data.The new full text search capability in Sybase IQ 15.2 is based on the use of a new index for columns of text data in many forms. The new index provides fast results to queries on columns containing a term or phrase.

When you perform a full text search, you are searching a TEXT index (not table rows). Before you can perform a full text search, create a TEXT index on the column to search. A TEXT index stores positional information for terms in the indexed columns. Queries that use TEXT indexes can be faster than those that must scan all the values in the table.

A text configuration object is used when creating the TEXT index. The object controls the terms that get stored in a TEXT index and how a full text query is interpreted.

See *Unstructured Data Analytics in Sybase IQ*.

Large object management enhancements

Sybase IQ 15.2 includes several enhancements for loading and working with large object data.

- You can load large object data of unlimited size, unless restricted by the operating system, from a primary load file in ASCII or BCP format. Large object data includes the LONG BINARY and LONG VARCHAR data types.
- The LOAD TABLE, INSERT…VALUES, INSERT…SELECT, INSERT…LOCATION, SELECT…INTO, and UPDATE SQL statements accept LONG BINARY and LONG VARCHAR variables of any size of data. Currently, a SQL variable can hold up to 2GB - 1 in length.
- The LIKE predicate supports LONG VARCHAR variables of any size.
- Most of the functions that support the LONG BINARY and LONG VARCHAR data types also support LONG BINARY and LONG VARCHAR variables of any size. See *Unstructured Data Analytics in Sybase IQ > Function Suppor*t.
- The TEXT index supports LONG BINARY and LONG VARCHAR columns.

Users must be specifically licensed to use the large object data types LONG BINARY and LONG VARCHAR. For details on the large object management enhancements and the Unstructured Data Analytics Option, see *Unstructured Data Analytics in Sybase IQ*.

Security enhancements

Earlier versions of Sybase IQ support two authorities for performing database administration tasks: DBA and RESOURCE.

Sybase IQ also supports a set of authorities that SQL Anywhere provides. See "Authorities overview" in the SQL Anywhere documentation at *SQL Anywhere 11.0.1 > SQL Anywhere Server - Database Administration > Configuring Your Database > Managing user IDs, authorities, and permissions > Database permissions and authorities overview*.

Sybase IQ 15.2 provides granularity in the database administration tasks through new authorities that are reserved for particular well-defined tasks. This enables users to run with as few privileges as possible at all times and limits the number of users with DBA authority.

Table 1 lists the new authorities and the tasks that each authority enables non-DBA users to perform.

Table 1: Granular authorities

Authority name	Description	Documentation
OPERATOR	Required to back up and checkpoint databases, and drop connections	*System Administration Guide: Volume 1 > Managing User IDs and Permissions > OPERATOR authority overview.*
MULTIPLEX ADMIN	Required to administer multiplex servers	*Using Sybase IQ Multiplex > Managing Multiplex Servers > MULTIPLEX ADMIN authority overview.*
PERMS ADMIN	Required to manage data permissions, groups, authorities, and passwords	*System Administration Guide: Volume 1 > Managing User IDs and Permissions > PERMS ADMIN authority overview.*
SPACE ADMIN	Required to manage dbspaces, manage CREATE permission on dbspaces, and perform read-only selective database restore operations	*System Administration Guide: Volume 1 > Managing User IDs and Permissions > SPACE ADMIN authority overview.*
USER ADMIN	Required to manage users, login policies, and external logins	*System Administration Guide: Volume 1 > Managing User IDs and Permissions > USER ADMIN authority overview.*

See *System Administration Guide: Volume 1 > Managing User IDs and Permissions > Authorities overview.*

SQL function enhancements

Microsecond support for date and time functions

To support fine-grained time-based data, these date and time functions have been extended to support the microsecond date part and the abbreviations US and MCS:

- DATEADD
- DATECEILING
- DATEDIFF
- DATEFLOOR

- DATENAME
- DATEPART
- DATEROUND

The data type conversion function CONVERT also supports five new format styles that include microsecond.

See *Reference: Building Blocks, Tables, and Procedures* > *SQL Functions*.

