



| IBM Software Group

Data Management Tools: Keys to Your Business Success

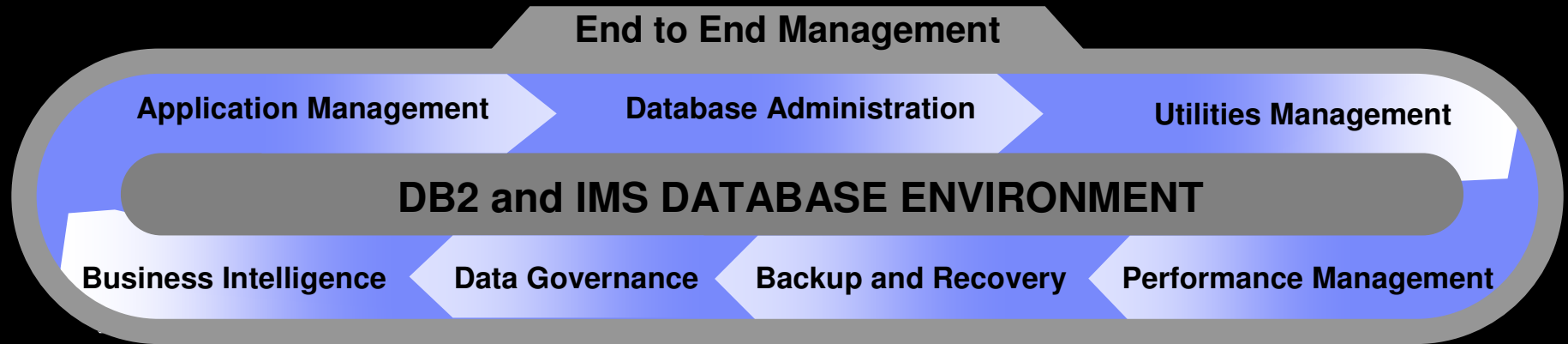


Agenda

- Introduction and Background – Business challenges
- The IBM Solution – How our tools for DB2 and IMS reduce your TCO and provide value to your business
- Solution Categories
 - ▶ Application Management
 - ▶ Database Administration
 - ▶ Utilities Management
 - ▶ Performance Management
 - ▶ Backup and Recovery
 - ▶ Data Governance
 - ▶ Business Intelligence / Data Warehousing



Managing your business environment



Business Challenges

- **Workload Management** - Managing the workload of the database to ensure optimal performance and availability.
- **Data Protection** - Ensuring the safety and integrity of data through backup and recovery strategies.
- **Performance Optimization** - Monitoring and tuning the database to improve response times and resource utilization.
- **Security and Compliance** - Implementing robust security measures and ensuring adherence to regulatory requirements.

