

Data and Test Management

X-Datatest is a comprehensive data and test management solution, providing the functionality required to test large IBM i applications while helping to ensure full data protection.

What's Inside

A description of Fresche's data and test management solution, X-Datatest. Powered by X-Analysis, the solution helps prepare test databases and develop test cases. It also provides regression testing and helps ensure compliance with data protection standards.

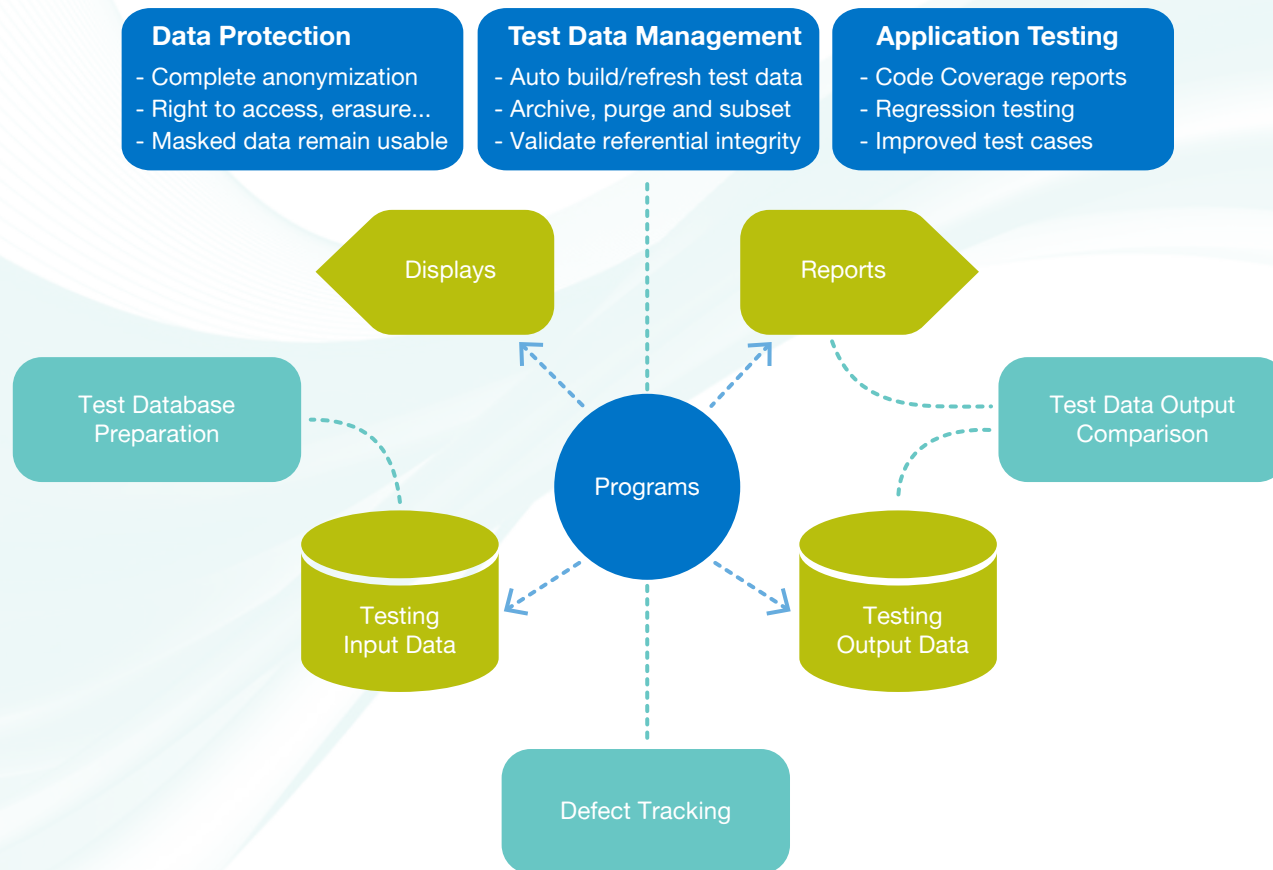


Data and test management on IBM i

Effectively test large applications on IBM i while protecting data sources

IBM i applications are often heavily modified over the years, and they typically do not come with a complete library of test cases or specifications. Building on X-Analysis, the world's leading IBM i code analysis toolset, Fresche has developed the industry-leading approach to testing IBM i applications. Fresche's data and test management solution reduces the effort required to create and manage test data, improves testing to catch bugs before they make it to production, anonymizes data to assist with compliance (GDPR, HIPAA, SOX) and provides Code Coverage reports so you know exactly what has been tested.

