



Securely Replicate PI System Data Across Segmented Networks

Dennis Lanahan, VP of Commercial Markets

2022 AVEVA World

AVEVA



Agenda

- About Owl: who we are and what we do
- How to isolate and separate OT and IT with hardware-enforced separation
- How to securely share PI system data between networks and systems that are 100% confidential from each other
- Critical infrastructure use case examples
- How to replicate PI system data to the cloud

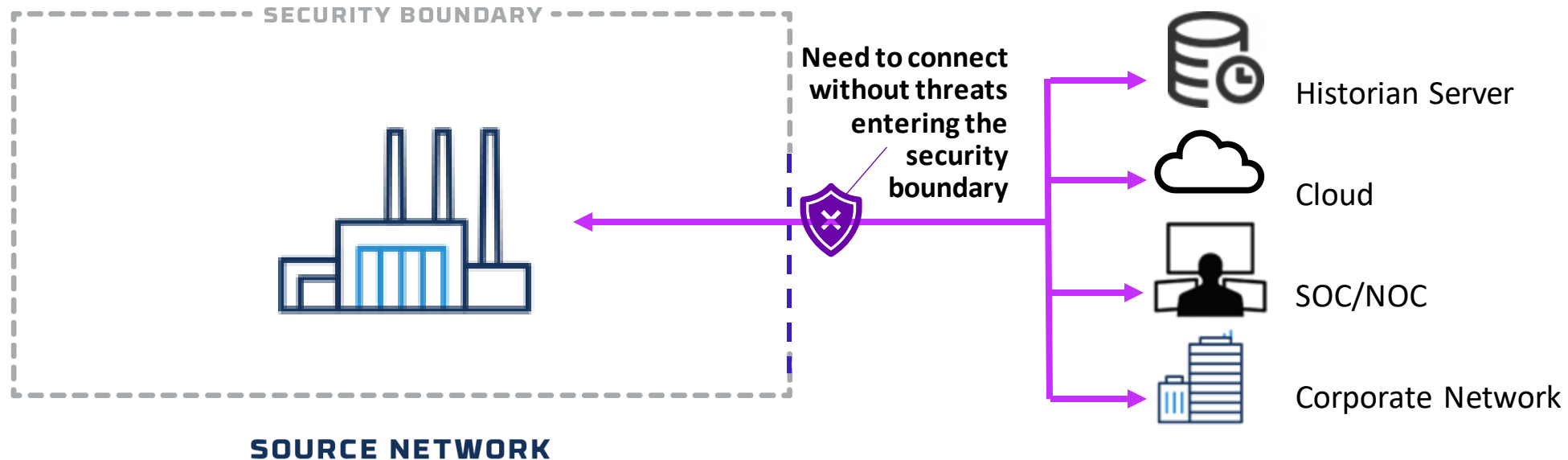


Owl History and Facts

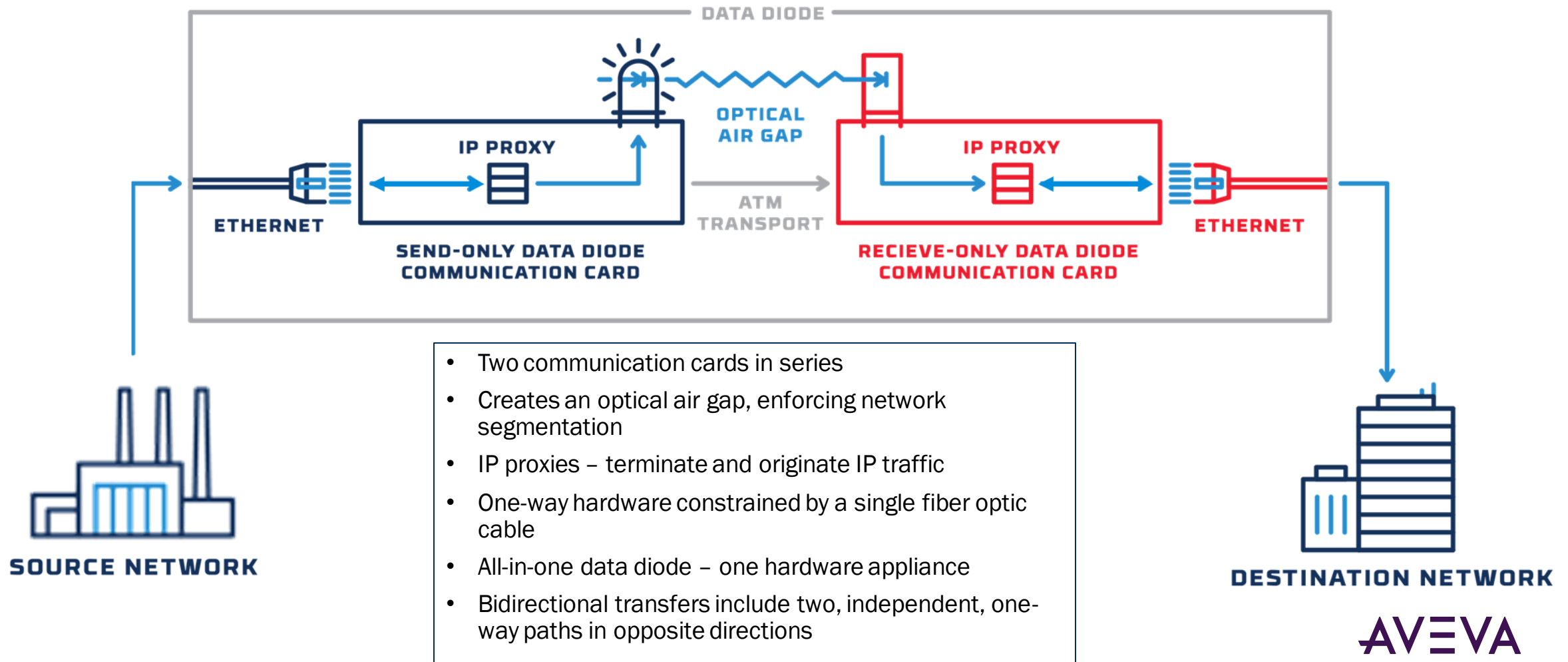
- 23 years securing Government and critical Infrastructure networks
- Pioneer and leader in the data diode market - first patented data diode on the market 23 years ago
- USA Sandia Labs based security technology designed to ensure the safest network boundary possible
- Over 3000 Global deployments
- Offices in the US (HQ), UK, Saudi Arabia, UAE, and Kuwait
- Elite hardware-enforced solutions and services that protect against the world's most sophisticated advanced persistent threats
- Expanded from supporting US Government Defense and Secret Networks in 2007 to defend US Nuclear and Fossil generation facilities in Support of NRC 5.71 and NERC CIP
- Deployed in oil and gas and petrochemical networks following Shamoon virus attacks in 2014

