IBM z Systems

Maximizing the Business Impact of DB2 for z in your Enterprise

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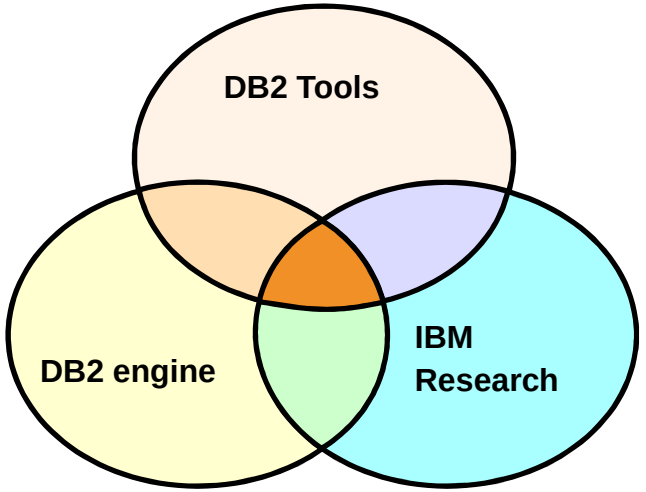
Topic Outline

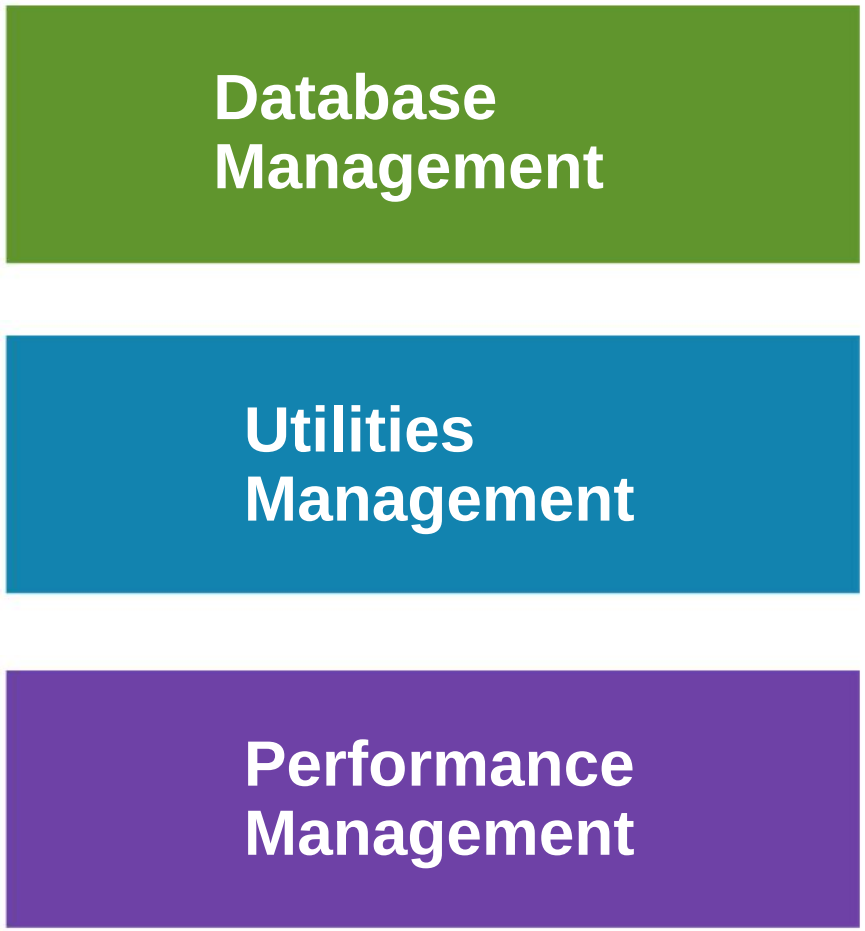
- Introduction
- Core DB2 Tools Solutions
- Strategic Initiatives for DB2 Tools
- Summary

Introduction to the DB2 Tools



- Significant Investments in:
  - Product development
  - Technical support
  - Migration and Implementation
  - Customer Partnerships
- Continue to improve and expand our portfolio
  - Continuous product improvement providing more value
  - Integrated and Autonomic Solutions
  - Modern GUI interfaces to attract new talent
  - New Products to address new concerns
  - Best Practices for DB2
- Remain flexible and responsive
  - Adjust plans to accommodate customer requirements
- Bottom Line
  - We succeed if we help our customers be successful with DB2

Manage and Optimize: DB2 Tools



Manage the Database

Manage the data

Optimize the Performance

DB2 Tools Solution Packs

- Simplified offerings in each of the key solution areas:
  - Database Administration
  - Utilities Management
  - Performance Management
  - Recovery Management

- Value:
  - Complete solution for all needs rather than having to purchase multiple products
  - Simplified install and maintenance
  - Build intelligence into when and how actions are p
  - Optimize performance and resource utilization associated with DBA activities to reduce TCO

Solution Overview

"More data, reduce costs"

Optimize, control manage & automate

How do we get the best control over DB2 utility processing?

How do we save CPU & Elapsed time while improving availability?

How can we smartly automate our DB2 utilities execution?

DB2 Utilities Solution Pack

"Modern Techniques, Less CPU"

Modernize, control optimize & protect

How do we maximize our storage for use with DB2 for z/OS?

How do we protect DB2 assets from disaster to app errors and in between?

How do we use modern techniques for data movement?

DB2 Fast Copy Solution Pack

"Improving the bottom-line"

Identify, diagnose solve & prevent

How do we zero in any performance issues affecting our profitability?

How can we solve performance issues more efficiently to minimize user dissatisfaction?

How do we reduce CPU and maintain performance?

DB2 Performance Solution Pack

"Limited Resources"

Navigate, manage change & track

How do we become more efficient in our day-to-day tasks?

How do we ensure the integrity of our DB2 for z/OS assets throughout the application lifecycle?

How do we do more with less resources?

DB2 Administration Solution Pack

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DB2 Utilities Solution

- Reduce utility CPU usage and elapsed time by up to 50%*
- Eliminate 100% of CPU and elapsed time by avoiding unnecessary utility processing
  - Dynamically schedule work only if necessary
- Fastest and most flexible DB2 Unload in the market to modernize data movement
- Extended online data load capability
- Set company-wide DB2 utility standards
  - Utilities run the first time… every time
  - Enforced and auditable
  - Set one policy
    - Thousands of very old, un-tuned Utilities can be tuned without changing a line of JCL
    - Easily adopt DB2 Utilities features in DB2 10 and DB2 11
- Full support for ALL DB2 function

"More data, reduce costs"

Optimize, control manage & automate

"DB2 Sort is an easy to install product which can be integrated in maintenance processes with no modifications. DB2 utilities in our shop benefit from significant CPU time reductions and additional zIIP offload, which also leads to a lower batch window frame."

"DB2 Sort 2.1 – same product, just faster. I am spoiled using this product. It is that easy and that effective."

During recent product evaluation, customer saw improvements in utility sort processing of:

- *87% reduced Sort CPU*
- *72% Sort CPU offload to zIIP*
- *46% reduction in Elapsed Time*

**** With zIIP engine***

DB2 Sort for z/OS v2.1 – GA October 24, 2014

- DB2 Sort provides high speed utility sort processing for data stored in DB2 for z/OS. It improves sort performance while optimizing overall system efficiency by exploiting the advanced facilities of the z/OS operating system and System z to provide the highest level of ROI.
- DB2 Sort leverages the strengths of the System z platform, DB2 for z/OS and the DB2 Utilities Suite to drive:
  - **Significant savings** in elapsed time and CPU during utility sort processing, especially LOAD, REBUILD INDEX and REORG
  - **Relief from application constraints of large volumes of data** in highly-transactional workloads performing numerous insert, update and delete operations against DB2 for z/OS databases
  - **Efficient use of resources** with dynamic adjustment of resources to avoid over-allocation while helping to maintaining optimal performance for all tasks
  - **Improved sort processing** for other IBM products such as DB2 Utilities Enhancement Tool, DB2 High Performance Unload, DB2 Recovery Expert, DB2 Log Analysis Tool and DB2 Change Accumulation Tool

DB2 Sort 2.1 Performance Benefits

- Use of DB2 Sort 2.1 with DB2 utilities, as compared with running DB2 utilities alone, may see: *
- Reduction of Sort CPU usage
  - Up to 84.8% reduction on machines with zIIP engines
  - Up to 49.1% reduction on machines without zIIP engines
- Reduction of Utility CPU usage
  - Up to 60.6% reduction on machines with zIIP engines
  - Up to 39.7% reduction on machines without zIIP engines
- Reduction of Utility Elapsed Time
  - Up to 44.6% reduction on machines with zIIP engines
  - Up to 46% reduction on machines without zIIP engines

* The information contained on this slide is distributed AS IS. Performance data and results presented were determined in various controlled laboratory environments, using specific, limited test configurations, and are for reference purposes only. Tests were run against the most current versions of DB2 Sort and DB2 Utilities Suite generally available as of October 24th, 2014. Results reported for machines with zIIP engines reflect a situation where all DB2 Sort program zIIP eligible instructions are successfully dispatched to execute on available zIIP processor(s). The results that may be obtained in other operating and production environments may vary significantly. Users of the product should verify the applicable results they might achieve for their specific environment.

