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TOPIC	Detection of Cyber Attacks with Access to Partial Data in Power System Using Spy Nodes
ORGANIZERS	Student Leadership Council and Faculty of ACIT Institute and TECHLAV Center
AREA	Cyber Security
SPEAKER	Khaled Alotaibi
DATE	Friday September 9, 2016
TIME	3:00 – 4:00 P.M. (EDT)
VENUE	Fort IRC 410, North Carolina A&T State University
FEES	No Charge

SYNOPSIS

Cyber-security in power system networks has become a hot topic in recent years. Injection of malicious data into the network data by cyber attackers may lead to a change in states of the system, causing potential problems such as power outages on the grid. To detect malicious data, the proposed approach entails altering the information about network topology that is transmitted through communication channels, by adding virtual buses to the network topology as seen by an attacker who intercepts the data. The attacker is misled by the existence of the virtual buses (referred to as "spy nodes") in the network and therefore is unable to obtain the exact topology of the power grid. These spy nodes compute data along with the actual data in the power network and are able to change the perceived network topology on which the attacker depends. The proposed method is applied on both attacking scenarios (full and partial data attacks) by simulating the IEEE 9-bus and 14-bus standard systems. This proposed method has mathematically been proven and shows that attackers can never have perfect attack vectors when the topology they understand is different from the correct topology. The proof was made from an attacker's viewpoint and the control center's viewpoint, and shows how the 2-norm never gives the same value before and after an attack by using our proposed method.

ABOUT THE SPEAKER



Khaled Alotaibi is a Ph.D. candidate student at North Carolina A&T State University. He is currently a graduate research assistant at the ACIT Institute working on Power Infrastructure Cyber Security. He received his Bachelor degree in Electrical & Computer Engineering from King Abdul-Aziz university Jeddah Saudi Arabia in 2006, and his Master degree in Computer Science from North Carolina A&T State University in 2009.