

Retek[®] Extract Transform and Load[™] 11.2

Release Notes

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- Detailed step-by-step instructions to recreate.
- Exact error message received.
- Screen shots of each step you take.

Overview

The RETL 11.2 product release includes significant improvements that enhance the product's configuration management, operations, performance and translation support.

It is strongly recommended that before any installation or development work is performed, that the RETL 11.1 Programmer's Guide, provided with the release, is read cover to cover. In particular, read and understand Chapter 2 and the 'Upgrade From A Previous Versions Of RETL'/'Backwards Compatibility Notes' section, and the 'Known Issues' section of the Release Notes. Additionally, product groups should take care to extensively complete all certifications and regression/volume testing with RETL 11 versions before deployment to customer sites.

Clients that took delivery of the RETL 11.1 release, prior releases and/or subsequent patch releases, are strongly encouraged to upgrade to the RETL 11.2 release once a full regression test has been performed. Issues identified in 11 releases and prior releases will be resolved with enhancements and fixes being delivered through RETL 11 patch releases. No additional releases of RETL 10.x are planned.

This upgrade is recommended to take advantage of several improvements:

- Partitioning/Sizing implementation - The concept of partitioning is to parallelize as much as possible, which in RETL, ideally results in a flow uninhibited by bottlenecks. The goal is to code flows so that they can be partitioned to perform within a customer's batch window.
- Major Performance Enhancements
 - RETL 11 releases include a new architecture that optimizes pipeline parallelism by consolidating connected operators into the same pipeline where possible. This reduces the number of threads required, minimizing context switching and thrashing among threads, and thereby allowing a framework that supports improved performance.
 - Enhanced funnel algorithm results in significant speed increases for flows that contain the funnel operator.
 - Internal types are now represented in native byte format, which saves space and results in increased performance from not having to convert to strings/etc.
 - Increased performance when handling rejects from the import operator. Users can now turn off 'verbosity' of printing rejects to the screen, which can result in vast improvements to RETL modules that reject records in import.
 - Significant improvements to performance in oraread and in the implementation of datasets that connect operators.
- Error handling
 - RETL 11 releases introduce better flow debugging by giving line and column specific error messages when RETL encounters problems reading an XML flow definition. Additionally, there is exception handling in RETL 11 that allows for better error handling and debugging.
 - Configuration of error threshold in orawrite. RETL can be configured to abort when reaching the maximum # of rejected records from sql*loader.
 - Overall improved error messages vs 11.1 and 10.x versions.

- Debugging and Logging
 - RETL Visual flow graphs. Beginning with RETL 11.2, a command-line option can be used to generate a visual graph of a RETL flow, complete with operator names, link names, and thread identifications. See the RETL Programmer's Guide for more info.
 - Enhanced performance logging. RETL 11.2 will now log significant events such as query execution, sorting via gsort, loading data via native database load utilities (e.g. sql*loader), and more.
 - Performance hotspots/bottleneck graph. RETL will now export an HTML graph of performance activity. This graph uses visual cues to point out bottlenecks in the flow so that flow developers, performance analysts, and services consultants can diagnose the cause of slow-performing flows.
- New Operators
 - Expression operator. Business logic can be coded in a java-like code scriptlet, which eliminates proliferation of too many operators, improves performance by reducing the # of operators (e.g. fieldmod, generator, binop), reduces maintenance costs by decreasing complexity of flows, and aids in a better sizeability when partitioning flows
 - Dblookup operator. Allows the flow to join records directly to a table in the database.
 - Change capture lookup operator. Identical in functionality to change capture, but can take unsorted input, which lends itself to better partitioning and sizing.
 - Splitter operator. A round-robin-based partitioning operator that allows equal distribution of records to each partition.
- Stability - 200+ bugs have been fixed since 11.1
- Certifications
 - Databases: DB2 v7, DB2 v8
 - O/S: AIX 5.2, Solaris 9
- Documentation
 - Much-improved Programmer's Guide
 - Performance Tuning Guide
 - Best Practices Guide
- Online Help - A command-line option has been added to RETL 11 releases that allows flow developers to view operator syntax and usage via the command-line without having to refer to this document.
- Simplified installation and configuration - RETL 11 releases consolidate code into a single binary rather than the 26 binaries of 10.x release. This considerably eases installation. In addition, there is less environment setup that needs to be done in order to complete an installation.

