

Networks on silicon: combining best-effort and guaranteed services

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Abstract: We advocate a network on silicon (NOS) as a hardware architecture to implement communication between IP cores in future technologies, and as a software model in the form of a protocol stack to structure the programming of NOSs. We claim guaranteed services are essential. In the ETHEREAL NOS they pervade the NOS as a requirement for hardware design, and as foundation for software programming.

Published in: Proceedings 2002 Design, Automation and Test in Europe Conference and Exhibition

Date of Conference: 04-08 March 2002	INSPEC Accession Number: 7341991
Date Added to IEEE Xplore: 07 August 2002	DOI: 10.1109/DATE.2002.998309
Print ISBN: 0-7695-1471-5	Publisher: IEEE
Print ISSN: 1530-1591	Conference Location: Paris, France

1 Introduction

It will soon be possible to manufacture systems on silicon (soss) containing 10M gates and megabytes of embedded software. The complexity of these systems will be overwhelming, and two fundamental questions arise. First, from a hardware view point, how can these SOSs be designed? What are the required hardware architectures and concepts? Second, from a software (application) perspective, how can the sos hardware be programmed? What software concepts are needed? Our tenet is that only a consistent approach to both questions will enable us to harness the opportunities offered by semiconductor technology.

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