DiPET

Abstract
Distributed Stream processing on Fog and Esge Systems via Transprecise Computing

The DiPET project investigates models and techniques that enable distributed stream processing applications to seamlessly span and redistribute across fog and edge computing systems. The goal is to utilize devices dispersed through the network that are geographically closer to users to reduce network latency and to increase the available network bandwidth. However, the network that user devices are connected to is dynamic. For example, mobile devices connect to different base stations as they roam, and fog devices may be intermittently unavailable for computing. In order to maximally leverage the heterogeneous compute and network resources present in these dynamic networks, the DiPET project pursues a bold approach based on transprecise computing. Transprecise computing states that computation need not always be exact and proposes a disciplined trade-off of precision against accuracy, which impacts on computational effort, energy efficiency, memory usage and communication bandwidth and latency. Transprecise computing allows to dynamically adapt the precision of computation depending on the context and available resources. This creates new dimensions to the problem of scheduling distributed stream applications in fog and edge computing environments and will lead to schedules with superior performance, energy efficiency and user experience. The DiPET project will demonstrate the feasibility of this unique approach by developing a transprecise stream processing application framework and transprecision-aware middleware. Use cases in video analytics and network intrusion detection will guide the research and underpin technology demonstrators.
(2018)
Smart Distribution of Computing in Dynamic Networks (SDCDN)

Partnership & Contact
DiPET starts in December 2019, lasts 36 months and involves the partnerships below. The financial support of CHIST-ERA is about 984 160,52 €.

Partnership	
The Queen's University of Belfast	United Kingdom
Universitat Politècnica de Catalunya	Spain
Institut de Recherche en Informatique et Systèmes Aléatoires	France
Foundation for Research and Technology - Hellas	Greece
West university of Timisoara	Romania

Contact: Dr. **Hans Viandierendonck** (coordinator), h.vandierendonck@qub.ac.uk [1]

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Links:
[1] mailto:h.vandierendonck@qub.ac.uk