From SAP DB to MySQL MaxDB

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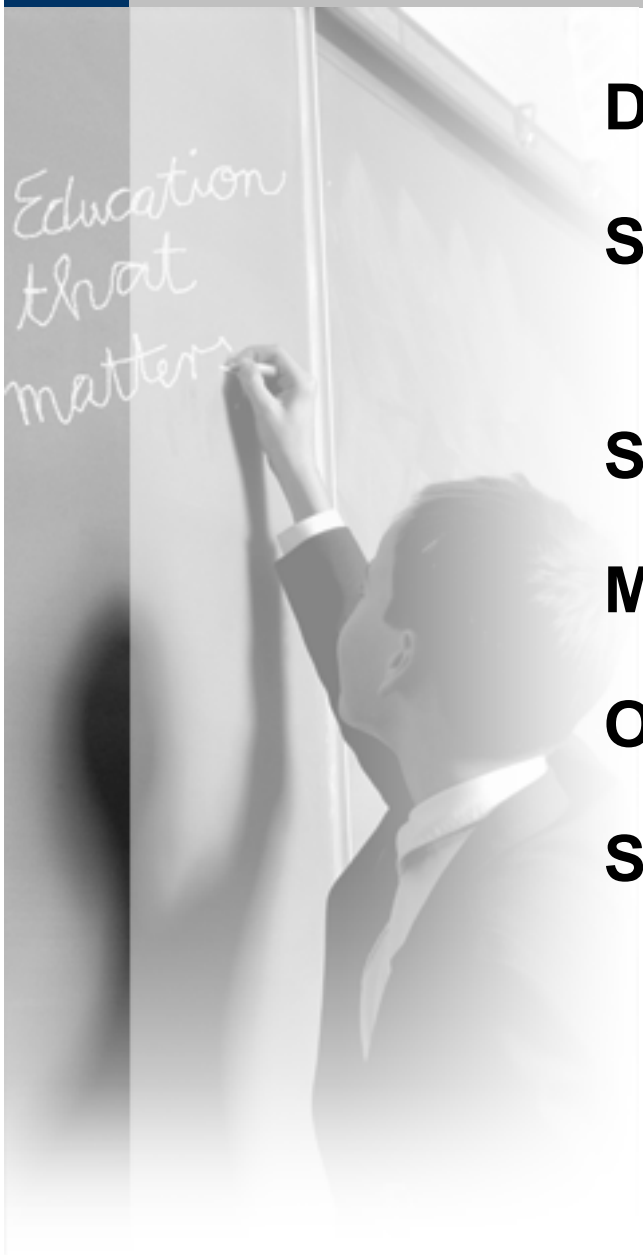
SAP AG

Agenda



DBMS Market Today

SAP DB and Open Source

- **Teaming up with MySQL**

SAP DB at Work

Minimal TCO with SAP DB

Outlook to MaxDB 7.5

Summary

DBMS Market Today

DBMS Market

DBMS are commodity ?

- **Feature-wise: Yes !**
- **Price-wise: No!**

The DBMS market is dominated by three players

- **Oracle**
- **IBM**
- **Microsoft**

DBMS technology has reached a saturation level

The feature war is over

DBMS pricing has not fully realized this market shift

Do OS or DBMS matter?

OS are important, but they matter less and less

- **Linux vs. Windows is important for Microsoft but not for CIOs**

DBMS are important, but they matter less and less

- **SAP DB vs. any other DBMS is no more important for CIOs**

Important questions for CIOs are:

- **Do we run the right applications?**
- **Can they be customized?**
- **Does everything fit into our budget?**
- **Can our IT staff handle the systems?**
- **Who will provide service and support?**

SAP DB and Open Source

SAP's Motivation to Open Source SAP DB

Energize competition in the DBMS market

- **Establish SAP DB in the DBMS market**
- **End the over-priced phase of the DBMS market**
- **Define new rules for the DBMS market**

Create a community of SAP DB users beyond SAP's customers

Use the Open Source community to get feedback for improvements

SAP's Commitment to SAP DB

SAP DB is SAP's strategic DBMS offering

- **Part of SAP's technology stack**
- **Runs all SAP applications**
- **Means one-stop shopping for our customers**
- **Default DBMS for SAP J2EE Engine in Web AS**

SAP DB's feature set and performance level is comparable to our competitors

SAP DB has been designed for easy administration and minimal costs of ownership

Ongoing SAP investment into the development of SAP DB

Teaming up with MySQL

Cross licensing and joint development agreement with MySQL

MySQL is the most popular open source DBMS

Combining the enterprise-ready SAP DB technology with the community and eco-system of MySQL

SAP DB has been renamed to MaxDB by MySQL

Ongoing SAP DB development, maintenance and support by SAP

Joint development of a next-generation DBMS

www.mysql.com

Consequences for SAP Customers

Rebranding will not affect existing SAP customers

SAP solutions on MaxDB will shipped with Web AS 6.40

MaxDB is the continuation of the SAP DB code line, that is identical behaviour and performance

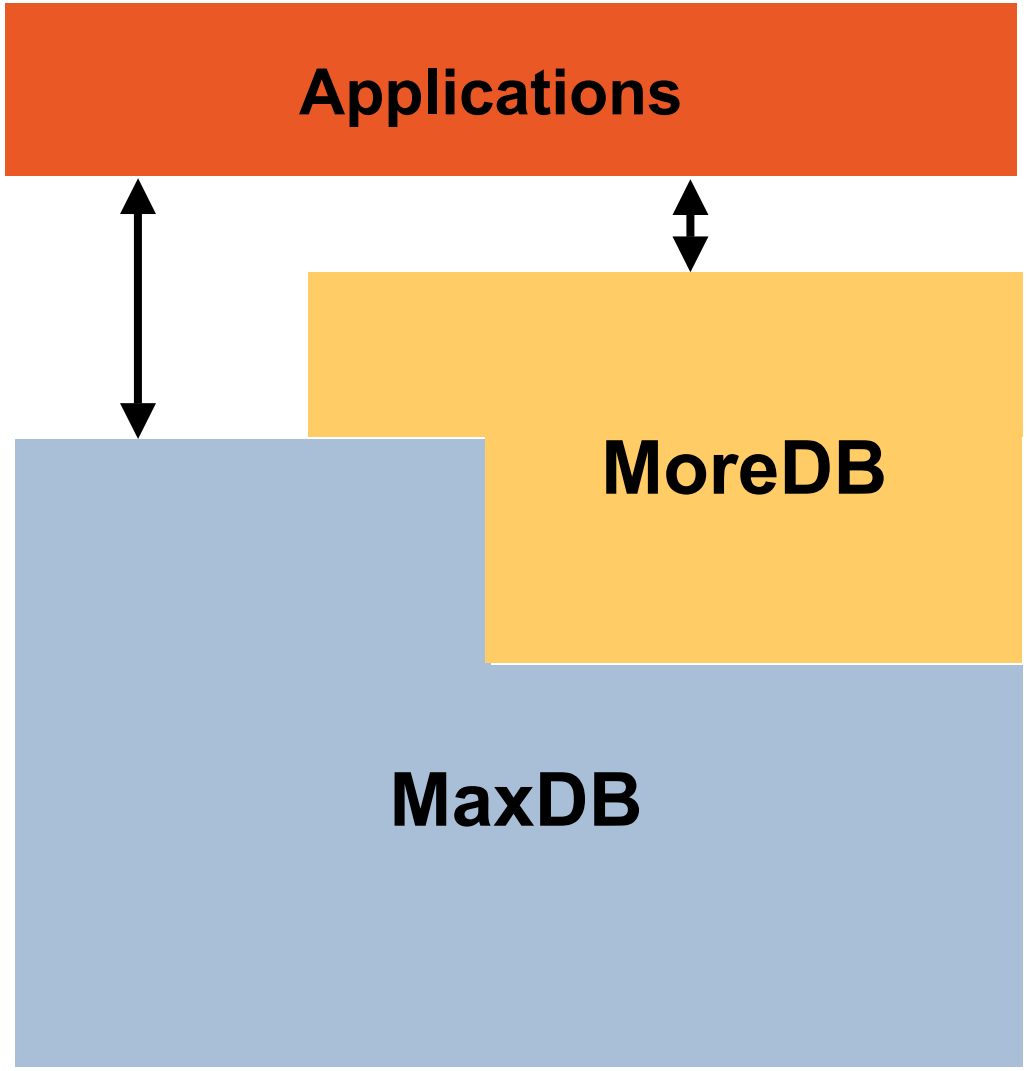
Replacing SAP DB 7.3 and 7.4 by MaxDB 7.5 in our open source offering has no impact on the end of their maintenance schedule

