



PhD : DNS Naming and Services for Secure Seamless IoT

Reference	CYBERINSTITUTE-PHD-19006
Description	<p>The candidate will join DiNS, a research project recently funded by ANR (French Research Agency). DiNS aims at breaking the silos in IoT networks and making them seamlessly interoperable with the Internet by taking advantage of advanced DNS schemes and extensions.</p> <p>We will start with the design of an overall architecture for scalable IoT naming and resolution schemes. To address security challenges, we propose to provide strict security guarantees for DNS names based on DNSSEC (DNS Security Extensions) and DANE (DNS-Based Domain Authenticated Naming Extension). The idea is to design a secure scheme for identifiers of IoT devices and support scalable key distribution for authentication. The project will also explore IoT discovery: how to represent the characteristics of IoT devices in DNS names to enable rich queries on devices and the data they generate. Finally, we will design a name resolution scheme allowing for roaming between multiple-tenant networks in a similar way to EduRoam. We plan to validate this architecture initially on LoRa and extend it for NB-IoT and future 5G MTC (Machine Type Communications) networks.</p>
Prerequisites	<p>The position requires strong competences in TCP/IP networking, DNS, cybersecurity, and IoT. The candidate needs to have excellent written and oral communication skills in English. Research experience in the field of networking or security is a plus.</p> <p>The candidate must have a master's degree (or equivalent) in computer science or telecommunications with excellent results. We seek for somebody with high motivation for research who enjoys working in an international team.</p>

Tutors	Andrzej Duda and Maciej Korczynski
Applications	Applicants should send a detailed curriculum vitae along with a letter of application, last diploma, transcripts for undergraduate and graduate studies to Andrzej.Duda@imag.fr. The mail subject must start with "[PhD DiNS]". References or letters of recommendation will be appreciated.
Deadline	September 30th 2019
Location	<p>LIG laboratory is located in Grenoble, the capital of the Alps. Grenoble is one of French major scientific and industrial centers for computer science and applied mathematics. The city lies amidst three mountain ranges and offers exceptional quality of life, with efficient public transportation and dedicated bikeways.</p> <p>Grenoble Institute of Technology is one of the leading European technical universities, at the heart of innovation for more than a century. With its solid combination of teaching, research, and business promotion, Grenoble Institute of Technology plays a key role in making Grenoble one of the most attractive scientific and industrial locations worldwide.</p> <p>LIG laboratory is a Joint Research Center of Grenoble Institute of Technology, CNRS (French national scientific research centre), Inria, and the Université Grenoble Alpes.</p> <p>The Drakkar team investigates all aspects of networking and explores new opportunities opened by all-IP networks, in particular, the development of future wireless networks and the integration of Sensors and Smart Objects within the Internet of Things. We also work on traffic measurement and monitoring, and network security. https://drakkar.imag.fr. The Drakkar team is also member of the Grenoble Alpes Cybersecurity Institute which aims at undertaking ground breaking interdisciplinary research in order to address cybersecurity and privacy challenges.</p> <p>LIG has just moved to the brand new IMAG building, thus offering a very good work environment. https://batiment.imag.fr</p>
Starting date	November 1, 2019
Duration	Fixed-term 3 years
Salary	Gross salary 21,447 €/year