Altibase®

New Features Guide

Release 7.1 (July 5, 2017)

ALTIBASE

Altibase® New Features Guide
Release 7.1

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Contents

1 New Features of Altibase Version 7.1.0.0.0

This chapter introduces new features available for Altibase version 7.1.0.0.0.

This chapter consists of the following sections:

1.1 Improved Features

1.1.1 Altibase Sharding

Altibase Sharding introduces Sharding technology in Altibase to improve the storage capacity and throughput per hour to distribute large volumes of database.

Altibase Sharding supports "server side sharding" and "client side sharding" simultaneously. You can choose client-side sharding as needed to improve the performance of your application, or you can choose server-side sharding to improve compatibility.

In particular, the client side sharding of Altibase Sharding can be applied by simply replacing the shard-only library without modifying existing application source code or existing SQL statements.

For further information, please refer to the following manual.

- *Altibase Sharding Guide*

1.1.2 SQL Extension

1.1.2.1 Conversion of Non-Partitioned table and Partitioned table(Partition Exchange)

CONJOIN TABLE: This statement controls converting a non-partitioned table into a partition of a table. The list partition and range partition are supported, but the hash partitioned is not supported. All the data created in the target table is transferred to the created partition.

DISJOIN TABLE: You can use this statement to convert a partition in a partitioned table into a non-partitioned table. The hash partition is not supported whereas the existing partition attributes of the non-partitioned table remain the same.

For further information, please refer to the following manual.

- *SQL Reference > Chapter 3. Data Definition Language> CONJOIN TABLE, DISJOIN TABLE*

1.1.2.2 Modifying Tablespace of Table

The tablespace storage of tables can transfer concurrently along with indexes and *LOB*

columns. However, only the record of tablespace specified by non-partitioned tables can transfer, and the record of the partitioned tables cannot be transferred.

Refer to the following manuals for in-depth information.

- *SQL Reference > Chapter 3. Data Definition Lauguagae > ALTER TABLE*
- *Getting Started Guide > Chapter 6.Database Replication > Executing DDL Statements in a Replication Environment*
- *Replication Manual > Chapter.3 Deploying Replication > Executing DDL Statement on Replication Target Tables*

1.1.2.3 User-defined Columns in a Queue

The user can define a column when creating a queue.

For further information, please refer to the following manuals.

- *SQL Reference > Chapter 3. Data Definition Language > CREATE QUEUE*

1.1.2.4 Syntax extension of COMPACT and AGING

COMPACT and AGING statements can be executed on a partitioned table by a partition unit.

Refer to the following manual for in-deth information.

- *SQL Reference > Chapter 3. Data Definition Language > ALTER TABLE*

1.1.2.5 NOWAIT and WAIT Options

NOWAIT and WAIT options has been supported in the INSERT, FOR UPDATE, and DEQUEUE statements. The time unit can be specified in the WAIT option is second(sec), millisecond(msec, 1/1000 sec), and microsecond (μsec, 1/1000000 sec).The second is applied unless otherwise specified.

For further information, please refer to the following manual.

- *SQL Reference > Chapter 3. Data Definition Language > INSERT, SELECT, DEQUEUE*

1.1.2.6 NOCOPY option

The NOCOPY is provided as an option for parameters and local variables in stored procedure and stored function to use call by reference method. It is only supported for

ASSOCIATIVE ARRAY type.

For further information, please refer to the following manual.

- *Stored Procedures Manual > Chapter 2. SQL Statements for Managing Stored Procedures*

1.1.2.7 Overloading of Package Subprogram

Overloading of package subprogram is supported. In other words, package subprograms can be defined with the same name if their parameters or data types are different.

For further information, please refer to the following manual.

- *Stored Procedures Manual > Chapter 13. Altibase Stored Packates*

1.1.2.8 Using BULK COLLECTION in FETCH syntax

BULK COLLECT INTO function is supported in the FETCH statement in stored procedure and stored function.

For further information, please refer to the following manual.

- *Stored Procedures Manual > Chapter 5. Using Cursors > FETCH*

1.1.2.9 Static SQL available for using Cursor

Not only the dynamic SQL is available, but the static SQL is also available for use in the *OPEN FOR clause*. Note that the *static SQL* cannot be executed with the *USING clause.*

For further information, please refer to the following manual.