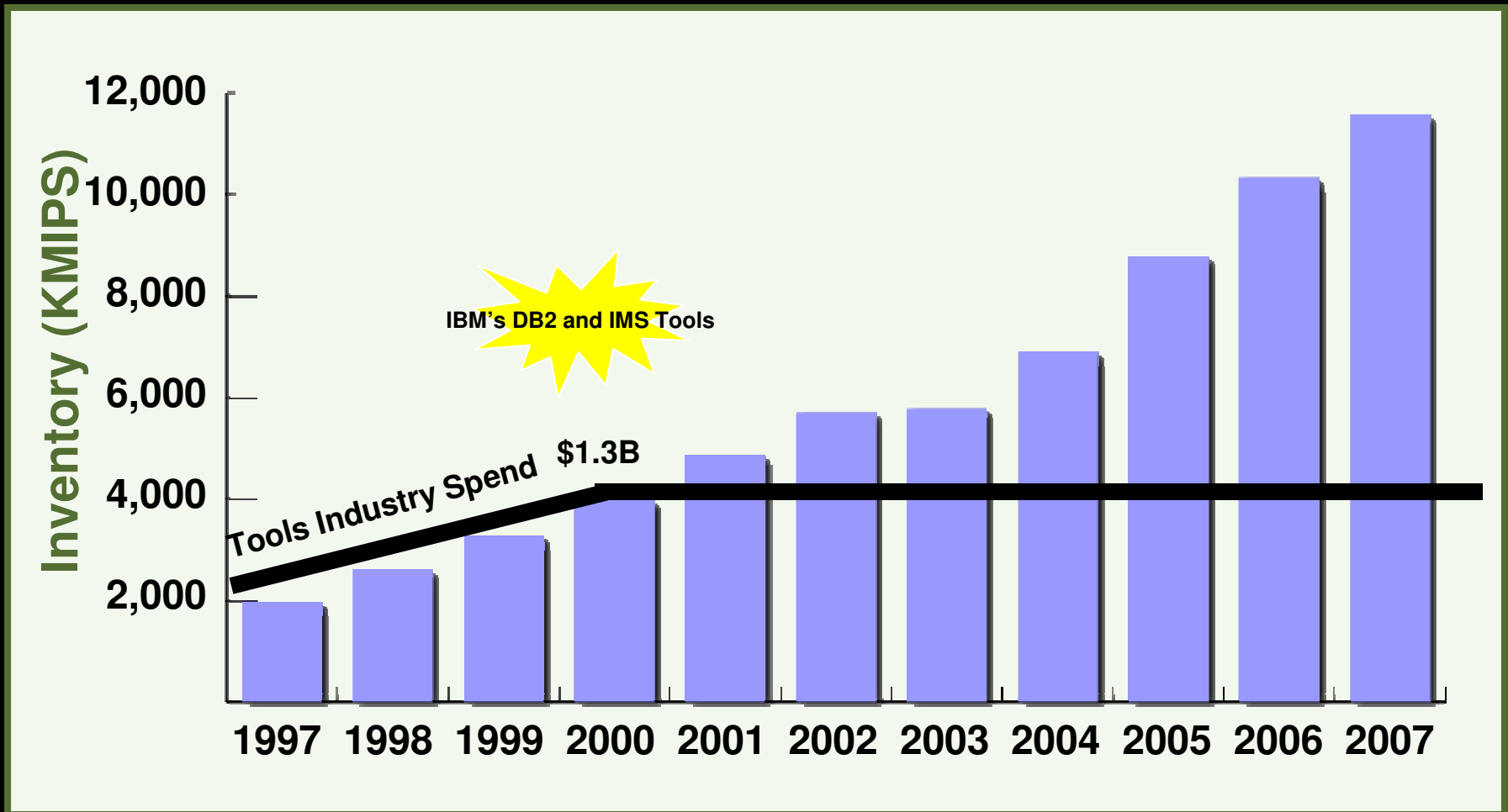


Reduce TCO

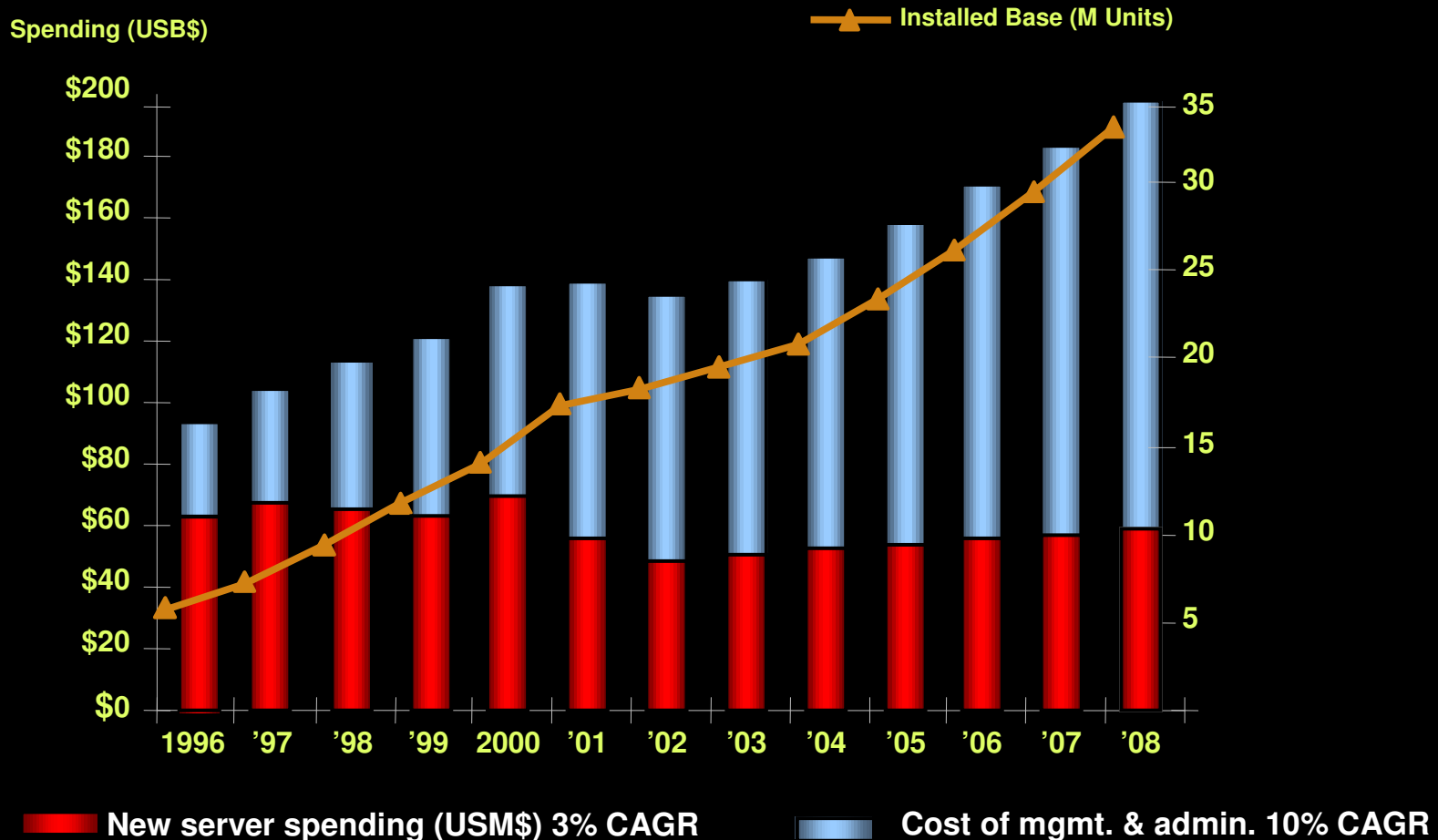
- ▶ Cost is hardware + software + people
- ▶ Hardware costs continue to decline
- ▶ Competition has driven SW costs down
- ▶ However, people costs have risen
 - Skills



System z Workload Growth



IDC: Since 2000, Labor Costs Have Exceeded the Cost of All Servers ... and are *Still* Growing



Source: IDC



DB2 Tools

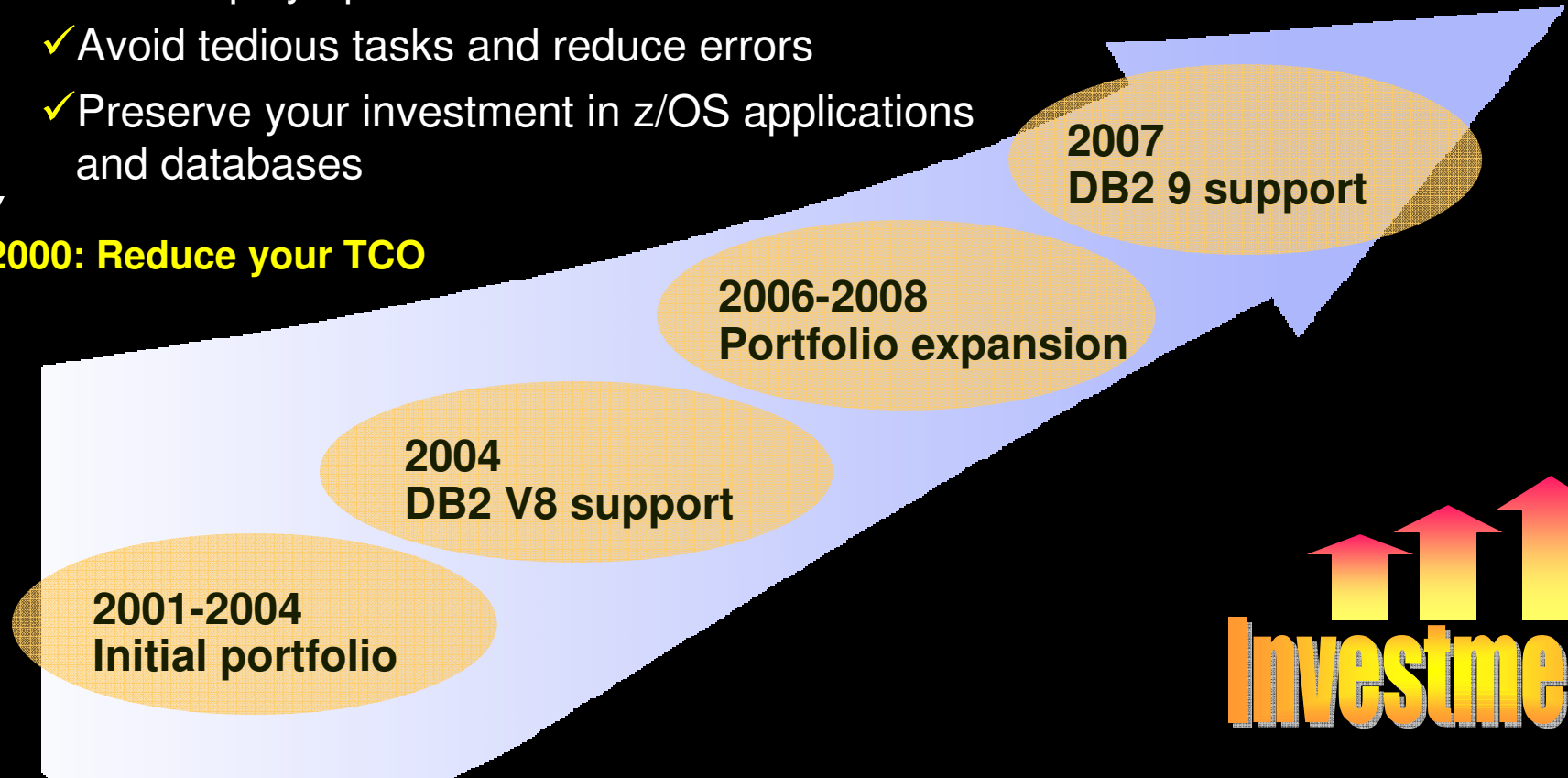
Reducing TCO is our first focus

- ✓ Provide autonomic features to add capability and simplify operations
- ✓ Avoid tedious tasks and reduce errors
- ✓ Preserve your investment in z/OS applications and databases



**2008: Reduce your TCO
Increased Value on z**

2000: Reduce your TCO



Investment



DB2 Tools Portfolio

Application Management

- DB2 Path Checker
- DB2 Bind Manager
- DB2 Table Editor

Utilities Management

- DB2 Utilities Suite
- DB2 Automation Tool
- DB2 Utilities Enhancement Tool
- DB2 High Performance Unload

