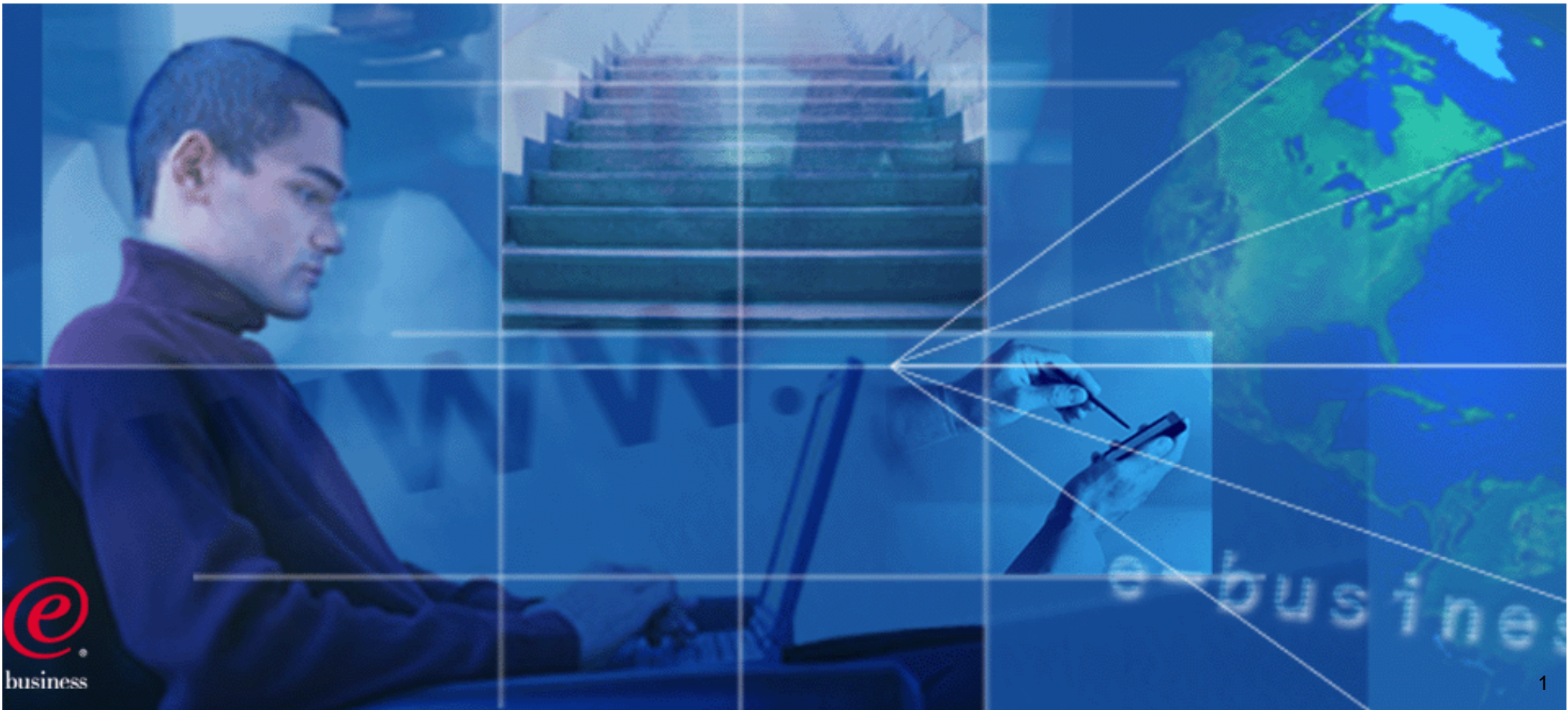


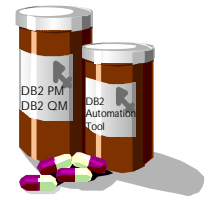
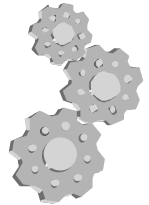
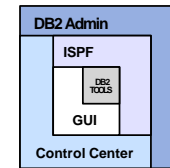
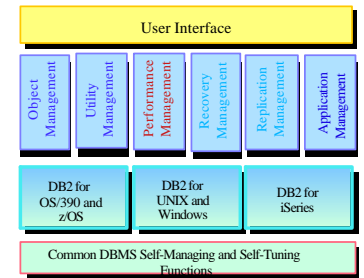
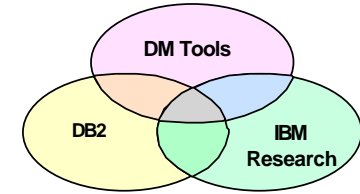


IBM Data Management Tools for DB2



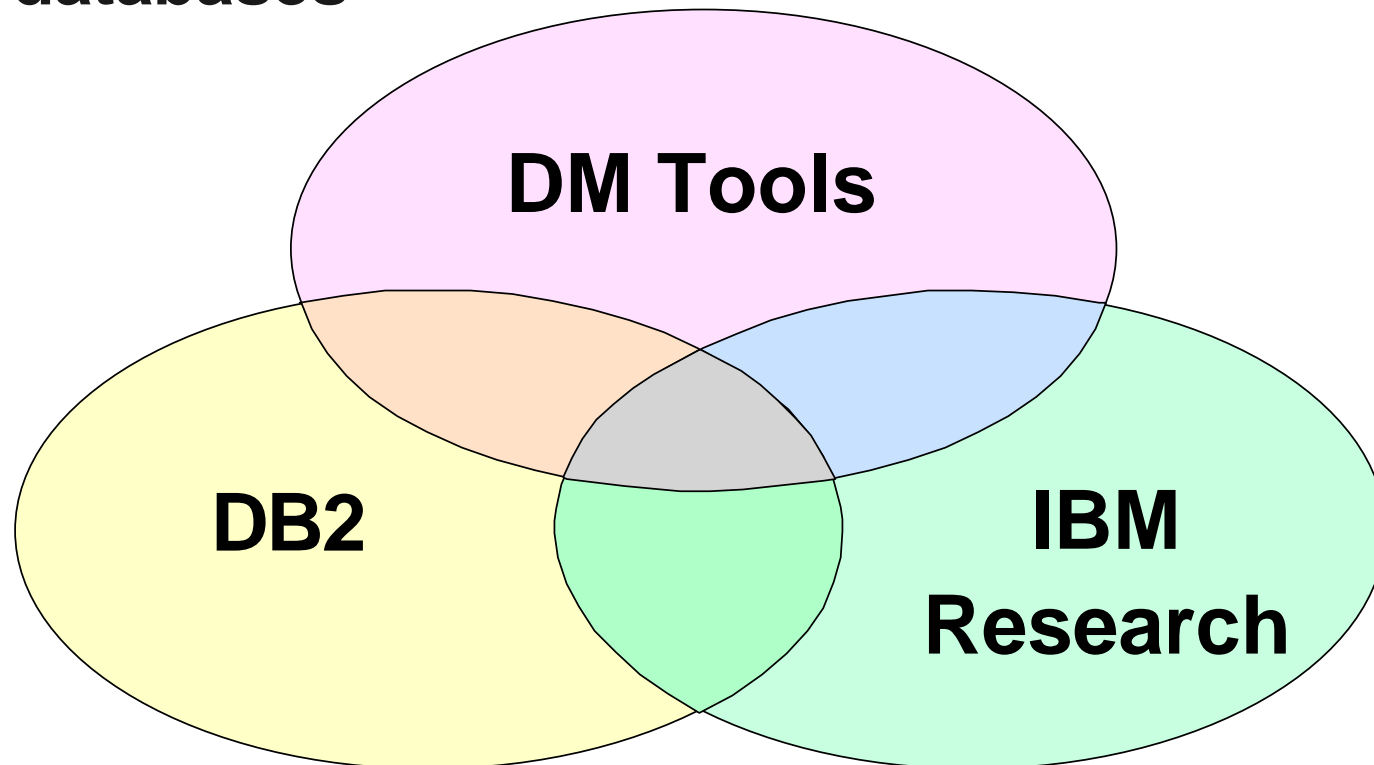
Agenda

- **Data Management Tools**
- **Comprehensive solutions and future directions**
- **Product Integration**
- **Database administration solutions span database engine and database tools**



