

Confronting the threat: analysis of the impact of MaDIoT attacks in two power system models

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Abstract-

The increasing penetration of Internet of Things (IoT) devices at the consumer level of power systems also increases the surface of attack for the so-called Manipulation of Demand through IoT (MaDIoT) attacks. This paper provides a comparison of the impact that MaDIoT attacks could have on power systems with different characteristics, such as the IEEE 39-Bus (New England) and the PST-16 system (simplified European model), by assuming that the attacker does not have advanced knowledge of the grid. The results for the IEEE 39-Bus system expand and complement the results obtained by previous work. The simulation results show that these systems present significant differences between them with respect to the success probability of an attack, being in general much higher for the IEEE 39-Bus system. In the PST-16 system, the required number of bots to obtain a certain success probability varies depending on the area attacked. However, a high probability of success does not necessarily mean a high impact on the system. This paper shows that the response to the high-impact MaDIoT attacks of the two models considered is very different as the initial impact of the attack on the system also differs, mainly affecting rotor angles in the PST-16 system, and the frequency in the IEEE 39-Bus.

Index Terms- cyberattack; power system dynamics; MaDIoT; load altering attacks; power system stability

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