DB2 Performance Solution

- Integrate business priorities directly
  - Monitor KPIs to better reflect end user experience
  - New version support a key
  - Allocate resources according to business needs
  - Continually drive down TCO
- Improve application performance proactively
  - Get query recommendations, optimize statistics, create appropriate indexes
  - Optimize results for entire workloads, not just single queries
  - Prevent performance problems before they occur
- Ensure SLAs and user satisfaction are achieved
  - Handle all workloads and all access types
  - Pinpoint and isolate problems to correct instantly

"Improving the bottom-line"

Identify, diagnose solve & prevent

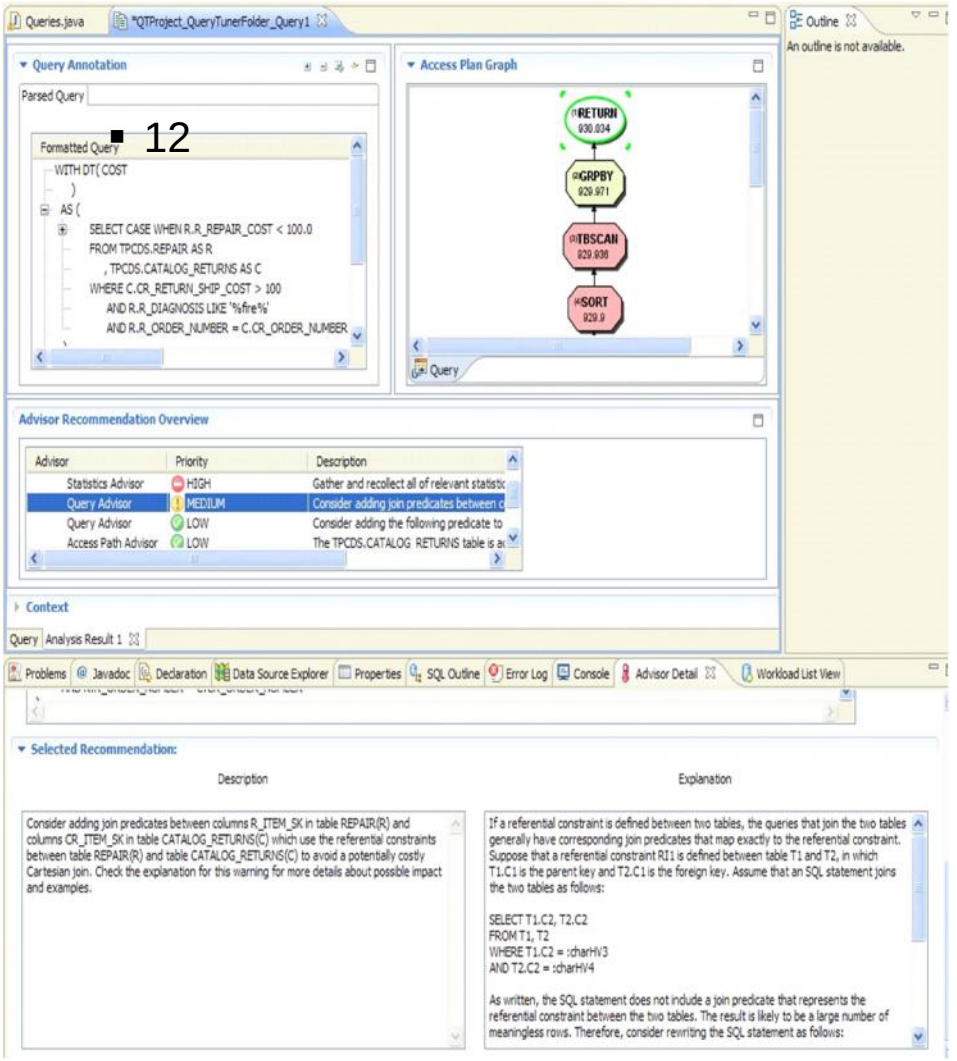
"The integration of OMEGAMON for DB2 with GUI solutions is **light years** ahead of its competition"

"…the Pennsylvania Department of Transportation has realized a 10-fold ROI by reducing MIPS usage and man hours in our DB2 z/OS environments."

"It gives us a different way to look at things, not only more info that we can use easily, but by bringing up exceptions that we have never looked at. Some of the things have been in production for a few years…we didn't even know we could do better."

InfoSphere Optim Query Workload Tuner

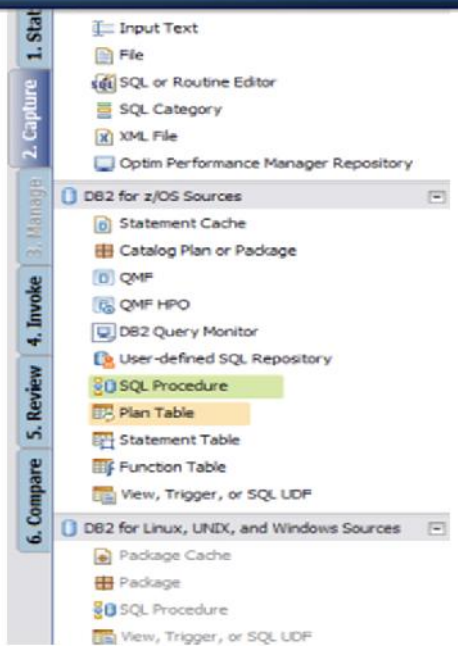
- Identify query candidates
  - DB2 catalog
  - Dynamic statement cache
  - Development Studio hot spots
  - Query or performance monitors
- Facilitate analysis
  - Query formatting
  - Query annotation
  - Access path visualization and annotation
- Get expert tuning advice
  - Improve query design
  - Improve statistics quality
  - Improve database design



Streamlined Performance Analysis

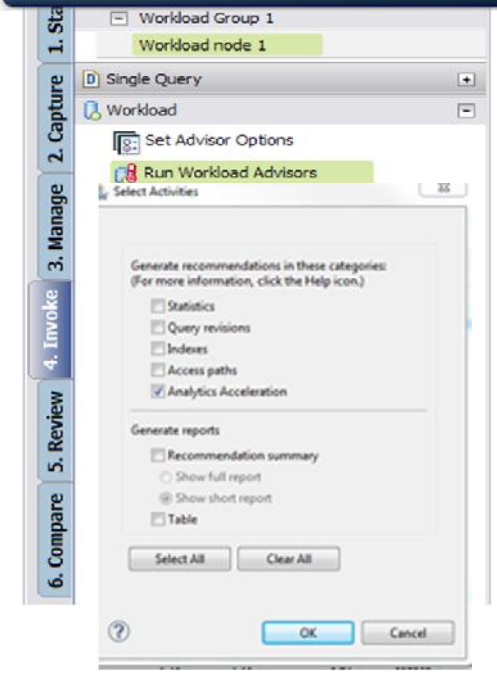
1

Define or select a workload



2

Execute Advisors



3

Drill Down into advice

Summary - 1 Initial

Recommendation	Number	Description
Shown		
Statistics	1	Repair statistics problems for this query. Gather missing statistics. ...
Query revision	2	Provide a join predicate based on the referential constraint betw...
Query revision	3	Provide a predicate on column WORKDEPT.
Access path	4	Avoid reading all index keys on an index scan (QBLOCKNO = 1, P...
Index	5	Index recommendations found.