- True Platform Independence - The new architecture of the RETL 11 releases has been written entirely in Java. As a result, RETL may now run on platforms that previously would have required significant efforts to port to. See the Programmer's Guide and the Compatibility Matrix for supported platforms. As a direct result of the platform independence, significant RETL resources in platform maintenance will be freed up to develop new features going forward.
- True Database Independence - With the RETL 11 releases, generic 'dbread'/'dbwrite' operators have been introduced. These operators use JDBC-compliant technology to connect to databases in a truly database-independent manner. Additionally, previous 10.x releases were unable to connect to different database types in the same flow. RETL 11 releases allow full interoperability among different databases in the same flow (e.g. among db2, oracle, teradata all in the same flow). See the programmer's guide for more information on this topic
- Backwards compatibility with previous releases - A requirement of RETL 11 versions is that they be backwardly-compatible with the 10.x versions. However, RETL 11 versions are more strict on enforcement of valid XML flow interfaces, input schemas, and data fields. In some instances, the RETL 11 product will find data and/or flow errors that may have previously been unreported. The result may be more discarded or rejected records and/or error messages than previously identified.

Compatibility Matrix

The following represents OS/Database combinations that are supported and have been certified to work properly :

OS	Version	Arch	DB	Version
AIX	5.1	32/64	none	none
AIX	5.1	64	Oracle	9.2
AIX	5.1	64	DB2	7.2.3
AIX	5.1	64	DB2	8.1.3
AIX	5.2	32/64	none	none
AIX	5.2	64	Oracle	9.2
AIX	5.2	64	DB2	7.2.3
AIX	5.2	64	DB2	8.1.3
HP-UX	11.11	32/64	none	none
HP-UX	11.11	64	Oracle	9.2
HP-UX	11.11	64	Oracle	9.0.1
HP-UX	11.11	32	Oracle	8.1.7
HP-UX	11.11	32	Tera	2r4.2
Solaris	8	32/64	none	none
Solaris	8	64	Oracle	9.2
Solaris	8	32/64	Oracle	9.0.1

OS	Version	Arch	DB	Version
Solaris	8	32	Oracle	8.1.7
Solaris	8	32	Tera	2r4.2
Solaris	8	32	DB2	7.2.3
Solaris	8	32	DB2	8.1.3
Solaris	9	32/64	none	none
Solaris	9	9	Oracle	9.2
Solaris	9	32/64	Oracle	9.0.1
Solaris	9	32	Oracle	8.1.7
Solaris	9	32	Tera	2r4.2
Solaris	9	32	DB2	7.2.3
Solaris	9	64	DB2	8.1.3



Note: RETL 11 only requires one binary and installation for all database/platform combinations listed above.

Installation

You may download from "<http://mspdev25:8080/retl/>". This release package contains everything needed for all platforms/databases.

You can check the contents of the package and verify that it is valid by executing the following command:

```
gunzip -c <package.tar.gz> | tar -tf -
```

To extract the package use the following command:

```
gunzip -c <package.tar.gz> | tar -xf -
```

This will create the directory and the package contents (see below).

Package Contents

The following is a brief description of the contents of retl.11.2.tar.gz:

bin/

Includes executables required for running retl on different platforms.

File	Description
gsort.SunOS	gsort for SunOS
gsort.HP-UX	gsort for HP-UX
gsort.AIX	gsort for AIX
retl	RETL executable
rfx	Symbolic link to retl provided for backwards compatibility
verify_ret1	The RETL verification tool
README.verify_ret1	The README for verify_ret1



Note: There is only one binary (retl/rfx) required for all database and platform combinations

lib/

These are jar files that are needed in order to run retl.

File	Description
retl.jar	RETL runtime library
ojdbc14.jar	Oracle JDBC driver
teradata.jar	NCR TeraData JDBC driver
xercesImpl.jar	Xerces XML Parser
xml-apis.jar	XML APIs
xmlParserAPIs.jar	XML APIs

docs/

This directory contains the documentation associated with RETL.

File	Description
ReleaseNotes.txt	This file.

etc/

This directory contains the documentation associated with RETL.

File	Description
rfl.conf	The default retl configuration file.

samples/

This directory contains the samples packaged with RETL. See the README in the samples/ directory for more information about the samples packaged with RETL. These are the samples that are run after the install, by `verify_retl`

Known Issues

General Known Issues

- The RETL does not handle arbitrary precision math.
- The export operator will default to use '|' delimited fields if there isn't a 'schemafilename' property specified. This can cause problems if the incoming data contains the '|' character. The recommendation is to use an export schemafilename if it is possible for data to contain a '|' character.
- Join operators may use a large amount of memory when the distribution of key-equivalent records is low and the number of records is high. It is important to test join operations with appropriate data volumes on each input side to verify the maximum amount of memory your application may require.