New SQL:2008 OLAP functions

Interrow functions are OLAP functions that access previous rows or subsequent rows in a data series without requiring you to define a self-join. These two interrow functions have been added:

- LAG – provides access to a row at a given physical offset prior to the CURRENT ROW in the table.
- LEAD – provides access to a row at a given physical offset after the CURRENT ROW in the table.

A ranking function has also been added:

- ROW_NUMBER – a ranking function that assigns a row number for each row in a window partition, restarting the numbering at each new partition. If you did not define window partitions, the function assigns unique row numbers for the complete result set.

See *Reference: Building Blocks, Tables, and Procedures* > *SQL Functions* and *System Administration Guide: Volume 2* > *Using OLAP.*

New time series and forecasting functions

New time series and forecasting functions have been added to Sybase IQ. These functions are available only with RAP – The Trading Edition® Enterprise.

Like all time series SQL functions, the new functions call two libraries: the IMSL C Stat, and IMSL C Math, integrated third-party libraries. Provided by Visual Numerics, these libraries contain C functions for time series and forecasting, and form part of the Sybase IQ scalar and aggregate UDF infrastructure. Sybase IQ automatically loads the IMSL libraries as needed when you call a valid function for time series and forecasting analysis.

The new aggregate time series SQL functions are:

- **TS_AUTO_ARIMA** Determines parameters of a multiplicative seasonal autoregressive integrated moving average (ARIMA) model, and produces forecasts that incorporate the effects of outliers with effects that persist beyond the end of the time series.
- **TS_AUTO_ARIMA_OUTLIER** Like the TS_AUTO_ARIMA aggregate function, TS_AUTO_ARIMA_OUTLIER accepts an input time series and automatically determines the parameters of an ARIMA model. However, whereas TS_AUTO_ARIMA uses the ARIMA model to forecast values beyond the set of inputs, TS_AUTO_ARIMA uses the ARIMA model to identify statistical outliers in the input time series, and returns the outlier type of each one.
- **TS_GARCH** Used to analyze and forecast volatility in time series data. TS_GARCH computes the estimates of the parameters of a GARCH(p, q) model. GARCH (generalized autoregressive conditional heteroskedasticity) is a generalized model of ARCH; the ARCH computation relates the error variance to the square of a previous period's error.

These scalar functions support the TS_AUTO_ARMA function:

- **TS_AUTO_ARIMA_RESULT_AIC** Retrieves the Akaike's Information Criterion (AIC) output parameter produced by TS_AUTO_ARIMA.
- **TS_AUTO_ARIMA_RESULT_AICC** Retrieves the corrected AIC (AICC) output parameter produced by TS_AUTO_ARIMA.
- **TS_AUTO_ARIMA_RESULT_BIC** Retrieves the Bayesian Information Criterion (BIC) output parameter produced by TS_AUTO_ARIMA.
- **TS_AUTO_ARIMA_RESULT_FORECAST_VALUE** Retrieves the forecasted values for the original input series produced by TS_AUTO_ARIMA.
- **TS_AUTO_ARIMA_RESULT_FORECAST_ERROR** Retrieves the forecasted standard error values for the original input series produced by TS_AUTO_ARIMA.
- **TS_AUTO_ARIMA_RESULT_MODEL_P** Retrieves the *p* value produced by TS_AUTO_ARIMA when computing the ARIMA model description.
- **TS_AUTO_ARIMA_RESULT_MODEL_Q** Retrieves the *q* value produced by TS_AUTO_ARIMA when computing the ARIMA model description.

- **TS_AUTO_ARIMA_RESULT_MODEL_S** Retrieves the *s* value produced by TS_AUTO_ARIMA when computing the ARIMA model description.
- **TS_AUTO_ARIMA_RESULT_MODEL_D** Retrieves the *d* value produced by TS_AUTO_ARIMA when computing the ARIMA model description.
- **TS_AUTO_ARIMA_RESULT_RESIDUAL_SIGMA** Retrieves the residual standard error of the outlier-free data points.
- **TS_INT_ARRAY** Constructs a logical array of constant integer values encoded as a varbinary value.

