

New Method for Designing Polymorphic System Programming Languages

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There are a lot of high level programming languages for application programming which make use of advanced techniques like classes, inheritance, polymorphism and virtual methods. However, the use of these languages for low level programming, like operating system or embedded system software development is quite limited because of their high overhead (e.g. explicit data tags of identifying dynamic type, virtual method tables etc.). This is probably the main cause that software for these systems are developed still in C, which neither does have the above mentioned techniques, nor is type safe. In our presentain we show language constructs which enable the system programmer to use many features of the object-oriented languages without significant extra overhead. Our solution is based on type invariants which identify the dynamic type of a variable instead of explicit data tags. Virtual method tables are replaced by small dispatcher routines generated at link time. The technique discussed in the presentation can be used either to extend already existing languages or to design a new language.

References

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