



IRI Data Protector Suite



IRI FieldShield
PII / PHI Classification & Masking



IRI RowGen
Smart Test Data Generation



IRI CellShield
PII / PHI Search & Mask in Excel



IRI Chakra Max
DB Firewall & Dynamic Data Masking



IRI, The CoSort Company

Vendor Background

- Specializing in data management and data protection
- Innovator in data manipulation functionality and speed
- 7/8 products share 1 metadata and Eclipse GUI
- Privately owned since 1978
- Headquartered 1 hour southeast of Orlando, FL
- Resellers in more than 40 international cities

Selected IRI Data Masking Customers

Most IRI customers process and protect PII in databases, flat-files, or “big data” repositories, including Hadoop or NoSQL DBs. Others are building or testing applications. IRI’s data masking consultants and clients are mostly in healthcare and BFSI.



IRI Data Manager Suite



IRI CoSort
Sort, Transform & Report

Speed or replace batch, BI, ETL, sort, and SQL programs

- Filter, join, aggregate, pivot, cleanse, lookup, calc, etc.
- Map, migrate, federate, and replicate data from 150 sources
- Segment data, capture changes, report details / summaries
- Analyze changing dimensions, support complex transforms



IRI FACT
Fast Extract for DBs

Speed RDBMS unloads for archival, migration, reorg, and ETL

- Extract tables to flat files in parallel using SQL queries
- Convert and re-format to change data types and layouts
- Create the data definitions for IRI software and DB loads
- Pipe to CoSort and DB loaders for faster reorg and ETL



IRI NextForm
Data, File & Database Migration

Unlock data and move between apps, DBs, and platforms

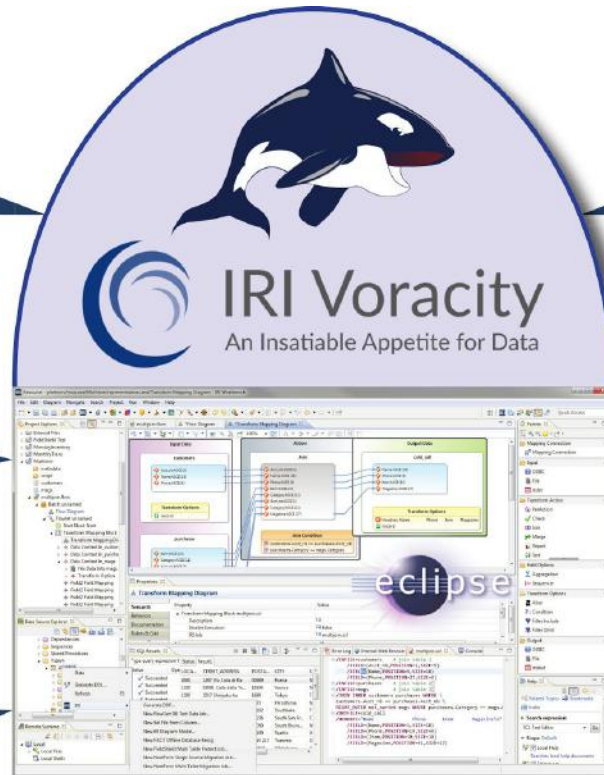
- Convert, federate, remap, and replicate legacy data
- Migrate data between databases and create new tables
- Change file formats, data types, and endian conditions
- Find, extract, and structure data in dark data documents



Total Data Management

CELEBRATING
40 YEARS
2018

The CoSort Company



Consolidate tools and tasks to process, protect, prototype, present

- Discover, define, and manage data in legacy and new sources
- Combine data integration, migration, governance, and analytics
- Exploit CoSort and Hadoop engines for optimum throughput
- Leverage Eclipse familiarity, functionality, and extensibility

IRI Data Protector Suite



IRI FieldShield
PII / PHI Classification & Masking

Comply with privacy laws, nullify breaches, govern data

- Search, profile, and classify sensitive data in DBs and files
- Encrypt, hash, redact, pseudonymize, randomize, tokenize
- Apply cross-table rules to save time and referential integrity
- Create an XML audit log of each job to verify compliance



IRI CellShield
PII / PHI Search & Mask in Excel

Profile and de-identify PAN/PHI/PII in Excel spreadsheets

- Define or use patterns to search for sensitive data
- Locate, report, and open all found ranges in the LAN
- Click to encrypt, mask, or pseudonymize data directly
- Auto-log protections to verify privacy law compliance



IRI RowGen
Smart Test Data Generation

Prototype DBs and ETL, stress-test, outsource, benchmark

- Use real data models and formats, not production data
- Combine generation and selection, create new formats
- Preserve referential integrity and frequency distributions
- Feed test DBs, files, and custom reports simultaneously



IRI Chakra Max
DB Firewall & Dynamic Data Masking

Define, monitor, block, and audit DB activity using RBAC

- High-volume, data-centric audit and protection (DCAP)
- Monitor, block, alert, and log users in real-time
- Low-impact on DB performance and availability
- Scan for, and dynamically mask, sensitive data

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Sources



Call Detail Records
ASN.1 Formats



Files & Pipes
COBOL, CSV, LDIF, LS-RS-VS, MFVL, Text, VB, Vision, XML

Mainframe
Adabas, Datacom, IDMS, IMS, ISAM, Pick, Unidata, VSAM, etc.

Semi & Unstructured
PDF, Word, Excel, PowerPoint

Other Sources
Custom Apps, ETL/ELT Tools, Packaged Apps, Web Logs

DISCOVER

Data Classification
Dark Data Search
DB & File Profiling
ER Diagramming
Metadata Definition
Metadata Forensics
Multi-Method Search

INTEGRATE

Slowly Changing Dimensions
Public/Private Mashups
Change Data Capture
Fast DB Un/Load
Data Federation
One-Pass ETL

MIGRATE

Incremental Replication
Data & File Types
Endianness
Databases
JCL Sorts
ETL Jobs

GOVERN

Data Quality
Data Masking
Data Lineage
Data Reconciliation
Test Data Generation
Metadata Management

ANALYZE

Embedded BI
Cloud Dashboard
Data Preparation
Predictive Analytics
BIRT & Splunk Feeds
Clickstream Analytics



DESIGN

Wizards with Rules
Graphical Dialogs
Scripts with Outlines
Workflow Palettes
Mapping Diagrams
Metadata Form Editors
ADS Mapping Manager

DEPLOY

CoSort CLI/API (SMP)
MapReduce (Grid)
Spark (In-Memory)
Storm (Streaming)
Tez (Batch)
Java, Kafka, SQL
Eclipse & Other Job Launchers

Targets



Custom Reports
Detail & summary reports



Files & Pipes
COBOL, CSV, LDIF, LS-RS-VS, MFVL, Text, VB, Vision, XML

Other Targets
Custom Apps, Data & SpreadMarts, ETL/ELT Tools, Federated Views, Packaged Apps, Test Suites





IRI FieldShield
PII / PHI Classification & Masking

IRI Data Protector Suite

What FieldShield Does

- Connect and interact with multiple source and target repositories, on-prem or cloud
- Discover and classify sensitive data in DB, flat-file, and dark-data sources
- Secure fields with PII, PHI, etc. via 12 built-in masking function categories
- Address multiple protections and recipients in one job script, one I/O
- Apply protection rules across tables and preserve referential integrity
- Support conditional security, i.e. based on patterns, values, or ranges
- Specify protections and layouts in Eclipse GUI and portable 4GL job scripts
- Integrate with DB apps via ODBC and .NET and Java SDK for dynamic data masking
- Retain data realism (e.g. FPE and pseudonyms) for testing and outsourcing
- Operate concurrently in big data EGL, migration, sub-setting, and BI/analytic jobs
- Log job and system runtime detail to an XML audit file to verify compliance
- Within Voracity, support streaming input and Hadoop execution paradigms

FieldShield Data Sources (Native)

Acucobol Vision	Delimited	MaxDB	SQL Server
Altibase (FACT)	Derby (WB)	Mongo (WB)	SQLite
ASN.1 TAP3	ESDS	MF-ISAM	Sybase ASA/E & IQ
BIRT DB (WB)	Excel (WB)	WF Var. Length	Tibero (WB)
BIRT Hive (WB)	ELF web logs	MySQL	Teradata (WB)
BIRT JDBC (WB)	Fixed	Oracle	Text
BIRT POJO (WB)	Heap / print	Outlook (WB)	UTF-8 & 16
C-ISAM	HSQLDB (WB)	PDF (WB)	Variable Block
CLF web logs	IDX 3, 4 & 8	PostgreSQL	Variable Sequential
CSV	Informix	Powerpoint (WB)	VSAM MVS (UniKix)
DB2 (UDB)	Ingres	Record Sequential	Web Services (WB)
DB2 for i5/OS (WB)	LDIF	RTF (WB)	Word (WB)
DB2 for z/OS (WB)	Line Sequential	SQL Anywhere	XML

FACT: requires IRI Fast Extract (FACT)

WB: requires IRI Workbench, the free Eclipse GUI for FieldShield, etc.