Note TS_INT_ARRAY also supports the TS_AUTO_ARIMA_OUTLIER aggregate function.

These scalar functions support the TS_GARCH function:

- **TS_DOUBLE_ARRAY** Constructs a logical array consisting of 3 –10 constant double-precision floating-point values, and returns a single varbinary value.
- **TS_GARCH_RESULT_A** Retrieves the log-likelihood output parameter, *A*, produced by the TS_GARCH aggregate function.
- **TS_GARCH_RESULT_AIC** Retrieves the Akaike's Information Criterion output parameter (AIC) produced by the TS_GARCH aggregate function.
- **TS_GARCH_RESULT_USER** Accesses each element in the logical array that describes the GARCH(p,q) model.

See the *Time Series Guide* for detailed information on each of these functions.

For reference information on the IMSL C functions, see *IMSL Numerical Library User's Guide: Volume 2 of 2 C Stat Library*.

Statements and Options enhancements

DIVIDE_BY_ZERO_ERROR option

The DIVIDE_BY_ZERO_ERROR option removed from Sybase IQ 15.0 has been reinstated in Sybase IQ 15.2. See *Reference: Statements and Options > Database Options > DIVIDE_BY_ZERO_ERROR option [TSQL]*.

ENABLE_LOB_VARIABLES option

The new ENABLE_LOB_VARIABLES database option controls the data type conversion of large object variables. Users must be licensed for the Unstructured Data Analytics Option to use large object variables. For ENABLE_LOB_VARIABLES syntax and a complete description, see *Unstructured Data Analytics in Sybase IQ*.

MAX_PREFIX_PER_CONTAINS_PHRASE option

The new MAX_PREFIX_PER_CONTAINS_PHRASE database option specifies the number of prefix terms allowed in a text search expression. Users must be licensed for the Unstructured Data Analytics Option to use the full text search functionality. For MAX_PREFIX_PER_CONTAINS_PHRASE syntax and a complete description, see *Unstructured Data Analytics in Sybase IQ*.

TEXT_DELETE_METHOD option

The new TEXT_DELETE_METHOD database option specifies the algorithm used during a delete in a TEXT index. Users must be licensed for the Unstructured Data Analytics Option to use TEXT indexes. For TEXT_DELETE_METHOD syntax and a complete description, see *Unstructured Data Analytics in Sybase IQ*.

New and changed SQL statement syntax

These SQL syntax changes are inherited from SQL Anywhere:

- CREATE PROCEDURE statement SQL SECURITY INVOKER | DEFINER clauses, which indicate whether to run the procedure as the user calling the routine (invoker) or the user who owns the routine (definer). See *Reference: Statements and Options*.
- SELECT statement INTO TEMPORARY TABLE clause. See *Reference: Statements and Options*.

Sybase IQ data access APIs

Sybase IQ includes support for a variety of programming languages and interfaces that you can use to build and deploy database applications. Documentation for these drivers is available in the *SQL Anywhere Server - Programming Guide*.

- Sybase IQ .NET support is provided by the SQL Anywhere.NET Data Provider. The SQL Anywhere .NET Data Provider provides native access to Sybase IQ databases in the Microsoft .NET Framework. Code samples are located in the *%ALLUSERSPROFILE%\SybaseIQ\samples\SQLAnywhere\ADO.NET* directory on Windows.

  For additional information, see "SQL Anywhere .NET Data Provider" in the SQL Anywhere documentation at *SQL Anywhere 11.0.1 > SQL Anywhere Server - Programming > SQL Anywhere Data Access APIs > SQL Anywhere .NET Data Provider*.
- Sybase IQ OLE DB and ADO development is provided by the SQL Anywhere OLE DB provider. The SQL Anywhere OLE DB provider gives you full access to Sybase IQ features in an ADO programming environment. Code samples are located in the *%ALLUSERSPROFILE%\SybaseIQ\samples\SQLAnywhere\VBSampler* directory.

