Invited Talk: P2P-enabling for Critical Infrastructure Protection*

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Summary. Critical Infrastructures (CI) are increasingly interconnected and consequently opposed to multiple new threats such as cyber attacks. Therefore, Critical Infrastructure Protection (CIP) is becoming a more and more important research field.
Peer-to-peer (P2P) overlay networks generalize the established centralized Client-Server architecture (as in most of CIs) and create a decentralized architecture where equal peer nodes simultaneously act as clients and servers. Along with this decentralized architecture P2P overlays provide for self-organization and self-healing properties which emphasizes the potentials that P2P can provide in building robust and autonomous Information and Communication Technology (ICT) systems resulting in resilient CIs. Furthermore, P2P architectures allow for masking strong heterogeneities in both communication nodes and links making them very attractive for the interconnected by-nature-heterogeneous CIs. In addition, P2P overlays work well for dynamic topologies that future CIs are tending towards to integrate dynamic ad hoc networks. Consequently, we consider P2P to play a major role in protecting CIs by enhancing their self-* properties and enabling their controlled evolvability.
In this talk, we will discuss the potentials of P2P for CIP while focusing on two broad classes of CIs along with two representative projects. First, we present the CoMiFin project, where we rely on overlays to build a scalable monitoring middleware for financial CIs. Second, we consider CIs such as power grid, which use Supervisory, Control and Data Acquisition (SCADA) systems and present our work within the European INSPIRE project. In this project, we investigate the benefits of deploying P2P architectures for enhancing the protection of existing as well as future SCADA systems.

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