Business Intelligence

- IBM DataQuant
- IBM QMF
- DB2 Web Query Tool

Database Administration

- DB2 Administration Tool
- DB2 Object Comparison Tool
- DB2 Storage Management Utility
- DB2 Change Management Expert

Performance Management

- OMEGAMON XE DB2 Performance Expert
- OMEGAMON XE DB2 Performance Monitor
- DB2 SQL Performance Analyzer
- DB2 Buffer Pool Analyzer
- DB2 Optimization Expert
- DB2 Query Monitor
- DB2 Performance Expert

Information Integration

- WebSphere Classic Data Event Publisher
- WebSphere Classic Federation Server
- WebSphere Classic Replication Server
- WebSphere DataStage
- WebSphere Replication Server
- DataMirror

Backup and Recovery

- Application Recovery Tool for IMS and DB2 Databases
- DB2 Archive Log Accelerator
- DB2 Change Accumulation Tool
- DB2 Cloning Tool
- DB2 Log Analysis Tool
- DB2 Object Restore Tool
- DB2 Recovery Expert

Data Governance

- IBM Optim Data Growth
- IBM Optim Data Privacy
- IBM Optim Test Data Management
- DB2 Audit Management Expert
- IBM Database Encryption Expert
- Data Encryption for DB2 and IMS

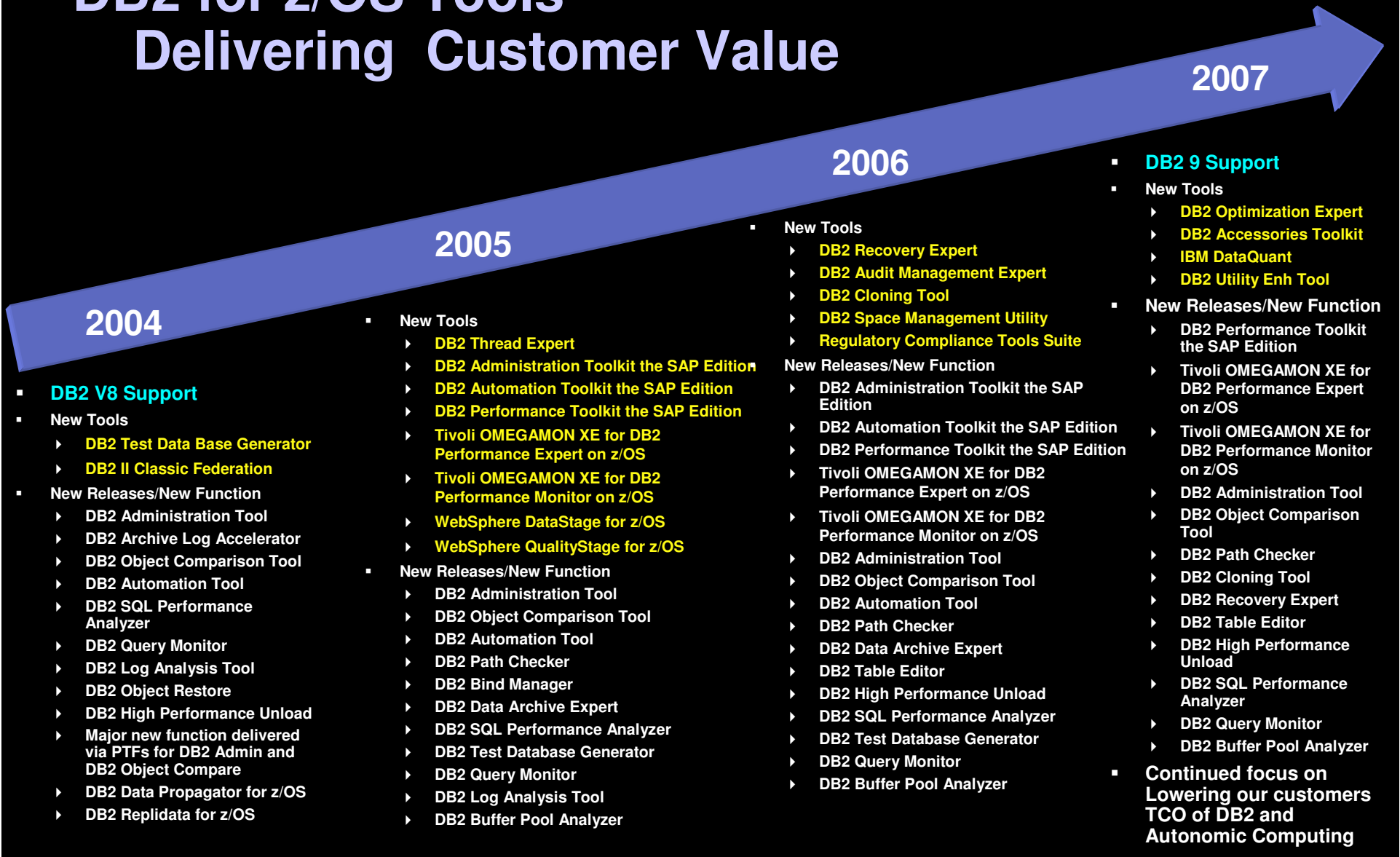
* Available only on System z

* Available on System z and LUW

* Available only on LUW



DB2 for z/OS Tools – Delivering Customer Value



Application Management

Business Challenges

- Maintaining and updating applications to support new requirements
 - Minimizing performance impact when updating applications
 - Minimizing downtime associated with application rollovers
- Managing complex application changes in a team environment

DB2 Tools

- DB2 Path Checker
- DB2 Bind Manager
- DB2 Table Editor



How DB2 Path Checker and Bind Manager can help with your V8 or DB2 9 migration?



- New optimizer delivered with V8 and DB2 9
 - ▶ Access path changes can occur based on optimizer changes or catalog statistics
 - ▶ Rebind highly recommended

- Planning for the release – DB2 Path Checker will catch undesirable Access Path changes and allow intervention before the rebind
 - ▶ Helps you understanding how applications currently execute and will isolate problems via access path regression analysis
 - ▶ Unacceptable access paths can be avoided by favoring the old access path via optimizer hint generated by Pathchecker

- What happens to packages which haven't been bound for many releases or old applications where source is no longer available?
 - ▶ If the application (DBRM) is no longer available, the BLDDBRM function is available in Bind Manager to build DBRM from the catalog
 - ▶ A number of SQL queries are shipped with Path Checker to help find potential problems prior to V8 or DB2 9 implementation

Database Administration

Business Challenges

- Managing changes to database objects and systems
- Propagating changes to other database environments
- Understanding the database resources required to support a change
 - Administering storage usage

DB2 Tools

- DB2 Administration Tool
- DB2 Object Comparison Tool
- DB2 Storage Management Utility
- DB2 Change Management Expert



DB2 Administration Tool: A Tool For ...

■ DB2 Database Administrators

- Create and manage objects (including managing authorizations to objects)
- Display tablespace and index status
- Run utilities

■ DB2 System Administrators

- Display and manage buffer pools, threads, traces and logs
- Display and update Zparm values

■ DB2 Application Developers

- Display object definition
- Manage plans and packages
- Prototype SQL
- Create test objects

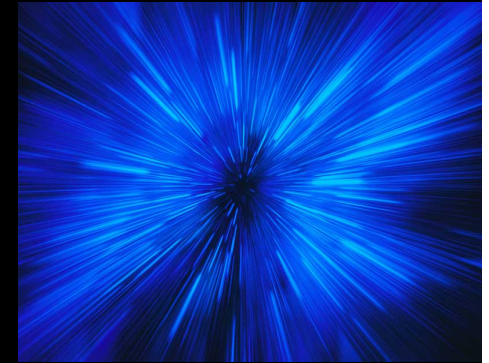


Provides a collaborative change management process in conjunction with DB2 Object Comparison Tool

- Changes are stored in a set of DB2 tables and tool then automates the steps
- Virtual changes can be built on top of changes not yet deployed



DB2 Space Management



- Are you increasingly challenged to analyze space-related factors that affect your DB2 performance?
- Do you need a way to review trends to assist in capacity planning?
- Do you want to generate a report that allows you review a DB2 space map?