  For additional information, see "SQL Anywhere OLE DB and ADO development" in the SQL Anywhere documentation at *SQL Anywhere 11.0.1 > SQL Anywhere Server - Programming > SQL Anywhere Data Access APIs > SQL Anywhere OLE DB and ADO development*.
- Sybase IQ Perl scripting support is provided by the SQL Anywhere Perl DBD::SQLAnywhere DBI module. The DBD::SQLAnywhere interface provides access to Sybase IQ databases from scripts written in Perl.

For additional information, see “SQL Anywhere Perl DBD::SQLAnywhere DBI module” in the SQL Anywhere documentation at *SQL Anywhere 11.0.1 > SQL Anywhere Server - Programming > SQL Anywhere Data Access APIs > SQL Anywhere Perl DBD::SQLAnywhere DBI module*

- Sybase IQ Python Database support is provided by the sqlanydb interface. The sqlanydb interface provides access to Sybase IQ databases from Python scripts that conform to the Python Database API specification, v 2.0.

  Sybase does not currently certify the Sybase IQ Python driver on HP-UXi64, AIX64 and SunOS64. Certification of these platforms for the Sybase IQ Python driver is planned for a later release.

  For additional information, see “SQL Anywhere Python Database support” in the SQL Anywhere documentation at *SQL Anywhere 11.0.1 > SQL Anywhere Server - Programming > SQL Anywhere Data Access APIs > SQL Anywhere Python Database support*

- Sybase IQ PHP API support is provided by the SQL Anywhere PHP module, operating-system-specific binaries, and PHP source code that provide access to Sybase IQ databases.

  For additional information, see “SQL Anywhere PHP API” in the SQL Anywhere documentation at *SQL Anywhere 11.0.1 > SQL Anywhere Server - Programming > SQL Anywhere Data Access APIs > SQL Anywhere PHP API*

Table 2: Sybase IQ 15.2 drivers

Platform	ADO.NET	OLEDB	Perl	Php	Python
Win32	Installed	Installed	Source shipped	Binaries and source	Driver shipped
Win64	Installed	Installed	Source shipped	32 bit binaries and source	Driver shipped
AIX-64	N/A	N/A	Source shipped	Source shipped	Driver shipped
HPi-64	N/A	N/A	Source shipped	Source shipped	Driver shipped
Linux64 (x64)	N/A	N/A	Source shipped	Binaries and source	Driver shipped
Linux64 (IBM)	N/A	N/A	Source shipped	Source shipped	Driver shipped
Sun64 Sparc	N/A	N/A	Source shipped	Binaries and source	Driver shipped
Sun64 (x64)	N/A	N/A	Source shipped	Binaries and source	Driver shipped

Notes

- Source code, sample projects, and OS-specific binaries for Perl, Python, and PHP are installed in the *%IQDIR15%\SDK* directory on Windows or *$IQDIR15/sdk* directory on UNIX. ADO.NET and OLEDB code samples are in the appropriate *%ALLUSERSPROFILE%\SybaseIQ\samples\SQLAnywhere* folder.
- Sample projects that ship with these drivers use the Sybase IQ sample database (*iqdemo.db*), not the SQL Anywhere sample database (*demo.db*). The ODBC data source name for *iqdemo.db* is Sybase IQ Demo. See the *Sybase IQ Quick Start Guide*.
- To compile the Perl drivers to run in a 64-bit Windows environment, see How to: Enable a 64-Bit Visual C++ Toolset at the Command Line at http://msdn.microsoft.com/en-us/library/x4d2c09s.aspx.

Utility enhancements

Command line initialization (iqinit) utility

The new iqinit utility, like the SQL Anywhere dbinit utility, lets you create an IQ or SQL Anywhere database from the command line without starting a database server or utility database to execute the CREATE DATABASE statement. See *Utility Guide > Database Administration Utilities > Initialization utility (iqinit)*.

Server startup -xd switch

The start_iq -xd switch, new in Sybase IQ 15.2, prevents the database server from becoming the default server. See *Utility Guide > Running the Database Server > Table 1-1*.

Thread infrastructure improvements

Substantial improvements have been made to the thread infrastructure in Sybase IQ 15.2. These improvements minimize thread switches and context switches.