4

Validate improvement

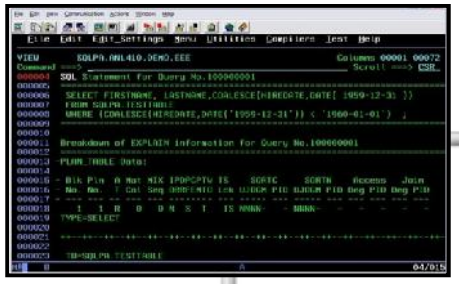
Name	Summary Status	Owner	Execution Time
WorkloadWithTypicalStats	ANALYZING	B3OSC12	CPU time: 97.32 (second...
WorkloadTunedWithStatsAdvisor	ANALYZING	B3OSC12	CPU time: 53.19 (second...
WorkloadTunedWithIndexAdvisor	ANALYZING	B3OSC07	CPU time: 40.67 (second...
AbsoluteCPUTimeExceptionMonitor	ENABLED/STARTED	SYSADM	N/A
NormalMonitor	ENABLED/STARTED	SYSADM	N/A

Integration Speeds Resolution Times

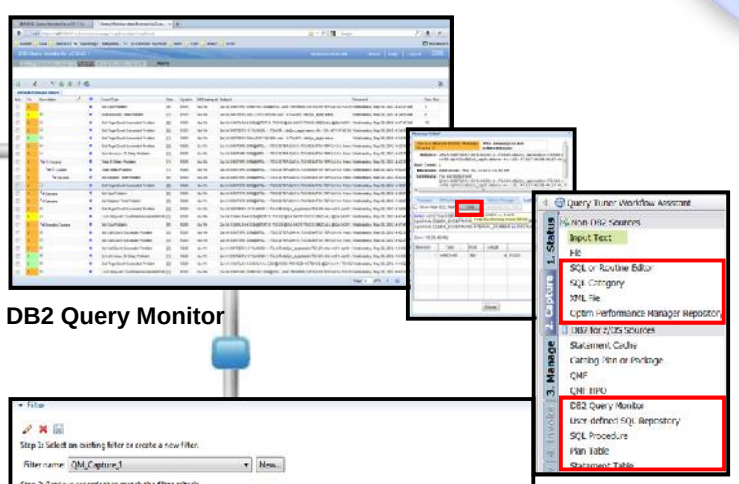
Solve problems closing the loop on problem determination

Solve

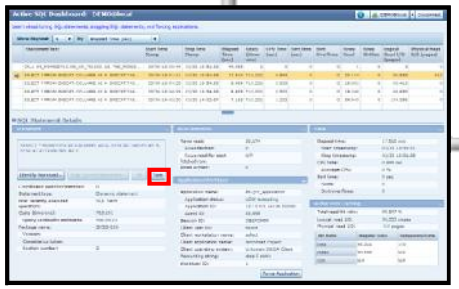
- Receive expert advise for problem resolution
- Correct the problem



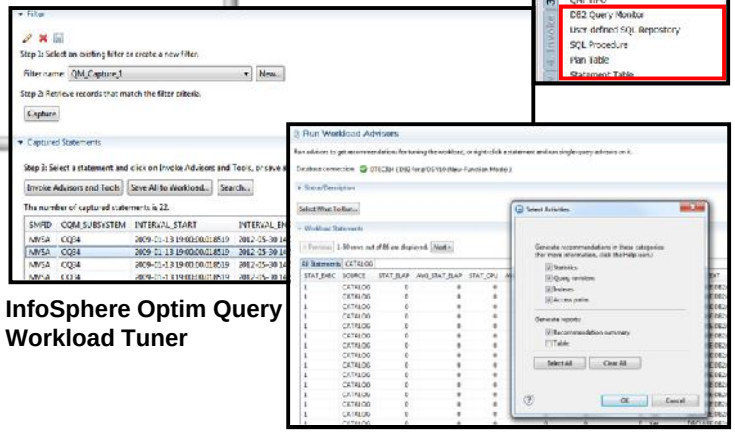
DB2 SQL Performance Analyzer



DB2 Query Monitor



OMPE and Extended Insight



InfoSphere Optim Query Workload Tuner

Why Clone data?

- Test, verify and problem solve new versions/maintenance prior to production
  - DB2 for z/OS, new versions, upgrades and maintenance
  - Applications, such as SAP or home-grown
- Performance and availability
  - Offload business processes from production
  - Improve production performance
- Data Warehousing
  - Quickly populate/refresh a data warehousing environment
- Replication
  - Load initial replicate

The bottom line:

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

DB2 Cloning Solution

- Clones at a DB2 subsystem AND object level
  - – Renames and catalogs the data sets, fixes the volume internals
- Is extremely fast and cheap
  - – Dramatically reduces costs of traditional methods
    - Uses dramatically less personnel time
    - Can automate operations
    - DB2 no longer needs to be shut down or conditioned the long traditional way
  - – Disk vendor independent
    - Uses any snap, mirror or PIT copy…

"Extreme productivity with low cost"

Insure, modernize optimize & protect

"It used to take 72+ hours to clone an IMS subsystem, now it takes 30 minutes"

"It took 2 days, using 2 people to clone 6 DB2 systems for a total of 96 days per year. Now it takes 1 person 30 minutes for a savings of 84 person days per year"

"We cloned a 20TB system (7200 volumes with 59,000 data sets) in 18 seconds, 11 minutes for the renaming".

DB2 Recovery Solution

- Eliminate daily backup costs
  - Gain value from fast replication devices
- Increase availability
- Protect critical DB2 for z/OS objects and data with an recovery insurance policy
  - Extensive validity checking guarantees a complete and accurate backup
- Take advantage of intelligent Recovery Manager
  - Analyze all resources and provide optimized cost-based recovery in real time
- Minimize risk of changes in application introducing costly errors
  - Health check function validates the ability to recover to selected points in time
- Fast DR Support

"Highest availability with low cost"

Insure, modernize optimize & protect

CPU Usage almost eliminated, replacing costly image copies with System Level Backup.
5 TB system backed up in .41 seconds
"It saved us countless hours and frustration as compared to using our previous method of individual RESTORE jobs using Image Copies and logs. The end result was less DBA time required and quicker turnover to the clients for validation and testing."

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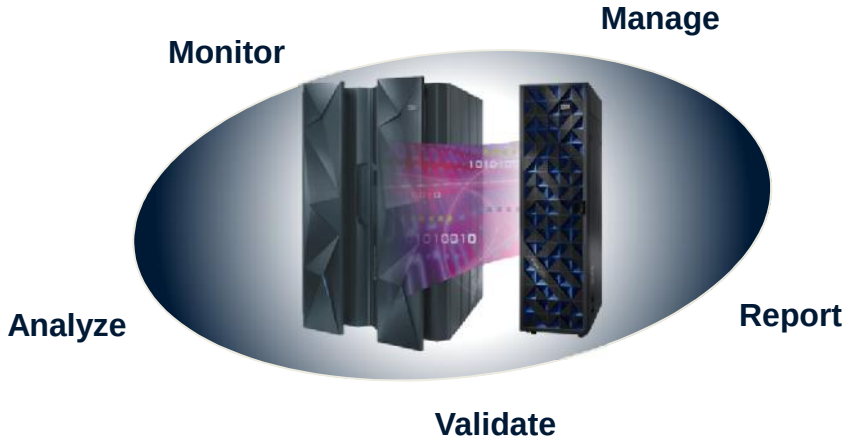
Tools Strategic Initiatives

- Increase technology lead over other vendors
  - Extend zIIP exploitation lead
  - Extend IDAA exploitation lead
  - Extend FlashCopy lead
- Modernize Database Management
  - Enhance Usability of IBM Solutions
  - Admin and Autonomics dashboard for Web and mobile
  - Increase solution integration and common architecture
  - Extend Autonomics within Portfolio
- Day 1 support of new DB2 features

Maximize Your Investment in IDAA

Surround IBM DB2 Analytics Accelerator with powerful capabilities to maximize its impact in your organization

