



IBM Software Group

Server Studio™ JE *with* Sentinel™

Command & Control Center for IBM Informix® DBMS Servers

DB2 Information Management Software



@business on demand software



Server Studio™ JE with Sentinel™

Command & Control Center for IBM Informix® DBMS Servers

- A comprehensive multi-platform suite of proven system management tools for IBM Informix® DBMS servers that help database professionals to be more effective and productive by simplifying complexities of daily tasks.
- Highly intuitive graphical console provides a powerful set of seamlessly integrated database management tools.
- Keeps database servers performing at peak levels with an extensive assortment of analytical tools to diagnose and respond to performance and availability problems in real time.
- Improves utilization of data storage resources by efficiently reorganizing vital databases with minimal application downtime.
- Preserves database investment with a comprehensive configuration auditing and change management solution.
- Maximizes availability of vital databases by enabling fully autonomic responses to critical server events.

Maximize Informix

increase availability, performance & maintainability



Partnership: IBM + AGS = Server Studio™ JE

- IBM and AGS have been cooperating on DBMS tools since 1999.
- IBM ships Server Studio™ JE with all Informix Dynamic Servers.
- Server Studio™ JE had 6 major releases since September 2000.

IBM is Committed to Informix Customers

*“IBM is dedicated to supporting and enhancing Informix database products to meet the needs of our customers now and in the future. The new release of **Server Studio™ JE** with **Sentinel™** represents a significant addition to the IBM Informix product offering and demonstrates IBM’s unwavering commitment to provide our customers with the best-of-bread, state-of-the-art database application development, management and optimization tools to improve ease-of-use and productivity, help ensure that vital databases remain up and perform at peak levels, reduce total cost of ownership and protect substantial investments IBM customers have made in Informix database products.”*

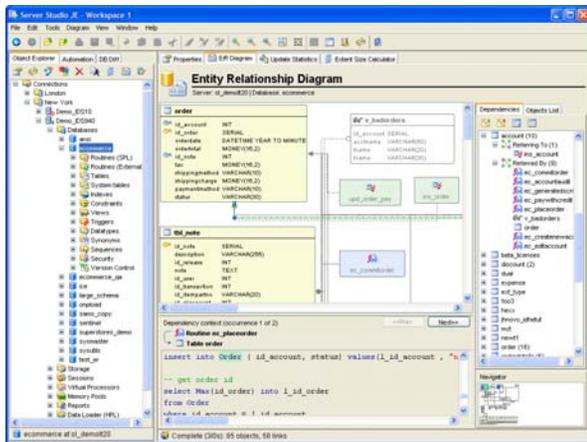
Bruce Weed

Program Director – Informix Business Leader

IBM Software Group

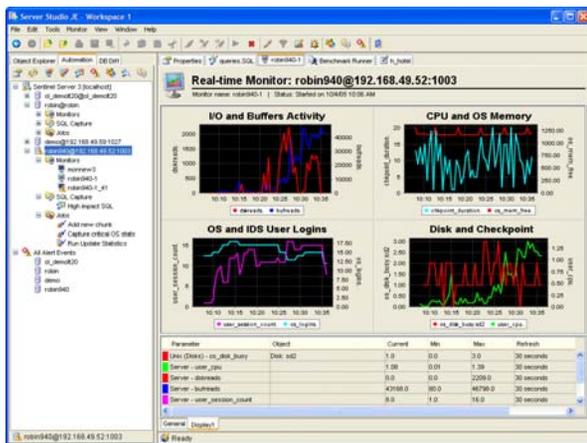
Avant-garde Management Tools for IBM Informix DBMS Servers

Server Studio™ JE and **Sentinel™** together provide powerful multi-platform suite of integrated, intuitive tools that help both seasoned database professionals and novices alike improve productivity and ensure that critical IBM Informix® databases remain up and perform at peak levels, manage change and assure availability of vital business information.



Server Studio™ JE provides a comprehensive collection of modern, proven, easy-to-use tools to help DBAs and developers perform efficiently common database tasks such as:

- Database SQL Application Development and Debugging
- Schema Management
- Configuration Auditing and Change Management
- Performance Tuning
- Data Storage Management and Reorganization
- Database Security Administration



Sentinel™ automates comprehensive proactive management of IBM Informix® DBMS environments by providing:

- 24 x 7 operational monitoring of IBM Informix® DBMS servers
- Continuous time-series measurement data of servers' performance
- Execution of regularly scheduled database maintenance tasks
- Highly flexible multi-level performance degradation alerts
- Autonomic response management to server events in real time

What Do IBM Informix Customers Have to Say?

“Server Studio brings Informix Database Administration into the 21st Century, replacing ancient command line tools with modern graphical tools. I really can't image how Informix DBAs survived without it!”

Kevin Godzman

Musto Ltd, UK

“I like Server Studio a lot. It is one of the best database tools I've used. The fact that I can view data in several instances at the same time, helps tremendously when testing software or comparing objects in development vs. production. The fact that I can change data in tables, given proper permissions, is of great importance when we have a data problem in production. I highly recommend Server Studio.”

Clifford Jardine

Computer Sciences Corporation (CSC)

“We are operating parts of our billing systems in distributed Informix databases (largest productive instance consists of four machines with eight processors and 16GB RAM each, database volume about 40..60TB). Several thousand tables in active use, several ten thousand tables kept for statistics etc. ... I'm using Server Studio to create new databases, copy structure and data from other instances to them, managing extents, moving tables into other dbspaces when space gets tight, eying locks and lock conflicts and playing with SQL. Server Studio keeps being the best front-end for Informix Systems I've ever tried and has raised my productivity a lot since I started using it.”

Norbert Karls

ePlus

“I'm new to Informix. I come exclusively from a SQL Server background. However, after using Server Studio for a while, I found that it has many features that are more powerful than MS Enterprise Manager and MS SQL Query Analyzer.”