DB2 Storage Management Utility

- Enables verification of the integrity of DB2 table spaces and index spaces
- Performs interactive repairs to spaces with errors
- Recovers wasted DASD space
- Performs analysis on space-related factors that affect DB2 performance
- Finds DB2 widows and orphans -- simplifies the clean-up of nonexistent and forgotten DB2 objects and VSAM data sets
- Allows historical analysis of DB2 space information



Utilities Management

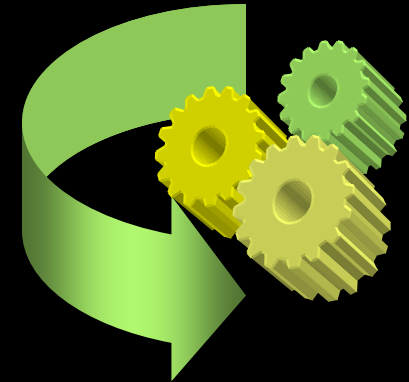
Business Challenges

- Reducing system resources used for unloading, reloading, and reorging data
- Reducing people resources used for unloading, reloading, and reorging data
 - Proactively preventing failures of utilities or applications
- Achieving higher availability and performance of database applications

DB2 Tools

- DB2 Utilities Suite
- DB2 Automation Tool
- DB2 Utilities Enhancement Tool
- DB2 High Performance Unload

Determining the need to REORG ... with DB2 Automation Tool



- DBA initiates a dialog with the tool
 - ▶ Define an object profile with ALL the table spaces
 - ▶ Define a utility profile for REORG with the proper options
 - ▶ Define an exception profile with checks for the proper statistics
 - ▶ Tie the three profiles together in a job profile
 - ▶ Set up Automation Monitor in job scheduler to run at a desired frequency
- That's it !
 - ▶ The “monitor” runs the job profile, statistics for each table space in the utility profile are retrieved, and compared to the criteria in the exception profile.
 - ▶ Jobs are generated using the REORG utility profile for table spaces that meet the exception profile criteria

Set it.... And forget it !



Enhancing DB2 Utilities

DB2 Utilities Enhancement Tool



- DSNUTILB Interface
 - ▶ IBM DB2 utility intercept function eliminates the need to modify any utility jobs to exploit the Thread Expert capabilities

- Utility enhancing functions
 - ▶ Can satisfy some customers requirements with pre- or post-processing of the utility statements (aka, outside of the utility code path)
 - ▶ For example → New capabilities for loading data
 - PRESORT keyword triggers the sorting of data, thus preventing a subsequent reorganization process
 - VALUEIF and CONSTANT keywords allow for overriding values for a given load
 - ▶ Automatic creation/deletion of mapping table for online reorg simplifies use of REORG Utility

Performance Management

Business Challenges

- Tuning SQL statements and database systems to improve performance
 - Determining why on-line transactions are failing
- Setting alerts to know when performance thresholds are reached or exceeded
 - End-to-end monitoring of your mission critical systems

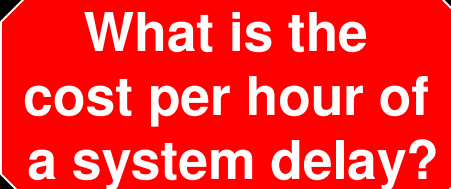
DB2 Tools

- OMEGAMON XE DB2 Performance Expert
- OMEGAMON XE DB2 Performance Monitor
- DB2 SQL Performance Analyzer
- DB2 Buffer Pool Analyzer
- DB2 Optimization Expert
- DB2 Query Monitor
- DB2 Performance Expert

For DB2 ... Someone has just reported a performance problem. Where do you start?

- **Could the problem be in DB2 itself?**
 - ▶ Did you run out of system resources?
- **Is the problem related to poorly coded SQL?**
 - ▶ Is the SQL static or dynamic?
 - ▶ What is the access path?
- **How about the network?**
- **When did this occur?**
- **Is this a one time occurrence, or has it happened before?**
- **Is the information stored in a history file somewhere?**

- **Do you have the knowledge, time, and expertise to do the analysis and determine the problem?**



What is the cost per hour of a system delay?

DB2 Performance Management Tools

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

DB2 Query
Monitor

OMEGAMON XE
for DB2 PE

Monitor

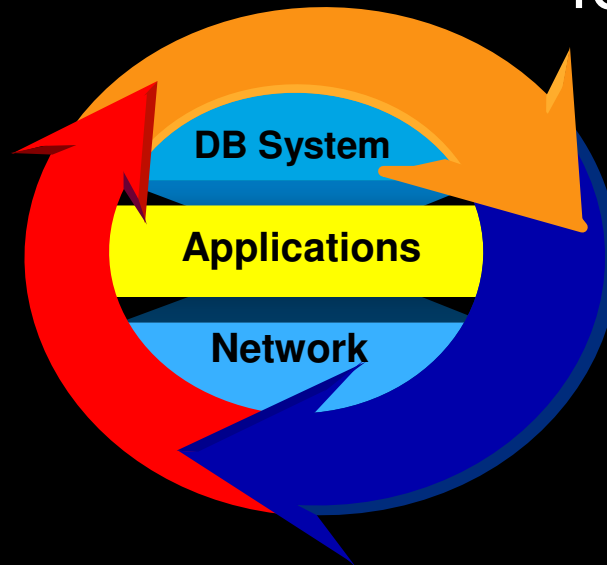
Tune and
Control

Analyze

DB2 SQL
Performance
Analyzer

DB2 Buffer
Pool Analyzer

DB2 Optimization Expert



OMEGAMON PE for DB2

Key function

An integrated application and system monitor for DB2 on z/OS

- ▶ **Detailed application and system problem determination**

Via real-time and historical monitors (TEP, Classic Interface, PE Client)

- ▶ **End-to-end monitoring**

Via Tivoli Enterprise Portal and for DB2 Connect gateways

- ▶ **System tuning**

Via Rule-of-thumbs and Buffer Pool Analyzer tool

- ▶ **Application roll-out and health checks**

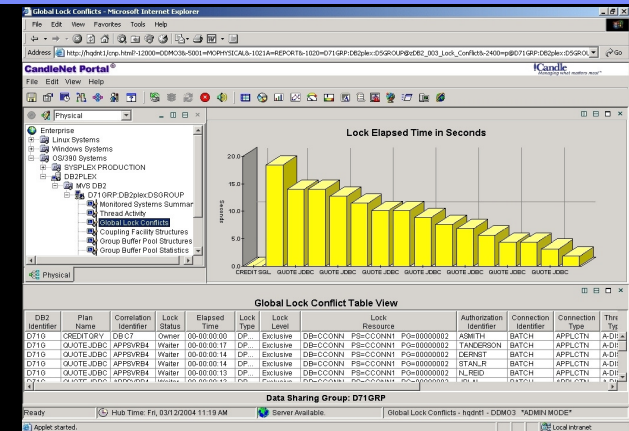
Via detailed reporting (such as SQL Activity report, locking report, etc.)