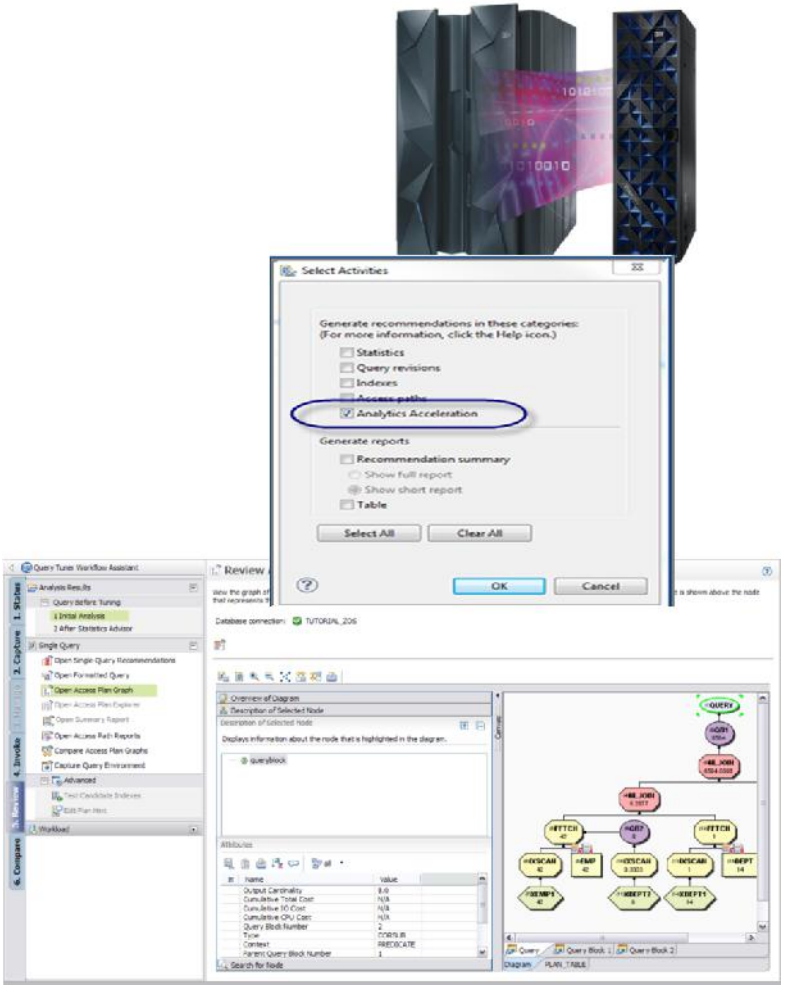
- Proactively monitor and manage your accelerated queries
- Validate performance ROI of accelerated queries
- Streamline query candidate selection
- Filter out un-accelerated queries to maximize workload tuning efforts
- Expand Use Cases for loading data into the Accelerator
- Administer and manage your Accelerator using a single tool



OQWT: Optimizing the Selection, Tuning and Access Plan Analysis of Accelerated Workloads

Workload Analytics Accelerator Advisor

- Identify candidate queries and tables to be routed to the accelerator
- Identify candidate tables to be routed to the accelerator
- Implement advisor-based tuning recommendations for mixed workloads of accelerated and un-accelerated queries
- Diagram accelerated queries in Access Plan Graphs
- Integrates with Query Monitor, OMPE, and OWR for capturing query workloads for complete analysis
- Enable “what if” analysis



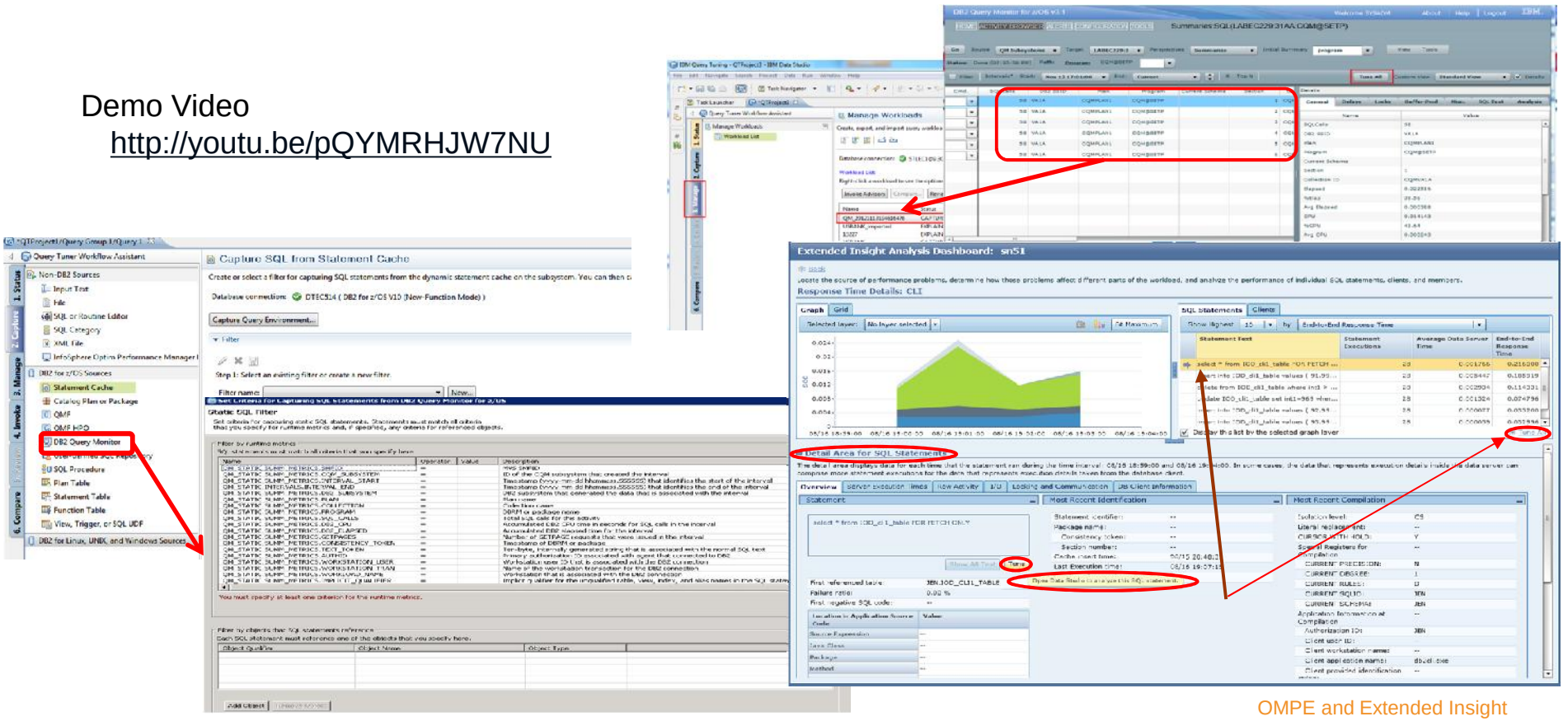
Benefits

- Shorten the process of selecting tables to be accelerated
- Visualize access paths of accelerated queries
- Increase productivity by working with accelerated queries through a unified interface
- Increase overall system capacity
  - Demo Video http://youtu.be/pQYMRHJW7NU

Integrate OQWT with DB2 QM / OMPE for complete analysis

- Support different integration scenarios
  - Push a SQL or SQL workload from DB2 QM client into OQWT
  - Push a SQL or SQL workload from OM DB2 PE to OQWT
  - Pull a SQL workload from DB2 QM offload repository on OQWT GUI

Demo Video
http://youtu.be/pQYMRHJW7NU



OMPE and Extended Insight

Loading data into the Accelerator - Tremendous Possibilities

- **How does data get loaded into the Accelerator today?**
  - The standard DB2 UNLOAD utility extracts data
  - Places tables in Read-only mode until Accelerator load is done (when using option for transactional consistent data)
  - Accelerator reflects DB2 data at point in time load was initiated
  - Optionally use CDC for near-real-time replication to Accelerator

- **Introducing the IBM DB2 Accelerator Loader**
  - Features
    - External 'Dual' Load
    - Group Consistent Load
    - Image Copy Load
  - Built for performance & usability
  - Loader populates data in the Accelerator
    - Load DB2 & non-DB2 data
    - Load in parallel to avoid application downtime
    - Load to historical point-in-time

I want to maximize the power of DB2 and System z for business analytics. How do I bring Oracle data to the Accelerator for query optimization?