Data Management Tools

- Tools from the company that builds world class databases



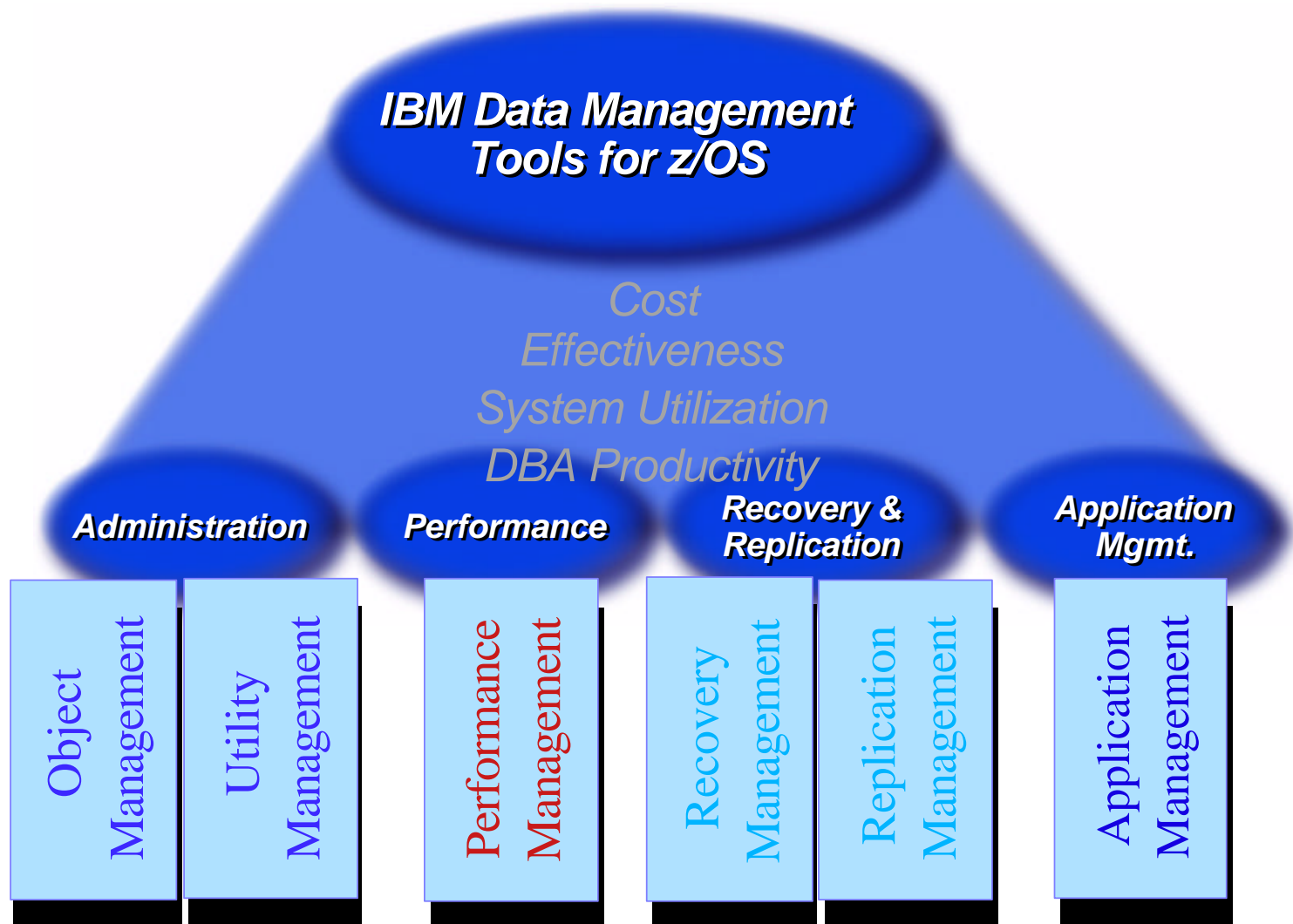
Not just a database tools vendor

Data Management Tools Today and Tomorrow

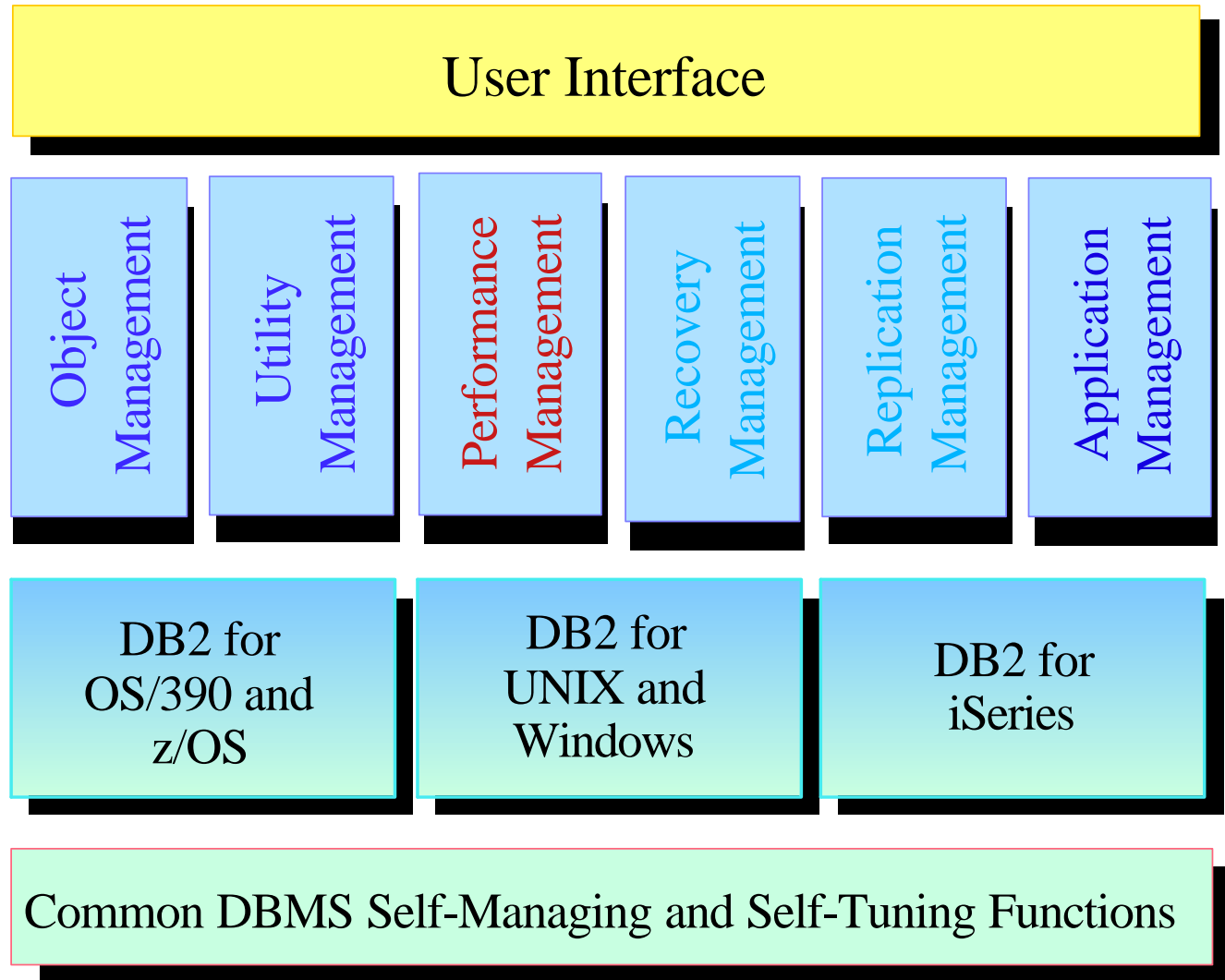
- Data Management Tools is a unique model in the database tools industry
- Investment increased to support future needs
- Comprehensive solutions now and more coming
- Independent of database server versions
- Multiplatform direction
- Common interfaces
- Cross-tool integration
- Products tested under same configurations and workloads as DB2

