BibTeX 1.0

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Abstract

This paper discusses the history of BibTeX, its current status, and the future goals and plans for it. BibTeX 1.0 will be the frozen version of BibTeX, just as TeX 3 (but not as TeX 2!) is the frozen version of TeX. Among the goals for BibTeX 1.0 are: easier creation of nonstandard bibliography styles; easier sharing of database files; and better support for non-English users. Among the new features will be: a program that lets users create their own bibliography styles; support for 8-bit input; support for multiple bibliographies within a single document; and the capability to indicate in a bibliography entry where in the text the entry was cited.

Introduction

BibTeX is the bibliography program designed originally to accompany Leslie Lamport's LaTeX (it now works with other versions of TeX, too). The first publicly released version of BibTeX, 0.98, came out in 1985. The second main release, version 0.99, came out in 1988. The long overdue final version, 1.0, is still under preparation. This paper discusses BibTeX and the plans for version 1.0. The remaining sections: explain BibTeX for those who haven't used it; give a brief history of BibTeX; describe the general goals for BibTeX 1.0; describe some specific new features for achieving those goals; and make some requests of the TeX community that will facilitate the release of BibTeX 1.0.

Using BibTeX

To use BibTeX you put into your (La)TeX source file citations like

```
... in the \TeX{}book~\cite{knuth:tex} ...
```

along with two other commands:

```
\bibliography{mybib}
\bibliographystyle{plain}
```

(La)TeX will typeset the citation as

... in the TeXbook [23] ...

or

... in the TeXbook[23] ...

or

... in the TeXbook (Knuth, 1984) ...

depending on which citation style you specify; (La)TeX's default citation style is a number in brackets. (In some citation styles — for example in the author-date style that produces 'Knuth, 1984' — BibTeX helps (La)TeX produce the citation.)

The `\bibliography` command does two things: it tells (La)TeX to put the bibliography at that spot in your document, and it tells BibTeX which file(s) to use for the bibliographic database, here just the single file `mybib.bib`. The `\bibliographystyle` command tells BibTeX which bibliography style to use, here the standard style `plain`.

The `\cite` command's argument `knuth:tex`, called a cite-key, must have a matching database-key for some entry in the bibliographic database. That entry (in `mybib.bib`) will look like

```
@BOOK{knuth:tex,
   author = "Donald E. Knuth",
   title = "The {{\TeX}}book",
   publisher = "Addison-Wesley",
   year = 1984,
}
```

The `@BOOK` tells BibTeX that this is a book entry. The `knuth:tex` is the database key. And the rest of the entry comprises four ⟨field⟩ = ⟨field-value⟩ pairs appropriate for this entry type. (La)TeX and BibTeX might (depending on the bibliography style) typeset this as

23. Donald E. Knuth. *The TeXbook.* Addison-Wesley, 1984.

(La)TeX determines a few things about how the reference list is formatted — things like whether the label 23 is followed by a period or is enclosed in brackets, and the vertical spacing between entries. But the BibTeX bibliography style determines everything else — things like how the entries are sorted, whether to use a slanted or italic type style for a book's title, whether the author's surname comes first or last, and whether to use the author's full given name or just initials.

To actually produce the typeset document, you run (La)TeX, BibTeX, (La)TeX, (La)TeX. The first (La)TeX run writes, to an `.aux` file, information for BibTeX:

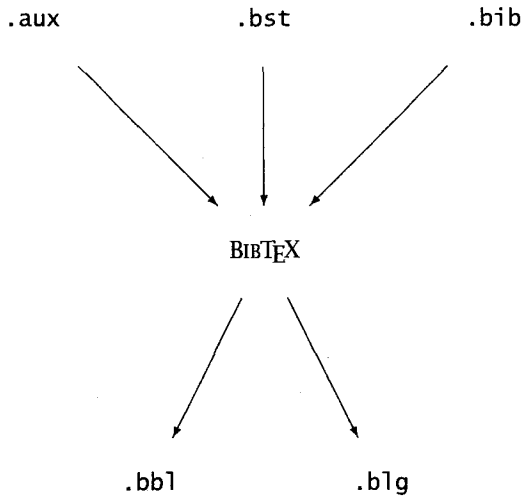

Figure 1: BIBTEX's input and output files.