I have to prepare a summary report from my business application as of last Thursday. How do I capture the data from a date that is other than current, that can be considered for query acceleration?

How do I improve the loading of objects into DB2 and/or Accelerator without impacting my DB2 production data?

I have an image copy from an external OLTP DB2 tablespace. How can I use this image copy to load an accelerator table?

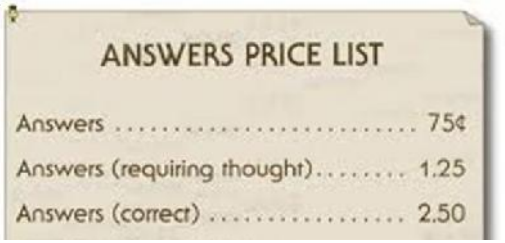
Tools Strategic Initiatives

- Increase technology lead over other vendors
  - Extend zIIP exploitation lead
  - Extend IDAA exploitation lead
  - Extend FlashCopy lead
- Revolutionize Database Management
  - Enhance Usability of IBM Solutions
  - Admin and Autonomics dashboard for Web and mobile
  - Increase solution integration and common architecture
  - Extend Autonomics within Portfolio
- Day 1 support of new DB2 features

The Growing z/OS Skills Gap

- Expert z/OS database skills are dwindling
  - Experienced DBAs and SysProgs continue to retire
  - New DBAs and SysProgs take years to become “experienced”
  - Industry wide – modern employees spend less time in a single role
    - Becoming less likely to find as many 25+ year experienced DBAs and SysProg
- Yet, the need for expert DBA / SysProg skills is growing
  - Demands for 24x7 high performance operation continue to increase
  - Allowed outage windows are shrinking and are less frequent
    - Maintenance done in those windows is more important than ever
  - Increasing system complexity makes planning, maintaining, and troubleshooting more difficult and time consuming
- DBAs / SysProgs must become more efficient, more quickly

Solution



- Advanced Graphical Interfaces
  - Consolidate and simplify information from various sources
  - Simplify the presentation of complex information (visuals)
  - Shorten the learning curve (integrated assistance and doc)
- Autonomics
  - Automate routine collection of data
  - Automate analysis of this data
  - Automate decisions based off this analysis
  - Automate execution of decisions
- Convergence of our Tools
  - IBM Tools working together and leveraging each others' functions
    "Sum is greater than the total of its parts"

Revolutionizing IT – Vision

Modern console provides autonomics, central management of database systems, and extensibility to analytics and cloud, enabling customers to deliver higher business value for their company

Unified strategy for automating and optimizing DB2 for z/OS and IMS capabilities to address the needs of the next generation of enterprise customers

Usability

Single web interface to administer DB2 for z/OS and IMS simply and quickly

Autonomics

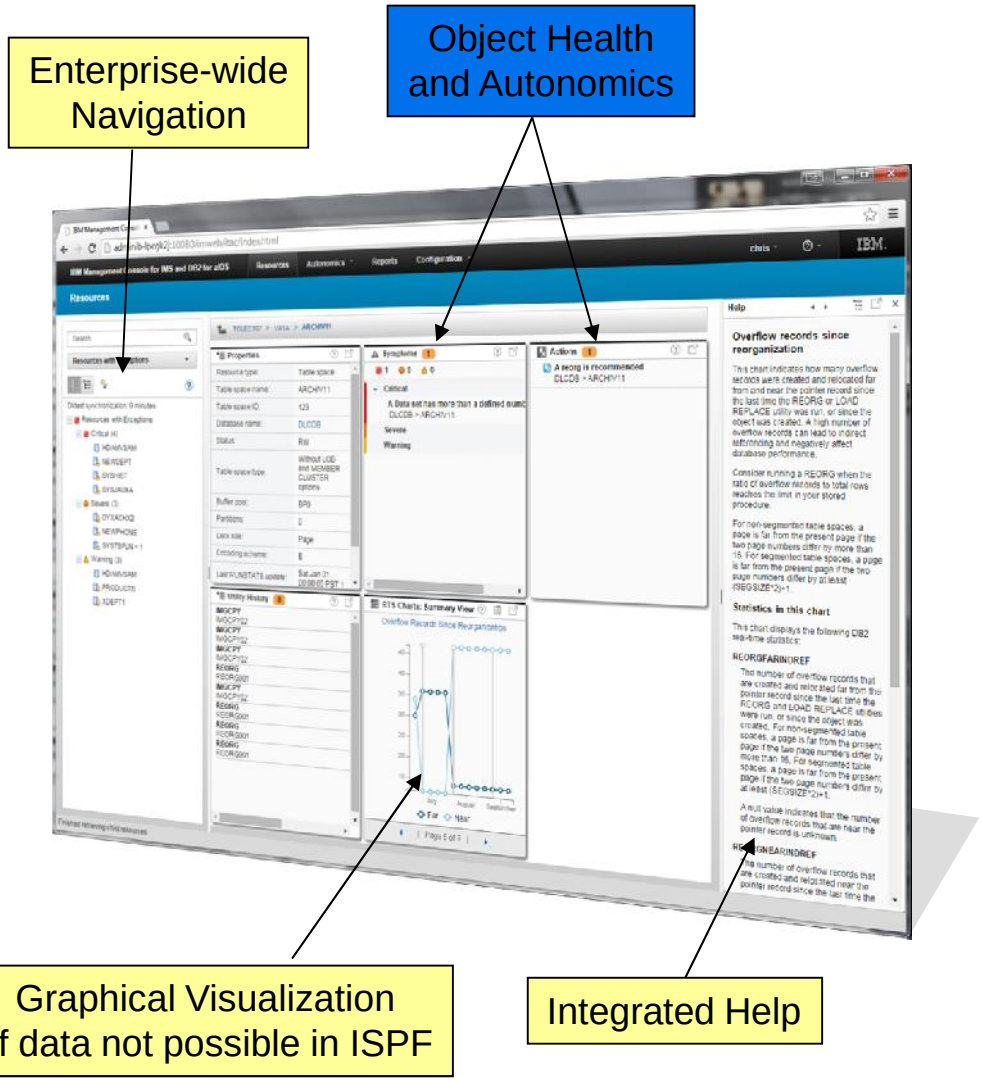
Automate basic administration to give freedom to work on higher business value tasks