Pricing will not change for current SAP DB users even when upgrading to MaxDB versions

Pricing changes planned for new customers in 2004

No impact for mySAP SCM and *live*Cache customers

liveCache = MaxDB + MoreDB



SAP DB at Work

Statistics

SAP DB as core DBMS has about 2300 installations

SAP DB as *live*Cache for APO has about 2700 installations

SAP DB as Content Server for KM has about 1800 (optional) installations

This means a total of of about 5000 – 6800 installations worldwide

Numbers of August 2003

SAP DB Customers (1)

R/3

Vaillant GmbH, Germany, 800 GB, 1800 user, R/3, HP-UX/64

Intersnack, Germany, 400 GB, 300 user, R/3, Windows

Deutsche Post, Germany, 120 systems, e.g. 8*120 GB, Windows, 8 CPU

TDS, Germany, 90 systems, application service provider

Thyssen (Triaton), Germany, 90 systems , one with 2 TB size

Toyota, South Africa

Tenaga, Malaysia

APEX Corp. , Japan

Yamaha, Japan

Showa Denko, Japan

SAP DB Customers (2)

APO / liveCache

Colgate, USA

Intel, USA

Eli Lilly, USA

Bayer, Germany

Bosch, Germany

Daimler-Chrysler, Germany

Epcos, Germany

Nestlé, Switzerland

Aventis, France

SAP DB Platforms

It‘s your choice

Present and Future DBMS Requirements

1) Performance

2) Availability

3) Ease of use

Our vision:

- Zero administration DBMS
- Invisible DBMS

Your benefit:

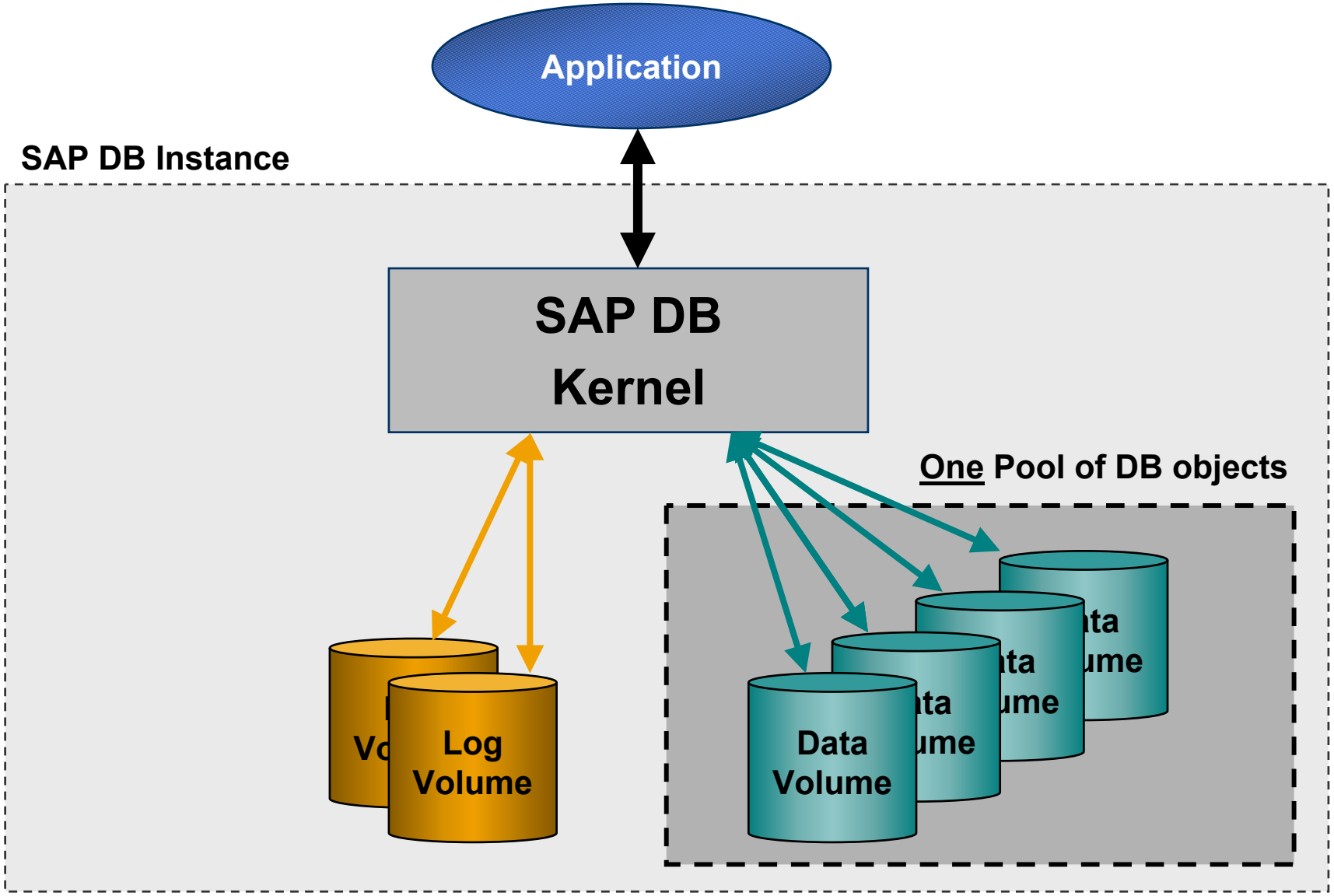
- Lowest cost of ownership
- Simplicity
- Convenience

Design Rationale of SAP DB

Do things right	–	simply elegant
No non-sense	–	less is more
Fight complexity	–	elegant simplicity

Make the product as simple as possible -
but not simpler !

