

# **SAP DB**

## **The Enterprise**

### **Open Source DBMS**

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## Content

**History**

**Positioning: About SAP, SAP DB and Open Source**

**Support Philosophy**

**Myths and Facts**

# History of SAP DB

# History of SAP DB (1)

## 1977 – 1980

- Research project at Technical University of Berlin
- Topic “Distributed databases on mini-computers”

## 1981 – 1989

- SQL DBMS with Product name “DDB/4”
- Shipped on Unix platforms
- About 2000 installations

## 1989 – 1992

- Spin-off of the DDB/4 development team as subsidiary

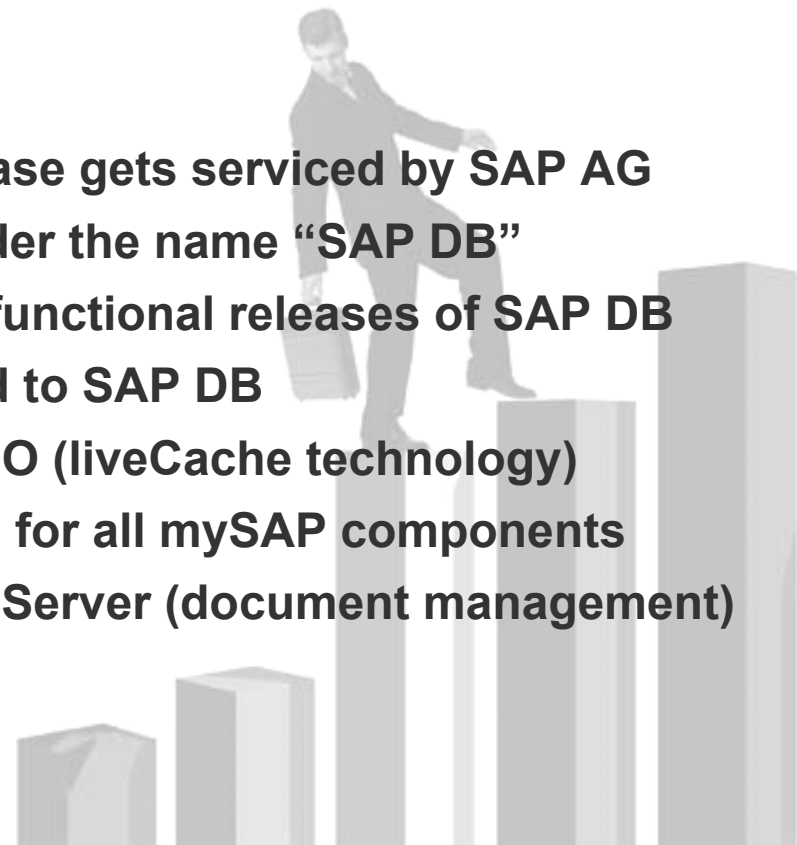


## 1993 – 1997

- License agreement with SAP AG
- SAP R/3 available with this database
- Fast growth of number of installations in combination with SAP R/3