Extensibility

Extend to other capabilities and environments such as analytics, cloud & mobile

IBM Management Console for IMS and DB2 for z/OS

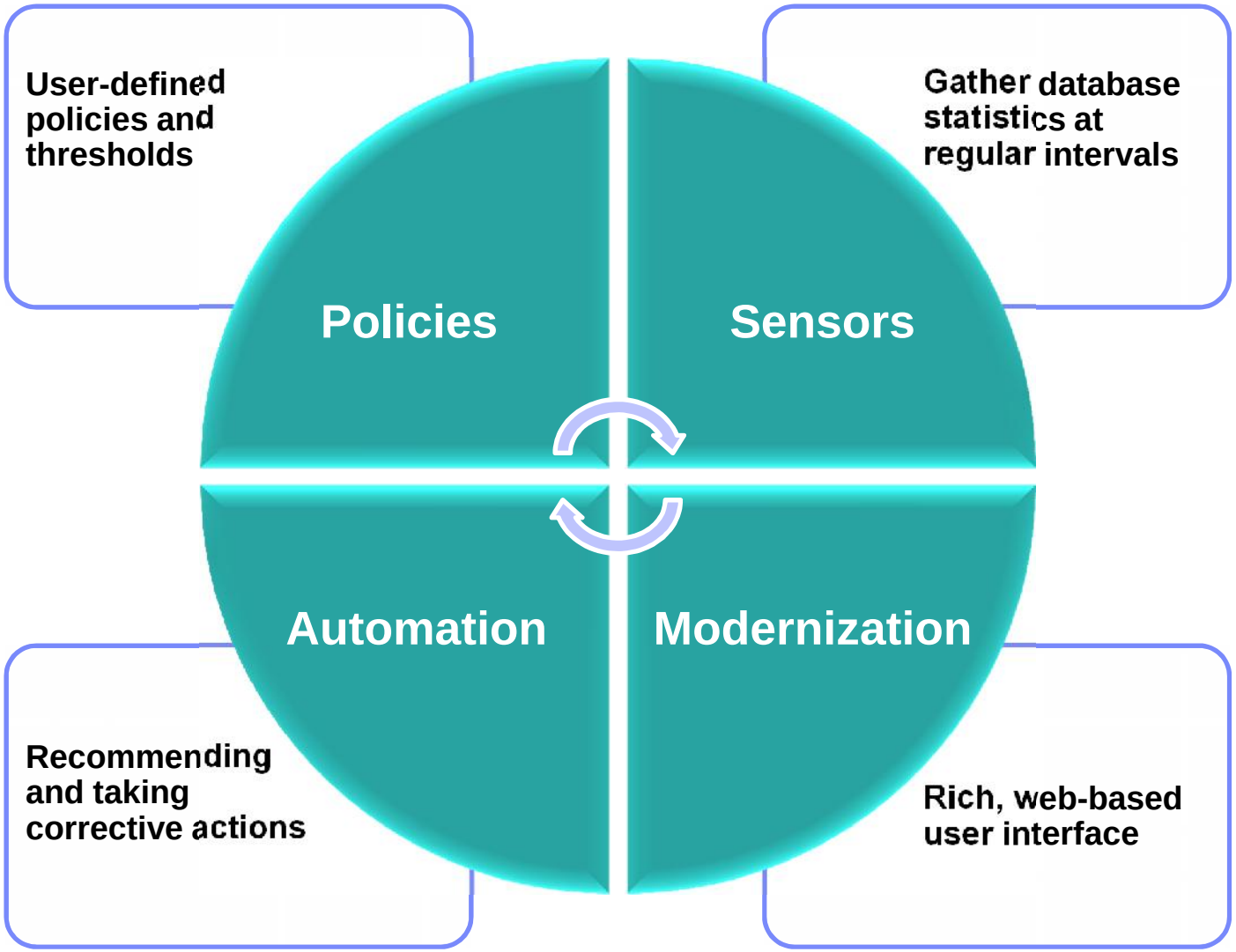
- Offers a unified interface
  - View and manage overall health of IMS and DB2 for z/OS subsystems across the enterprise
- Navigate and drill down from the enterprise or system level
  - View, understand and access identified IMS and DB2 for z/OS symptoms and recommended actions
- Individual resource dashboards
  - Consolidate information from a variety of sources and tools
- Embedded help for IMS and DB2 for z/OS
  - Helps reduce learning curve and enable users to be up and running faster



Delivered with no-charge Management Console

Utilities Solution extensions to Management Console

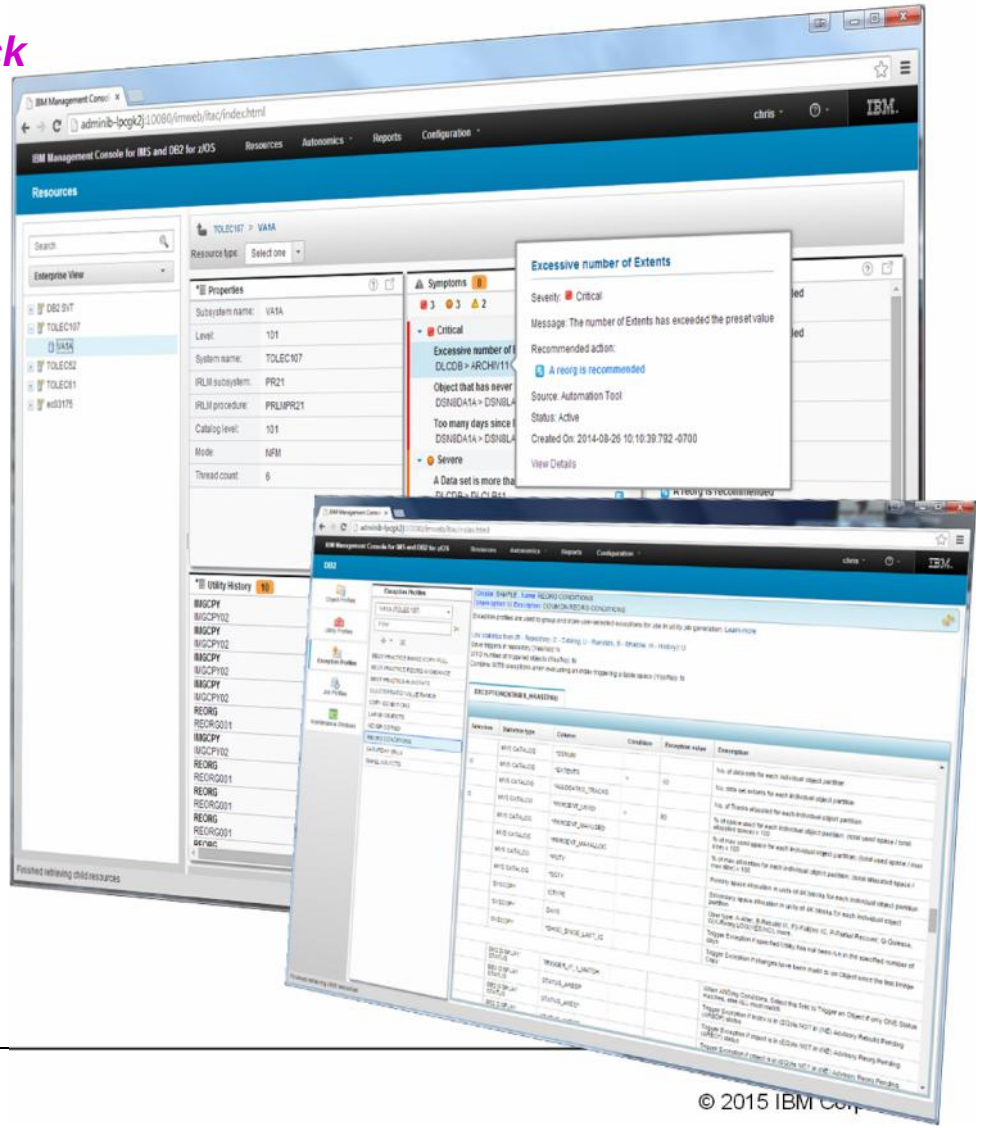
Autonomics – Putting information to work for you



