

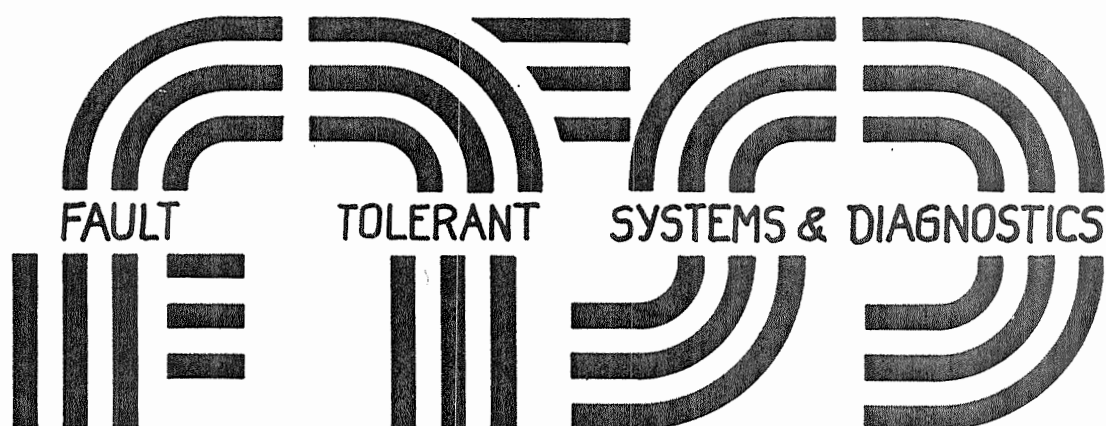
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OPEN, DEPENDABLE DISTRIBUTED SYSTEMS:  
THE DELTA-4 APPROACH

P. Ciompi \*, F. Grandoni \*, L. Simoncini \*\*, L. Strigini \*

\*Istituto di Elaborazione dell'Informazione - CNR, Pisa, Italy

\*\*Universita' di Reggio Calabria, Reggio Calabria, Italy

ABSTRACT

The DELTA-4 project is an ESPRIT project that started in March 1986 and will continue till 1989. The industrial partners of the present consortium are Bull, prime contractor, and Jeumont-Schneider from France, BASF from West Germany, Ferranti from UK, and Telettra from Italy. The research partners are IITB-FhG and FIRST-GMD from West Germany, LAAS-CNRS and LGI from France, INESC from Portugal, MARI from UK, IEI-CNR and University of Bologna from Italy.

The overall aim is the Definition and Design of an open Dependable Distributed computer system architecture covering a wide application area, especially CIM (Computer Integrated Manufacturing) and Office Systems. Three key quality attributes of the DELTA-4 architecture are dependability, performance and software portability.

In the area of dependable and distributed systems, most of the existing solutions do not offer a sufficient openness by the fact that they are limited to specific applications, and that they are proprietary, making difficult, even impossible, use of these solutions for other existing computer systems. The environment provided by the DELTA-4 project is open, in the sense that it allows the use of existing proprietary computer systems, it accomodates the connection of heterogeneous equipment and it is capable of co-existing with, and interworking with, ISO standards conforming to the OSI model.

In this paper we will present the overall design approach of DELTA-4 which consists of a number of heterogeneous host computers interconnected in a local area network, with particular regard to the solutions provided for obtaining a dependable service. The use of a dependable multicast communication system for providing a user-transparent tolerance of faults in host computers, the proper design of network attachment modules for providing "fail-silentness" of host computers and the concept of incremental fault-tolerance on a service-by-service basis will be discussed.