FieldShield Data Sources (Legacy)

Access	D3	GA-Power 95, R91	K-ISAM	Pathway	RMS
Adabas	Datacom	Gemstone	Knowledgeman	PDS	Reality/X
Advanced Pick	Dataflex	GENESIS	KSDS	PervasiveSQL	RRDS
ALLBASE	Db4o	Gigabase	Lotus	Pick/Pick64+	SAP HANA
Alpha5	dBase	H2	Manman	PI-Open	Sequoia
Amazon RDS	Desktop Adapter	IDMS	Mentor / pro	Powerflex	Sharebase
Azure	DL/1	IDS	MO	Powerhouse	Supra
BizTalk	DSM	Image	Model 204	Progress	Terracotta
Cache	Enscribe	IMS	Mumps	QueryObject	Total
Clipper	Enterprise Adapter	Interbase	MyBase	rBase	Ultimate
Codasyl	FileMaker	Intersystems	Netezza	R83	UltPlus
CorVision	Firebird	ISM	NonStop SQL	Rdb	Unidata
ConceptBase	Focus	Jasmine	ObjectStore	REALITY	Universe
D-ISAM	FoxPro	JBase	Paradox	Red Brick	VSAM VSE

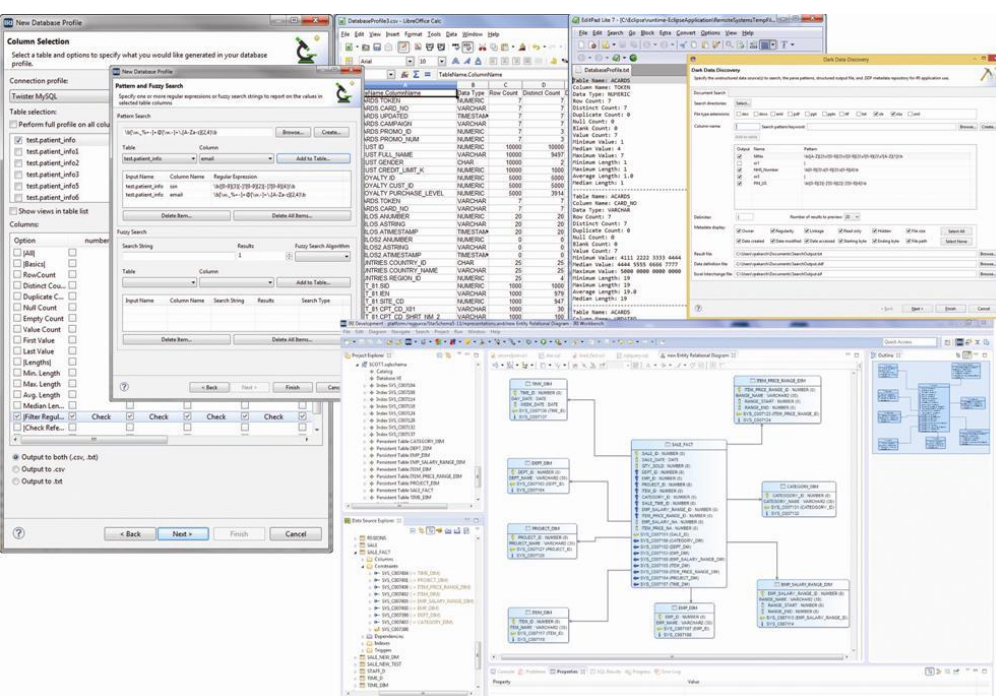
Accessible via IRI partner (CONNX) J/ODBC drivers

FieldShield Data Sources (Modern)

Amazon EMR Hive	FinancialForce	Marketo	Pivotal Greenplum
Apache Cassandra	Force.com apps	MongoDB	Pivotal HD Hive
Apache Hadoop Hive	Hortonworks Hive	MS Dynamics CRM	Salesforce.com
Cloudera CDH Hive	Hubspot	MS SQL Azure	ServiceMAX
Cloudera Impala	Lightning Connect	Oracle Eloqua	Spark SQL
Database.com	MapR Hive	Oracle Service Cloud	Veeva CRM

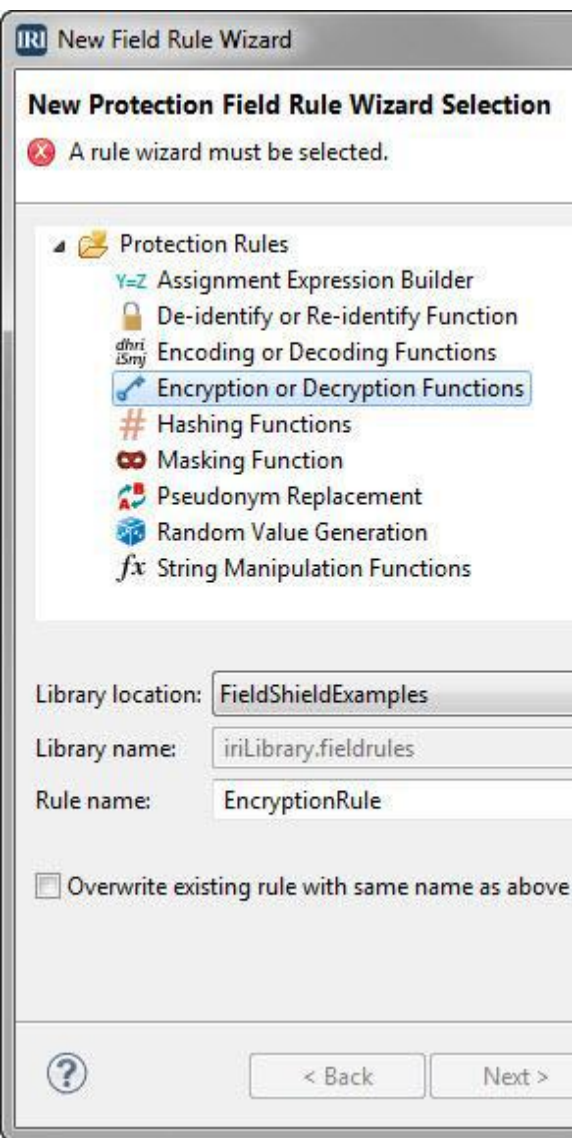
Sensitive Data Discovery - Multiple Wizards

FieldShield (and all IRI software) includes PII discovery capability, which includes cross-source data identification and classification, string (literal or dictionary), pattern, and fuzzy-logic searches, statistical reporting, and automatic metadata creation. Fit-for-purpose GUI wizards deliver:

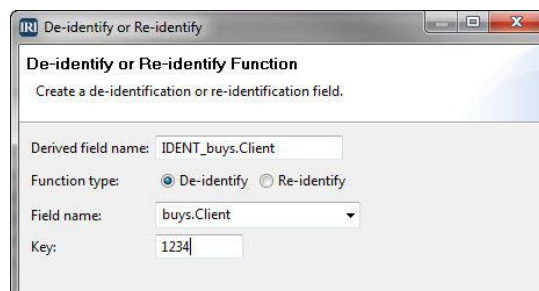


- DB and file classification, with rule matcher libraries
- DB profiling and E-R diagramming
- Dark data discovery and structuring, with metadata reporting
- Flat-file statistical and value searching
- Structured data metadata discovery and definition

Static Data Masking Functions (1-3 of 12)

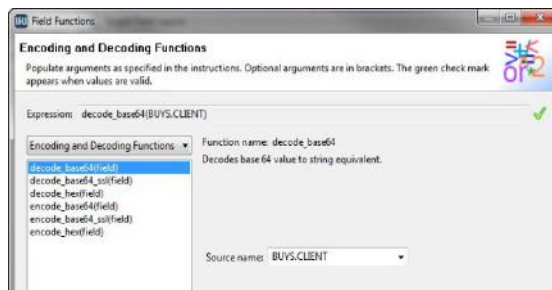


De- & Re-Identification



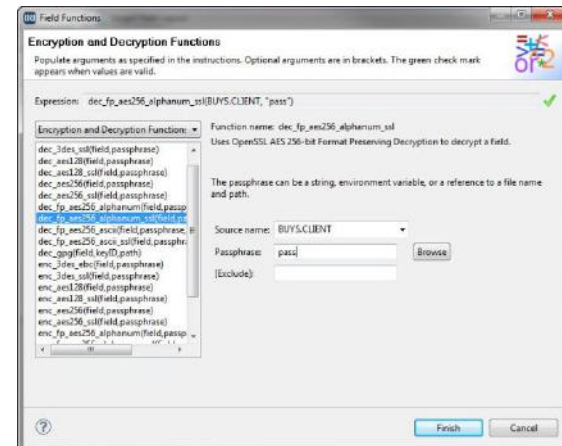
- For ASCII data
- Less secure
- Reversible

Encoding & Decoding



- Converts binary to ASCII
- Supports base64 & hex
- Reversible

Encryption & Decryption



- 3DES EBC & SSL
- AES-128 & -256 CBC
- AES-256 Format-Preserving
- GPG (PGP-compatible)
- FIPS-compliant OpenSSL
- Custom

Static Data Masking Functions (4-6 of 12)

Pseudonymization

Pseudonym Replacement

Create a pseudonym field that will use values in a set file as substitutes for the original field's values.

Pseudonymize field: \${FIELDNAME}

Use provided pseudonym list (non-recoverable)
 Name options: PseudoSetPage_grpPseudoFiles=Pseudonym Files
 Name type: First
 Sex: Male
 Order: First and Last
 Default pseudonym list file: C:\IRI\CoSort95\sets\names\names_male_first.set
 Use only unique names from pseudonym list
 (Blanks inserted when # of records is greater than # of unique names)

Use your own pseudonym list (non-recoverable)
 User pseudonym list
 Pseudonym list file: Browse...
 Use original field as a look-up into pseudonym list
 Use random draw from pseudonym list
 Use only unique names from pseudonym list
 (Blanks inserted when # of records is greater than # of unique names)

Type	Value

< Back Next > Finish Cancel

- Provides realistic names
- Reversible lookup values
- Non-reversible selection

Character Masking

Masking Function

Replaces a range of characters in the required source field with a replacement character.

Source field: \${FIELDNAME}

Use predefined masks
 Predefined Masks
 Mask Example: (0)123456789 => *****
 Mask: Whole Field

Define mask
 Arguments
 Mask character (* by default):
 Start position: Add to table
 Length:

Type	Value

< Back Next > Finish Cancel

- Partial/full-field masking
- Conditional omission
- Non-reversible

Randomization

Random Value Generation

Randomly generate a new value for this field.

