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A Technical Overview of the IBM DB2 Data Base Tools for an SAP Environment

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SAP environment - typical characteristics

Characteristics	Needs	Tools
<p><i>Very Large Number of objects</i></p> <p>A typical SAP environment would have over 100,000s of objects. A customer might have a database of the size of 4 terabytes (TB)</p>	<p>Management of large number of objects</p> <p>This means a high level of parallelization, asynchronous processing, and managing by exception must be present in almost any tool's activity.</p>	<ul style="list-style-type: none"> ■ DB2 Automation Tool ■ DB2 Administration Tool ■ DB2 Cloning Tool
<p><i>Large Size of Objects - tables, indexes, table spaces, databases</i></p> <p>It is also typical for an SAP environment to have large database objects, e.g. finding 1TB tables is not uncommon in an SAP environment.</p>	<p>Management of large sized objects</p> <p>This means a high level of parallelization, asynchronous processing, and managing by exception must be present in almost any tool's activity.</p>	<ul style="list-style-type: none"> ■ DB2 Automation Tool ■ DB2 Administration Tool ■ DB2 Cloning Tool
<p><i>Dynamic Environment</i></p> <p>SAP has a dynamic environment due to the high volume of transactions and high degree of concurrency that would often cause resource contentions, e.g. deadlocks.</p>	<p>DB2 tools should assume resource contentions, e.g. deadlocks, will happen and prevent contention by serializing access to objects or automatically retry.</p>	<ul style="list-style-type: none"> ■ Tivoli Omegamon XE for DB2 Performance Expert ■ DB2 Query Monitor ■ DB2 Automation Tool
<p><i>Business-critical systems</i></p> <p>Once in production, companies rely on SAP systems to support their business operations.</p>	<p>SAP systems requires a high degree of continuous operations. Tools that use non-disruptive techniques such as retry logic on failures and resource checking are critical to prevent disruptive system failures.</p>	<ul style="list-style-type: none"> ■ Tivoli Omegamon XE for DB2 Performance Expert ■ DB2 Administration Tool

DBAs in an SAP environment often perform repetitive and/or challenging tasks that could benefit from tools

Tasks	Tools
<p><i>Routinely performed tasks:</i></p> <ol style="list-style-type: none"> 1. Monitor tablespace growth - add space as required 2. Monitor/adjust table extent sizes 3. DR sync process - PRD -> DR system 4. ONLINE/OFFLINE backups 5. Performance tuning/resource management 6. System restores/refreshes 7. Apply data base patches (security APARS) 8. Kernel upgrades to both data base and SAP 	<p>DB2 Administration Tool DB2 Automation Tool Tivoli Omegamon XE for DB2 Performance Expert DB2 Query Monitor</p>
<p><i>Challenging tasks:</i></p> <ol style="list-style-type: none"> 1. Data base product upgrade 2. SAP upgrade 3. DB reorgs 4. Developing SQL scripts for automation - alerts 5. Developing scripts (Kornshell/Perl/C/Bourne) for automation - alerts 	<p>DB2 Administration Tool DB2 Automation Tool DB2 Cloning Tool</p>

TOOLS for SAP ENVIRONMENT

- Administration Tools
 - DB2 Administration Toolkit for SAP
 - DB2 Administration Tool
 - DB2 Object Comparison Tool
- Performance Tools
 - DB2 Performance Toolkit for SAP
 - Tivoli Omegamon XE for DB2 Performance Expert
 - DB2 Query Monitor
- Automation Tools
 - DB2 Automation Toolkit for SAP
 - DB2 Automation Tool
- Cloning Tools
 - DB2 Cloning Tool



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IBM DB2 Administration Toolkit for z/OS the SAP Edition

DB2 Administration Tool V7.2
DB2 Object Comparison Tool V7.2



DB2 ADMINISTRATION TOOL

Catalog Navigation

Change Management

- ✓ Complex Table Alters
- ✓ Migration

- ISPF interface
- Supports DB2 z/OS
- Supports DB2 V9

DB2 ADMINISTRATION TOOL

Catalog Navigation

- Online help
- Primary / Line cmds
- Drill up/down
- Filtering
- Display detail info
- Extract DDL
 - DDL
 - GEN
- Explain SQL statements
- Generate / Execute IBM utilities
- Issue DB2 Commands
- Browse data
- Drop / Revoke Impact reports
- Manage zParms
- Much, much more...

Users seldom alter structures in SAP, however SAP will at times send instructions on how to either reset table space partitions or move tables in segmented tablespaces into partitioned tablespaces

Detailed Key Features

- **Supports DB2 V8 Online Schema Evolution**
 - Drop the partitioning index
 - Change the clustering index
 - Add a partition to the end of a table, which extends the limit value
 - Support for automatic rebalancing of partitions during REORG
 - Support REORG of parts in REORG pending status
 - Add a column to an existing index
- **Allows faster changing of tablespace partitioning via RDEF command**

DB2 ADMINISTRATION TOOL

DB2 V8 Exploitation

- Long names
- 4096 partitions
- Sequence Objects
- Materialized Query Tables
- Partitioned Tables
- Volatile Tables
- Data Partitioned Secondary Indexes (DPSI)
- Index padding
- **BACKUP SYSTEM / RESTORE SYSTEM**

DB2 Administration Tool reduces the complexity of managing and executing SAP-initiated database changes, enabling DBA's to make faster and more accurate decisions.

Detailed Key Features (cont)

- **Guide users through the process of changing zPARMS dynamically**
- **Useful for problem determination**
- **Consistent interface for SAP and non-SAP environments**

DB2 OBJECT COMPARISON TOOL

Compare structure of DB2 objects

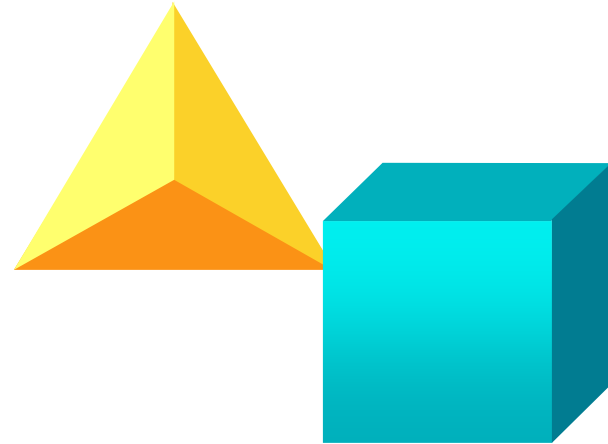
- ✓ Reports
- ✓ Apply jobs – make target look like the source

- ISPF interface
- Supports DB2 z/OS
- Supports DB2 V9
- Requires DB2 Administration Tool