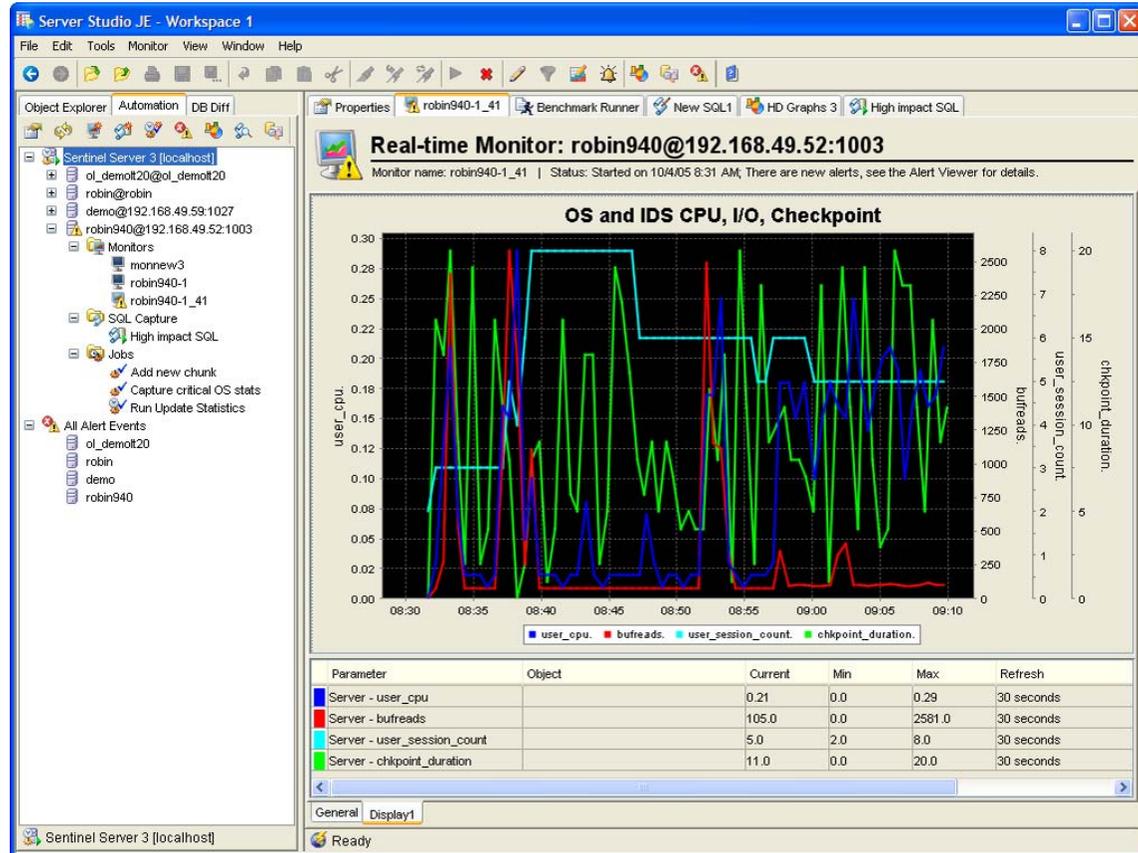
Jim Kodet

Talk America

Sentinel™

Performance and Availability Monitoring of Informix Databases

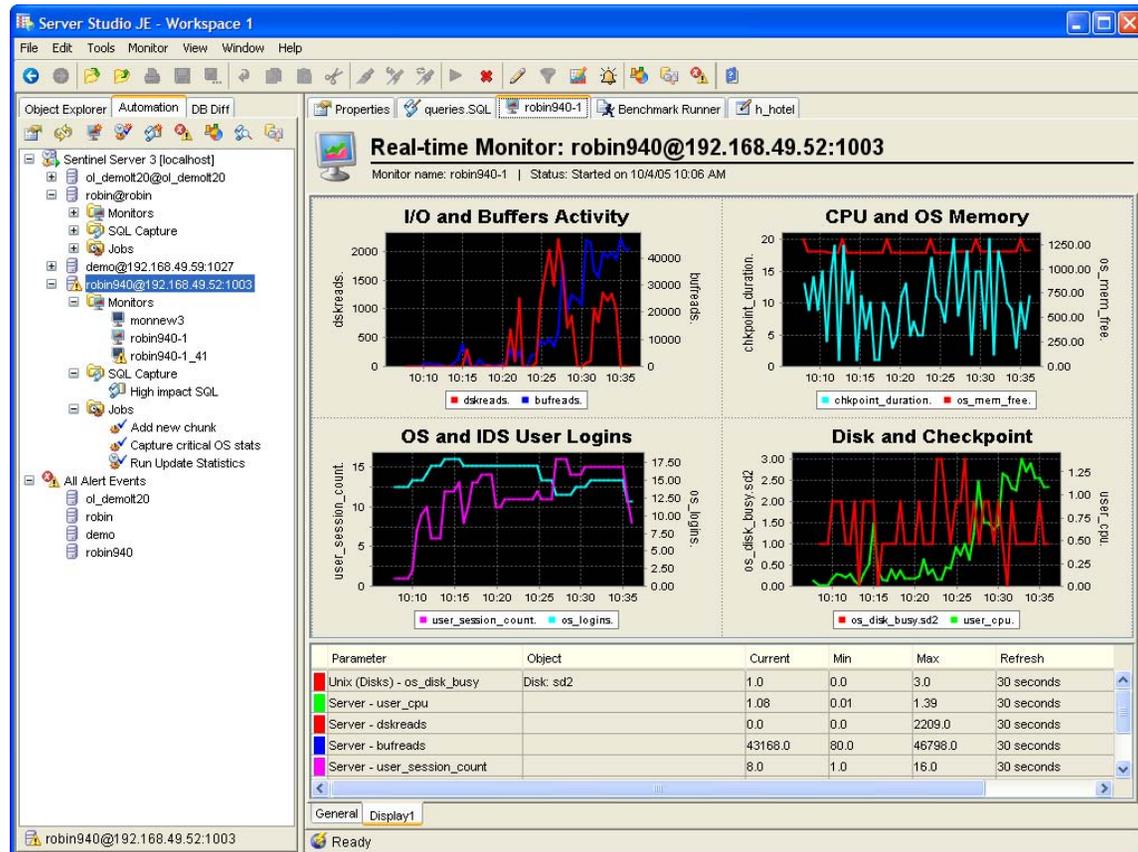
- ▶ Automate real-time 24x7 monitoring of vital Informix DBMS operational parameters.
- ▶ Capture continuous time-series measurement data of the server's performance in an integrated SQL-compliant repository.
- ▶ Retrieve dynamically SQL statements running on the server with robust SQL Capture facilitates.
- ▶ Exploit extensive assortment of analytical tools to help diagnose and quickly respond to performance degradation problems.
- ▶ Use highly flexible multi-level alerts to flag availability degradation problems.
- ▶ Execute regular database systems maintenance tasks with a flexible Job Scheduler.
- ▶ Maximize availability of vital databases with fully autonomic responses to critical server events.
- ▶ Conduct performance stress testing under real-life server loads.



Sentinel™

Real-Time Performance and Event Monitoring

- Create customized performance monitors from nearly 200 IDS-specific and operating system measurement parameters.
- For each IDS instance, real-time monitors can be defined at the level of:
 - ▶ Server
 - ▶ Chunk
 - ▶ Dbospace
 - ▶ Table
 - ▶ Index
 - ▶ Session
 - ▶ CPU
 - ▶ Physical and Virtual Memory
 - ▶ Storage Devices
 - ▶ Network I/O



Sentinel™

Event Alerts and Autonomic Response

- Assign multi-level threshold Alerts to each performance parameter being monitored.
- Centralized console for managing all alert events.
- Notification via email, pager, cell phone, etc.
- Autonomic response to system events by:
 - ▶ User-defined administration scripts
 - ▶ OS commands
 - ▶ SQL scripts
 - ▶ Stored procedures
 - ▶ IDS native utilities

Alert Events
Alerts generated by Sentinel Server(s)

DB Instance: <ALL> Display: Last 100 Events

Time	DB Instance	Condition	Source
Oct 2, 2005 7:21:04 AM	robin940@192.168.49.52:1003		System
Oct 2, 2005 7:19:39 AM	robin940@192.168.49.52:1003		System
Oct 2, 2005 7:19:07 AM	robin940@192.168.49.52:1003		System
Oct 2, 2005 7:18:35 AM			System
Oct 2, 2005 6:51:08 AM	demo@192.168.49.59:1027		System
Oct 2, 2005 6:50:34 AM	ol_demoit20@demoit20	DBSpace - sp_perc_used > 60	Storage Monitor
Oct 2, 2005 6:38:42 AM	robin940	Server - chkpoint_duration > 10	robin940-1
Oct 2, 2005 6:32:36 AM	robin940@192.168.49.52:1003		System
Oct 2, 2005 6:30:13 AM	ol_demoit20@demoit20	DBSpace - sp_perc_used > 60	Storage Monitor
Oct 2, 2005 6:28:38 AM	robin940@192.168.49.52:1003		System
Oct 2, 2005 6:21:35 AM	robin@192.168.49.52		System
Oct 2, 2005 6:20:08 AM	ol_demoit20@demoit20	DBSpace - sp_perc_used > 60	Storage Monitor
Oct 2, 2005 5:50:59 AM	robin940	Server - chkpoint_duration > 2	robin940-1
Sep 30, 2005 2:38:58 PM	demo@192.168.49.59:1027		System
Sep 30, 2005 2:35:12 PM			System

Severity: Warning Date: Oct 2, 2005 6:36:42 AM Source: robin940-1

DB Instance: robin940 Condition: Server - chkpoint_duration > 10

Parameter	Value
Server - chkpoint_duration	13

Job Status: Job: Details...