- ▶ **Trend and Capacity Planning**

Via a long-term performance repository (PWH/PDB)

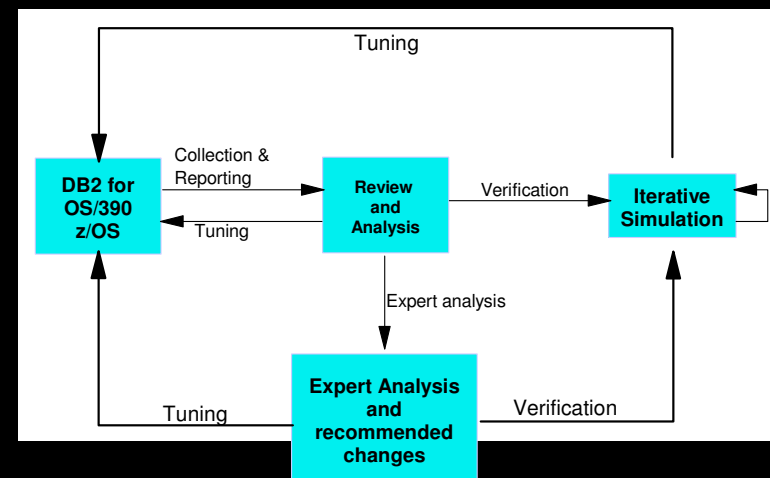
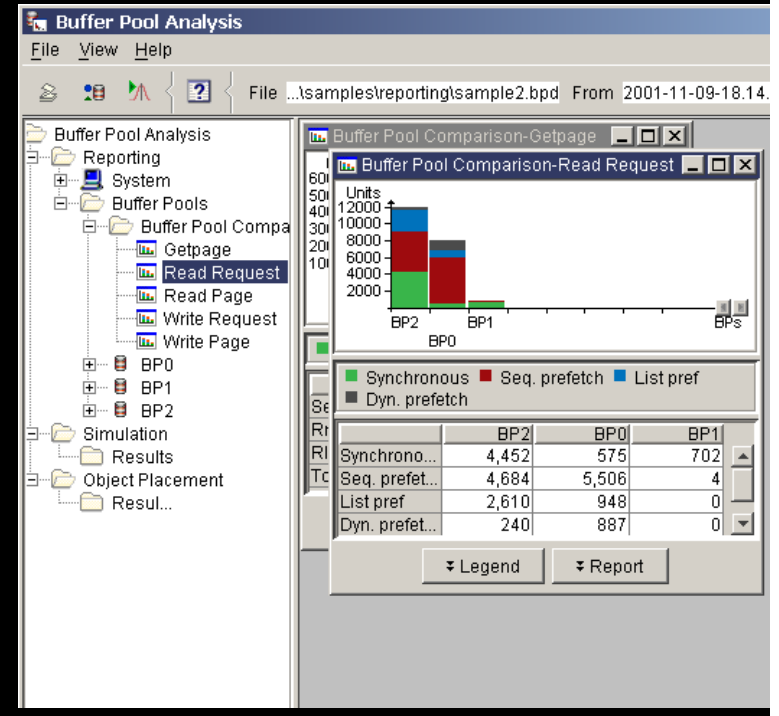
- ▶ **Accounting and Charge-back**

Via accounting reports and performance repository



DB2 Buffer Pool Analyzer

- **Collects** buffer pool data
 - as summary or detailed data
 - continuously or in sampling mode
 - in Online and Batch
- Generates various **reports and displays** results in multiple formats for BP and GBP (including graphical end-user interface)
- Provides expert knowledge and recommendations
- Recommends **object placements, BP size & thresholds**
- Generates **ALTER statements** for the recommendation
- Provides **simulation** for planned changes
- Makes it easy to tune your buffer pools



What does DB2 SQL Performance Analyzer (PA) Do ?



Forecasts SQL performance:

- ▶ Response Times, CPU Times, I/O Counts

plus the **COST** of the query, in terms of:

- ▶ Charge Back (monetary), QUNITS™ (query service units)

Transforms Optimizer access paths into real world costs

Provides an **Enhanced EXPLAIN** report:

- ▶ Catalog Statistics, Access Path Information, RI Relationships

Plus key **ADVICE** on each SQL statement:

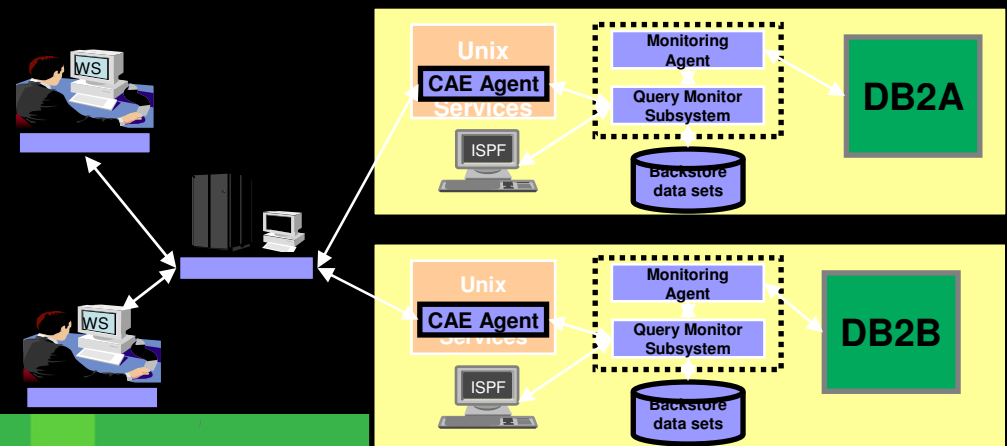
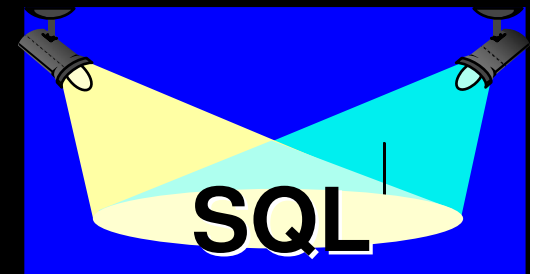
- ▶ Warnings and Alerts, Guidelines and Recommendations, Performance Notes and Good News

SQL PA teaches users how to write better SQL



DB2 Query Monitor

- Low overhead SQL statement monitor
- Identifies SQL requests which are consuming excessive resources and may be preventing critical requests from completing on schedule
- Proactively manage DB2 resources
 - ▶ React quickly and effectively to DB2 problems like inefficient SQL or inadequate object structures
 - ▶ Determine which tables and indexes are actually being used
- **Collects information about** exceptional SQL-related events
 - ▶ Performs analysis of exceptional events
 - ▶ Undertakes notification and curative actions when exceptional events occur



Backup and Recovery

Business Challenges

- Identifying resources that must be in place to ensure a proper recovery
 - Determining which objects have been impacted by a failure
 - Cloning systems with minimal people and system disruption
- Time spent to create and maintain disaster recovery scenarios

DB2 Tools

- Application Recovery Tool for IMS and DB2 Databases
- DB2 Archive Log Accelerator
- DB2 Change Accumulation Tool
- DB2 Cloning Tool
- DB2 Log Analysis Tool
- DB2 Object Restore Tool
- DB2 Recovery Expert