DB2 OBJECT COMPARISON

COMPARE STRUCTURE OF DB2 OBJECTS

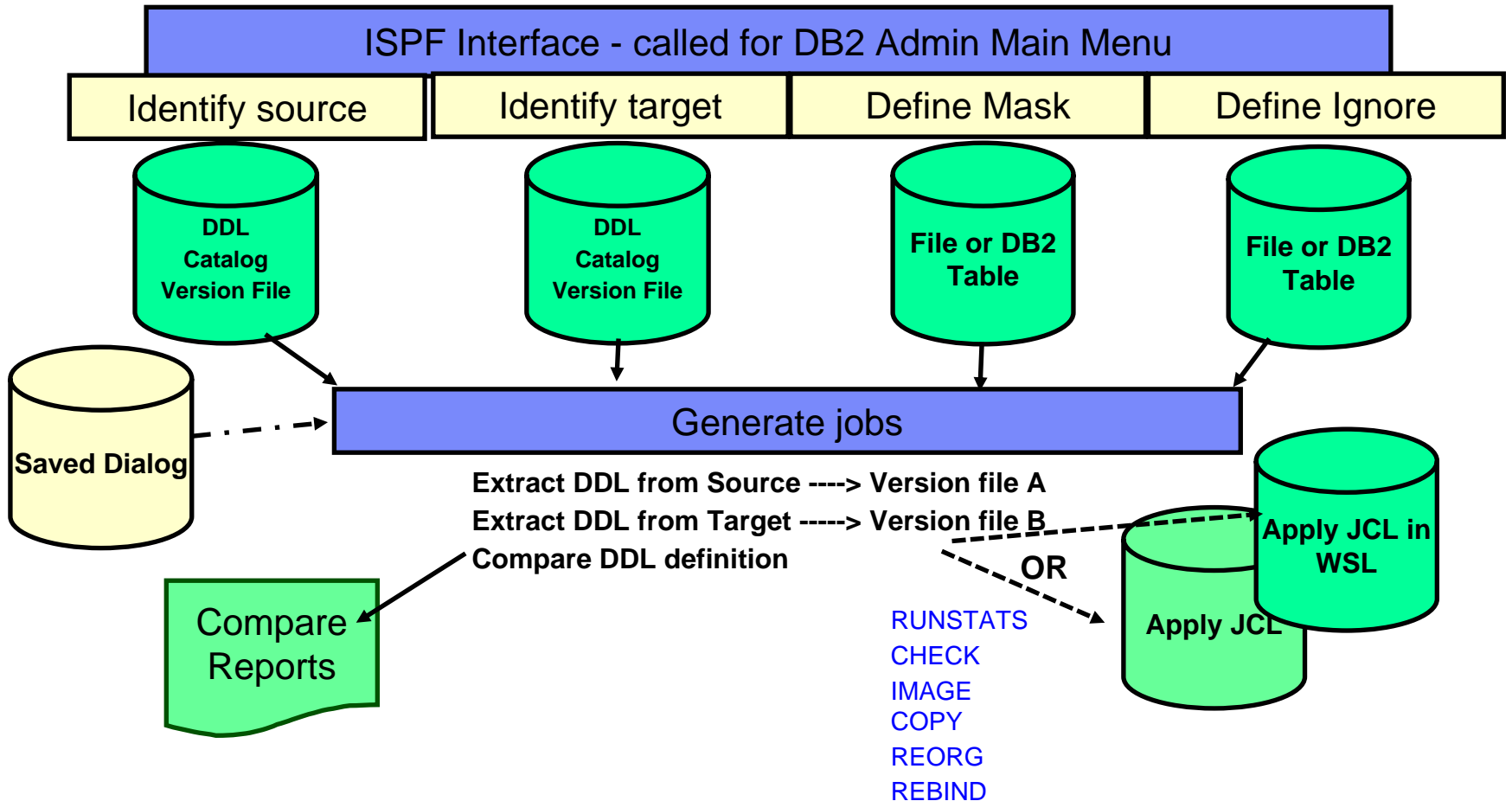
- DDL
 - DB2 Catalog
 - Flat file
 - Versioning file
- Supports an ignore capability
- Supports a masking file
- Generate report(s)
- Generate JCL to make the target look like the source -
APPLY JOBS
 - Generate native JCL jobs or use Work Statement List
- Save the compare parameters in a file for recall (dialog)
- Ability to generate apply jobs against multiple targets



DB2 OBJECT COMPARISON TOOL

Product Architecture

Supports DB2 V9



DB2 Object Comparison Tool promotes database object integrity when objects are transported from test to production

Detailed Key Features

- **Alerts DBA of any user-defined objects (usually indexes) that will be affected by applying the change**
- **Compare objects in SAP databases before they are transported, e.g. from test to production**
 - Identify potential risks of long running changes
- **Reduces the time to verify that changes are propagated to each SAP instance**



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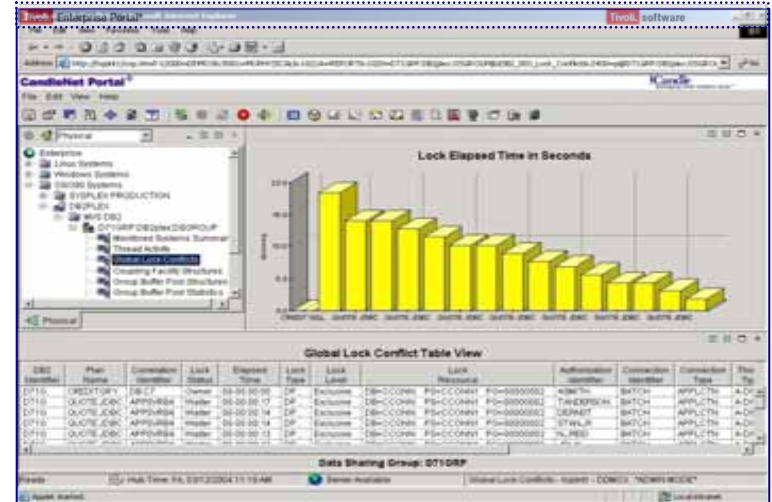
IBM DB2 Performance Toolkit for z/OS the SAP Edition

Tivoli Omegamon XE for DB2 Performance Expert (OMPE)
DB2 Query Monitor



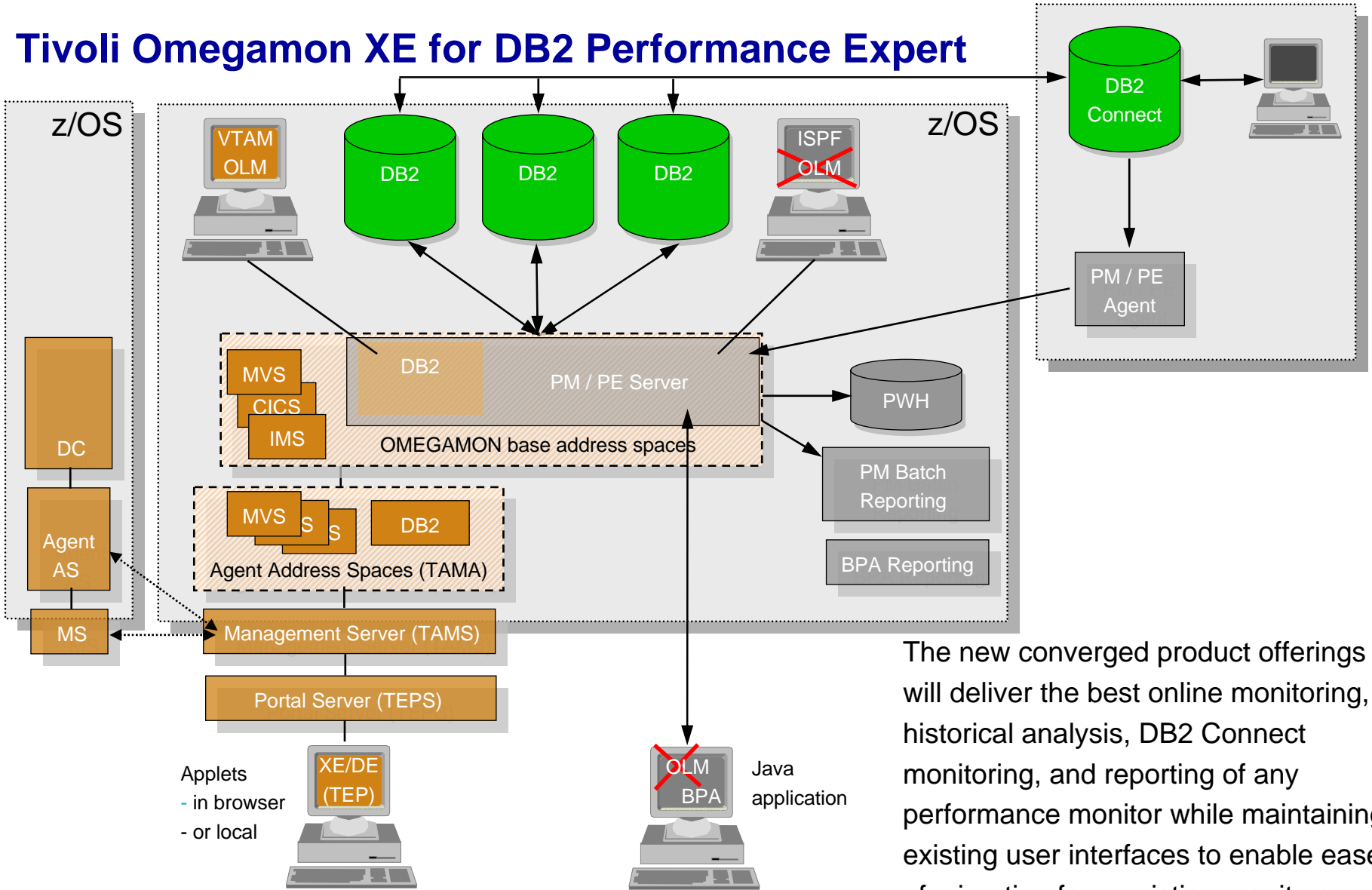
TIVOLI OMEGAMON XE for DB2 PERFORMANCE EXPERT (OMPE)