Differences between 10.x and 11.x versions of RETL

- RETL 11 versions are more strict on enforcement of valid XML flow interfaces, input schemas, and data fields. In some instances, the RETL 11 product will find data and/or flow errors that may have previously been unreported. The result may be more discarded or rejected records and/or error messages than previously identified.
- An unintended feature of 10.x allowed input datafiles to contain more fields than are specified in the schemafilename. RETL 11 does not allow more fields to exist in the datafile and will throw an exception should this happen. This is logged as bug#632 and will be fixed in a future version of RETL 11
- Output field order between 10.x and 11.x may be different for those flows that don't specify a 'schemafilename' property in the export operator.
- RETL 11.x versions require additional properties for dbread/dbwrite operators. 'hostname' and 'port' are now required properties and may be specified in rfx.conf for convenience. See the programmer's guide for more information on syntax and usage.
- When upgrading an oracle database, a separate instance of RETL should be used in order to test the new database. This is because only one port can be specified in rfx.conf at a time. The other option is to use RETL with the '-c' option to use a different config file. See the programmer's guide for more info.
- RETL 11.x versions may require more physical memory for certain flows than 10.x releases.

Backwards-Compatibility Issues with 10.x versions

- It is not recommended to upgrade to RETL 11 unless the product using RETL has been certified on RETL 11.

Known bugs in RETL 11.2

Changes since RETL 11.1

- See 'new features' section above for any new enhancements in the 11.2 release
- Fixes Bug#407 - In framework we treat all int and uint type as long in Java version
- Fixes Bug#421 - rejected records get printed to the screen which can produce too much output
- Fixes Bug#441 - Support for properly-formatted precision in dfloat/sfloat
- Fixes Bug#445 - parallel file reads
- Fixes Bug#461 - Include Specific Error in Import Rejects
- Fixes Bug#464 - determine if we really need hostname/port for oraread/write
- Fixes Bug#484 - Need Build Information Option
- Fixes Bug#488 - Better exception handling in Operator base class
- Fixes Bug#493 - Record Key Hash Non-Unique with Multiple Key Fields
- Fixes Bug#499 - Import Doesn't Use nullvalue Property to Detect Null Values
- Fixes Bug#503 - Fixed Width of Zero Not Allowed
- Fixes Bug#507 - Schema.parseKeyFields(...) should be more robust
- Fixes Bug#508 - Number Format is not Standardized on Export
- Fixes Bug#510 - userid/password properties don't exist for db2read/teraferead operators
- Fixes Bug#515 - jdbcwrite should set proper type in constructor
- Fixes Bug#516 - Implement native load mechanisms for orawrite in 11.x versions
- Fixes Bug#517 - Implement native load mechanisms for terawrite in 11.x versions
- Fixes Bug#522 - generator doesn't implement partnum_offset or partcount_incr
- Fixes Bug#532 - final_delimiter not Implemented
- Fixes Bug#534 - Missing len From Fixed Schema File Causes Delimited Export
- Fixes Bug#541 - Incorrect Handling of Too Few Fields in Import
- Fixes Bug#543 - Multiple Use of Same Dataset as Input Throws Null Pointer Exception
- Fixes Bug#547 - JDBCWrite Should Check Schema Owner
- Fixes Bug#548 - port is not configurable for teradata (terawrite)
- Fixes Bug#553 - checks if there is sqldr
- Fixes Bug#555 - Strip Schema Attribute Not Handled
- Fixes Bug#557 - fieldmod doesn't check if fieldnames actually exist in incoming dataset
- Fixes Bug#558 - createtablemode should only allow recreate/create

- Fixes Bug#561 - RETL doesn't abort gracefully if dbwrite password not specified
- Fixes Bug#564 - should modify maxsize if database column maxsize < field maxsize
- Fixes Bug#572 - Merge jdbcread methods with DatabaseUtils and ColumnInfo
- Fixes Bug#574 - logical error in changecapture
- Fixes Bug#579 - Fatal error trapping when using SQL-loader
- Fixes Bug#606 - Handling environment problems with retl executable/library
- Fixes Bug#610 - In the fixed import, we should check if the total len of the record equals sum of the len of fields
- Fixes Bug#632 - Incorrect Handling of Too Many Fields in Import
- Fixes Bug#635 - Generator Doesn't Create Null Values Same as 10.x
- Fixes Bug#641 - Generator Sequence Doesn't Respect Destination Field Datatype
- Fixes Bug#643 - Convert Can't Handle Duplicate Source Fields in One CONVERTSPEC
- Fixes Bug#647 - Reject File Incorrect Format
- Fixes Bug#648 - Incorrect Contents of Reject File
- Fixes Bug#675 - Sort of Generated String Fails on Re-Import
- Fixes Bug#678 - Multibyte Fixed Width Export Incorrect/Slow
- Fixes Bug#685 - funnel shouldn't be waiting when there is not data in any one of inputs
- Fixes Bug#686 - Dataset should check with deadlock listener always even though the dataset has been expanded.
- Fixes Bug#694 - Non-UTF Encodings Cause Exception in Import
- Fixes Bug#696 - 11.x can break the output schemafilename definition
- Fixes Bug#698 - sortfunnel outputs wrong data --- logical problem
- Fixes Bug#700 - Generator Sequence Doesn't Work With Doubles
- Fixes Bug#701 - Binop Incorrect When Destination Field is a Source Field
- Fixes Bug#703 - Improved performance when handling errors
- Fixes Bug#705 - Performance bottlenecks in orawrite.getRecordStringBuffer(...)
- Fixes Bug#708 - Performance Improvement in jdbcread
- Fixes Bug#709 - Performance Degredation in jdbcread Due to String Comparison
- Fixes Bug#710 - sort doesn't handle non-existent 'key' gracefully
- Fixes Bug#713 - changecapture Codes Incorrect in Documentation
- Fixes Bug#714 - Error message bad when null value is in non-null field
- Fixes Bug#716 - Delimiter Property of Sort Not Working Correctly
- Fixes Bug#718 - NullPointerException in Lookup
- Fixes Bug#719 - rightouterjoin Invalid Schema

