Editors' preface

This issue combines Numbers 2 and 3 of Volume 4. It contains four refereed articles and a reprint of a classic report on the Bell–LaPadula model, with a new foreword by Leonard LaPadula.

The article "Detecting illicit leakage of information in operating systems" by Shiuh-Pyng Shieh and Virgil Gligor addresses the problem of covert channels, which may exist in spite of adherence to an access control policy such as that in the Bell–LaPadula model. While some covert channels can be closed, the rest must be audited. The Shieh–Gligor paper discusses how audit collection mechanisms and analysis tools should be designed.

In the paper "The expressive power of multi-parent creation in monotonic access control models", Ammann, Lipton and Sandhu show that single-parent creation is less expressive than multi-parent creation in monotonic access control models, in which subjects and objects are not destroyed or access rights deleted. Multi-parent creation operations can implement solutions to mutual suspicion problems, confinement, originator control, and separation of duties, and this paper furnishes grounds for regarding it as a fundamental primitive operation.

In "A sound type system for secure flow analysis", Volpano et al. describe how to embed information flow into an inference system that manipulates fragments of program text. The programs are written in a special purpose, but relatively conventional, programming language. The paper encodes security (or integrity) information as types for expressions, variables, and commands. Rules in the inference system enumerate the type of a given program structure as a function of the constituent parts of that program structure. A noninterference theorem shows that the result (but not the timing) of a computation in a well-typed program is unaffected by computations at incomparable or dominating levels.

As the title "Analytic performance comparison of transaction processing algorithms for the SINTRA replicated-architecture database system" suggests, McDermott and Mukkamala compare the performance of five of the most promising protocols for maintaining mutual consistency of the replicas in trusted database management systems based on the replicated architecture. Their analytical model shows that although different protocols performed better under different workloads, the differences were relatively small. These protocols have distinct structural properties, and it is recommended that the choice among these protocols be made based on either these structural properties or other factors, not performance.

<div align="right">Sushil Jajodia and Jonathan Millen</div>