This infrastructure change may affect the memory usage of your IQ server if you use the database server startup options -gn, -gss, -iqmt, and -iqtss. For the definitions of these options, see *Utility Guide > Running the Database Server > Starting the database server.*

Licensing changes

The large object management functionality of the Large Objects Management Option and full text searching is now included in the Unstructured Data Analytics Option. The Unstructured Data Analytics Option is required for full-text searching. See “Full text searching” on page 3.

Documentation changes

These product manuals are new in Sybase IQ 15.2:

- *Time Series Guide* – describes SQL functions for time series forecasting and analysis. Time series content was located in *Reference: Building Blocks, Tables, and Procedures* in Sybase IQ 15.1. The Time Series product option requires RAP – The Trading Edition Enterprise.
- *Unstructured Data Analytics in Sybase IQ* – explains how to store and retrieve unstructured data in Sybase IQ databases. To correspond with the licensing change described in “Licensing changes” on page 13, *Unstructured Data Analytics in Sybase IQ* includes the former contents of the Sybase IQ 15.1 *Large Objects Management in Sybase IQ* plus instructions about the new full text search capability. The Unstructured Data Analytics Option requires a separate license.

Behavior changes

This section describes behavior changes in Sybase IQ 15.2.

Catalog store changes

Connection properties supported for SQL Anywhere tables

The connection properties QueryBypassedCosted, QueryBypassedOptimized, QueryDescribedOptimizer, and StatementPostAnnotatesSimple are updated only for queries against SQL Anywhere tables, not for Sybase IQ tables.

Server property returns only SQL Anywhere edition

The server property ServerEdition returns the SQL Anywhere edition. For Sybase IQ license information, run the stored procedure sp_iqlmconfig.

System table returns only information for SQL Anywhere tables

If executed against a Sybase IQ table, the system table sa_get_table_definition returns the error "`sa_get_table_definition not implemented for IQ tables, SQLCODE=30000, ODBC 3 State="HY000"`."

Data manipulation language changes

This section contains new features and behavior changes related to data manipulation language (DML).

Conversion of large object (LOB) variables

When the ENABLE_LOB_VARIABLES database option is ON (the default is OFF), unsupported implicit conversions of large object (LOB) variables are not performed automatically, even if the data length is less than 32K. Existing SQL code that uses variables of LONG VARCHAR or LONG BINARY data type may require an explicit cast. In all cases, the LONG VARCHAR or LONG BINARY variable is cast down. For example, a LONG VARCHAR variable is cast down to a VARCHAR data type.

Predicates in subqueries with LOB columns

In Sybase IQ 15.2, a query containing a subquery with no FROM clause, that also includes predicates involving LONG BINARY or LONG VARCHAR columns, returns an error, as Sybase IQ does not support predicates with these data types.

If you encounter this problem and need to maintain the behavior of versions prior to Sybase IQ 15.2, set the temporary option CIS_OPTION for the duration of the query:

```
SET TEMPORARY OPTION CIS_OPTION = 8
```

Do not set CIS_OPTION on a global basis, as this can adversely affect performance.

Database option changes

These database options have changed:

- The DIVIDE_BY_ZERO_ERROR option removed from Sybase IQ 15.0 has been reinstated in Sybase IQ 15.2. See *Reference: Statements and Options > Database Options > DIVIDE_BY_ZERO_ERROR option [TSQL]*.
- The LOAD_MEMORY_MB option has been deprecated. Instead of setting LOAD_MEMORY_MB, you must now adjust the IQ temporary cache setting. The amount to increase the IQ temporary cache is approximately the sum of all the LOAD_MEMORY_MB settings of all of the concurrent LOAD TABLE executions.