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- Fixes Bug#721 - Import of Multi-Byte Fixed-Width Files Fails
- Fixes Bug#722 - ConvertByteToBytes Incorrect
- Fixes Bug#723 - LONGVARCHAR Only Partially Supported
- Fixes Bug#724 - cannot handle "select NULL something from test_jdbc"
- Fixes Bug#725 - Generator Backwards Compatibility Issue with Field Length
- Fixes Bug#726 - ArrayIndexOutOfBoundsException when Missing Field Type in Schema
- Fixes Bug#727 - NullPointerException when numloader > 1 and RFX_SHOW_SQL=1
- Fixes Bug#728 - I18N and Fixed Width Incorrect
- Fixes Bug#729 - The dataset hang when generaor-->noop with independent thread with very small buffersize and huge data
- Fixes Bug#734 - NullPointerException when Paging
- Fixes Bug#736 - ArrayOutOfBounds in export
- Fixes Bug#737 - Rejects File Not Flushed When Exiting Due To Too Many Rejects
- Fixes Bug#738 - parallel orawrite doesn't alternate TEMPDIRs
- Fixes Bug#739 - tempdir property should override setting in rfx.conf
- Fixes Bug#740 - intra-operator parallelism properties should have standard names
- Fixes Bug#743 - temporary directories should be checked
- Fixes Bug#745 - Schema Assembler Should Ensure Field Delimiter != Record Delimiter
- Fixes Bug#746 - Orawrite Should Ensure Output Delimiter != Record Delimiter
- Fixes Bug#747 - orawrite cannot handle preload and postload for stored procedure
- Fixes Bug#748 - Convoluted Error Output When Setting Properties
- Fixes Bug#749 - Issue Warning Instead of Error for Unrecognized Properties
- Fixes Bug#751 - Combine DataSet, SDataSet, DataSet_Simple, and DataSet_RawBytes
- Fixes Bug#752 - add --graphviz-files
- Fixes Bug#753 - sp_prequery should be executed BEFORE the query
- Fixes Bug#754 - heterogeneous output schemas
- Fixes Bug#756 - Add 64bit JVM support in RETL 11
- Fixes Bug#757 - Convert doesn't handle TYPEPROPERTY properly
- Fixes Bug#758 - Int32/Int64 Field type rollover
- Fixes Bug#760 - Binop odd division rounding error
- Fixes Bug#761 - Lookup Returns False Matches
- Fixes Bug#762 - Unsigned Integer issues
- Fixes Bug#764 - NumberUtils.ConvertIntToBytes Poor Algorithm