- *Stored Procedures Manual > Chapter 8. Dynamic SQL > OPEN FOR*

1.1.2.10 Autonomous Transation and Exception Initializing Pragma

Autonomous Transaction(Autonomous_Transaction) pragma and Execption Initialization (Exception_Init Pragma) pragma are supported.

Autonomous_Transaction pragma enables a stored module like stored procedure, stored function, stored package to independentaly operate within a transaction. Exception_Init pragma initializes exception variables in a stored module with an Altibase error code.

For further information, please refer to the following manual.

- *Stored Procedures Manual > Chapter 10. Pragma*

1.1.2.11 Aggregate functions and Windows functions

Various functions such as, the percentage rank, ratio analysis functions, cumulative distribution of a group, array functions, sort functions, coefficient of correlation, sample covariance, and population distribution are supported in the aggregate functions and window functions as below;

- PERCENT_RANK
- CUME_DIST
- RATIO_TO_REPORT
- NTILE
- CORR
- COVAR_SAMP
- COVAR_POP

For further information, please refer to the following manual.

- *SQL Reference> Chapter 7. SQL Functions> Aggregate Functions*

1.1.2.12 User Lock functions

The following functions are supported in an attempt to request or release the user lock.

- USER_LOCK_REQUEST
- USER_LOCK_RELEASE

The added properties are as follows.

- USER_LOCK_POOL_INIT_SIZE
- USER_LOCK_REQUEST_CHECK_INTERVAL
- USER_REQUEST_LIMIT
- USER_LOCK_REQUEST_TIEMOUT

Refer to the following manual for in-depth information.

- *SQL Reference> Chapter 7. SQL Functions> Other Functions*

1.1.2.13 Other functions

The following function returns the context information of the current database session.

- SYS_CONTEXT

The functions returning the VARBYTE type character strings through encoding or decoding are supported as follows:

- BASE64_DECODE
- BASE64_ENCODE

Altibase supports functions which can return VARBAYTE type character strings either by decoding or encoding the VARBYTE type character strings that were converted to *Quoted printable format*. The functions include as follows:

- QUOTE_PRINTABLE_DECODE
- QUOTE_PRINTABLE_ENCODE

The following functions are provided to support the database-level message queue functionality. These functions do not belong to a specific schema :

- MSG_CREATE_QUEUE
- MSG_DROP_QUEUE
- MSG_SND_QUEUE
- MSG_RCV_QUEUE

For further information, please refer to the following manual.

- *SQL Reference> Chapter 7. SQL Functions> Other Functions*

1.1.2.14 'UNTIL NEXT DDL' in LOCK TABLE

With 'UNTIL NEXT DDL' specified in a NON-AUTOCOMMIT session, COMMIT will be automatically executed before DDL(Data Definition Language) execution. However, if EXCLUSIVE lock mode is specified in the session, COMMIT will not be executed automatically before the DDL execution.

For further information, please refer to the following manual.

- *SQL Reference> Chapter 4. Data Manipulation Language> LOCK TABLE*

1.1.2.15 ENABLE and DISABLE functions

A user can set ENABLE or DISABLE status when creating triggers. The use can change the status using ALTER TRIGGER.

For further information, please refer to the following manual.

- *SQL Reference> Chapter 3. Data Definition Language > CREATE TRIGGER*

1.1.2.16 Extension of COMPACT clause

The maximum size of page compression can be specified when using a query statement with ALTER TABLE table_name COMPACT.

Refer to the following manual for in-depth information.

- SQL Reference> Chapter 3. Data Definition Language > ALTER TABLE

1.1.2.17 TOUCH Statement

Using the TOUCH clause increases the SCN(System Commit Number) of the table, thereby forcing the optimizer to recreate the execution plan of the query containing the table.

Refer to the following manual for in-depth information.

- *SQL Reference> Chapter 3. Data Definition Language > ALTER TABLE*

1.1.2.18 Session Close

A user name can be specified with ALTER DATABASE statement to terminate a session, and all sessions can be terminated at once with ALL statement.

Refer to the following manual for in-depth information.

- *SQL Reference > Ch.3 Data Definition Language > ALTER DATABASE*

1.1.2.19 Newly Spatial Object Creation Functions

A spatial object creation functions are newly added as below.

- RECTFROMTEXT
- RECTFROMWKB

Refer to the following manual for in-depth information.