Sentinel™ SQL Capture

- Capture SQL statements for:
 - ▶ selected user sessions
 - ▶ specified user
 - ▶ statements originating from a specified host
- Review captured SQL in real-time
- Store captured SQL in the built-in data repository for future analysis.
- Use captured SQL for performing query analysis and optimization.

The screenshot shows the 'High Impact SQL' monitor in Server Studio JE. The main window displays a table of captured SQL statements with columns for Time, Session, SQL, DB, Est Cost, and Est. The selected row shows a query for session #353: informix @ 192.168.49.61.

Time	Session	SQL	DB	Est Cost	Est
10/4/05 2:16:42 PM	#353: informix @ 192.168.49...	select sum(usercpu) user_cpu, sum(sysc...	sysmaster	34	
10/4/05 2:15:56 PM	#450: informix @ 192.168.49...	set lock mode to wait 5	sysmaster	1	
10/4/05 2:15:56 PM	#353: informix @ 192.168.49...	set lock mode to wait 5	sysmaster	1	
10/4/05 2:15:56 PM	#353: informix @ 192.168.49.61	select round(((select sum(used) from syslogs ...	sysmaster	2	
10/4/05 2:15:56 PM	#353: informix @ 192.168.49...	select name, value from sysmaster:'infor...	sysmaster	8	
10/4/05 2:15:56 PM	#353: informix @ 192.168.49...	select round((pl_physused * 100.0)/pl_phys...	sysmaster	8	
10/4/05 2:15:56 PM	#450: informix @ 192.168.49.61	select t2.cbl_sessionid session_id, cbl_stmt:lva...	sysmaster	8	
10/4/05 2:15:56 PM	#353: informix @ 192.168.49.61	select sum(usercpu) user_cpu, sum(syscpu) s...	sysmaster	34	
10/4/05 2:15:55 PM	#353: informix @ 192.168.49...	select count(*) user_session_count from ...	sysmaster	36	

The detailed view at the bottom shows the following SQL statement and its statistics:

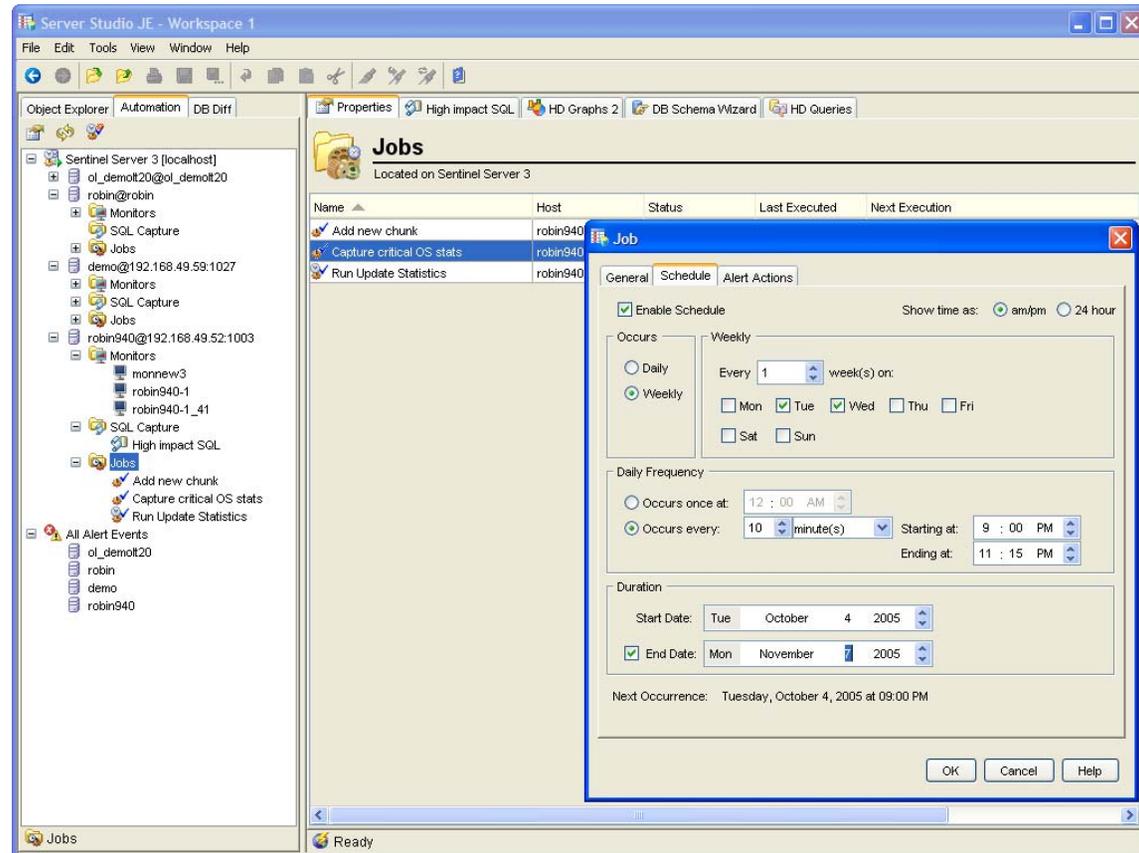
```
select round(((select sum(used) from syslogs where
number <=(select number from syslogs where is_current
= 1))/sum(size)),2)*100 perc_lgcl_log_used from
syslogs
```

Session: #353: informix @ 192.168.49.61
 Estimated Cost: 2
 Estimated Rows: 1
 Sequential Scans: 0
 Auto Index: 0
 Number of Temp Files: 0