- Fixes Bug#769 - Sort Failure on Date without Century
- Fixes Bug#771 - Sort Isn't Removing Temporary Files
- Fixes Bug#772 - RETL 11.x Doesn't Support Partitioning
- Fixes Bug#774 - Lookup ArrayIndexOutOfBoundsException with Multiple Lookup Tables
- Fixes Bug#776 - Out of Memory Exception Should Abort Flow
- Fixes Bug#779 - FieldMod Loses SortKeys
- Fixes Bug#780 - Schema Assembler Sets Sort Keys Incorrectly
- Fixes Bug#782 - Default Value for Properties Not Set for Join
- Fixes Bug#784 - graphviz cleanup
- Fixes Bug#786 - Should error when record len != sum(field lens) in schemafile
- Fixes Bug#788 - Forwards compatibility for operator properties
- Fixes Bug#790 - Join with database operator
- Fixes Bug#791 - GroupBy Requires reduce Property before Min, Max, ... Fields
- Fixes Bug#792 - Verify retl.jar during retl startup
- Fixes Bug#793 - Verify retl.jar during retl startup
- Fixes Bug#796 - enhanced performance logging
- Fixes Bug#799 - Deadlock Detection not Working for Pipelines with More than Two Outputs
- Fixes Bug#800 - Occasional Errors when Paging
- Fixes Bug#801 - Paging May Result in Too Many Files Open
- Fixes Bug#802 - DataSet Paging Files May Not Be Created
- Fixes Bug#803 - Unneeded check for duplicate tables in existence
- Fixes Bug#811 - leftouterjoin Doesn't Support Spaces in nullvalue Property
- Fixes Bug#812 - fieldmod blows away sorted order
- Fixes Bug#813 - rightouterjoin Invalid Sort Order
- Fixes Bug#816 - Record.Join uses incorrect calculation to get # of fields
- Fixes Bug#818 - Poor Message Displayed when Output Record breaks Schema
- Fixes Bug#821 - Delimited Import Strips Trailing Whitespace in 11 But Not in 10
- Fixes Bug#822 - Package debug/non-optimized version of retl.jar
- Fixes Bug#823 - Programmer's Guide Description of ifnotfound Property is Incorrect
- Fixes Bug#824 - Improve logging information with flow name
- Fixes Bug#825 - Paths in retl Script Get Fouled up on Windows
- Fixes Bug#826 - Add 'loader_options' parameter to orawrite
- Fixes Bug#829 - Maxlength of 0 Messes up Orawrite

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- Fixes Bug#830 - slsildmdm runs faster in 10.x than 11.x
- Fixes Bug#832 - Incorrect Null in Fullouterjoin
- Fixes Bug#833 - Error in Double to Byte
- Fixes Bug#834 - dotty files removed with -g option
- Fixes Bug#835 - need specific error message in oraread query
- Fixes Bug#836 - Missed Record in Multi-Threaded Import
- Fixes Bug#838 - Stack Overflow in Generator if limit < init
- Fixes Bug#839 - Copy Doesn't Perform Deep Enough Copy
- Fixes Bug#841 - dfloat fields can break fixed output schema
- Fixes Bug#842 - Lookup Table Loading is Dependant on Data Record Production
- Fixes Bug#843 - assertion is fired in allocation size_profile script
- Fixes Bug#845 - Assertion in Parser_ByteSequence.readFixedField in Allocation size_profile
- Fixes Bug#847 - Pipeline Initialization and Schema Resolution is Serial
- Fixes Bug#848 - ArrayIndexOutOfBoundsException when 1 INPUT Provided to lookup
- Fixes Bug#852 - Operator jdbcwrite Needs parallel Property
- Fixes Bug#853 - Check for WHERE in dblookup select_sql Property Incorrect
- Fixes Bug#854 - Partitioned Orawrite Runs preload and postload for each Partition
- Fixes Bug#855 - db2write deletes log files even after a fatal error
- Fixes Bug#859 - Monitor Method of Funnel Doesn't Work for Empty Datasets
- Fixes Bug#860 - 4 RETL Instances Much Quicker than 4 Orareads
- Fixes Bug#862 - Adding batched funnel algorithms causes dataset._pblock to be null
- Fixes Bug#864 - should print a warning if orawrite can't be partitioned
- Fixes Bug#867 - verboserejects should be a visible property in import
- Fixes Bug#868 - retl doesn't print any warning if rejects + verboserejects=false
- Fixes Bug#869 - Errors not caught in DatabaseUtils.Connect()
- Fixes Bug#871 - ImportRejectSupporter throws an error on processing rejected records
- Fixes Bug#872 - Multiple-query JDBCRead is slower than Multiple JDBCReads
- Fixes Bug#873 - jdbcread needs to partition
- Fixes Bug#874 - Import partitioning doesn't calculate number of partitions correctly
- Fixes Bug#875 - Import partitioning doesn't need to end thread
- Fixes Bug#877 - verify_retl chokes on space between -d and databse type
- Fixes Bug#881 - Schema compatibility checking in export is too strict
- Fixes Bug#883 - Partitioning fails in aipt_future_delivery