X-Datatest gives you:

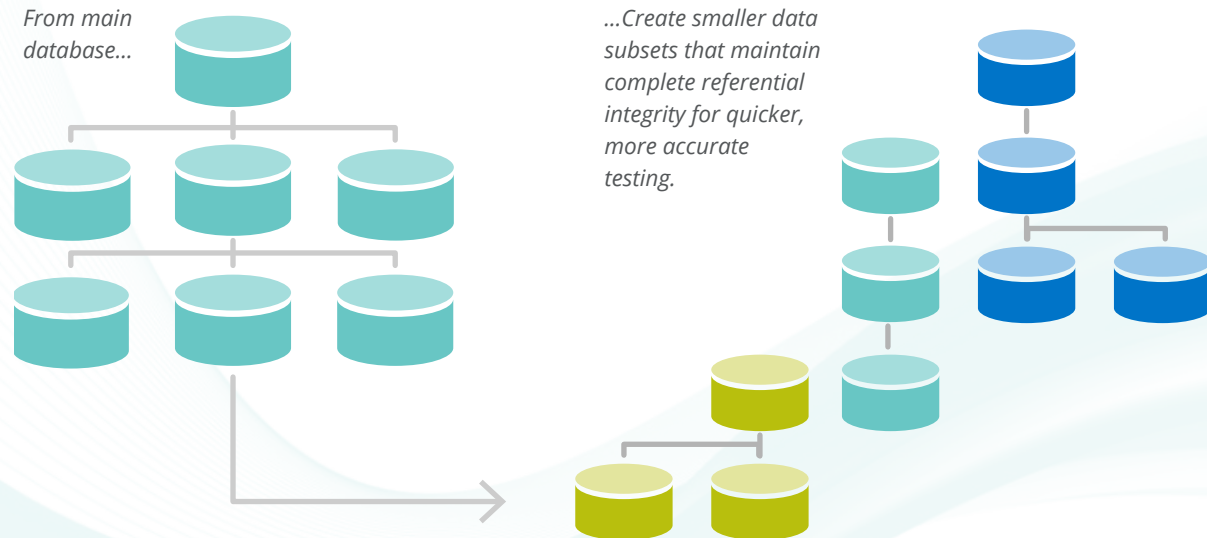


Solution Features

- ▶ Creates complete test data subsets from live data based upon the existing application data model.
- ▶ Verifies and reports on referential integrity of entire live data based upon existing application data model.
- ▶ Anonymizes sensitive data while retaining integrity of special formats such as telephone numbers, names, Zip/Post codes, etc.
- ▶ Simplifies and automates the effort required for compliance to regulatory rules that apply to data — e.g., GDPR
- ▶ Validates data for testing by finding orphaned records
- ▶ Generates Code Coverage reports to help evaluate the completeness of tests
- ▶ Defines and populates checkpoints
- ▶ Automates the process of executing tests repeatedly
- ▶ Compares the resulting data in files and data areas, and displays the differences in a user-friendly manner

Automated test database preparation

Create controlled database subsets for accurate testing



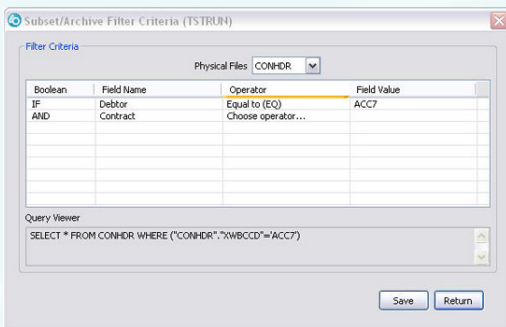
...Create smaller data subsets that maintain complete referential integrity for quicker, more accurate testing.

In complex situations with multiple data environments for development, testing and production, it is difficult to maintain data integrity for testing purposes. Copying production data is the most common practice, but keeping data current for each discrete project and environment combination is a very labor-intensive task, not to mention the impact it has on performance and disk capacity.

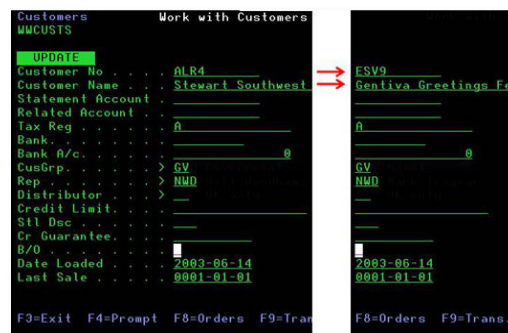
A test database containing only the files and related data used to test a development or maintenance project improves testing performance and accuracy and long term coding quality.

