GDPR and Data Privacy – Enterprise IT Considerations

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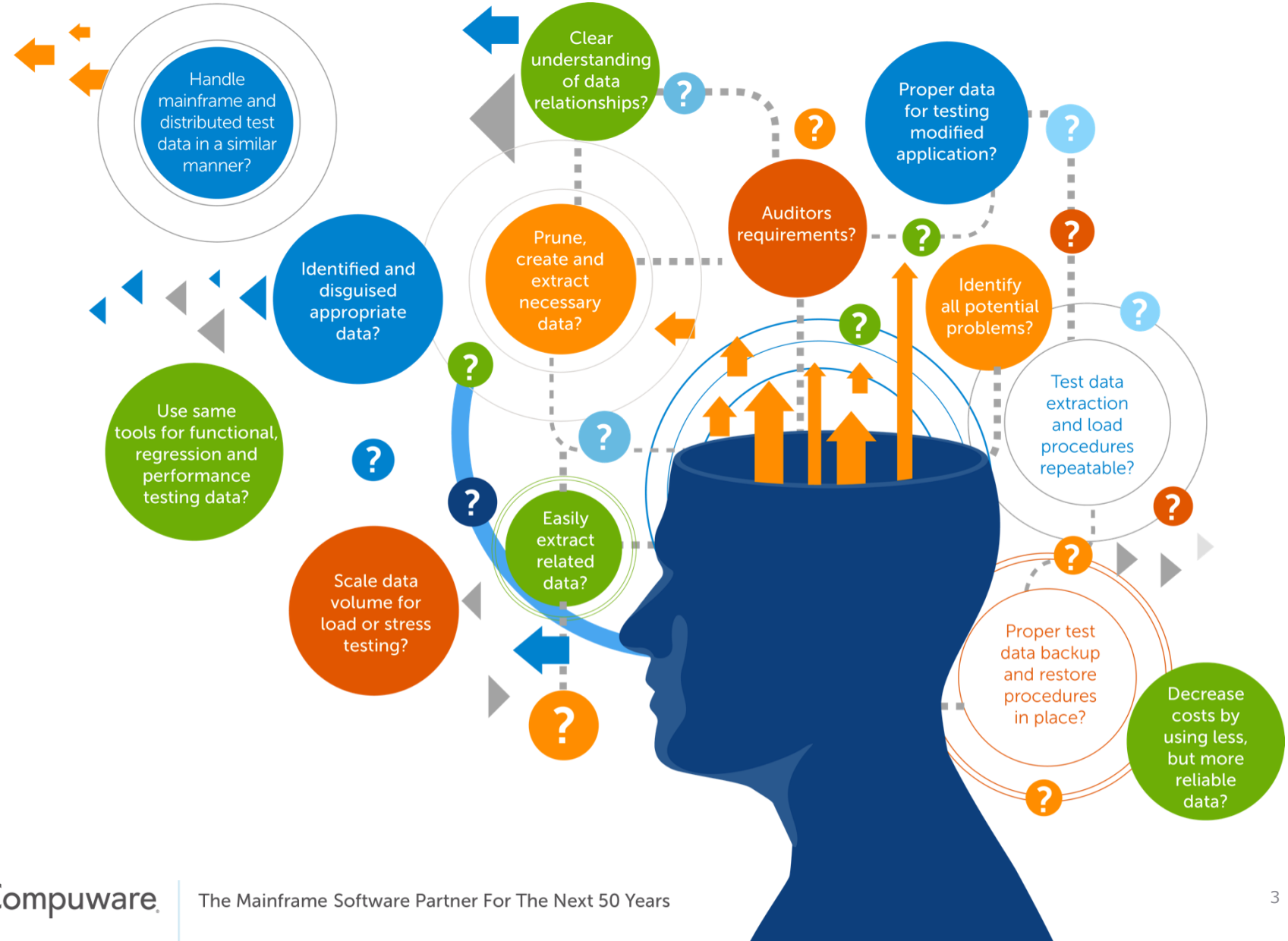
September 27, 2018

DATA MANAGEMENT

Test Data Management Challenges



What Are You Looking for in Test Data Management?

Simplified Data Management

- Provide self-sufficiency for developers
- View and edit data easily
- Copy, compare, reformat and convert multiple database/file types with ease
- Eliminate need to write SQL or special programs enabling simple, accurate and secure access to data
- Generate test data
- Visualization

Protect Sensitive Data

- Create meaningful, disguised test data
- Ensure quality and reliability of application and data
- Subset and disguise data while maintaining data relationships

Access Multiple Environments

- Access data consistently across multiple environments
- Comprehensive test data management solution

Test Data Management

File-AID

- Industry leading data and file management

Topaz Workbench

- Quickly access Compuware products through modern Eclipse IDE included with maintenance
- Access to common z/OS functionality

Topaz for Enterprise Data

- Discover and work with both mainframe and distributed data in an intuitive manner
- Visualization of complex data relationships

Test Data Provisioning

Too much test data not relevant, therefore each development team building their own

Protecting customer data without impacting quality testing

Right-sized

Subset data while maintaining relationships

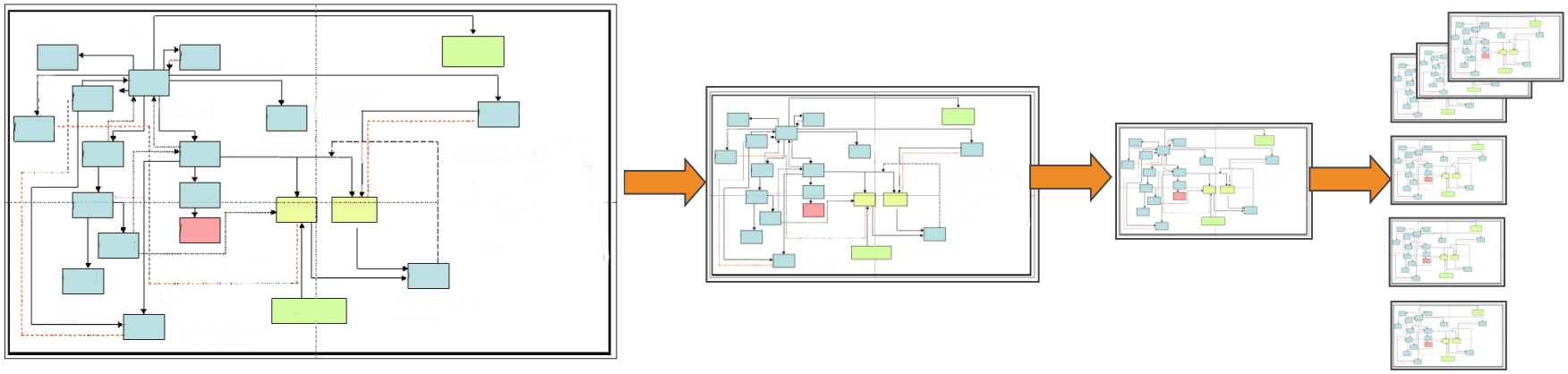
Coverage

Use precise, relevant data to ensure all test conditions are met

Secure

Mask production data before moving to test environment

Production → **Test Beds**



Capabilities

Test Data Management and Privacy

Discover – Relationships and Sensitive Data

Right-sized

- Extract and load related subsets of production data
- Maintain application and DBMS relationships
- Repeatable refresh of test environment
- Data browse, edit, print and compare
- Supplement with additional test cases

Coverage

- Precise data to ensure all test conditions are met
- Discrete data bundle
- Re-establish and maintain clean test environments
- Customize data for specific conditions
- Data evolution