Derived field name: RAND_\${FIELDNAME}

Generate random value
 Random value options
 Type: ASCII
 Random Min Size: 0
 Random Max Size: 0

Random selection from a set file
 Set file
 File: Browse...

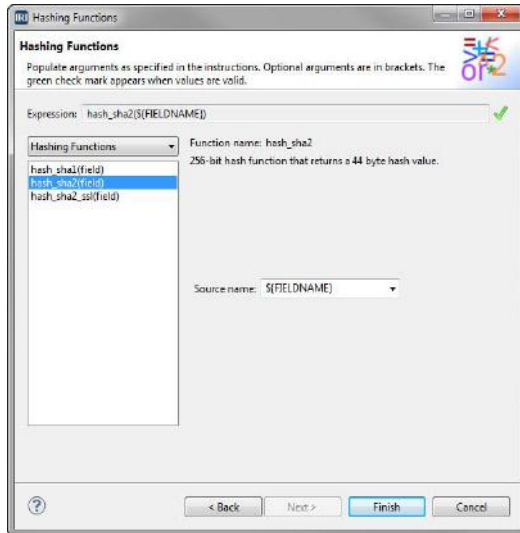
Type	Value

< Back Next > Finish Cancel

- Random data generation
- Random data selection
- Non-reversible

Static Data Masking Functions (7-12 of 12)

Hashing

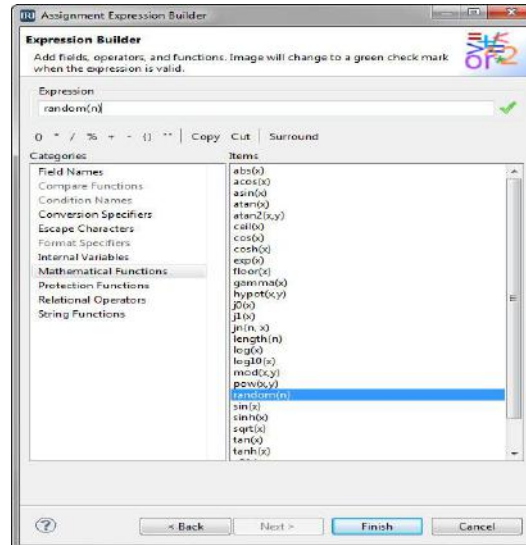


- SHA-1 & 2 cryptographic
- Returns hash of fieldstring
- Use for integrity checking

#10 Hashing

Target layout declaration with or without selection logic

Expressions

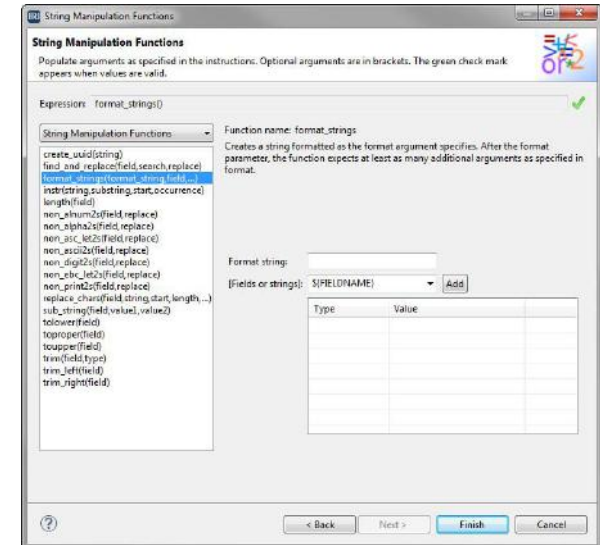


- Mathematical operations
- PCRE logic
- Custom blurring

#11 Tokenization

DB-value substitute for PCI DSS

String Manipulations



- Find, replace, and add
- Reposition and trim
- Use INSTR information

#12 Custom Function

User's field-level call

Mongo Masked

The screenshot displays the IRI Workbench interface with two windows open. The top window, titled 'IRI Development - MYDB.CUSTOMERS_MASK - IRI Workbench', shows the unmasked data for the 'CUSTOMERS' collection. The bottom window, titled 'IRI Development - Mongo/new_batch/MYDB_CUSTOMERS.fcl - IRI Workbench', shows the masked data for the 'CUSTOMERS_MASK' collection. A red arrow points from the unmasked data to the masked data, and a green arrow points from the masked data back to the unmasked data. The text '... and unmasked' is overlaid on the right side of the image.

Unmasked Data (CUSTOMERS):

PHONE [VARCHAR(4000)]	_ID [VARCHAR(24)]	ID [VARCHAR(4000)]	STATE [VARCHAR(4000)]	NAME [VARCHAR(4000)]
8514532145	5630BC2D259D18...	12409	OHIO	REID
9654125893	5630BC2D259D18...	85460	MAINE	CHARLES
9641258637	5630BC2D259D18...	95364	GEORGIA	FOSTER
2156354789	5630BC2D259D18...	15634	CALIFORNIA	TIM
3216874517	5630BC2D259D18...	85475	IDAHO	FRANK
5126987456	5630BC2D259D18...	45214	TEXAS	BOB
4582147965	5630BC2D259D18...	32567	NEVADA	DAVID
2145896732	5630BC2D259D18...	14563	NEW YORK	ISABELLE
5412395475	5630BC2D259D18...	25469	WASHINGTON	PAUL
5214596324	5630BC2E259D18...	45625	COLORADO	RON

Masked Data (CUSTOMERS_MASK):

PHONE [VARCHAR(4000)]	_ID [VARCHAR(24)]	ID [VARCHAR(4000)]	STATE [VARCHAR(4000)]	NAME [VARCHAR(4000)]
851*****	5630BC2D259D18...	12409	OHIO	REID
965*****	5630BC2D259D18...	85460	MAINE	CHARLES
964*****	5630BC2D259D18...	95364	GEORGIA	FOSTER
215*****	5630BC2D259D18...	15634	CALIFORNIA	TIM
321*****	5630BC2D259D18...	85475	IDAHO	FRANK
512*****	5630BC2D259D18...	45214	TEXAS	BOB
458*****	5630BC2D259D18...	32567	NEVADA	DAVID
214*****	5630BC2D259D18...	14563	NEW YORK	ISABELLE
541*****	5630BC2D259D18...	25469	WASHINGTON	PAUL
521*****	5630BC2E259D18...	45625	COLORADO	RON

Field Rules (CUSTOMERS_MASK):

```

/INFILE="MYDB.CUSTOMERS;
/ALIAS=MYDB_CUSTOMER;
/PROCESS=ODBC
/FIELD=(PHONE, TYPE=
/FIELD=(ID, TYPE=ASI
/FIELD=(ID, TYPE=ASC
/FIELD=(STATE, TYPE=
/FIELD=(NAME, TYPE=A

/REPORT

/OUTFILE="MYDB.CUSTOMERS
/PROCESS=ODBC
/FIELD=(MASK_PHONE=r
/FIELD=(ID, TYPE=ASI
/FIELD=(ID, TYPE=ASC
/FIELD=(STATE, TYPE=
/FIELD=(NAME, TYPE=ASCII, POSITION=5, SEPARATOR="|", EXT_FIELD="NAME")
    
```

... and unmasked

Masking et al in Hadoop, Too

IRI Development - platform/resource/Hadoop/representations.aird/Transform Mapping Diagram - IRI Workbench

File Edit Diagram Navigate Search Project Run Window Help

Quick Access

personalInformation2

1	9654-4338-8732-8128	W389-324-33-473-Q	Jessica Steffani	0
2	2312-7218-4829-0111	H583-832-87-178-P	Cody Blagg	1
3	8940-8391-9147-8291	E372-273-92-893-G	Jacob Blagg	1
4	6438-8932-2284-6262	L556-731-91-842-J	Justine Rushlo	0
5	8291-7381-8291-7489	G803-389-53-934-J	Maria Sheldon	0
6	7828-8391-7737-0822	K991-892-02-578-O	Keenan Ross	1
7	7834-5445-7823-7843	F894-895-10-215-N	Francesca Leonie	0
8	8383-9745-1230-4820	M352-811-49-765-N	Nadia Elyse	0
9	3129-3648-3589-0848	S891-915-48-653-E	Gordon Cade	1
10	0583-7290-7492-8375	Z538-482-61-543-M	Hanna Fay	0
11				

Input Data: personalInformation2

- CREDIT_CARD_ASCII (id)
- DRV_LIC_ASCII (id)
- NAME_ASCII (id)
- GENDER_ASCII (id)

Action: Sort

- personal_Info.CREDIT_CARD_ASCII (id)
- personal_Info.DRV_LIC_ASCII (id)
- personal_Info.NAME_ASCII (id)
- personal_Info.GENDER_ASCII (id)

Section Options: Process DELIMITED, Alias personal_info

Action Key: NAME

Output Data: female_personal_info_encrypted

- MASK_CREDIT_CARD_ASCII (id)
- ENC_DRV_LIC_ASCII (id)
- NAME_ASCII (id)

Section Options: Process DELIMITED, Include where GENDER EQ 0

Output Data: male_personal_info_encrypted

- MASK_CREDIT_CARD_ASCII (id)
- ENC_DRV_LIC_ASCII (id)
- NAME_ASCII (id)

Section Options: Process DELIMITED, Include where GENDER EQ 1

Run Configurations: Create, manage, and run configurations

Name: Hadoop_demo

File: Hadoop/HadoopDemo.scl

Working directory: /user/java/demo/

Engines: Map Reduce 2, Spark, Spark Stream, Storm, Tez

Map once, deploy anywhere

demo

- female_personal_info_encrypted
- male_personal_info_encrypted
- chefs.txt
- personalInformation
- personalInformation2
- purchases