File and directory name changes

Table 3 lists files and directories that have been renamed in Sybase IQ 15.2:

Table 3: File and directory name changes

15.1 name	15.2 name
IQ-15_1.sh	IQ-15_2.sh
IQ-15_1.csh	IQ-15_2.csh
IQ-15_1	IQ-15_2
IQAgent1510.jar	IQAgent1520.jar
IQHelpen1510.jar	IQHelpen1520.jar
IQPlugin1510.jar	IQPlugin1520.jar

Load behavior changes

These behavior changes are related to loading data:

- The LOAD_MEMORY_MB option has been deprecated. Instead of setting LOAD_MEMORY_MB, you must now adjust the IQ temporary cache setting. The amount to increase the IQ temporary cache is approximately the sum of all the LOAD_MEMORY_MB settings of all of the concurrent LOAD TABLE executions.
- Sybase IQ does not support loading large object columns from primary files using the LOAD TABLE…FORMAT BINARY clause. You can load large object data in binary format from secondary files. See *Unstructured Data Analytics in Sybase IQ > Large Object Data Load and Unload*.

  Users must be specifically licensed to use the large object data types LONG BINARY and LONG VARCHAR. For details on the Unstructured Data Analytics Option, see *Unstructured Data Analytics in Sybase IQ*.
- The LOAD TABLE statement BLOCK FACTOR, BLOCK SIZE, and UNLOAD FORMAT clauses have been deprecated.
- When binary data of hexadecimal format is loaded into a LONG BINARY column from a primary file, the total number of hexadecimal digits (nibbles) must be an even number. The error "`Odd length of binary data value detected on column`" is reported, if the cell value contains an odd number of hexadecimal digits. Input files for LONG BINARY loads should always contain an even number of hexadecimal digits.

  When loading VARBINARY and BINARY data type columns from a primary file, Sybase IQ prepends a 0 nibble when the number of hexadecimal digits is an odd number.

- Partial-width loads and loads of rows spanning file boundaries by LOAD TABLE and INSERT have been deprecated in this version of Sybase IQ.

SQL function changes

Table 4: SQL function changes

SQL function	Description of change
LAG	New function. See “New SQL:2008 OLAP functions” on page 6.
LEAD	New function. See “New SQL:2008 OLAP functions” on page 6.
ROW_NUMBER	New function. See “New SQL:2008 OLAP functions” on page 6.
TS_AUTO_ARIMA	New function. See “New time series and forecasting functions” on page 6.
TS_AUTO_ARIMA_OUTLIER	New function. See “New time series and forecasting functions” on page 6.
TS_AUTO_ARIMA_RESULT_AIC	New function. See “New time series and forecasting functions” on page 6.
TS_AUTO_ARIMA_RESULT_AICC	New function. See “New time series and forecasting functions” on page 6.
TS_AUTO_ARIMA_RESULT_BIC	New function. See “New time series and forecasting functions” on page 6.
TS_AUTO_ARIMA_RESULT_FORECAST_VALUE	New function. See “New time series and forecasting functions” on page 6.
TS_AUTO_ARIMA_RESULT_FORECAST_ERROR	New function. See “New time series and forecasting functions” on page 6.
TS_AUTO_ARIMA_RESULT_MODEL_P	New function. See “New time series and forecasting functions” on page 6.
TS_AUTO_ARIMA_RESULT_MODEL_Q	New function. See “New time series and forecasting functions” on page 6.
TS_AUTO_ARIMA_RESULT_MODEL_S	New function. See “New time series and forecasting functions” on page 6.
TS_AUTO_ARIMA_RESULT_MODEL_D	New function. See “New time series and forecasting functions” on page 6.
TS_AUTO_ARIMA_RESULT_RESIDUAL_SIGMA	New function. See “New time series and forecasting functions” on page 6.
TS_DOUBLE_ARRAY	New function. See “New time series and forecasting functions” on page 6.
TS_GARCH	New function. See “New time series and forecasting functions” on page 6.
TS_GARCH_RESULT_A	New function. See “New time series and forecasting functions” on page 6.

SQL function	Description of change
TS_GARCH_RESULT_AIC	New function. See “New time series and forecasting functions” on page 6.
TS_GARCH_RESULT_USER	New function. See “New time series and forecasting functions” on page 6.
TS_INT_ARRAY	New function. See “New time series and forecasting functions” on page 6.

SQL statement authority changes

Table 5 lists statements that can be executed by users with new authorities as an alternative to DBA authority.