Not just a database tools vendor

DB2 Tools for z/OS

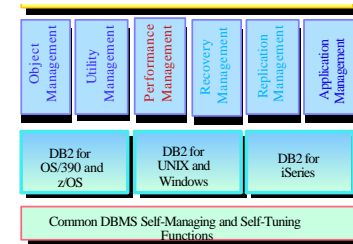


Comprehensive solutions





Multiplatform Tools

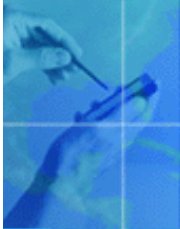


- **Priorities**

- Help complete the DB2 solution
- Common UIs to reduce training
- Day-one support of the DBMS releases
- Run on most server platforms and OS'
 - OS/390 & z/OS, iSeries, AIX, Linux
 - Windows, HP-UX, Solaris

- **Future**

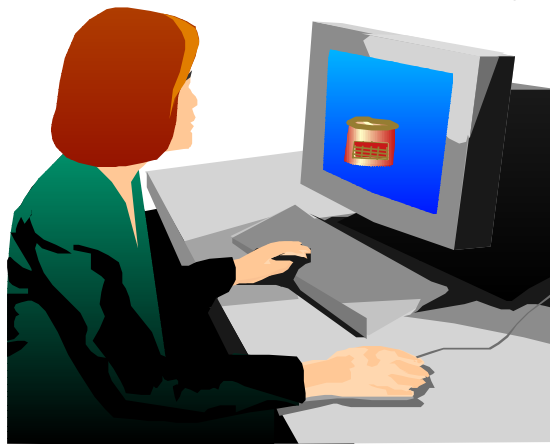
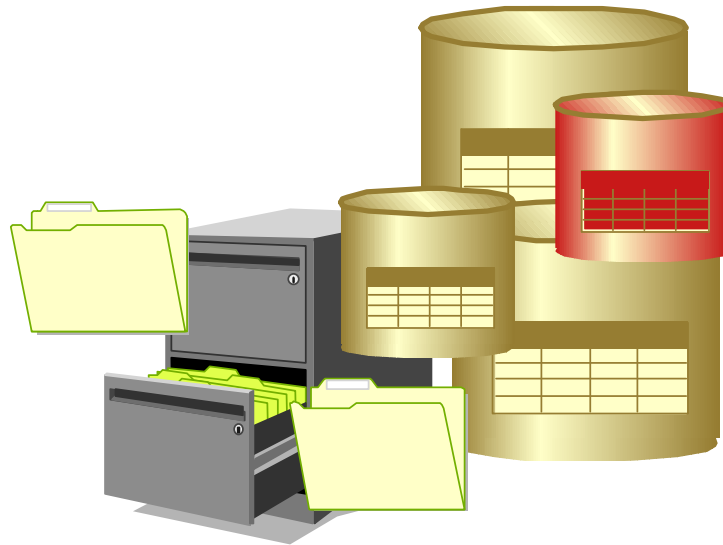
- Comprehensive suites of tools operating in synergy with base DB2 engine products for a more complete manageable, cost effective, total DB2 solution.
- Focusing on manageability, scalability, and ease of use
- Top Requirements:
 - Recovery, Performance, and High Performance Utilities



Object Management

*Ensure that the DB2 catalog contains correct information.
Support DBA operations on one or many objects.*

Object Management	Utility Management	Performance Management	Recovery Management	Replication Management	Application Management
DB2 for OS/390 and z/OS	DB2 for UNIX and Windows	DB2 for iSeries	Common DBMS Self-Managing and Self-Tuning Functions		

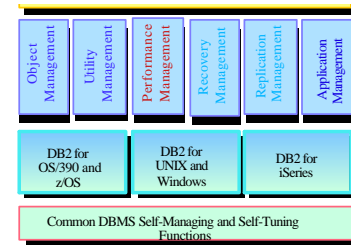


**DB2 Administration Tool
DB2 Object Comparison**

- ▶ **Manage DB2 for OS/390 and z/OS**
- ▶ **Drill down catalog navigation**
- ▶ **Migrate changes between systems**
- ▶ **Alter multiple objects in one operation**
- ▶ **Issue commands against single object or selection lists**
- ▶ **Manage space of DB2 objects**
- ▶ **Compare and synchronize objects between systems**



Object Management



- **DB2 Administration Tool**

- Provides catalog navigation
- Use copy of catalog or catalog from another system
- Generate DB2 utility jobs
- BIND, REBIND, FREE selected plans/packages
- Issue GRANT and REVOKE
- Manage space of DB2 objects
- Alter/Migrate option for multiple jobs or one job
- Online display and change of DB2 system parameters
- Online/batch/edit for DDL, DCL and DML statements
- Generation/save of change operations into work statement lists
- **Cloning of work statement lists**
- **Restart of alter/migrate jobs automated**
- **Altering of primary key with propagation to foreign keys**
- **DROP/REVOKE Impact Analysis**



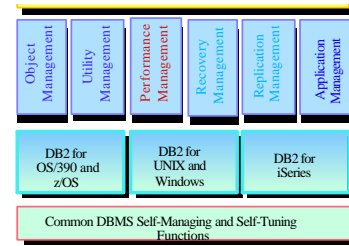
- **DB2 Object Comparison Tool**

- Allows comparison of DB2 objects between Catalogs and DDL
- Report on differences **with improved reports in V2**
- Generate and migrate changes from a source to a target
- **Support for Work Statement Lists**





Object Management

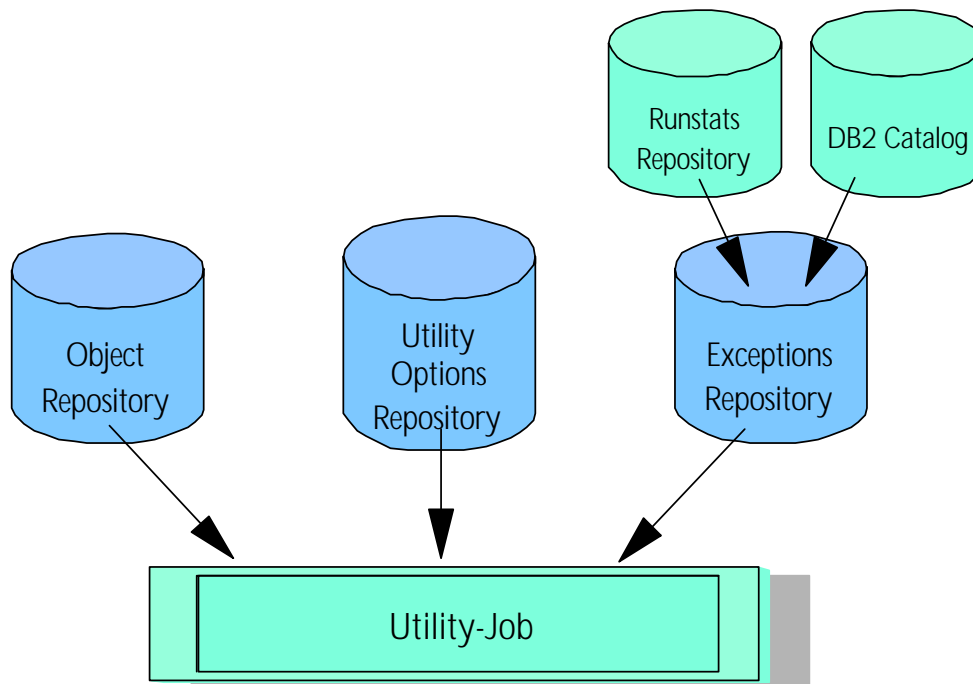


- **High priority requirements**
 - Alter additional objects
 - Remote management of other S/390 DB2 images
 - Additional filtering capabilities on objection selection lists
 - Ability to operate on a group of objects rather than one at a time
 - Tighter integration with rest of tool set

Utility Management

Manage DB2 systems with high performance utilities and automation

Object Management	Utility Management	Performance Management	Recovery Management	Replication Management	Application Management
DB2 for OS/390 and zOS	DB2 for UNIX and Windows	DB2 for iSeries	Common DBMS Self-Managing and Self-Tuning Functions		



DB2 Automation Tool
DB2 Utilities Suite
DB2 High Performance Unload

- ▶ **High Performance utilities for management of DB2 systems**
- ▶ **Automation of DB2 utilities**
- ▶ **Event or timer based**
- ▶ **Reduces need for manual intervention**
- ▶ **Comprehensive reporting**
- ▶ **Supports latest level of DB2**