- Real Time Monitoring
- History
- Batch Reporting
- DB2 Connect Monitoring
- Object Analysis
- Performance Warehouse
- Buffer Pool Analyzer



- VTAM, Web Browser, GUI & ISPF interfaces
- Supports DB2 z/OS
- Supports DB2 V8

Tivoli Omegamon XE for DB2 Performance Expert



The new converged product offerings will deliver the best online monitoring, historical analysis, DB2 Connect monitoring, and reporting of any performance monitor while maintaining existing user interfaces to enable ease of migration from existing monitors.

OMPE for z/OS optimizes DBA's time by providing timely & relevant statistics through REAL TIME MONITORING

■ System Information

- Summary of DB2 activity
- Issue console commands
- View messages

■ Exception Analysis

- Monitor for problems related to threads / CICS / IMS / system operations
- View messages
- Online recommendations

■ Locking conflict information

■ Thread Information

- View all threads connected to DB2
- Thread summary – TSO, CICS, IMS, Background
- Inactive threads
- Thread detail
- Cancel thread
- Threads having DB2 Connect gateway connections

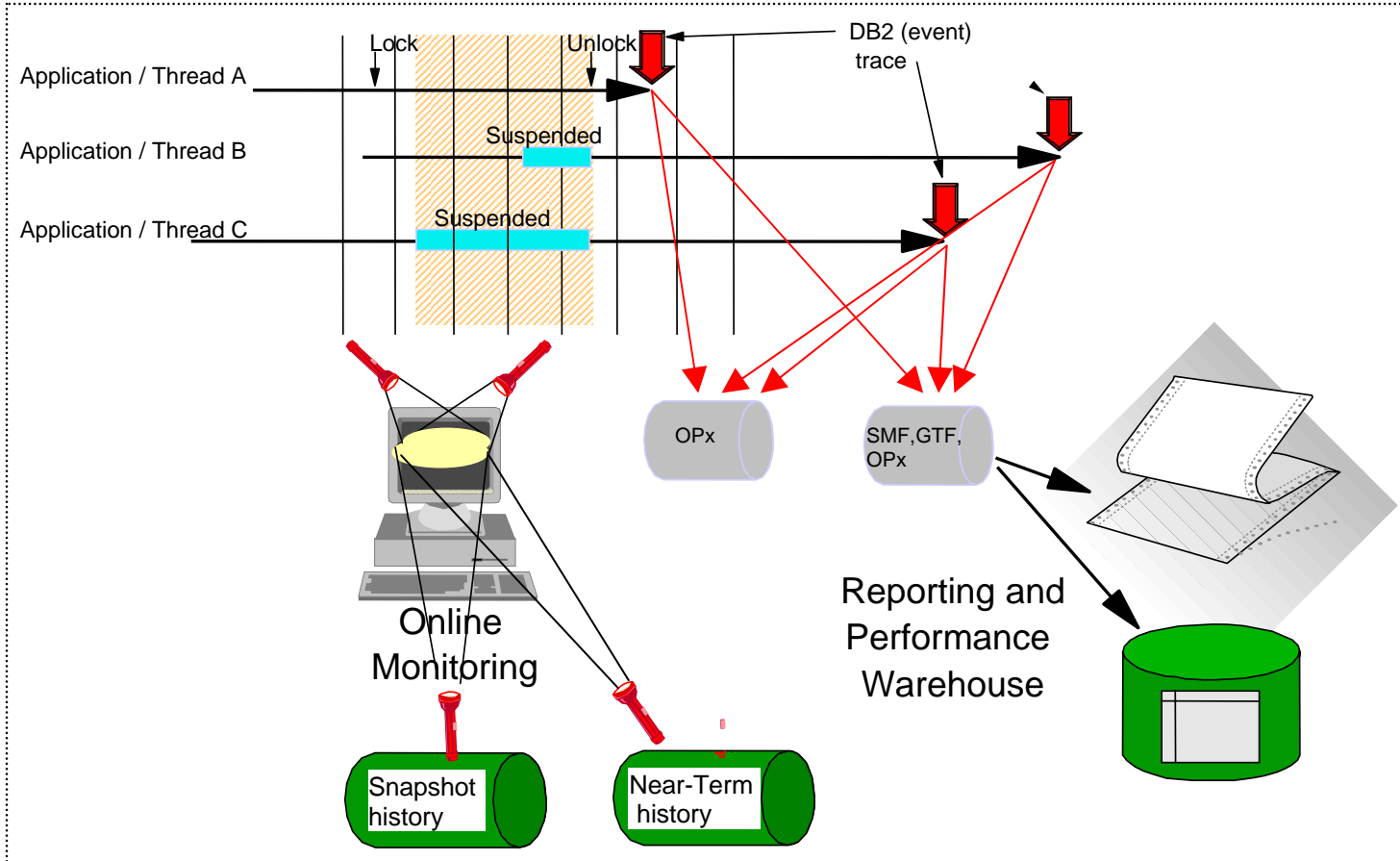
■ Resource managers – logs, EDM pools, RID pools, dynamic SQL cache, DSNZPARMS

OMPE HISTORY DATA - General

- Near-term history Online monitor
 - Long-term history Reports, Perform.DB
 - Snapshot history Online Monitor
 - Short-Term history TEP GUI
- } Based on DB2 (event) traces