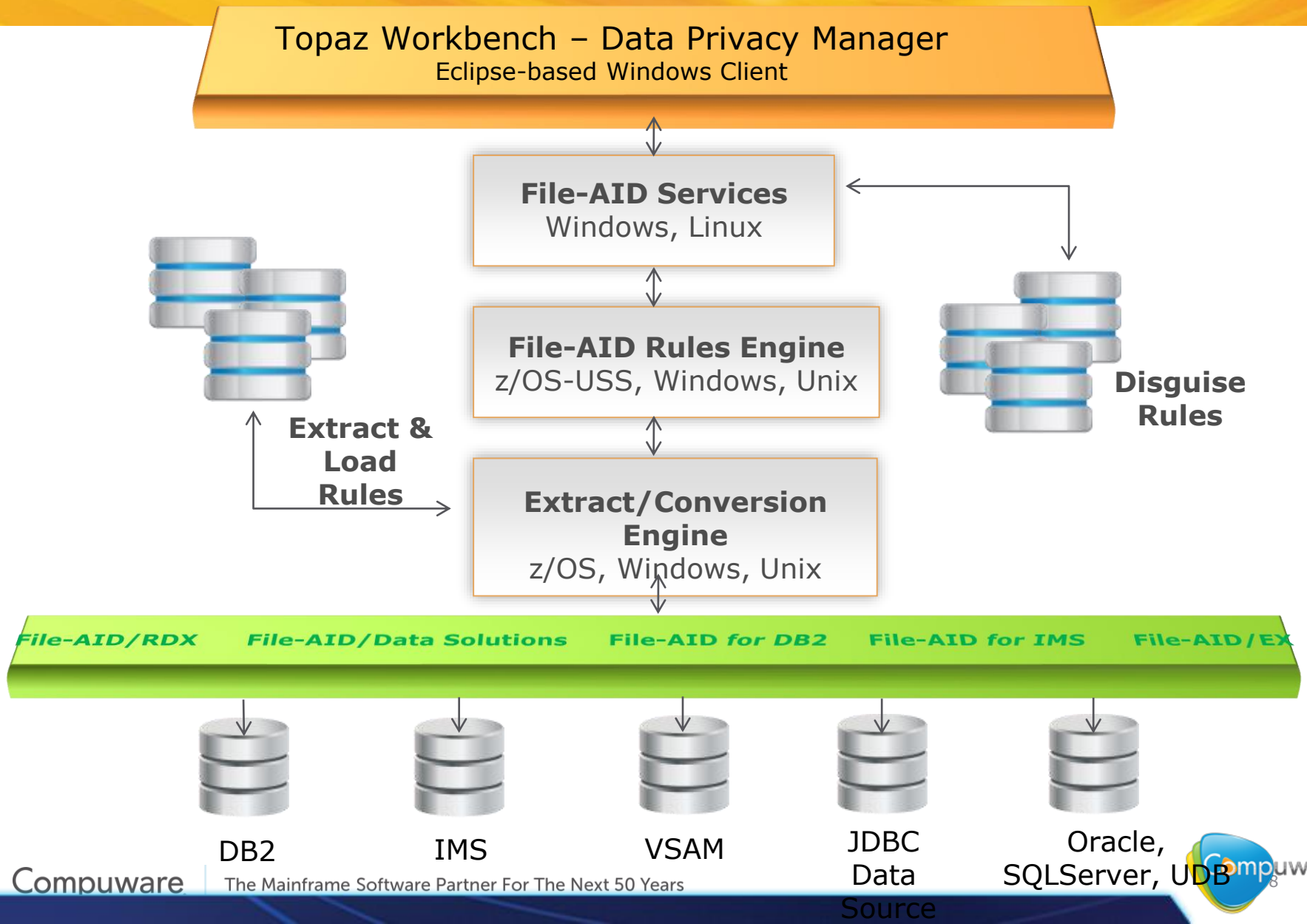
Secure

- Encrypt with formulated data
- Translate with meaningful data
- Age dates while maintaining integrity
- Mask partial fields
- Generate fictitious data
- Centralized rules administration

Best Practice Guide and Methodology

Solution

Test Data Management Architecture

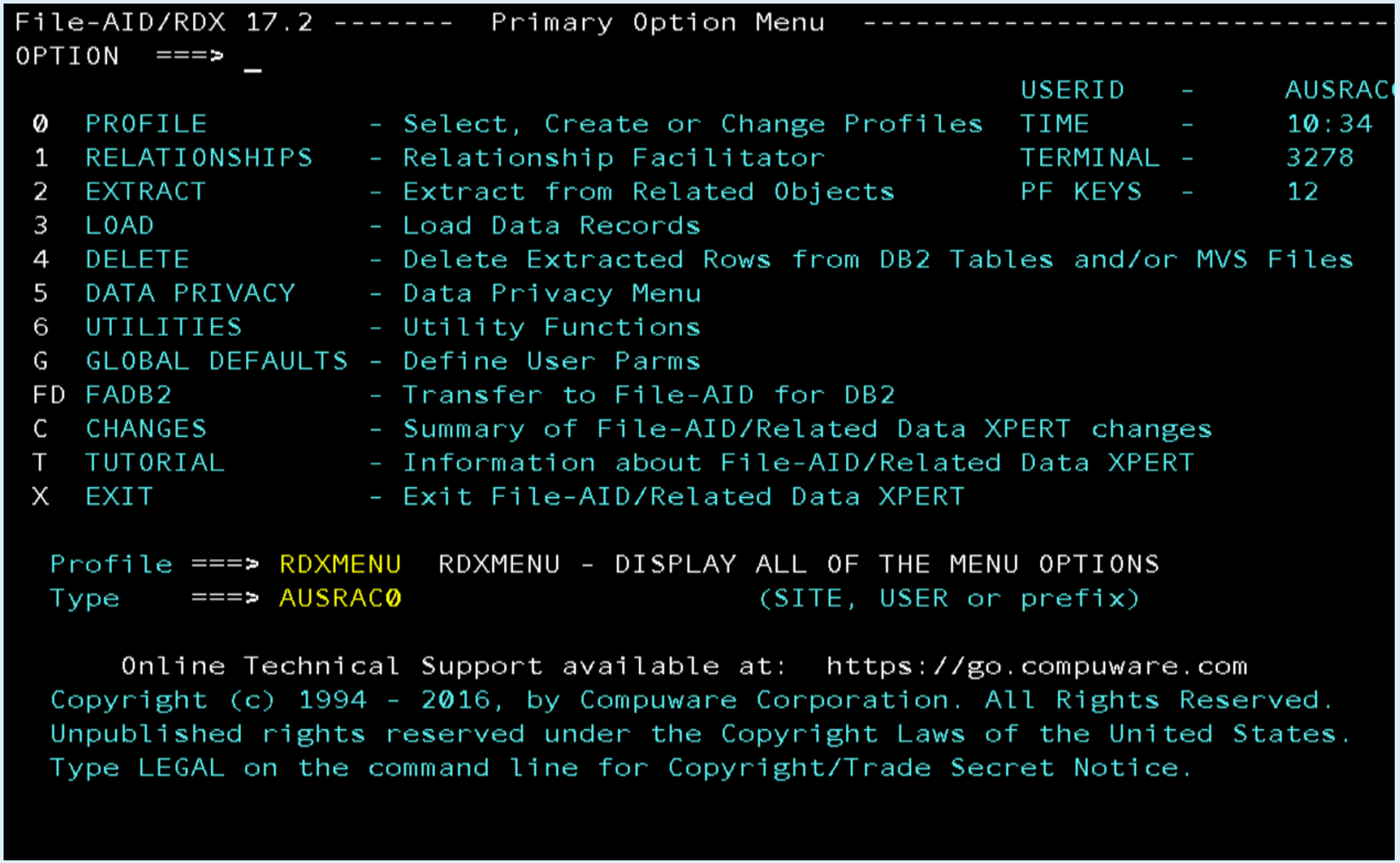


File-AID/RDX

Managing Relationally Intact Sets of Data

- Offers developers and DBA's an efficient way to subset, extract, load, protect and delete synchronized subsets of related DB2 and MVS data.
- Integration between File-AID/RDX and dynamic privacy rules help companies address data privacy requirements in the test environment.
- Using File-AID/RDX and File-AID/EX, you can easily populate test databases with related mainframe data.
- Relationship function provides the means of defining relationships between objects. These are shared between the different Compuware components.
- Completes more test cycles in less time
- Allows an easy refresh for related tables
- Preserves data integrity and data relationships
- Provides self-sufficiency for developers
- Ensures high-quality testing by allowing you to create a reusable test environment in which sensitive data is protected

