

# TECHNICAL CORRESPONDENCE

## Reply to “Type-Extension Type Tests Can Be Performed In Constant Time”

N. WIRTH

Institut Für Informatik, Zurich

---

It is always a pleasure to learn that a proposed feature is even better or easier to implement than originally thought. I gladly retract my mistaken statement that a loop is (in general) unavoidable for a type test.

Cohen's reference to Dijkstra's display compels me to add another remark. The display containing the addresses of statically enclosing procedure activation records appeared to be a marvelous idea to increase the efficiency of access to nonlocal variables. Upon closer analysis, we decided to discard the use of a display that was already in our first Pascal compiler (1969). The reason was that (1) the display requires updating for every procedure call and return (!) that causes a change of context, and (2) variables at intermediate levels (neither local nor global) are referenced quite rarely. As a result, the maintenance of a display turned out to be more costly than the inefficient access of nonlocal variables via a static link.

I wish to point out that, unlike Dijkstra's display, no such “hidden” maintenance is necessary for type descriptors. They do not disappear and do not require updating. Hence, there is no “hidden” cost compensating for the gain in efficiency, except slightly larger type descriptors of variable size.

---

Author's address: Institut Für Informatik, Eth, 8092 Zurich, 237, Switzerland

Permission to copy without fee all or part of this material is granted provided that the copies are not made or distributed for direct commercial advantage, the ACM copyright notice and the title of the publication and its date appear, and notice is given that copying is by permission of the Association for Computing Machinery. To copy otherwise, or to republish, requires a fee and/or specific permission.

© 1991 ACM 0164-0925/91/1000-0630 \$01.50