— Based on DB2 snapshot data

— Collected and saved by TEMS or TEMA

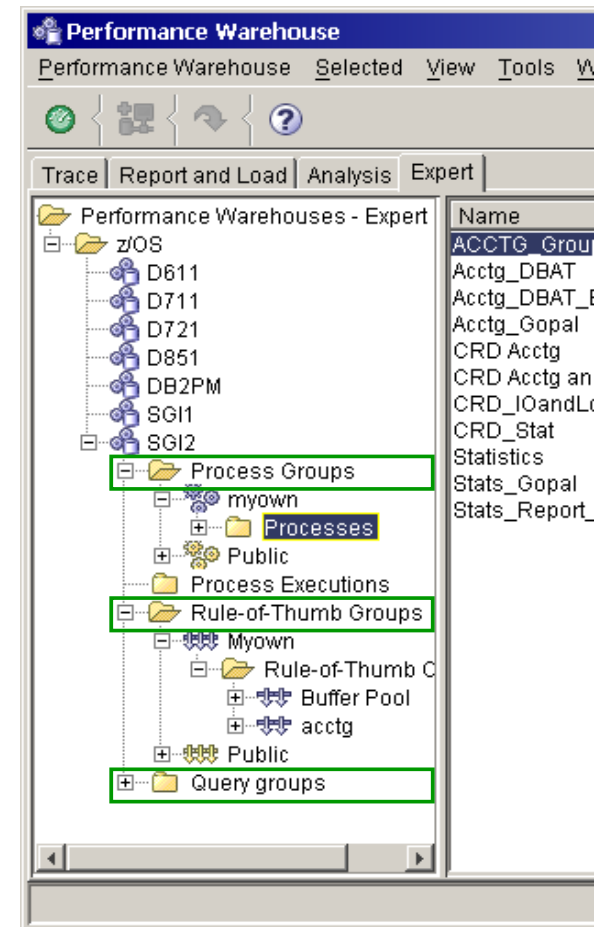


or TEMA

OMPE PERFORMANCE WAREHOUSE

can assist you to efficiently make better decisions and recommending actions to tune performance

- Holds raw and aggregate DB2 trace information (long term history)
- Used for performance trend analysis
- Rules of Thumb (ROT)
 - Expert rules help ID more complex performance problems
 - Provides recommendations
- SQL Performance Queries



OMPE RULE OF THUMB (ROT)

Rule-of-Thumb Properties

General Definition **Select table and column to be added to the 'Value expression'**

VALUE and additional columns

Table: DB2PM_STAT_BUFFER

Report block: Buffer Pool General

Column Name	Field Name	Description
CURR_ACTIVE_BUFF	QBSTCBA	The number of currently active
VPOOL_FULL	QBSTXFL	The number of times a usable
EXPANSION_FAILED	QBSTXFV	The total number of virtual buf

VALUE expression: `>> DB2PM_STAT_BUFFER.READ_PAGE_INS_REQ/(DB2PM_STAT_BUFFER.SYNC_READ_IO+DB2PM_STAT_BUFFER.SEQ_PREFETCH_PAGE+DB2PM_STAT_BUFFER.LIST_PREFETCH_PAGE+DB2PM_STAT_BUFFER.DYN_PREFETCH_PAGE)`

Additional columns: `>>`

Assist with 'How to Tune Performance'

WARNING and PROBLEM thresholds

VALUE `>` WARNING threshold: 0.01
 Recommendation: Increase available Central Storage or reduce Virtual Pool size and use Hiper Poc

PROBLEM threshold: 0.05
 Recommendation: Increase available Central Storage or reduce Virtual Pool size and use Hiper Poc

Define thresholds and recommendations

OK Apply Cancel Help

OMPE RULE OF THUMB

Rules of Thumb Analysis Result
 Result View Help

jdbc:db2:D621 - My own ROT - DB2PM.Statistics.Buf 'All' view for ro

Filter Result matrix Row details Column details

Attention values for rules of thumb sorted by time stamps

INTERVAL_TSTAMP	DM threshold	Merge pass degrad	No_prefetch_no_buf	Page_in for read	Page_in for write	Prefetch disabled	Synch reads
2001-01-10 23:05:0...	OK	-	OK	problem	OK	OK	-
2001-01-10 23:05:0...	OK	OK	OK	OK	OK	OK	warning
2001-01-10 23:05:0...	OK	-	OK	problem	OK	OK	-
2001-01-10 23:05:0...	OK	OK					
2001-01-10 23:05:3...	OK	OK					
2001-01-10 23:05:3...	OK	-					
2001-01-10 23:05:3...	OK	OK					
2001-01-10 23:05:3...	OK	-					
2001-01-10 23:09:5...	OK	-					
2001-01-10 23:09:5...	OK	-					

Rules of Thumb Analysis Result
 Result View Help

jdbc:db2:D621 - My own ROT - DB2PM.Statistics.Buf 'All' view for ro

Filter Result matrix Row details Column details

Selected time stamp 2001-01-10 23:05:05.800069

ROT name	Attention
DM threshold	OK
Merge pass degrad	-
No_prefetch_no_buf	OK
Page_in for read	problem
Page_in for write	OK
Prefetch disabled	OK
Synch reads-sequ	-
Workf requ reject	-
Workfile prefetch	-
Write engine	OK

Rules of thumb details

ROT description Page-In for read i/o < 1 to 5% of pages read

VALUE expression DB2PM_STAT_BUFFER.READ_PAGE_INS_REQ/(DB2PM_STAT_BUFFER.READ_PAGE_INS_REQ+DB2PM_STAT_BUFFER.SYNC_READ_IO+DB2PM_STAT_BUFFER.SEQ_PREFETCH_PAGE_INS_REQ+DB2PM_STAT_BUFFER.LIST_PREFETCH_PAGE+DB2PM_STAT_BUFFER.LIST_PREFETCH_PAGE+DB2PM_STAT_BUFFER.LIST_PREFETCH_PAGE)

VALUE 5.62248995983936e-001 > 0.05 (Problem threshold)

Recommendation Increase available Central Storage or reduce Virtual Pool size

Value expression columns

Name	Value
DB2PM_STAT_BUFFER.READ_PAGE_INS_REQ	1.4000000000000000e+001
DB2PM_STAT_BUFFER.SYNC_READ_IO	2.3700000000000000e+001

Additional columns

Name	Value
------	-------

Depending on the selected ROT and the performance data you may get a result matrix, select row and column to get more specific information

OMPE SQL PERFORMANCE QUERIES

The screenshot shows the Performance Warehouse interface. On the left is a tree view of 'Performance Warehouses - Expert' containing folders like 'Multiplatforms', 'z/OS', 'Process Groups', and 'Query groups'. The main pane displays a list of queries with columns 'Name' and 'Description'. One query is highlighted: 'DB2PM.Expert Analysis ACCOUNTING.Step 1' with description 'Step 1: Compare class 1 and class 2 times, simulate threshold query groupin'. A 'Query Properties' dialog box is open, showing the 'Definition' tab. It has 'Report type' set to 'ACCOUNTING' and 'Report block' set to 'Accounting Short Report Layout'. The 'Columns' table lists several columns from the 'DB2PMSACCT_BUFFER' table. The 'Query' text area contains the following SQL:

```

SELECT SUM(DOUBLE(CLASS2_ELAPSED)) / SUM(DOUBLE(CLASS1_ELAPSED)),
CORRNAME, CONNECT_TYPE FROM DB2PM.DB2PMSACCT_GENERAL WHERE
CONNECT_TYPE IN ('CICS','IMS-MPP','IMS-TBMP') GROUP BY CORRNAME,
CONNECT_TYPE HAVING SUM(DOUBLE(CLASS2_ELAPSED)) /
SUM(DOUBLE(CLASS1_ELAPSED)) > 0.5 ORDER BY 1 DESC
    
```

Buttons for 'OK', 'Apply', 'Cancel', and 'Help' are visible at the bottom of the dialog.