Name	Size	Modified
female_personal_info_encrypted		11/17/2016 07:59:00
male_personal_info_encrypted		11/17/2016 07:59:29
chefs.txt	2 KB	11/16/2016 15:50:55
personalInformation	1 KB	11/16/2016 15:48:21
personalInformation2	1 KB	11/21/2016 10:20:54
purchases	1 KB	11/16/2016 15:23:50

Data Viewer: File: /user/java/demo/male_personal_info_encrypted/hgrid247-00000

```
*****0111 78]?cU=bnRj0_zq:I Cody Blagg
*****0848 MNRMa?''Q8jB4PJ> Gordon Cade
*****8291 b"mJc45uq*Z=(YB8 Jacob Blagg
*****0822 >Qu:xQ8cYIM-ck*1H Keenan Ross
```

Data Viewer: File: /user/java/demo/female_personal_info_encrypted/hgrid247-00000

```
*****7843,a"oTajcsS]?xGH/yG,Francesca Leonie
*****8375,10#?9CS'erDe'4F,Hanna Fay
*****8128,QW0>x0W51rURz2M-J,Jessica Steffani
*****6262,jVR Y:1jM7xA07p1C,Justine Rushlo
*****7489,} u,E4M2K6YtzXvzC,Maria Sheldon
```


IRI Dynamic Data Masking Options

Method	Operation
ODBC Select / Update	Apply protections with precision to any given column value(s) in qualifying row(s)
DB App Invocation	Use .NET or Java SDK library functions or system-call job scripts on the fly
<i>In-Situ</i> Redaction	User and SQL-specific full and partial column masking on query (Chakra Max)
Custom I/O Procedures	Drive real-time application data directly to/from FieldShield jobs in memory
Real-Time Processing	Hadoop Spark and Storm processing of dynamic input streams in Voracity

Encryption Key Management Options

1. Passphrase (key string) embedded in script
2. String as environment variable
3. String in (securable) key file
4. Multi-factor authentication via Townsend Security Alliance Key Manager

Audit Log Management

QEMU (6200) vortex.iri.com:6200

IRI Development - FieldShield_Table_File/scl/FSlog.xml - IRI Workbench

File Edit Navigate Search Project Run Design Window Help

Quick Access

Project Explorer

- map_name1.set 3
- name_match.scl 3
- password 3
- patient_dec.scl 3
- patient_enc.scl 33
- patient_record.ddf 3
- FS-Tables.SQL 10
- Notes.html 10
- patient_record.data 3
- pr_metadata.ddf 10
- Flow 66 repo
- JCL_SORT_Convert 55 repo
- NextForm_Data_Migration 52 repo
- NextForm_DB_Migration 9 repo
- NextForm_Multi_Table_Migration 21 repo
- Offline_DB_Reorg 77 repo
- RowGen_Test_DB_Data 45 repo
- RowGen_Test_File_Data 69 repo
- SCD 82 repo
- Telecom 78 repo
- zSchema 12 repo

FSlog.xml

```

1 <?xml version="1.0" encoding="UTF-8" standalone="yes"?>
2 <AuditTrail>
3 <AuditRecord>
4 <Product>CoSort</Product>
5 <Version>9.5.3</Version>
6 <VersionTag>R95140122-1600</VersionTag>
7 <Serial>99999.demo</Serial>
8 <OperatingSystem>Windows 7</OperatingSystem>
9 <User>IRIDEMO</User>
10 <ProcessId>1396</ProcessId>
11 <Terminal>console</Terminal>
12 <Program>sortcl</Program>
13 <Command>/spec=patient_enc.scl </Command>
14 <StartTime>2014-02-20 13:31:49</StartTime>
15 <EndTime>2014-02-20 13:31:54</EndTime>
16 <RunTime>00:00:05</RunTime>
17 <ReturnCode>0</ReturnCode>
18 <ErrorMessage>normal return</ErrorMessage>
19 <RecordsProcessed>10</RecordsProcessed>
20 </Script>

```

FSlog.xml

Node	Content
VersionTag	R95140416-1006
Serial	99999.demo
OperatingSystem	Windows 7
User	IRIDEMO
ProcessId	3732
Terminal	console
Program	sortcl
Command	/spec=patient_enc.scl
StartTime	2014-09-09 05:22:16
EndTime	2014-09-09 05:22:17
RunTime	00:00:01
ReturnCode	0
ErrorMessage	normal return

Design Source

Console Problems Properties SQL Results Scheduler

FSlog.xml - FieldShield_Table_File/scl

Resource	Property	Value
Info	derived	false
	editable	true
	last modified	December 21, 2015 at 9:27:50 AM
	linked	false
	location	C:\IRI\CoSort95\workbench\workspace\FieldShield_Table_File\scl\FSlog.xml
	name	FSlog.xml
	path	/FieldShield_Table_File/scl/FSlog.xml
	size	45,058 bytes

Data Source Explorer

- Database Connections
 - BIRT Classic Models Sample Databases
 - Oracle (Oracle v. 0.2.0.2.0 - Productive)
 - XE
- ODA Data Sources
 - Classic Models Inc. Sample Database
 - Excel Data Source
 - Flat File Data Source
 - Hive Data Source

FSlog.xml - FieldShield_Table_File/scl

11:29 AM 12/22/2015

User Profiles

- Vertical industries and governmental agencies storing, processing, or outsourcing applications with sensitive data, such as:
 - Banks
 - Health Care
 - Census / Tax
 - Insurance
 - Defense
 - Schools
- Application, DB, and DW users handling sensitive data
- CISOs, compliance teams, consultants, IT managers, and solution architects

Use Cases

Tesco Bank/RBS UK

- Decrypt and re-encrypt fields in credit card migration and test files
- Generate and manage encryption and user ID keys
- Other projects protect 38,265 records per minute on Windows

Accenture Singapore

- Design and run encryption and masking jobs on Linux servers
- Secure PHI for the Ministry of Health Holdings (MOHH)'s Oracle DB
- Row sequencing and job audits

Medicx Media Solutions USA

- Encryption and hashing functions to PII and PHI in geo-medical consumer health databases
- Exceeds HIPAA requirements in provisioning mScores™ data to digital and direct marketers

Key Differentiators

Developer Support

- Version controls
- Master data definition
- Secure key management
- Project management (teaming)
- SDK supports .NET and Java calls
- Source data and metadata discovery
- XML job audit logs (for verifying privacy law compliance)

Price Performance

- The data-centric security tool with:
 - ➔ The most sources
 - ➔ The most protection functions
 - ➔ The most target file formats
- Fastest standalone protection software

One-Stop-Shop

- Extract, Transform, and Load (ETL)
- Data and DB migration
- Test data generation
- Advanced BI
- Reporting

Ease-of-Use

- Familiar Eclipse GUI
- Self-documenting 4GL syntax
- Easy management and modification of jobs/metadata

Competitive Advantages

vs. IBM

- FieldShield scripts simpler than Optim interoperability model and Javascript options
- Seamless integration with more sources
- More functions
- Lower cost

vs. CA (Grid-Tools)

- FieldShield's CoSort engine is faster than Grid-Tool's Fast Data Masking
- Tight integration with data profiling, ETL, data quality, and BI operations
- Multi-target/format options
- Lower cost

vs. Informatica

- FieldShield DDM inclusive with product (compared to Informatica's upgrade)
- More protection functions
- Integration with Eclipse and Excel
- Access to 4GL scripts
- Lower cost

vs. GRT

- FieldShield has more masking and encryption functions
- Hash, decode, and pseudonymize functions
- Faster and more extensible in the IRI Workbench IDE
- Lower cost