- *Spatial SQL Reference > Ch.2 Spatial SQL > Spatial Object Creation Functions*

1.1.3 Application Interface Improvement

1.1.3.1 JDBC Logging

JDBC Logging indicates recording of all sorts of logs occurring in the Altibase JDBC driver, and the relevant logs can be stored by using java.util.logging package.

For further information, please refer to the following manuals.

- *JDBC User's Manual > Chapter 3. Advanced Functions > JDBC Logging*

1.1.4 Data Types

1.1.4.1 Support for Date format

Altibase supports 'WW2' data format that returns which week of the year regardless of the date. It begins with the 1st of January and it is distinguished by 7 days unit. The last week is the 53th week.

And date types for Julian calendar and BC dates are newly added as below.

- SYYYY : mark the BC years
- SCC : mark the BC centurys

Refer to the following manuals for more details.

- *General Reference> Chapter 1. Data Type> Date Date Types*

1.1.5 Built-in Functions

1.1.5.1 DBMS Stats Functions

The built-in function has been added in this release, and this function can duplicate partition stats.

- COPY_TABLE_STATS

For further information, please refer to the following manual.

- *Stored Procedures Manual > Chapter 12. Altibase Stored Procedures and Built-in Functions > DBMS Stats*

1.1.5.2 Other Built-in Functions

These newly added stored procedures set V$SESSION information.

- SET_CLIENT_INFO
- SET_MODULE

For further information, please refer to the following manual.

- *Stored Procedures Manual > Chapter 12. Altibase Stored Procedures and Built-in Functions > DBMS Stats*

1.1.6 Client Tools

1.1.6.1 Improved altimon.sh

The altimon.sh has been enhanced in order to efficiently monitor the Altibase server and the host system in which the *altiMon* is installed. altiMon primarily monitors OS information and DB information. The operating system is required to have PICL library to gather the OS information.

In order to use altiMon, config.xml, Metrics.xml, and GroupMetrics.xml files located under the *$ALTIBASE_HOME/altiMon/conf* directory should be properly configured.

Refer to the following manual for in-depth information.

- *Utilities Manual > Chapter 4. Other Utilities > altimon.sh*

1.1.6.2 Host Variable

The default value of declared host variables has been modified.

For further information, please refer to the following manual.

- *iSQL User's Manual > Chapter 2. Examples of iSQL in Use > Host Variables > Declaring a Host Variables*

1.1.6.3 Substitution variable when using iSQL.

This tool helps parameters be input when executing a script file with the substitution variable by using *START* command in iSQL. *SET DEFINE ON* should be executed in order to use the substitution variables.

Refer to the following manuals for in-depth information.

- *iSQL Users' Manual> Chapter 1 Using iSQL> iSQL Commands*
- *iSQL User's Manual> Chapter 2 Examples of iSQL in Use. > File management*

1.1.6.4 New iSQL command

Commands for the display format of SELECT results in iSQL have been added.

- SET NUMF[ORMAT] : This command configures the display format of numeric data type.
- COLUMN : This command configures the display format for columns of character or numeric type.
- CL[EAR] COL[UMNS] : This removes all the columns configured by the COLUMN command.
- SET VERIFY: This command specifies whether or not to display SQL statements before and after replacing the substitution value with the parameter value inserted by a user when executing a script file containing substitution variables. The default value is set to ON and it signifies displaying SQL statements.

For further information, please refer to the following manuals.

- *iSQL User's Manual > Chapter 1. How to Use iSQL > iSQL Commands*
- *iSQL User's Manual > Chapter 2. iSQL Examples > Formatting SELECT Query Results*
- *iSQL User's Manual> Chapter 2. iSQL Examples > File Management > Running Scripts*

1.1.6.5 --prefetch_rows otpion of iLoader utility

iLoader utility newly supports -prefetch_rows option in the out mode. This specifies the number of records that can be fetched from the database at once. The default value is 0 which is the maximum size in which the network packet can be transferred.

For further information, please refer to the following manuals.

- *iLoader User's Manual > Chapter 2. Using iLoader > Command-line option*
- *iLoader User's Manual > Chapter 2. Using iLoader > General Option*

1.1.6.6 Partition Information Output

The DESC command allows to view partition information when viewing the table structure.

Refer to the following manuals for in-depth information.