OMPE PERFORMANCE QUERIES

Query Execution

View SQL View Result

```

SELECT  DB2PM.DB2PMSACCT_PROGRAM.PRIMAUTH, DB2PM.DB2PMSACCT_PROGRAM.PCK_COLLECTION_ID,
DB2PM.DB2PMSACCT_PROGRAM.PCK_ID, DB2PM.DB2PMSACCT_PROGRAM.CLASS7_CPU_AGENT,
DB2PM.DB2PMSACCT_PROGRAM.PROGRAM_TYPE, DB2PM.DB2PMSACCT_PROGRAM.PCK_RECORDS,
DB2PM.DB2PMSACCT_PROGRAM.SQL_STMTS_ISSUED, DB2PM.DB2PMSACCT_PROGRAM.CLASS7_ELAPSED,
DB2PM.DB2PMSACCT_PROGRAM.CL7_ELAPSED_LAST, DB2PM.DB2PMSACCT_PROGRAM.CL7_CPU_AGENT_LAST,
DB2PM.DB2PMSACCT_PROGRAM.USED_BY_STPROC, DB2PM.DB2PMSACCT_PROGRAM.CL7_SU_CPU_PARAL,
DB2PM.DB2PMSACCT_PROGRAM.PLAN_NAME
FROM DB2PM.DB2PMSACCT_PROGRAM
Where DB2PM.DB2PMSACCT_PROGRAM.INTERVAL_TIME > '2003-08-01-00.00.00.000000' and
      DB2PM.DB2PMSACCT_PROGRAM.INTERVAL_TIME < '2003-08-31-00.00.00.000000'
ORDER BY DB2PM.DB2PMSACCT_PROGRAM.CLASS7_CPU_AGENT DESC
    
```

PRIMAUTH	PCK_COLLECTION_ID	PCK_ID	CLASS7_CPU_AGE...	PROGRAM_TYPE	PCK_RECORDS	SQL_STMTS_ISSUEI
JEN	FIJ1	FIMDMRPB	7.17957	PACKAGE	8	97992
JEN	FIJ1	FIMDMTO4	3.434576	PACKAGE	8	45712
JEN	FIJ1	FIMDPH1	3.243343	PACKAGE	8	1712
JEN	FIJ1	FIMDLIST	5.788597	PACKAGE	8	15008
JEN	FIJ1	FIJDCAIB	0.332601	PACKAGE	8	2128
JEN	FIJ1	FIMDMTO3	0.292510	PACKAGE	8	2424
JEN	FIJ1	FIMDMTO1	0.179883	PACKAGE	8	2016
JEN	FIJ1	FIMDMTO2	0.052481	PACKAGE	8	680
JEN	FIJ1	FIMDEXR	0.020087	PACKAGE	8	392
JEN	FIJ1	FIMDPUR	0.010087	PACKAGE	8	216

Row(s) 1 - 20 of 20

Save... Browse

Close Help

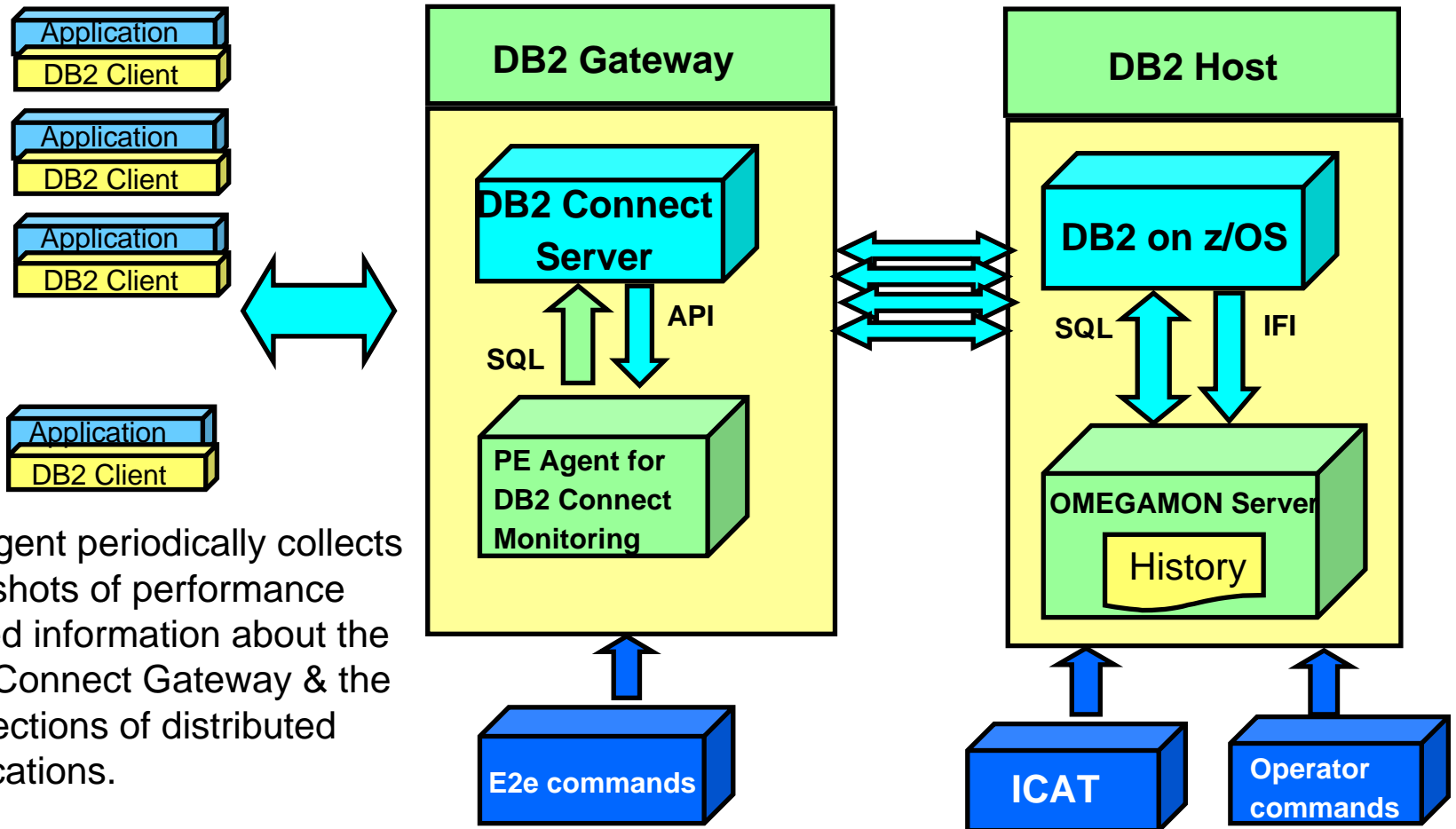
The result can be sorted by clicking on any header title

The result can be saved or shown in a browser window

OMPE BATCH REPORTING

- Report facility which
 - Takes SMF, GTF or TSO data sets as input (collected by 'Collect Report Data')
 - Generates a variety of customizable reports and traces:
 - ◆ [Statistics](#)
 - ◆ [Accounting](#)
 - ◆ [Subsystem Parameters](#)
 - ◆ [Locking](#)
 - ◆ [SQL Activity](#)
 - ◆ [I/O Activity](#)
 - ◆ [Utility](#)
 - ◆ [Audit](#)
 - ◆ [Record Trace](#)
 - ◆ [Explain](#)
 - Related data of different IFCIDs belonging to the same object are reported together
 - Additional derivated counters are shown
- are customizable by using of
 - ◆ [Reduce, Include/Exclude, From/to](#)
 - ◆ [Summarizedby, Orderby](#)
 - ◆ [Layout](#)
 - ◆
- differentiate mainly between "reports" and "traces"
- Allows to [tailor online](#) the layout of Accounting and Statistics reports and traces

OMPE DB2 CONNECT GATEWAY MONITOR



PE Agent periodically collects snapshots of performance related information about the DB2 Connect Gateway & the connections of distributed applications.

