FORTINET | **WELOTEC**

Fortinet and Welotec Security Solution

Virtualized FortiGate Firewall on Welotec IEC 61850-3 Substation Server for Transmission and Distribution Substations

Executive Summary

Welotec and Fortinet have partnered to deliver an industry-leading security solution for electric substations. Virtualizing the FortiGate next-generation firewall (NGFW) on the Welotec RSAPC increases the security level and decreases operational cost.

Challenges

Substations are at the heart of power grids. Through connecting the different voltage levels, they are responsible for the reliability of the overall power system. Their digitalization is one of the central steps toward the transformation of energy systems.

In modern power substations, intelligent systems like HMI, SCADA, RTU gateway, and firewall are used. In many substations we find a separate device (hardware) for each of those applications. In general, the single devices are performing one task each.

Managing the proprietary hardware systems and software revisions becomes an increasingly complex task and increases cost. Missed updates and patches for the hardware/software systems increase the threat level.

Joint Solution

Welotec and Fortinet have partnered to deliver an industry-leading security solution to address these challenges. The integration of the Welotec Substation Server and FortiGate, enabled through the Fortinet Open Fabric Ecosystem Partner Program, delivers easy and secure management of FortiGate, HMI, substation gateway, and other applications. The usage of virtual machines and a virtualized FortiGate in IEC 61850 substations enables the accommodation of many systems on one platform. With a virtualized firewall, there is no need for a single hardware-based solution to be integrated in the computing network. This leads to easier handling and reduced maintenance costs. At the same time, hardware-based firewall and switch ports can be saved.

Joint Solution Components

- Fortinet FortiGate Next-Generation Firewall
- Welotec RSAPC IEC 61850-3 Substation Server

Joint Solution Benefits

- Increase IT and OT security in digital substations
- Deep packet inspection including IEC 104 and IEC 61850
- Easy scalability of the firewall performance through virtualization
- Easy rollout because no additional hardware is needed
- Reduce OpEx and CapEx

FORTINET Fabric-Ready

Redirecting the communication from a physical device on the host system enables controlling the complete data traffic, for virtual machines and external physical devices. Furthermore, it provides security regulation for virtual machines. This includes the arrangement of communication rules for single virtual machines, the definition of instructions for data exchange, and a traffic control on a protocol or service basis.

With the integrated IDS/IPS and DPI, it is possible to detect more than 1,700 different OT applications and protocols via our deep packet inspection and thus only allow certain commands on protocols such as IEC 61850 or IEC 104 or perform a plausibility check for correct ASDU or COT in the IEC 104 protocol.

Joint Solution Components

Welotec Rugged Substation Server

Welotec RSAPC provides a virtualization platform for modern IT structures to take advantage of virtualization in harsh substation environments. This includes the reduction of hardware costs, increasing availability and security. With its powerful Xeon processor and 64 GB memory, the RSAPC can run multiple virtual machines with different systems simultaneously. This includes firewall solutions for virtual machines and physical devices.

Joint Solution Integration

With a FortiGate VM64-HV virtual machine it is possible to replace a hardware firewall in a substation. The whole communication from and to a physical interface on the host system is redirected to the firewall and it is possible to monitor and control the whole traffic.

In addition to that, an additional security layer is added to the virtual environment, helping to secure the communication of each virtual machine and the traffic between virtual machines.

Inside of the virtualized environment, an advanced network environment as a virtual structure is created. Rules can be defined more precisely to meet the needs of controlling traffic for each virtual machine inside the environment. This allows the RSAPC to be used as a virtualization platform, providing an additional security layer for the virtual machine communication and can at the same time be a firewall solution to secure the whole network traffic for external devices as well.

Running the FortiGate as a virtual machine, you have all the benefits when it comes to scaling the solution to meet the needs of each individual installation.
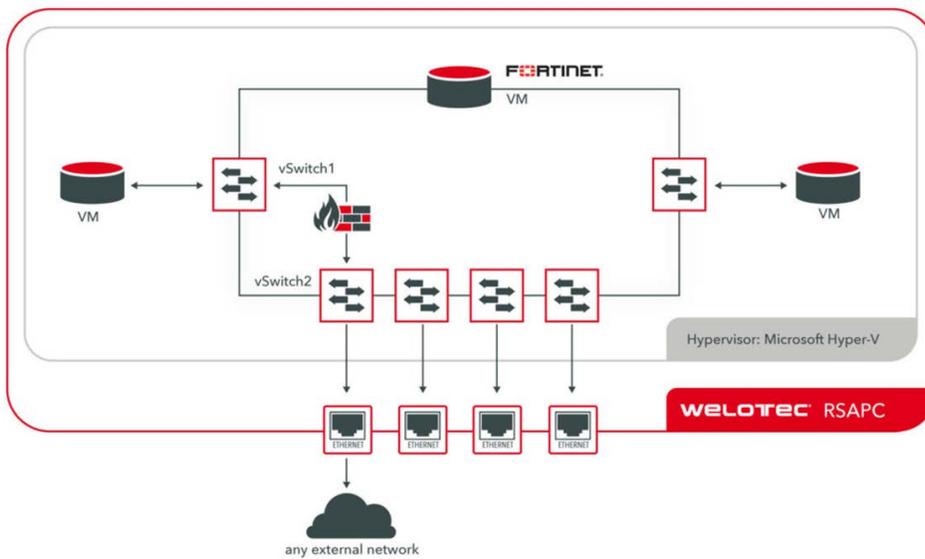
Figure 1: FortiGate VM running as virtual machine on Welotec Rugged Substation Computer beside other VMs.

About Welotec

For 50 years, Welotec has offered tailor-made solutions for the transformation of the industry, specializing in Substation Automation for Transmission and Distribution Grids as well as for HVDC and FACTS transmission.

Welotec designs and builds digital solutions and services that support power grids around the world with their IT/OT convergence. Welotec is the inventor of IEC 61850 Rugged Substation Automation Computer (RSAPC). Through virtualization, more applications and advanced OT security in digital substations are possible. Headquartered in Laer, Germany, Welotec has supported DSOs and TSOs since 1969. Learn more at https://www.welotec.com/.

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