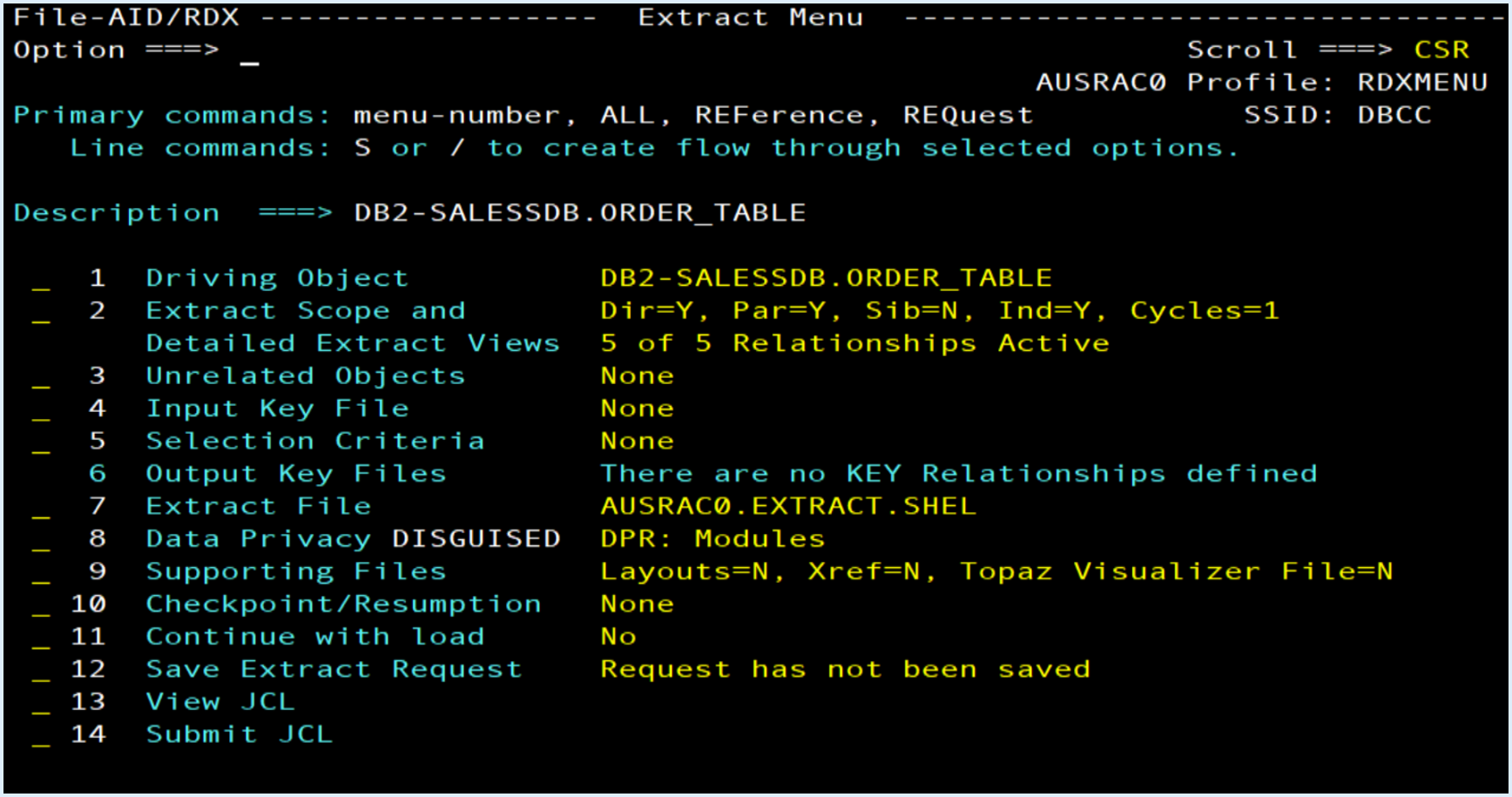
RDX Main Menu



DB2 Relationships

```
File-AID/RDX       -   Relationship Detail  ------------------ Row 1 to 6 of 10
Command ===> _                                                 SCROLL ===> CSR

Base object:     DA01CW01.SALESSDB.ORDER_TABLE

Line Commands:   S = Select Relationship to Modify  D = Delete Relationship
                 A = Add Application Relationship   I = Relationship Information

                                                    Obj  Rel       Status/
CMD      Parent/Dependent                           Type Type      Description
--- ------------------------------------------------ ---- ----- ----------------
 _   DA01CW01.SALESSDB.CUSTOMER_TABLE               DB2  AR
       DA01CW01.SALESSDB.ORDER_TABLE                 DB2
 _   DA01CW01.SALESSDB.ORDER_TABLE                  DB2  RI
       DA01CW01.SALESSDB.ORDER_LINE_TABLE            DB2        ORDLORD
 _   DA01CW01.SALESSDB.ORDER_TABLE                  DB2  AR-C
       DA01CW01.SALESSDB.ORDER_TABLE                 DB2
 _   DA01CW01.SALESSDB.CUSTOMER_TABLE               DB2  RI    ASSOCIATED REL.
       DA01CW01.SALESSDB.CONTACT_TABLE               DB2         CONTCUST
 _   DA01CW01.SALESSDB.CUSTOMER_TABLE               DB2  AR    ASSOCIATED REL.
       'AUSRAC0.DEMOENV.CUSTOMER'                    MVS
 _   DA01CW01.SALESSDB.CUSTOMER_TABLE               DB2  AR    ASSOCIATED REL.
       'AUSRAC0.DEMOENV.CUSTOMER'                    MVS
```

Extract Menu



GDPR

- GDPR is designed to unify data privacy requirements across the European Union (EU) so if your company processes the information of EU Data Subjects (which include end users, customers and employees) you will need to make sure you address these key requirements.

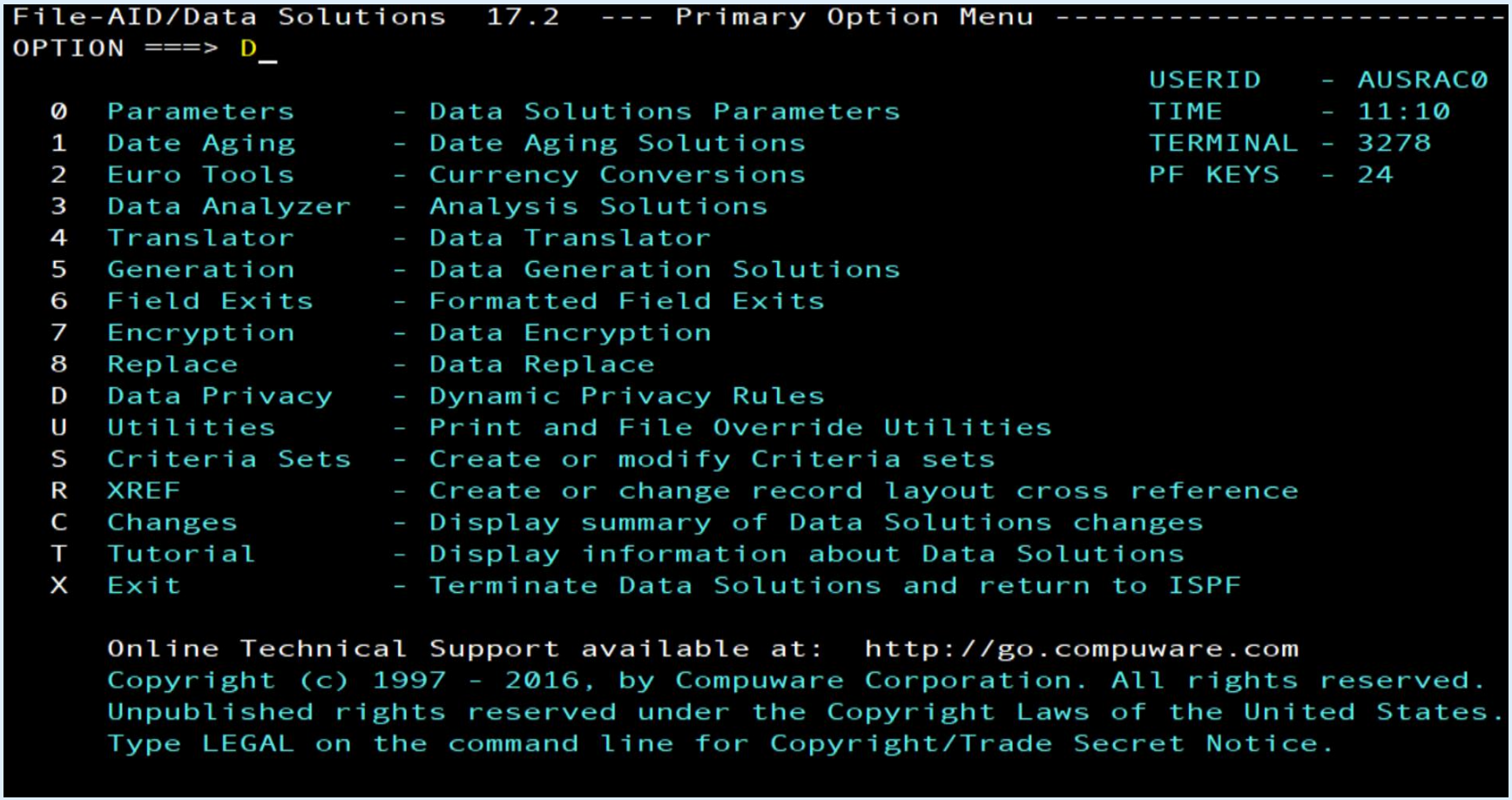
- How will you address the Right to be Forgotten? Creating a process to surgically remove all of a person's data once it is entwined within your systems. Use the relationships within Db2 for a related extract and delete.

File-AID/Data Solutions

Highly Productive Set of Data Utilities

- Provides consistent, efficient methods to create accurate test data and perform data conversion and analysis without writing one-time programs or completing tedious manual tasks.
- Data Validation and Analyzer functions validate and scan electronic data files for invalid data values to prevent processing problems and abends.
- Create reliable test data quickly for new and enhanced applications for a thorough range of test cases.
- Protect production data from unauthorized viewing during application testing, when sensitive data can be vulnerable to fraud or theft.
- Integrates with dynamic privacy rules to protect sensitive production data used in a test environment
- Improves programmer productivity by eliminating custom programming
- Provides repeatable, consistent methods
- Reduces production downtime
- Minimizes skill level required to manipulate data using a familiar ISPF and Compuware File-AID/MVS look-and-feel

