Using the SEL-2488 to Provide IEEE 1588 Version 2 Grandmaster Functionality to Isolated Ethernet Networks

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INTRODUCTION

IEEE 1588 Version 2 is a standard for delivering precise time through Ethernet networks. Precision Time Protocol (PTP), used in accordance with the IEEE 1588 standard and with standard-compliant devices, allows time synchronization over Ethernet networks with submicrosecond accuracy.

PROBLEM

Some applications require isolated Ethernet networks for the separation of protection, automation, and reporting network traffic, depending on security requirements, traffic loading, or other design requirements.

It is a challenge to provide highly accurate time to all isolated Ethernet networks without compromising design requirements or connecting the networks. After segregating the networks to provide isolation, system designers do not want to install routing to allow time signals to be received from one source. They also want to avoid the cost of installing separate clocks on each network.

SEL SOLUTION

The SEL-2488 Satellite-Synchronized Network Clock with the PTP option was designed with multiple independent Ethernet connections and can be leveraged to provide precise time to separated networks.

The SEL-2488 has four interfaces that can provide time to four separate networks. Each interface on the SEL-2488 is independent of the other, and the PTP master options are set for each interface. This allows the same clock to provide precise time to each of the networks without joining the networks or compromising the design requirements.

The SEL-2488 provides cost savings because it does not require separate clocks for each network.

Figure 1 shows an example of the SEL-2488 connected to isolated networks. Optionally, a second SEL-2488 can be connected, as shown, to provide backup or redundancy.
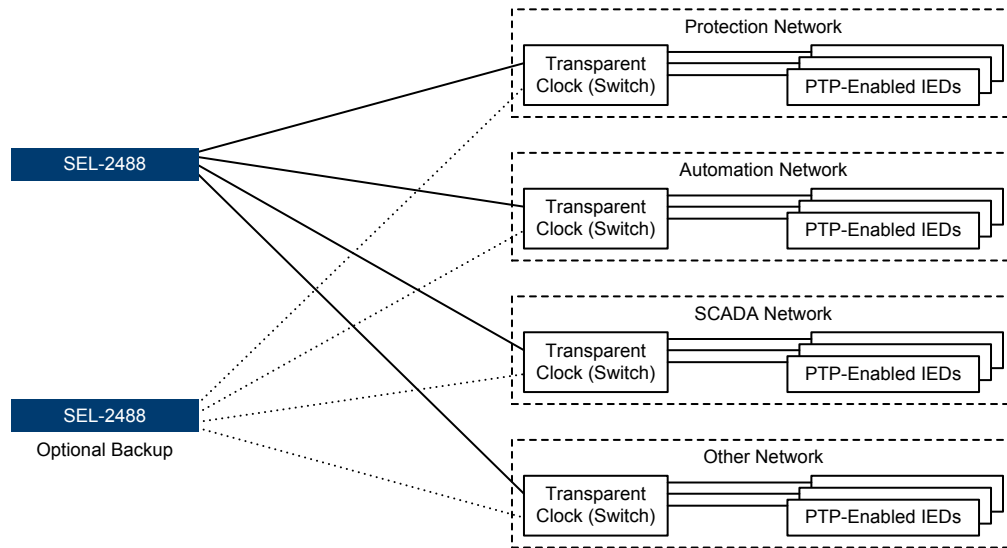

Figure 1   SEL-2488 Connected to Isolated Networks

CONCLUSION

The SEL-2488 provides PTP time synchronization for up to four isolated Ethernet networks without compromising the segregation or security of those networks. With four main Ethernet connections to one device, the SEL-2488 maintains isolation in hardware and firmware. This saves the cost of installing separate SEL-2488 Clocks on each network.

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