

Enhancing Security and Dependability of Industrial Networks with Opinion Dynamics

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Abstract

Opinion Dynamics poses a novel technique to accurately locate the patterns of an advanced attack against an industrial infrastructure, compared to traditional intrusion detection systems. This distributed solution provides profitable information to identify the most affected areas within the network, which can be leveraged to design and deploy tailored response mechanisms that ensure the continuity of the service. In this work, we base on this multi-agent collaborative approach to propose a response technique that permits the secure delivery of messages across the network. For such goal, our contribution is twofold: firstly, we redefine the existing algorithm to assess not only the compromise of nodes, but also the security and quality of service of communication links; secondly, we develop a routing protocol that prioritizes the secure paths throughout the topology considering the information obtained from the detection system.

Keywords: advanced, persistent, threat, opinion dynamics, quality, service, routing, protocol.