IRI CellShield
PII / PHI Search & Mask in Excel

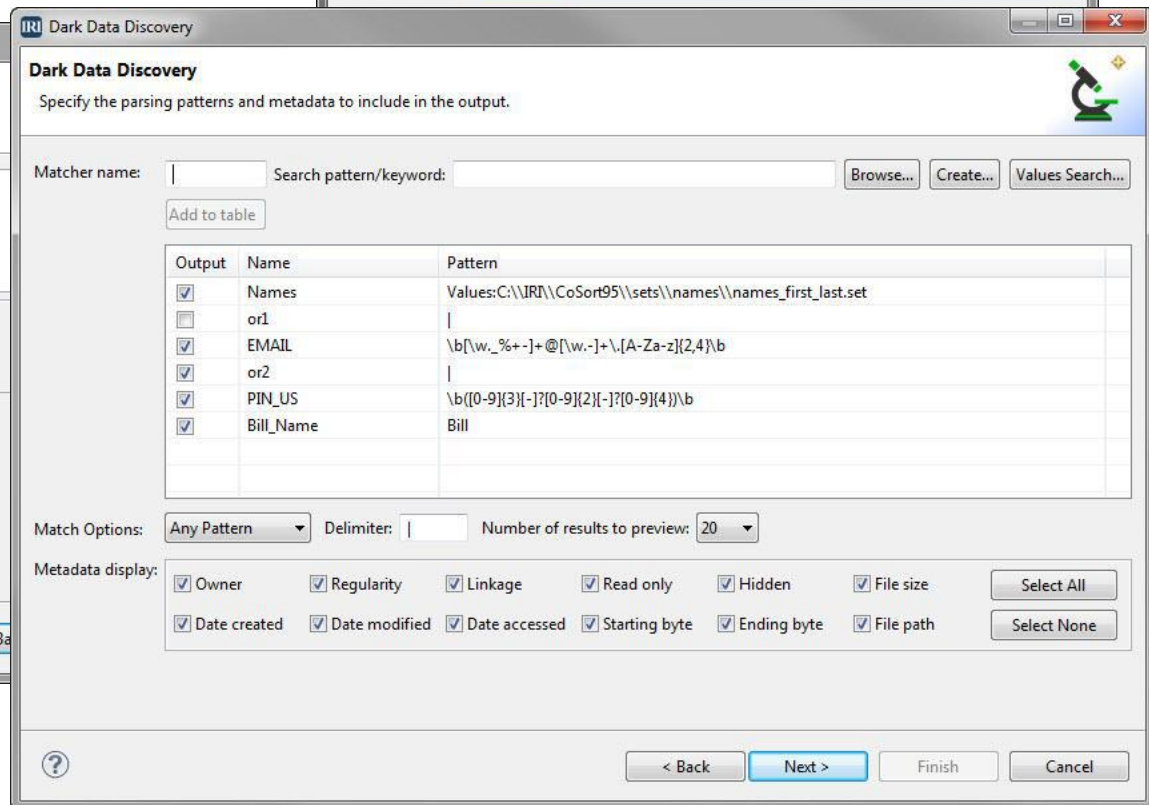
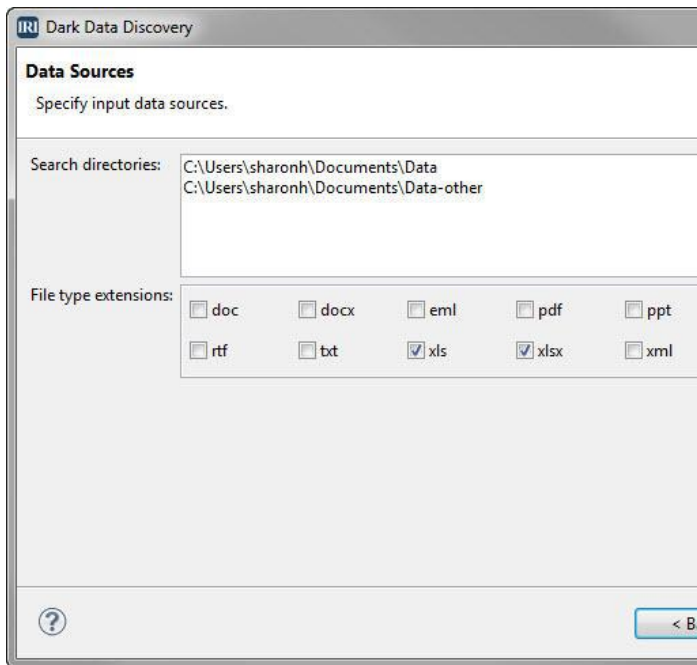
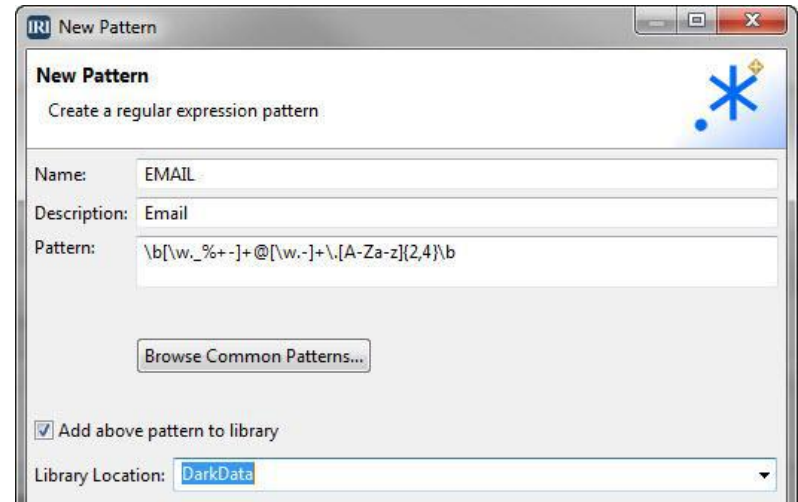
IRI Data Protector Suite

What CellShield Does

- Discover, report, and mask PII and perform audit actions in Excel 2010 & 2013
- Search & secure spreadsheets (and other dark data) throughout a LAN
- Provide common and allow new search pattern definitions for PII formats
- Search for strings in a dictionary, and find/fix PII *floating* in cells
- Support reuse and sharing of patterns in project or cloud repositories
- Generate a report of all patterns found and open it for action in a worksheet
- Open applicable worksheets and highlight the located ranges for protection
- Click to encrypt, mask, or pseudonymize with supplied functions and options
- Reveal data with the decryption key, or if reversible pseudonym was used
- Overlay results directly into the affected cells or in another worksheet
- Move between or bulk-remediate all identified worksheets and ranges
- Auto-insert protection details into an un-editable audit column in the report

CellShield PII Discovery

The dark data profiling wizard in the IRI Workbench searches network-wide for sensitive data in spreadsheets based on user-specified (plus popular and saved) Java regular expressions (patterns):



CellShield Reporting

The report produced by the profiling wizard opens in a dynamic worksheet supported by an action dialog for protection and auditing activities

The screenshot shows a Microsoft Excel spreadsheet titled "SearchOutput.eif - Microsoft Excel non-commercial use". The spreadsheet contains a table with columns: A (checkbox), B (File Path), C (File Name), D (Sheet Name), E (Pattern Name(s)), and F (Pattern). The table lists five files with their respective paths, names, sheet names, and patterns. A dialog box titled "CellShield Spreadsheet Selector" is overlaid on the spreadsheet, showing fields for Interchange File, Workbook, Sheet Name, Column, Start Row, End Row, Name of Pattern, and Pattern. The dialog also includes a "Bulk Remediate" section with dropdown menus for "Choose Pattern" and "Choose Protection Type", and buttons for "Open Selected Workbook" and "Remediate".

A	B	C	D	E	F
	File Path	File Name	Sheet Name	Pattern Name(s)	Pattern
<input checked="" type="checkbox"/>	C:\Users\rpekarch\Documents\Testing Documents for DDD\NamesNHSN1.xlsx	NamesNHSN1.xlsx	Sheet1	NHS_Number	\b[0-9]{3}\s[0-9]{3}\s[0-9]{4}\b
<input checked="" type="checkbox"/>	C:\Users\rpekarch\Documents\Testing Documents for DDD\NamesNHSN2.xls	NamesNHSN2.xls	Sheet1	NHS_Number	\b[0-9]{3}\s[0-9]{3}\s[0-9]{4}\b
<input checked="" type="checkbox"/>	C:\Users\rpekarch\Documents\Testing Documents for DDD\NamesNHSN3.xlsx	NamesNHSN3.xlsx	Sheet1	NHS_Number	\b[0-9]{3}\s[0-9]{3}\s[0-9]{4}\b
<input checked="" type="checkbox"/>	C:\Users\rpekarch\Documents\Testing Documents for DDD\NamesNHSN4.xls	NamesNHSN4.xls	Sheet1	NHS_Number	\b[0-9]{3}\s[0-9]{3}\s[0-9]{4}\b
<input checked="" type="checkbox"/>	C:\Users\rpekarch\Documents\Testing Documents for DDD\NamesNHSN5.xlsx	NamesNHSN5.xlsx	Sheet1	NHS_Number	\b[0-9]{3}\s[0-9]{3}\s[0-9]{4}\b
<input checked="" type="checkbox"/>	C:\Users\rpekarch\Documents\Testing Documents for DDD\NamesNINo1.xls	NamesNINo1.xls	Sheet1	NINo	\b([A-Z]{2})\s?[0-9]{2}\s?[0-9]{2}\s?
<input checked="" type="checkbox"/>	C:\Users\rpekarch\Documents\Testing Documents for DDD\NamesNINo2.xlsx	NamesNINo2.xlsx	Sheet1	NINo	\b([A-Z]{2})\s?[0-9]{2}\s?[0-9]{2}\s?
<input checked="" type="checkbox"/>	C:\Users\rpekarch\Documents\Testing Documents for DDD\NamesNINo3.xls	NamesNINo3.xls	Sheet1	NINo	\b([A-Z]{2})\s?[0-9]{2}\s?[0-9]{2}\s?
<input checked="" type="checkbox"/>	C:\Users\rpekarch\Documents\Testing Documents for DDD\NamesNINo4.xlsx	NamesNINo4.xlsx	Sheet1	NINo	\b([A-Z]{2})\s?[0-9]{2}\s?[0-9]{2}\s?
<input checked="" type="checkbox"/>	C:\Users\rpekarch\Documents\Testing Documents for DDD\NamesNINo5.xls	NamesNINo5.xls	Sheet1	NINo	\b([A-Z]{2})\s?[0-9]{2}\s?[0-9]{2}\s?

CellShield Protection

Perform point-and-click encryption and decryption, masking (full or partial cell), or pseudonymization (reversible and nonreversible) of the applicable ranges within the spreadsheets in the report:

The screenshot displays the Microsoft Excel interface with the CellShield ribbon active. The spreadsheet contains patient information with columns for ID, Name, Address, and State. Three dialog boxes are overlaid on the spreadsheet:

- Data Encryption:** Prompts for a range of cells to encrypt and a pass phrase. It offers encryption types like 'enc_3des_etc' and 'enc_aes128'. Options include sending encrypted data to a new spreadsheet or replacing the selected range with encrypted data.
- Data Mask/Redact:** Allows selecting a range of cells to mask and specifying a masking character. Options include masking the whole field or a partial field, and sending masked data to a new spreadsheet or replacing the range with masked data.
- Pseudonymization:** Prompts to select a recoverable or non-recoverable restore set to prevent data restoration. The 'Recoverable' option is selected.
- CellShield Spreadsheet Selector:** Shows the current file path, workbook, and sheet name. It also displays a pattern for NHS numbers: 'NHS_Number' with the pattern '\b[0-9]{3}\s[0-9]{3}\s[0-9]{4}\b'.