Utility Management

Object Management	Utility Management	Performance Management	Recovery Management	Replication Management	Application Management
DB2 for OS/390 and zOS		DB2 for UNIX and Windows		DB2 for iSeries	
Common DBMS Self-Managing and Self-Tuning Functions					

• DB2 Utilities

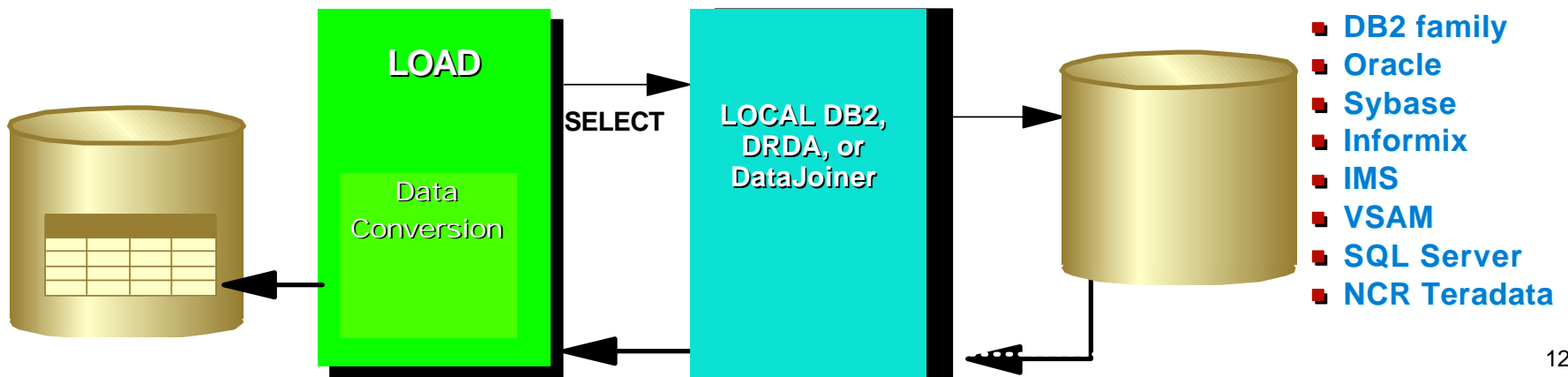
- Full set of IBM utilities
- V7 added
 - UNLOAD
 - CopyToCopy
 - DB2 Family Cross Load capability
 - **Copy/Recover parallelism to tape**
- and enhanced utilities
 - Productivity
 - Performance
 - Availability

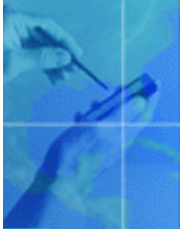
• DB2 High Performance Unload

- Extracts data from tables or image copies
- Full SQL selection
- User exit for greater manipulation and flexibility
- **Toleration of competitive unload products JCL**
- **More SQL support directly**
- **DB2 Admin line command**
- **Tablespace name optional**



DB2 Family Cross Loader

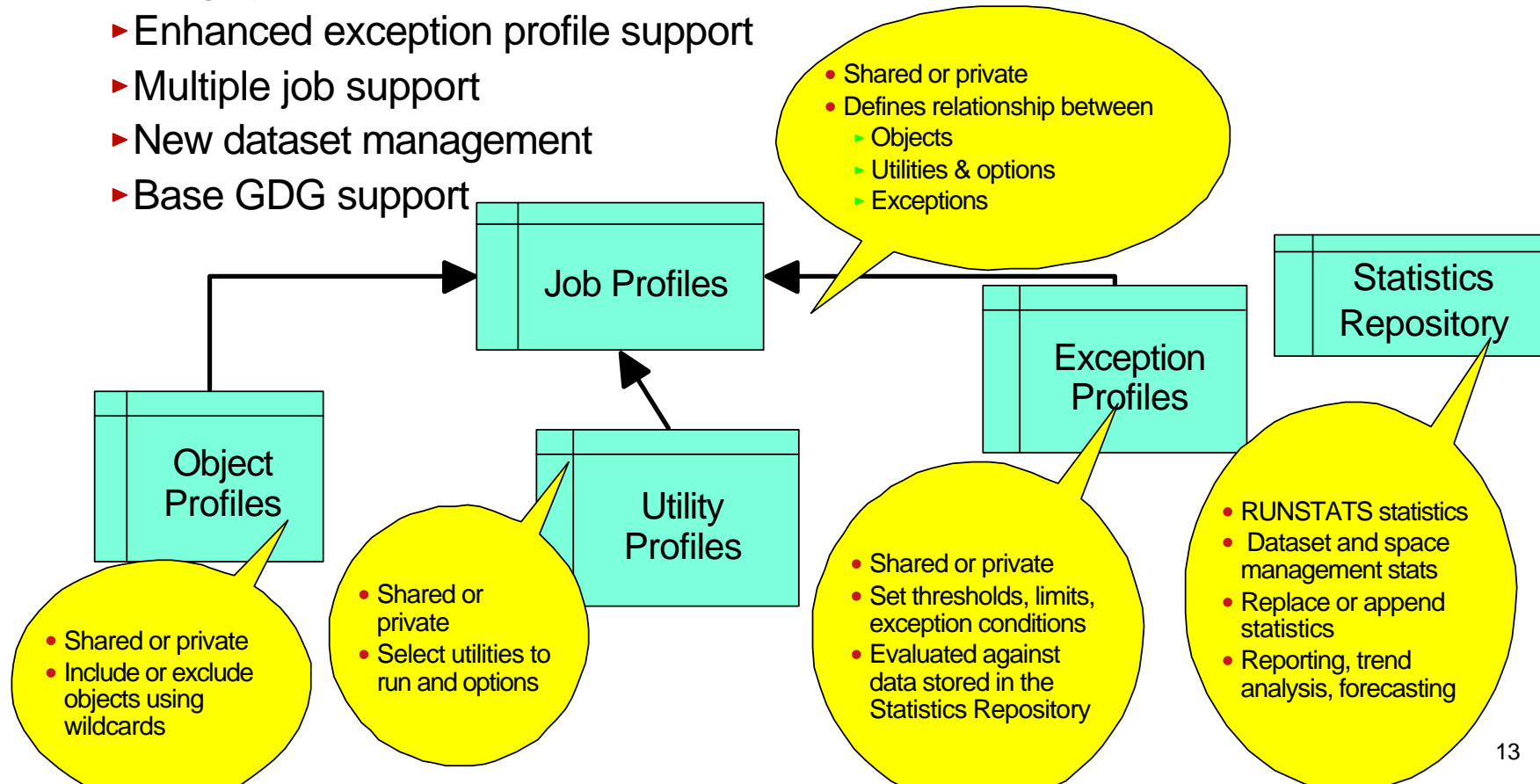




Utility Management

• DB2 Automation Tool

- ▶ Automates the execution of DB2 utilities
 - Utility jobs created based on DBA-defined thresholds/conditions
 - Support for Image Copy, REORG, RUNSTATS, MODIFY, and QUIESCE
- ▶ Statistical history captured and stored
- ▶ Dataset page browse/edit facility
- ▶ Integrity checker
- ▶ Enhanced exception profile support
- ▶ Multiple job support
- ▶ New dataset management
- ▶ Base GDG support

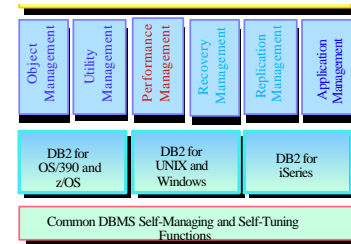


Object Management	Utility Management	Performance Management	Recovery Management	Replication Management	Application Management
DB2 for OS/390 and zOS	DB2 for UNIX and Windows	DB2 for iSeries	Common DBMS Self-Managing and Self-Tuning Functions		



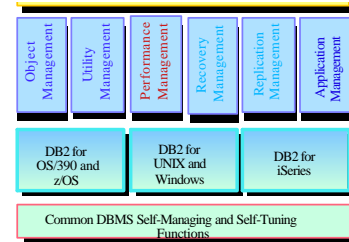
Utilities Management

- **High Priority Requirements**
 - Continued focus on utilities
 - Performance
 - Availability
 - Function
 - Integration
 - Greater automation
 - Load Balancing
 - Greater control of scheduling (e.g., don't run during a specified time)
 - More utilities supported
 - Multiplatform support

