Large scale trustworthy distributed collaborative systems: challenges and prospective solutions

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1. Résumé

Computer-mediated collaboration is now part of both professional and personal spheres, facilitated by advancements in mobile and ubiquitous communication technologies and the widespread adoption of existing tools by users. The ubiquity of remote work has accentuated the reliance on computer-mediated collaborative tools across various domains such as work, education, and entertainment. This reliance is expected to grow further due to the ongoing digitalization of activities and the imperative to reduce travel in response to global warming.

While current computer-mediated tools effectively support small groups engaged in well-organized collaboration, they fall short when it comes to facilitating cooperation among large and diverse groups and organizations working on more extensive projects over extended durations.

Existing collaborative systems face several challenges including privacy concerns arising from the control of personal user data by major corporations, with users having limited influence over the utilization of their information. Performance and security issues are also notable, particularly when considering the scale of these collaborative systems.

This presentation outlines our vision for the development of trustworthy distributed collaborative systems, wherein communities of users can engage in collaborative endeavors securely and confidently without the necessity of a centralized authority. The discussion will primarily delve into anticipated solutions for issues related to replicated data consistency, security, and trust within the context of large-scale collaboration. Recognizing the pivotal role of the human factor in designing

trustworthy distributed collaborative systems, we emphasize the imperative of evaluating these systems through user studies.

2. Biographie

Claudia-Lavinia Ignat[1] is a tenured research scientist at Inria and head of the Coast team. She obtained a PhD in Computer Science from ETH Zurich, Switzerland and an habilitation (HDR) from Lorraine University. Her research domain is distributed collaborative systems that enable distributed group work using computer technologies. Designing such systems requires an expertise in distributed systems and computer-supported cooperative work. Besides theoretical and technical aspects of distributed systems, design of distributed collaborative systems must take into account the human factor to offer suitable solutions for users.

Her work is organized around three axes of research: collaborative data management referring to the design and evaluation of various approaches related to the management of distributed shared data including data replication and group awareness; security mechanisms for distributed collaborative systems without central authority; trustworthy collaboration referring to the evaluation of trust in collaborators.

She was general co-chair and PC member co-chair of ECSCW 2018 international conference. She is an associate editor of Journal of Computer Supported Cooperative Work and a regular PC member of the CHI, CSCW, ECSCW, GROUP, CollabTech and ICCP conferences. She was the coordinator of the USCOAST associated Inria team in collaboration with the Department of Psychology from Wright State University. She is the coordinator of Alvearium Inria challenge project on peer-to-peer cloud storage with hive enterprise and of the IPCEI DXP project on a federated and distributed data exchange platform with Amadeus. She also co-coordinates the PILOT project of PEPR eNSEMBLE.

[1] https://members.loria.fr/CIgnat/