ID	Name	Address	State
74	David Davis	4154 Andell Road	CA
75	Jason Harrison	3652 Sherwood Circle	IL
76	Joseph Branham	2764 Junkins Avenue	TX
77	Deborah Pryor	2457 Delaware Avenue	AZ
78	Duane Johnson	4129 Parkway Drive	NM
79	Brooke Boldt	1745 Hilltop Haven Drive	TX
80	Adolfo Jackson	277 Late Avenue	TN
81	Eddy Webster	4068 Boundary Street	CA
82	Max Boone	1209 Newton Street	IL
83	Valentin Welch	4814 Emily Renzelli Boulevard	TX
84	Sandra Abad	1857 Steele Street	AZ
85	Jessie Rosenbaum	463 Loving Acres Road	NM
86	Charles Sawyer	4065 Polk Street	TX
87	David Stanley	4014 Cooks Mine Road	TX
88	Janet McCann	2719 Thrash Trail	TN
89	Charles Russo	4222 Lords Way	CA
90	Mary Mc		
91	James Brc		
92	Melissa Wa		
93	David Ma		
94	Benjamin Ha		
95	Larry Har		
96	Jesse Par		
97	Doris Fos		
98	Julia Goi		
99	Dorothy Bie		
100	Romaine Mc		
101	Ann Hu		
102	Debbie Car		
103	Francis Wh		
104			

CellShield Intra-Cell Search & Mask

Feature finds and fixes floating PII, *ad hoc*, or *en masse*

The screenshot displays the Microsoft Excel interface with the 'Intra-Cell Search' dialog box open. The dialog box is configured with the following settings:

- Name of Pattern: CREDIT_CARD
- Pattern: `\b(?:<Visa>4[0-9]{12}(?:[0-9]{3})?)?(?:<Master`
- Masking Character: #
- Search Scope: Partial String (selected)

A 'Match Count' popup window is also visible, stating: 'Found 68259 matches in the file.' The background spreadsheet shows a list of individuals with their personal information and associated comments. The 'Comment' column contains text that has been partially masked with '#' characters, indicating the search results.

Name	City	State	CCNumber	NationalID	Comment
Sarah	Perez	Sacramento	CA	5172220379670164	This is a comment with CC# 5277602665938940, and ID 797-25-6593, which includes duplicate string
Kenneth	Dolan	Savona	NY	5439944787043735	This is a comment with CC# 5277602665938940, and ID 797-25-6593, which includes duplicate string
Justin	Kenney	San Antonio	TX	4929315916943055	ID 797-25-6593, which includes duplicate strings in the comments 4916854731597212, 841-01-7611,
Chris	Jones	Clancy	MT	4532133809760265	This is a comment with CC# 5277602665938940, and ID 797-25-6593, which includes duplicate string
Maria	Siegel	Springfield	MA		This is a comment with CC# 5277602665938940, and ID 797-25-6593, which includes duplicate string
James	Miraglia	Hillsboro	OR	5302522835404333	
Beth	Cave	Boulder	CO	4916247070135936	This is a comment with CC# 5277602665938940, and ID 797-25-6593, which includes duplicate string
Herman	Pascua	Washington	DC	4916210045532181	no comments
Edward	Spencer	Sacramento	CA		This is a comment with CC# 5277602665938940, and ID 797-25-6593, which includes duplicate string
Bernice	Mireles	Warner Springs	CA	4556458974584484	This is a comment with CC# 5277602665938940, and ID 797-25-6593, which includes duplicate string
Bruce	Hale	Solomons	MD	5366411880014226	ID 797-25-6593, which includes duplicate strings in the comments 4916854731597212, 841-01-7611,
Cheryl	Almond	Hitterdal	MN	453900631097799	This is a comment with CC# 5277602665938940, and ID 797-25-6593, which includes duplicate string

CellShield Auditing

An uneditable log entry for the protection applied to each pattern identified in the report is automatically appended on each action:

The screenshot displays the Microsoft Excel interface with the CellShield ribbon active. The ribbon includes options like 'Show/Hide Comment', 'Show All Comments', 'Show Ink', 'Unprotect Sheet', 'Protect Workbook', 'Share Workbook', 'Track Changes', and 'Protect and Share Workbook'. Below the ribbon, a comment box shows the following text: '3:A103 using # for characters 1 to 3, User: tupanu\rpekarch, Time Stamp: 6/16/2015 10:18:44 AM'.

The main spreadsheet area shows a table with columns F through J. The 'Comment' column contains the following entries:

Column	Start Row	End Row	Comment	
-9]{4}\b	A	3	103	Action: Masked A3:A103 using # for characters 1 to 3, User: tupanu\rpekarch, Time Stamp: 6/16/2015 10:18:44 AM
-9]{4}\b	G	1	101	Action: Encrypted G1:G101 using enc_fp_aes256_alphanum, User: tupanu\rpekarch, Time Stamp: 6/16/2015 10:18:44 AM
-9]{4}\b	G	1	101	
-9]{4}\b	G	1	101	
-9]{4}\b	G	1	101	
:?[0-9]{2}\s?[0-9]{2}\s?[A-Z]{1}\b	A	3	103	Action: Encrypted 3:103 using enc_3des_etc, User: tupanu\rpekarch, Time Stamp: 6/16/2015 10:18:44 AM
:?[0-9]{2}\s?[0-9]{2}\s?[A-Z]{1}\b	G	1	101	Action: Encrypted 1:101 using enc_3des_etc, User: tupanu\rpekarch, Time Stamp: 6/16/2015 10:18:44 AM
:?[0-9]{2}\s?[0-9]{2}\s?[A-Z]{1}\b	G	1	101	Action: Encrypted 1:101 using enc_3des_etc, User: tupanu\rpekarch, Time Stamp: 6/16/2015 10:18:44 AM
:?[0-9]{2}\s?[0-9]{2}\s?[A-Z]{1}\b	G	1	101	Action: Encrypted 1:101 using enc_3des_etc, User: tupanu\rpekarch, Time Stamp: 6/16/2015 10:18:44 AM
:?[0-9]{2}\s?[0-9]{2}\s?[A-Z]{1}\b	G	1	101	Action: Encrypted 1:101 using enc_3des_etc, User: tupanu\rpekarch, Time Stamp: 6/16/2015 10:18:44 AM

The 'CellShield Spreadsheet Selector' dialog box is open, showing the following configuration:

- Interchange File: C:\Users\rpekarch\Documents\SearchOutput.eif
- Workbook: C:\Users\rpekarch\Documents\Testing Documents for DDD\NamesNHSN1.xlsx
- Sheet Name: Sheet1
- Column: A
- Start Row: 3
- End Row: 103
- Name of Pattern: NHS_Number
- Pattern: \b[0-9]{3}\s[0-9]{3}\s[0-9]{4}\b

At the bottom of the dialog, there are options for 'Bulk Remediate' (Choose Pattern and Choose Protection Type) and an 'Open Selected Workbook' button.