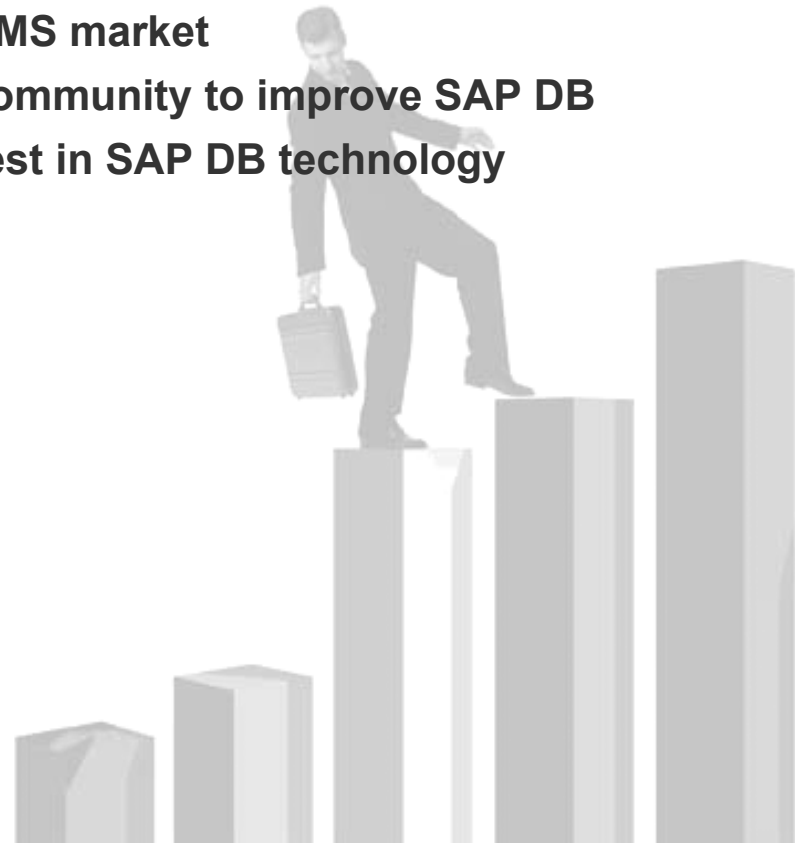
## 1997 – 2000

- Installed database customer base gets serviced by SAP AG
- SAP AG sells the database under the name “SAP DB”
- Substantial investment in new functional releases of SAP DB
- Object data management added to SAP DB
- Used in SAP’s SCM product APO (liveCache technology)
- SAP DB becomes DBMS option for all mySAP components
- SAP DB is part of SAP Content Server (document management)



## 2000 – today

- SAP DB becomes Open Source under GNU public license (GPL)
- [www.sapdb.org](http://www.sapdb.org)
- Goals
  - ◆ Create a user community independent of SAP applications
  - ◆ Energize competition in the DBMS market
  - ◆ Feedback of the open source community to improve SAP DB
- SAP continues to substantially invest in SAP DB technology



## Implementation Facts

- *Since 1997 SAP AG has invested considerably into the ongoing improvement of SAP DB technology. Major parts of the system have been completely redesigned and re-implemented to address issues of performance, availability, and ease-of-use.*
- **Optimized checkpoint handling**
- **Parallel create index**
- **Parallel backup and restore**
- **Optimized locking and logging**
- **Online handling of 'log full' or 'database full'**
- **Assisted restore process**
- **Reduced converter cache size (factor 10)**
- **Improved monitoring and diagnostics**
- **Unicode support (UTF-16)**
- **Linux as additional platform**
- **64-bit Unix platforms**
- **New database tools**





