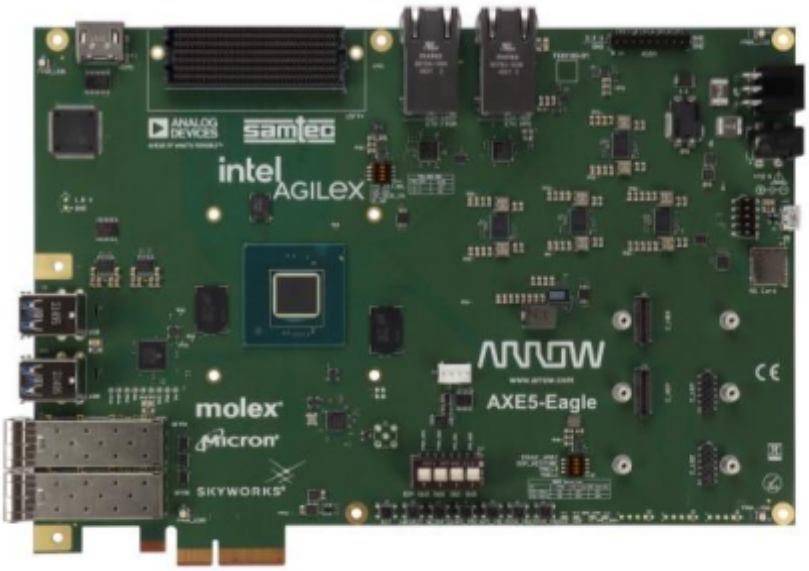
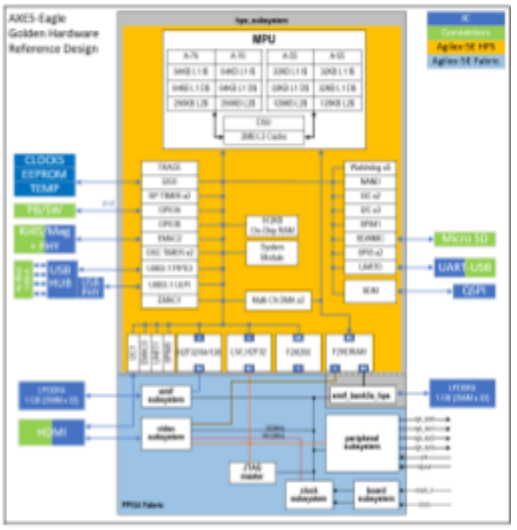
Agilex 5E SmartNIC

25 GigE SmartNIC with Altera Agilex-5E SoC FPGA

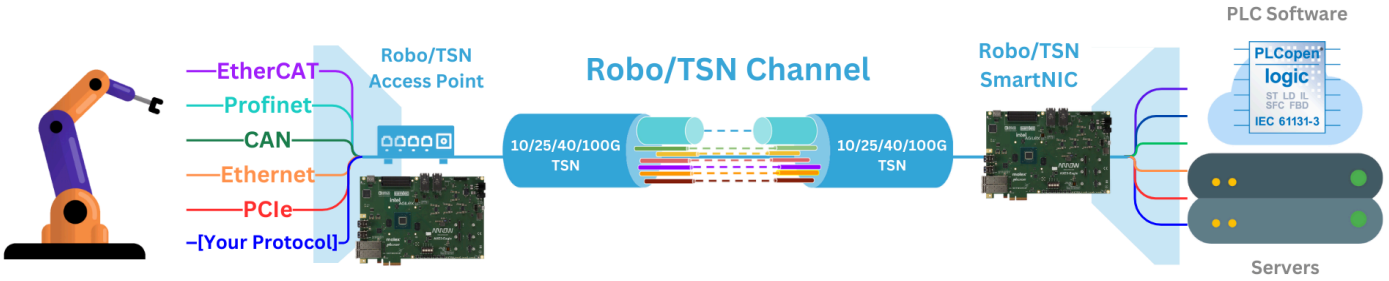




Modern Factory Floors Are Hamstrung By Legacy Control Hardware!

This hinders the adoption of virtualized Programmable Logic Controllers (PLC) in Operational Technology (OT) which, again, curtails the benefits of Software-Defined Automation (SDA) and Artificial Intelligence (AI) in factory automation.

MLE has developed breakthrough network virtualization technology to bridge the gap between modern cloud computing and traditional factory automation. This so-called Robo/TSN solution virtualizes open standard Information Technology (IT) networks such that a Factory Cloud can connect to existing sensors and actuators on a factory floor.



The innovation lies in MLE's patented integrated circuit technology, which enables legacy OT fieldbus protocols to run over standard IT infrastructure with unprecedented reliability, security, and speed. Robo/TSN slashes costs, simplifies maintenance, reduces down-time and delivers microsecond-precise performance at scale.

Robo/TSN is based on open IEEE standards such as Time-Sensitive Networking (TSN), is compatible with modern off-the-shelf server equipment and IEC 61131-3 PLC software and programming environments.

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And, most importantly, Robo/TSN is fully transparent to existing legacy hardware and software interfaces: Means, zero modifications to existing factory equipment – a rare "plug-and-play" solution in the industrial automation space.

Use Cases

- Connect high speed sensors in the field with AI engines in edge factory clouds.
- Tunnel OT protocols like Ethercat or Profinet via virtual connections over high-speed TSN.
- Transparent connection of sensors and actuators from automation cells to AI engines and/or virtualized/software PLCs in edge cloud data centers via high-speed TSN.
- Offload computing and controlling/ PLC tasks to edge cloud/ data center infrastructure with all advantages like virtualization, containerization, redundancy, backup organization etc. and without any compromises concerning real-time and high-speed requirements.

Features and Benefits

- Bridging/ Tunneling of several protocols like PCIe, Ethercat, Profinet, Ethernet, CAN, etc.
- Scalable from 1 to 100 Gbps
- Precision time synchronization with IEEE TSN or IEEE 1588 v2 (CERN White Rabbit)
- Hardware accelerated deterministic transport with Ultra Low Latency (RTT < 600 ns)
- Reliable transports via TCP/IP and/or QRP/IP
- Optional security features MACsec, IPSec, TLS

Real-time Compliance

- Time Sync IEEE 802.1AS (IEEE 1588 profile)
- IEEE 802.1Qav Credit Based Traffic Shaper
- IEEE 802.1Qbu / 802.3br Preemption
- IEEE 802.1Qbv Scheduled Traffic
- Dedicated Resources & API
- IEEE 802.1Qat Stream Reservation
- IEEE 802.1Qcc TSN Config
- IEEE 802.1CS Link-Local Reservation

Deliverables and Options

- Pre-configured SmartNIC PCIe-Card based on Intel Agilex 5 FPGA, ready-to-run
- Linux device drivers (GPL sources)
- Application-specific expert design service
- Appliance implementation
- License for ASIC/ FPGA Full System Stack

Contact Information

Robo/TSN is available under MLE's Early Access Program to end-users and development partners

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