- *iSQL User's Manual > Chapter 1. Using iSQL > iSQL Command-Line Option*
- *iSQL User's Manual > Chapter 2. Examples of iSQL in Use> Formatting SELECT query results*

1.1.6.7 aexport Property

The following properties of aexport utility have been added.

- ILOADER_ARRAY: This property specifies the number of rows which will be executed all at once when uploading or downloading data with iLoader.
- ILOADER_COMMIT: This property specifies the unit(number) to commit when uploading or downloading data with iLoader.
- ILOADER_ERRORS: This property specifies the maximum number of allowable errors when uploading data with iLoader.
- ILOADER_PARALLEL: This property specifies the number of concurrent threads which will be executed parallelly when uploading or downloading data with iLoader.

For further information, please refer to the following manuals.

- *Utilities Manual > Chapter 1. How to Use aexport> aexport properties*

1.1.6.8 dataCompJ

When replicating data from the Altibase database to a heterogeneous database, dataCompJ has been added as a utility to verify the data consistency and resolve the data inconsistencies.

Refer to the following manual for more information.

- *Utilities Manual > Chapter 3. dataComJ*

1.1.6.9 Asynchronous prefetch attributes

Asynchronous prefetch attributes are newly added as below.

- async_prefetch off| on| auto (off : default)
- ILOADER_ASYNC_PREFETCH = ON| OFF|AUTO

Refer to the following manual for more information.

- *Utilities Manual > Chapter 3. dataComJ*

1.2 Efficiency

1.2.1 Enhanced Server Performance

1.2.1.1 Newly Added Packages

The system-defined stored packages newly added in Altibase are as follows :

- DBMS_ALERT: The DBMS_ALERT package informs and provides an alert to other users with the support of an interface form in regards to various database events.
- DBMS_APPLICATION_INFO: The DBMS_APPLICATION_INFO package configures the performance view in order to manage information of clients' application.
- DBMS_CONCURRENT_EXEC: The procedure cannot be concurrently executed.
- DBMS_LOCK: The DBMS_LOCK package provides an interface for user to request lock/unlock.
- DBMS_OUTPUT: The DBMS_OUPUT allows a user to output a string stored in the buffer to clients.
- DBMS_RANDOM: The DBMS_RANDOM package creates random numbers.
- DBMS_SQL: The DBMS_SQL package provides procedures and functions to use dynamic SQL.
- DBMS_STATS: The DBMS_STATS package provides an Sub-programs to use various database statistical information.
- DBMS_RECYCLEBIN: The DBMS_RECYCLEBIN package can completely purge tables, which have been dropped and managed in the recycle bin, from the entire system.
- DBMS_UTILITY : The DBMS_UTILITY package provides various utility functions and procedures.
- UTL_FILE: The UTL_FILE package can access to text files, which are managed by the operating system, and read and write them.
- UTL_RAW: The UTL_RAW package can convert or alter RAW(VARBYTE) type data into a different data type.
- UTL_TCP: The UTL_TCP package controls TCP access in the stored procedure.

For in-depth contents and information on the package procedures and functions, please refer to the following manuals.

- *Stored Procedures Manual > Chapter13. Altibase Stored Packages*

1.2.1.2 Result Cache

By using the Result Cache, the intermediate result or the final result of initially executed query can be stored so that the results can be reused when executing the same query.

The following hints has been newly added.

- RESULT_CACHE
- TOP_RESULT_CACHE

The following properties in relation to the Result Cache have been added.

- RESULT_CACHE_ENABLE
- RESULT_CACHE_MEMORY_MAXIMUM
- TOP_RESULT_CACHE_MODE

For further information, please refer to the following manuals.

- *General Reference > Chapter 2. Altibase Properties> Performance Properties*
- *SQL Reference > Chapter 2. Altibase SQL Basics> Hint List*
- *Performance Tuning Guide > Chapter 6. SQL Hints> Types of Hints*
- *Performance Tuning Guide > Chapter 7. SQL Plan Cache > Result Cache-related Properties*

1.2.1.3 Two-Phase Commit(2PC)Level of DBLink

DB Link provides 2PC protocol to ensure interoperable compatibility of the global transaction conducted between other database system and the Altibase.

Altibase and remote database system perform the two-phase commit exchanging messages following the 2PC protocol after the DBLINK_GLOBAL_TRANSACTION_LEVEL property is set to the two-phase commit level.

The following properties have been added.