# **SAP DB Positioning**



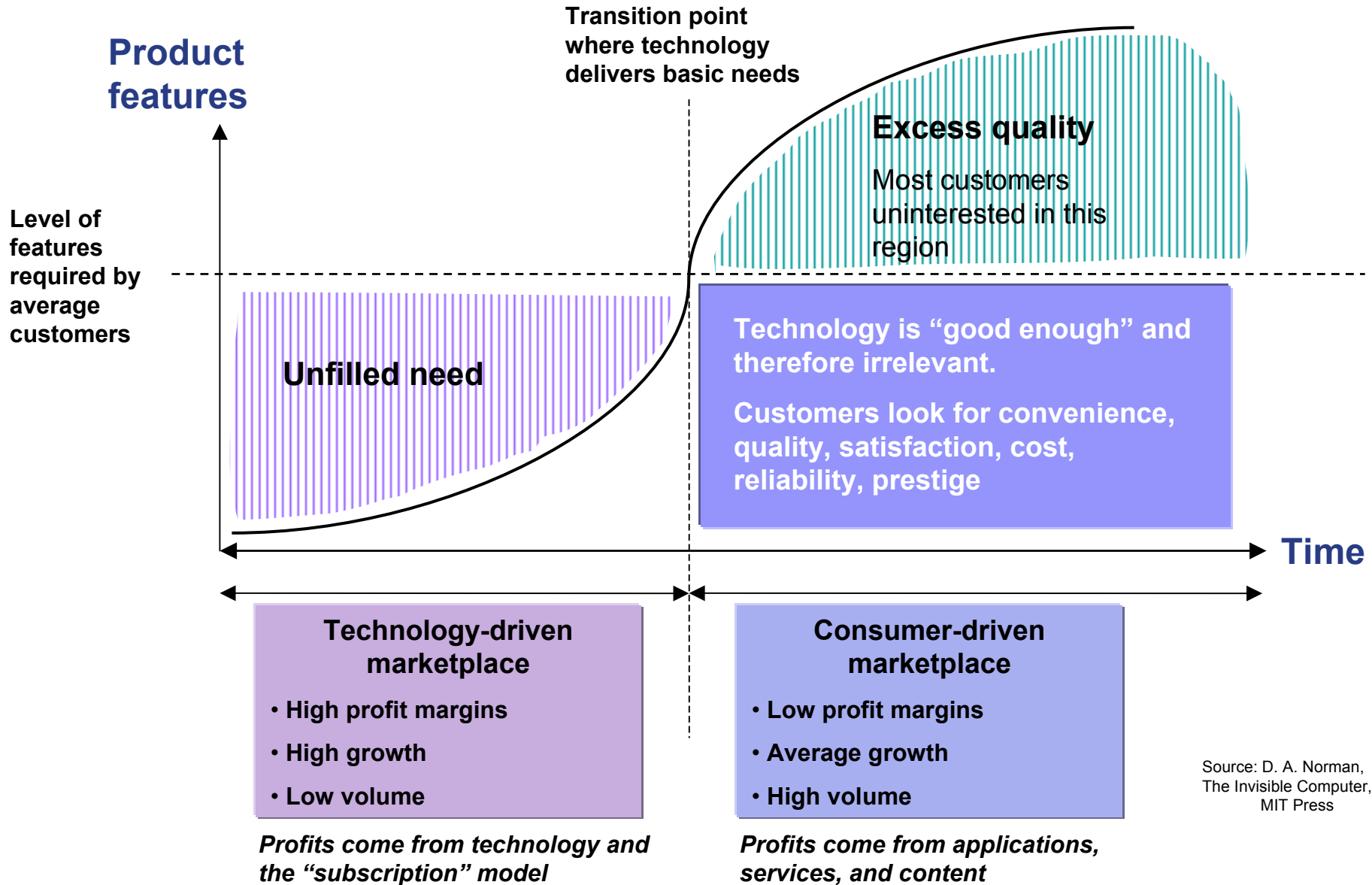
- **SAP is the third largest software company**
- **SAP is the leading vendor of enterprise and inter-enterprise (e-business) applications**
- **To provide the most productive application development environment, the most scalable application server technology and a leading deployment and software lifecycle infrastructure SAP invests heavily in an own technology stack**
- **SAP technology is available for SAP customers and partners but is not sold independently of SAP applications**
  - ◆ **Today's only exception: SAP Web Application Server**

# SAP DB's Market Position

- SAP DB is part of the SAP technology stack
- SAP DB is offered to SAP's customers as a DBMS option (e.g. OLTP DBMS) or is integrated into SAP applications like SAP Supply Chain Management (APO) or SAP Content Server
- There are no plans for SAP to enter the DBMS market by marketing campaigns or dedicated sales forces for SAP DB
- The focus of SAP is and will be applications

- The DBMS market is currently 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

# DBMS Market Transition



**Performance and Scalability**

**High Availability**

**Lowest cost of ownership**

- **Zero administration**
- **Simplicity**
- **Convenience**

## **SAP DB is a ,state of the art‘ SQL DBMS for enterprise applications.**

### **Convenience**

- No reorganization
- Automatic space management
- Easy administration

### **Licensing**

- No licensing problems for SAP solutions
- No license fee for customers
- Offered under GPL/LGPL

### **Adaption to SAP requirements**

- liveCache
- Content Server
- Repositories



- **Energize competition in the DBMS market**
  - ◆ Establish SAP DB in the SQL DBMS market
  - ◆ The days of a highly priced DBMS market are over
- **Create a user community for SAP DB beyond SAP customers and partners**
- **Use the open source community to improve SAP DB in addition to the SAP DB development team sponsored by SAP**
- **SAP's revenue is generated by application sales not by technology sales**

## ■ **mySQL and PostgreSQL ...**

- ◆ **Simply do not play in the same league**
- ◆ **Are not able to run SAP applications (e. g. SAP R/3)**
- ◆ **Lack concepts like views or transaction handling (mySQL)**
- ◆ **Lack OLTP performance for high volume workloads (mySQL, PostgreSQL)**

## ■ **SAP DB is the only Open Source DBMS for enterprise applications**



# SAP's Commitment to SAP DB

- **SAP has donated SAP DB to the open source community**
- **This does not mean that SAP abandons SAP DB**
- **On the contrary, SAP employs an ambitious development team to enhance and improve SAP DB according to market needs**
- **This development team also provides a high quality online support for SAP DB free of charge**
- **Open sourcing SAP DB simply was the most appropriate way to make SAP DB available to everybody**