Current Market State

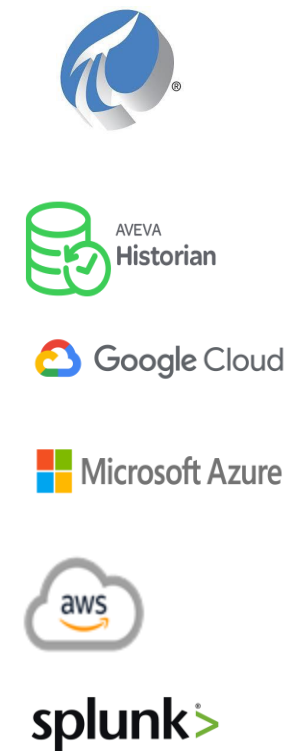
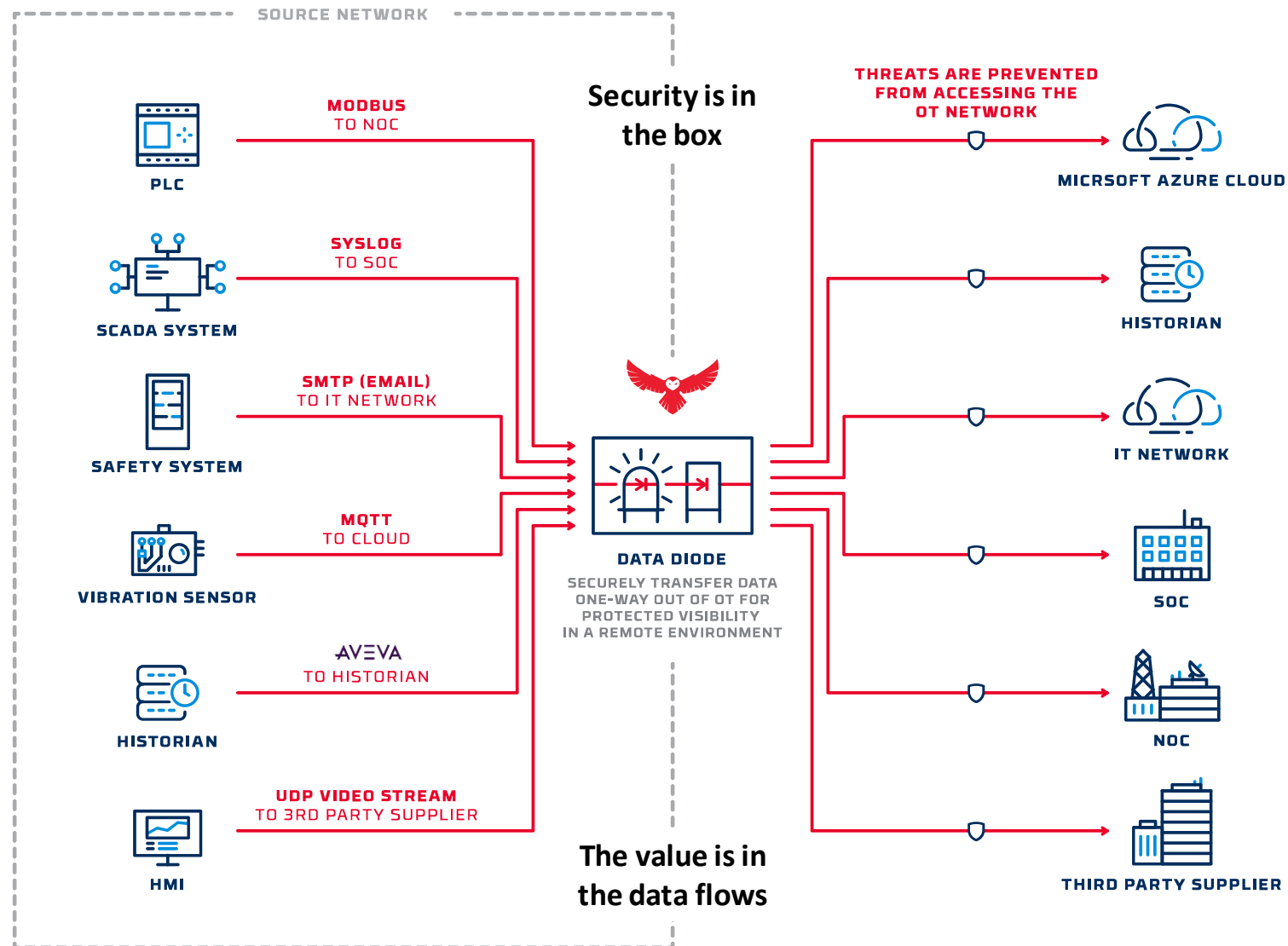
- Secure critical infrastructure networks need to connect with untrusted/less trusted networks without compromising security of the operations network
- Organizations want assurance that the access to a secure network is protected and/or limited, while still enabling the sharing of data between networks
- Value is in the data - sharing data securely and protecting your assets is a “must have”



Hardware-Enforced Data Diode Network Separation



The Most Secure One-Way Architecture



AVEVA

Use Case Markets



NRC nuclear regulated market



NERC coal regulated market



Oil and gas



Mining



Petrochemical



Pharma



- **We support:**
 - Aveva PI System
 - eDNA
 - Aveva Historian (Wonderware)

PI System Replication

- PI System data needs to be replicated one-way out of a secure network without introducing risk to the secure network
- Software-based solutions fail to protect secure networks from cyber attacks
- Hardware-enforced solutions provide a physical layer of security that prevents threats from entering back into the secure network through PI System replication