- DBLINK_RECOVERY_MAX_LOGFILE
- DBLINK_GLOBAL_TRANSACTION_LEVEL

The following performance views have been altered/added.

- V$DBLINK_NOTIFIER_TRANSACTION_INFO
- V$DBLINK_LINKER_DATA_SESSION_INFO
- V$DBLINK_GLOBAL_TRANSACTION_INFO
- V$DBLINK_REMOTE_STATEMENT_INFO
- V$DBLINK_REMOTE_TRANSACTION_INFO
- V$SESSION

For further information, please refer to the following manuals.

- *General Reference > Chapter 2. Altibase Properties > Performance Properties*
- *General Reference > Chapter 3. The Data Dictionary*
- *Database Link User's Manual > Chapter 1. Introduction to Database Link*
- *Database Link User's Manual > Chapter 3 Configuration of Database Link*
- *Database Link User's Manual > Chapter 4. Database Link-Related SQL Statments*

1.2.1.4 Automatic Database Statistics

Database statistics for query optimizer can be gathered automatically.

The following properties have been added.

- OPTIMIZER_AUTO_STATS

For further information, please refer to the following manuals.

- *General Reference > Chapter 2. Altibase Properties > Performance Properties*
- *Performance Tuning Guide > Chapter 5. The Optimizer and Statistics > Managing Statistics*

1.2.1.5 Additional Hints

In Altibase 7.1, various and advantageous hints, such as Normalization code, join methods, table access methods, and parallel query execution have been added.

The following properties have been added.

- INDEX_ASC
- INDEX_DESC

- LEADING
- NO_EXPAND
- NO_INDEX
- NO_PARALLEL
- NO_USE_HASH
- NO_USE_MERGE
- NO_USE_NL
- NO_USE_SORT
- USE_CONCAT

For further information, please refer to the following manuals.

- *Performance Tuning Guide > Chapter 6. SQL Hints > Types of Hints*
- *SQL Reference > Chapter 2. Altibase SQL Basics > Hint List*

1.2.1.6 Delay on Execution Plans

Query execution can be delayed until the first fetch is performed for hierarchy, sorting, windowing, grouping, set, and distinction queries. The user can check the added DELAY plan under the top PROJECTION in the execution plan.

The following property is newly included with regards to query execution delay.

- OPTIMIZER_DELAYED_EXECUTION

The property related to result cache property has been added as follows.

- NO DELAY
- DELAY

For further information, please refer to the following manual.

- *General Reference > Chapter 2. Altibase Properties > Performance-related Properties*
- *Performance Tuning Guide > Chapter 6. SQL Hints > Type of Hints*

1.2.1.7 IPCDA Protocol

IPCDA(Inter Process Communication Direct Attach) is a protocol provided by Altibase to exchange data between the server and client by using shared memory. IPCDA can produce much advanced performance by reducing idle time between the server and

client as well as simplifying data reading and writing.

CLI and OBDB is supported, but JDBC is not supported. Besides, LOB data cannot be used when using IPCDA. IPCDA is only supported on Linux. The following properties should be configured to use IPCDA.

The property related to IPCDA has been added as follows.

- IPCDA_CHANNEL_COUNT
- IPCDA_DATABLOCK_SIZE
- IPCDA_FILEPATH

For further information, please refer to the following manual.

- *Administration's Manual > Chapter 1. Introduction > Altibase Features*
- *Administration's Manual > Chapter 2. Altibase Components > trc Directory*
- *Administration's Manual >Chapter 12. Communication Layer > Communication Protocols*
- *General Reference > Chapter 2. Altibase Properties > Session Properties*
- *iSQL User's Manual > Chapter 1. Using iSQL > Setting Up iSQL*
- *iSQL User's Manual > Chapter 1. Using iSQL > iSQL Environment Variables*

1.2.1.8 ACCESS_LIST Management Extension

ACCESS_LIST_FILE property has been added to specify an external file to set access information for certain IP addresses. When it is specified, ACCESS_LIST in the altibase.properties file will be ignored.

Besides, the maximum number of the list which can be used is 2014, and only the contents should be written out omitting 'ACCESS_LIST='.

The added property is as follows.

- ACCESS_LIST_FILE

The added performance views is as follows.

- V$ACCESS_LIST

For further information, please refer to the following manual.

