

# *IT Professionals Forum*

## Database Back Ends

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# *Where are they in your IT environment?*

**Wherever users want to store data**

- sticky notes, To Do lists, Calendars
  - text documents
  - MS Excel
  - MS Access
  - other database systems (FilemakerPro, FoxPro)
  - Server based: MS SQL Server, Oracle, mySQL, PostgreSQL
  - Accounting software
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# *What is a Database?*

- a defined set of data
  - what it looks like ('blueprint') is called a **Schema**
  - usually has more than one **Table**
  - each table has **rows** and **columns**
  - each column is called a **field**
  - example – the Phone Book
  - slice and dice – can Order/ Sort
  - Relational Database Management Systems (**RDMS**)
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# *RDBMS Features*

- Parent/ Child relationships

- Stored Procedures

- Referential Integrity

(example: Cascading deletes)

- Triggers (Insert, Update, Delete)

- Advanced Features: Replication  
(Snapshot, Transactional, Merge)

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# RDBMS – Admin Tools

The screenshot shows the pgAdmin III interface. On the left, a tree view displays the database structure for 'bfdata', including Schemas (public), Aggregates (1), Conversions (0), Domains (0), Functions (107), Trigger Functions (7), Operators (3), Operator Classes (0), Sequences (137), and Tables (200). The 'Functions' folder is selected and highlighted in yellow. On the right, a table displays the details of the selected functions.

| Function                  | Comment   |
|---------------------------|---|
| alldates(date, ...)       | This generates a "table" of the dates between the first and last dates.       |
| appvar(text)              | This retrieves the variable value named by text from app_variables.           |
| auditinventory(...)       | This changed the inventory value from iPartid to fQty and iPartid to fPartid. |
| autopull()                |   |
| bike_orderid(int4)        |   |
| bike_scheduleddate(int4)  | This returns a bike's scheduleddate given a buildabikeid.                     |
| bikeattempt_top(int4)     |   |
| bikeframe_findcolor(int4) |   |
| biketype(int4)            | Given a buildabikeid, returns its biketype text.                              |
| calcinpoint(int4, int4)   | This function never made it out of test mode ( I believe).                    |
| categorystate(int4, int4) | Given a custid and categoryid return if the category is to be used.           |

Properties | Statistics | Depends on | Referenced by

Retrieving Functions details... Done. 0.07 secs

# *What do I DO with them?*

- Storing all that data of course
- Reporting (Users sure love reports...)
- Applications (Data entry, Accounting, Manufacturing, Reporting)



# *Which one is the “Best”?*

Factors to consider, among others:

Cost (some are “free”!)

Suitability to task

Size limitations

“Benchmarks”

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# Costs

- MS Access - comes with MS Office Suite (Word, Excel, PowerPoint); Retail approx \$500. Just Access 2007 is \$240
  - MS Visual FoxPro; Retail approx \$649
  - mySQL (Not necessarily free - see licensing)
  - PostgreSQL (free – open source)
  - MS SQL Server (\$\$\$)
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# *Costs (continued)*

Speed:

Hardware matters – is/ are your server(s) up to the challenge?

Network Bandwidth matters – will your infrastructure support it?



# *Suitability to task*

MS SQL Server – Employee List

MS Access – Qwest Phone Book



# *Capacity & Size limitations*

Your OS Matters (Win (FAT32, NTFS) vs Linux)

Watch for 2 GB limitations with some DB's!

The only things certain in life are Death, Taxes and ever expanding databases



# *Benchmarks*

Lies, Lies and more Lies



# *MS Access 2000/XP*

Overall size of database (excluding logs): 2 GB

Number of columns per table: 255

Number of Rows per Table: limited by storage

Number of columns per query: 255

Number of tables per query: 32

Number of concurrent user connections: 255

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# PostgreSQL

Overall size of database (excluding logs): “unlimited”

Number of columns per table: 250- 1600

Number of Rows per Table: limited by storage

Number of columns per query: ?

Number of tables per query: ?

Number of concurrent user connections: “unlimited”  
(stateless)

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# *MS SQL Server 2000*

Overall size of database (excluding logs): 1,048,516 TB

Number of columns per table: 1024

Number of Rows per Table: limited by storage

Number of columns per query: 4096

Number of tables per query: 256

Number of concurrent user connections: 32767

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# Front End Example

rdesktop - 192.168.1.106 <2>

Bike Friday DB --- v2.14.98.tikits

File Edit View Format Records Quick Window Help

Contacts --- v2.14.98.tikits

Contacts/Customers Quick Find Promotions Info Request Env/Labels Close  
 Referred By Print Record Refresh Put On Deck

Customer Information Referrals Bike Designs ORDERS Bikes Currently Owned

Customer for: 2 years  
 [No Prom. Spans for 6 weeks.]

First Name: Matt  
 Last Name: Jarvis  
 Address: 1697 Cal Young Rd  
 Addr Line 2:  
 Zip: 97401  
 City: Eugene  
 State: OR  
 Country: UNITED STATES

Occupation: Bike Industry  
 Company: Bike Friday  
 Title: IT Manager  
 This Record is for a company:

DayPhone: 541/342-2203  
 EvePhone: 541/513-6287  
 Fax:  
 Best time to call: before 1:00 PM

Sales Rep: MattJ  
 Status: BF Employee  
 Priority: Low  
 Will show?: Maybe  
 Rating:

Default Terms: Pre-Paid  
 Mail Code: Mail  
 Entered: 8/15/2005  
 Cust ID: 98228

Email List:  Rec FF:  Rec EFF:

Overall: 100% TotalBike: 36 Total\$: \$775.23 #Pur Ref: 0 Ref\$: \$0.00 Cur Bike: 1

cell phone: 513-6287

Email: mattj@bikefriday.com  
 Send Email

Tour  Roac  Mtn  Fun  Com  Tan  Sport  Rec

Associate With Use Cust ID

| To Note     | Subject   | Created Date         | Follow Date | Compl. Date | Type    | Priority |
|-------------|---|----------------------|-------------|-------------|---------|----------|
| File        | Sent Info Request   | 4/10/2007 3:06:59 PM |             | /10/2007    | Tickler | Medium   |
| Matt Jarvis | Bike has been shipped on 3/20/07 11:09:23 AM. Call and remind customer. | /20/2007 11:09:26 AM | 3/20/2007   |             | Tickler | High     |
| File        | Nameplate Ordered!  | /12/2006 10:07:11 AM |             |             | Note    | Low      |

Form View



# References

- MS Access, MS FoxPro, MS SQL Server  
(<http://msdn.microsoft.com>)
  - MySQL  
(<http://www.mysql.org>)
  - PostgreSQL  
(<http://www.postgresql.org>)
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