Transition to Replicate PI Systems

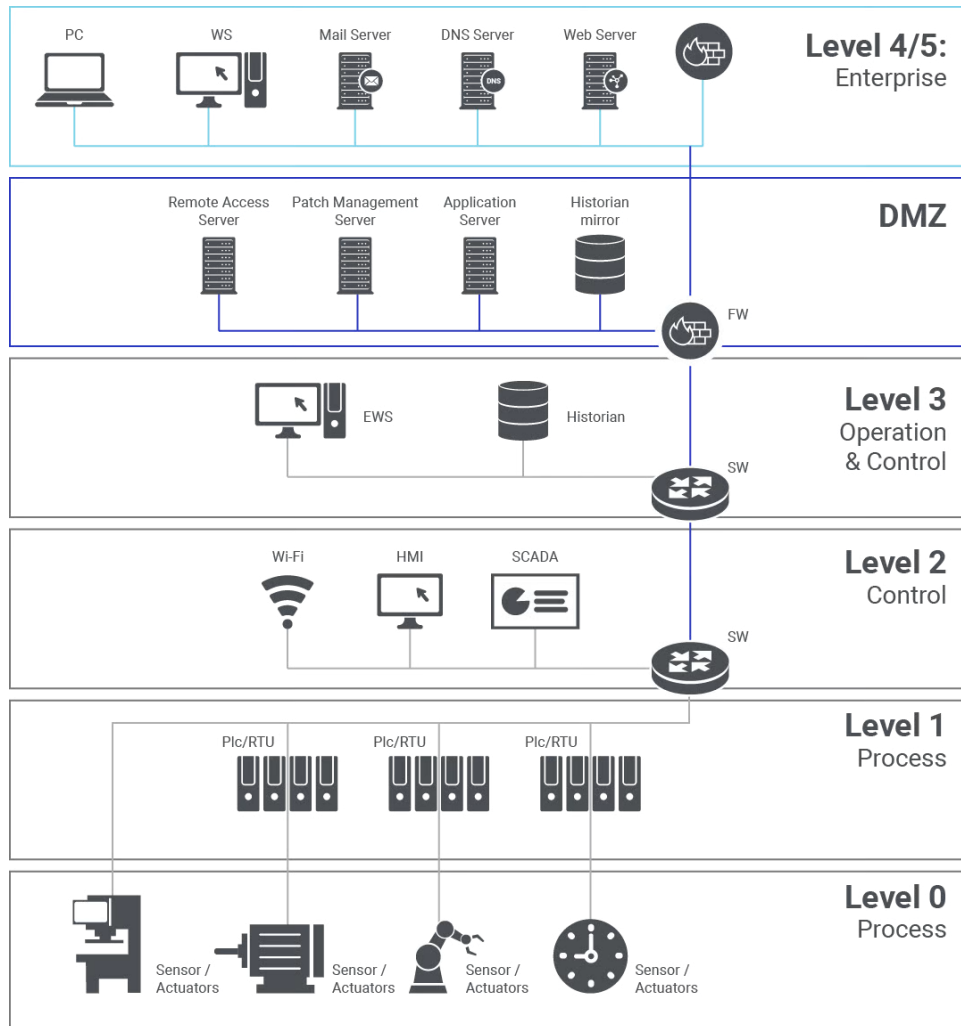
Challenge:

- Many networks have a single PI System at level 3.5
- OT and IT access that PI System from their respective sides of the DMZ
- If both sides of the DMZ can access the PI System, then IT threats can get through to OT

How it Works:

- **Step 1:** PI System at level 3.5 becomes an OT asset
- **Step 2:** Replicate PI System goes in the destination network
 - Corp, Data center, Cloud, On Prem, Off Prem
- **Step 3:** Owl Solution with OPTS is deployed between the source and the destination networks to securely transfer data
- **Step 4:** PI System data is replicated in the destination network
 - Users in IT networks use PI System in the IT network to get their job done – no longer need access to OT or the DMZ to do get data

Secure Segmentation within the Purdue Network Model



4) Secondary PI System for business use outside the DMZ and OT network

3) Unidirectional data flow from DMZ to level 4/5

2) Source PI System of record and history protected in secure DMZ

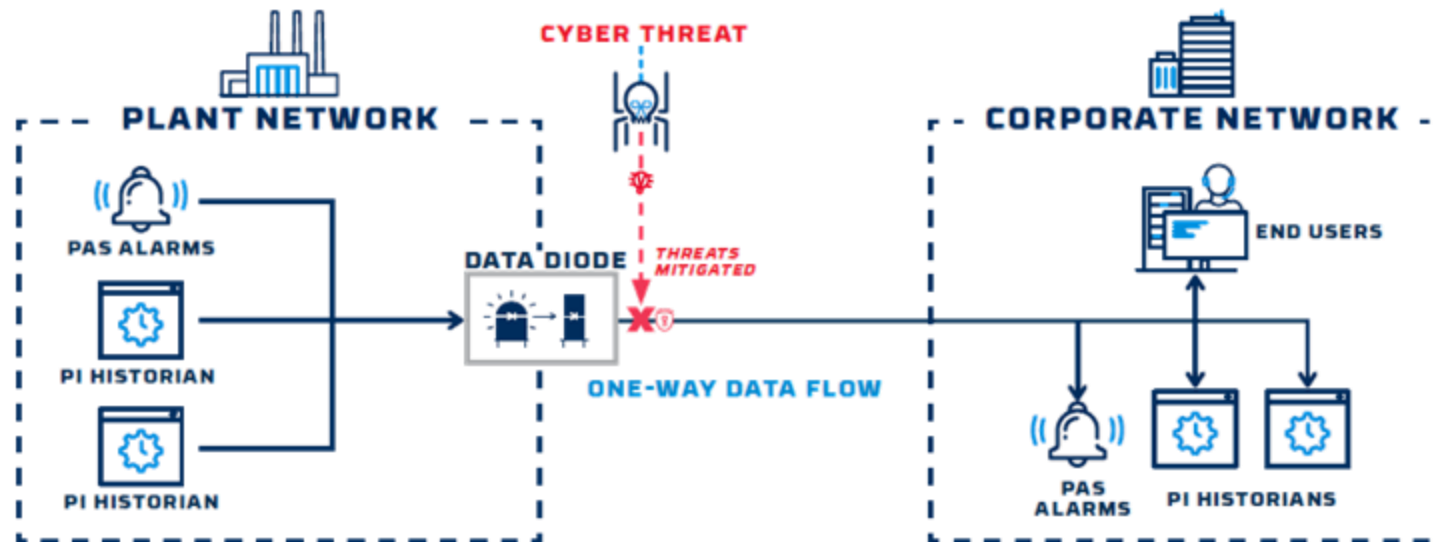
1) Collection of asset data to the source PI System