which bibliography style to use, which database file(s) to use, and which database entries to include. The BIBTEX run reads all that information from the `.aux` file, reads the specified database (`.bib`) files, formats the reference list according to the instructions in bibliography style (`.bst`) file, and writes its output onto a `.bbl` file. The next (LA)TEX run reads the `.bbl` file and incorporates the reference list into the document. The final (LA)TEX run gets the forward references due to the `\cite` commands correct. Figure 1 shows the files that BIBTEX uses (the file with extension `.blg` is BIBTEX's log file).

That's a quick overview. The following sources provide details about using BIBTEX. Leslie Lamport's LATEX book (1994) explains how to use BIBTEX with LATEX. The file `btxmac.tex` (1992) documents its use with plain TEX, with or without Karl Berry's `eplain.tex` package (for which the `btxmac` macros were originally written). The "BIBTEXing" document (1988a), which is distributed along with BIBTEX itself, contains further hints for BIBTEX users. The "Designing BIBTEX Styles" document (1988b), also distributed with BIBTEX, explains the postfix stack-based language used to write BIBTEX bibliography styles. Michel Goossens, Frank Mittelbach, and Alexander Samarin's *LATEX Companion* (1994) summarizes much of the information contained in the sources above, and it describes some of the tools available for helping with BIBTEX bibliographies. Norman Walsh's *Making TEX Work* (1994) also describes such tools.

History

Brian Reid, in the late 1970's at Carnegie-Mellon University, wrote a document production system called Scribe (Unilogic 1984). One of its basic tenets was that, to the extent possible with a computer program, writers should be allowed to concentrate on content rather than on formatting details. Or, as Reid so amusingly put it[1]:

> Not everyone should be a typesetter.

(I think of LATEX as a fairly successful Scribification of TEX — LATEX is almost as easy to use as Scribe yet almost as powerful as TEX.)

In any case, Scribe had become popular in certain academic circles, and Leslie Lamport decided that, to make it easy for Scribe users to convert to LATEX, he would adopt Scribe's bibliography scheme in LATEX. But TEX macros alone were insufficient in practice to do all the things, like alphabetizing, a bibliography processor needs to do; he decided instead to have a separate bibliography program. That program would manipulate the bibliographic information in Scribe-like database files according to the instructions programmed in a special-purpose style language. The postfix stack-based language he had in mind was to be powerful enough to program many different bibliography styles.

My own work on BIBTEX started in February 1983 as a "three-week project" (not unlike the "three-hour tour" of the 1960's American television series *Gilligan's Island*, in which an afternoon's harbor cruise became a shipwreck adventure lasting years). Over the course of the next year and a half I implemented Lamport's basic design, with a few enhancements.

The first working version of BIBTEX (0.41) trudged forth in the summer of 1984. Lamport wrote, and Howard Trickey modified, a bibliography style based on Mary-Claire van Leunen's suggestions in her *Handbook for Scholars* (1979). Trickey's modified version was to become `btxbst.doc`, which is the template from which BIBTEX's four standard styles (`plain`, `abbrv`, `alpha`, and `unsrt`) are generated.

The first public release of BIBTEX, in March 1985, was version 0.98, for LATEX version 2.08. Several upgrades, including one for LATEX 2.09, followed later that year. Version 0.99, which added many new features, was released in January 1988; two minor upgrades followed the next month, but BIBTEX itself has remained unchanged since then. The standard styles have been unchanged since March 1988.

In 1990 Karl Berry wrote some macros, for use in his `eplain.tex` package, that made BIBTEX usable with plain (and other versions of) TEX. He and I modified the macros and released them as `btxmac.tex` in August 1990, usable with or without the `eplain` package. Several upgrades followed, the most recent in March 1992.

The current versions are: 0.99c for BIBTEX itself; 0.99b for `btxbst.doc` (the standard styles' template file — but version 0.99a for each of the four standard styles); and 0.99j for `btxmac.tex`.

