ByteNite: A New Commercial Model of Grid Computing

Location: Room **Servanty**

Scheduled time: **10:15 – 11:00**

Speaker: Niccolò Castelli – ByteNite

ByteNite is a 1-year-old startup based in San Francisco, US, whose CEO is Fabio Caironi and CTO is Niccolò Castelli. Throughout 2022 it has developed a grid computing system that benefits from common devices like smartphones, tablets, and computers to recreate the power of a supercomputer and solve large commercial processing tasks. The system encompasses a patent-pending core middleware, responsible for the scheduling of computational tasks, a user-level middleware, responsible for the execution of the tasks on the devices, and a SaaS platform for running the distributed applications. ByteNite has today 5 full-time team members and is the first general-purpose utility computing service powered by grid computing.

Abstract

Years and years of technological advancement have paved the way to cloud computing towards Industry 4.0, making it possible for a wide range of cloud solutions to become a reality, bringing innovation and efficiency to business processes and changing our lifestyles. With the benefit of hindsight in a fully digitalized era, have we ever wondered where does cloud computing come from? Furthermore, as the on-premise commercial model shifted to cloud computing with the advent of the internet, what will the increase in worldwide connectivity and the rise of 5G turn the cloud model into? This article describes in a model for a new commercial grid computing implementation, called "ByteNite". We open the paper with the state of the art of the distributed computing models, including an overview of cloud and grid computing, their commonalities and history, and how they are topical in today's world. We build the foundations of our work through a key insight that triggers powerful implications in connection with the current technologies. We address the new proposed model through a description of the system, its overall functioning, the underlying business concepts and the innovative value proposition. We then dive into its architecture and workflow design, delineating its structure and key features, and the chronological phases of its operation. A presentation of the algorithm and data in use follows, including the type of information queried to

the grid, the building of specific indexes, a scheduling algorithm and distribution pipeline, and a fault tolerance mechanism. We dwell on the two type of users of the system, the customers and the users, the way they can access the grid from a buyer and a supplier perspective respectively, and we finally highlight the growth strategy and patterns of such a marketplace.