Stores in the PWH

OMPE DB2 CONNECT MONITOR – TEP Interface

Tivoli Enterprise Portal®
Tivoli software

File Edit View Help

Physical

- Physical
- SYS3
- DB2
 - SDE1:SYS3:DB2
 - Thread Activity
 - System Status
 - Detailed Thread Exception
 - Lock Conflicts
 - Subsystem Management
 - Log Manager
 - Utility Jobs
 - EDM Pool
 - Buffer Pool Management
 - Volume Activity
 - CICS Connections
 - IMS Connections
 - DB2 Connect Server**
 - SDE3:SYS3:DB2

DB2 Connect Server - SQL Statement Time

Network Connection

DB2 Connect Information

Name	IP Address	Server Instance Name	Gateway Snapshot Time
B99FF913	9.152.96.28	DB2	09/26/05 18:35:08

Times for Sample SQL Statement

Total Host Response Time	Elapsed Time in DB2 Connection Execution	Total Statement Execution Elapsed Time	Time In Network Connection
00:00:00.022	00:00:00.000	00:00:00.007	00:00:00.014

Ready
Hub Time: Mon, 09/26/2005 04:35 PM
Server Available.
DB2 Connect Server_JEN - localhost - SYSADMIN

Applet CMWApplet started
Local intranet

OMPE OBJECT ANALYSIS

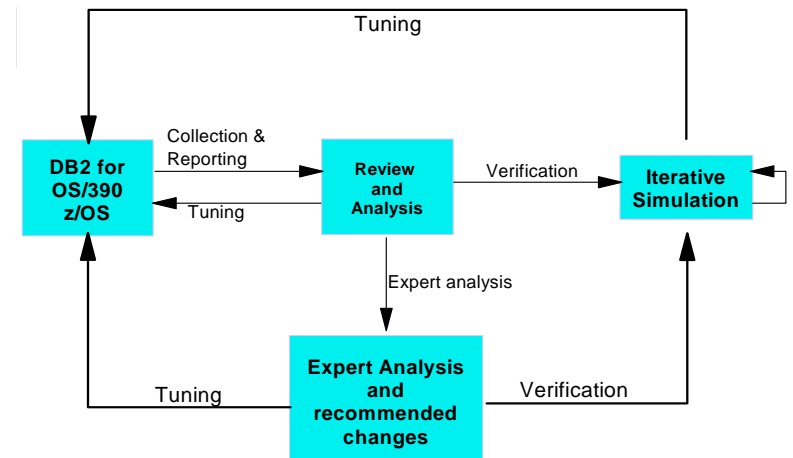
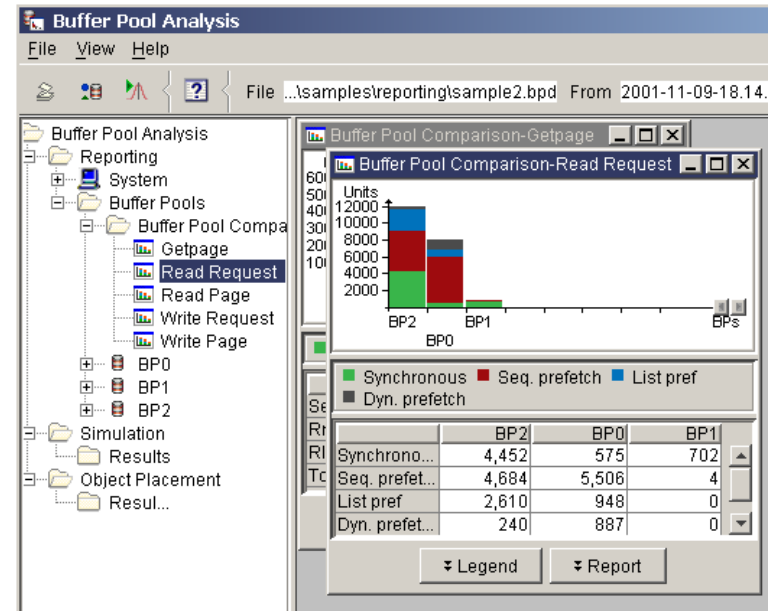
- Aids in the analysis of DB2 object allocations
- Linear VSAM dataset extend activity
- I/O activity at DASD volume level
- Object activity from a DB2 perspective

Scenario: Customer implements SMS which places objects based on defined constructs
Most of the time SMS makes good choices, but occasionally poor object placement occurs

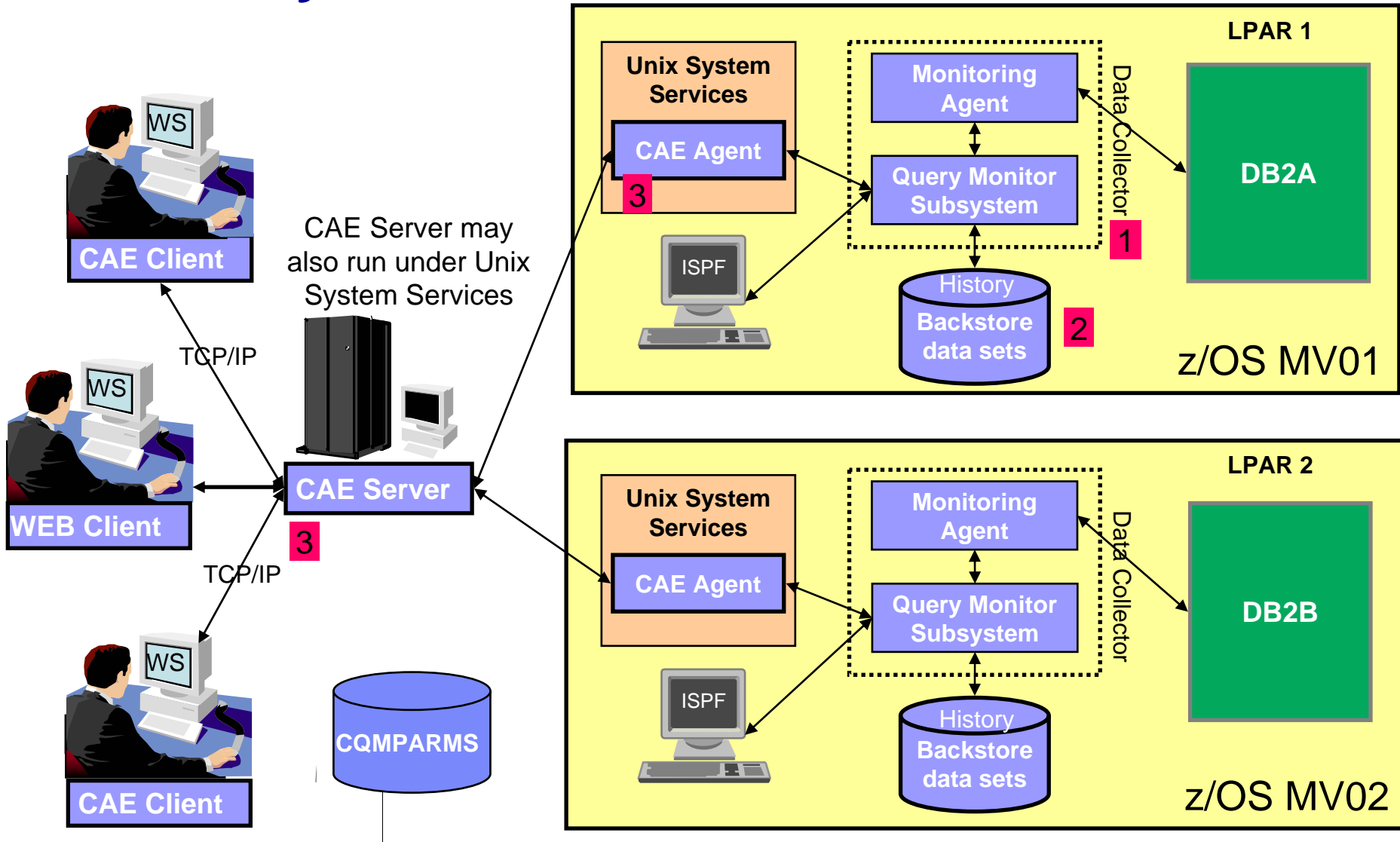
Example – a highly active index on the same DASD device as the tablespace part
I/O increases for both data sets

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



DB2 Query Monitor for z/OS Architecture



SAP Environment – DB2 Query Monitor

DB2 Query Monitor helps DBA's to optimize system resources by providing timely & relevant statistics from multiple sub-systems.

