OWL Cyber Defense   **OnTime networks**

Precision Time Protocol (PTP) Data Diode

- Secure, one-way data diode solution optimized for IEEE 1588 PTP synchronization

- Various form factors – 19" rack-mount to fully rugged, low SWaP-C tactical hardware

- PTP synchronization between unclassified and classified networks

- Hardware-enforced IEEE 1588 protocol validation

- Low latency, low jitter delivery of timing updates enables precision time synchronization through a secure one-way interface

- Ideal for:
  ‣ Range architectures
  ‣ Ground vehicles
  ‣ Mobile shelters
  ‣ Ground sensor systems
  ‣ Ships
  ‣ Aircrafts
  ‣ UAVs

Synchronization Between Components

Today's military systems have components that span across multiple segmented networks, that need to be synchronized to ensure accurate coordination across complex, distributed missions. To maintain synchronization and time accuracy between components, precision time must always be consistent across all networks. Presently, cross domain solutions (CDS) are deployed for communication between segmented networks operating in separate security domains. However, a standard CDS will introduce unacceptably long and unpredictable delays in message delivery, making them unsuitable for use in precision time synchronization. As a result, defense networks typically use independent time signal receivers to achieve synchronization among isolated networks. The use of multiple, independent receivers dramatically increases the challenge of making these networks resilient against sophisticated RF-based attacks.

To address these challenges, Owl and OnTime Networks have partnered to provide the world's first Precision Time Protocol (PTP) Data Diode, a secure one-way transfer solution that supports the IEEE 1588 Precision Time Protocol (PTP) for synchronization. Through a proprietary implementation of their clocks, OnTime now fully supports a one-way transfer of synchronization messages over the PTP Data Diode for reliable and predictable synchronization and accuracy across isolated network segments.

Precision Time Protocol Data Diode

The PTP Data Diode enables IEEE 1588 PTP time synchronization across segmented security domains to ensure predictable, consistent time across mission systems. This solution includes advanced, hardware-based protocol validation technology that only allows valid IEEE 1588 traffic and blocks all other packets. The efficient, hardware-based packet filter and reliable, one-way transfer mechanism deliver valid PTP update messages with precise latency and virtually no jitter. This technology can be packaged in a rugged, low size, weight, power, and cost (SWaP-c) tactical solution. It is also available in a standard 19" rack-mounted package for conventional data center applications. The flexibility, scalability, and security of this solution makes it ideal for deployments in a range architectures, including mobile shelters, ground sensor systems, aircrafts, UAVs, and on ground vehicles and ships.

## Enabling Secure Data Diode PTP Synchronization

The PTP Data Diode permits efficient and secure IEEE 1588 PTP synchronization between unclassified and classified networks that would otherwise require separate RF-based time signal receivers. This solution allows for the replacement of legacy RF-based receivers that do not meet modern resilience and security requirements. The hardware-based filtering and one-way transfer capabilities of this device raise the bar of cybersecurity, while providing design efficiency, cost savings, modernization, and security. This solution offers a new path to help military and government agencies solve both time synchronization and risk management challenges, while moving to IEEE 1588 PTP network synchronization.

Enabling Secure Data Diode IEEE 1588 PTP Synchronization For Range And Tactical Edge Applications

The PTP Data Diode, coupled with OnTime Networks' proprietary IEEE 1588 Precision Time Protocol (PTP) Boundary Clocks, enables secure distribution of precision timing signals through a hardware-enforced, one-way transfer device. The PTP signals are published from OnTime's rugged, Grandmaster Clock and are transferred through the PTP Data Diode to provide time synchronization and predictable latency across a segmented network boundary. Only valid PTP packets are transferred and they are stripped of routing and IP information before being forwarded to the destination network. PTP signals are then delivered to a Boundary Clock Switch on the destination networks for consistent time synchronization across mission systems.

CURRENT STATE

- Separate network domains – each with its own GPS antenna, GPS receiver, and Network Clock
- No time synchronization between the various domains leads to operational challenges, ranging from discrepancies in operational pictures to unsuccessful target engagements
- Separate GPS receiver systems feeding different networks drives high lifecycle costs
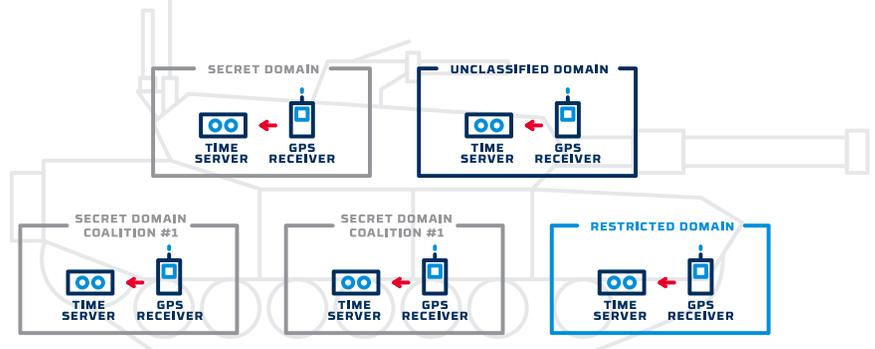
FUTURE STATE

- Common network time domain – one GPS receiver and Time Server securely delivering one-way Precision Time signals via a PTP Data Diode to all domains
- Tight synchronization between the various security domains for improved mission outcomes
- Reduced platform lifecycle costs
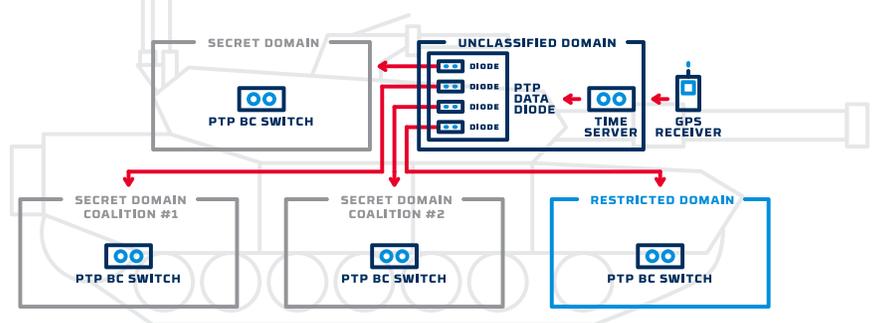
Owl Cyber Defense cross domain, data diode, and portable media solutions provide hardened security checkpoints for absolute threat prevention and secure data availability. Certified by the U.S. government, independent testing authorities, and international standards bodies, Owl technologies and services help to secure the network edge and enable controlled unidirectional and bidirectional data transfers. For over 20 years, clients worldwide in defense, intelligence, and infrastructure have trusted Owl's unmatched expertise to protect networks, systems, and devices.

OnTime Networks is a technology leader for rugged, time synchronized, fully managed, modular Gigabit Ethernet switches, routers, taps, GNSS time servers, as well as compute solutions, specifically designed to operate reliably in harsh and climatically demanding environments of the aerospace and defense markets. As a pioneer in timing solutions, data communication products, and engineering services, we are a proven resource for small and major clients in the U.S. and around the world.