CCE_17

Title of the doctoral program

Computer and Control Engineering

Title of the research activity

Formal verification of security aspects in next generation computer networks

Short description of the research activity

Next generation computer networks are very sensitive to security, because of their increased pervasiveness and device mobility support. At the same time, the new concepts that characterize the emerging network architectures, such as for example software defined networking, network function virtualization, and cloud computing, are introducing new kinds of security threats and scenarios. Accordingly, the techniques developed in the past for the formal analysis of security protocols in classical client-server scenarios may have to be revisited and the implications of the new architectures on these techniques need to be studied. The aim of the proposed research activity is exactly this. The candidate will investigate how some of the new next generation networks architectures may benefit from security-related formal analysis techniques, by experimenting with them. The expected results are twofold: on the one hand, this work may reveal interesting results related to security and privacy issues in next generation network architectures, and on the other hand it may shed light on the limitations of the current formal analysis techniques and stimulate their enhancement.

Scientific responsible (name, surname, role, email)

Riccardo Sisto, Full Professor, riccardo.sisto@polito.it

Number of vacancies for XXXI cycle (3 years program)

1

Specific requirements (experiences, skills)

A Master in Computer Engineering or Computer Science is required.

The candidate must have a good background in the field of programming languages and compilers, and strong programming skills, with special reference to C/C++ and Java. The candidate must also have a good knowledge of the basics of computer security and very good knowledge of computer networks and protocols. Specific knowledge of formal methods and formal verification techniques is valuable for the proposed research activity but it is not an absolute must, because this knowledge can also be acquired during the PhD course.

Website of the research group (if any)

http://netgroup.polito.it/