- Provides a complete history on statements
- Shows host variables for statements
- Provides information object accessed for executed statements
- Provides statement level alerts
 - Can capture alerts and show performance data from multiple sub-systems on multiple LPARs using the CAE GUI interface
- Transaction ID support assists in problem identification
- Provides reports on all SQL statements, not just the first occurrence
- Integrated with explain solutions
 - DB2 SQL Performance Analyzer on z/OS
 - Visual Explain off of GUI



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IBM DB2 Automation Toolkit for z/OS the SAP Edition

DB2 Automation Tool



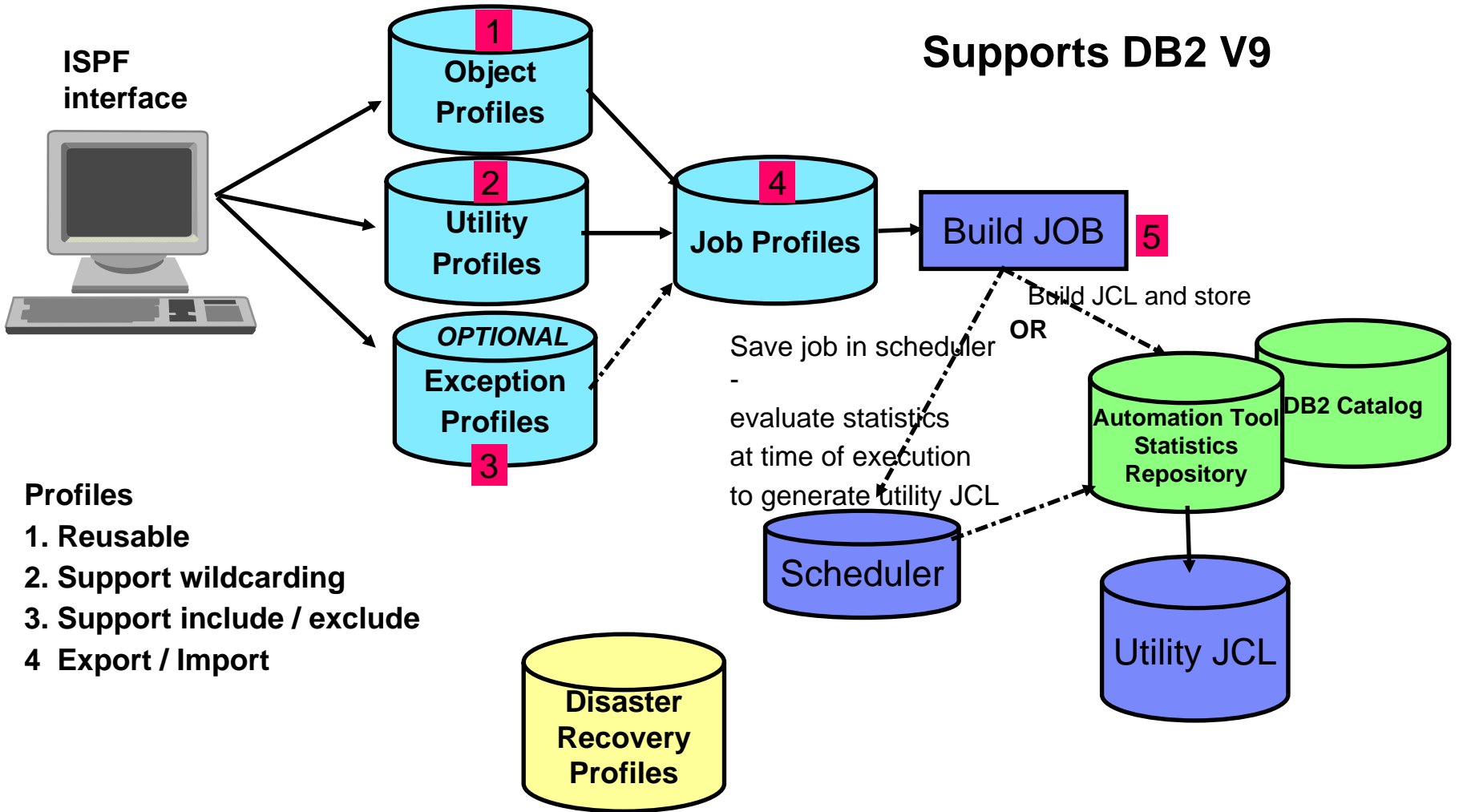
DB2 AUTOMATION TOOL

- Automate the generation of utility JCL on an as needed basis
- Disaster Recovery
- Auxiliary Functions
 - Data Set Manager
 - Data Page Display

- ISPF interface
- Supports DB2 z/OS
- Supports DB2 V9

DB2 AUTOMATION TOOL

Product Architecture



Profiles

1. Reusable
2. Support wildcarding
3. Support include / exclude
4. Export / Import

SAP Environment – DB2 Automation Tool

DB2 Automation Tool helps businesses optimize their data infrastructure investments through better management of system resources and reducing the complexity in recovery.

- Object Profile supports wildcarding capabilities to include / exclude objects
 - ▶ Saves the need for manual intervention
 - ▶ Avoids JCL errors
- Utility Profile provides
 - ▶ Support for a set of utilities to assist in Point in Time (PIT) data recovery
 - ▶ Can generate multiple RECOVER steps
 - ▶ LOAD balancing – based on time or space
- Support for BACKUP SYSTEM / RECOVER SYSTEM

SAP Environment – DB2 Automation Tool

- Exception Profile criteria can assist in determining when to execute utilities against an object or group of objects
- Offers a variety of statistical sources – many SAP users use real time statistics
 - Real time statistics
 - Check statistics directly
 - Or use the DSNACCOR stored procedure to determine which objects do not need utility JCL to be generated
- Provides an exit that you can use to make smarter decisions when a utility needs to be executed
- Displays an object counter on the screen, showing, for example, "50 of 12,000." This automatic and error-free object counter enhances your efficiency, helping you to deal with the large number of objects displayed in SAP environments.



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IBM DB2 Cloning

DB2 Cloning Tool



DB2 CLONING TOOL

Clone a DB2 subsystem
Clone an application

- Batch
- Supports DB2 z/OS
- Supports DB2 V8

Why Clone??