Owl PI Transfer Service (OPTS)

Key Features of Owl Solutions with OPTS:

- Dedicated PI System® platform for critical application support
- Auto-build of database configurations; auto-discovery of adds/deletes/changes
- Real-time transfer of data points:
 - Point records
 - Snapshot data
 - Historical records
 - Digital state tables
- Realtime and continuous point backfill – auto backfill due to network outages
- PI System replication of over 500K points
- Secure LINUX operating system for transfer reliability
- System setup and configuration as both PI Systems are live and operational
- Aveva PI System Collective HA support
- Owl High Availability with failover and redundancy

Single Plant to Corporate Replication



Step 1 - OPTS logs into the Source PI System via PI Trust Authentication

Step 2 - OPTS queries Source PI System and pulls the PI Tag List, Tag Attributes, Digital States and Digital Names

Steps 3A - OPTS pulls the Destination PI System database obtaining PI Tag List, Tag Attributes, Digital States and Digital Names

Step 3B - OPTS synchronizes the Source and Destination PI System by adding/deleting/updating tags

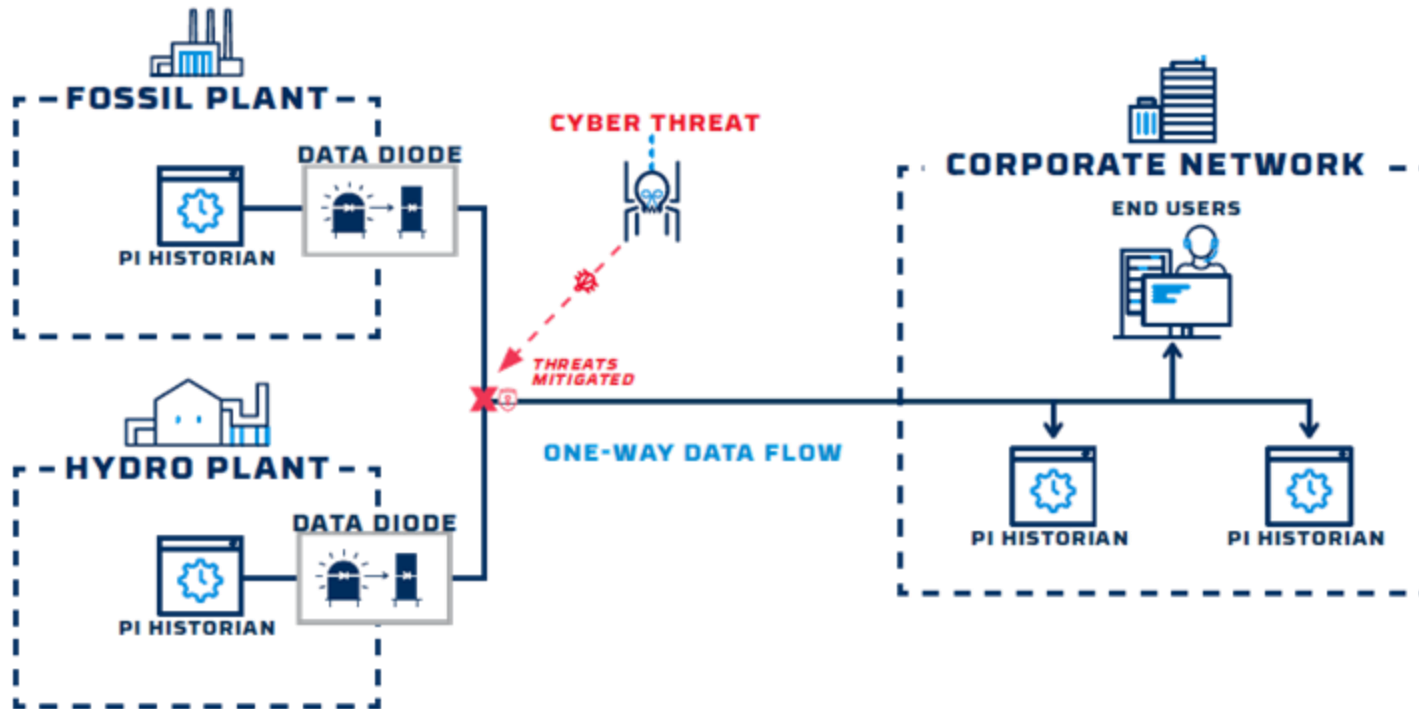
Step 4 - Once the Destination PI System is built and synchronized, Snapshot data begins to flow

