ABSTRACTS LSDVE

ARTICONF: TOWARDS A SMART SOCIAL MEDIA ECOSYSTEM IN A BLOCKCHAIN FEDERATED ENVIRONMENT

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The ARTICONF project funded by the European Horizon 2020 program addresses issues of trust, time-criticality and democratisation for a new generation of federated infrastructure, to fulfil the privacy, robustness, and autonomy related promises critical in proprietary social media platforms. It aims to: (1) simplify the creation of open and agile social media ecosystem with trusted participation using a two stage permissioned blockchain; (2) automatically detect interest groups and communities using graph anonymization techniques for decentralised and tokenized decision-making and reasoning; (3) elastically autoscale time- critical social media applications through an adaptive orchestrated Cloud edge-based infrastructure meeting application runtime requirements; and (4) enhance monetary inclusion in collaborative models through cognition and knowledge supply chains. We summarize the initial envisaged architecture of the ARTICONF ecosystem, the industrial pilot use cases for validating it, and the planned innovations compared to related other European research projects.

BITCOIN PRICE VARIATION: AN ANALYSIS OF THE CORRELATIONS

Barbara Guidi and Andrea Michienzi

The Bitcoin system is attracting a huge community both from specialists and common people, who see in it a great opportunity of investment. Thanks to the fact that the Bitcoin blockchain in publicly available, and considering that it shows properties of a real economy, Bitcoin is becoming more and more often subject of a number of studies. One of the hardest task in this field, yet interesting also from a non specialist point of view, is the bitcoin price correlation and prediction. In this paper we present a methodological framework for the bitcoin exchange graph analysis which helps in focusing only on restricted time spans that show interesting dynamics of the bitcoin price. We also present our study on three separate time spans and show that empirical correlations can be found between the bitcoin price and some bitcoin exchange graph measures. Lastly, with our framework we are also able to detect some unexpected behaviour from particular users which tend to pile up big amounts of bitcoin over the selected time spans.

A SEMANTIC MODEL WITH SELF-ADAPTIVE AND AUTONOMOUS RELEVANT TECHNOLOGY FOR SOCIAL MEDIA APPLICATIONS

Zahra Najafabadi Samani, Alexander Lercher, Nishant Saurabh, and Radu Prodan

With the rapidly increasing popularity of social media applications, decentralized control and ownership is taking more attention to preserve user's privacy. However, the lack of central control in the decentralized social network poses new issues of collaborative decision making and trust to this permission-less environment. To tackle these problems and fulfil the requirements of social media services, there is a need for intelligent mechanisms integrated to the decentralized social media that consider trust in various aspects according to the requirement of services. In this paper, we describe an adaptive microservice-based design capable of finding relevant communities and accurate decision making by extracting semantic information and applying role-stage model while preserving anonymity. We apply this information along with exploiting Pareto solutions to estimate the trust in accordance with the quality of service and various conflicting parameters, such as accuracy, timeliness, and latency.

A NOVEL DATA-CENTRIC PROGRAMMING MODEL FOR LARGE-SCALE PARALLEL SYSTEMS

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This paper presents the main features and the programming constructs of the DCEx programming model designed for the implementation of data-centric large-scale parallel applications on Exascale computing platforms. To support scalable parallelism, the DCEx programming model employs private data structures and limits the amount of shared data among parallel threads. The basic idea of DCEx is structuring programs into data-parallel blocks to be managed by a large number of parallel threads. Parallel blocks are the units of shared- and distributed-memory parallel computation, communication, and migration in the memory/storage hierarchy. Threads execute close to data using near-data synchronization according to the PGAS model. A use case is also discussed showing the DCEx features for Exascale programming.

CO-LOCATED AND ORCHESTRATED NETWORK FABRIC (CONF): AN AUTOMATED CLOUD VIRTUAL INFRASTRUCTURE FOR SOCIAL NETWORK APPLICATIONS

Zeshun Shi, Huan Zhou, Yang Hu, Spiros Koulouzis, Carlos Rubia, and Zhiming Zhao

Cloud environments can provide virtualized, elastic, controllable and high-quality on-demand infrastructure services for supporting complex distributed applications. However, existing IaaS (Infrastructure-as-a-Service) solutions mainly focus on the automated integration or deployment of generic applications; they lack flexible infrastructure planning and provisioning solutions and do not have rich support for the high service quality and trustworthiness required by social network applications. This paper introduces an automated cloud virtual infrastructure solution for social network applications, called Co-located and Orchestrated Network Fabric (CONF), which was conducted in a recently funded EU H2020 project ARTICONF. CONF aims to improve the existing infrastructure support in the DevOps lifecycle of social network applications to optimize QoS performance metrics as well as ensure fast recovery in the presence of faults or performance drops.

AUTO-SCALING FOR A STREAMING ARCHITECTURE WITH FUZZY DEEP REINFORCEMENT LEARNING

Dong Nguyen Doan, Daniela Zaharie, and Dana Petcu

A streaming architecture is aiming to transport, process and store data and acts on real-time or nearly real-time for Big Data analytics and Internet of Things (IoT). The main requirement for such architecture to achieve its aim is the elasticity. Cloud computing is an excellent solution to satisfy the elasticity requirement. Its auto-scaling processes are allowing to automatically acquire or release resources according to the arriving workload. However, the fluctuation in scaling up and down resources is still in an unsolved problem. We propose a novel approach called Fuzzy Deep Reinforcement Learning to scale the resources effectively and efficiently. The experimental results show that our proposed approachoutperforms the existing approach based on Fuzzy Q-Learning.