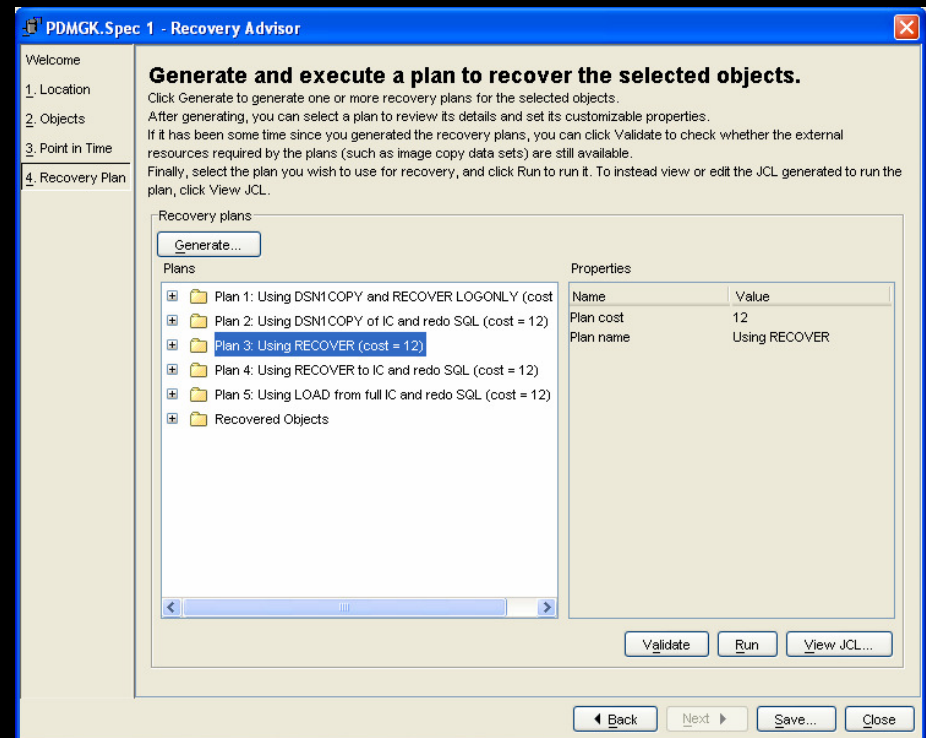
DB2 Recovery

- Recovery is perhaps the most complex activity that DBAs participate in
- There are many different potential scenarios
- Recoveries are not an everyday thing
 - ▶ most people don't practice recovery enough
 - ▶ skills are often not sharp when they are needed
- Questions that come to mind
 - ▶ Where do I start?
 - ▶ What objects are involved?
 - ▶ What is the point of consistency to be recovered to?
- There is a need for an Expert type product to assist DBAs in recovery activities



DB2 Recovery Expert for z/OS

- Provide Expert assist for performing many types of DB2 recoveries
- DB2 Recovery Expert analyzes the requested recovery and
- Provides a selection of possible recovery plans
 - ▶ Determines the needed recovery assets and utilities
 - ▶ Estimates the relative costs of the different plans
 - ▶ Builds and submits required JCL
 - ▶ Uses a versioning repository to inspect version levels available for restoration including related dependent objects even if they no longer exist in the DB2 catalog
 - ▶ Saves recovery and log analysis specifications for later use
- **A simple, self-managing recovery solution** that enables database recovery operations with minimal disruption



DB2 Cloning Tool

Cloning Challenges

- ▶ Extended downtime is the norm, as most data is shut down during cloning
- ▶ The requirement for a separate image
- ▶ How to clone different types of data?
 - DB2 – PeopleSoft, SAP
 - CICS, IMS
 - Non-database
- ▶ How to simplify cloning when using multiple replication products
- ▶ How to quickly access replicas

The bottom line:

- ▶ **Cloning costs you excessive amounts of people time and system resources**



DB2 Cloning Tool

- Creates Volume-based Clones
- Clones a DB2 subsystem AND at an object (Dataset level)
 - ▶ Supports DB2, Peopleoft and SAP
- Is extremely fast and cheap!
 - ▶ Disk vendor independent
 - ▶ Reduces production online downtime when cloning
 - ▶ Dramatically reduces costs
 - DB2 no longer needs to be shut down or conditioned the long traditional way
 - ▶ Provides virtually 24x7 access to data

Data Governance

Business Challenges

- Ensuring sensitive data is protected throughout the application lifecycle
 - Maintaining large amounts of unreferenced & inactive data
- Validating that company processes comply with existing regulations

DB2 Tools

- IBM Optim Data Growth
- IBM Optim Data Privacy
- IBM Optim Test Data Management
- DB2 Audit Management Expert
- Data Encryption for DB2 and IMS



The Requirements of Regulatory Compliance

Regulators have multiple goals. which drive investment in several areas

- ✓ Improved risk management across the enterprise
- ✓ Integrity of financial reporting processes and related business practices
- ✓ Customer information security



- People: Professionals with regulatory experience will be hired to enable firms to meet and anticipate new regulatory requirements
- Process: More robust processes and procedures will enable top management to monitor and enhance regulatory compliance
- Technology: Significant investment will be made. The following are critical for your DB2 systems:

Patriot Act HIPAA Anti-Money Laundering
 SEC Rule 17A-4 Basel II
 Gramm-Leach Bliley
 Corporate Information Security Accountability Act of 2003
 California Bill 1386 Department of Defense - 5015.2
 Sarbanes Oxley

- Encrypt sensitive data
- Protect sensitive production data
- Save data for future audits and to comply with retention rules
- Auditability - discover who did what, where and when



PCI – A closer look at one compliance example

- PCI – Payment Card Industry
 - ▶ The Payment Card Industry (PCI) Data Security Standard was created by major credit card companies to safeguard customer information
 - ▶ Credit card issuers (Visa, MasterCard, American Express, and others) mandate that merchants and service providers meet certain minimum standards of security when they store, process and transmit cardholder data
 - ▶ Severe penalties for non-compliance
 - ▶ Synchronicity with other compliance initiatives
 - ▶ Compliance viewed by many as competitive advantage