Sentinel™

Task Automation

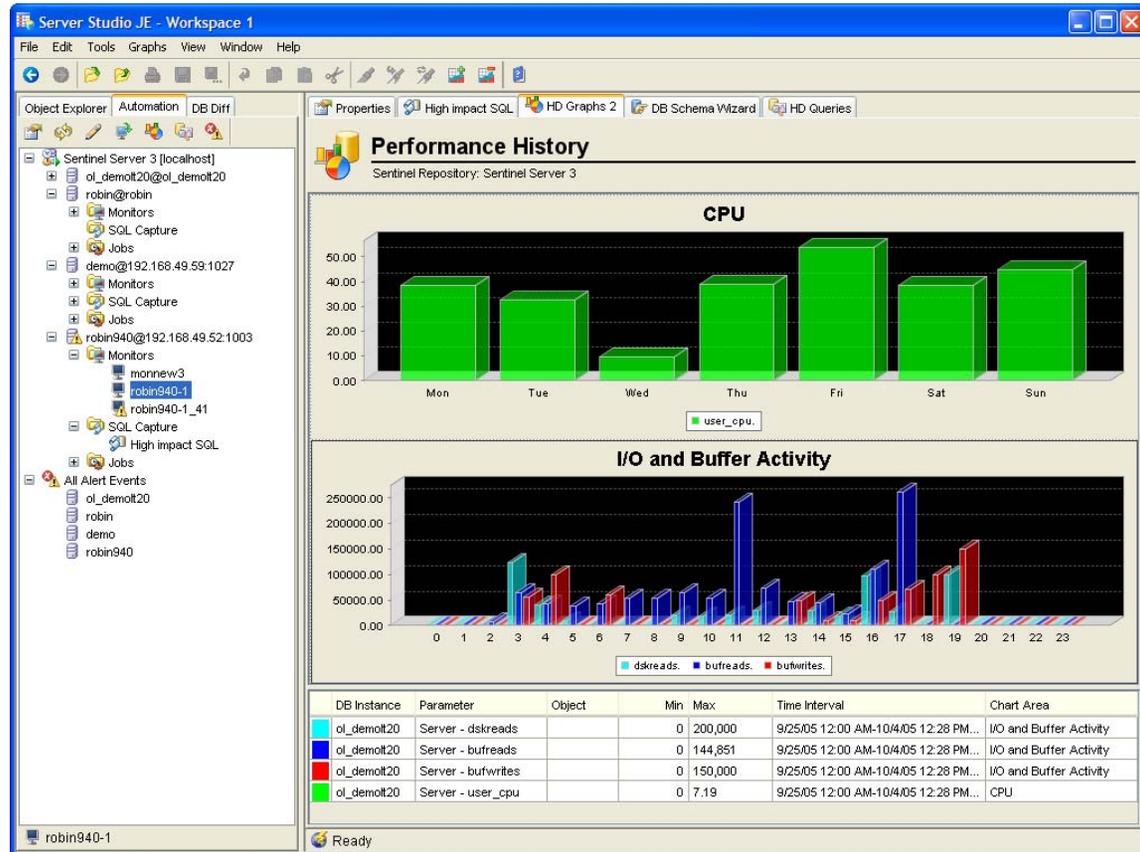
- Automation of regular maintenance tasks via scheduled custom-defined jobs.
- Define OS commands and SQL scripts as jobs.
- Highly flexible job scheduler.
- Map existing administration scripts and Informix utilities as jobs.
- Execute jobs as responses to user-defined alert events.
- Output produced by jobs is logged into built-in data repository for future analysis.



Sentinel™

Performance Data Time-Series Analysis

- For all IDS instances under monitoring, the time-series repository stores in its own built-in SQL-compliant database:
 - performance parameters data
 - Event Alerts history
 - SQL scripts captured from user sessions
 - Result sets captured from autonomic execution of administration scripts or IDS native utilities
- Correlation analysis can be easily performed over any available time interval to spot performance bottlenecks and anomalies.
- Run SQL queries against the time-series repository to export complex performance parameters data sets for analysis in external programs.



Server Studio™ JE

The premier multi-platform suite of highly intuitive, integrated system management tools that provide database professionals with extensive functionality to:

- ▶ Consolidate, and manage with ease your entire IBM Informix database servers' infrastructure at a central point of control.
- ▶ Improve efficiency of database development and testing.
- ▶ Preserve database investment through automating database configuration auditing and change management.
- ▶ Proactively diagnose performance and availability problems with extensive analytic tools.
- ▶ Obtain maximum leverage from existing data storage investments.
- ▶ Resolve problems with comprehensive facilities for SQL tuning.
- ▶ Effectively manage database security.

The screenshot displays the IBM Server Studio JE interface for a workspace named 'Workspace 1'. The main window shows an Entity Relationship Diagram (ERD) for a database named 'ecommerce' on a server 'ol_demoit20'. The ERD includes several tables and views:

- order** (Table): Attributes include id_account (INT), id_order (SERIAL), orderdate (DATETIME YEAR TO MINUTE), ordertotal (MONEY(16,2)), id_note (INT), tax (MONEY(16,2)), shippingmethod (VARCHAR(10)), shippingcharge (MONEY(16,2)), paymentmethod (VARCHAR(10)), and status (VARCHAR(30)).
- tbl_note** (Table): Attributes include id_note (SERIAL), description (VARCHAR(255)), id_release (INT), note (TEXT), id_user (INT), id_transaction (INT), id_itempartno (VARCHAR(20)), and id_placement (INT).
- tbl_badorders** (View): Attributes include id_account (SERIAL), acctname (VARCHAR(50)), fname (VARCHAR(20)), and lname (VARCHAR(30)).
- ec_placeorder** (Routine): A SQL script is shown below the diagram, including a comment '-- get order id' and a query: `select Max(id_order) into l_id_order from Order where id_account = l_id_account`.

The interface also features an Object Explorer on the left showing a tree view of the database structure, including connections, databases, and various database objects like routines, tables, and views. A Dependencies pane on the right shows a list of objects and their relationships. The bottom status bar indicates 'Complete (3/0s): 85 objects, 58 links'.

Server Studio™ JE

Database Administration

- Manage server's mode:
 - ▶ ON
 - ▶ Quiescent
 - ▶ Off
- Examine all of the ONCONFIG parameters at a glance.
- Monitor and manage user sessions:
 - ▶ number of reads, writes and locks, placed by the session
 - ▶ last SQL statement executed by the session
 - ▶ locks' details and I/O activity statistics
 - ▶ terminate problematic user sessions
- Manage users' permissions and roles.
- Update statistics on selected table, group of tables, or entire database.

The screenshot shows the Server Studio JE interface for a workspace named 'Workspace 1'. The main window displays the 'ONCONFIG' parameters for the 'Demo_IDS940' Informix Server. The left pane shows the 'Object Explorer' with a tree view of the server's structure, including connections, databases, storage, sessions, and reports. The right pane shows the 'Properties' window with a table of ONCONFIG parameters.

Name	Boottime Value	Currently Used Value	Default
AFCRASH		1537	1537
AFFAIL		1025	1025
AFF_NPROCS	0	0	0
AFF_SPROC	0	0	0
AFLINES		0	0
AFWARN		1025	1025
BAR_ACT_LOG	f:\informix\bar_ol_demo\20.log	f:\informix\bar_ol_demo\20.log	%tmp%\bar_act.log
BAR_BSALIB_PATH	f:\SM2.20\bin\libsa.dll	f:\SM2.20\bin\libsa.dll	
BAR_DEBUG		0	0
BAR_DEBUG_LOG		%tmp%\bar_debug.log	%tmp%\bar_debug.log
BAR_HISTORY		0	0
BAR_MAX_BACKUP	0	0	4
BAR_NB_XPORT_COUNT	10	10	10
BAR_PROGRESS_FREQ		0	0
BAR_RETRY	1	1	1
BAR_XFER_BUF_SIZE	15	15	15
BLOCKTIMEOUT	3600	3600	3600
BTSCANNER			
BUFFERS	20000	20000	1000
CDR_DBSPACE			
CDR_DSLOCKWAIT	5	5	5
CDR_EVALTHREADS	1,2	1,2	1,2
CDR_MAX_DYNAMIC_LOGS		0	0
CDR_NIFCOMPRESS	0	0	0
CDR_QDATA_SBSpace			
CDR_QHDR_DBSPACE			
CDR_QUEUEMEM	4096	4096	4096

The bottom of the window shows tabs for 'General', 'Profile', 'Logical Logs', 'ONCONFIG', and 'Message Log'. The status bar indicates 'Ready'.