[www.sapdb.org](http://www.sapdb.org)

## [www.sapdb.org](http://www.sapdb.org)

- Information and News
- Documentation
- Database Binaries Download
  - ◆ UNIX (AIX, HPUX, SOLARIS, Tru64)
  - ◆ Windows (NT, 2000)
  - ◆ Linux
- Development Download
  - ◆ Development environment currently as binaries
  - ◆ Database software sources
- Mailing lists
  - ◆ [sapdb.general@listserv.sap.com](mailto:sapdb.general@listserv.sap.com)
  - ◆ [sapdb.announce@listserv.sap.com](mailto:sapdb.announce@listserv.sap.com) (r/o)
- FAQ
- Programming samples
- Sample database (Installation script)



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## SAP THE BEST-RUN E-BUSINESSES RUN SAP

Software Tools Interfaces Development Documentation

**You Are Here:** SAP DB

### Welcome to the world of SAP DB

SAP DB is an open, SQL-based, relational database system that provides high availability and performance scaling from small to very large implementations. In addition, SAP DB goes beyond relational database technology by offering object orientation as well as support for managing unstructured data. It supports open standards including SQL, JDBC and ODBC; access from Perl and Python; and HTTP-based services with HTML or XML content. SAP DB is platform independent, so users can deploy it for a wide array of projects. Since 1994, the SAP e-Business Solution is available on SAP DB technology. Today SAP DB is being used by more than 1000 customers. On October 5, 2000, at Linux World SAP DB was announced to be made available as Open Source software using the GNU General Public License for the database kernel and the GNU Lesser General Public License for clients and programming interfaces.

**SAP DB Community**

**SAP DB Information**

- [Fact Sheet](#)
- [SAP DB Features](#)
- [FAQ](#)
- [Web Links](#)
- [Mailing Lists](#)
- [Support](#)
- [SAP DB Logo](#)
- [CD-ROM](#)
- [Jobs@SAP DB](mailto:Jobs@SAP DB)