Data Solutions Main Menu



Copy Disguise Single File

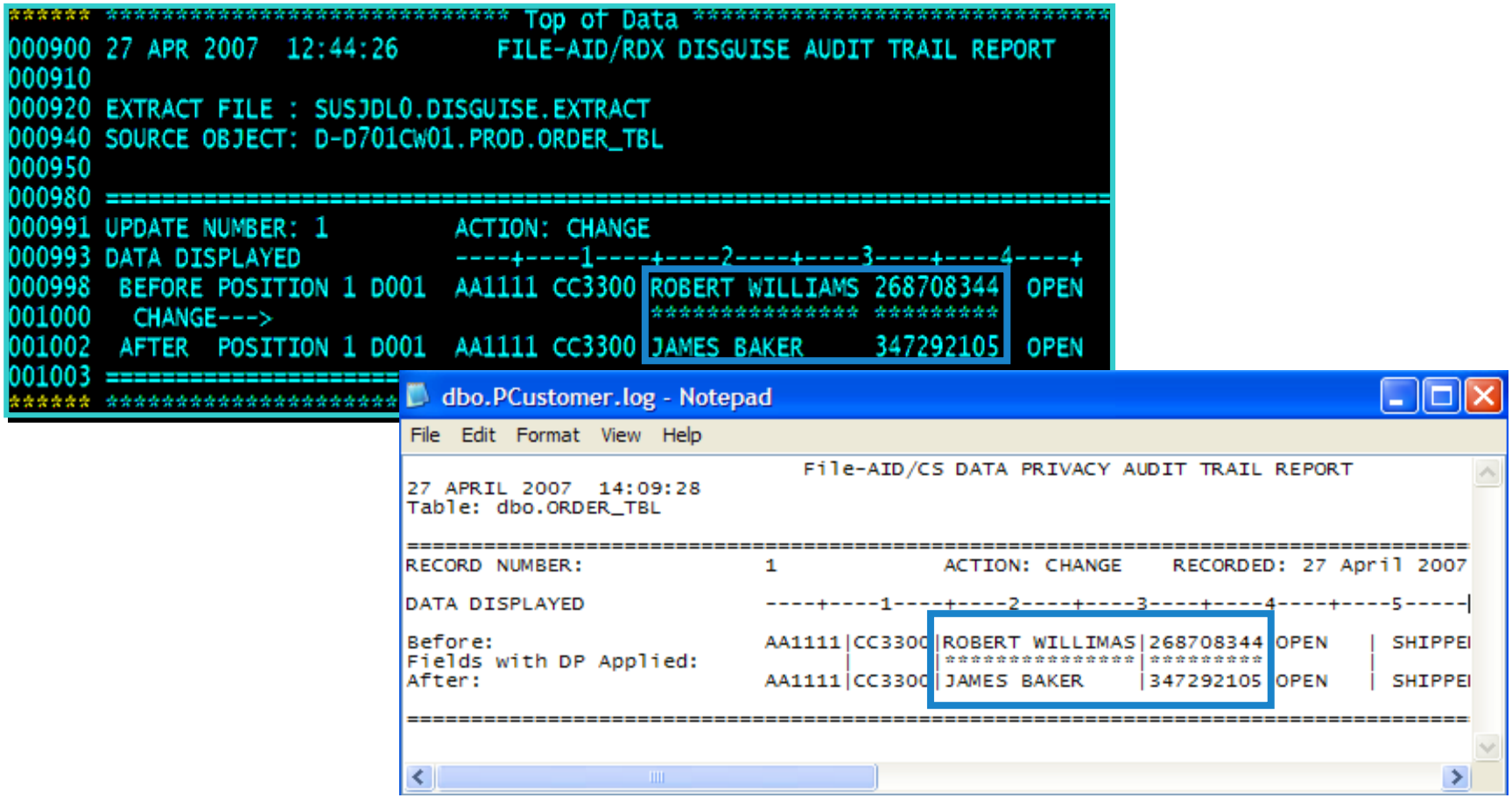
```
File-AID/Data Solutions - Input Dataset Specification -------------------------
COMMAND ===> _                                              SCROLL ===> PAGE

Specify Input Dataset Information:
  Dataset name            ===> 'AUSRAC0.DEMOENV.CONTACT'
  Member name             ===>              (Blank or pattern for member list)
  Disposition             ===> OLD          (OLD or SHR)
  I/O exit name           ===>              (User written I/O program)
Specify Record Layout and XREF Information:
  Record layout usage     ===> S            (S = Single; X = XREF)
  Record layout dataset   ===> 'AUSRAC0.DEMOENV.LAYOUTS
  Member name             ===> CONTACT      (Blank or pattern for member list)
  XREF dataset name       ===> 'AUSRAC0.WEST.XREF'
  Member name             ===> ADMGR        (Blank or pattern for member list)
Specify Dynamic Privacy Rule Information:
  Repository name    ===> File-AID Rules
  Project name       ===> Modules
```

Deliver – Extract & Disguise Reports

```
File-AID/RDX  4.4                                    Extract Summary Report

Extract File. . : SUSJDL0.DISGUISE.EXTRACT
Extract Request : SUSJDL0.TRAINDB.V4R3.REQUEST(TEST)
Relationship File SUSJDL0.TEST.RELATION
Driving Object. : D-D701CW01.PROD.ORDER_TBL
ID         Rows  Extracted Objects and Relationships
---- ----------  ------------------------------------------------------------
D001        972  D-D701CW01.PROD.PART_TBL
                      972 Rows from relationship Parent:  D-D701CW01.PROD.PAR
                                                 Dependent:  D-D701CW01.PROD.ORD

                      972 Keys written t

D002         97  D-D701CW01.PROD.CUSTOMER
                      972 Rows from rela
```

```
FILE-AID/RDX DISGUISE SUMMARY REPORT
====================================
    INPUT EXTRACT FILE: SUSJDL0.RDX.EXTRACT.D070427.T120743
DISGUISED EXTRACT FILE: SUSJDL0.DISGUISE.EXTRACT
 DISGUISE CONTROL FILE: SUSJDL0.CONTROL
FILE-AID/DATA SOLUTIONS CRITERIA FILE: SUSJDL0.CRITERIA
------------------------------------------------------------------------------
OBJECT: D- DB2-PROD.ORDER_TBL
ROWS: 972
 COLUMN: CUSTOMER_NAME                  RULE: A0000003  DESC: ASSOCIATED CUS
 COLUMN: SOC_SEC_NUM                    RULE: R0000003  DESC: RELATED SOC_SE
SET  1 TRAN-=================================================================
SET  1 TRAN-RECORDS READ 972, SELECTED 972, CONVERTED 972, INVALID 0
SET  1 100% UNIQUE VALUES ASSIGNED _______972 ASSIGNED VALUES
SET  2 ENCR-=================================================================
SET  2 ENCR-RECORDS READ 972, SELECTED 972, FIELDS CHANGED 972,INVALID 0
```