Step 5 - During run time, the OPTS Historical Backfill feature continuously cycles historical data and passes it the Destination PI System

Step 6 - The Destination PI System replaces data missing from any unplanned network outage or interruption, ensuring data is never lost



Multi-Plant to Corporate Replication



Step 1 - OPTS logs into the Source PI Systems via PI Trust Authentication

Step 2 - OPTS queries Source PI Systems and pulls the PI Tag List, Tag Attributes, Digital States and Digital Names

Steps 3A - OPTS pulls the Destination PI System database obtaining PI Tag List, Tag Attributes, Digital States and Digital Names

Step 3B - OPTS synchronizes the Sources and Destination PI System by adding/deleting/updating tags

Step 4 - Once the Destination PI System is built and synchronized, Snapshot data begins to flow

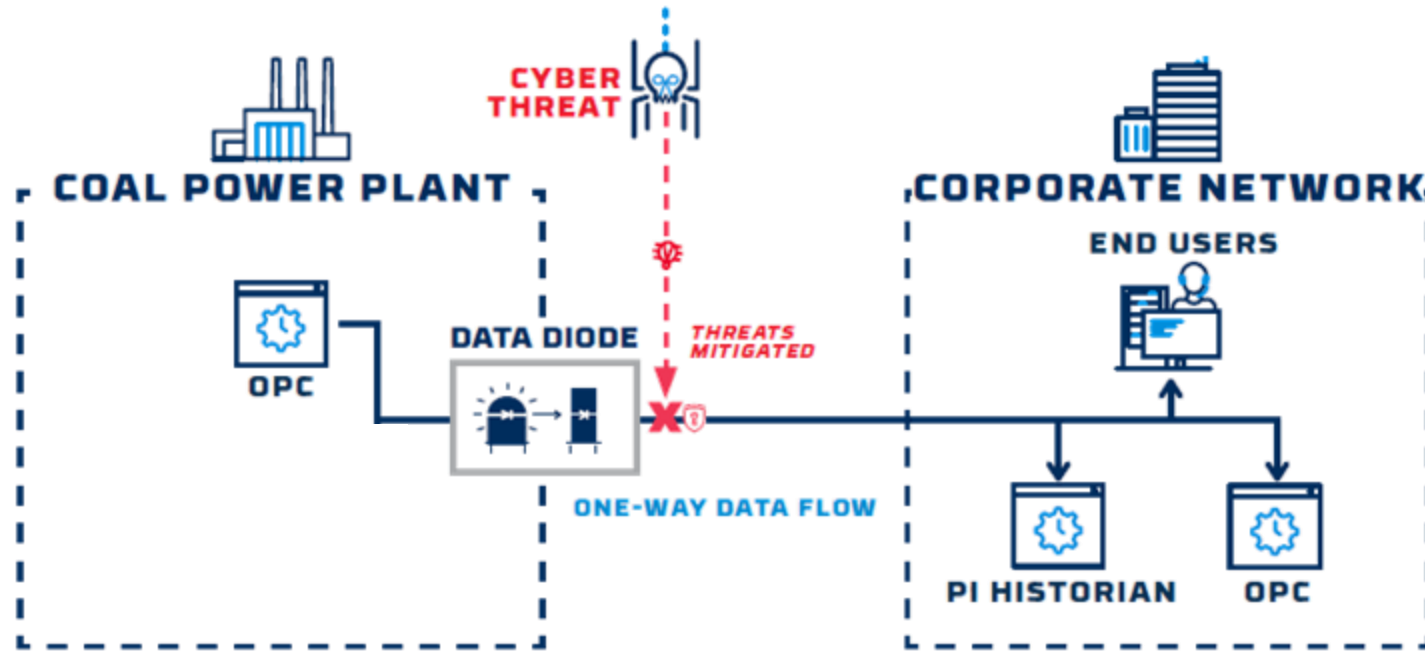
Step 5 - During run time, the OPTS Historical Backfill feature continuously cycles historical data and passes it the Destination PI System