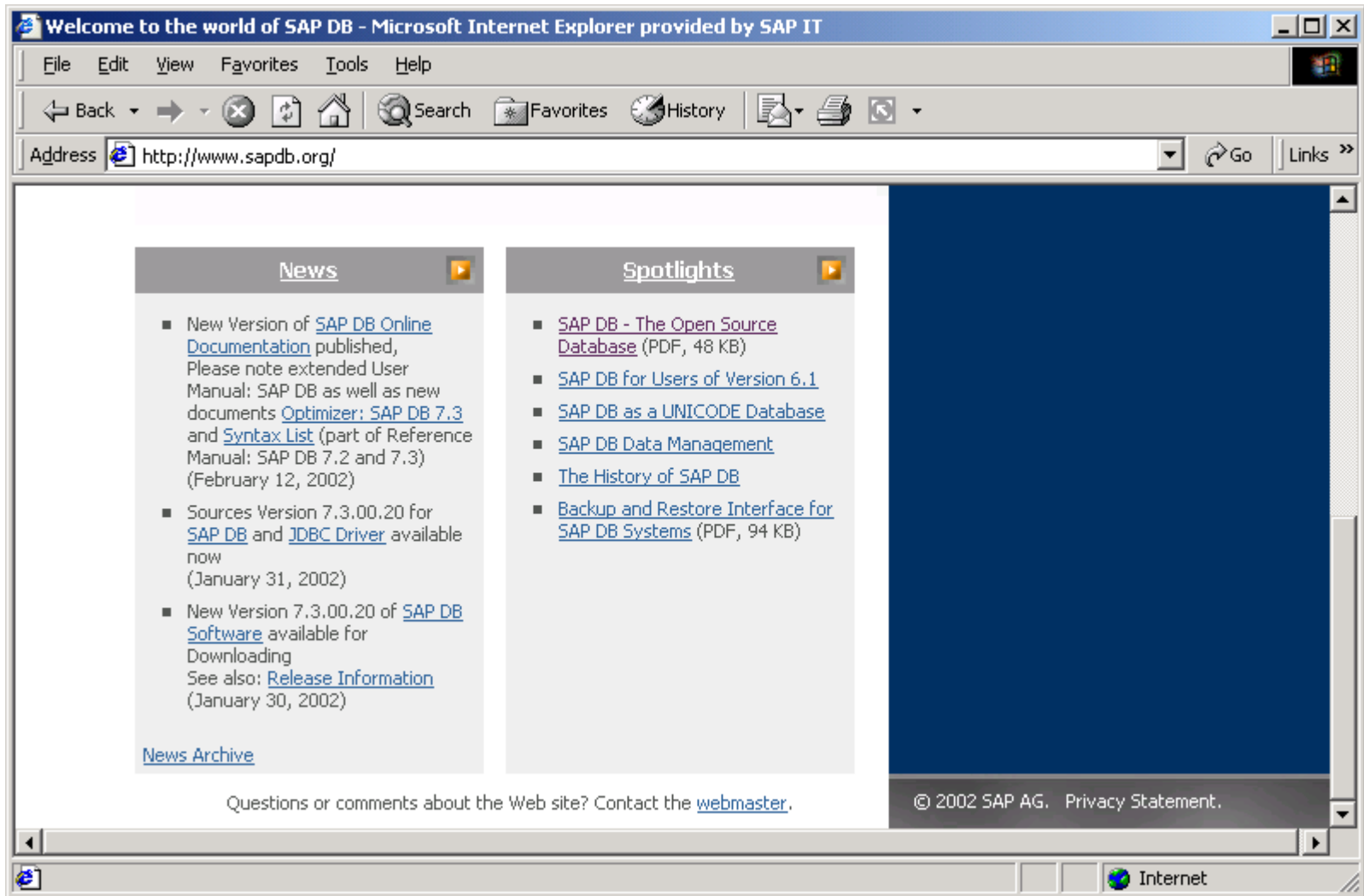
**News**

- New Version 7.3.00.21 of [SAP DB Software](#) and [Sources](#) available  
See also: [Release Information](#)

**Spotlights**

- [SAP DB - The Open Source Database](#) (PDF, 48 KB)

Internet



Operating	Tools	Interfaces
<p><b>Database Manager</b> <b>DBMGUI (Windows)</b> <b>DBMCLI</b> <b>Web DBM</b></p> <ul style="list-style-type: none"><li>• <b>Installation</b></li><li>• <b>Configuration</b></li><li>• <b>Monitoring</b></li><li>• <b>Backup/Restore</b></li><li>• <b>AutoSave</b></li><li>• <b>Media Manager</b></li></ul>	<p><b>SQL Studio (Windows)</b> <b>Web SQL</b></p> <p><b>Replication Manager</b></p>	<p><b>C/C++ precompiler</b></p> <p><b>ODBC 3.5</b></p> <p><b>JDBC 2.0/3.0</b></p> <p><b>Perl</b> <b>Python</b> <b>PHP</b></p>

## SAP DB Kernel

# SAP DB Database Manager

**Database Manager**

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Databases

Name	State	Data	Log	Sessions	Data Cache Hit F
PSA	Offline				
S10	Warm	81 %	32 %	22 %	100 %
S20	Offline				
LCA	Warm	29 %	12 %	15 %	98 %

Info - I/O - S10 06.02.2002 14:00:27

Name	Logical Reads	Logical Writes	Physical Reads	Physical Writes
Catalog	13466350	2776	77860	464
Perm Data	429605837	2421385	1839134	115763
Temp Data	222265183	87921105	320663	316681
Long Data	298520	9316	135348	2718
Leaf	300197333	87610809	2234272	429140
Level 1	224977827	2935340	145667	18682
Level 2	145739979	233475	14134	1892
Level 3	2284197	0	50	0
Sum (Tree)	673497856	90788940	2529471	452432

Database Error Code Description Date/Time

S10 S10 on p26615

# SAP DB Web DBM

SAPDB Database Manager - Microsoft Internet Explorer provided by SAP IT

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Address http://p59951:85/webdbm

Log Off **SAP DB**

## Database Manager

Information

- Backup History
- Caches
- Data
- Log
- Locks
- Sessions
- Versions

Backup

- Complete
- Incremental
- Log
- AutoLog On/Off

Recovery

- Database
- Index
- Devspaces

Tuning

- Optimizer
- Statistics
- Index Use

Check

- Database
- Backup
- Server

State - s10

Data 81%
 Log 32%
 Sessions 22%
 WARM

Converter Cache Hit Rate	100%	AutoLog	ON
Data Cache Hit Rate	100%	Bad Indexes	NO
Database Full	NO	Kernel Trace	OFF