Table 5: Statements with new authorities

Statement	Alternate authority to DBA	Documentation
ALTER DBSPACE	SPACE ADMIN	*Reference: Statements and Options*
ALTER INDEX MOVE TO	SPACE ADMIN	*Reference: Statements and Options*
ALTER LOGIN POLICY	USER ADMIN	*Reference: Statements and Options*
ALTER MULTIPLEX RENAME	MULTIPLEX ADMIN	*Using Sybase IQ Multiplex*.
ALTER MULTIPLEX SERVER	MULTIPLEX ADMIN	*Using Sybase IQ Multiplex*.
ALTER TABLE MOVE TO	SPACE ADMIN	*Reference: Statements and Options*
ALTER USER	PERMS ADMIN to change another user’s password, USER ADMIN to set or reset login policy and to cause password expiration	*Reference: Statements and Options*
BACKUP	OPERATOR	*Reference: Statements and Options*
CHECKPOINT	OPERATOR	*Reference: Statements and Options*
COMMENT ON DBSPACE	SPACE ADMIN	*Reference: Statements and Options*

Statement	Alternate authority to DBA	Documentation
CREATE DBSPACE	SPACE ADMIN	*Reference: Statements and Options*
CREATE EXTERNLOGIN	USER ADMIN	*Reference: Statements and Options*
CREATE LOGIN POLICY	USER ADMIN	*Reference: Statements and Options*
CREATE MULTIPLEX SERVER	MULTIPLEX ADMIN	*Using Sybase IQ Multiplex*
CREATE USER	USER ADMIN	*Reference: Statements and Options*
DROP CONNECTION	OPERATOR	*Reference: Statements and Options*
DROP EXTERNLOGIN	USER ADMIN	*Reference: Statements and Options*
DROP LOGIN POLICY	USER ADMIN	*Reference: Statements and Options*
DROP MULTIPLEX SERVER	MULTIPLEX ADMIN	*Using Sybase IQ Multiplex*
DROP USER	USER ADMIN	*Reference: Statements and Options*
DROP DBSPACE	SPACE ADMIN	*Reference: Statements and Options*
GRANT MULTIPLEX ADMIN|OPERATOR|PERMS ADMIN|RESOURCE|SPACE ADMIN|USER ADMIN	PERMS ADMIN can grant all authorities except DBA and REMOTE DBA	*Reference: Statements and Options*
GRANT CONNECT	PERMS ADMIN to change an existing user's password; USER ADMIN to create a new user	*Reference: Statements and Options*
GRANT CREATE ON	SPACE ADMIN	*Reference: Statements and Options*
GRANT EXECUTE ON	PERMS ADMIN	*Reference: Statements and Options*

Statement	Alternate authority to DBA	Documentation
GRANT GROUP	PERMS ADMIN	*Reference: Statements and Options*
GRANT INTEGRATED LOGIN	USER ADMIN	*Reference: Statements and Options*
GRANT KERBEROS LOGIN	USER ADMIN	*Reference: Statements and Options*
GRANT MEMBERSHIP	PERMS ADMIN	*Reference: Statements and Options*
GRANT SELECT|INSERT|UPDATE|DELETE|ALTER|REFERENCES	PERMS ADMIN	*Reference: Statements and Options*
RESTORE	SPACE ADMIN for read-only selective restore	*Reference: Statements and Options*
REVOKE MULTIPLEX ADMIN|OPERATOR|PERMS ADMIN|RESOURCE|SPACE ADMIN|USER ADMIN	PERMS ADMIN can revoke all authorities except DBA and REMOTE DBA	*Reference: Statements and Options*
REVOKE CONNECT	USER ADMIN	*Reference: Statements and Options*
REVOKE CREATE ON	SPACE ADMIN	*Reference: Statements and Options*
REVOKE EXECUTE ON	PERMS ADMIN	*Reference: Statements and Options*
REVOKE GROUP	PERMS ADMIN	*Reference: Statements and Options*
REVOKE INTEGRATED LOGIN	USER ADMIN	*Reference: Statements and Options*
REVOKE KERBEROS LOGIN	USER ADMIN	*Reference: Statements and Options*
REVOKE MEMBERSHIP	PERMS ADMIN	*Reference: Statements and Options*

