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SCADA Systems

This article states the facts about SCADA Systems containing what they are and how they are beneficial to us, and risks dealing with SCADA Systems. I believe that SCADA systems are important and need to stay protected for various reasons. This article does a great job at explaining SCADA systems.

What Is a SCADA System?

SCADA stands for Supervisory Control and Data Acquisition. SCADA systems are usually used to control infrastructure processes,facility based processes or industrial processes. An infrastructure Process is considered processes such sewage systems, wind mills or water. A facility based process could include airports ,ships, etc. An Industrial process could include anything from production to power generations and manufacturing. These systems usually need the help of a human to help them operate. The supervisory system gathers all important information and data making to where human operators will be able to see the processed data/information. They often use Remote Terminal Units (RTUs) or Programmable Logic Controllers (PLCs) which often control actions.(*SCADA systems. SCADA Systems. (n.d.).*

Remote Terminal Units

Remote Terminal Units also known as an RTUs is a control device that can help monitor field devices , including sensors, valves or actuators(*Armenta, A. (2021, November 21).* The earliest RTU was first used in the 1950's , it quickly evolved over time into what it is now.The RTU is now microprocessor controlled and can be known to be way more advanced than the earlier versions. RTUs are made up of hardware panels where input and output modules are used , the most important component of a RTU is the Central Processing Unit. The power supply mainly comes from a main line and uses batteries such as lead-acids and lithium batteries.(*Armenta, A. (2021, November 21).*

Programmable Logic Controllers (PLCs)

A programmable Logic Controller is a device that controls electro-mechanical processes. The PLC was first developed in 1968 by Richard E. Dick Morley. PLCs are often used to reduce time and costs to update processes. PLCs are now digital instead of having many cords that had to be plugged in. A PLCs job is to detect input devices , execute the program and operate the output devices. These PLC then later communicate with Human Machine Interfaces(HMIs).(*Lavoie, S. (2023, March 3).*

Human Machine Interfaces(HMIs).

A Human Machine Interface is often known as a HMI, it is an apparatus that gives the processed data to the human operator. They help with maintenance procedures and troubleshooting guides,

and often shoot out graphical information that mimics diagrams. Human Machine imterfaces are oftenly used in many alarming systems such as check engine lights. (*SCADA systems. SCADA Systems. (n.d.).*

SCADA Hardware

SCADA Hardware has lots of components that relate to the Distributed Control Systems. Station computers are often used for communication between PACs and protective relays. RTUs are connected to physical equipment and may take control of the equipment; they are also responsible for converting electrical signals that come from the equipment. Supervisory Staions are used for communication with field instruments. SCADA Uses modern conncections of direct and radio serial to meet any communication requirements. (*SCADA systems. SCADA Systems. (n.d.).*

SCADA Architectures

SCADA consists of three different generations. The first generation is known as the Monolithic, it was primarily used for computing and was an independent system and the protocols were proprietary. The second generation is known as the Distributed and was similar to the first but was reduced in costs and size, and shared information between stations in real time. The protocols were still proprietary which sparked security concerns. The third generation was known as Netwoked, this is what we currently use, communication is done through WAN protocols and can be accessed through the internet.(*SCADA systems. SCADA Systems. (n.d.).*

SCADA Trends and Issues

In the 1990's SCADA systems used open message structures. We currently use standard networking technologie and web services/technologies. Issues include being a target for cyberterrorism, internet connectivity concerns, security concerns and latency issues. Unauthorized acces to software and Pocket Access to the network are also two other issues. The Cybercrime community is using specialized Industrial VPNs and firewall solutions to address these many risks. (*SCADA systems. SCADA Systems. (n.d.).*

Conclusion

SCADA Systems are very important to daily life and to the cybercrime community. It is importsant to consider how SCADA systems work and how they get their jobs done. I believe that the SCADA systems will continue to evolve and grow over time to help protect industrial and infrastructures.

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