Offline
  Cold
  Warm

Information - IO - s10

Name	Logical Reads	Logical Writes	Physical Reads	Physical Writes
Catalog	13466553	2776	77860	464
Perm Data	429607394	2421430	1839169	115763
Temp Data	222268907	87922911	320663	316681
Long Data	298539	9316	135364	2718
Leaf	300201730	87612654	2234315	429140
Level 1	224978625	2935348	145675	18682
Level 2	145740293	233477	14134	1892
Level 3	2284197	0	50	0
Sum (Tree)	673503384	90790795	2529538	452432

Done Local intranet



The screenshot displays the SAP SQL Studio interface. The main window shows a query window titled "/select staff" containing the SQL statement: `select * from staff where track = 'blues brothers'`. Below the query window, a table of results is displayed with columns ID, NAME, CATEGORY, and TRACK. The results show 9 rows of data. The status bar at the bottom indicates "Statement successfully executed" and shows connection details: SAPR3, PSA, us8802.

ID	NAME	CATEGORY	TRACK
1	john belushi	actor	blues brothers
2	dan akroyd	actor	blues brothers
3	carrie fisher	actor	blues brothers
4	aretha franklin	musician	blues brothers
5	cab calloway	musician	blues brothers
6	james brown	musician	blues brothers
7	hannah brown	cutter	blues brothers
8	derek miller	cutter	blues brothers
9	hank clinton	camera	blues brothers

websql - Microsoft Internet Explorer provided by SAP IT

Address <http://p59951:85/websql>

Log Off **SAP DB**  
**Web SQL**

sapr3 on PSA  
select staff

Path of Stored Statement: /select staff

```
select * from staff where track = 'blues brothers'
```

Autocommit: On  
SQL Mode: Internal  
Isolationlevel: Committed  
Type: SQL Window

Create Folder Rename  
Move To Folder Delete

Execute Clear Prev Statement Next Statement Save

ID	NAME	CATEGORY	TRACK
1	john belushi	actor	blues brothers
2	dan akroyd	actor	blues brothers
3	carrie fisher	actor	blues brothers
4	aretha franklin	musician	blues brothers
5	cab calloway	musician	blues brothers
6	james brown	musician	blues brothers

Local intranet

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## SAP DB Documentation

[Glossary of SAP DB Terms](#)

[How to work with SAP DB](#)

*Documentation in HTML Format*

- [Online Reading](#)
- [Download](#) (1.8 MB)

Please note:  
If your browser changes the package extension from `.tgz` to `.tar` during the download, please rename the package to `.tgz` before installing it.

*Documentation in PDF Format*

**Basic Knowledge**

- [User Manual: SAP DB](#) [PDF](#) (600 KB)
- [Reference Manual: SAP DB 7.2 and 7.3](#) [PDF](#) (1.7 MB)

SAP DB Community

Internet

## Start

- Tool and kernel sources
- SAP Labs Berlin hold master sources
- Development environment binaries
- Patch proposals through mailing list
  - ◆ SAP Labs will evaluate proposals
- Periodical replacement of sources on our ftp server
  - ◆ tgz package



## Future

- CVS-hosting

## SAP DB provides own development and make environment

- First offered as binary
  - ◆ To get used to it's handling
- Bootstrap will be offered as follow up
  - ◆ Automake, Autoconf

## SAP DB Version 7.4

- **Binaries and Sources of Beta-Version**
  - ◆ second half of 2002
  
- **Benefits of 7.4**
  - ◆ no more separate System Volume (Converter)
  - ◆ increased converter scalability
  - ◆ databases might shrink now
  - ◆ every backup can be restarted
    - new handling of before and after images
  - ◆ and more ....



# **SAP DB**

# **Support Philosophy**

# SAP DB Support Model



	SAP Solution		3rd Party Solution
	3rd Party DBMS	S A P	D B
SAP Solution Maintenance	✓ A1	✓ A2	
SAP DB Premium Support			✓ B3
Free Online Support			✓ C3