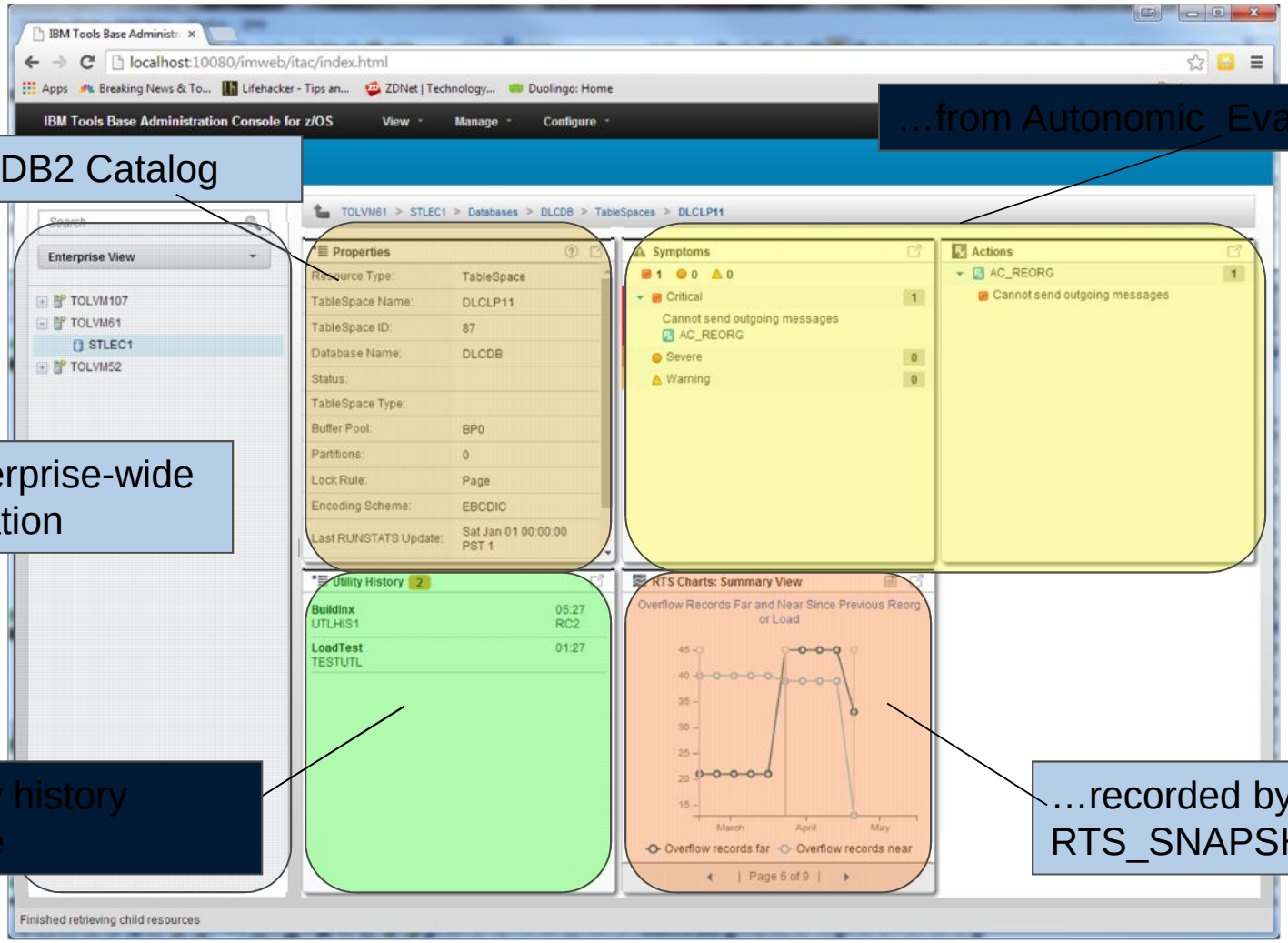
IBM Management Console for IMS and DB2 for z/OS

Extended with the DB2 Utilities Solution Pack

- Identification and Diagnosis of symptoms and recommended actions for REORGs, ICs, Runstats
  - Display resources with highest severity symptoms/exceptions
  - Navigate directly to those resources
- Reporting on historical utility execution including timestamp, elapsed time, system output, etc
- Graphical interfaces to define Automation Tool Object, Utility, Exception, and Job Profiles