[1] — while barefoot, with a pregnant pause, to a Bell Labs Computer Science Colloquium audience that included some `troff` true believers

Goals

BibTeX has been very stable for several years now. Software stability is nice; it helps others build tools that augment the software. Indeed many tools have grown up around BibTeX. But the popularity of (LA)TeX has taken BibTeX into unanticipated places, necessitating some changes. I have five main, general goals for BibTeX 1.0:

1. Easier nonstandard styles: The most frequent requests I see are for new bibliography styles. Creating a new bibliography style generally entails programming in the `.bst` language, which is difficult. For BibTeX 1.0, ordinary users, too, must be able to create new bibliography styles reasonably easily.
2. More international: BibTeX has spread to the non-English-speaking world. BibTeX 1.0 must address associated issues.
3. Enhanced sharing capabilities: There now exist huge `.bib`-format bibliographic databases, some available to users world wide. BibTeX 1.0 needs to make the sharing of those databases easier.
4. Better documentation: BibTeX 1.0 documentation needs to be more extensive and easier to find.
5. FroZeN: To enhance stability of the program (and its author — that is, for both practical and personal reasons) BibTeX needs to be frozen. As with TeX 3.0, BibTeX 1.0 will be upgraded for bug fixes only.

Some of the features planned for implementing those goals appear in the next section.

New Features

Over the last six years I have accumulated a list of new features and probable changes for BibTeX 1.0. The list below is certainly not exhaustive, but it contains the most important items. Each one listed has a high probability of existing in BibTeX 1.0.

- A Bibsty program: There will be a new scheme for generating bibliography style (`.bst`) files. A program called Bibsty will create a customized `.bst` file from (i) a BibTeX template (`.btp`) file — which will be similar in spirit to (but contain lots more options than) the current file `btxbst.doc` — together with (ii) options that the user specifies. BibTeX 1.0's standard template file, to be called `btxstd.btp`, will, among other options, have an easily changed symbolic name for each string that a bibliography style outputs directly (such as 'editor' or 'volume'). This will make it much easier to, for example, convert bibliography styles from one language to another. Figure 2 shows how the new Bibsty program will fit into the scheme.

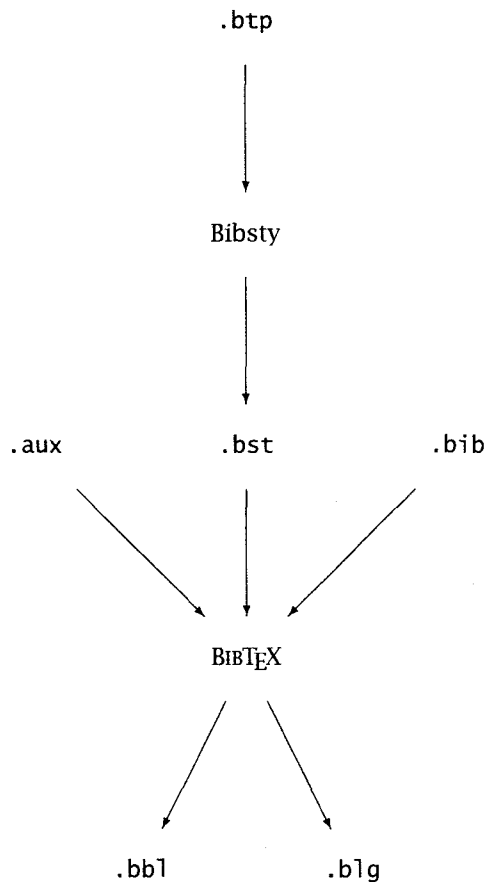

Figure 2: BibTeX 1.0 input and output files.