Statement	Alternate authority to DBA	Documentation
REVOKE SELECT|INSERT|UPDATE|DELETE|ALTER|REFERENCES	PERMS ADMIN	*Reference: Statements and Options*

SQL statement syntax changes

Table 6: SQL statement syntax changes

SQL statement	Description of change
ALTER TEXT CONFIGURATION	New statement to support full-text searching. See *Unstructured Data Analytics in Sybase IQ > SQL Statement Support > ALTER TEXT CONFIGURATION statement*.
ALTER TEXT INDEX	New statement to support full-text searching. See *Unstructured Data Analytics in Sybase IQ > SQL Statement Support > ALTER TEXT INDEX statement*.
CREATE DATABASE	Syntax has been enhanced to specify the user name for the single usable user ID with DBA authority created with a new database. See *Reference: Statements and Options > SQL Statements > CREATE DATABASE statement*.
CREATE TEXT CONFIGURATION	New statement to support full-text searching. See *Unstructured Data Analytics in Sybase IQ > SQL Statement Support > CREATE TEXT CONFIGURATION statement.*
CREATE PROCEDURE	New SQL SECURITY INVOKER | DEFINER clauses. These clauses are inherited from SQL Anywhere (see "Utility enhancements" on page 12). See *Reference: Statements and Options > SQL Statements > CREATE PROCEDURE statement.*
CREATE TEXT INDEX	New statement to support full-text searching. See *Unstructured Data Analytics in Sybase IQ> SQL Statement Support > CREATE TEXT INDEX statement.*
DROP TEXT CONFIGURATION	New statement to support full-text searching. See *Unstructured Data Analytics in Sybase IQ > SQL Statement Support > DROP TEXT CONFIGURATION statement*.
DROP TEXT INDEX	New statement to support full-text searching. See *Unstructured Data Analytics in Sybase IQ > SQL Statement Support > DROP TEXT INDEX statement*.
GRANT	New syntax to support granular authorities. See *Reference: Statements and Options > SQL Statements > GRANT statement*.
LOAD TABLE	BLOCK FACTOR, BLOCK SIZE, and UNLOAD FORMAT clauses have been deprecated.
REVOKE	New syntax to support granular authorities. See *Reference: Statements and Options > SQL Statements > REVOKE statement.*

SQL statement	Description of change
SELECT	New INTO TEMPORARY TABLE clause. This clause is inherited from SQL Anywhere (See "Utility enhancements" on page 12). See *Reference: Statements and Options > SQL Statements > SELECT statement*.

System procedure change

sp_iqpassword now returns a **Permission denied** error if a user without DBA/PERMS ADMIN authority tries to change another user's password.

Table 7 lists procedures that can now be executed by users with new authorities as an alternative to DBA authority.

Table 7: System procedure authority changes

System procedure	Authority
sa_get_user_status	DBA or USER ADMIN can view information about all users.
sp_addlogin	DBA or USER ADMIN.
sp_adduser	Creating a user requires DBA or USER ADMIN. Creating a user and also adding that user to an existing group requires both USER ADMIN and PERMS ADMIN authority.
sp_droplogin	DBA or USER ADMIN.
sp_dropuser	DBA or USER ADMIN.
sp_expireallpasswords	DBA or USER ADMIN.
sp_addgroup	DBA or PERMS ADMIN to change an existing user to group. Creating a new user and changing it to group requires DBA or both USER ADMIN and PERMS ADMIN authority.
sp_changegroup	DBA or PERMS ADMIN.
sp_dropgroup	DBA or PERMS ADMIN.
sp_password	Users with DBA or PERMS ADMIN can change another user's password.
sp_iqpassword	Users with DBA or PERMS ADMIN can change another user's password. A **Permission denied** error is returned if a user without DBA or PERMS ADMIN tries to change another user's password.

System tables and views changes

The ownership of SYSOPTIONSDEFAULTS system table has changed from dba to dbo. In applications, change all references from "dba.SYSOPTIONDEFAULTS" to "dbo.SYSOPTIONDEFAULTS."