IRI RowGen
Smart Test Data Generation

IRI Data Protector Suite

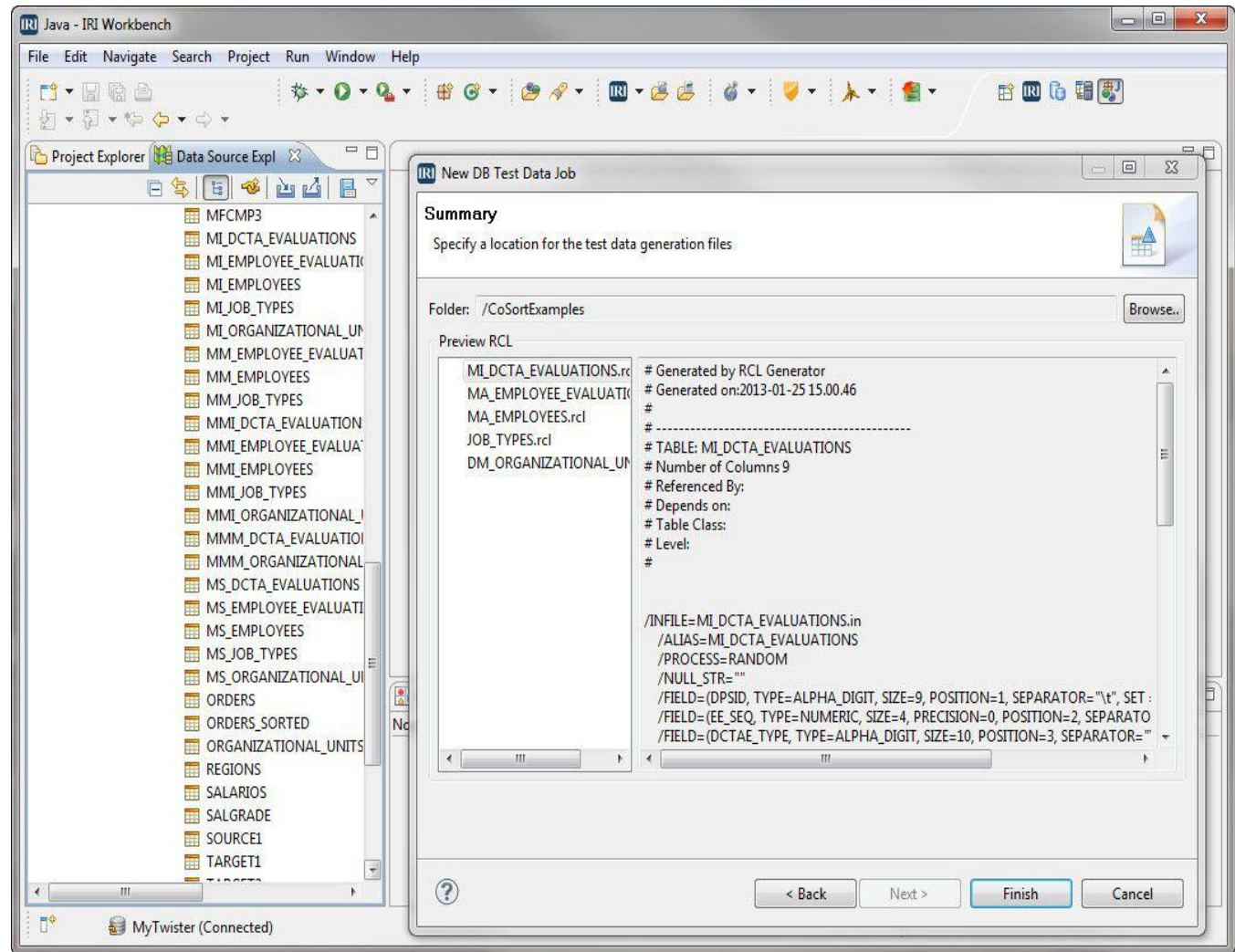
What RowGen Does

- Create synthetic but realistic random and random-real test data simultaneously
- Improve DB prototypes, application quality, benchmarking, and outsourced operations
- Use standard DB DDL, production file, and custom metadata to define layouts
- Preserve structural and referential integrity of real EDW DBs for testing
- Produce data in any types, structure, volumes, value ranges, and if condition
- Synthesize composite data values and custom (master) data formats
- Generate computationally valid and invalid NID (Codice Fiscale, etc.) SSNs, and CCNs
- Set and graph test data value distributions (linear, normal, random, etc.)
- Apply common attribute rules (like lookups) rules for pattern-matched field names
- Filter, transform, and pre-sort test data while it's being generated
- Write loader metadata and perform direct path loads for test DB populations
- Build test flat-file and custom/structured detail and summary report targets
- Subset and mask databases automatically for test purposes
- Provide SDK functions for generating test data in Java apps and Hadoop

Use Existing Data Models and Metadata

Build Test Data for:

- CoSort
- DataStage
- DB2
- Hadoop
- Informatica
- NoSQL DBs
- Oracle
- SQL Server
- Sybase
- Teradata
- CSV
- XML
- LDIF
- COBOL



DB Subsetting with the Masking Option

RowGen's subsetting and test data generation wizards facilitate DB and EDW prototyping. Smaller, referentially-correct copies of larger table extracts ensure production data is safe and test data is realistic. Masking secures the sensitive information in them.

The image displays four overlapping screenshots of the IRI RowGen 'Subset Job' wizard, illustrating the steps for creating a database subset with masking options.

- Table Selection:** The first screenshot shows the 'Table Selection' step. The 'Connection profile' is 'Oracle twister'. A list of tables is shown, with 'QA.SALE_FACT' selected. The 'Number of Rows (Subset Size)' is set to 100.
- Sort and Key Fields:** The second screenshot shows the 'Sort' and 'Key Fields' configuration. Under 'Input Fields', 'QA.SALE_FACT;DSN=oratwist;' is selected. Under 'Key Fields', 'SALE_ID' is selected. The 'Number of Rows (Subset Size)' remains at 100.
- Data Targets:** The third screenshot shows the 'Data Targets' step. The 'Imported by' field is empty. The 'Name' field is 'QA.SUB_SALE_FACT'. The 'Imports' field lists related tables: 'QA.CATEGORY_DIM', 'QA.DEPT_DIM', 'QA.EMP_DIM', 'QA.EMP_SALARY_RANGE_DIM', and 'QA.ITEM_DIM'.
- Subset Targets:** The fourth screenshot shows the 'Subset Targets' step. A tree view shows the subset target 'Outfile QA.SUB_SALE_FACT' and its related targets. The 'Target Column Layout...' button is visible.

Navigation buttons at the bottom of the wizard include '< Back', 'Next >', 'Finish', and 'Cancel'.

User Profiles

Anyone doing DB testing, app development, stress-testing, or benchmarking, including:

- Developers (programmers)
- DBAs and DW (ETL) architects
- Analysts and consultants

Use Cases

Bank of Montreal

- Generates safe, realistic 20GB Oracles tables with RI for query testing

MasterCard Peru

- Synthesizes PAN and PII in files to support OLTP and app testing

Transitive UK

- Simultaneously creates and transforms data to test cross-OS virtualization

Key Differentiators

1. Big data generation and population performance
(embedded CoSort pre-sorting engine speeds bulk loads)
2. Synthetic data that's broader and safer than real data
3. Concurrent test data manipulation and reporting
4. Familiar Eclipse IDE and simple, portable, modifiable test data generation and auto-built DB loader scripts
5. Metadata compatibility with IRI DM
(and third-party ETL, BI, etc. platforms via AMM/MIMB)



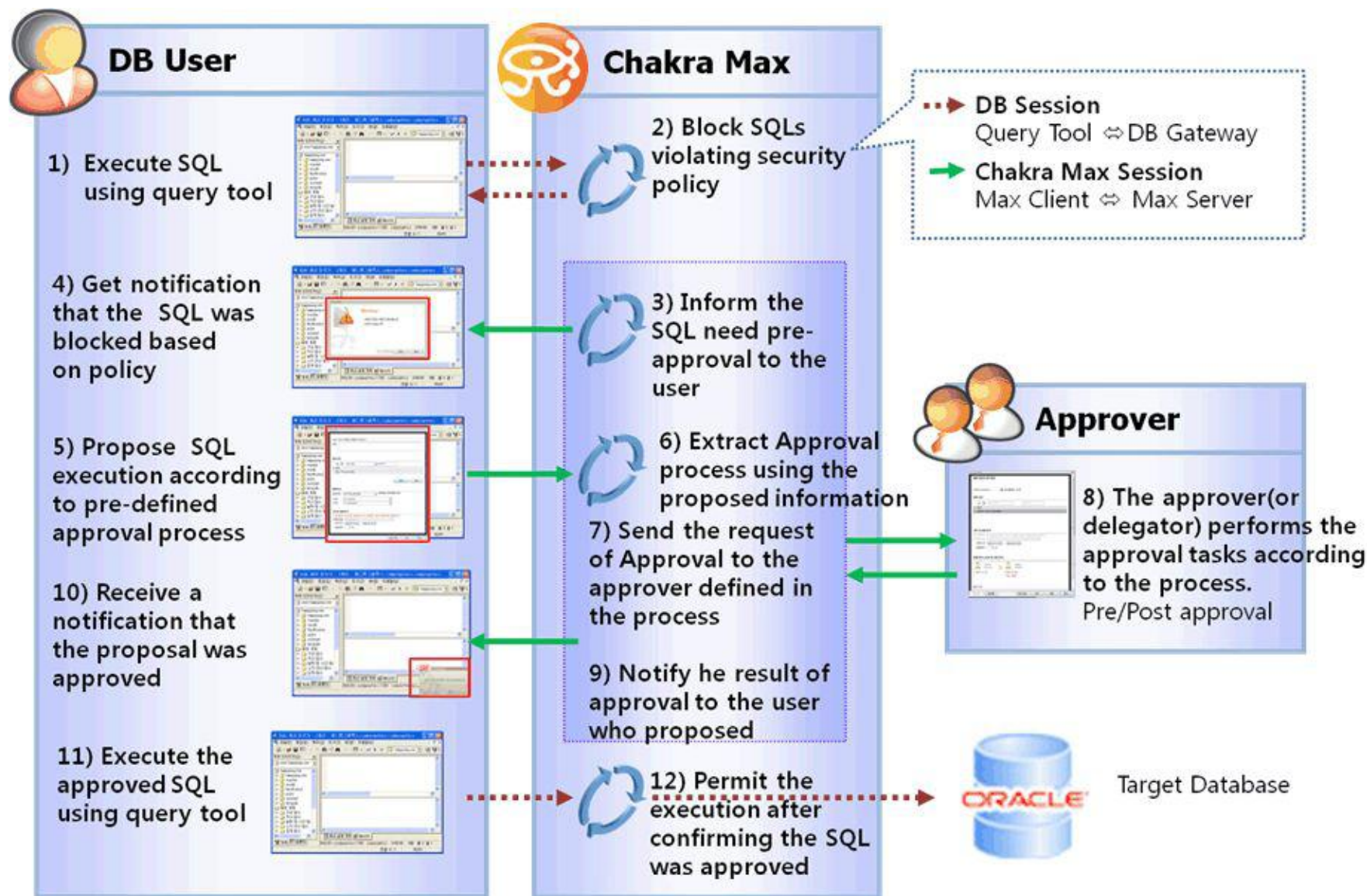
IRI Chakra Max
DB Firewall & Dynamic Data Masking

IRI Data Protector Suite

What Chakra Max Does

- High-volume, data-centric audit and protection (DCAP) for 20 different databases
- Monitor, block, alert, and log users and traffic in real-time without impacting DB performance or availability
- Control DB access and permissible SQL executions by user and rule
- *Mask data dynamically* with full or partial field value redaction
- Apply policies across multiple DB instances at once
- PII access logging
- ISO 27001-compliant activity reporting and log analysis
- Uses a 3-tier Web Application Server (WAS) agent to collect packets between the client and DB, and it monitors and controls them

Chakra Max Overview



Real-Time Monitoring & Auditing

The screenshot displays the Chakra Max monitoring interface. The main window shows a table of database metrics with columns for Database Type, Site, Database, Sessions, Number of SQL, Avg. Response Time, Network Traffic (bps.), Rows, and Database Group. The table lists various databases including MySQL, MSSQL Server, DB2 for iSeries, ORACLE, Cubrid, PostgreSQL, and Sybase ASE across different sites.