Server Studio™ JE

Database Development – SQL Editor

- A powerful, full-featured color-coded editor, customized specifically to support IBM Informix SPL and SQL languages.
- Fully multi-threaded, non-blocking execution of scripts.
- Multiple result sets in spreadsheet-style grids.
- Statistics for the executed SQL statements:
 - ▶ number of rows affected by the operation
 - ▶ execution and fetch times
- Fully supports LOAD and UNLOAD statements for data import and export.
- integrated Query Execution Plan Analyzer to help tune the performance of SQL queries.

The screenshot displays the IBM Server Studio JE interface. The main window shows a SQL script editor with the following code:

```

select discountpercent into l_discountpercent
from Discount
where (Discount.id_product = p_id_product)
and (expirationdate > Today);

end if
if l_discountpercent is null then
let l_discountpercent = 0;
end if

Return l_discountpercent;
end procedure;

-- Permissions for routine "ec_calculatedscnt"
grant execute on function 'informix'.ec_calculatedscnt(integer,integer)
to 'public';

select * from systables;
  
```

Below the editor, the execution results are shown in a grid format:

# Rows:	Execution Time:	Fetch Time:	Total Time:
92	0.04 sec	0.11 sec	0.15 sec

tablename	owner	partnum	tabid	rowsize	ncols	nindexes	nrows	created	version	tabtype
systables	informix	1049998	1	469	20	2	73	09/04/05	65538	T
syscolumns	informix	1049999	2	151	8	2	531	09/04/05	65538	T
sysindexes	informix	1050000	3	3307	14	2	116	09/04/05	65538	T
systabauth	informix	1050001	4	77	4	2	72	09/04/05	65538	T
syscolauth	informix	1050002	5	73	5	2	17	09/04/05	65538	T
sysviews	informix	1050003	6	70	3	1	21	09/04/05	65538	T

Server Studio™ JE

Database Development – Table Manager

- Interactively create new, or edit existing tables and views.
- Highly granular access to all attributes including:
 - ▶ columns
 - ▶ datatypes
 - ▶ table and index fragmentation definitions
 - ▶ referential integrity constraints
 - ▶ Primary keys
 - ▶ Foreign keys
- Dynamically generate SQL CREATE and ALTER statements, as the modifications to the table or index structure is performed in a visual designer.

Server Studio JE - Workspace 1

Object Explorer: order

- Columns
 - id_account: INT
 - id_order: SERIAL
 - orderdate: DATETIME YEAR TO MINUTE
 - ordertotal: MONEY(16,2)
 - tax: MONEY(16,2)
 - shippingmethod: VARCHAR(10)
 - shippingcharge: MONEY(16,2)
 - paymentmethod: VARCHAR(10)
 - status: VARCHAR(30)
- Indexes
 - 127_70 (id_account, id_order)
 - id_account: INT
 - id_order: SERIAL
 - ix_order1 (orderdate)
 - orderdate: DATETIME YEAR TO MIN
 - ix_order2 (paymentmethod), Disabled
 - 127_72 (id_account, id_order, orderdate)
- Triggers
 - ins_order (order), Disabled
 - upd_order_pay (order)
- Foreign Keys
 - fk_order1 references account
 - id_account = account.id_account
- Constraints
 - pk_order1 (Primary Key) id_account, id_order
 - ct_order1 (Check) (tax >= '0.00')
 - ct_order2 (Unique) id_account, id_order, order...
- Version Control
 - 9/10/05 2:44 PM
 - 9/10/05 12:24 PM

Properties: order

Server: ol_demott20 || Database: superstores_demo

Table Profile

Name: order Indexes: 5 Type: Standard Row Size: 95 Date Created: 2005-09-07

Owner: informix Columns: 9 Size: 128.00 KB No. Rows: 0 Stats Updated: 2005-10-04

Columns

No.	Name	Data Type	Length	Scale	Nulls	Special
1	id_account	Int			✓	
2	id_order	Serial			✓	
3	orderdate	Datetime			✓	year to minute
4	ordertotal	Money	16	2	✓	
5	tax	Money	16	2	✓	
6	shippingmethod	Varchar	10		✓	
7	shippingcharge	Money	16	2	✓	
8	paymentmethod	Varchar	10		✓	

Indexes

- 127_70 (Unique)
- id_account
- id_order
- 127_72 (Unique)
- id_account
- id_order

Foreign Keys

- fk_order1 references account
- order.id_account = account.id_account

Constraints

Name	Type	Constraint
ct_order1	Check	(tax >= '0.00')
ct_order2	Unique	id_account, id_order, order...

Triggers

- ins_order
- upd_order_pay

General Design Storage SQL Data Permissions E/R Diagram

Foreign Keys in superstores_demo

Ready

Server Studio™ JE

Database Development – SPL Debugger

The only interactive debugger for Informix database servers' stored procedures and triggers available on the market. It can:

- ▶ execute stored procedures and triggers line-by-line
- ▶ step into nested procedures or fired triggers
- ▶ set breakpoints
- ▶ watch and to modify values of procedures' variables and calling arguments
- ▶ break infinite loops
- ▶ can "hook" into a stored procedure or trigger already executing on the server

Server Studio Debugger: Routine ec_accountaudit (Session for ec_accountaudit - Active)

```

define l_html_format_end varchar(10);
define l_html_format_br char(4);
on exception in (-1006) set l_sqlerr , l_isamerr , l_ms
    Return l_msgerr;
end exception
● if (p_acctname is null or p_acctname = '') or
    (p_password is null or p_password = '') then
    Raise exception -1006 , 0 , 'Bad input parameters';
end if
--create header
● select id_account , acctname , fname , lname , state , a
    l_id_account , l_acctname , l_fname , l_lname,
from Account
where acctname = p_acctname and password = p_password;

-- if there is no such account
● if l_acctname is Null then
    Raise exception -1006 , 0 , 'No account was found w
end if
--initialize variables
Let l_html_format_beg = '<p align="left">';
  
```

ol_agsny01

- Databases
 - sysmaster
 - sysutils
 - e-commerce
 - Procedures
 - aa1 (integer)
 - _aa1 (char)
 - _aaaa ()
 - _my (integer)
 - _my ()
 - _simple ()
 - _te_nest (integer,varchar,date,float)
 - _test ()
 - _test_foreach ()
 - _test_tr ()
 - _test1 ()
 - a_ahk_intern (integer,date,integer,smallin
 - aaa1 (char,varchar)
 - aaa3 (char,varchar)
 - alter_java_path (varchar,varchar)
 - session (tbl)

Ln:41 Pos:1 | READ ONLY

EXECUTE PROCEDURE "informix".ec_accountaudit('while','myp34rt')

(expression)

