

## $\varepsilon$ - $\Omega$ : A step towards the future with a look at the past

“A che serve vivere, se non c'è il coraggio di lottare?” (Giuseppe Fava)  
“What purpose is living, if you don't have the courage to fight?”

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### Abstract

In recent times, a topic of increasing relevance in discussions on the future of  $\text{\TeX}$  has been the number of different extensions to Knuth's original work, and the possibility of bringing them all together in a single program. In particular, on the one hand we have the features introduced in  $\varepsilon\text{\TeX}$  which are almost essential to developers of modern formats (`Con\TeXt`, `\LaTeX3`); on the other hand, the advanced typesetting features present in  $\Omega$  are of vital importance, especially for  $\text{\TeX}$  users using non-Latin scripts.

This talk presents  $\varepsilon\text{\Omega}$ , a project whose aim is to provide a stable, fast variant of  $\Omega$  supporting the  $\varepsilon\text{\TeX}$  extensions. We will present the short history of the project (focusing in particular on the reasons behind some debatable choices), its current status and ideas for the project's future.

### Goals and history of the project

In much the same way as  $\varepsilon\text{\TeX}$  is (was) intended to fill the gap between  $\text{\TeX}3$  and  $\mathcal{N}\mathcal{T}\mathcal{S}$ , the goal of  $\varepsilon\text{\Omega}$  is to fill the gap between the current  $\Omega$  release(s) and the future ones that promise to have “every feature everyone wanted”.  $\varepsilon\text{\Omega}$  thus intends to provide functional programs and tools that satisfy more modest requirements.

The need for a separate branch of  $\Omega$  arose because the  $\Omega$  development was not being responsive to important requests;  $\varepsilon\text{\TeX}$  extensions were not provided despite long-time requests, and long-standing bugs and deficiencies were not being addressed; as a result, neither of the two available versions of  $\Omega$  (1.15 and 1.23) was fully feasible for production use:

- 1.15 because of a major bug affecting day-to-day usage; this bug prevents  $\Omega$  1.15 from tripping correctly;
- 1.23 trips successfully, but is sadly too slow and bloated (both memory-wise and output-wise)<sup>1</sup> to be usable for heavy jobs;

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<sup>1</sup> This depends on the introduction of a very important and useful node (`info_node`), but the advancements provided by it cannot be effectively turned off when not needed.

- Finally, both versions have buggy supporting utilities (the ones that deal with font-metric creations,  $\Omega$ CPs and  $\Omega$ TPs, etc.).

Therefore, the goal of the  $\varepsilon\text{\Omega}$  project is to provide a program that:

- has  $\varepsilon\text{\TeX}$  extensions;
- is stable enough (trips correctly);
- is fast enough;
- produces non-bloated DVI code;
- has solid supporting utilities.

My job has been first to choose which  $\Omega$  to use as a base, and then to try to merge the  $\varepsilon\text{\TeX}$  changefile. Luckily, I discovered that the differences between the two series had very little influence on the resulting changefiles, which meant I could focus on working on only one of them and still easily adapt the final outcome to the other version. Speed and leanness being two of the main considerations, I chose to concentrate on the 1.15 series.

Of course, support for  $\varepsilon\text{\TeX}$  multidirectional typesetting was dropped. A more important and arguable change was the removal of the SGML/XML code from  $\Omega$ : first, since part of it conflicted with some  $\varepsilon\text{\TeX}$  code (the introduction of the `\middle`

primitive) and second, since (in the team’s opinion) the XML feature had a lower priority than merging  $\varepsilon$ - $\text{\TeX}$ . This, making a timely release dictated the (temporary) removal of the  $\Omega$  SGML/XML code from  $\varepsilon$ - $\Omega$ .

A first release of  $\varepsilon$ - $\Omega$  was thus officially made on December 21, 2002 (and yes, I must confess that the choice of the day was also dictated by aesthetic reasons . . .). This release still had the “tripping bug” that affected the 1.15 series of  $\Omega$ , but did provide  $\varepsilon$ - $\text{\TeX}$  enhancements for those who needed them (which for now means essentially Con $\text{\TeX}$ t users).

### Current status

In late April, having a little free time on my hands, I decided to give  $\varepsilon$ - $\Omega$  a second shot, trying to look for the code that caused the “tripping bug” that affected the  $\Omega$  1.15 series (and its variants): the bug, which revealed itself with a crash when running the `trip` test, affected production use of  $\Omega$  in many contexts where over-/underfull boxes appeared, as well as causing the disappearance of ligatures, and other problems.

Since the bug did not affect any other version/variant of  $\text{\TeX}$  in my possession (including the 1.23 series of  $\Omega$ ), spotting the problem was rather easy by three-way diff’ing  $\text{\TeX}$ ,  $\Omega$  1.15 and  $\Omega$  1.23. Once the culprit code was found, the solution was trivial. As a result, the latest official  $\varepsilon$ - $\Omega$  fully addresses three of the five target points, and is a good step forward towards a fourth one (stability).

There still are some known issues. (In particular,  $\varepsilon$ - $\Omega$  does still not pass `trip`: if `mem_bot` is set to 1, glue/skip assignments fail.) At this point, however, none of the known bugs in  $\Omega$  itself prevent use of the program.

### Future developments

The focus for the next release is to get closer to the final goals, by fixing the remaining bugs in the chief executable. This includes finding and fixing any  $\Omega$ / $\varepsilon$ - $\text{\TeX}$  incompatibilities.

The following step will be working on the complementary utilities, making them functional again. This will then complete the five main goals of the project. Once these are accomplished, and if deemed necessary by the  $\Omega$  status at the time of completion, a forward-port to the latest  $\Omega$  branch will be attempted.

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### Editorial Note

The name of the project formerly known as  $\varepsilon$ - $\Omega$  has since been changed to “Aleph” ( $\aleph$ ).