- Fixes Bug#887 - Execute jdbcread subthreads in parallel
- Fixes Bug#888 - Dataset-less Funnel
- Fixes Bug#889 - Check for retl.jar in rel script doesn't check RETL_DIST_LIB variable
- Fixes Bug#890 - Funnel should have 11.1 algorithm in 11.2
- Fixes Bug#891 - Generated HTML for graphs contains incorrect message about dotted file
- Fixes Bug#892 - Funnel should drop sort order
- Fixes Bug#895 - Add create_options property to orawrite
- Fixes Bug#901 - Include 1.4.1 AIX JRE in package rather than 1.4.0
- Fixes Bug#903 - Inlining lookup may improve performance
- Fixes Bug#904 - Splitter needs to end thread when partitioning
- Fixes Bug#907 - Non-deterministic output if debugging is set on
- Fixes Bug#910 - Incorrect schema resolution for fullouterjoin
- Fixes Bug#911 - Binop produces incorrect field type when multiplying int by dfloat
- Fixes Bug#912 - NullPointerException in binop when left or constleft not specified
- Fixes Bug#913 - Conflicting versions of rfx.conf num partitions and -n option do not seem to resolve properly
- Fixes Bug#919 - Import partitioning doesn't work with multiple files
- Fixes Bug#920 - Poor error message when nullable missing in import schemafile
- Fixes Bug#921 - Hash partitioning after splitter uses incorrect dimensions
- Fixes Bug#922 - Import - Multi-Threaded imports are losing records
- Fixes Bug#923 - Export should partition
- Fixes Bug#924 - FileUtils concatenation() errors when output file doesn't exist yet
- Fixes Bug#925 - Misleading error message "record was too long" in import
- Fixes Bug#927 - Changelogcapture algorithm doesn't allow for partitioned imports
- Fixes Bug#929 - install_jre fails on some servers
- Fixes Bug#930 - Cannot override default logger file from config file
- Fixes Bug#931 - Log file should be in temp directory if directory not specified
- Fixes Bug#932 - Unable to write to log file
- Fixes Bug#935 - changecapturelookup interferes with lookup's tablekeys property

Changes since RETL 11.0

- Implements native database load utilities for orawrite and terawrite
 - orawrite - implements sql*loader
 - terawrite - implements mload/fastload
- Adds increased parallelism & configurability for the orawrite operator
 - properties NUMLOADER, ROWS, SINGLEROW, SORTEDINDEXES have been added. See the Programmer's Guide for more information on syntax usage
- Fixes Bug#396 - generator doesn't handle delimiter when defining fields
- Fixes Bug#406 - changing input on jdbcwrite will cause errors
- Fixes Bug#426 - give better error message when connecting to database fails
- Fixes Bug#465 - Sort Occasionally Hangs.
- Fixes Bug#496 - Merge backward bug
- Fixes Bug#525 - Generator Appends Fields at End Instead of at Beginning
- Fixes Bug#529 - Export File Format Inconsistency with 10.x
- Fixes Bug#530 - Import Inconsistency with 10.x with Trimming Whitespace
- Fixes Bug#531 - Assignment of Null Value to a Non-Nullable Field
- Fixes Bug#539 - Blanks Not Allowed for Null Dates
- Fixes Bug#545 - Exception when writing to table with more columns than input
- Fixes Bug#546 - Filter errors on checking IS_NULL for non-nullable fields
- Fixes Bug#552 - Logger level 2 is broken
- Fixes Bug#556 - outerjoin doesn't rename incoming duplicate fields correctly
- Fixes Bug#559 - Allow configurability of orawrite parameters
- Fixes Bug#567 - "Migrate jdbcwrite, orawrite, terawrite to use common jdbc utilities"
- Fixes Bug#568 - RDW flow slsildmex produces incorrect data
- Fixes Bug#569 - 10.x versions write latest duplicated column to db but 11.x
- Fixes Bug#570 - Funnel Does Not Allow for Equivalent Schemas
- Fixes Bug#571 - Bug in AreColumnInfosCompatible
- Fixes Bug#575 - backwards compatibility problem when truncating existing table
- Fixes Bug#576 - Binop Doesn't Set Max Length of New Fields
- Fixes Bug#577 - Orawrite writes out multiple NULLIF statements to the sql*loader
- Fixes Bug#578 - Binop Doesn't Handle -1 Left Hand Side Constants
- Fixes Bug#581 - Problems with New Fields Generated by Binop
- Fixes Bug#582 - columnInfo doesn't get populated for orawrite/jdbcwrite

