Man-in-the-Middle Attacks on a Power Grid: Attack Mechanisms and Counter Measures

Lang Tong
Irwin and Joan Jacobs Professor in Engineering
School of Electrical and Computer Engineering
Cornell University
E-mail: ltong@ece.cornell.edu

PSERC Public Webinar
Tuesday, November 19, 2013
2-3 PM Eastern Time (11 AM-Noon Pacific Time)

Description

A defining feature of a smart grid is its ability to adapt to changing operating conditions and contingencies by leveraging advanced sensing, communication, and networking capabilities. However, relying on networking for grid monitoring and real time operation comes with increasing security risks of cyber-attacks.

In this talk, we consider man-in-the-middle attacks on the power grid where an adversary manipulates analog and digital data with the goal of misleading the control center with an incorrect network topology and operating state. Two types of attacks are considered. The first type of attacks avoid detection by the control center and covertly change the system operating state. The second type of attacks openly attack the control center but hide the actual source of attack. We discuss the impacts of man-in-the-middle attacks on market operations and possible counter measures of such attacks.

Biography

Lang Tong is the Irwin and Joan Jacobs Professor in Engineering at Cornell University and the Cornell site director of the Power Systems Engineering Research Center (PSERC). He received the B.E. degree from Tsinghua University, Beijing, China, and PhD degree in EE from the University of Notre Dame, Notre Dame. He was a Postdoctoral Research Affiliate at the Information Systems Laboratory, Stanford University. Lang's research interests lie in the general areas of statistical inference, decisions, communications, and complex networks. His current research focuses on energy and power systems and related data analytics. He received the 2004

Best Paper Award from the IEEE Signal Processing Society, the 2004 Leonard G. Abraham Prize Paper Award from the IEEE Communications Society, and the 1993 Outstanding Young Author Award from the IEEE Circuits and Systems Society. He is also a coauthor of seven student paper awards. He is a Fellow of IEEE.

Registration for Webinar Participation: None required. There is no charge for participating!

Participation by Webinar: There are several options for participating.

- Recommended option: We will be using the Adobe Connect 9 webinar platform. You will be able to watch the presentation slides on your computer from the designated site https://connect.asu.edu/pserc and listen to the webinar through your computer's speakers or headphones. Click here for the connection details and instructions for testing your connection. If you cannot hear the presenter, check to make sure your speaker is not muted in Adobe Connect. It may also be possible to use the app "Adobe Connect™ Mobile" to participate via smartphone or tablet.

- You can also listen to the audio over the public phone bridge at 712-432-0800 (passcode: 937250#). Be sure to mute your phone (press *6) so sounds in your room do not go out to the phone bridge with other listeners. Should you not be able to connect to the webinar, you can also download the slides from the PSERC website and listen to the audio over the phone.

- You can watch the archived webinar at a different time by clicking here and then on the link for this webinar.

Asking Questions During the Webinar: You are invited to ask questions or make comments during the webinar using the Adobe Connect webconferencing platform. Just enter your question into the Q&A box.

Professional Development Hour Certification: PDH certification is available for PSERC members (only). Send an email requesting PDH certification to pserc@asu.edu with the subject "PDH". *Include the name and title of each participant.*

Assistance: If you have any questions, please call 480-965-1643 or email pserc@asu.edu.

PSERC's Webinar Coordinator: Venkataramana Ajjarapu, Iowa State University, vajjarap@iastate.edu.

Ajjarapu welcomes feedback on the webinars and suggestions for future ones.