- *General Reference > Chapter 2. Altibase Properties > Other Properties*

- *General Reference > Chapter 3 Data Dictionary > V$ACCESS_LIST*
- *SQL Reference > Chapter 5. Data Control Language > ALTER SYSTEM*

1.2.1.9 support Buffer for minimizing the data loss of replication

Buffer is supported for minimizing the data loss of replication. When the network is shut down after saving a certain amount of xlog, apply the xlog stored in the buffer and terminated.

For further information, please refer to the following manual.

- *Replication Manual > Chapter 3. Deploying Replication > Extra Features*

1.2.2 Resource Efficiency

1.2.2.1 Reorganization of Memory Index

You can reorganizes the index space through integration of leaf nodes in memory index. This function ensures high space efficiency especially when the index range is relatively greater than that of the data, or there is an occurrence of index fragmentation on a particular index.

The following property has been added.

- MEM_INDEX_KEY_REDISTRIBUTION
- MEM_INDEX_KEY_REDISTRIBUTION_STANDARD_RATE

For further information, please refer to the following manual.

- *General Reference > Chapter 2. Altibase Properties > Performance-related Properties*
- *SQL Reference > Chapter 3. Data Definition Language > ALTER INDEX*

1.3 High Availability

1.3.1 Hybrid Partitioned Table

Hybrid partitioned tables are supported in Altibase 7.1, and the partitioned table can transfer data from disk tablespace to memory/volatile tablespace, and vice versa; however, global indexes are not supported.

For further information, please refer to the following manuals.

- *Administrator's Manual > Chapter 7. PartitionedObjects> Partitioned Objects, Partitioning Methods*
- *SQL Reference > Chapter 3. Data Definition Language > ALTER TABLE*
- *Replication Manual> Chapter 3. Deploying Replication> Executing DDL Statements on Replication Target Tables*
- *Getting Started Guide > Chapter 6. Database Replication > Executing DDL Statements in a Replication Environment*

1.3.2 Specifying the size of character data

Properties that can determine the size of character data type used in the stored procedures and the stored functions have been added as indicated below.

- PSM_CHAR_DEFAULT_PRECISION
- PSM_NCHAR_UTF8_DEFAULT_PRECISION
- PSM_NCHAR_UTF16_DEFAULT_PRECISION
- PSM_NVARCHAR_UTF8_DEFAULT_PRECISION
- PSM_NVARCHAR_UTF16_DEFAULT_PRECISION
- PSM_PARAM_AND_RETURN_WITHOUT_PRECISION_ENABLE
- PSM_VARCHAR_DEFAULT_PRECISION

The properties specifying the basic size of character type data have been removed as follows.

- CHAR_DEFAULT_PRECISION
- NCHAR_DEFAULT_PRECISION

- NVARCHAR_DEFAULT_PRECISION
- VARCHAR_DEFAULT_PRECISION

For further information, please refer to the following manuals.

- *General Reference> Chapter 1. Data Types> Character Data Types*
- *General Reference > Chapter 2. Altibase Properties > Other Properties*

1.3.3 REMOTE Functions for Batch Process

Remote function and the related functions have been added for the database links to execute batch queries. The functions can be used only within the stored procedures.

- IS_ARRAY_BOUND
- IS_FIRST_ARRAY_BOUND
- IS_LAST_ARRAY_BOUND
- REMOTE_ADD_BATCH
- REMOTE_ALLOC_STATEMENT_BATCH
- REMOTE_BIND_VARIABLE_BATCH
- REMOTE_EXECUTE_BATCH
- REMOTE_FREE_STATEMENT_BATCH
- REMOTE_GET_RESULT_COUNT_BATCH
- REMOTE_GET_RESULT_BATCH

For further information, please refer to the following manual.

- *Database Link User's Manual > Chapter 4. Database Link-Related SQL Statements*

1.3.4 Snapshot Backup

The snapshot backup is configured based upon at the point of time when BEGING SNAPSOT is executed, and data can be exported with iLoader standing on the pertaining SCN.

Only the DBA with SYSDBA privilege can set up or disable the snapshot.

The following properties have been newly added this time.

- SNAPSHOT_DISK_UNDO_THRESHOLD
- SNAPSHOT_MEM_THRESHOLD

The following performance view has been included.

- V$SNAPSHOT

For further information, please refer to the following manuals.