- Fixes Bug#584 - Number * Null Gives Exception
- Fixes Bug#585 - First Record Containing Null Field Causes NullPointerException
- Fixes Bug#586 - Null Exception in Filter
- Fixes Bug#587 - Import Error in slsildmex
- Fixes Bug#589 - Convert Doesn't Handle Multiple CONVERTFUNCTION
- Fixes Bug#590 - orawrite doesn't drop data from INFILE
- Fixes Bug#592 - orawrite control file len is off by one
- Fixes Bug#593 - 'len' in orawrite control file should be based on actual field
- Fixes Bug#594 - changecapture incorrectly drops fields in certain cases
- Fixes Bug#596 - There are new line in value of orawrite tablename property in RDW flow
- Fixes Bug#597 - CompareDifferentSchemas fails comparing records with null fields
- Fixes Bug#600 - leftouterjoin Drops Record(s)
- Fixes Bug#602 - Dataset should generate unique temp file.
- Fixes Bug#603 - sortfunnel doesn't work if the field order is different in input schemas
- Fixes Bug#604 - more problems with column->field mappings in orawrite
- Fixes Bug#607 - error when re-importing from a sort
- Fixes Bug#608 - Backwards-compatibility problem in groupby
- Fixes Bug#627 - Numeric Database Type Not Converted to RETL Type Correctly
- Fixes Bug#629 - Bug in checking actual RETL types
- Fixes Bug#630 - sortfunnel should use schema/fields from LHS
- Fixes Bug#631 - orawrite doesn't handle null fields
- Fixes Bug#633 - 10.x funnel allows conversion nullable->non-nullable
- Fixes Bug#634 - Regression introduced in checkin to bug#589
- Fixes Bug#637 - "leftoutjoin , rightoutjoin, and fulloutjoin have to change output schema the nullable=false to true if the null will be set to the field."
- Fixes Bug#644 - Binop Destination Field Nullability Incorrect
- Fixes Bug#645 - orawrite does an unnecessary delete when truncating table
- Fixes Bug#650 - thread corruption of date/time/ts fields
- Fixes Bug#653 - Sort Not Working in slsmkdnildex.ksh
- Fixes Bug#654 - string cache for numeric fields can be invalid
- Fixes Bug#656 - binop always uses Field_Double to add constright/constleft
- Fixes Bug#657 - Adding space to field in binop throws nullpointerexception
- Fixes Bug#663 - RDW factopendm.ksh Has Null Pointer Exception in FieldMod

Retek Extract Transform and Load

- Fixes Bug#667 - JDBCRead Doesn't Allow userid and password Properties
- Fixes Bug#668 - JDBCRead Doesn't Support schemaowner Property Required
- Fixes Bug#669 - Exception Handling Dates in Teradata
- Fixes Bug#670 - Exception in Teradata JDBCRead
- Fixes Bug#671 - orawrite supports multiple sqlloaders
- Fixes Bug#672 - RDW Load Fails with Japanese Characters
- Fixes Bug#677 - Terawrite Unable to Create Tables
- Fixes Bug#679 - NullPointerException in Terawrite
- Fixes Bug#680 - Exception in Funnel tsildqdm.ksh
- Fixes Bug#681 - "Terawrite ""Operation not allowed"" Exception"
- Fixes Bug#682 - slsmkdnilddm Fails on Load
- Fixes Bug#683 - Incorrect Column Datatypes in DWI in pre_dwi_temp.ksh
- Fixes Bug#687 - Incorrect Datatypes Created by JDBCRead
- Fixes Bug#689 - Incorrect Max Field Length in JDBCRead
- Fixes Bug#691 - Join should buffer records on RHS instead of LHS
- Fixes Bug#416 - -sSCHEMAFILE option doesn't print actual datatypes
- Fixes Bug#533 - Switch Doesn't Handle Quoted Case Values
- Fixes Bug#540 - Nulls Not Detected Correctly on Input
- Fixes Bug#551 - Datasets that page to disk will never re-use memory
- Fixes Bug#580 - Funnel Transforms Records Unnecessarily
- Fixes Bug#583 - Sortfunnel Does Not Allow for Equivalent Schemas
- Fixes Bug#599 - terawrite Doesn't Drop Data
- Fixes Bug#601 - Schema is Not Shown Unless All Schemas Are Resolved
- Fixes Bug#609 - orawrite/jdbcwrite can't obtain table information in certain
- Fixes Bug#651 - Default output delimiter should be pipe '|'
- Fixes Bug#655 - Sum in Groupby Fails on Null Field
- Fixes Bug#661 - sort operator doesn't delete the temp files
- Fixes Bug#664 - AreSchemasCompatible Is Too Strict On Float Data Types
- Fixes Bug#588 - The '|' or other delimiter can not be content of data field
- Fixes Bug#619 - We may need add preload or postload in orawrite.
- Fixes Bug#620 - "need ""arraysize"" property in jdbcread like C++ does"
- Fixes Bug#621 - We should be able to let user specify the control file name
- Fixes Bug#691 - Join should buffer records on RHS instead of LHS