Deliver – Audit Reports Generated

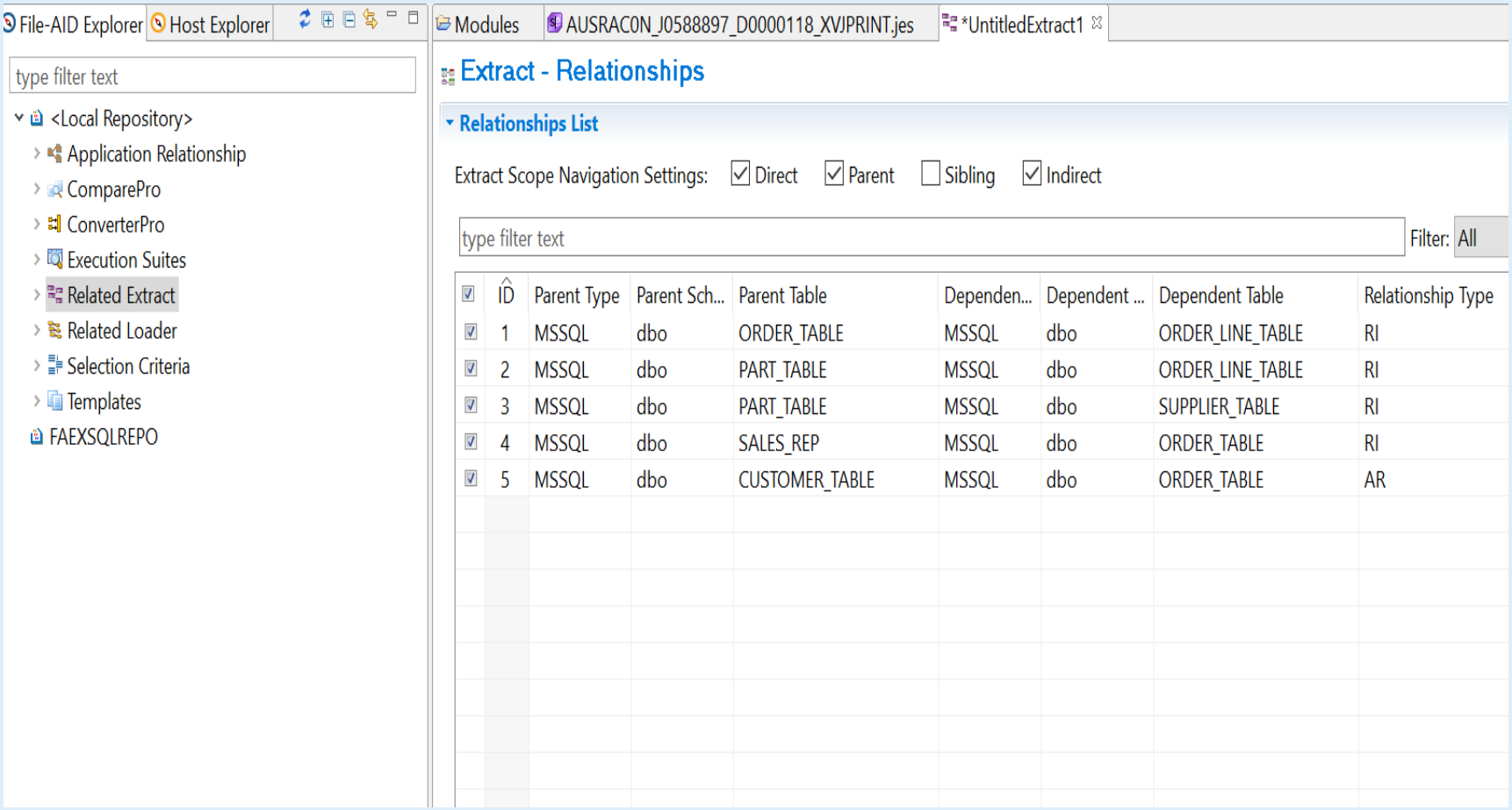


File-AID/EX

Distributed Test Data Management Made Simple

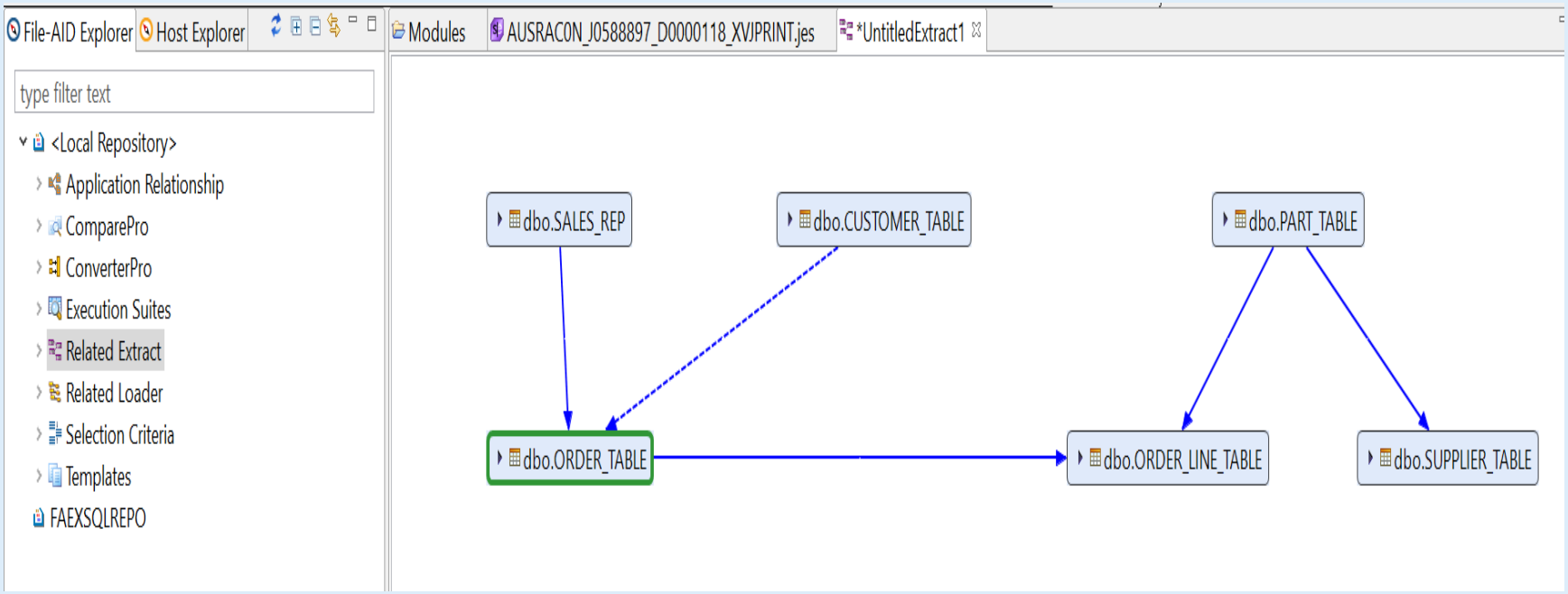
- Easily subset data while maintaining data relationships.
- Integrates with dynamic privacy rules to protect sensitive data.
- Copy, reformat and convert multiple database/file types with ease.
- Generate test data.
- Compare data and schemas.
- Automate database comparisons to validate tests.
- Access data consistently across multiple environments.
- Offers a comprehensive test data management solution in a single tool for all your data needs.
- Eliminates the need to write SQL or special programs enabling simple, accurate and secure access to distributed data.
- Creates meaningful, manageable, disguised test data with minimal expertise.
- Provides self-sufficiency for developers.
- Ensures the quality and reliability of your application and data.
- Leverages your current File-AID investment

Distributed Relationships

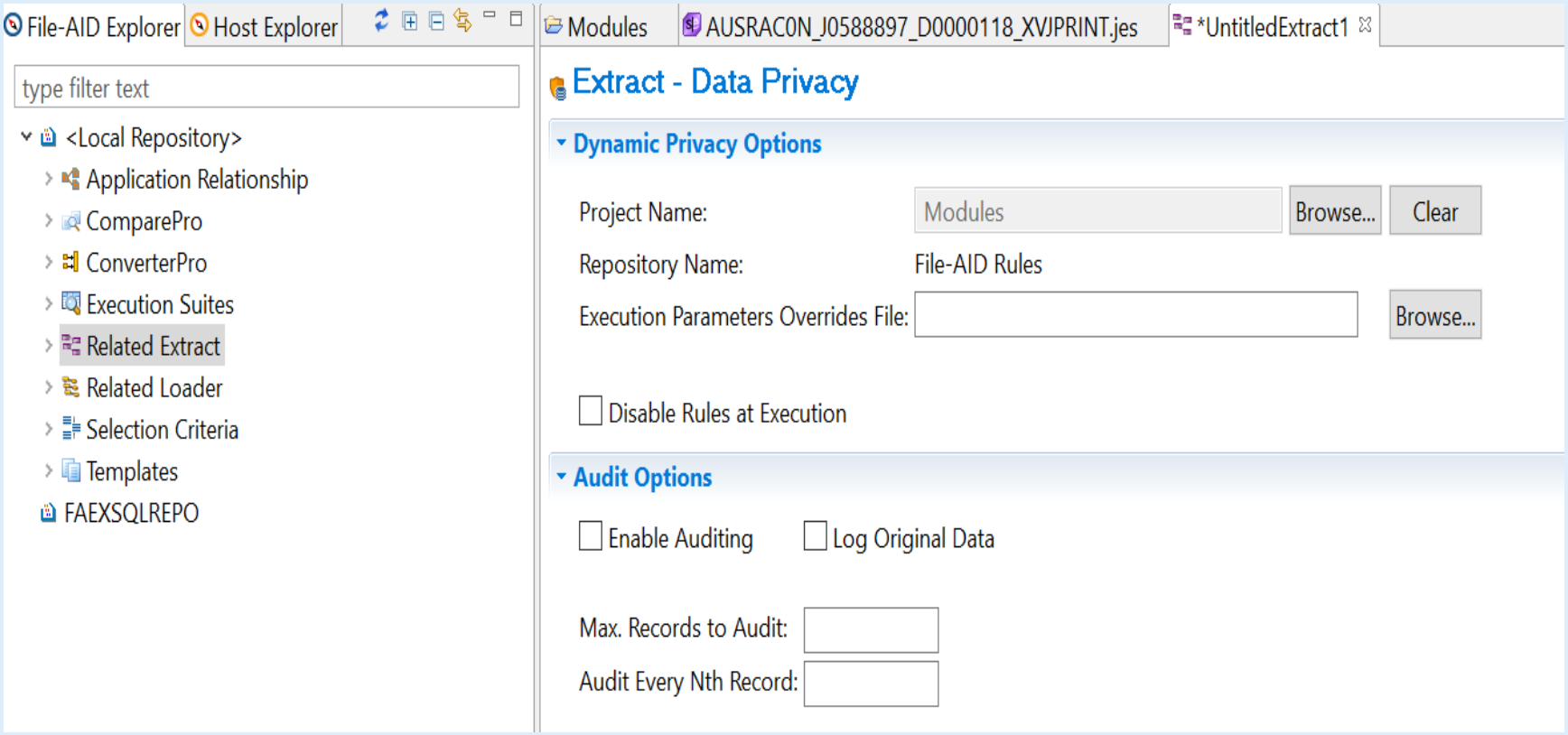


ID	Parent Type	Parent Sch...	Parent Table	Dependen...	Dependent ...	Dependent Table	Relationship Type
1	MSSQL	dbo	ORDER_TABLE	MSSQL	dbo	ORDER_LINE_TABLE	RI
2	MSSQL	dbo	PART_TABLE	MSSQL	dbo	ORDER_LINE_TABLE	RI
3	MSSQL	dbo	PART_TABLE	MSSQL	dbo	SUPPLIER_TABLE	RI
4	MSSQL	dbo	SALES_REP	MSSQL	dbo	ORDER_TABLE	RI
5	MSSQL	dbo	CUSTOMER_TABLE	MSSQL	dbo	ORDER_TABLE	AR