- **Create a production quality assurance environment**
- **Online inquiry**
- **Data mining**
- **Data warehouse**
- **Test new functions**
- **Give end users access to applications that are updated on a continual basis**

Cloning: act of replicating data, making it accessible, then reusing the replica in lieu of the original

DB2 CLONING TOOL

- **How it works**

- Select volumes
- Initiate copy
- Rename data sets
- Optional DB2 commands initiated
- DONE

- **Requirements**

- Need a job scheduler
- Data replication tools – snapshot, mirroring, PIT copy
- DB2 Cloning Tool

DB2 CLONING TOOL

- **Setup jobs**

- Setup copy job
- Select volumes to clone
 - Volser numbers
 - Masking – ensures you have all the data
 - SMS storage group

ICF Catalog (VSAM space & GDG information) –
a lot of times not on the same volumes as DB2

- **Initiate copy (Flashcopy / STK Snapshot / EMC timefinder ...)**

- Issue some commands
 - Shut down DB2 subsystem
 - OR
 - Suspend DB2 subsystem / SET LOG LOAD / SET LOG SUS PENDING

DB2 CLONING TOOL

- **Rename data sets**

- Names are chosen during initial JCL setup
- Catalogs target volume data sets
- Fixes the VTOC, VTOCIX, VVDS conflicts

```
RENAME – VOLBKUP - DDN(VOLBKUP)  
- JOURNAL – DDN(JOURNAL)  
- RENAME – MASKS(DB2AXX,DB2BXX
```

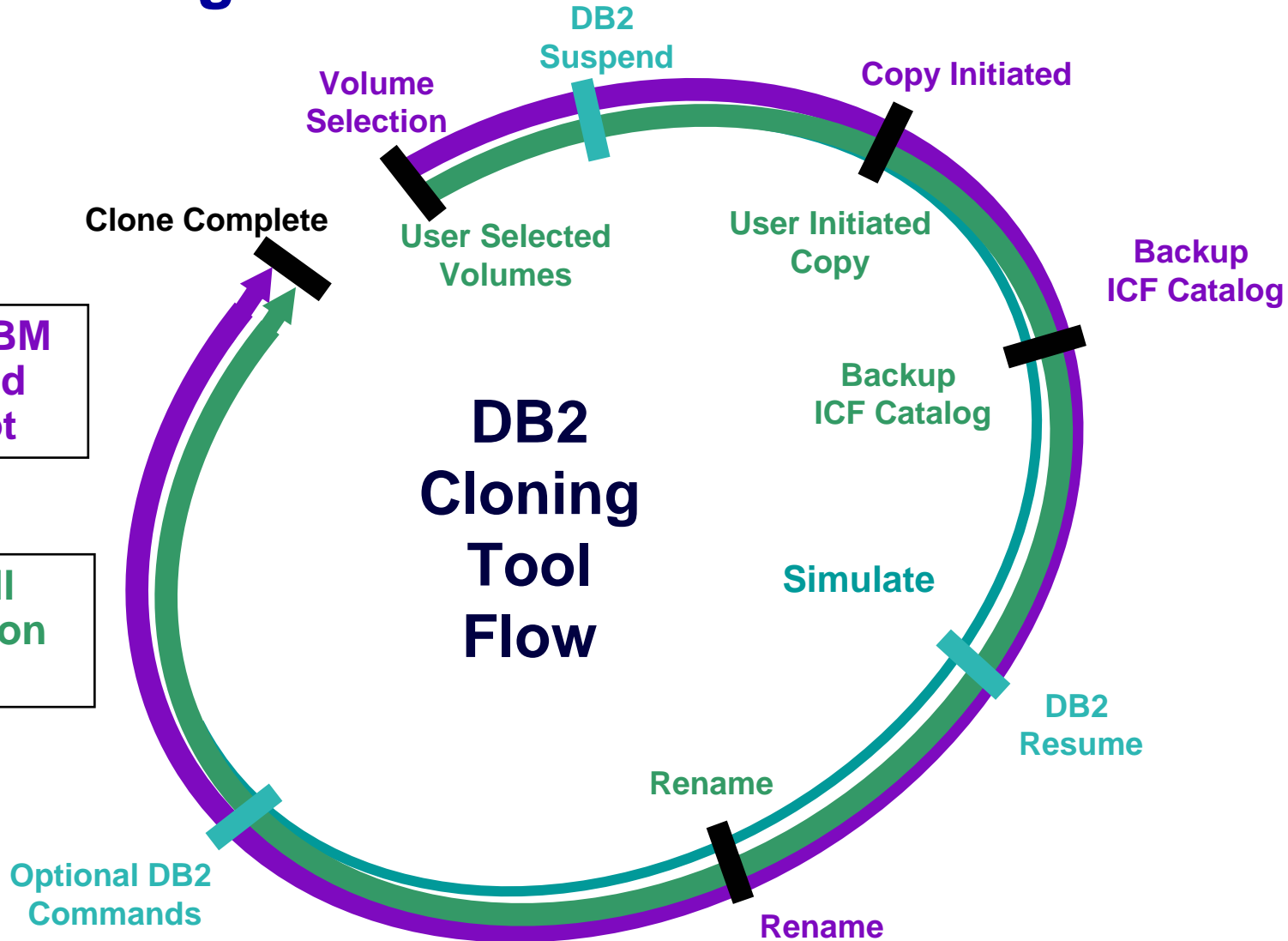
- **Optional commands**

- Start/Stop new target DB2
- Update DB2 internals with new names – BSDS, Directory, DB2 Catalog
- Fix restricted table space

DB2 CLONING TOOL

- **Can clone offline (DB2 is stopped and started) or online (DB2 Suspend and Resume)**
- **Updates internal control information**
 - BSDS
 - Directory
 - DB2 Catalog
- **Supports data sharing**
 - Can clone data sharing to non-data sharing
 - Can reduce the number of data sharing members
- **Simulate**

How DB2 Cloning Tool Works



SAP Environment – DB2 Cloning Tool

- *DB2 provides fast cloning of your SAP system, e.g. from production to test, allowing DBA's to focus more on verifying the SAP system integrity in the test environment.*
 - Allows fast cloning of SAP systems – one of the most common things done is cloning an SAP system for test purposes. Since SAP is generally the only thing running on this DB2 instance the clone is for the entire system.
 - DB2 Cloning Tool uses disk technologies (e.g. FLASHCOPY) to accomplish the copy and then performs all necessary steps to complete the clone (e.g. rename datasets, reset OBIDs, etc.)

SUMMARY

- Administration Tools
 - **DB2 Administration Toolkit for SAP**
 - DB2 Administration Tool
 - DB2 Object Comparison Tool
- Performance Tools
 - **DB2 Performance Toolkit for SAP**
 - Tivoli Omegamon XE for DB2 Performance Expert
 - DB2 Query Monitor
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 - DB2 Automation Tool
- Cloning Tools
 - **DB2 Cloning Tool**

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Tuesday Sept 18, 2007

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for 90 days.

IBM presents the Business Intelligence Virtual Symposium Attend From Your Desktop On Demand

Introducing "From Insight to Foresight", a complimentary Business Intelligence Virtual Conference and Exposition brought to you by IBM, KnowledgeStorm and CIOView.

Through a state of the art interactive technology, you can experience this live event from the convenience of your desktop.

**For more information and to register:
<http://events.unisfair.com/rt/ibmbi~bi?code=V01>**

This virtual conference will provide you with unique insight into approaching some of the most prevailing issues in turning business data into knowledge. Hear speakers like Claudia Imhoff (Intelligent Solutions), Scott McReady (CIOView) and Bill O'Connell (Data Warehousing CTO for IBM) discussing how Business Intelligence is changing and the way your business can benefit.

Exchange ideas in the wiki forum and visit the booths to find out more about the innovative solutions to help you move from Insight to Foresight. Topics will include:

- Managing information and compliance
- Ensuring a single consistent view of your data
- Delivering knowledge
- Moving beyond insight to foresight and pro-active change
- Easing your mind around security and the privacy of your data & knowledge

Simply register now to reserve your spot in the on-line conference and then log-in on September 18th with your email address and password starting at 9am EDT.

IOD CONFERENCE

- **DATE: October 14 – 19 (Sunday – Friday)**
- **LOCATION: Mandalay Bay, Las Vegas**

- **EXPO: Opens on October 14 (Sunday) at 5:00 PM**
- **DEMO SUITES**
 - Located at THEHotel Mandalay Bay – Marble B
 - Open October 15 – October 17 (Monday - Wednesday)

THANK YOU