- Reference-list back pointers: BibTeX 1.0 will provide the capability to indicate in a reference-list entry where in the text that entry was cited. This is a very useful feature that I suspect will become widespread now that our new typesetting technology makes it painless.
- Eight-bit input: BibTeX 1.0 will support this by adhering as closely as possible to the character-set conventions of TeX 3.
- Support for multiple bibliographies within in a single document: Many large documents contain several bibliographies — a book might have one bibliography per chapter, or a conference proceedings might have one per paper. Several solutions have arisen for handling such situations, but BibTeX 1.0 will support multiple bibliographies directly, hence those solutions won't be necessary.
- An `@ALIAS` command: Suppose you have a database file that uses a different database-key from the cite-key you prefer. For example the database file might have the database-key `knuth:tex` for an entry for which you've used `texbook` as a cite-key. With BibTeX 1.0 you will

be able to keep the cite-key and database-key as is, as long as you put a command like

```
@ALIAS{texbook = knuth:tex}
```

in your database.

- A @MODIFY command: With BibTeX 1.0 you will be able to make changes to an entry in a public database file without having to repeat in your own personal database file all the information in that entry. For example, to create a second-edition update for an entry whose first edition is in a public database, you can put something like

```
@MODIFY{latexbook,
   edition = "second",
   year = 1994,
}
```

  in your own database file, as long as the database-key of the @MODIFY command matches the database-key from the public database.
- Distinguishing among identical database-keys: If you are using two different database files that happen to use the same database-key for different entries, you will be able to specify which entry you want by using a citation of the form

```
\cite{filename::database-key}
```

- A .bib-file extraction mode: BibTeX 1.0 will have a mode that will let you extract just the .bib-file information you need into a much smaller database file. For example if you are submitting a paper to a journal that wants a .bib-file in addition to a .tex-file, but the bibliographic database you are using for the paper is huge, you can use the extraction mode to put just the entries you need for the paper into a separate .bib file that you can then send to the journal.
- A \bibtexoptions (LA)TeX command: This command will improve communication between (LA)TeX and BibTeX 1.0. For example, currently BibTeX has a compile-time constant min_crossrefs; a \bibtexoptions command might let a user set this from within the (LA)TeX file.
- Extensions to the (LA)TeX \cite command: Many citation styles aren't handled very gracefully by (LA)TeX's current \cite command. BibTeX 1.0 and (LA)TeX will support more flexible \cite commands.
- Standard-style changes: The standard styles for BibTeX 1.0 will have a few minor changes, such as the addition of day, isbn, and issn fields, and a new @PERIODICAL entry type.
- .bst-language changes: There will be a few minor changes to the .bst language.
- btxmac.tex update: These macros will be updated so that the user interfaces to BibTeX 1.0 from LaTeX and plain TeX are identical.
- Documentation: The "BibTeXing" (1988a) and "Designing BibTeX Styles" (1988b) documents currently distributed with BibTeX are unfortunately not as widely known as they should be. To improve the situation for BibTeX 1.0, the documentation will be in a book. It will be much more thorough than the current documentation. For example it will give a .bib-file grammar, so that those who are writing tools to manipulate the database files can make their software more robust.

Requests

To facilitate the release of BibTeX 1.0, I have some requests of the TeX community.

- Please don't ask me routine BibTeX questions via e-mail. Instead, post them to the newsgroup comp.text.tex; in fact your request will get a wider distribution if you send it to the mailing list INFO-TeX@SHSU.edu, as it will also be posted automatically to the comp.text.tex newsgroup. State clearly in your message exactly what it is you want to know. Ask to have responses sent to you directly (assuming you aren't on that mailing list and don't read that newsgroup). Usually you get useful responses.
- Until BibTeX 1.0 is finished, I will skim the comp.text.tex newsgroup for BibTeX-related postings, so it suffices to post there anything you think I should see.
- Please send directly to me any suggestions for BibTeX 1.0 that are probably not of interest to the rest of the TeX community, such as:
  - Primitives that you think belong in the .bst language based on your experience programming it.
  - Things you've had to put in BibTeX's WEB change file for your system that you think belong in bibtex.web itself.
  - Non-English language pitfalls that you think BibTeX 1.0 should avoid.

To conclude the paper: I can't say for sure when BibTeX 1.0 will actually appear; a beta-test version might exist by the end of 1995. But as soon as it's available it will be announced on comp.text.tex.

Acknowledgments

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