Guest editor’s introduction: Special issue on security issues in coordination models, languages, and systems

Coordination models and languages were defined in the early eighties in the context of parallel computing as a means to separate the computational model underlying the computing entities from the coordination model describing their interaction. This simple but effective idea has permitted coordination models and languages to be successfully applied also in many other more recent scenarios spanning from local and wide-area networking to global, ubiquitous and mobile computing. Nevertheless, the traditional coordination models and languages cannot be directly applied in these novel scenarios mainly due to problems related to security. In fact, traditional coordination languages have been designed for closed environments such as parallel computers where the interacting processes are known beforehand. In contrast, mobile and wide-area networks are open systems where new processes and users can enter the system without any previous notice.

The guest editors of this special issue have been particularly active in promoting the study of security aspects in coordination models and languages. In particular, starting from 2003, they have organized the International Workshop on Security Issues in Coordination Models, Languages, and Systems (SecCo) that each year groups together researchers working on this as well as on related topics.

The special issue includes a foreword that provides an overview of the main security problems in traditional coordination models and languages, and proposes a taxonomy of the main solutions available in the literature. The other four papers, on the other hand, are extended versions of papers selected among those presented at the first edition of the International Workshop on Security Issues in Coordination Models, Languages, and Systems that took place in June 28–29, 2003, Eindhoven, as a satellite of the Thirtieth International Colloquium on Automata, Languages and Programming.

The first of the invited papers, by Alessandro Aldini, analyses noninterference problems in the context of shared dataspace coordination languages. The second paper, by Antonio Brogi, Carlos Canal, and Ernesto Pimentel, addresses security issues in coordinated systems based on components (as intended in the context of component based software engineering). The third paper, by Rocco De Nicola, Daniele Gorla, and Rosario Pugliese, applies type checking techniques to guarantee confinement constraints in distributed coordinated applications. Finally, the last paper, by Andrea Omicini, Alessandro Ricci, and Mirko Viroli, considers secure coordination in multi-agent systems.

We are grateful to the reviewers who did excellent work in giving insightful comments that permitted improvement of the presentation of the published papers. Moreover, we wish to thank also Bas van Vlijmen and Jan Bergstra for precious support in the editing process.

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