Visualizer


File-AID Explorer
Host Explorer
type filter text
<Local Repository>
Application Relationship
ComparePro
ConverterPro
Execution Suites
Related Extract
Related Loader
Selection Criteria
Templates
FAEXSQLREPO
Modules
AUSRACON_J0588897_D0000118_XVJPRINT.jes
*UntitledExtract1
dbo.SALES_REP
dbo.CUSTOMER_TABLE
dbo.PART_TABLE
dbo.ORDER_TABLE
dbo.ORDER_LINE_TABLE
dbo.SUPPLIER_TABLE

Apply Data Privacy

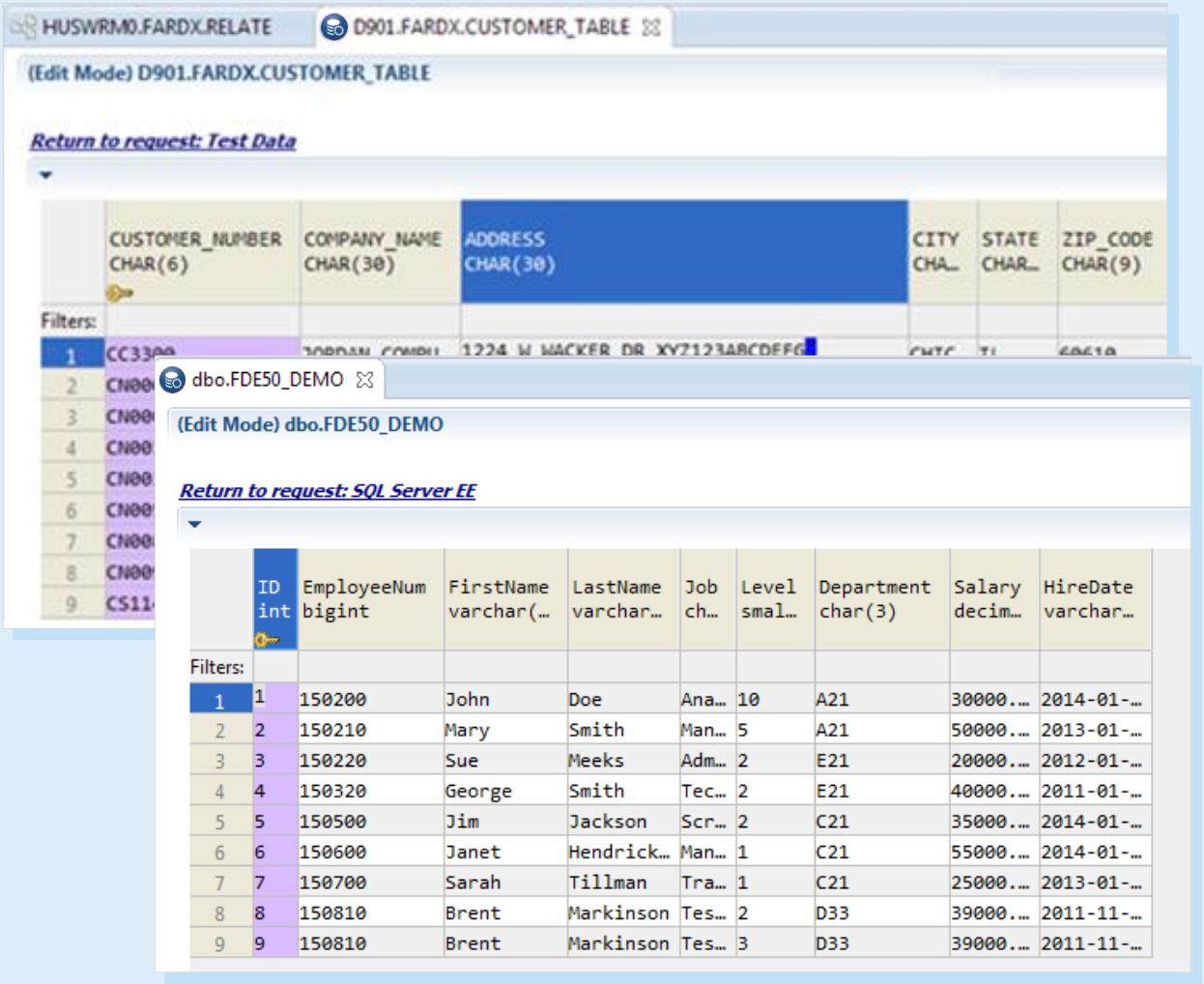


Topaz Workbench

Mainframe Modernization Environment

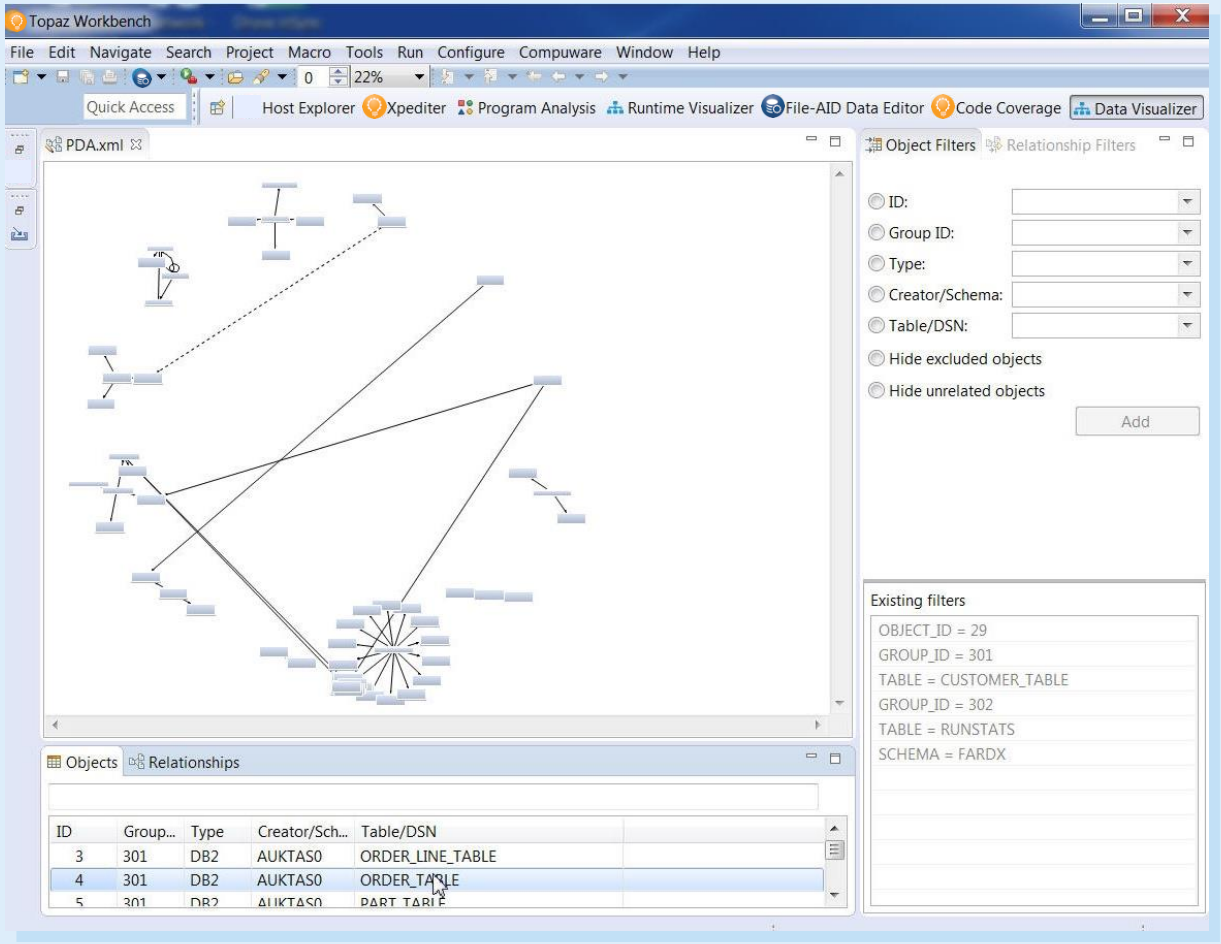
- Single launch point to initiate Compuware's mainframe products.
- Flow from task to task while developing and maintaining mix of cross platform applications.
- View and edit data with spreadsheet-like access: sequential, indexed, VSAM, DB2, and IMS.
- A right-click of the mouse displays a context menu of possible actions.
- Intelligent source code editor.
- Host Explorer plug-in emulates many ISPF tasks .
- Access data consistently across multiple environments.
- Bridges the gap of a transitioning workforce.
- Brings power of Compuware products to IT staff of all experience levels.
- Furthers the investment in the Compuware mainframe products – File-AID, Abend-AID, Xpediter, Strobe, and Hiperstation.
- Provides self-sufficiency for developers.
- Leverages your current File-AID investment.