Anatomy of a SAP DB Instance



SAP DB‘s Ease of Use

Few configuration parameters

No size estimates for individual database objects

Automatic space allocation and de-allocation

Automatic balancing of disk I/O

No permanent attention required

Low cost of ownership

High Availability of SAP DB

No reorganization

Online backup of database and log

Online extension of database and log

Online change of configuration parameters

Parallel backup and restore

Support of cluster and hot-stand-by configurations (failover)

No planned shutdowns, continuous operation

Minimal TCO with SAP DB

What Means Minimal Cost of Ownership?

DBMS license costs	low impact
DBMS maintenance costs	low impact
Hardware resources	medium impact
DBA resources	high impact

TCO means people

DBMS Experiences of SAP Hosting

System A:

- Needs lots of hard disk space
- Needs DB reorg every 3 to 6 months
- Inefficient backup
- Needs higher I/O rate (factor 2) in comparison to SAP DB (same workload)

System B:

- Can not backup logs and DB in parallel
- Needs higher I/O rate (factor 2) in comparison to SAP DB (same workload)
- High CPU consumption

System C:

- Needs lots of hard disk space
- Needs DB reorg every 3 to 6 months

SAP DB:

- More or less no administration needed once the database is set up
- Does not need a DB reorganization
- Less disk and CPU resources needed

Disk Space Comparisons Made by SAP Hosting

Migrations from System A → SAP DB:

- Database size shrinks to 30 - 40% of its previous size

Migration from System C → SAP DB

- Database size shrinks to 30 - 40% of its previous size

DBA Resources as Planned by SAP Hosting

DB Size / Instance	SAP DB	System B	System A	System C
0 - 30 GB	0,1	0,2	0,2	0,2
30 - 100 GB	0,1	0,2	0,5	0,5
100 - 500 GB	0,2	0,4	0,5	0,5
500 GB - 1 TB	0,2	0,5	1,0	1,0
> 1 TB	0,3	1,0	1,5	1,5

SAP DB Performance

Multi-process / multi-threaded server

SMP scalability

Minimal I/Os

CREATE INDEX with parallel processing

Tuned for SAP applications

Competitive performance level

SAP DB Benchmark – Small Configuration

1 Central Server

- 2-way SMP, Intel Xeon 3.06 GHz
- 512 KB L2 Cache, 3 GB main memory

292 concurrent users in SAP's SD Benchmark Profile

Average Dialog Response Time	1,96 sec
CPU utilization on DB server	98 %
SAP DB Version	7.3
Operating System	SuSE SLES 8
Total Disk Space	108 GB
Throughput	1.470 Benchmark Items (SAPS)

SAP R/3 4.6C, 2-tier, Certification No. 2003021

www.sap.com/benchmark

SAP DB Benchmark – Small Configuration II

1 Central Server

- 4-way SMP, Intel Itanium II, 1 GHz
- Caches: 32 KB L1, 256 KB L2, 3 MB L3
- 7 GB main memory

470 concurrent users in SAP's SD Benchmark Profile

Average Dialog Response Time	1,74 sec
CPU utilization on DB server	99%
SAP DB Version	7.3
Operating System	SuSE SLES 8
Total Disk Space	51 GB
Throughput	2.400 Benchmark Items (SAPS)

SAP R/3 4.6C, 2-tier, Certification No. 2003031

www.sap.com/benchmark

SAP DB Benchmark – Medium Large Configuration

1 Database Server

- 8-way SMP, Intel Xeon 2.0 GHz
- 2 MB L3 Cache, 8 GB main memory

61 Application Servers

- 48 Dialog Servers, 2-way SMP
- 12 Update Servers, 2-way SMP
- 1 Message/Enqueue Server , 1-way

5500 concurrent users in SAP‘s SD Benchmark Profile

Average Dialog Response Time	1,96 sec
CPU utilization on DB server	98 %
SAP DB Version	7.3
Operating System Database Server	SuSE SLES 8
Operation System Applic. Servers	SuSE SLES 7
Total Disk Space	2.500 GB
Throughput	27.770 Benchmark Items (SAPS)

SAP R/3 4.6C, 3-tier, Certification No. 2003014

www.sap.com/benchmark

Customer Statement of Thyssen-Krupp Hosting

Quotes from Hans Reiffer, Head of Triaton Hosting Center:

As an SAP partner for Hosted Solution, Triaton has been using SAP DB as a database for Hosting customers for many years. Of now more than 600 systems in Triaton's computer centers, 90 systems work with a SAP DB database.

The biggest system with a size of about 2 TB was recently put into productive operation.

For administrating the SAP DB databases of these 90 systems, only 2 FTE are required, as the database system has stood out for years through its easy operation, robustness and performance.

ThyssenKrupp

Triaton
The BusinessProcessor

Customer Statement of TDS

Quotes from Klaus Zimmermann, SAP Administrator:

TDS Informationstechnologie AG has been employing SAP DB successfully in Application Hosting since 1992. At present, we run approximately 90 SAP DB installations in 7x24 operation for various mySAP solutions.

Thanks to the convenient maintenance and operating characteristics of SAP DB, the administration effort is distinctly lower than with other databases. The storage management concept saves memory space and costs of reorganization.

SAP DB is completely integrated into our backup and monitoring concept and thus runs efficiently, performant and "silent" - all that for the benefit of our satisfied customers.

Customer Statement of Translogic Corporation (1)

Located in Denver, CO

Part of Swisslog, Switzerland

Product portfolio:

- **Pneumatic tube systems**
- **Electric track vehicles**
- **Automatic guided vehicles**
- **Selective vertical conveyors**

SAP system landscape:

- **2 application servers (2-way Intel boxes)**
- **DB server with 2 GB memory and 270 GB disk space**
- **140 named R/3 users**
- **SAP DB customer since 1996**

Customer Statement of Translogic Corporation (2)

Quotes from Charlie Brann, SAP Adminstrator:

During these last seven years, we have found this database product to be very stable and highly reliable. We have a relatively small IT staff with only one SAP Technical Resource person: me. I serve as ABAP programmer, Security administrator, Basis administrator, and DBA.

I‘ve worked with System A and System B in the past, but I find SAP DB to be easier to administer, more stable, and it requires a great deal less of my time.

There is no recurring daily, weekly, or monthly process that must be accomplished to keep the DB humming. I spend only an hour or so a week on the DB directly, just checking and verifying – just in case ...

