

.dbf

The **.dbf** file extension represents the **dBASE** database file. The file type was introduced in 1983 with the introduction of dBASE II. The file structure has evolved over the years to include many more features and capabilities and has introduced various other files to help support data storage and manipulation. The current .dbf file level is called, Level 7. The .dbf format is supported by a number of **database** products.

1 Overview

The original **dBASE** database was started by **Wayne Ratliff** in 1978 and was known as Project Vulcan. At the time the file that held the data was a simple table that could have data added, modified, deleted and printed using ASCII characters set.^[1] As the product became more popular, the underlying file type .dbf was expanded and additional files were added to increase the capabilities of the database system. Keep in mind, that **dBASE** is an **IDE** (Integrated Development Environment), a database system, a compiler, and a database application builder. However, underneath all that is the .dbf file, which is the actual data storage mechanism. If you want to understand the structure at a much lower level, review the Level 5 DOS Headers section of this article.

2 File Architecture Overview

Project Vulcan (Level 1) There are no public records on the exact layout of the file the best information at this time is that it was a simple table that allows for adding, deleting, modifying, and printing out ASCII information. It was designed to run on 8-bit machine running **CP/M**.

dBASE II – MS-DOS (Level 2) was the first major release of **Aston-Tate** and offered many advancements above and beyond the simple table structure of the original tables found in Project Vulcan.^[2]

- Still written for 8-bit computing
- Increased the number of Fields from 16 to 32
- Introduced a SORT routine
- 16-bit version finally released in April 1983 version 2.4

dBASE III – MSDOS (Level 2sh) was now completely focused on 16-bit operations and was introduced in 1.0 was released in June 1984. The underlying dBASE database was still based on an intermediate version of the dBASE II file format. The dBASE III file format is not compatible with the dBASE III+ format.

dBASE III+ – MS-DOS (Level 3) this starts the modern era of dBASE .dbf files. The dBASE III+ was introduced in December 1985 when the product was released.

- 16-bit version finally released in April 1983 version 2.4

Structure layout of the file type:^[3]

dBASE IV – MS-DOS (Level 4)

- 1.0 x322 Oct 88
- 1.0 x55 Mar 93 – dBASE Compiler
- 2.0 x12 Oct 93 Includes fixes in dBASE IV v2.0 x16 above (not x17 i.e. not VLM compatible, dB5D exe's are compatible). It's also a new version that contain new features not in the V1.0 product:
 - 32-bit generation - Auto compiling and linking - Smaller .EXE size - Menu driver user interface - Linker can produce combined .DBO output - Linker can produce a .MAP file - Compiler supports alternate date formats - Support for wild-card character in file names used with command-line switches.

dBASE V – MS-DOS (Level 5)

- 1.0 x46 Jun 94

BDE – Borland Database Engine 2.52

This is the last update to the 16-bit version of the Borland Database Engine (BDE). Download and unzip to a temporary folder, and run the SETUP program.^[4]

dBASE V – MS-Windows (Level 5)

- 5.5 b673 Jul 95

2.1 Level 5 DOS Headers

While **dBASE** has been around for many years, the files themselves seem to be shrouded in mystery. Below is the

Structure of a database (.dbf) file for dBASE V for MS-DOS.

A database (.DBF) file is composed of a header, data records, deletion flags, and an end-of-file marker. The header contains information about the file structure, and the records contain the actual data. One byte of each record is reserved for the deletion flag.

Database header structure

The header structure, detailed in Table D.1 and Table D.2, provides information dBASE for DOS uses to maintain the database file.

- 1. The ISMARKEDO function checks this flag. BEGIN TRANSACTION sets it to 01, END TRANSACTION and ROLLBACK reset it to 00.
- 2. If this flag is set to 01H, the message Database encrypted appears. Changing this flag to 00H removes the message, but does not decrypt the file.
- 3. n is the last byte in the field descriptor array. The size of the array depends on the number of fields in the database file. n is equal to $31 + 32 * (\text{the number of fields})$.
- 4. The maximum number of fields is 255.
- 1. The maximum length of a field is 254 (FEH).