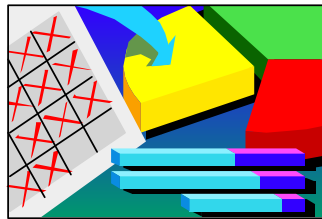
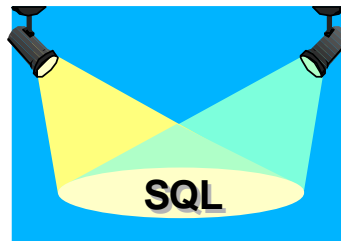
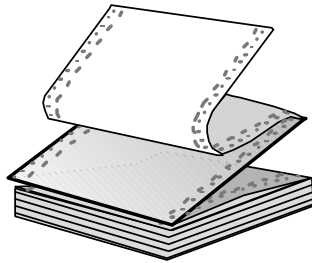


Performance Management

Provide tools to monitor and tune DB2 systems and applications to obtain optimal performance and lowest cost



DB2

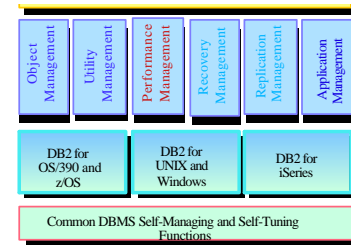


- DB2 Performance Expert
- DB2 Query Monitor
- DB2 SQL PA
- DB2 Performance Monitor
- DB2 Buffer Pool Analyzer

- ▶ Analyze, control, and tune DB2 and DB2 applications
- ▶ Real-time online monitoring and comprehensive reporting
- ▶ Trigger, capture, and cancel runaway queries
- ▶ Expert analysis/recommendations to improve SQL performance and cost
- ▶ Analysis and simulation to improve buffer pool usage



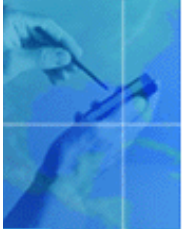
Performance Management



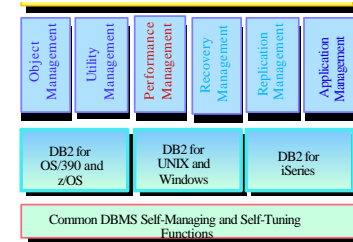
- **DB2 Performance Expert**

- **DB2 Performance Monitor for z/OS**
- **DB2 Buffer Pool Analyzer for z/OS**
- **New Application Performance Expert Facilities**
 - **Identify potential DB2 tuning opportunities**
 - **Focusing in on problem areas**
 - **Exception reports for 9 common performance problems identify and quantify the excessive CPU and elapsed time on a plan AND package basis**
- **Performance Data Warehouse**
 - **Save DB2 trace and report data for further investigation**
 - **Use analysis functions that are shipped with the product or define your own.**





Performance Management



- **DB2 Performance Monitor**

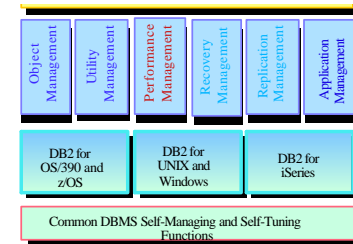
- and tune DB2 and DB2 applications
- Real-time online monitor, ISPF or workstation based
 - Snapshot view of DB2 activity
 - Thread activity
 - Subsystem statistics
- Comprehensive reports for in-depth analysis
- Explain feature to analyze and explain SQL statements
- Helps improve utilization of resources
- Consolidation of resources & Parallel Sysplex member synergy
- Improved end user interface with SQL activity tracing
- Improved handling of performance DB with new analysis capabilities

- **DB2 Buffer Pool Analyzer**

- Data Collection of virtual buffer pool activity
- Comprehensive reporting of buffer pool activity
- Simulation of buffer pool usage (what if analysis)
- GUI display



Performance Management



- **DB2 Query Monitor**

- Monitors SQL and plan execution, quickly identify problem queries
- Summary Level Tracking
- **Enhanced Monitoring profiles**
- **Section oriented tracking and visibility**
- **SQLCODE reports available**
- **Quiet time detection**



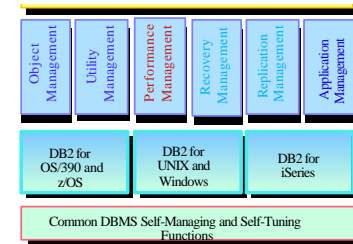
- **DB2 SQL Performance Analyzer**

- Forecasts SQL performance and helps avoid long running queries
- Indicate indexes other than chosen by optimizer
- Helps design new queries
- Connectivity to remote DB2s for statistics gathering and SQL analysis
- **Enhanced SQL Advisor**
- **Multiple DBRM member support under ISPF**
- **Supplemental Information on Indices**
- **Improved cost estimates**





Performance Management



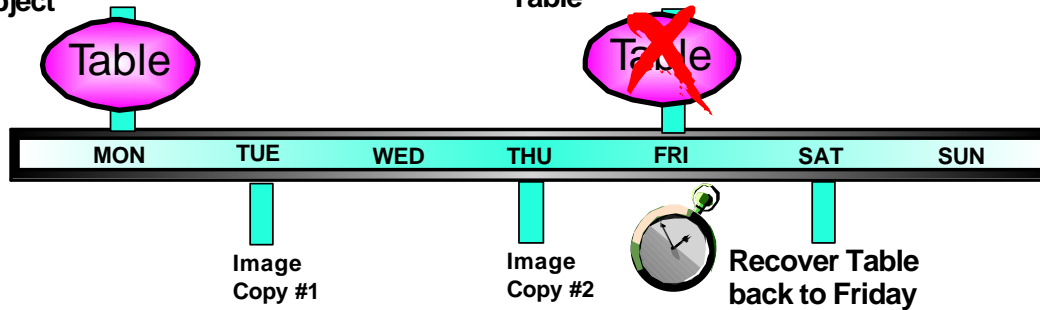
- **High priority requirements**
 - Extend DB2 PM to monitor and analyze DB2 and DB2 applications across platforms and network
 - Multiple platform performance monitoring to include
 - Additional integrated functions
 - Expert analysis of key indicators, guidance and recommendations
 - In-depth OLTP application tuning advice
 - Monitoring of DB2 Connect

Recovery Management

Object Management	Utility Management	Performance Management	Recovery Management	Replication Management	Application Management
DB2 for OS/390 and zOS	DB2 for UNIX and Windows	DB2 for iSeries	Common DBMS Self-Managing and Self-Tuning Functions		

Provide tools to recover DB2 objects to a point in time in the event of system outage or application failure

Create Object



- DB2 Archive Log Compression
- DB2 Log Analysis Tool
- DB2 Change Accumulation Tool
- DB2 Object Restore
- DB2 Row Archive Manager
- DB2 Recovery Manager

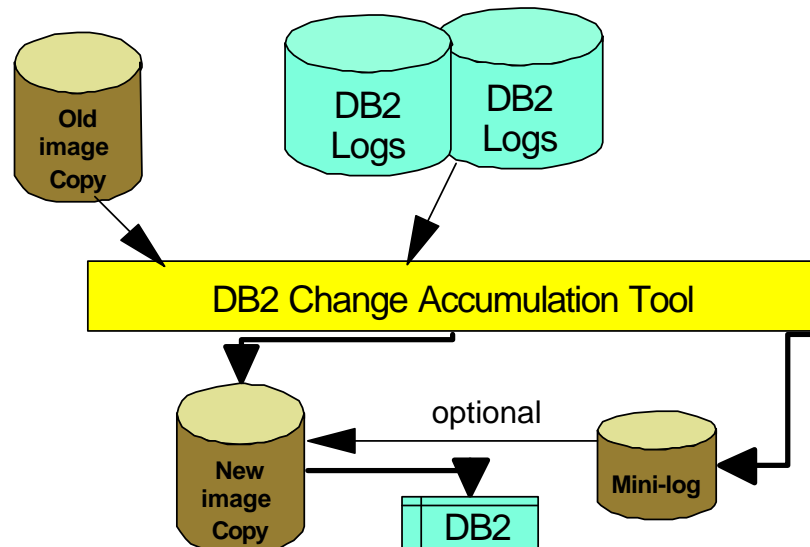
- ▶ Create new image copies to a "point in time" without impacting production systems
- ▶ High performance compression of logs
- ▶ Analyze and undo errant transactions
- ▶ Undrop objects and data
- ▶ Synchronize recovery of DB2 and IMS applications
- ▶ Archive and retrieve selected data
- ▶ Provide audit capabilities