Edit Multiple Data Types in One Interface



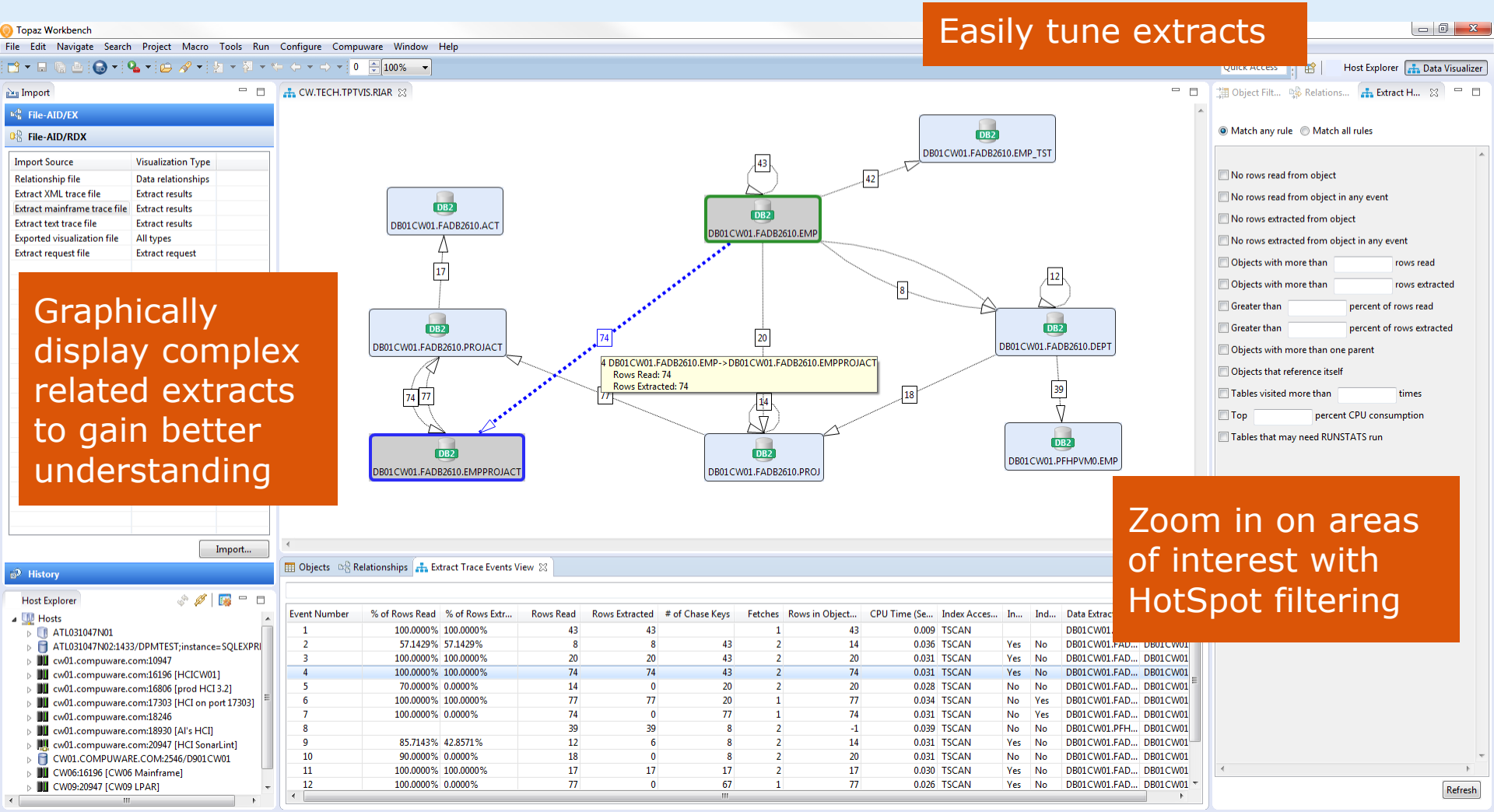
- Single, intuitive user interaction model to edit data from multiple sources
- Manage mainframe data as well as Oracle, DB2, LUW, SQL Server and Sybase
- Easy access to test data creation and validation results, regardless of platform

Visualize Data Relationships Across Platforms



- Graphically display data objects and relationships between objects
- Filter and zoom in to isolate areas of interest
- Visualize data related by referential integrity (RI) or application-defined relationships (AR)

Ensure Accurate Test Data with Extract Visualizer



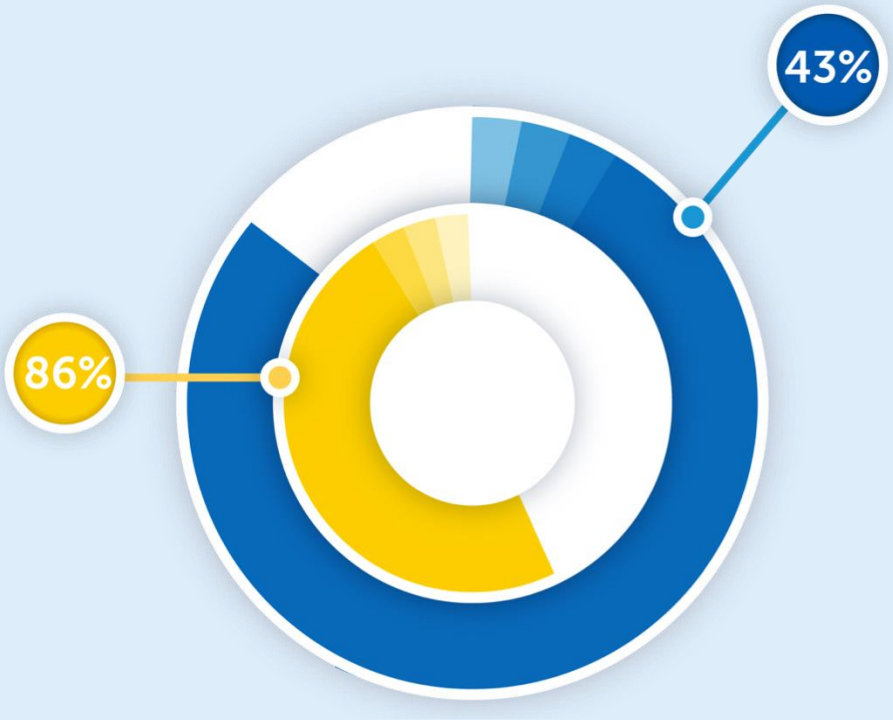
TEST DATA PRIVACY

Problems to be Solved

Production Data is Exposed

For many organizations, live customer data files represent an easy and cheap source of data to use when testing applications.

- Realistic data is needed for testing, training and analysis
- Creating related data from scratch is difficult



86% of businesses use live customer data in app testing, **but 43%** can't guarantee data is anonymized*

*Survey conducted by Vanson Bourne on behalf of Compuware

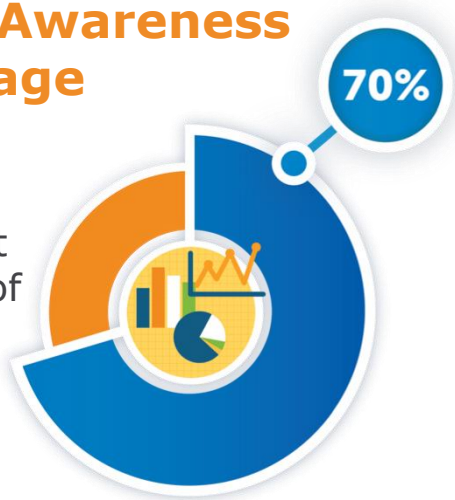
Problems to be Solved

Disguising Data is Not Easy

- Data must be disguised consistently
- Disguised data must be valid for application
- Data relationships must be preserved
- Enterprise data is complex
  - Data is stored on variety of platforms
  - Data types vary by platform

Increased Awareness of Data Usage

70% of consumers are concerned about companies use of personal data



Often unclear who is responsible for security of customer data within orgs

Challenges and obstacles: Organizational

Centralized- A single team responsible for performing the data masking function for all lines of business or application areas. This organization is also often referred to as a center of excellence model.

- Benefits
  - Fewer resources need to be trained on the data disguise software and activities;
  - Increased control over consistency of the disguise techniques and behavior; and
  - Increased productivity of these resources as they work across applications.
- Drawbacks
  - Increased effort during the Analyze phase as these resources gain the necessary application centric knowledge;
  - Increased duration as there are typically less of these resources, so more effort with less people results in long duration.