Database records

The records follow the header in the database file. Data records are preceded by one byte: a space (20H) if the record is not deleted, or an asterisk (2AH) if the record is deleted. Fields are packed into records without field separators or record terminators. The end of the file is marked by a single byte with the line feed marker, an ASCII 10 (0AH) character.

You can input ASCII data as indicated in the following table.

2.2 Memo fields and the .DBT file

A memo (.DBT) file consists of blocks numbered sequentially (0,1,2, and so on). SET BLOCKSIZE determines the size of each block. The first block in the memo file, block 0, is the memo file header.

Each memo field of each record in the .DBF file contains the number of the block (in ASCII) where the memo field begins. If the memo field contains no data, the .DBF file contains blanks (20H) rather than a number.

When data is changed in a memo field, the block numbers may also change, and the number in the .DBF may be changed to reflect the new location.

Unlike dBASE III PLUS, if you delete text in a memo field, dBASE for DOS may reuse the space from the

deleted text when you input new text. dBASE IQ PLUS always appended new text to the end of the .dbt file. In dBASE III PLUS, the .DBT file size grew whenever new text was added, even if other text in the file was deleted.

dBASE 7 – MS-Windows (Level 7)

- 7.0 b1345 Dec 97 Full 32 bit version for Win 95/NT

2.3 Level 7 Tables

Level 7 brought many improvements. The field names can have up to 31 characters (from a maximum of 10 before). Some new fields types have appeared (for example, the Auto-Increment field^[5] that makes nearly impossible to give the same number to two records in the same table). If your tables have to be used by other software, you might have to sacrifice these advantages for the sake of compatibility, as few applications can use a level 7 table.^[6]

2.4 Level 7 Structure

The Level 7 Structure is the latest supported by dBASE and BDE.^[7]

BDE version 5.1.0

Significant improvements over the prior releases.^[8] There are also some limitations with regards to what the BDE can handle.^[9]

3 Other File Types Found in dBASE

There are many file types or files that have extensions that can be used by dBASE. The following list is presented in the order of use. This is a combination list of files that are related to dBASE and is compiled from the dBASE III+, dBASE IV, and dBASE CLASSIC documentation.^[10]

4 See also

- Clipper
- File format
- FoxBASE

5 References

- [1] Powell, David B. (1984-02-07). "From Basement To Boardroom". PC Magazine: 131. Retrieved 24 October 2013.

- [2] Powell, David B. (1984-02-07). "From Basement to Boardroom". *PC Magazine*: 131–135. Retrieved 2014-08-15.
- [3] "dBASE Table File Format (DBF)". Digitalpreservation.gov. Retrieved 2014-08-15.
- [4] "dBASE Documentation Download - dBase, LLC". Dbase.com. Retrieved 2014-08-15.
- [5] Jean-Pierre Martel. "AutoIncrement Fields". Dbase.com. Retrieved 2014-08-15.
- [6] level and language of a table
- [7] "dBASE .DBF File Structure". Dbase.com. Retrieved 2014-08-15.
- [8] Jean-Pierre Martel. "New BDE 5.1.0 and Visual dBASE 7.01". Dbase.com. Retrieved 2014-08-15.
- [9]
- [10] "dBASE Classic". dBASE Classic. Retrieved 2014-08-15.

6 Further reading

- Ben Fry. *Visualizing Data: Exploring and Explaining Data with the Processing Environment*. p. 325. ISBN 9780596554729.
- Allen Kent, James G. Williams. *Encyclopedia of Microcomputers: Volume 4 - Computer-Related Applications: Computational Linguistics to dBase*. p. 398. ISBN 9780824727031.

7 External links

- dBase official website
- dBASE CLASSIC(TM) Web Site
- dBASE's Official YouTube Channel

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8.1 Text

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