Outlook to MaxDB 7.5

SAP DB Interfaces & Tools

Operations	Tools	Interfaces
Database Manager DBMGUI (Windows) Web DBM DBMCLI DBAnalyzer • Installation • Configuration • Monitoring • Backup/Restore • AutoSave	SQL Studio (Windows) Web SQL Loader Replication Manager WebDAV MySQL Proxy	C/C++ precompiler ODBC 3.5 JDBC 3.0 Perl Python PHP SQLCLI

SAP DB Kernel

MySQL Proxy

Connectivity between existing MySQL applications and MaxDB

MySQL applications will work with MaxDB with almost no changes

Supports upgrading from MySQL to MaxDB

MySQL Proxy converts SQL syntax and kernel protocol

Database Manager second edition

Improved administration of multiple database instances

Backup Wizard

Recovery Wizard

Installation Wizard

Configuration Wizard

Backup History

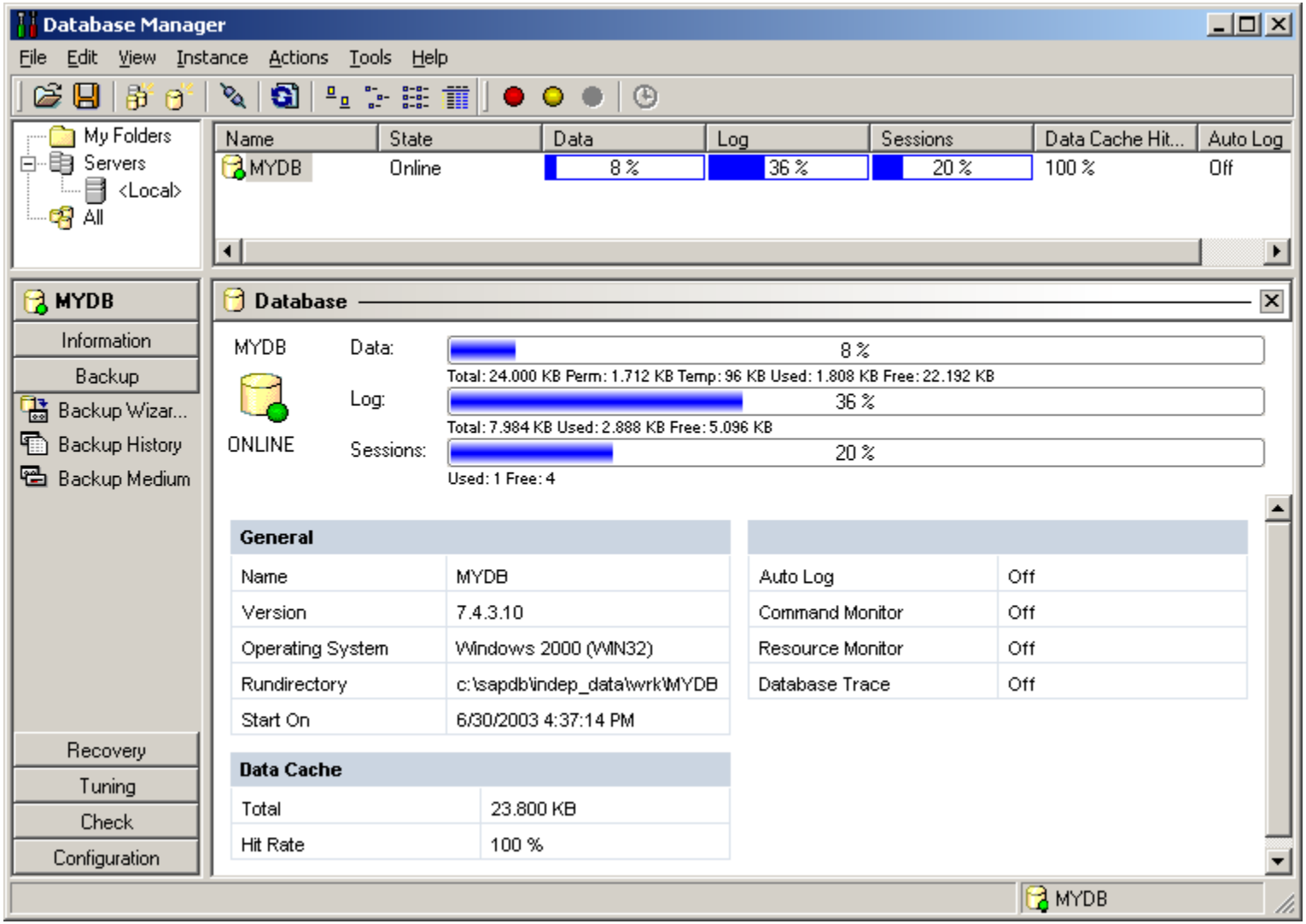
- **Improved access to backup history**
- **Context-specific visual guideance during the recovery process (Backup/recovery, complete/incremental/log backup)**