Recovery Management

Object Management	Utility Management	Performance Management	Recovery Management	Replication Management	Application Management
DB2 for OS/390 and zOS	DB2 for UNIX and Windows	DB2 for iSeries	Common DBMS Self-Managing and Self-Tuning Functions		

• DB2 Change Accumulation Tool

- Precisely restores database objects with minimal disruption
- Allows recovery to focus on single objects and previous states
- Lowers cost of database maintenance and minimizes downtime
- **"Mini-log" support**
- **User selects mini-log or image copy creation (as it works today)**
- **Mini-log can be applied to an existing image copy or directly to tablespace**
- **Improved support of local/remote copy**
- **Up to 5000 tablespaces per job**
- **TO_QUIESCE control card**
- **Usability and data sharing support improved**



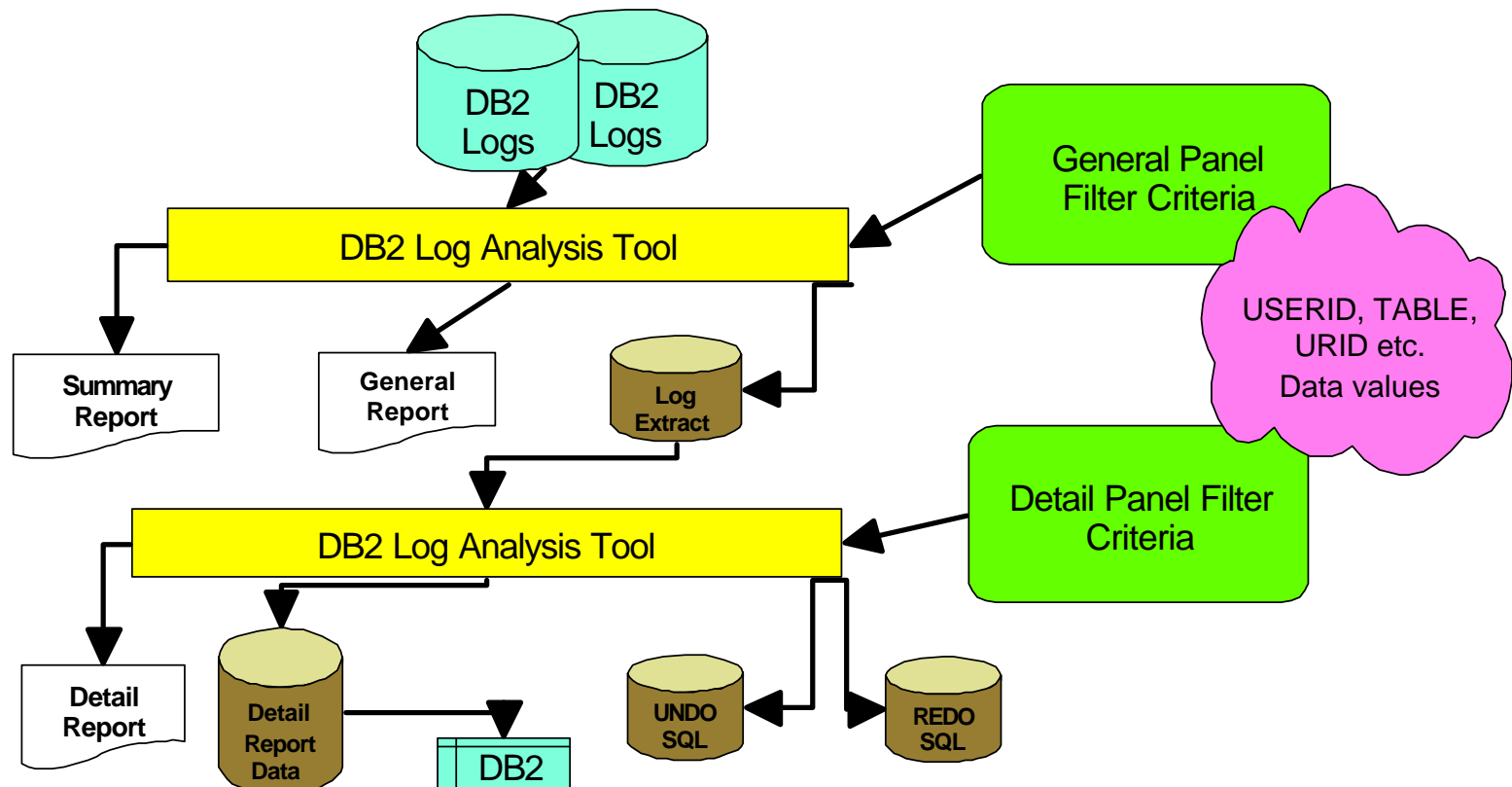
New Release

Recovery Management

Object Management	Utility Management	Performance Management	Recovery Management	Replication Management	Application Management
DB2 for OS/390 and zOS	DB2 for UNIX and Windows	DB2 for iSeries	Common DBMS Self-Managing and Self-Tuning Functions		

- **DB2 Log Analysis Tool**

- **Selectively back out errant application updates**
- **Provides summary reports and multiple filtering options**
- "Auto-Continue" mode
- Generation for static SQL for undo and/or redo records
- Process through utility operations
- Filter criteria expanded to include OBID, PSID and DBID