Step 6 - The Destination PI System replaces data missing from any unplanned network outage or interruption, ensuring data is never lost



Secure OPC Transfer of Asset Data to PI System

Delivery of Asset Data Directly to the PI System



Step 1 – Owl OPC Client pulls data from OPC Server

Step 2 – Owl Data Diode Transfers the OPC Data across the network boundary

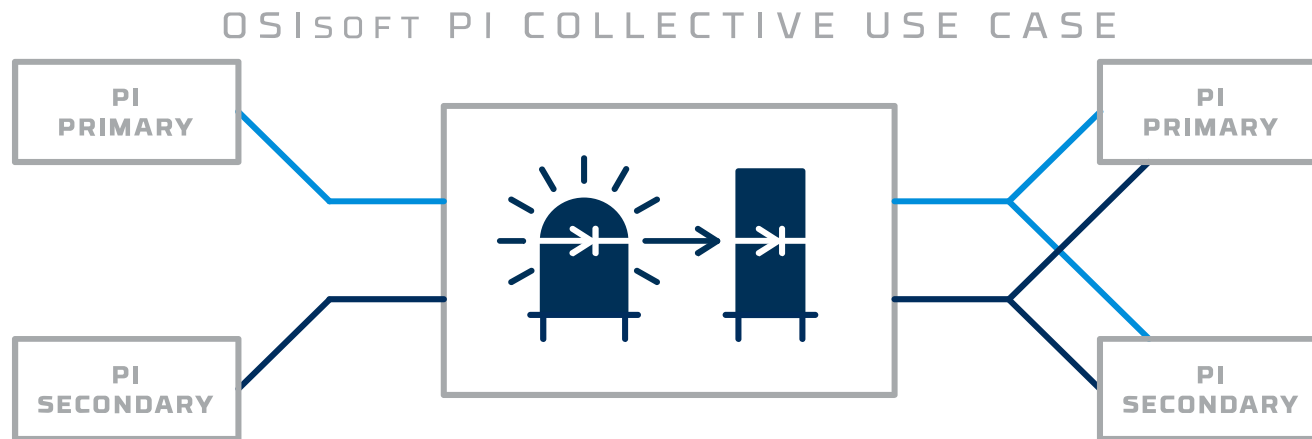
Step 3 – Owl OPC Server Application captures real-time values

Steps 4 – Aveva PI System Interface OPC Application reads real-time OPC Values from Owl OPC Server

Note – Asset data can be OPC UA, OPC DA, Modbus, files, and other sources of data to feed the PI System



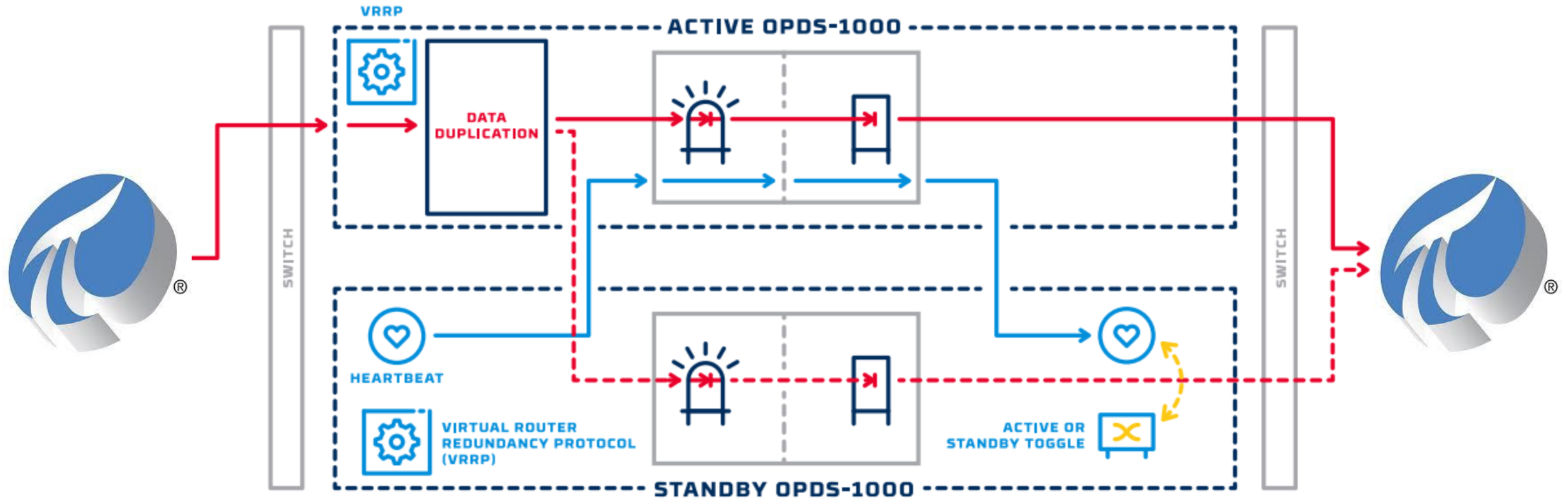
Support for High Availability (HA) and Aveva PI System Collective



