



Industrial Network Security: Securing Critical Infrastructure Networks for Smart Grid, SCADA, and Other Industrial Control Systems

By Eric D. Knapp, Joel Thomas Langill

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Industrial Network Security: Securing Critical Infrastructure Networks for Smart Grid, SCADA, and Other Industrial Control Systems describes an approach to ensure the security of industrial networks by taking into account the unique network, protocol, and application characteristics of an industrial control system, along with various compliance controls. It offers guidance on deployment and configuration, and it explains why, where, and how security controls should be implemented.

Divided into 11 chapters, the book explains the basics of Ethernet and Transmission Control Protocol/Internet Protocol (TCP/IP) networking communications and the SCADA and field bus protocols. It also discusses industrial networks as they relate to “critical infrastructure” and cyber security, potential risks and consequences of a cyber attack against an industrial control system, compliance controls in relation to network security practices, industrial network protocols, such as Modbus and DNP3, assessment of vulnerabilities and risk, how to secure enclaves, regulatory compliance standards applicable to industrial network security, and common pitfalls and mistakes, like complacency and deployment errors.

This book is a valuable resource for plant operators and information security analysts, as well as compliance officers who want to pass an audit with minimal penalties and/or fines.

- Covers implementation guidelines for security measures of critical infrastructure
- Applies the security measures for system-specific compliance
- Discusses common pitfalls and mistakes and how to avoid them

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Editorial Review

Review

"One of the most mysterious areas of information security is industrial system security...What raises the mystery even higher is that the stakes in the area of industrial security are extremely high. While the loss of trade secret information may kill a business, the loss of electricity generating capability may kill not just one person, but potentially thousands. And finally the mystery is solved?with this well-researched book on industrial system network security."--Dr. Anton A. Chuvakin, Security Warrior Consulting "For those looking to get a handle on how to effectively secure critical infrastructure networks, Industrial Network Security is an excellent reference... The reality is that industrial system security can be effectively secured, and the book shows the reader exactly how to do that. In 11 densely written chapters, the book covers all of the necessary areas in which to secure critical infrastructure systems... For those looking for a solid overview of the topic, Industrial Network Security is an excellent reference."--Security Management

From the Back Cover

For a decade now we have been hearing the same thing?that our critical infrastructure is vulnerable and it needs to be secured. *Industrial Network Security* examines the unique protocols and applications that are the foundation of industrial control systems and provides you with comprehensive guidelines for their protection. While covering compliance guidelines, attacks and vectors, and even evolving security tools, this book gives you a clear understanding of SCADA and Control System protocols and how they operate.

About the Author

Eric D. Knapp is a globally recognized expert in industrial control systems cyber security, and continues to drive the adoption of new security technology in order to promote safer and more reliable automation infrastructures. He first specialized in industrial control cyber security while at Nitrosecurity, where he focused on the collection and correlation of SCADA and ICS data for the detection of advanced threats against these environments. He was later responsible for the development and implementation of end-to-end ICS cyber security solutions for McAfee, Inc. in his role as Global Director for Critical Infrastructure Markets. He is currently the Director of Strategic Alliances for Wurdtech Security Technologies, where he continues to promote the advancement of embedded security technology in order to better protect SCADA, ICS and other connected, real-time devices.

He is a long-time advocate of improved industrial control system cyber security and participates in many Critical Infrastructure industry groups, where he brings a wealth of technology expertise. He has over 20 years of experience in Information Technology, specializing in industrial automation technologies, infrastructure security, and applied Ethernet protocols as well as the design and implementation of Intrusion Prevention Systems and Security Information and Event Management systems in both enterprise and industrial networks. In addition to his work in information security, he is an award-winning author of fiction. He studied at the University of New Hampshire and the University of London.

He can be found on Twitter @ericdknapp

Joel Langill brings a unique perspective to operational security with over three decades field experience exclusively in industrial automation and control. He has deployed ICS solutions covering most major industry sectors in more than 35 countries encompassing all generations of automated control from pneumatic to cloud-based services. He has been directly involved in automation solutions spanning feasibility, budgeting, front-end engineering design, detailed design, system integration, commissioning, support and legacy system migration.

Joel is currently an independent consultant providing a range of services to ICS end-users, system integrators, and governmental agencies worldwide. He works closely with suppliers in both consulting and R&D roles, and has developed a specialized training curriculum focused on applied operational security. Joel founded and maintains the popular ICS security website SCADAhacker.com which offers visitors extensive resources in understanding, evaluating, and securing control systems. He developed a specialized training curriculum that focuses on applied cyber security and defenses for industrial systems. His website and social networks extends to readers in more than 100 countries globally.

Joel devotes time to independent research relating to control system security, and regularly blogs on the evaluation and security of control systems. His unique experience and proven capabilities have fostered business relationships with several large industry firms. Joel serves on the Board of Advisors for Scada Fence Ltd., works with venture capital companies in evaluating industrial security start-up firms, and is an ICS research focal point to CERT organizations around the world. He has contributed to multiple books on security, and was the technical editor for "Applied Cyber Security and the Smart Grid".

Joel is a voting member of the ISA99 committee on industrial security for control systems, and was a lead contributor to the ISA99 technical report on the Stuxnet malware. He has published numerous reports on ICS-related campaigns including Heartbleed, Dragonfly, and Black Energy. His certifications include: Certified Ethical Hacker (CEH), Certified Penetration Tester (CPT), Certified SCADA Security Architect (CSSA), and TÜV Functional Safety Engineer (FSEng). Joel has obtained extensive training through the U.S. Dept. of Homeland Security FEMA Emergency Management Institute, having completed ICS-400 on incident command and crisis management. He is a graduate of the University of Illinois–Champaign with a BS (Bronze Tablet) in Electrical Engineering.

He can be found on Twitter @SCADAhacker

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