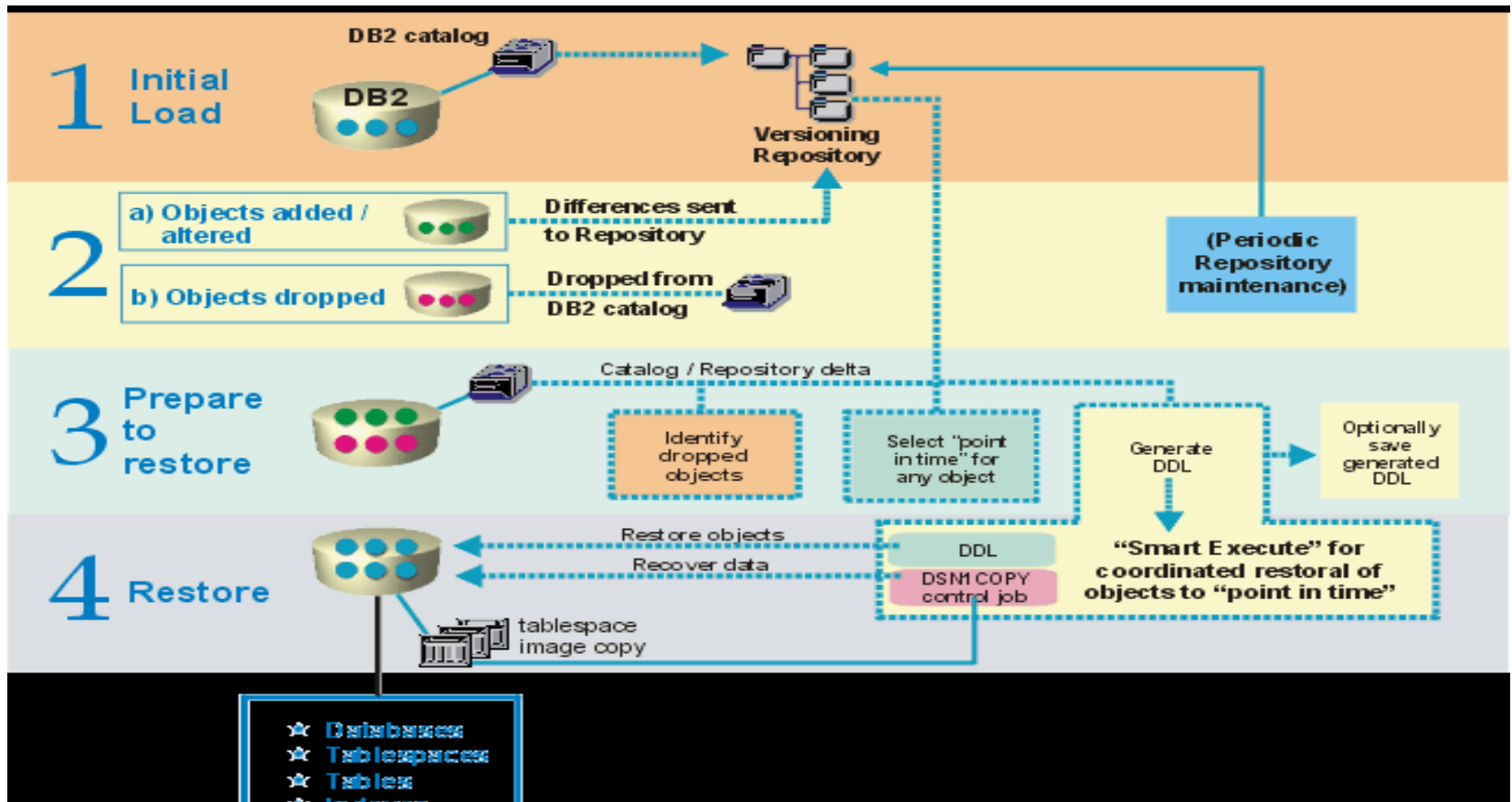


Recovery Management

Object Management	Utility Management	Performance Management	Recovery Management	Replication Management	Application Management
DB2 for OS/390 and zOS	DB2 for UNIX and Windows	DB2 for iSeries	Common DBMS Self-Managing and Self-Tuning Functions		

- **DB2 Object Restore**

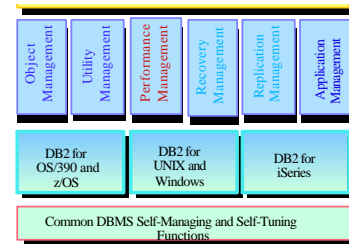
- Rapid recovery of dropped objects, data and related dependencies
- Point in time recovery with menu-driven interface
- Integration with Log Analysis Tool
- More control over what is restored
- More objects and their dependencies restored





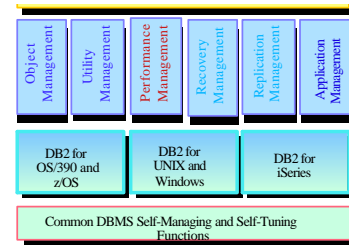
Recovery Management

- **DB2 Archive Log Compression**
 - ▶ Lowers storage cost
 - ▶ Reduction in size of up to 95%
 - ▶ Making Storage of DB2 logs on DASD affordable
- **DB2 Row Archive Manager**
 - ▶ Selectively archives aged DB2 data
 - ▶ Reduces storage requirements, improves DB2 performance
- **DB2 Recovery Manager**
 - ▶ Application failure or corrupted data means recovery to prior point
 - aids in selection of image copy
 - aids in building the proper JCL for recovery
 - ▶ Synchronizes DB2 and IMS recovery





Recovery Management



- **High Priority Requirements**

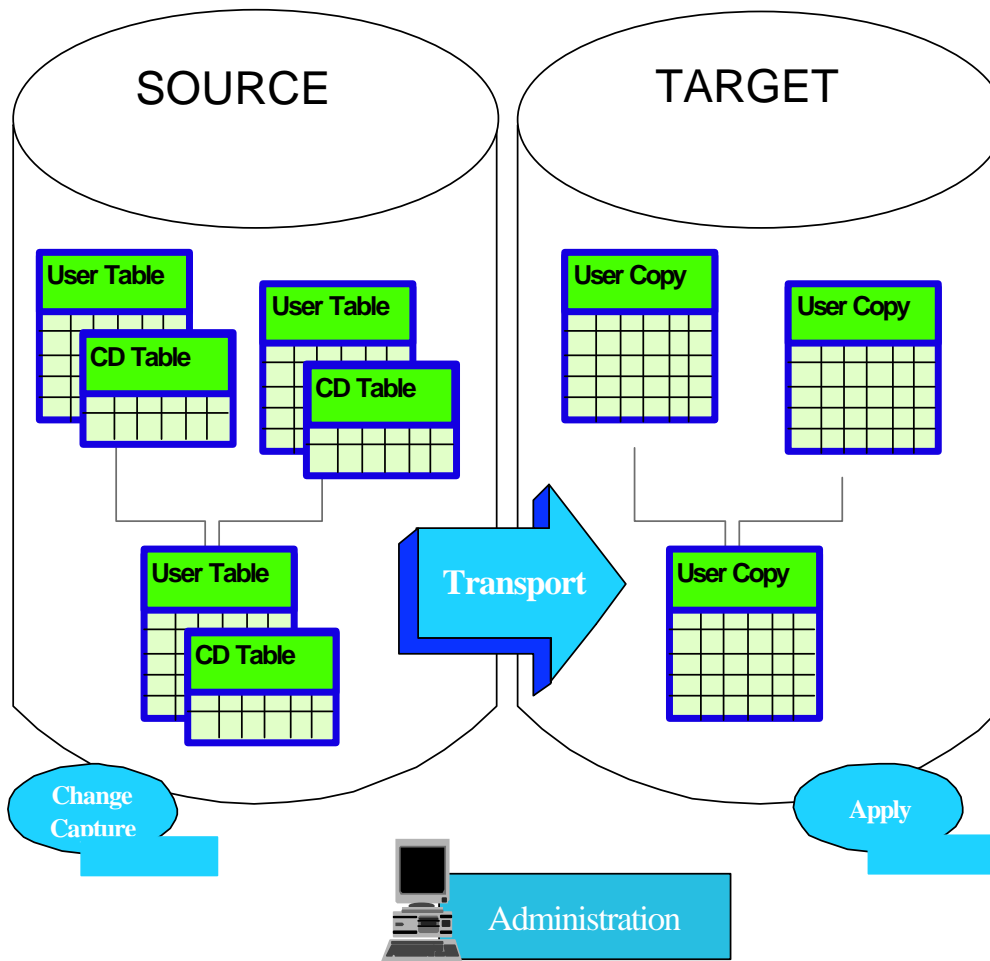
- Automated point in time recovery
 - Across DB2 Family
 - Recover to RBA, Quiesce point, image copy, "quiet time" or specify exact time to recover to (only committed data recovered)
 - Process for 1 object or 1000s
 - Support for volume level recovery
- Disaster recovery
 - Provide support for building a remote site
 - Step user through process of bringing up the disaster site



Replication Management

Object Management	Utility Management	Performance Management	Recovery Management	Replication Management	Application Management
DB2 for OS/390 and zOS		DB2 for UNIX and Windows		DB2 for iSeries	
Common DBMS Self-Managing and Self-Tuning Functions					

Manage multiple copies of data by capturing and applying changes to remote systems



DB2 DataPropagator

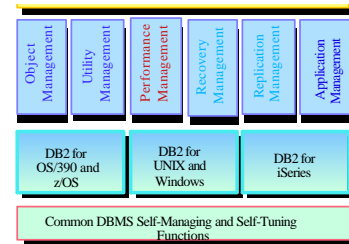
- ▶ Capture changes to DB2 log and apply to target system
- ▶ Asynchronous access at table level
- ▶ Supports subscription sets
- ▶ Timer or Event Driven
- ▶ Provides data transformation
- ▶ No programming or application changes required



Replication Management

- **High Priority Requirements**

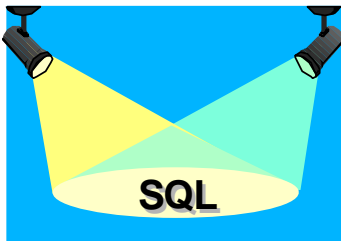
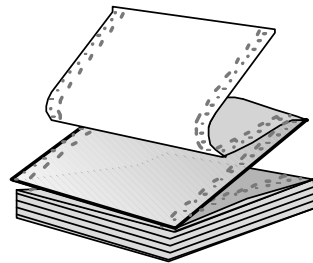
- New Replication Center integrated into DB2 CC
- Emphasis on continuous operation
- Multithreaded transaction based capture
- Reduced need for joins
- Dynamic Trace
- Improved password management
- Transaction-based replication via MQ Series
- DB2 data published to MQ/MQSI