- *Admin > Chapter 10. Backup and Recovery > SNAPSHOT Backup*
- *SQL > Chapter 3. Data Definition Language > ALTER DATABASE*
- *General Reference > Chapter 2. Altibase Properties > Backup and Recovery Properties*
- *General Reference > Chapter 3. The Data Dictionary > Performance Views*

1.3.5 jdbcAdapter

jdbcAdapter is a utility that can apply changed data in Altibase to other JDBC supported databases.

It can be used with Altibase 6.3.1 or later, or with other databases using JDBC 4.1 or earlier. jdbcAdapter only supports the Linux operating system.

For further information, please refer to the following manuals.

- *Adapter for JDBC User's Manual*

1.4 Others

1.4.1 Other Changes

1.4.1.1 Unsupporting Window Platform

Server and client for Window are not supported since Altibase 7.1.

1.4.1.2 Table Function

The TABLE FUNCTION transforms associative array type or record type variables returning from user defined functions into a table format and output them;; however, this is not a function.

For further information, please refer to the following manual.

- *SQL Reference > Chapter 4. Data Manipulation Language > SELECT*

1.4.1.3 Dynamic SQL Method 4

Dynamic SQL Method 4 has been added in Altibase Precompiler. This method allows the user to set parameter markers at runtime when exeucting the program instead of when compiling it. Functions, such as BIND VARIABLES, SELECT LIST, and ARRAY SIZE SET have been added in 7.1 and OPEN, FETCH, and EXECUTE functions have been much improved.

For further information, please refer to the following manual.

- *Precompiler User's Manual > Chapter 10. Dynamic SQL Statments > Using Dynamic SQL Statements*

1.4.1.4 CLOSE Statement for Precompile Cursors

A cursor in the OPEN state can be re-opened without the CLOSE execution, which is identical to OPEN after executing CLOSE.

Refer to the following manual for more details.

- *Precompiler User's Manual > Ch.8 Using Cursors > Cursor-Related SQL Statements.*

1.4.1.5 Support for Hibernate

Hibernate dialect class is supported for Altibase to provide non-standard SQL. Since the official Hibernate library does not include AltibaseDialect.class, AltibaseDialect.java file should be compiled and ported in order to use.

Refer to the following manual and Altibase Github website for in-depth information.

- https://github.com/ALTIBASE/hibernate-orm
- *JDBC User's Manual > Chapter 3. Advanced Functions > Hibernate*

1.4.1.6 Support for JRE 1.5

JDK and JRE 1.5 or above is supported.

1.4.1.7 Elimination of DataPort

Data transferring function of DataPort, and convdp utility have been deleted and unfortunately no longer supported.

1.4.1.8 Eliminataion of altiAdapter

The functions of AltiAdpater are replaced with jdbcAdapter. The jdbcAdapter is newly supported since Altibase 7.1 version.

Refer to the following manuals for in-depth information.

- *Adapter for JDBC User's Manual*

1.4.1.9 Deprecation of Disaster Recovery

Disaster Recorvery is no longer supported since Altibase 7.1 version.

1.4.1.10 Deprecation of Shared Memory mode

Shared-memory mode is no longer supported since Altibase 7.1 version. The management tool supporting shared memory 'shmutil' and the following properties are not available for use anymore.

- SHM_DB_KEY
- SHM_PAGE_COUNT_PER_KEY
- STARTUP_SHM_CHUNK_SIZE

1.4.1.11 Asynchronous prefetch properties

Asynchronous prefetch properties are newly added in the CLI funtions as below.

- SQLDriveConnect
  : SOCK_RCVBUF_BLOCK_RATIO
- SQLGetConnectAttr
  : ALTIBASE_SOCK_RCVBUF_BLOCK_RATIO
- SQLSetConnectAttr
  : ALTIBASE_SOCK_RCVBUF_BLOCK_RATIO
- SQLSetStmtAttr
  : ALTIBASE_PREFETCH_ASYNC
  : ALTIBASE_PREFETCH_AUTO_TUNING

Asynchronous prefetch properties are newly added in the JDBC driver as below.

- sock_rcvbuf_block_ratio
- fetch_async
- fetch_auto_tuning

Refer to the following manuals for in-deth informaion

- *CLI User's Manual > 2. Altibase CLI functions*
- *JDBC User's Manual > 2. Altibase CLI functions*

1.4.1.12 Deprecation of Failover attributes

Failover related connection attributes are dropped as below.