X-Datatest automates the building and refreshing of test databases. X-Analysis cross reference meta-data is used to map all data files related to a maintenance task, while the derived foreign keys of the X-Analysis Data Model are used to ensure that records selected for testing have all related records from related files.

The testing databases have predictable data with referential integrity. Refresh of data functions can be integrated into managed testing procedures, or with SCM tool task management processes.



Filter Criteria function lets you extract a subset of data with complete referential integrity for testing



Anonymization feature lets you mask sensitive data while retaining integrity of special formats

Automated regression testing and test cases

Benefit from automated comparison of before and after testing results

Comparison of XTSR3 Results with XTSR0 - App Area: TSTRUN

Result Comparison		
Database File		
+ Differences in Contract Detail(CONDET)		
- Differences in Stock Balances(STKBAL)		
Difference in record 126:	"Onhand Quantity"(XWBHQT)	XTSR0: 0.0 - XTSR3: 1.0; "Pur Ord Balance"
Difference in record 128:	"Onhand Quantity"(XWBHQT)	XTSR0: 0.0 - XTSR3: 1.0; "Pur Ord Balance"
Difference in record 130:	"Onhand Quantity"(XWBHQT)	XTSR0: 0.0 - XTSR3: 1.0; "Pur Ord Balance"
Difference in record 132:	"Onhand Quantity"(XWBHQT)	XTSR0: 0.0 - XTSR3: 1.0; "Pur Ord Balance"
Difference in record 127:	"Store"(XWAACS)	XTSR0: UK - XTSR3: SWI; "Onhand Quantity"(XWBHQT)
Difference in record 129:	"Store"(XWAACS)	XTSR0: UK - XTSR3: SWI; "Onhand Quantity"(XWBHQT)
Difference in record 134:	"Store"(XWAACS)	
Difference in record 135:	"Store"(XWAACS)	
Difference in record 136:	"Store"(XWAACS)	
Difference in record 137:	"Store"(XWAACS)	
Difference in record 138:	"Store"(XWAACS)	
Difference in record 139:	"Store"(XWAACS)	
- Differences in Store Master(STOMAS)		
- Records appearing in XTSR3 (that are not in "Store"(XWAACS): SWI		

Detail Comparison of Test Result with XTSR0 for File STKBAL - Rec No 126		
Field	Test value	Base Value
Store (XWAACS)	RSA	RSA
Product (XWABCD)	000100	000100
Grp 1 (XWAGCD)	10	10
Grp 2 (XWAHCD)	10	10
Grp 3 (XWAICD)	30	30
U/M (XWA2CD)	EA	EA
Onhand Quantity (XWBHQT)	1.0	0.0
Pur Ord Balance (XWBKQT)	1.0	0.0
Stk Bal Sales Order (XWBM...)	0.0	0.0
Stk Bal Production (XWFWQT)	0.0	0.0

Before and after data content analysis. Drill-downs (at right) provide a high level of comparison detail

Regression testing with X-DataTest

Enhancing or changing code can introduce errors. These software bugs or "regressions" can be very difficult to find and labor intensive to test for in large complex systems. An effective way to test for regressions is to analyze data before and after code changes. This analysis of potentially thousands of fields and records after every code change is time consuming and requires significant manpower. Many companies wait for regressions to appear in

production environments, but they sometimes only appear years later. X-DataTest provides you with a high-level view of test results and comparisons, enabling you to quickly home in on potential defects. Important to this sort of analysis is the ability to filter out expected and unavoidable differences for such things as timestamps. X-DataTest gives you flexibility for filtering out expected discrepancies so you can focus your energy and time on meaningful indicators of defects.

X-DataTest helps build a suite of test cases...

Developing test cases that maximize test coverage of large amounts of code is challenging and time consuming. IBM i systems often contain many thousands of business rules and their databases often contain many surprises.

Through the use of recovered business rules, pseudo code, and data content analysis, the general purpose features of X-Analysis can help you efficiently construct a high quality suite of test cases.

...and generates code coverage reports

The code coverage report generated by the execution of test cases provides a clear indication of how complete your test case is and helps to identify missing test points as well as the supporting test data that is required.

View Coverage Report For TSTRUN	
File/Field/Value	Comment
- CONDET	
- XWRICD	2 of 3 TRNTYP values exist in test data
INV	Found in test data
CRN	Found in test data
SUN	Missing from test data
- CONHDR	
- PERSON	3 of 6 SLMEN values exist in test data
STU	Found in test data
JKL	Found in test data
NWD	Found in test data
MTT	Missing from test data
KAN	Missing from test data
SDS	Missing from test data

Automated customizable reports help you keep track of test coverage so you know what has been tested

Data protection and regulatory compliance

X-DataTest can help ensure data privacy and compliance with emerging regulations

Data privacy is one of the greatest concerns in business and a hot topic in IT departments. Fresche's clients around the world have a growing interest in all aspects of data security. For example, to continue doing business with European organizations requires adherence to exacting standards under GDPR, and passing security audits requires an ability to show tools and processes for data protection. X-DataTest helps these clients achieve a high level of protection through anonymization and other functionality.