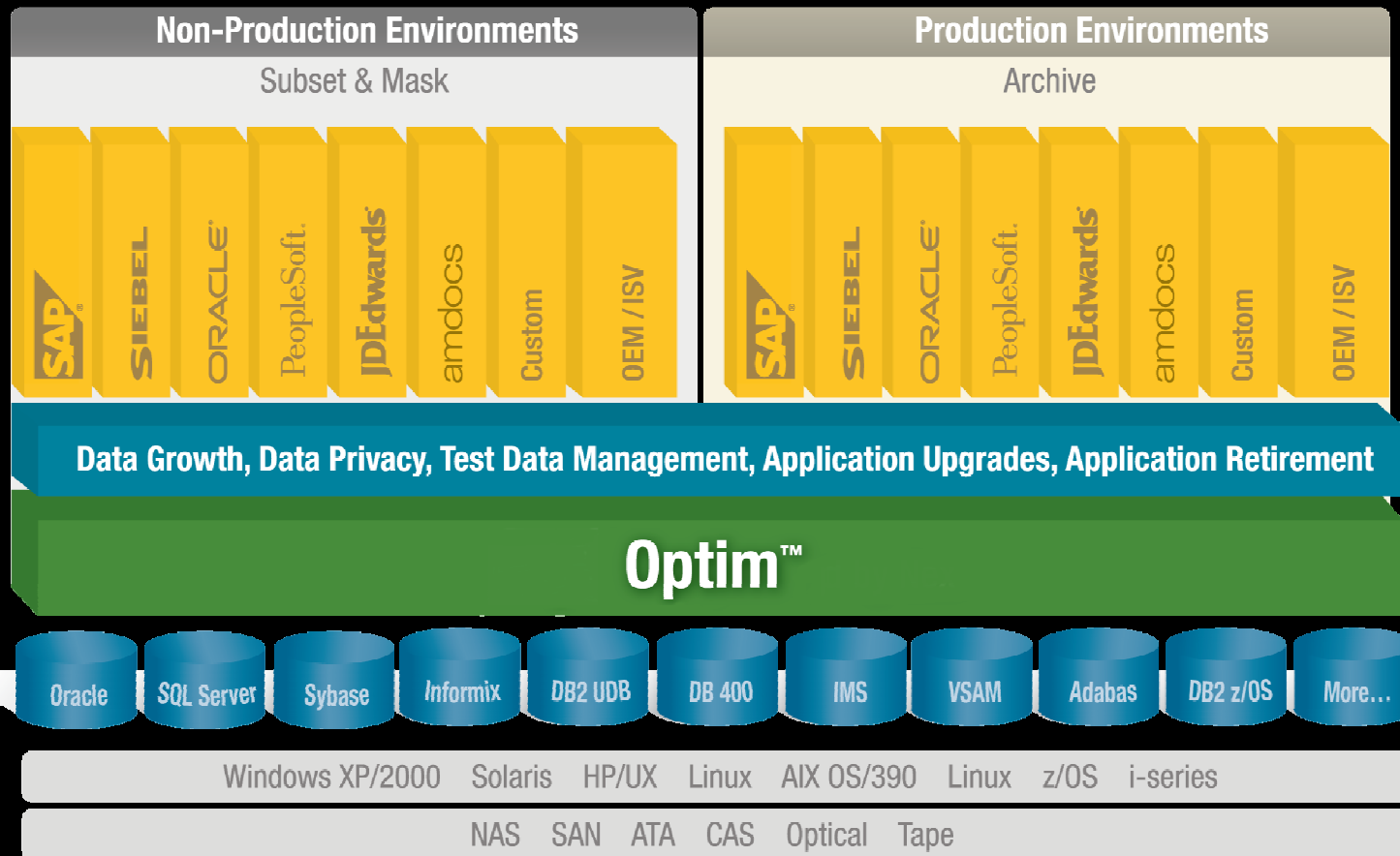
PCI – IBM Compliance Solution



- **Requirement 3: Protect Stored Data**
 - ▶ IBM Data Encryption Tool for DB2 and IMS Databases
 - ▶ DB2 Encryption Expert for LUW
- **Requirement 6: Test Data and Development life cycle management**
 - ▶ IBM Optim Test Data Management
- **Requirement 7: Restrict access to data by business “need to know”**
 - ▶ DB2 for z/OS V8 Multi-Level Security implemented via RACF
- **Requirement 10: Track and monitor all access to network resources and cardholder data**
 - ▶ IBM Tivoli OMEGAMON XE for DB2 Performance Expert on z/OS
 - ▶ DB2/IMS Audit Management Expert
 - ▶ IBM Tivoli Consul Insight
- **Requirement 10.7 Retain your audit trail history for a period that is consistent with its effective use, as well as legal regulations**
 - ▶ IBM Optim Data Growth Solution



Enterprise Architecture



- **Single, scalable, interoperable EDM solution provides a central point to deploy policies to extract, store, port, and protect application data records from creation to deletion**





IBM Data Encryption for IMS and DB2 Databases for z/OS

- Row level encryption
- Supports all levels of DB2 - no application changes needed
- Exploits System z and S/390 **Crypto Hardware features**, which results in low overhead encryption/decryption
 - ▶ Uses the **ANSI Data Encryption Algorithm (DEA)**, also known as the U.S. National Institute of Science and Technology (NIST) Data Encryption Standard (DES) algorithm
- Supports both secure key and clear key encryption
- Compatible with DB2 Load/Unload utilities and DB2 Tools
- Performance is similar to row level data compression
- <http://www.ibm.com/software/data/db2imstools/db2tools/ibmencrypt.html>



DB2 Encryption Expert for LUW

New

Data protection for IBM DB2 LUW environments

- ✓ Offline data protection – theft and loss
 - Backups typically written to portable media
 - Often stored offsite for long periods
 - Encryption/Compression of database backups
- ✓ Online data protection – internal threats
 - Attackers breaking through perimeter security
 - Privileged user abuse
 - Data replicates to many locations
 - Encryption of online database files
 - Privileged user access control to database files
- ✓ Centralized administration
 - Policy and Key management
 - Audit logs
 - High Availability

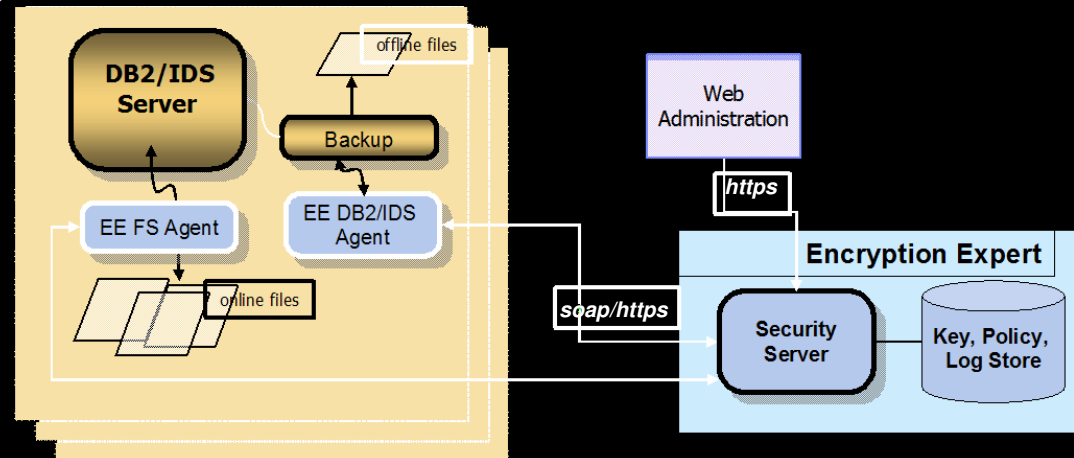
What are your needs?

Potentially high cost of data compromise

- Loss of Intellectual Property
- Loss of Competitive Advantage
- Brand Damage (newspaper headlines)

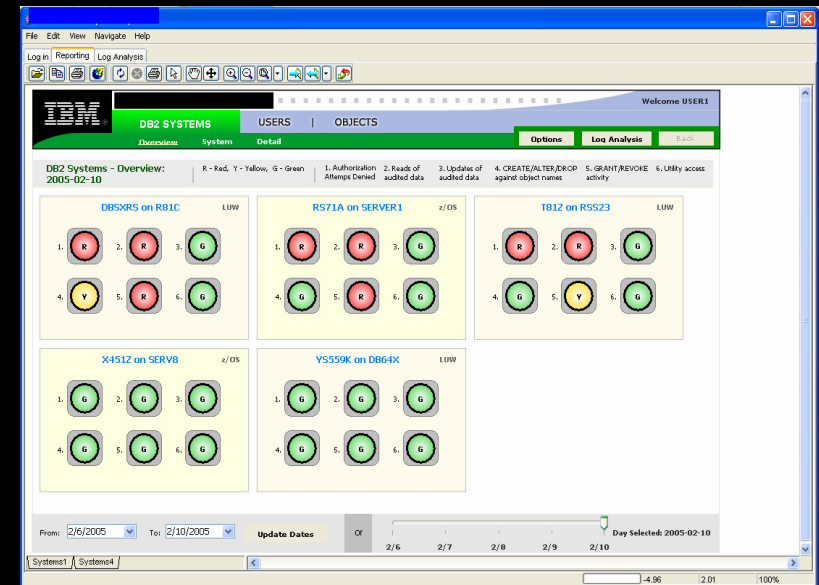
Compliance and regulation

- Financial Data : Sarbanes-Oxley; FFIEC
- Payment Card Industry: PCIDSS
- Consumer's Personal Information: GLBA ; HIPAA; US State Laws (SB 1386)



DB2 Audit Management Expert

- Provides centralized auditing of DB2 and IMS bringing together information from many different sources into a correlated, coherent view
- Enables auditors to collect, view, analyze and report on data and save it into an audit repository
- Allows auditors to automatically generate their own reports and export the data into other applications such as Excel spreadsheets



Makes life for auditors and DBAs much easier !!

New

For DB2 LUW !!!!