Changes since RETL 11.0 BETA

- Fixes Bug#405 - recreating a table has problems
- Fixes Bug#409 - IS_NULL operation doesn't check for null
- Fixes Bug#410 - Filter doesn't work on dates
- Fixes Bug#412 - switch doesn't work without ifnotfound
- Fixes Bug#413 - Innerjoin is broken
- Fixes Bug#414 - groupby requires key property
- Fixes Bug#415 - Sortfunnel doesn't handle null records
- Fixes Bug#417 - jdbcread doesn't handle fields w/ null values correctly
- Fixes Bug#418 - join shouldn't rename fields to include "left" and "right" prefixes
- Fixes Bug#419 - output schemafile cannot reorder or drop fields
- Fixes Bug#420 - Fieldmod performs operations sequentially which causes an error in schemas
- Fixes Bug#423 - Copy operator doesn't clone schemas
- Fixes Bug#424 - unable to compare float and int in changecapture
- Fixes Bug#425 - jdbcwrite should check if getField is null before writing to db
- Fixes Bug#427 - verify_retl on RETL 11.0
- Fixes Bug#429 - i18n problem with import
- Fixes Bug#430 - i18n orawrite problem
- Fixes Bug#431 - outerjoin flavors don't support nullvalue property
- Fixes Bug#432 - lookup mishandles null records
- Fixes Bug#433 - Join hangs
- Fixes Bug#435 - export should allow implicit conversion from non-nullable to nullable
- Fixes Bug#437 - static final configuration variables are not configurable
- Fixes Bug#438 - temporary flow files created by retl should be removed upon exit
- Fixes Bug#444 - Copy after Generate Results in Incorrect Results
- Fixes Bug#448 - Need Time/Timestamp datatypes for 11.0
- Fixes Bug#449 - JDBCWrite doesn't work with dfloat
- Fixes Bug#450 - JDBCRead doesn't read dfloats properly
- Fixes Bug#451 - removedup doesn't handle null records properly
- Fixes Bug#452 - switch doesn't allow multiple values to be on same output
- Fixes Bug#453 - Collect operator isn't Implemented
- Fixes Bug#454 - numeric overflow in jdbcread

Retek Extract Transform and Load

- Fixes Bug#455 - RETL hangs on certain RDW flows
- Fixes Bug#457 - Copy doesn't clone record in certain cases
- Fixes Bug#458 - export operator doesn't support 'mode' property
- Fixes Bug#459 - dbwrite operators don't have 'primaryindex' property
- Fixes Bug#460 - Date, Time, TimeStamp in JDBCRead / Write
- Fixes Bug#462 - Need to propagate schemas through each operator
- Fixes Bug#463 - Backwards-compatibility bug in JDBCWrite
- Fixes Bug#466 - Problem with JDBCWrite table with schema owner attached
- Fixes Bug#467 - Date, Time, TimeStamp in JDBCWrite
- Fixes Bug#468 - Support Date, Time, TimeStamp in JDBCRead
- Fixes Bug#469 - JDBCRead Doesn't Support TO_CHAR Conversion
- Fixes Bug#471 - Generator has problems being both source and serial operator
- Fixes Bug#472 - Required nullvalue isn't enforced
- Fixes Bug#473 - Null Value with Table Recreate Causes Exception in Orawrite
- Fixes Bug#474 - Null pointer exception in convert when making field nullable
- Fixes Bug#475 - Dfloat nullvalue doesn't work properly
- Fixes Bug#476 - Lookup fails with an ArrayIndexOutOfBoundsException
- Fixes Bug#477 - JDBCWrite Throws Exception with Dates and createtablemode="create"
- Fixes Bug#478 - In the lookup the key fields in the "tablekeys" are separate
- Fixes Bug#485 - Lookup Gives Incorrect Results using Multiple Keys
- Fixes Bug#486 - NullPointerException in leftouterjoin variants
- Fixes Bug#487 - ArrayOutOfBoundsException in join variants
- Fixes Bug#490 - ArrayIndexOutOfBoundsException in binop operator
- Fixes Bug#491 - filter does not require second output when rejects=true
- Fixes Bug#497 - Null Date Truncated on Fixed Export
- Fixes Bug#498 - Null Value Length Not Enforced for Fixed Width Schemas
- Fixes Bug#500 - NullPointerException in Parser_CharSequence
- Fixes Bug#501 - NullPointerException in doResolveSchemas()
- Fixes Bug#502 - NullPointerException in Record.hashKey()
- Fixes Bug#504 - Chained Lookups Do Not Work
- Fixes Bug#505 - Import Rejects Record if Numeric Value Has Trailing Spaces
- Fixes Bug#506 - Lookup 'tablekeys' property should accept comma-delimited list
- Fixes Bug#509 - OpProperties are shared among operators

- Fixes Bug#520 - Operator_Join can not run if both input have the same field
- Fixes Bug#521 - JDBC write can not run if no. of import is more than no. of output