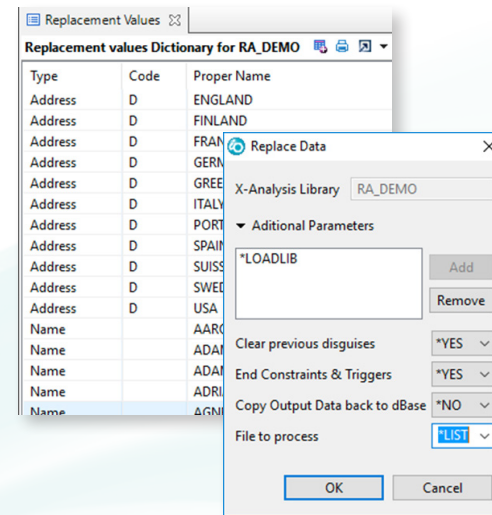
Anonymization

X-DataTest automates complete anonymization of sensitive data while ensuring integrity of the data format so that testing remains perfectly coherent. Formats such as dates, names, ID numbers, etc. are maintained but completely anonymized so that tests run correctly with complete protection of personal data.

Further regulatory compliance with X-DataTest

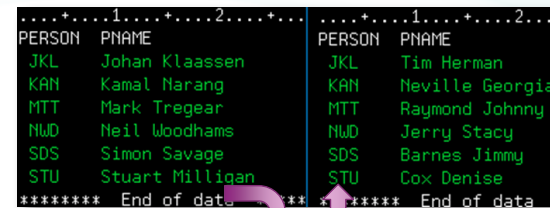
X-DataTest tracks and manages data use throughout your programs on IBM i and informs on how the data are being used. It helps you implement regulatory principles for GDPR, HIPAA, SOX, etc. For example:

- ▶ **Right to be Informed:** Quickly finds where customer information is stored in DB2 files and anonymizes sensitive data
- ▶ **Right to Access:** Easily subsets all the data related to a person
- ▶ **Right to Erasure:** Quickly removes data and related information
- ▶ **Right to Restrict Processing:** Archives and sets aside your data
- ▶ **Right to Data Portability:** Provides copies of information stored about you in DB2
- ▶ **Right to Object and Profiling:** Facilitates DB2 changes with minimal disruption



Customizable replacement values dictionary

Highly automated anonymization process



Before and after: data is masked in usable format



Replacement values file that can be cleared for more security

Ready to Learn More?

X-Analysis products are available in a variety of configurations. At Fresche Solutions, we work closely with you to assess your needs and recommend the best solutions. To get started, contact us using the information below:

www.freschesolutions.com | info@freschesolutions.com
1.800.361.6782 (Worldwide)

X-Analysis Advisor is the main offering in the X-Analysis suite, which includes productivity and modernization tools for your IBM i applications and databases. Following is a brief description of the solutions in the suite:

Understanding and Impact Analysis: An IBM i analysis tool that provides automated online documentation and powerful impact analysis.

Business Process Mapping and Metrics: A complete IBM i analysis tool, providing automated documentation, impact analysis, business rule extraction and code quality metrics.

Data and Test Management: Analysis of data quality; data archiving, data subsetting and data anonymization. Test data automation and management.

Field Resizing: Automated resizing of all occurrences of a field throughout your entire application environment; includes detailed problem analysis.

CA 2E Analysis: Everything required to analyze and document CA 2E applications. Includes business rule extraction and code quality auditing.

Application Modernization: RPG, COBOL and CA 2E (Synon) automatically converted to Java.

Database Modernization: Automated conversion of DDS to DDL, including creation of constraints, long field names and views.

Open Systems Analysis: Cross-referencing and documentation of Java, C#, PHP, and other languages.

About Fresche Solutions

Fresche is the leading provider of automated digital transformation enablement for companies who rely on IBM i systems. Through its transformation framework (tools, processes and methodologies), Fresche delivers high quality application modernization as a service (MaaS) in addition to a wide range of optimization solutions.

With over 400 digitally connected colleagues around the world and an extensive network of over 200 business partners, Fresche collectively brings clients the best solutions to drive innovation and IT success. For more information about our company, visit us on the Web at www.freschesolutions.com