Documentation integrated as Windows Help

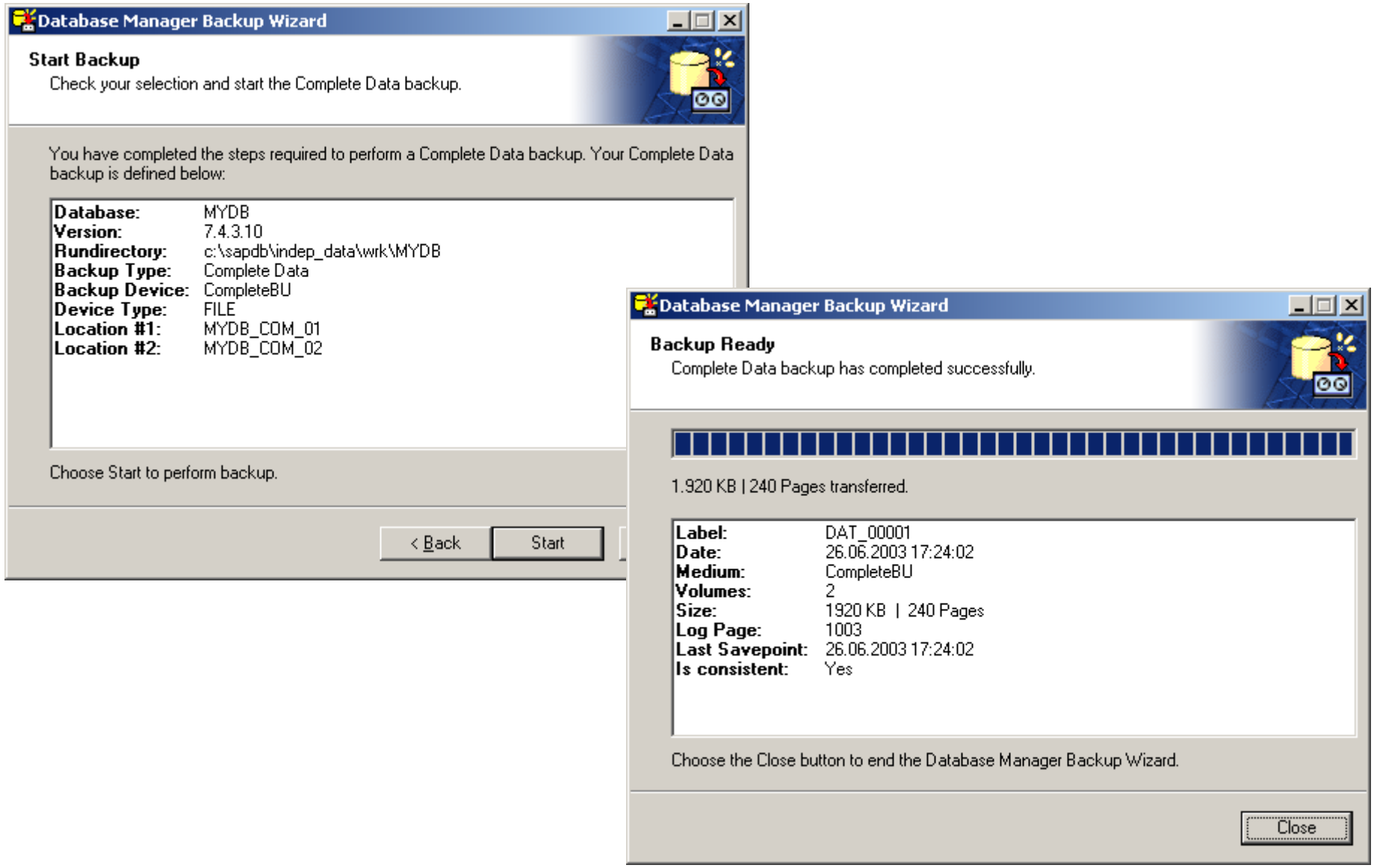
Support of Hot-standby configurations

Support of Archive instances

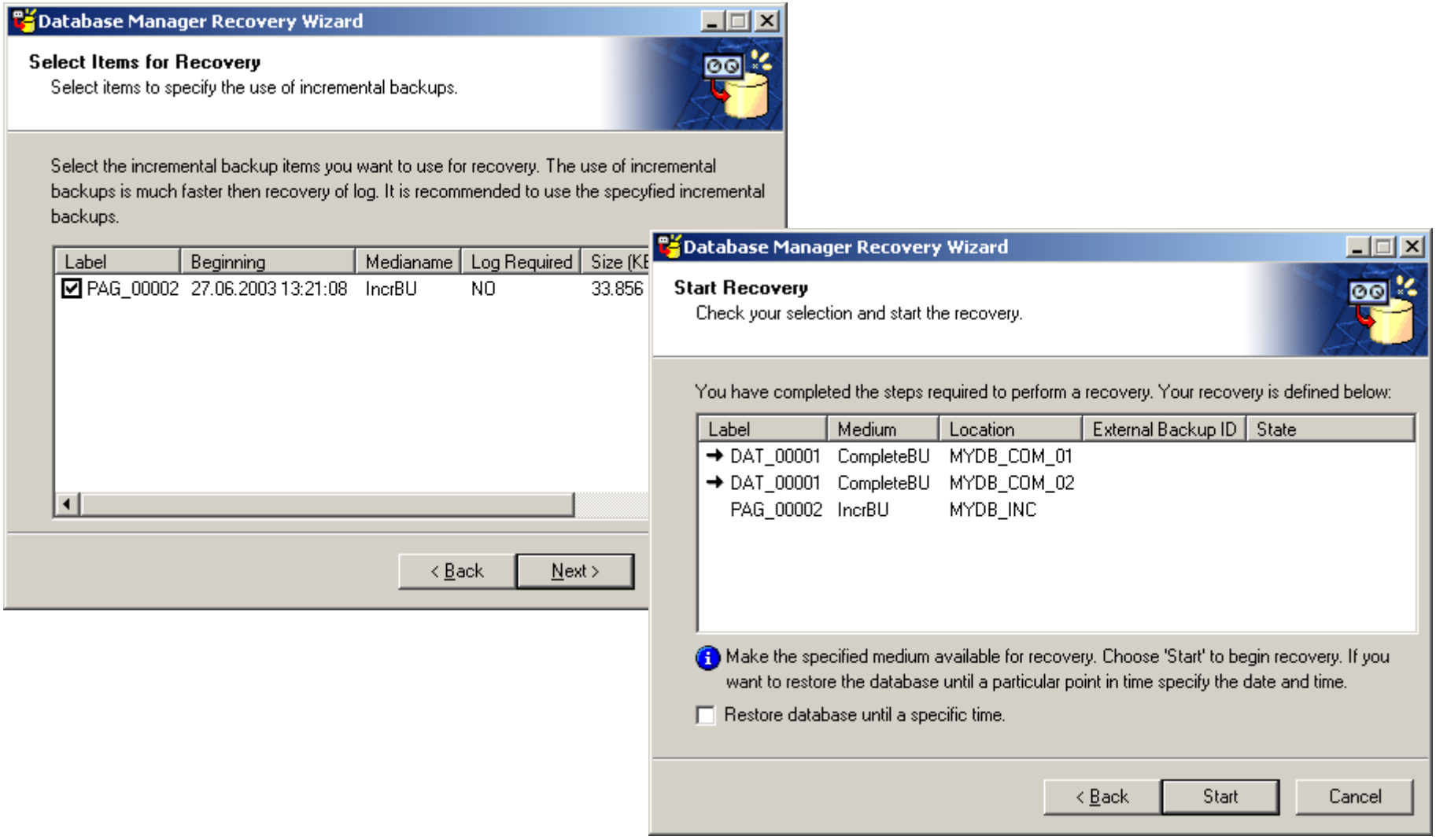
Database Manager (1)



