MIDDLEWARE FOR SMART HETEROGENEOUS CRITICAL INFRASTRUCTURE NETWORKS INTERCOMMUNICATION

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***Abstract*-Critical Infrastructures (CIs) are physical assets and organizations responsible for the production and distribution of society's vital goods and services. The increasing interconnection of CIs has resulted in interdependencies which might lead to propagation of failure from one infrastructure to another. Most of current critical infrastructures are equipped with data collection and communication capabilities that can be used to inform and warn other CIs about such events and alarms. In this paper, a publish/subscribe-based communication system among dissimilar (heterogeneous) CIs is presented. The proposed system improves the manageability of CIs by providing an exchange medium for status information and alerts. It achieves this via a uniform architecture, within and across infrastructure boundaries, that maintains data restrictions that reflect real life organizational, administrative, and policy boundaries. Finally, the proposed system is modeled using the OMNET++ simulation framework, and a network performance study investigating scalability is presented. Simulation results showed that system scalability depends on service time per packet, subscription density, and number of clients per router.**

Index terms*:* Critical infrastructure, Publish/Subscribe, Interdependency, Smart Utilities.