AMD XILINX

CASE STUDY

Moxa Pushes Time-Sensitive Networking to Industry 4.0 Forefront with AMD-Xilinx MPSoC Device

Zynq UltraScale+ MPSoC Powers TSN-G5000-Series Ethernet Switches for Industrial Manufacturing Networks

AT A GLANCE:

Moxa is a leader in edge connectivity, industrial computing, and network infrastructure solutions for enabling connectivity for the Industrial Internet of Things (IoT). With 35 years of industry experience, Moxa has connected more than 82 million devices worldwide and has a distribution and service network to serve customers in more than 80 countries.

Industry: Industrial Communications and Networking
Location: Taipei, Taiwan
Established: 1987
Website: www.moxa.com

Figure 1. Moxa TSN-G5000-Series Ethernet Switch

OVERVIEW:

Time-Sensitive Networking (TSN) is an important advancement in the world of industrial automation by delivering deterministic, time-sensitive features over a standard Ethernet connection. TSN ensures that data is delivered where and when it is needed in large-scale industrial networks.

Moxa has built a series of TSN switches that help make manufacturing networks compatible with Industry 4.0. The solutions are powered by AMD-Xilinx's Zynq® UltraScale+™ MPSoC solution, which delivers adaptable and secure, high-performance data processing along with upgradability and reconfigurability to meet evolving standards and future customer requirements.

CHALLENGE:

Several years ago, Moxa realized that TSN was evolving into the primary standard for converged factory networks. The company was looking to accelerate the development of TSN technology in order to design a truly unified network solution for industrial automation.

The goal was to build a family of TSN-capable, full Gigabit-managed Ethernet switches that could power real-time, machine-to-machine communications for such applications as smart factories, railroads, smart grids, power generation, highway systems, the oil and gas industry, and mining.

The solution would be designed to solve a variety of design challenges, including time-to-market, integration of compute resources, security, latency, and programmability to keep up with standards evolution.

SOLUTION:

Moxa's TSN-G5004 and TSN-G5008-series switches are built to make manufacturing networks compatible with Industry 4.0. They come with either 4GbE or 8GbE ports and up to two fiber-optic ports and are managed by a web-based GUI for easy device configuration and maintenance. Each comes with built-in security features, based on the IEC 62443 standard. The switches are ideal for upgrading an existing network to Gigabit speeds, or for building a full-Gigabit platform for future high-bandwidth needs, and they are designed to support real-time communications using TSN technology.

The AMD-Xilinx Zynq UltraScale+ MPSoC device at the heart of the system provides 64-bit processor scalability while combining real-time control with soft and hard engines for graphics, video, waveform, and packet processing. Built on a common real-time processor and programmable logic equipped platform, the device is offered in distinct variants including dual-application processor (CG) devices and quad-application processor GPU (EG) devices, creating unlimited possibilities for a wide array of applications, including industrial IoT.

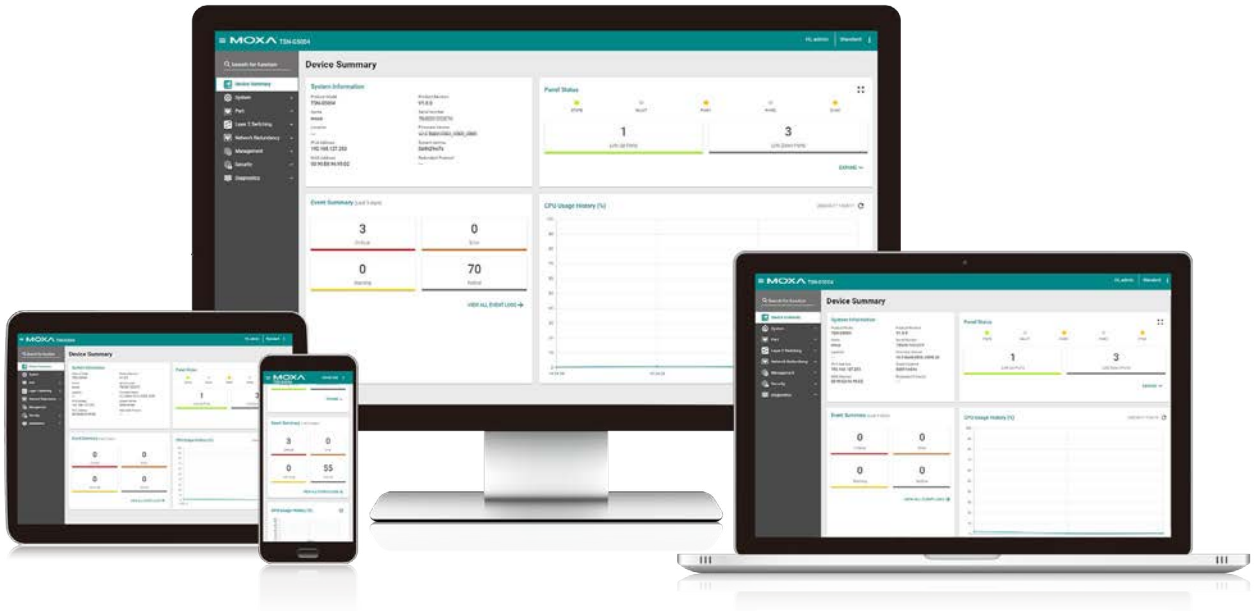

Figure 2. Moxa's TSN-G5000-Series Ethernet Switch is accessed through a simple, responsive web design, and dashboard-style graphical user interface for monitoring and managing system performance.

RESULT:

"TSN standards, like any popular industry standards, keep evolving, and most TSN implementations, based on dedicated chipsets, have limited future-proof capabilities to address customers' needs," stated Zico Lee, deputy general manager of networking at Moxa. "AMD-Xilinx's technology fixes the flexibility issues brought by the ongoing evolution. The combination of adaptable, high-performance AMD-Xilinx SoCs and Moxa's TSN bridge solutions offer significant upgradability and reconfigurability to support the evolving standards and customer needs in the expansion of future applications," he said.

Lee added that the collaboration with AMD-Xilinx has been a big part of the Moxa's TSN-G5000 switch success.

"Moxa is thrilled to have collaborated closely with AMD-Xilinx to push TSN technology to the forefront in industrial automation," he said. "Our offerings deliver enhanced interoperability between bridge solutions and endpoints to address customers' changing needs in control and latency-sensitive industrial applications, and help accelerate TSN ecosystem development," he said.

ADDITIONAL RESOURCES:
Learn More About AMD-Xilinx's Zynq SoCs
Learn More About Moxa and Moxa TSN

Corporate Headquarters
Xilinx, Inc.
2100 Logic Drive
San Jose, CA 95124
USA
Tel: 408-559-7778
www.xilinx.com

Xilinx Europe
One Logic Drive
Citywest Business Campus
Saggart, County Dublin
Ireland
Tel: +353-1-464-0311
www.xilinx.com

Japan
Xilinx K.K.
Art Village Osaki Central Tower 4F
1-2-2 Osaki, Shinagawa-ku
Tokyo 141-0032 Japan
Tel: +81-3-6744-7777
japan.xilinx.com

Asia Pacific Pte. Ltd.
Xilinx, Asia Pacific
5 Changi Business Park
Singapore 486040
Tel: +65-6407-3000
www.xilinx.com

India
Meenakshi Tech Park
Block A, B, C, 8th & 13th floors,
Meenakshi Tech Park, Survey No. 39
Gachibowli(V), Seri Lingampally (M),
Hyderabad -500 084
Tel: +91-40-6721-4747
www.xilinx.com

Printed in the U.S.A. SF03/22