- LoadBalance
- HealthCheckDuration

1.4.1.13 DB link property

A property which can specify JVM bit(32/64) in DB Link has been included as follows.

- ALTILINKER_JVM_BIT_DATA_MODEL_VALUE

1.4.2 Properties

1.4.2.1 New Properties

The following properties have been newly added in this release.

- ACCESS_LIST_FILE

- DBLINK_RECOVERY_MAX_LOGFILE
- IPCDA_CHANNEL_COUNT
- IPCDA_DATABLOCK_SIZE
- IPCDA_FILEPATH
- LOCK_MGR_CACHE_NODE
- LOCK_MGR_DETECTDEADLOCK_INTERVAL
- LOCK_MGR_MAX_SLEEP
- LOCK_MGR_MIN_SLEEP
- LOCK_MGR_SPIN_COUNT
- LOCK_MGR_TYPE
- LOCK_NODE_CACHE_COUNT
- MEM_INDEX_KEY_REDISTRIBUTION
- MEM_INDEX_KEY_REDISTRIBUTION_STANDARD_RATE
- MSG_QUEUE_PERMISSION
- OPTIMIZER_AUTO_STATS
- OPTIMIZER_DELAYED_EXECUTION
- OPTIMIZER_PERFORMANCE_VIEW
- PSM_CURSOR_OPEN_LIMIT
- PSM_CHAR_DEFAULT_PRECISION
- PSM_NCHAR_UTF8_DEFAULT_PRECISION
- PSM_NCHAR_UTF16_DEFAULT_PRECISION
- PSM_NVARCHAR_UTF8_DEFAULT_PRECISION
- PSM_NVARCHAR_UTF16_DEFAULT_PRECISION
- PSM_PARAM_AND_RETURN_WITHOUT_PRECISION_ENABLE
- PSM_VARCHAR_DEFAULT_PRECISION
- RESULT_CACHE_ENABLE
- RESULT_CACHE_MEMORY_MAXIMUM
- SNAPSHOT_DISK_UNDO_THRESHOLD
- SNAPSHOT_MEM_THRESHOLD
- TABLE_LOCK_MODE
- TOP_RESULT_CACHE_MODE

- USER_LOCK_POOL_INIT_SIZE
- USER_LOCK_REQUEST_CHECK_INTERVAL
- USER_LOCK_REQUEST_LIMIT
- USER_LOCK_REQUEST_TIMEOUT

1.4.2.2 Dropped or Changed Properties

The following properties has been dropped.

- AUTODETECT_UNIQ_INX
- CHAR_DEFAULT_PRECISION
- DATAPORT_FILE_DIRECTORY
- DATAPORT_IMPORT_COMMIT_UNIT
- DATAPORT_IMPORT_STATEMENT_UNIT
- IPC_PORT_NO
- NCHAR_DEFAULT_PRECISION
- NVARCHAR_DEFAULT_PRECISION
- SHM_DB_KEY
- SHM_PAGE_COUNT_PER_KEY
- STARTUP_SHM_CHUNK_SIZE
- VARCHAR_DEFAULT_PRECISION

The following properties has been changed.

- DEFALUT_THREAD_STACK_SIZE
  : 1048576 --> 3145728 (Byte)
- REPLICATION_LOG_BUFFER_SIZE
  : 30 --> 0(MB)
- REPLICATION_PREFETCH_LOGFILE_COUNT
  : 0 --> 3
- OPTIMIZER_AUTO_STATS
  : 2-->0 (not collect the statistics info)

1.4.3 Meta Tables

The following meta tables have been dropped.

- SYS_DATA_PORTS_

1.4.4 Performance Views

The following performance views have been added.

- V$ACCESS_LIST
- V$DBLINK_NOTIFIER_TRANSACTION_INFO
- V$RESERVED_WORDS
- V$SNAPSHOT

The following performance views have been altered.

- V$DBLINK_LINKER_DATA_SESSION_INFO
- V$DBLINK_GLOBAL_TRANSACTION_INFO
- V$DBLINK_REMOTE_STATEMENT_INFO
- V$DBLINK_REMOTE_TRANSACTION_INFO
- V$MUTEX: Add column THREAD_ID
- V$REPSENDER
- V$REPSENDER_PARALLEL
- V$SESSION
- V$TRANSACTION : Add column ISOLATION_LEVEL to indicate the isolation level of the transaction

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