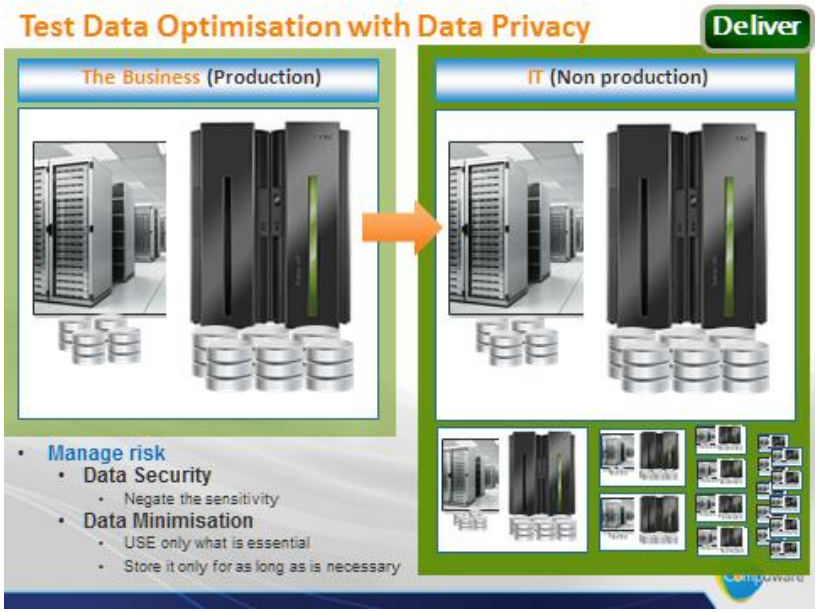
Decentralized- Each application group is responsible for the data masking functions.

- Benefits
  - Existing application domain knowledge can be leveraged;
  - The duration of Analyze phase may be shortened as activities can be performed in parallel; and
  - This model streamlines the communication model between the groups.
- Drawbacks
  - Increased effort related to training; and
  - Increased demand on communications in order to maintain consistency.

Challenges and obstacles: Addressed

General

- Users vs. Requestors
- Ownership & responsibility
- Source and target environments
- Access restrictions
- Repeatability/Reusability/Automation



Operational model

- **Managed data**
  - Create a master baseline (optionally disguised)
    - Variable scope – application wide and/or discreet data bundles
  - Manipulate the baseline data as required
  - Sub select the baseline (optionally disguise/further disguise)
  - Load the user environment
- **Automated Testing**
  - Data management 'bundles' linked with automated testing tools
- **Extract and load on demand**

Supported Data Sources

z/OS

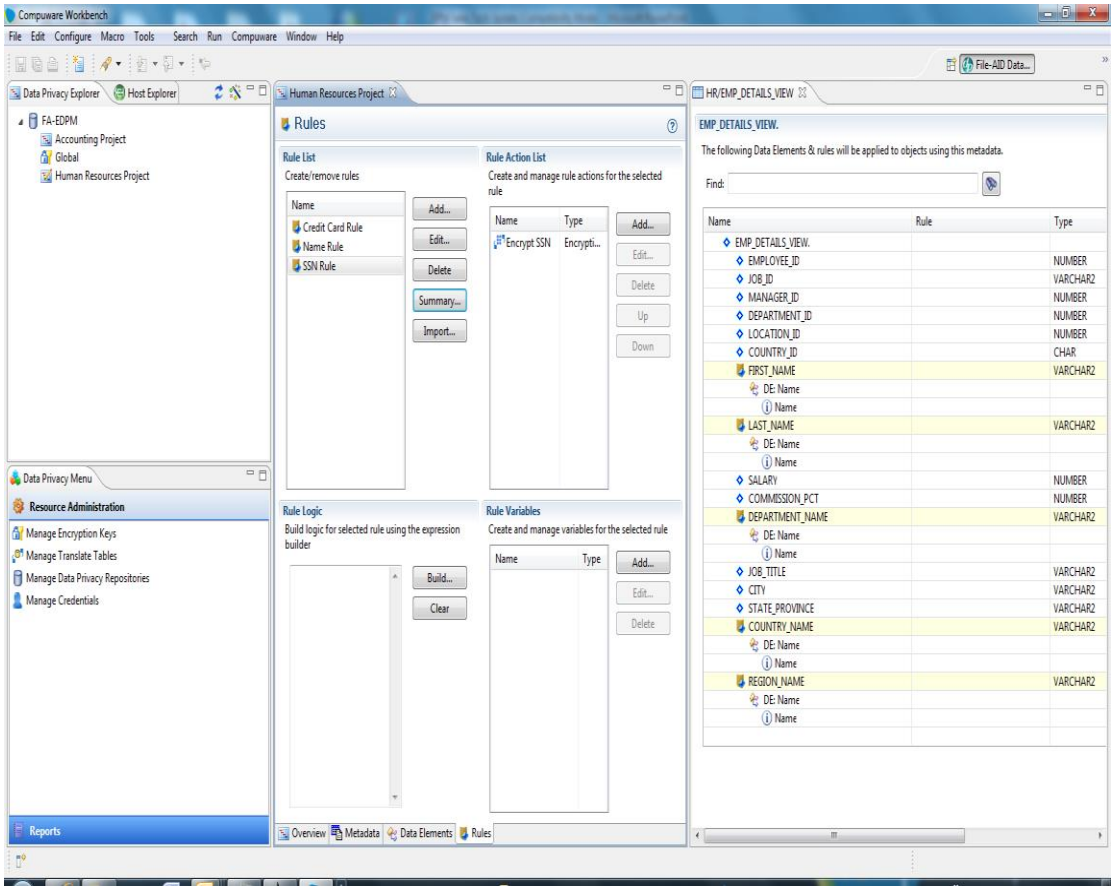
- IBM z/OS relational DB2 database
- IBM z/OS hierarchical IMS database
  - Full function and Fastpath
- z/OS flat file structures
  - VSAM, QSAM, PDS

Distributed

- Microsoft SQL Server
- Oracle
- Sybase
- IBM DB2 UDB
- Microsoft Access, Excel
- Teradata
- File structures (Delimited, fixed, XML)
- Other JDBC data sources

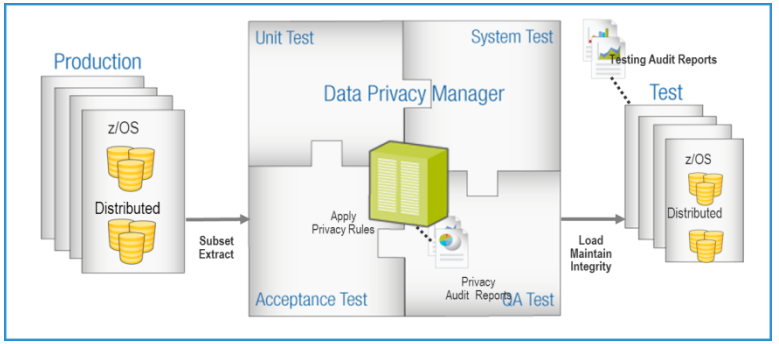
APIs available to support other applications and data types

Data Privacy Manager



- Dynamic Disguise Rule Application
- One Eclipse Based Interface
- One Enterprise Repository
- One Set of Rules
- Normalization of Data
- Consistent Audit Reporting
- Role Based Authorizations

Best Practices: Dynamic Data Privacy



- **Time Savings**
  - Single rule for data item regardless of location
  - Reduced number of disguise rules
  - The dynamic rules respond to object's metadata
- **Quicker Time to Value**
  - Rule maintenance is reduced
  - Rules are based on the metadata, not named

Example Data Elements

SSN Data Element

- 23 source data identifiers
- 149 unique field names
- 301 fields disguised

Email Data Element

- 2 source date identifiers
- 28 unique field names
- 84 fields disguised

Data Privacy Results for Auditability

Original Data	Disguised Data	Rule Applied
Mary Ward	Jill Jones	Translated
03-20-1962	04-18-1962	Aged
104 Main Street	111 State Avenue	Translated
Flint, MI 48025	Flint, MI 48025	Unchanged
370-55-2939	431-81-6492	Encrypted
4294 5730 5839 3037	42XX XXXX XXX9 3037	Masked
$300,000	$126,877	Encrypted
null	(810) 609-2873	Generated

Compuware Data Privacy

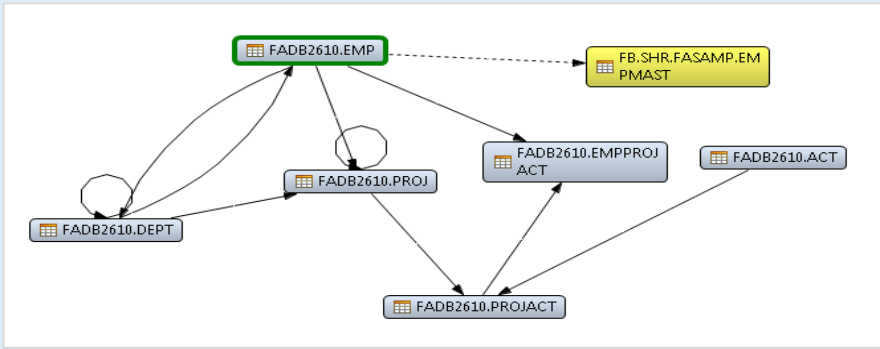
Enterprise-wide Solution

- Integrated into File-AID products
- Multi-platform implementation
- **Consistent results across platforms**
- **Manageable over time**
- Dynamic privacy rules
- Maintain relationship integrity
- Handle complex privacy requirements
- Java API
- Visualization

Proven at medium and large organizations around the world

Unique Features

- Normalization
- Overloaded and Composite processing
- Rule Logic
- Custom functions
- Two-tier translation
- Audit trails



The Mainframe Software Partner
For The Next 50 Years

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