Database Type	Site	Database	Sessions	Number of SQL	Avg. Response Time	Network Traffic (bps.)	Rows	Database Group
MySQL	site A	MySQL 1 / 21b.40.10...	0	0	0	0	0	2. DB
MSSQL Server	site A	MSSQL Server 172.1...	0	0	0	0	0	2. DB
DB2 for iSeries (OS/...	site A	DB2 for iSeries (OS/...	0	0	0	0	0	2. DB
ORACLE	site A	ORACLE 172.16.40.1...	9	1	0	0	0	2. DB
ORACLE	site A	ORACLE 172.16.40.1...	0	0	0	0	0	2. DB
ORACLE	site A	ORACLE 172.16.40.1...	2	0	0	0	0	2. DB
Cubrid	site A	Cubrid 172.16.40.10...	0	0	0	0	0	2. DB
ORACLE	site A	ORACLE 172.16.40.1...	0	0	0	0	0	2. DB
ORACLE	site A	ORACLE 172.16.40.1...	0	0	0	0	0	2. DB
PostgreSQL	site A	PostgreSQL 172.16...	0	0	0	0	0	2. DB
Cubrid	site A	Cubrid 172.16.40.10...	0	0	0	0	0	2. DB
MSSQL Server	site A	MSSQL Server 172.1...	0	0	0	0	0	2. DB
DB2 for iSeries (OS/...	site A	DB2 for iSeries (OS/...	0	0	0	0	0	2. DB
MSSQL Server	site A	MSSQL Server 172.1...	7	0	0	0	0	2. DB
Sybase ASE	site A	Sybase ASE 172.16...	0	0	0	0	0	2. DB
MSSQL Server	site A	MSSQL Server 172.1...	11	0	0	0	0	2. DB
MySQL	site A	MySQL 1 / 21b.40.10...	0	0	0	0	0	2. DB
DB2 for iSeries (OS/...	site A	DB2 for iSeries (OS/...	0	0	0	0	0	2. DB
Cubrid	site A	Cubrid 172.16.40.10...	0	0	0	0	0	2. DB
ORACLE	site A	ORACLE 172.16.40.1...	0	0	0	0	0	2. DB
MSSQL Server	site A	MSSQL Server 172.1...	0	0	0	0	0	2. DB
ORACLE	site A	ORACLE 172.16.40.1...	0	0	0	0	0	2. DB
PostgreSQL	site A	PostgreSQL 172.16...	0	0	0	0	0	2. DB
MSSQL Server	site A	MSSQL Server 172.1...	0	0	0	0	0	2. DB

On the right side of the interface, there are three summary charts:

- ORACLE 172.16.40.101 1...:** A box containing the IP address.
- Summary Metrics:**
 - Connected Session: 9 session
 - SQL Execution Count: 1.5QL/sec
 - Avg. Response Time: 0.001 ms
- Sessions Count:** A bar chart showing session counts over time, with a peak around 10:33:15.
- SQL Count:** A line chart showing SQL execution counts over time, with several spikes between 10:33:00 and 10:33:30.
- Network Usage Trend:** A line chart showing network usage trends over time, with a scale from 0 to 1.


Dynamic Data Masking

Security Policy Wizard Type

Alert Policy

-  **Database Access Control Policy**
Define database access control policy.
-  **SQL Execution Control Policy**
Define SQL execution control policy.
-  **System Access Control Policy**
Define system access control policy.
-  **System Command Execution Control Policy**
Define command execution control policy.

Masking Policy

-  **SQL Result Masking Policy**
Define masking policy for SQL result.

Approval Policy

-  **Database Access Approval Policy**
Define the approval policy in order to gain access
-  **SQL Execution Approval Policy**
Define approval policy to control an authority to
-  **SQL Result Save Approval Policy**
Define approval policy to control an authority to
-  **Approval Policy For Masking Exception**
The result of the approved query defines unmask

Modified Data Policy

-  **Modified Data Policy**
Define modified data logging policy.

Security Policy Wizard

Step 01 Configure Policy Step 02 Define Security Rules **Step 03 Define Masking Rules**

Define Masking Rules

Object(s)

Select Table, Column Select Sensitive Pattern

Table	Column	Type	Format
EMPLOYEE	FIRSTNAME	Full Masking	

Column: For a delimiter, please use semicolon only. Enter "*" for masking all columns of a table.

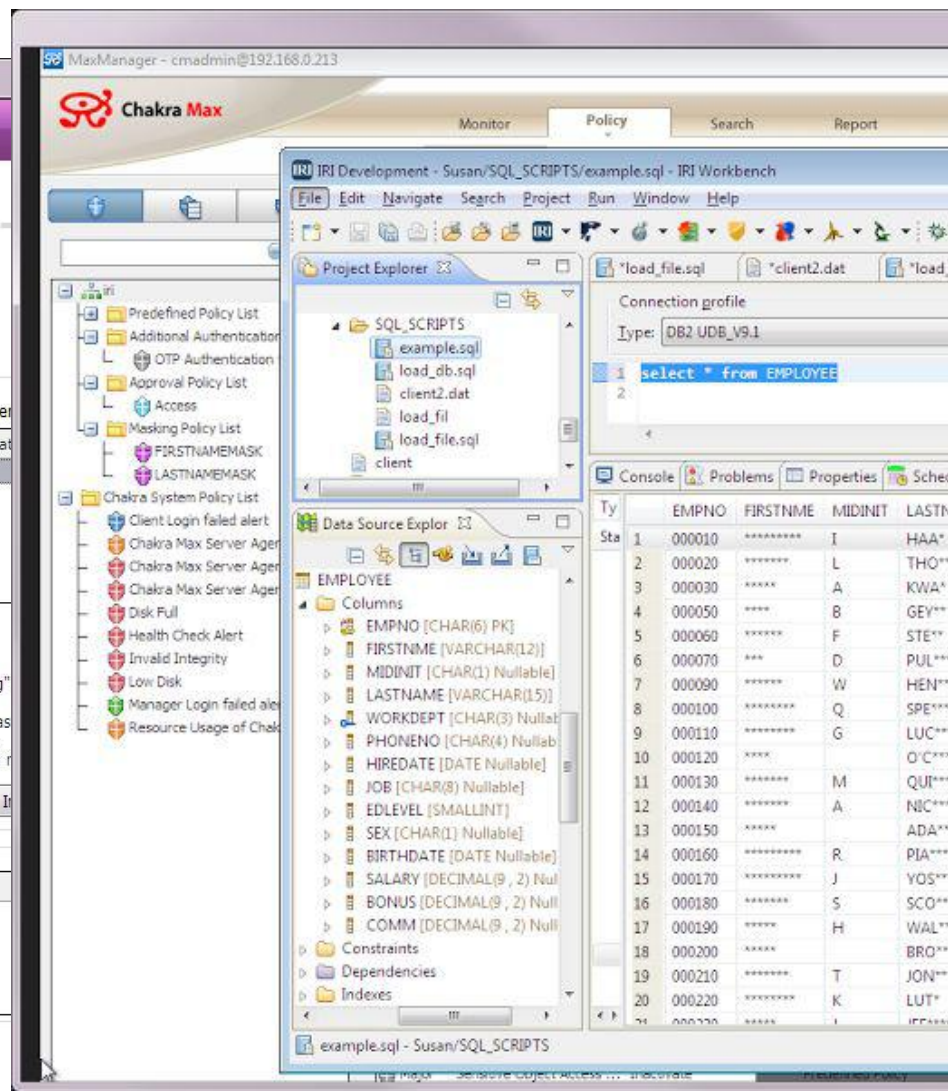
Type: To mask the full column data, select "Full Masking" select "Partial Masking".

Format: Set the partial masking format. Please use "*" as For all other characters, data will not be masked.

Note: For numeric columns, data must be masked with r

Exception Object(s)

Table	Column
There are no items to show.	



The screenshot shows the Chakra Max interface with a SQL query window open. The query is `select * from EMPLOYEE`. The result set shows columns EMPNO, FIRSTNAME, MIDINIT, and LASTNAME. The FIRSTNAME column contains masked values (e.g., '*****'). The interface also shows a Project Explorer with SQL_SCRIPTS and a Data Source Explorer with an EMPLOYEE table.

User Profiles

- Anyone with databases containing PAN, PII, PHI, or other sensitive information
- Companies needing a standard multi-source DCAP solution
- Businesses requiring central and differential control over DB access
- Anyone needing real-time DB monitoring and alerting

Use Cases

Hankook Performance Tires

- Chose Chakra Max's for scalability and low-impact on performance

LG U+

- Secures access to PII in customer DBs across mobile services network

University of Maryland Medical Center

- Uses DDM and secure audit log facilities for PHI protection
and compliance verification

Key Differentiators

Performance

- Most stable and best-performing DCAP solution for high-traffic volume environments
- Firewall thousands of DBs at once
- 100k SQL/second monitor speed
- 10k-25k SQL/second audit speed
- Low-impact

Interoperability

- Support for 20 different DBs on Linux, Unix, and Windows platforms
- Extensible with IRI Voracity
 - ➔ Discount for bundled purchase
 - ➔ Enables all-in-one data discovery, integration, migration, governance, and analytics

Capability

- User-level access and execution privileges
- DDM without changing original DB content
- Monitors all login attempts, transaction commands, and results sets
- Real-time logging
- Automated reports
- 40 formats for printing
- 14 formats for saving

Compliance

- Internal and data privacy law compliance
- Powerful and flexible auditing facilities for both real-time alerts and logging and forensic investigation of the logs
- Complete audit history
- Automatic backups
- Post-deletion restore capabilities



Learn and Share

IRI.com

[IRI blog](#)

LinkedIn Data Masking & Protection Group
LinkedIn Test Data Management Group



CELEBRATING
40 YEARS
2018
The CoSort Company