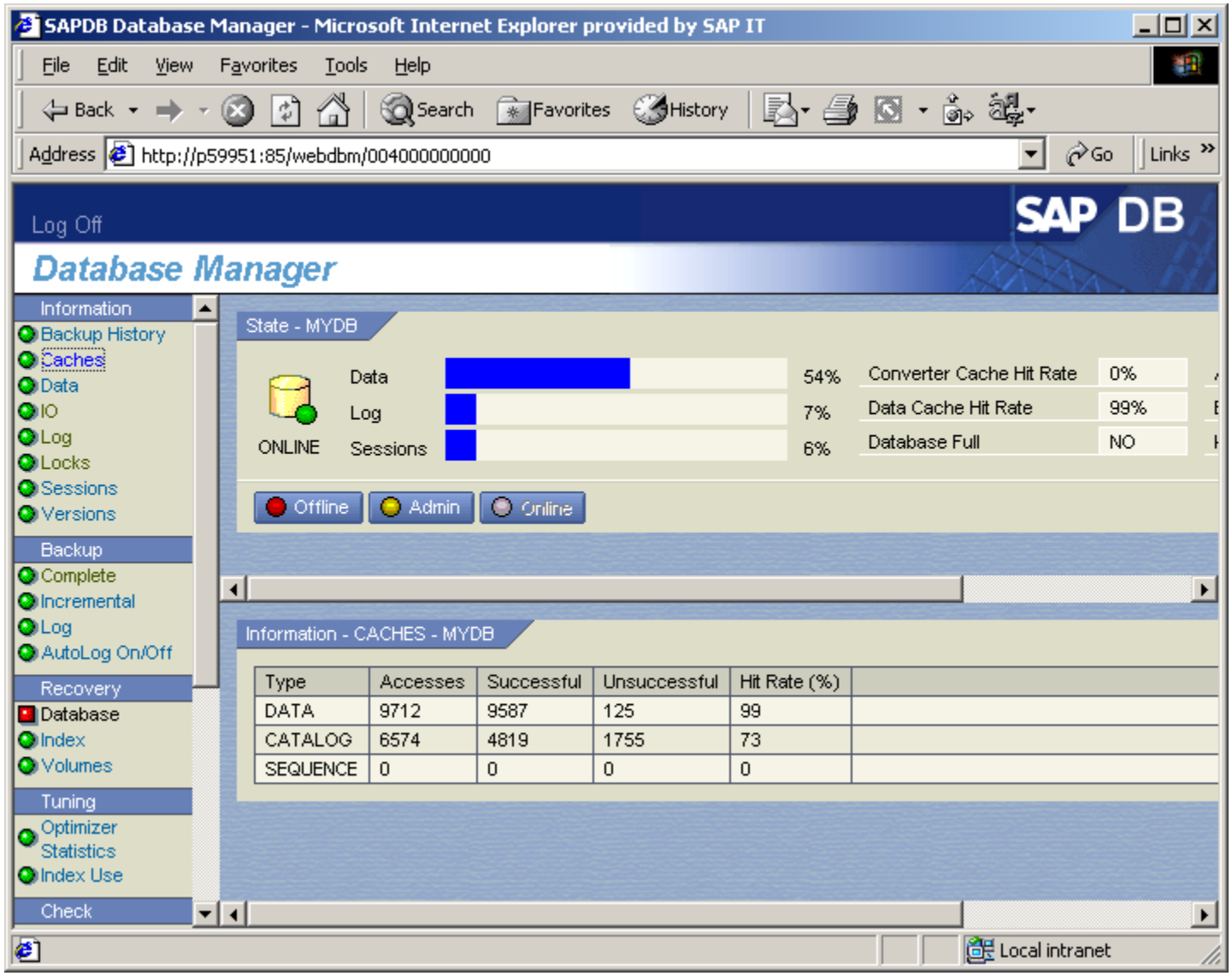
Database Manager (2)



Database Manager (3)