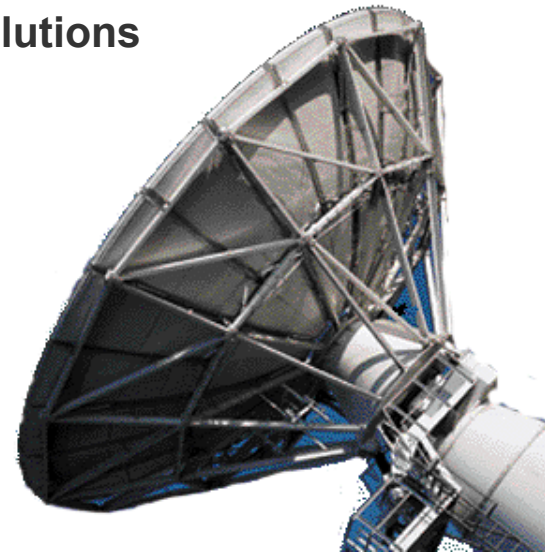
Mailing list [sapdb.general@listserv.sap.com](mailto:sapdb.general@listserv.sap.com)

- SAP DB users help each other
- SAP DB development team monitors discussions and reacts to reported problems
- This support is free of charge and thus does not guarantee response or reaction/solution times but we take care of each problem
- Service level tends to be better than other DBMS' maintenance you already pay for



## Premium support contract provides access to SAP's support infrastructure

- Customer Competence Center (CCC) with a limited number of contact persons needs to be set up
- Support fee has to be paid per year per CCC
  - ◆ SAP credits the SAP DB maintenance fees for SAP solutions



# **Myths & Facts**

**about**

**SAP DB**

- **Some of our competitors feel the need to argument against the usage of SAP DB**
- **In most cases these counterarguments lack any substance**
- **In this place we will respond to the most popular myths we have heard of**



# No SAP DB Installations?

## **Myth #1:**

- SAP DB has only a few, small installations

## **Fact:**

- There is a considerable number of large SAP DB installations all around the globe (see list). Some Thousand installations use SAP DB for SAP applications.

# Sample Of SAP DB Installations

## R/3

Vaillant GmbH, Germany

Intersnack, Germany

Deutsche Post, Germany

TDS, Germany

Thyssen, Germany

Toyota, South Africa

Tenaga, Malaysia

APEX Corp. , Japan

Yamaha, Japan

Showa Denko, Japan

Siderar, Argentina

## APO/liveCache

Colgate, USA

Intel, USA

Bayer, Germany

Braun, Germany

Epcos, Germany

Bertelsmann, Germany and USA

Toyota, South Africa

Becton & Dickinson, USA

Nestec, Switzerland

Eastman Chemical, USA

Daimler Chrysler, Germany

Bridgestone, Belgium

# Limited Number Of Concurrent Users?

## **Myth #2:**

- SAP DB can only support a limited number of concurrent users.

## **Fact:**

- The maximum number of concurrent users is only limited by the available main memory (address space).

# Database Size Limitations?

## Myth #3:

- SAP DB's maximum database size is limited.

## Fact:

- SAP DB's pagesize defines the limit for the maximum database size.

For 8 KB pages this means 32 TB.

For 64 KB pages this means 256 TB.

# No Reorganization?

## **Myth #4:**

- SAP DB might need no reorganization but this is bad for performance.

## **Fact:**

- SAP DB in fact does not need any reorganizations. In spite of this administrative comfort level SAP DB's performance is comparable to other leading DBMS products.



## Myth # 5:

- Because of bad performance there are no SAP DB benchmarks.

## Fact:

- Benchmarks are typically driven by HW vendors not by DBMS vendors. Therefore the so-called DBMS market leaders dominate the benchmark list. This does not mean that other DBMS would have failed to produce similar numbers.
- For SAP DB we have run 2-tier SAP benchmarks for Linux and Windows with excellent results and plan to do a 3-tier benchmark in the near future
- However, our main focus is not “benchmarking” but performance improvements for productive SAP applications

## Myth #6:

- SAP will abandon SAP DB.

## Fact:

- SAP is an application company, not a technology provider.
- Therefore SAP DB (independent of SAP applications) is made available as Open Source and not by a dedicated SAP sales force.
- SAP has a vital interest in defining and building an own technology stack in which SAP DB and Linux play an important role.
- SAP DB is more than just a SQL-DBMS. Main memory data management (*liveCache*) for SAP's SCM and XML-based document management (SAP Content Server) are areas where we drive database technology beyond SQL.

# High Availability Scenarios?

## Myth #7:

- SAP DB does not support high availability (HA) scenarios

## Fact:

- SAP DB supports HA scenarios of several SW/HW vendors

# SAP<sup>TM</sup> DB

The Enterprise Open Source DBMS



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