Local | Global | Arguments

Ready | ecommerce@ol_agsny01 as informix | Filter by local host, by any user

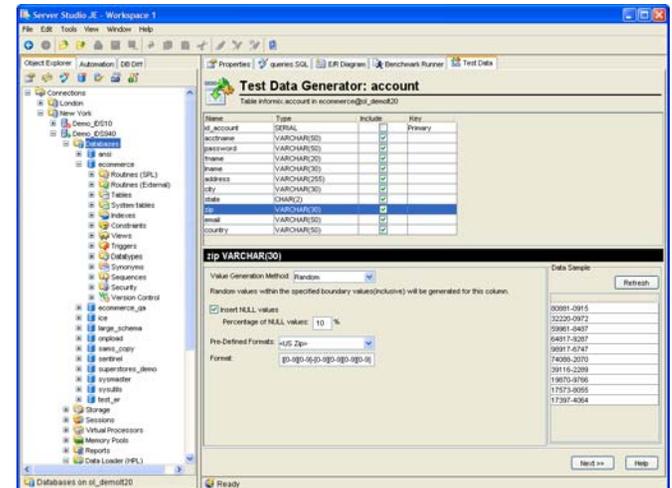
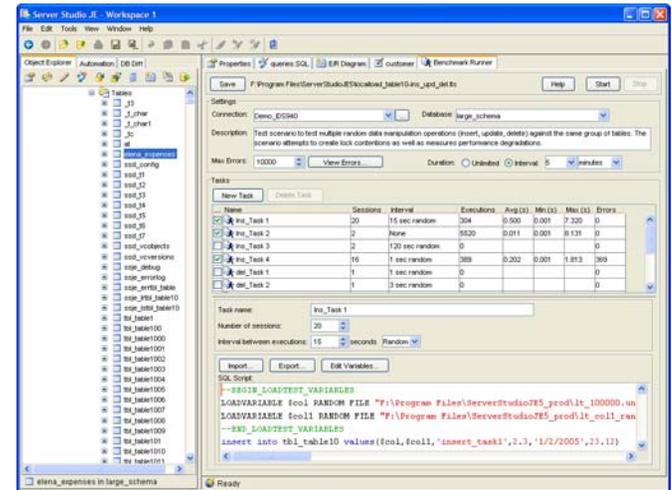
Server Studio™ JE

Pre-Deployment Testing

Benchmark Runner provides a comprehensive testing solution that effectively simulates real-life load scenarios of hundreds or thousands of users simultaneously accessing your database application and automatically measures client-side response time.

Test Data Generator can populate test databases with millions of rows of meaningful, syntactically correct test data, unique indexes and other dependencies, while fully maintaining referential integrity constraints. It supports number of data value generation options:

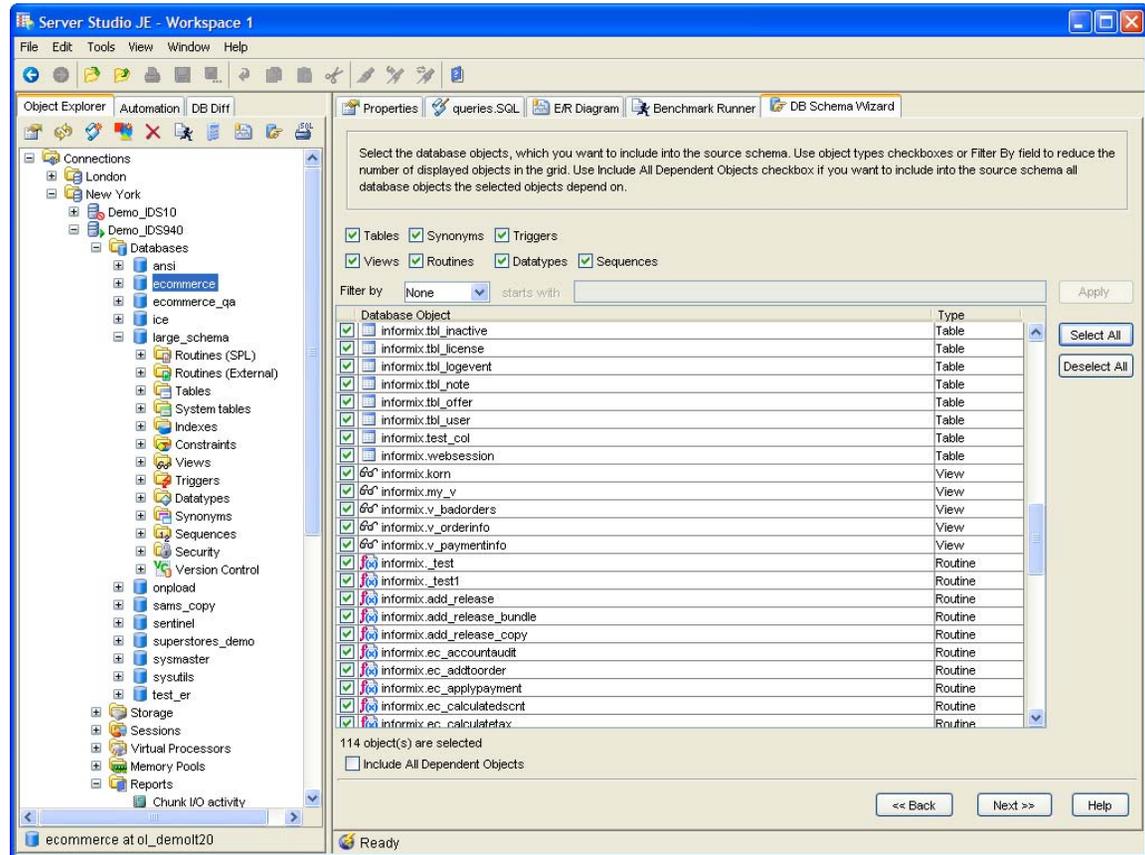
- text file-based
- values obtained from a database
- ability to specify data ranges
- text data patterns
- sequential, BLOB and CLOB data generation methods



Server Studio™ JE

Change Management & Configuration Auditing – Schema Manager

- Manage DDL scripts for either entire database schemas, or user-defined sub-schemas that may be comprised of either particular types or groups of database objects.
- Full support for managing all dependent database objects to maintain the integrity of the user-defined sub-schemas is built-in.
- Directly deploy database schemas or sub-schemas and specify how to map DB spaces and BLOB spaces from the source to the target server.



Server Studio™ JE

Change Management & Configuration Auditing – E/R Diagrams



- Entity Relationship Diagrams for entire database or selected groups of objects that include tables, views, stored procedures and triggers.
- Built-in Object Dependencies Analyzer displays details about object relationships using the tree and SQL views.
- Stored diagrams can be easily re-synchronized with the current database state without losing user-defined diagram object layouts.

The screenshot shows the Server Studio JE interface with an Entity Relationship Diagram (ERD) for the 'ecommerce' database. The main window displays the ERD with tables like 'tbl_order' and 'tbl_note', and views like 'v_badorders'. The 'tbl_order' table has columns: id_account (INT), id_order (SERIAL), orderdate (DATETIME YEAR TO MINUTE), ordertotal (MONEY(16,2)), id_note (INT), tax (MONEY(16,2)), shippingmethod (VARCHAR(10)), shippingcharge (MONEY(16,2)), paymentmethod (VARCHAR(10)), and status (VARCHAR(30)). The 'tbl_note' table has columns: id_note (SERIAL), description (VARCHAR(255)), id_release (INT), note (TEXT), id_user (INT), id_transaction (INT), id_itempartno (VARCHAR(20)), and id_account (INT). Views include 'v_badorders' with columns: id_account (SERIAL), acctname (VARCHAR(50)), frame (VARCHAR(20)), and lname (VARCHAR(30)). Stored procedures shown are 'upd_order_pay' and 'ins_order'. A dependency tree on the right shows relationships between objects like 'account (10)', 'ins_account', 'ec_commitorder', 'ec_accountaudit', 'ec_generatedscr', 'ec_paywithcredit', 'ec_placeorder', 'v_badorders', 'order', 'ec_createnewacc', and 'ec_editaccount'. At the bottom, a dependency context for 'Routine ec_placeorder' shows a table 'tbl_order' with the following SQL script:

```

insert into Order ( id_account, status) values(1_id_account , "n
-- get order id
select Max(id_order) into 1_id_order
from Order
where id_account = 1_id_account
    
```

The status bar at the bottom indicates: Complete (3/0s): 85 objects, 58 links.