Web DBM



DBAnalyzer

Rule-based expert system to watch SAP DB instances

Collects statistical and monitoring data

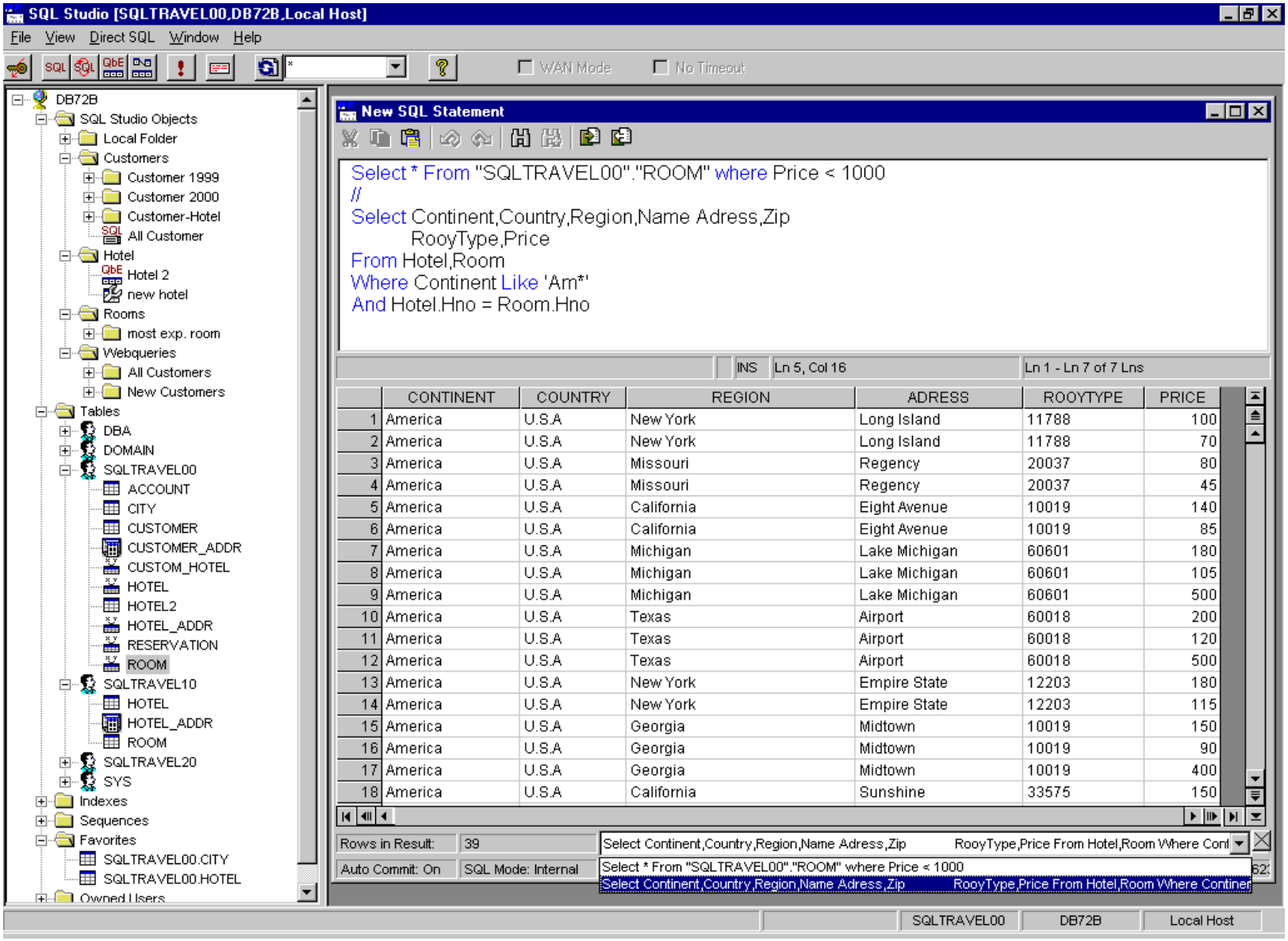
Collects system messages

Supports remote access

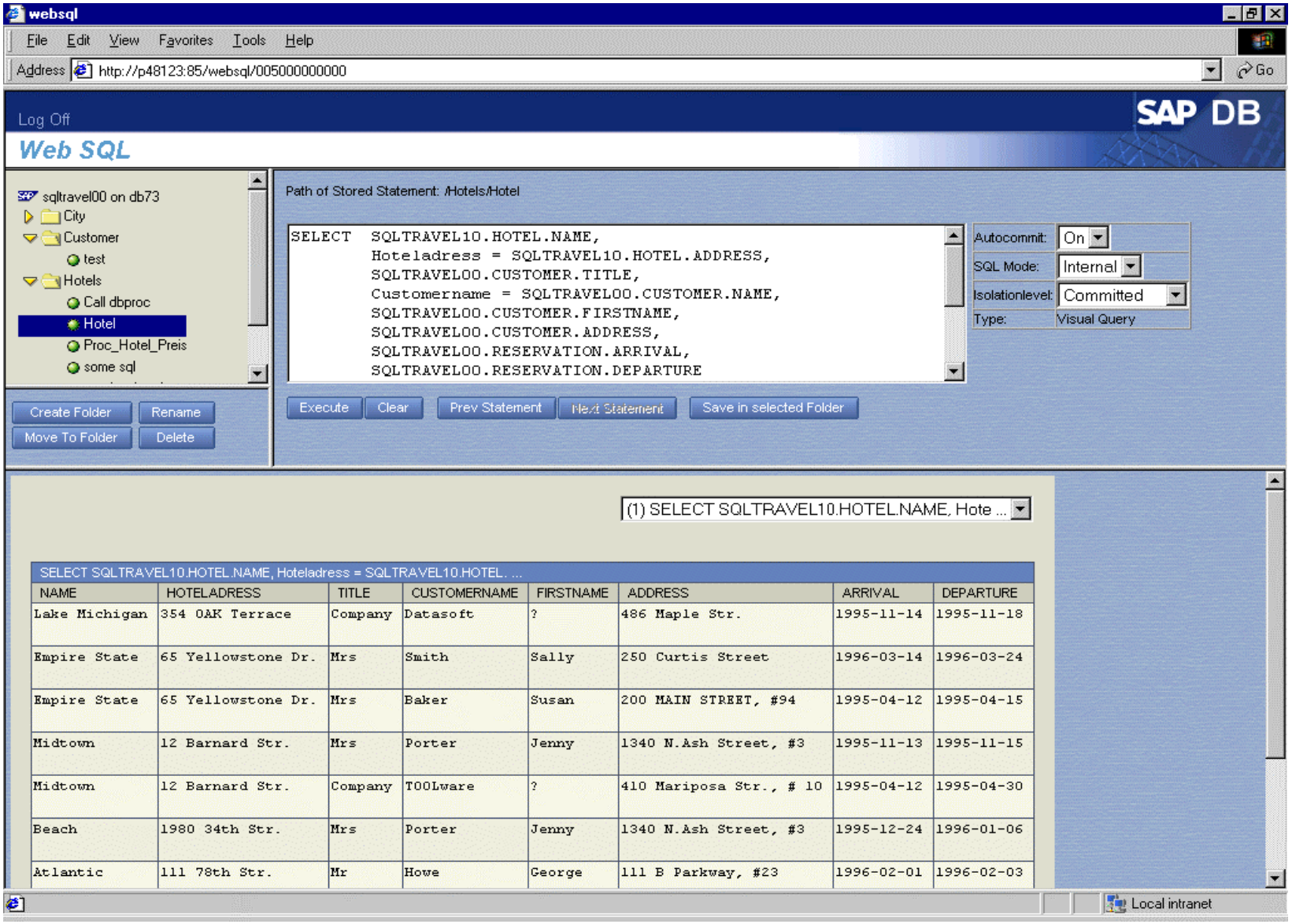
Detects and reports

- Low cache hit rates
- High I/O load
- Low hit rates of DML commands (Select, Update, Delete)
- Log queue overflows
- User lock collisions
- Command timings
- Timings and frequencies of system locks

SQL Studio



Web SQL Studio



Document Repository and XML Indexing

WebDAV server

- Document repository with files and folders
- Accessible via HTTP (web folders)
- Checkout / checkin support
- The Internet file system

Indexing of XML data

- XML data are stored as LOB
- XML indexes are defined by XPath expressions
- Synchronous or asynchronous index maintenance
- XML indexes are implemented by SQL tables
- Retrieval support for pre-defined XML indexes

Internet connectivity to (XML) documents

Snapshots

Freeze a consistent state of the database (for a future restore)

- Instantaneous backup of the complete database
- All subsequent changes are written to new pages

Recovery to previous snapshot

- Restore snapshot
- Restart

Usage scenarios

- Restore of demo or training systems to a previous state
- Very fast point-in-time recovery (e.g. during SAP solution upgrades)

Archive Instances

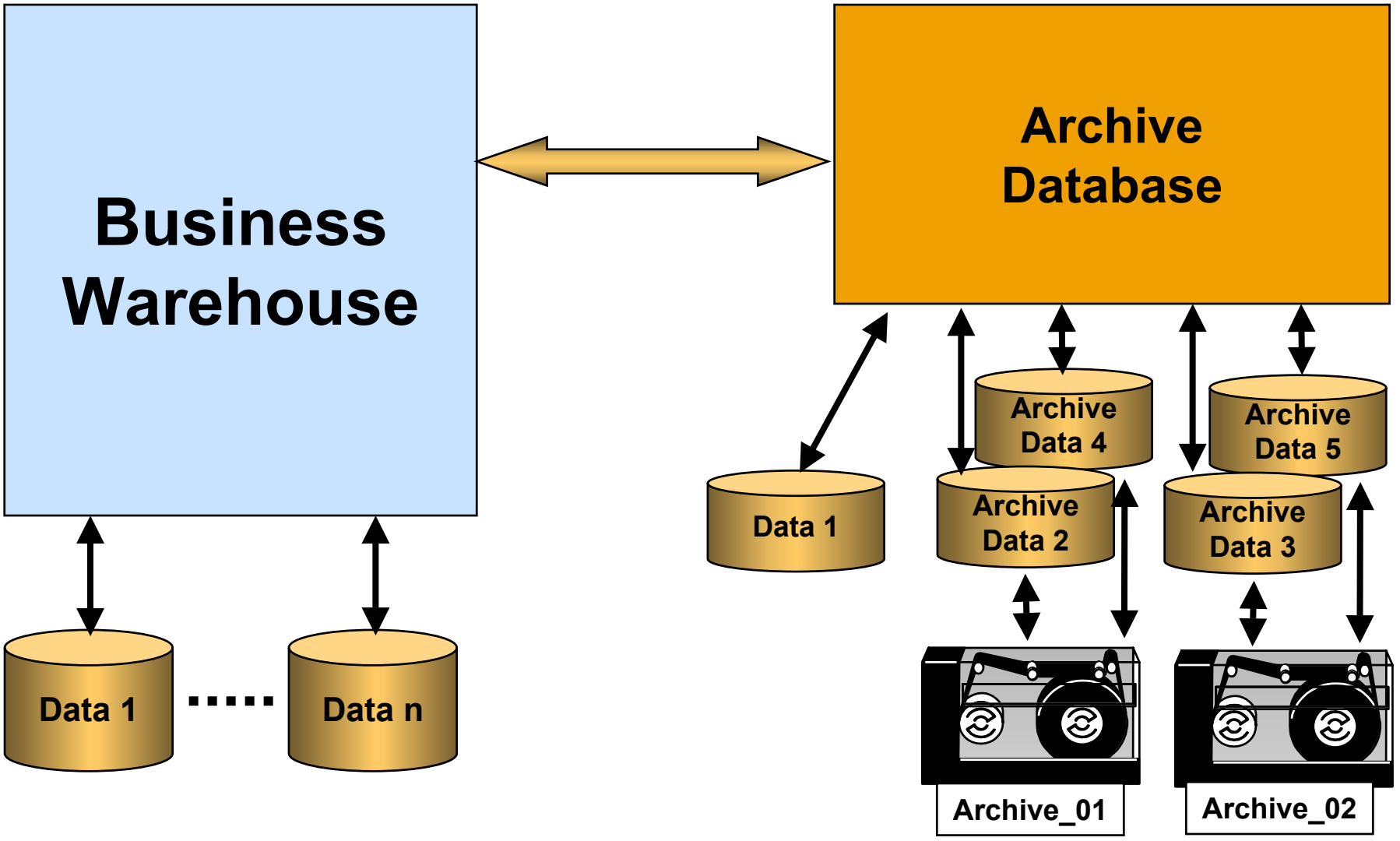
Support for archive instances

- Archive attribute for SQL tables
- Archive tables are stored using special archive volumes
  - Archive volumes can be mapped to large archive systems based on cheaper and slower tertiary storage (e.g. tapes)
- Archive rows can only be written once
  - Restricted DML on Archive tables
- Secondary indexes are stored on standard data volumes
- Data backup does not include Archive tables