Business Intelligence

Business Challenges

- Maintaining real-time warehousing information co-located near OLTP systems
 - Need for performance, reliability and data security in warehouse systems
 - Managing large volumes of data needed for query, reporting and analysis

DB2 Tools

- IBM DataQuant
- IBM QMF
- DB2 Web Query Tool



A Single View of the Enterprise Drives the requirement for Data Warehousing



- New **work** is added
- Data **volumes** rise
- Amount of **historical Information** grows
- Number of **users** grows
- Questions are more **numerous** and **sophisticated**
- **Schema** complexity grows
- Workload **mixture** changes
- **Development** time shrinks



Factors that Influence Data Warehouse on System z Platform Selection

- ✓ Existing infrastructure
- ✓ Platform preferences and skills in-house
- ✓ Budget/Cost
- ✓ Server Consolidation
- ✓ Market trends in warehousing solutions and vendors
- ✓ Complexity
- ✓ Competitive influences
- ✓ Mergers and acquisitions or consolidations
- ✓ Data or application sources
- ✓ Business processes required and business drivers
- ✓ Reliability, Extremely High Availability, Security



New Information On Demand Software for System z

Better business decisions, faster and with a lower overall TCO

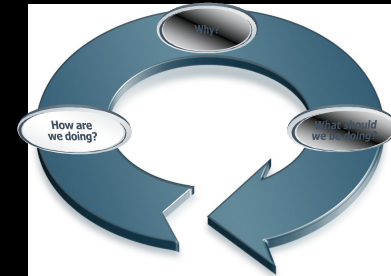
Cognos 8 Business Intelligence for System z

Coming!

Single solution for reporting, analysis, dashboards and scorecards

Delivers a competitive advantage for organizations with operational information on System z

Accepting participants for a beta program on Cognos 8 for Linux on System z.



DB2 for z/OS Value Unit Edition

Now Available

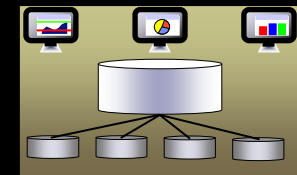
New one-time-charge offering that simplifies the deployment of new application workloads

Strengthens the role of System z as a cornerstone for key business initiatives such as SOA, DW, BI & SAP

Delivers pureXML which optimizes information availability in the New Enterprise Data Center

Data Warehousing on System z

More than 50 new features in the last two releases of DB2 for z/OS supporting warehousing Information Server for System z - brings new scalability, information consistency and performance to System z customers



InfoSphere Master Data Management Server for System z

More effectively manage high-value operational information

- Customers, suppliers, partners, product materials and employees

Addresses and solves the root cause of master data complexity

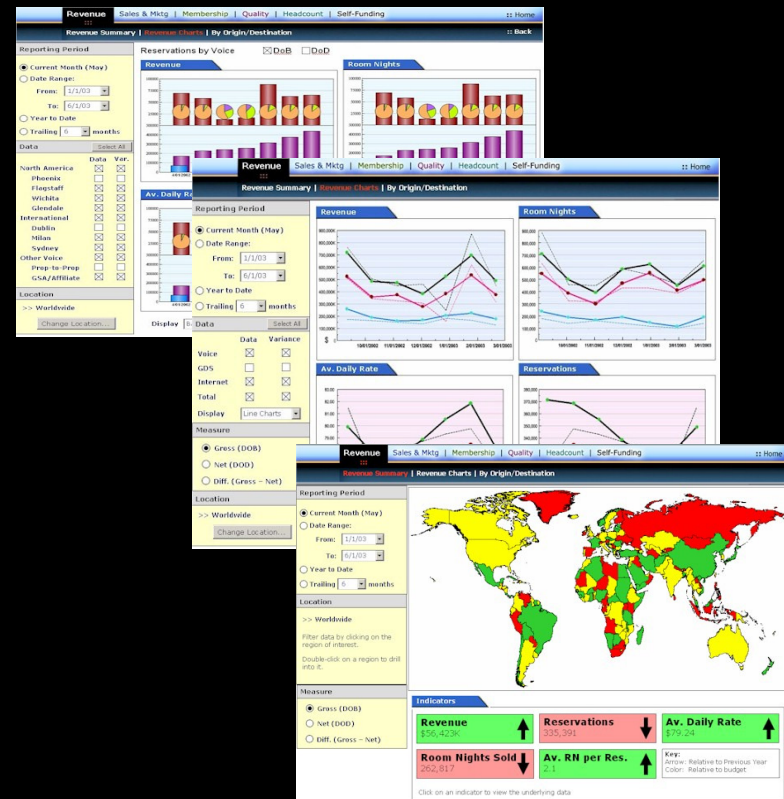
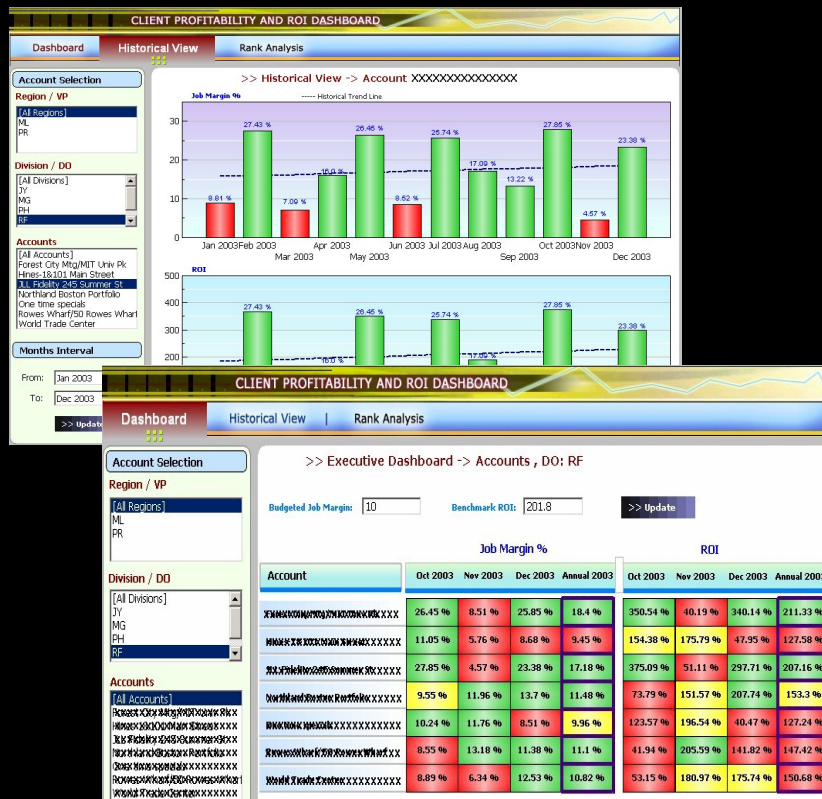
Coming!

Information on Demand Software Stack is now on System z



IBM DataQuant

- Adds compelling new Warehouse/Business Intelligence component
- Visual Dashboards, Enhanced Graphical Reporting, Security and Personalization, SOA Layer, Enhanced Analytics, access to most relational databases
- Offers a “rich” client with DataQuant for Workstation, or a pure HTML, browser based client with DataQuant for WebSphere



Summary



Why IBM Tools?



- **Reduce TCO** by optimizing IT staff efficiency
 - ▶ Every product is developed with one goal; to lower the TCO of managing the DB2/IMS environment
- IBM has a **vision** and is **investing in a strategy** for its tools
 - ▶ We introduced 3 DB tools in 2000 – we have 100+ today
 - ▶ Continuous improvement of IBM tools over the last 7 years
- A **comprehensive portfolio** to manage, access, integrate and analyze data
 - ▶ Support and exploit DB2 V8, DB2 9, and IMS V10 today



THANK YOU