Server Studio™ JE

Change Management & Configuration Auditing – Dependencies Analyzer



- Intuitive graphical impact analysis that helps examine "up" and "down" dependencies of any database object, including:
 - ▶ referential integrity constraints
 - ▶ call tree dependencies for stored procedures and triggers.
- Powerful database search function.
- Search for any object usage pattern within a single or multiple databases, or for any text string within the syntax of any database object.
- Convenient graphical dependencies trees with full drill-down capabilities.

Server Studio™ JE

Change Management & Configuration Auditing – Version Control



- Create snapshots of database schema for versioning of database changes in a built-in Version Control repository.
- Create versions of individual objects such as stored procedures, tables, etc.
- Maintain versions of database security states, such as user's and role's permissions and track security changes for audit purposes.
- Preview versions of database schema objects using graphical tools and recover selected objects' schema
- Compare database versions with a current database state as well as between the stored schema versions.
- Share the Version Control Repository among groups of DBAs and developers to support team work.

The screenshot displays the Server Studio JE interface. On the left, the Object Explorer shows a tree view of database objects under 'Demo_IDS40'. The 'superstores_demo' database is expanded, showing sub-objects like 'Routines (SPL)', 'Tables', 'Indexes', 'Constraints', 'Views', 'Triggers', 'Datatypes', 'Synonyms', 'Sequences', and 'Security'. The 'Version Control' icon is visible at the bottom of this tree.

The main window shows the 'Version Control for: database superstores_demo' dialog. It includes the following fields and text:

- Date:** Sep 10, 2005 12:24:14 PM
- Label:** Beta 1
- User:** Developer15 SIP
- Description:** Beta version of this database delivered for presentation.

Below this, it lists the objects in the snapshot:

- Procedures
- Tables
- Views
- Triggers
- Synonyms
- Datatypes
- Sequences

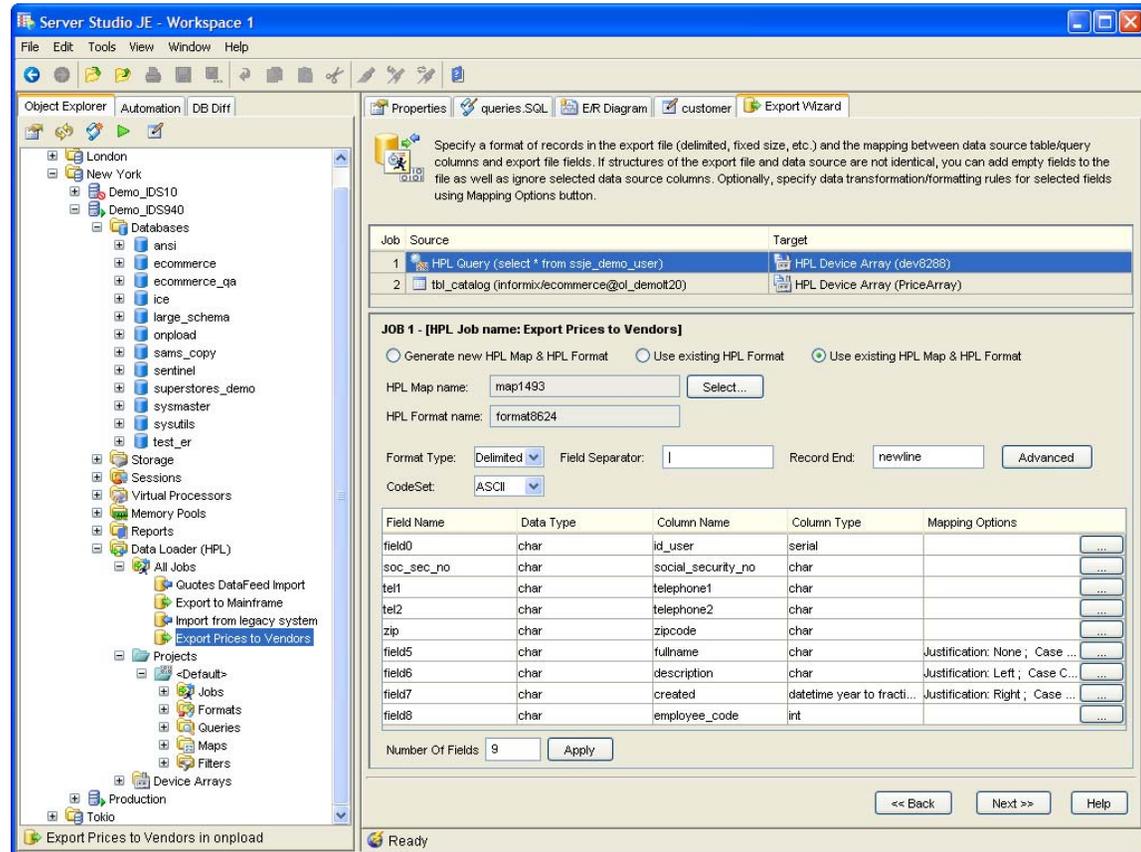
A smaller 'Version Control' dialog is overlaid on top, showing a message: 'Database superstores_demo at ol_demott20 on demott20 will be saved in Server Studio JE Version Control. Type an optional description. Press the 'OK' button to save objects in Version Control.' It has a 'Label' field with 'Production' and a 'Description' field with the text: 'This version is delivered to the customer on 12/3/2005.'