Usage scenario

- Extending the SAP Business Warehouse by a semi-online Archive
- Current business data is available online for queries
- Archived business data will be made transparently available from the Business Warehouse Archive

Archive Instance for Business Warehouse



Workstation Installation

Goal: Invisible DBMS

- Mobile Clients
- Workstations
- Embedded DBMS

Installation and configuration without user interaction

- Silent mode
- Optional template (S, M, L) selection

Automatic operations

- Restart, shutdown
- Backup, recovery
- Database extension

MinDB

Minimal footprint pure Java DBMS in main memory

Targets mobile clients (PDA) and desktops

JDBC-compliant

Subset of MaxDB JDBC

Supported SQL functionality:

- Create/Delete Table
- Simple Select, Insert, Update, Delete, Commit/Rollback

Multi-session support

Backup and restore of the main memory database

Replication Manager

Replication of tables or views from a master database to multiple client databases

Replication Server decouples master and client DBMS

Replication of the initial state

Replication of single or accumulated changes (transactions)

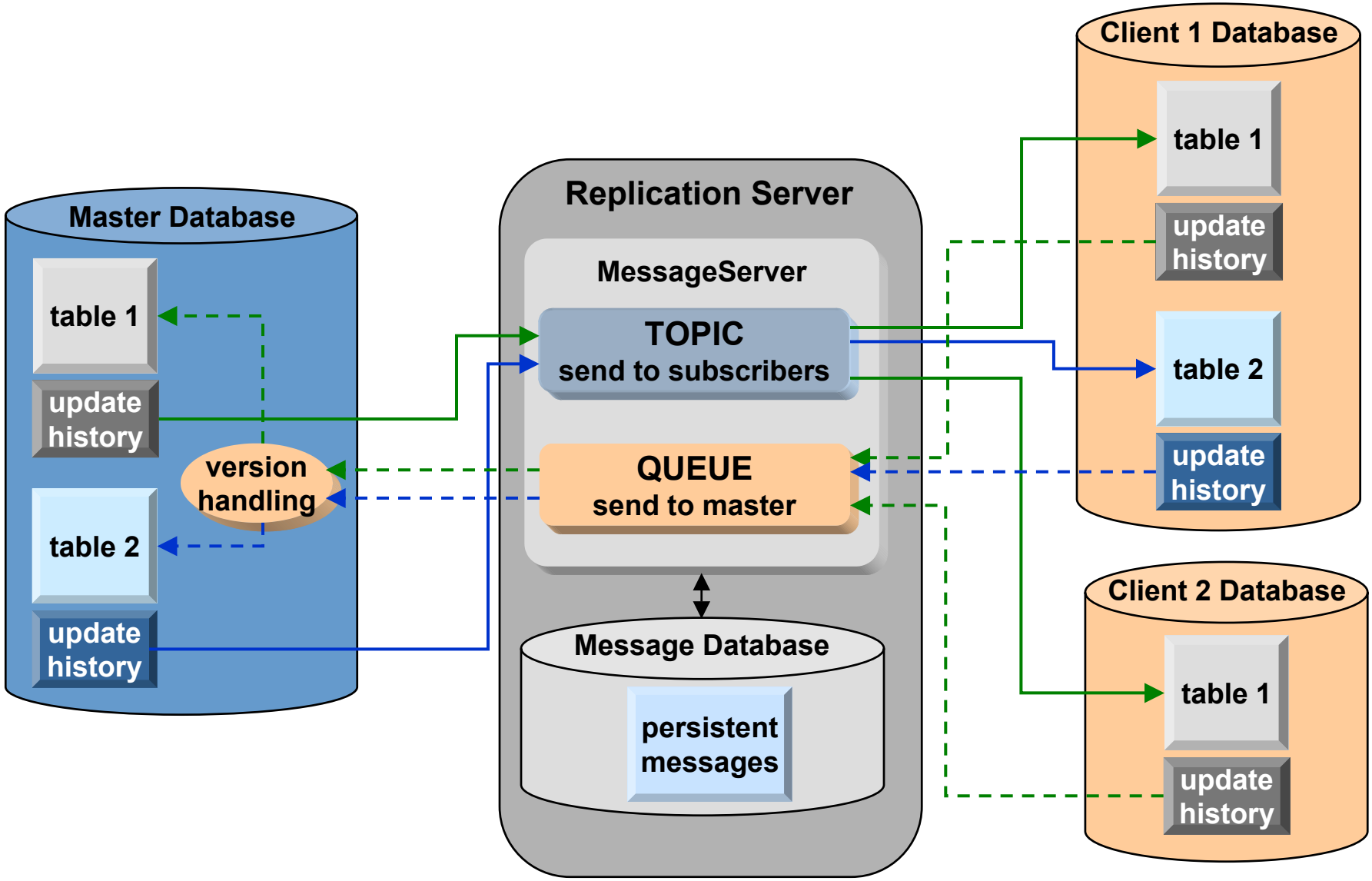
Point-to-point replications (queues)

Broadcast replications (publish/subscribe)

Support for bi-directional replications

Admin tool to define replication scenarios

Replication Architecture



Summary

Buying a DBMS is no longer a strategic but a tactical decision

Reasons to buy MaxDB

- **MaxDB automates most DBA activities which means minimal TCO**
- **Buying MaxDB from SAP means one-stop shopping**
- **MaxDB is fit for the job and tuned for SAP applications**

www.sapdb.org
www.mysql.com/maxdb

Further Information

Public Web:

www.sapdb.org, www.mysql.com/maxdb

SAP Customer Services Network: www.sap.com/services/

Consulting Contact

Jörg Hoffmeister, Theo Theis

Related SAP Education Training Opportunities

http://www.sap.com/education/

ADM515, Database Administration SAP DB
WB550, SAP DB Internals Workshop

Related Workshops/Lectures at SAP TechEd 2003

SAP DB – Administration made Easy, Hand-On Workshop

liveCache – Administration and Monitoring, Hand-On Workshop

Questions?

Q&A

Feedback

Please complete your session evaluation and drop it in the box on your way out.

Thank You !

The SAP TechEd ’03 Basel Team