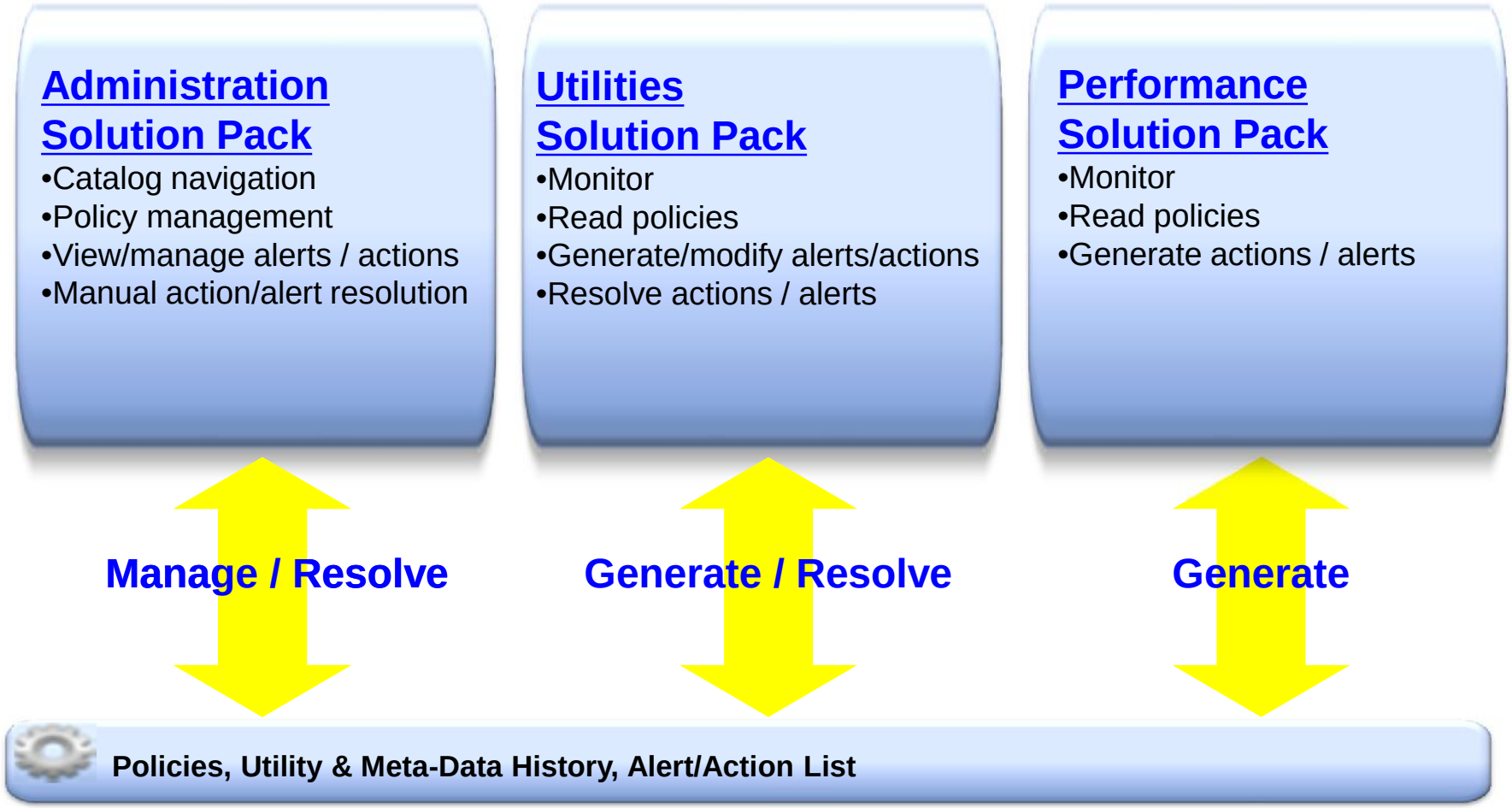
Holistic Dashboard of DB2 Objects



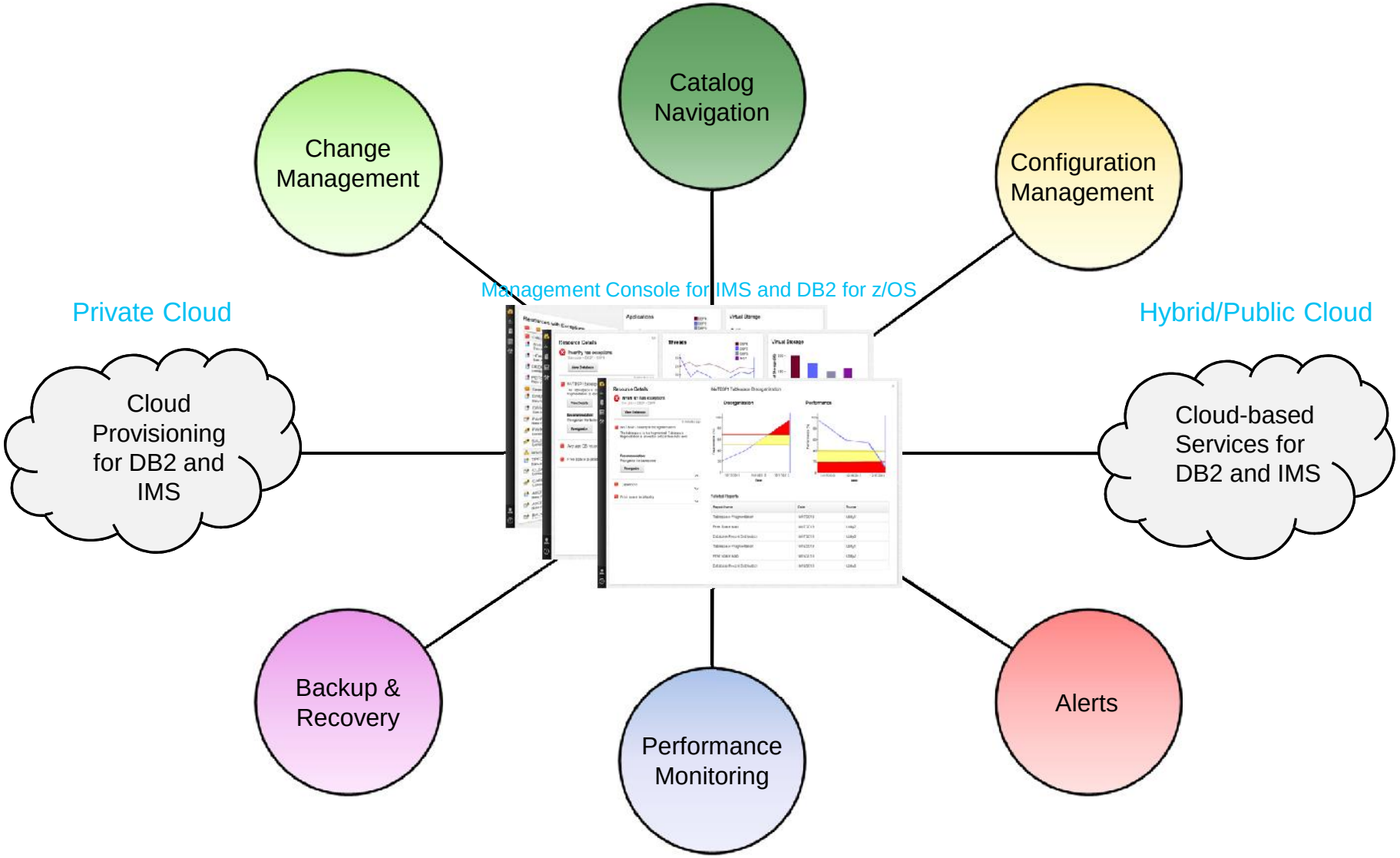
Delivered with no-charge Management Console

Utilities Solution extensions to Management Console

IT Modernization Architecture



Vision


Catalog Navigation
Change Management
Configuration Management
Management Console for IMS and DB2 for z/OS
Private Cloud
Hybrid/Public Cloud
Cloud Provisioning for DB2 and IMS
Cloud-based Services for DB2 and IMS
Backup & Recovery
Performance Monitoring
Alerts

What is IBM Data Server Manager?

Delivers a Simplified User Experience

- ***Single installer and integrated repository***

Provides a Common Integrated Web Console

- ***Provides enterprise view of your environment***
- ***Guided workflow and analysis***

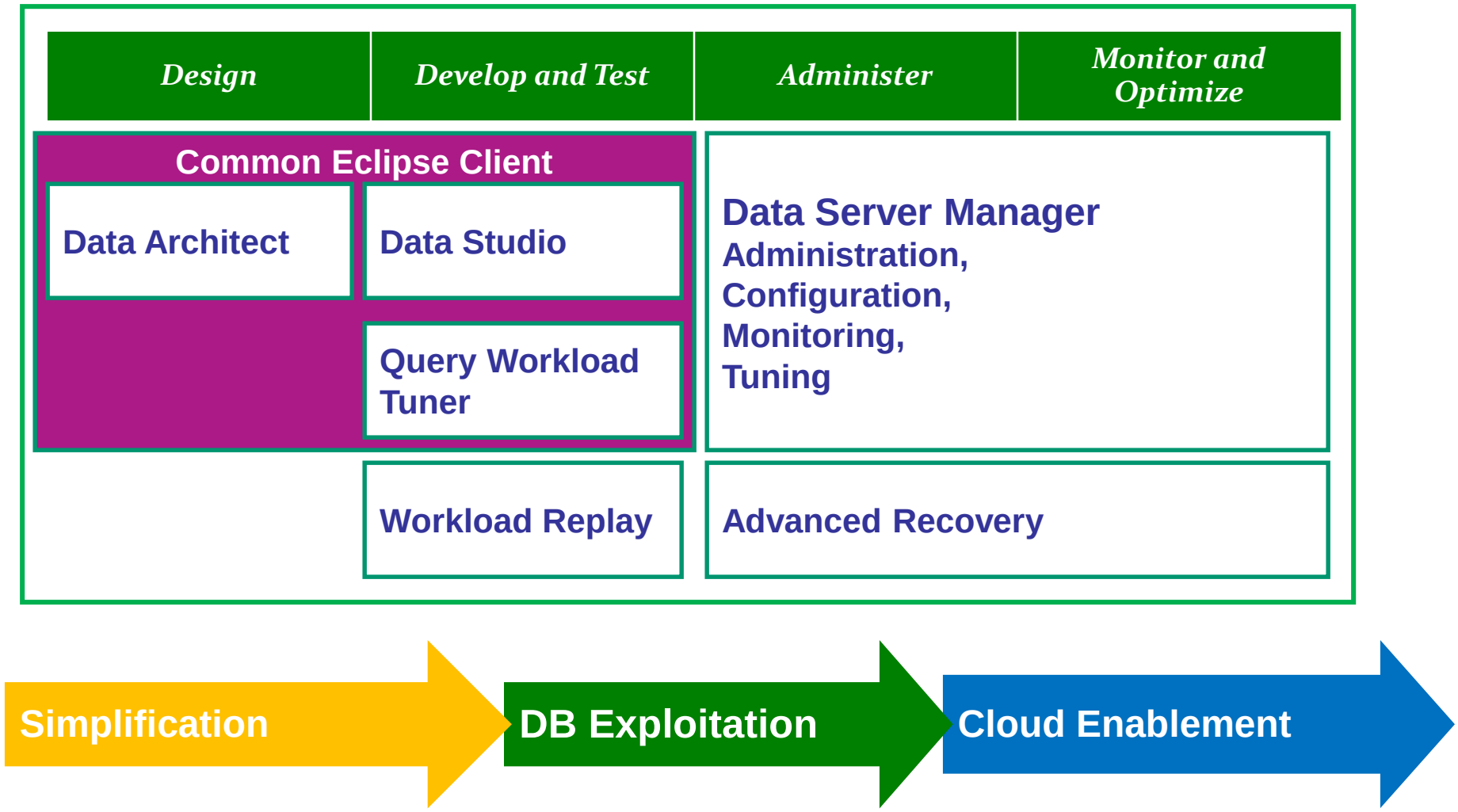
Delivers Familiar Capabilities from Optim Database Tools

- ***Performance, Tuning, Configuration, Storage and Database Administration as extensible services***

IBM Data Server Manager

- ✓ ***Simple***
- ✓ ***Scalable***
- ✓ ***Smart***

Data Tools Vision



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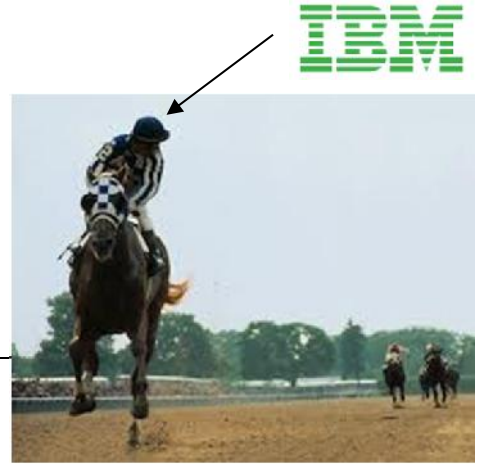
IBM Database Tools

- Our focus is to help maximize your IT investment
  - Lower costs, higher data availability and increased efficiencies
  - Free up staff and resources to drive business growth and optimization
- IBM in the unique position of building the Tools for the Database
  - Close relationship between Development and Tools
  - Focused on incorporating the best technology to help manage growth and complexity while lowering costs on the platform
  - "Day 1" support for new DB2 releases
  - Broadest portfolio to meet and exceed your business requirements
- Committed to the long-term future of the System z platform
  - Investment exceeds all other vendors combined
  - On-going effort is to reduce cost of System z platform
- Investing in Solution Packs will position you to take advantage of IBM's strategic focus on revolutionizing IT
- Bottom Line … "We succeed if we help you to be successful with DB2"




Thank
You