- Owl OPTS supports PI HA Architecture of redundant source and destination servers
- Hardware redundancy achieved by using Owl's High Availability data diode
- Continuous and simultaneous backfill



Owl High Availability Architecture



OT-to-Cloud Use Case



Step 1 - OPTS logs into the Source PI System via PI Trust Authentication

Step 2 - OPTS queries Source PI System and pulls the PI Tag List, Tag Attributes, Digital States and Digital Names

Steps 3A - OPTS pulls the Destination Cloud PI System database obtaining PI Tag List, Tag Attributes, Digital States and Digital Names

Step 3B - OPTS synchronizes the Source and the Destination Cloud PI System by adding/deleting/updating tags

Step 4 - Once the Destination Cloud PI System is built and synchronized, Snapshot data begins to flow

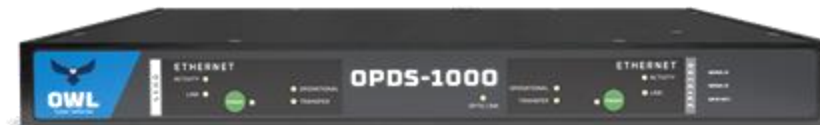
Step 5 - During run time, the OPTS Historical Backfill feature continuously cycles historical data and passes it the Destination Cloud PI System

Step 6 - The Destination Cloud PI System replaces data missing from any unplanned network outage or interruption, ensuring data is never lost



How Can We Help?

- **UNDEFEATED for over 20 years**
- We specialize in defending networks – we've been enabling critical networks to share data and communicate with untrusted networks
- With a defense that strong, you can have the assurance that your critical network is secured, while still being able to connect externally
- Our customers have told us that even when they are under attack, they can sleep peacefully knowing they are protected, unlike other areas of the organization





OWL Cyber
Defense

Contact Us!

www.owlcyberdefense.com

Dennis Lanahan, VP of Commercial Markets

dlanahan@owlcyberdefense.com

Visit us at booth #4

AVEVA

Questions?

Please wait for the microphone.
State your name and company.



Please remember to...

Navigate to this session in the mobile app to complete the survey.



Thank you!

This presentation may include predictions, estimates, intentions, beliefs and other statements that are or may be construed as being forward-looking. While these forward-looking statements represent our current judgment on what the future holds, they are subject to risks and uncertainties that could result in actual outcomes differing materially from those projected in these statements. No statement contained herein constitutes a commitment by AVEVA to perform any particular action or to deliver any particular product or product features. Readers are cautioned not to place undue reliance on these forward-looking statements, which reflect our opinions only as of the date of this presentation.

The Company shall not be obliged to disclose any revision to these forward-looking statements to reflect events or circumstances occurring after the date on which they are made or to reflect the occurrence of future events.

 [linkedin.com/company/aveva](https://www.linkedin.com/company/aveva)

 [@avevagroup](https://twitter.com/avevagroup)

ABOUT AVEVA

AVEVA is a global leader in industrial software, sparking ingenuity to drive responsible use of the world's resources. The company's secure industrial cloud platform and applications enable businesses to harness the power of their information and improve collaboration with customers, suppliers and partners.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. With operations around the globe, we are headquartered in Cambridge, UK and listed on the London Stock Exchange's FTSE 100.

Learn more at www.aveva.com