Application Management

Object Management	Utility Management	Performance Management	Recovery Management	Replication Management	Application Management
DB2 for OS/390 and zOS	DB2 for UNIX and Windows	DB2 for iSeries	Common DBMS Self-Managing and Self-Tuning Functions		

Manage DB2 application changes with minimal effort

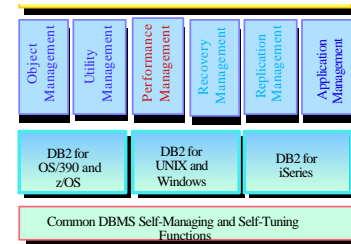


DB2 Bind Manager
DB2 Path Checker
DB2 Data Export Facility
DB2 Table Editor
DB2 Web Query

- ▶ **Avoid unnecessary binds**
- ▶ **Validate access paths before committing to a bind**
- ▶ **Full screen table editing**
- ▶ **Export sets of referentially related data**
- ▶ **Provide global data access with Java based query tool**

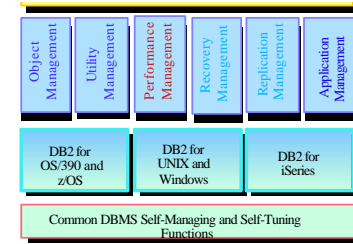


Application Management



- **DB2 Bind Manager**
 - Avoids unnecessary binds
 - Compares current vs. would-be DBRMs
 - Includes DBRM Checker
 - Reduces application maintenance efforts
 - Supports wildcarding
- **DB2 Path Checker**
 - Validate access paths before committing to BIND
 - Identifies differences between existing access paths and potential access paths
 - Provides easy to understand Explain
 - Shows new SQL statements
 - Interface with SQL Performance Analyzer
- **DB2 Data Export Facility**
 - Export or copy sets of referentially related data
 - ISPF interface for navigation through referentially related data
 - Starting point can be anywhere in referential set

Application Management



- **DB2 Table Editor**

- Full screen table editor
- ISPF, Windows, Java front-end applications
- Multiplatform support
- ISPF Interface enhancements
- Direct invocation from DB2 Admin
- **Row at a time mode selectable**
- **Edit remote data**
- **Usability improvements**

**New
Release**

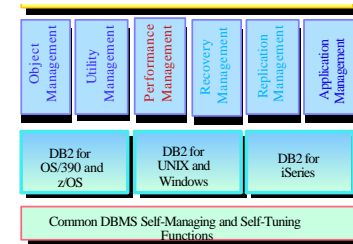
- **DB2 Web Query Tool**

- 100% Java tool used by DBA's and developers to
 - Run SQL queries, store for later use
 - View/save results to multiple formats, including XML/**XSL**
 - Copy data from multiple formats into DB2
- Multiplatform support
- WAP and e-mail support
- Copy, Convert, and Compare data
- **J2EE support**
- **Stored Procedure and LOB support**

**New
Release**



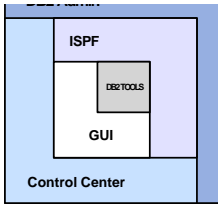
Application Management



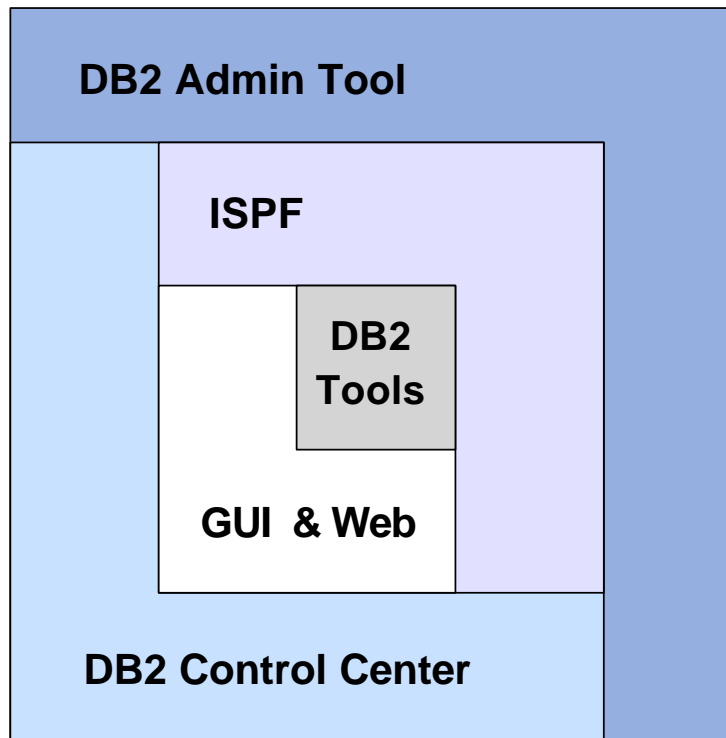
- **High Priority Requirements**

- Application restart tool
 - Reposition I/O files
 - Reset work areas
 - Reset cursors
 - Minimal code changes
- Test management tools
 - Replicate a subset of data and/or DDL from production
 - Map production schema to test schema
 - Generate test data on a column or table basis
 - Compare before and after images of the data
 - Full referential integrity support

Product Integration Strategy



Common Interfaces

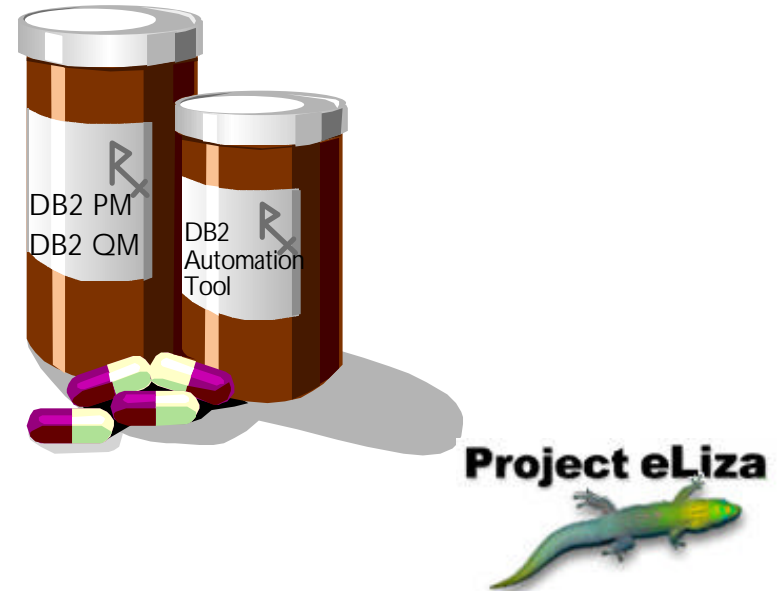


- **Launchability**
 - Ability to launch tools from each other
- **Data Interchange**
 - Data gathered by one tool available to other tools as needed
- **Installation and Customization**
 - Single installation process, turnkey process
 - Common install parameters and customization process

***Common look, feel,
& operation***

Database administration solutions span database engine and database tools

- **The future holds more...**
 - **Self-tuning**
 - **Self-healing**
 - **Self-managing**



Self Managing and Resource Tuning Databases

Optimization / system handles 90% of database tuning. It takes experts to handle the remaining 10% ... too hard!





Database administration solutions span database engine and database tools

- **Simultaneous and full exploitation delivery with DB2**
 - **Example:**
 - **DB2 Admin and DB2 PM become generally available with full exploitation at the same time DB2 becomes generally available**
- **Some tools function will move into the DBMS**
 - **Example:**
 - **DB2 V7 now maintains RUNSTATS history just like the DB2 Automation Tool does**
 - **DB2 V7 also now delivers Real Time Statistics that can reduce the monitoring provided by some tools**

Summary

- **Data Management Tools is a unique model in the database tools industry**
- **Investment increased to support future needs**
- **Comprehensive solutions now and more coming**
- **Independent of database server versions**
- **Multiplatform direction**
- **Common interfaces**
- **Cross-tool integration**
- **Database administration solutions span database engine and database tools**

- **IBM Data Management Tools for DB2 on the web**
 - ibm.com/software/data/db2imstools/