2017-00162 - Development in OS architecture for IoT (H/F)

**Contract type:** Public service fixed-term contract  
**Level of qualifications required:** Graduate degree or equivalent  
**Fonction:** Temporary scientific engineer  
**Corps d'accueil:** Ingénieur de Recherche (IR)  
**Level of experience:** Up to 3 years

**About Inria**

Inria, the French National Institute for computer science and applied mathematics, promotes “scientific excellence for technology transfer and society”. Graduates from the world’s top universities, Inria's 2,700 employees rise to the challenges of digital sciences. With its open, agile model, Inria is able to explore original approaches with its partners in industry and academia and provide an efficient response to the multidisciplinary and application challenges of the digital transformation. Inria is the source of many innovations that add value and create jobs.

**About the research centre or Inria department**

Graduates from the world’s top universities, Inria's 2,600 employees rise to the challenges of digital sciences. Research at Inria is organised in “project teams” which bring together researchers with complementary skills to focus on specific scientific projects. With this open, agile model, Inria is able to explore original approaches with its partners in industry and academia and provide an efficient response to the multidisciplinary and application challenges of the digital transformation. The source of many innovations that add value and create jobs, Inria transfers expertise and research results to companies (startups, SMEs and major groups) in fields as diverse as healthcare, transport, energy, communications, security and privacy protection, smart cities and the factory of the future.

**General Information**

- **Theme/Domain:** Networks and Telecommunications  
  System & Networks (BAP E)  
- **Town/city:** Villeneuve d'Ascq  
- **Inria Center:** CRI Lille - Nord Europe  
- **Starting date:** 3/1/18  
- **Duration of contract:** 12 months  
- **Deadline to apply:** 6/30/18

**Contacts**

- **Inria Team:** FUN  
- **Recruiter:** Mitton Nathalie / nathalie.mitton@inria.fr

**The keys to success**

Beyond your technical abilities, you are a real asset to the team by your ability to explain things and contribute to.

**Conditions for application**

**Defence Security:**

This position is likely to be situated in a restricted area (ZRR), as defined in Decree No. 2011-1425 relating to the protection of national scientific and technical potential (PPST). Authorisation to enter an area is granted by the director of the unit, following a favourable Ministerial decision, as defined in the decree of 3 July 2012 relating to the PPST. An unfavourable Ministerial decision in respect of a position situated in a ZRR would result in the cancellation of the appointment.

**Recruitment Policy:**

As part of its diversity policy, all Inria positions are accessible to people with disabilities.

**Warning:** you must enter your e-mail address in order to save your application to Inria. Applications must be submitted online on the Inria website. Processing of applications sent from other channels is not guaranteed.
The Inria Lille - Nord Europe research center, created in 2008, has 360 people, including 305 scientists in 16 research teams. Recognized for its strong involvement in socio-economic development in the Nord-Pas-de-Calais region, the Inria Lille - Nord Europe research center pursues a close approach with large companies and SMEs. By promoting synergies between researchers and industrialists, Inria contributes to the transfer of skills and expertise in digital technologies and provides access to the best European and international research for the benefit of innovation and businesses, particularly in the regions.

**Context**

This mission is in the context of the collaborative project VESSEDIA.

The VESSEDIA project (Verification Engineering of Safety and Security Critical Industrial Applications) aims at improving the safety and security for information and communication technologies, particularly for Internet-of-Things (IoT). More precisely, the goal of the project is to make formal methods easier to use for application domains that want to improve the safety and the security of their software by the help of formal methods.

The role of Inria in the VESSEDIA project is mainly to apply the formal verification tools enhanced by the project to a particular use-case: the Contiki operating system, which is a lightweight open-source OS for Internet-of-Things devices. Contiki provides the basic features of an OS (resource management, scheduling, ...), supports 17 different hardware platforms and different libraries (for example an IPv6 stack). Currently, the verification relies on a specific hardware platform and a specific set of static configuration.

**Assignment**

With the support of the FUN researchers working on VESSEDIA, the role of the engineer will be to identify and extract a hardware/software interface common to the different hardware platforms (that is currently not clearly defined), to identify and classify the set of configurations (and the constraints that can exist between them) that can be specified about an instance of Contiki, and to produce the skeleton of a generic platform that could be specified. This task will require to follow some of the evolution proposed by Contiki-NG.

**Main activities**
• Improve the global architecture of Contiki, at the hardware/software interaction level
• Help the members of the team to understand this architecture and its configurations
• Take in account some evolutions in Contiki-NG (next generation)

Beyond these technical tasks, the engineer is expected to assist the FUN team in the project commitments such as deliverables writing, project meeting, etc.

Skills
Knowledge in embedded systems or internet of things
Programming language C
Spoken English
Autonomy
The ability to work in a team
(Optional) experience with Contiki
(Optional) all links to work done in C would be appreciated

Benefits package

Subsidized catering possible on site
Public transport partially reimbursed

Remuneration

The position is open:

to Inria's internal mobility, remuneration according to statutory conditions
in civil service fixed-term, remuneration according to experience between 30K € and 35K € gross annual.