Server Studio™ JE

Data Management – High Performance Loader

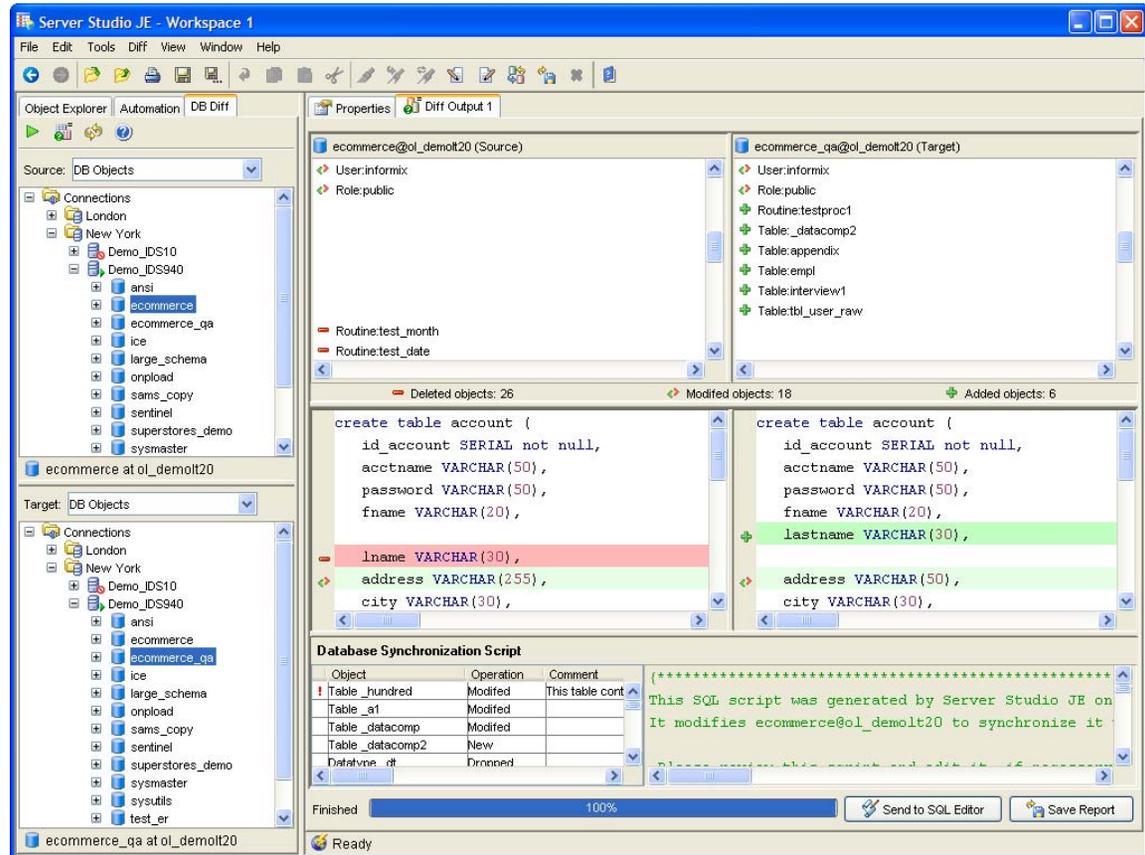
- Provides highly intuitive multi-platform user interface for IDS High Performance Loader
- Streamlines creation of new HPL data load and unload jobs
- Simplifies maintenance of existing HPL jobs
- Allows to group multiple HPL jobs into logical containers



Server Studio™ JE

Change Management & Configuration Auditing – DB Difference Analyzer

- A powerful change management tool that compares entire databases, located on the same or on different servers.
- Perform comparative analysis of all database objects' properties including:
 - ▶ table structures
 - ▶ referential integrity
 - ▶ Fragmentation
 - ▶ syntax of stored procedures, triggers and views
- Entire databases, individual database objects or groups of objects can be examined for changes.
- Generate synchronization scripts based on database comparison results.



Server Studio™ JE

Change Management & Configuration Auditing – DB Difference Analyzer



- Compare data in tables with compatible structures
- Compared tables can be located in the same database, on the same server or on different servers
- Very efficient comparison algorithm - millions of records can be compared within minutes
- Detail graphical analysis of data changes that covers added, deleted and modified data records
- Ability to store lists of compared tables, such as list of tables with meta-data, for repetitive analysis

Data Diff Analyzer
Performs detail differentiation analysis of data content

Source	Target	Status	Time
datadiff1 (superstores_dem...	datadiff12 (superstores_dem...	Finished	Total Runtime: 7 seconds
ssje_demo_datacompare (su...	ssje_demo_datacompare_1 (...	Finished	Total Runtime: 3 seconds

Summary Analysis

Source: datacompare (superstores_demo@ol_demolt20 Owner: informix Host:demolt20) Total Rows: 30000
 Target: tacompare_1 (superstores_demo@ol_demolt20 Owner: informix Host:demolt20) Total Rows: 29993

Rows: Deleted: 9 Modified: 2 Added: 2

	emp_id	fullname	social_security	salary	date_hired
5	5	Leo Chan	024-79-0473	20197.04	06/15/85
6	6	Ben Chandranan	010-60-1371	79482.30	05/20/53
7	7	John Brown	156-83-1382	30484.25	12/20/63
8	8	Gary Cooper	637-74-4520	71484.88	12/11/53
9	9	Max Smith	211-21-8085	52443.57	01/30/58
10	487	John Brown	786-78-7550	72222.63	03/29/89
11	495	Max Smith	947-83-8161	2463.01	02/08/10
12	50000	Gary Cooper	582-93-6580	42821.01	03/29/01
13	50001	Ben Chandranan	471-25-2818	56842.00	01/05/02

Row: 1

Show Different Columns Only

Column	Source Value
1 emp_id	1
2 fullname	John Brown
3 social_security	833-83-5481
4 salary	94676.13
5 date_hired	07/24/09

Server Studio™ JE

Storage Space Management and Database Reorganization

- Identify easily which storage spaces are getting filled and may require additional chunks. Examine in detail:
 - ▶ DbSpaces
 - ▶ BLOBSpaces
 - ▶ Chunks
 - ▶ Percentage of used and free space.
 - ▶ List of database objects residing in a given Dbspace and chunk.
 - ▶ Other storage spaces related information.

Server Studio JE - Workspace 1

Chunk #8
Chunk properties for server ol_demot20

Name	Database	Extents	Size Allocated in Chunk	% in Chunk
tbl_table10_new	large_schema	3	9216 pg - 36 MB	36
ssje_demo_user	superstores_demo	6	7200 pg - 28.12 MB	28.12
ix_tbl_table10	large_schema	2	2698 pg - 10.54 MB	10.54
ssje_irtbl_table10	large_schema	10	2146 pg - 8.38 MB	8.38
_datacomp2	ecommerce_ga	39	728 pg - 2.84 MB	2.84
_datacomp	ecommerce_ga	1	704 pg - 2.75 MB	2.75
tbl_creditcard	ecommerce	1	496 pg - 1.94 MB	1.94
ix_datacompe	ecommerce_ga	38	344 pg - 1.34 MB	1.34
_datacomp	ecommerce	2	320 pg - 1.25 MB	1.25
ssje_istbl_table10	large_schema	1	250 pg - 1000 KB	.98
ix_datacomp1	ecommerce_ga	2	232 pg - 928 KB	.91
sysprocbody	ice	6	88 pg - 352 KB	.34
ssje_debug	large_schema	9	72 pg - 288 KB	.28
sysindices	ice	2	32 pg - 128 KB	.12
sysprocedures	ice	4	32 pg - 128 KB	.12
tbl_certificate	ecommerce	1	24 pg - 96 KB	.09
_hundred	ecommerce	1	16 pg - 64 KB	.06
sysprocbody	ecommerce	1	16 pg - 64 KB	.06
sysprocbody	ecommerce_ga	1	16 pg - 64 KB	.06
syscasts	ice	1	16 pg - 64 KB	.06
syscolumns	ice	1	16 pg - 64 KB	.06
sysconstraints	ice	2	16 pg - 64 KB	.06
sysprocauth	ice	2	16 pg - 64 KB	.06
100_57	ecommerce_ga	1	11 pg - 44 KB	.04
100_59	ecommerce	1	11 pg - 44 KB	.04
108_60	ice	1	10 pg - 40 KB	.04

General DB Objects Logical Logs

Ready

IDUG / IIUG 2006 North America Conference

*May 7th-11th – Tampa Convention Center
Tampa, Florida, USA*

- See a Demo of Server Studio JE with Sentinel, and meet Anatole Vishon
- Attend In-Depth Informix-specific Educational Seminars
- Hear Technical Presentations by Informix R&D Staff and fellow Informix Users
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* Note: All registration is handled by IDUG – The International DB2 User Group (IDUG).



Questions

Thank
YOU

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