



**ENERO**  
solutions



# CIBO Virtual Committee Meeting

Navigating the Modern Challenges of Interconnectivity,  
Remote Monitoring and Cybersecurity: Practical Use  
Cases

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2024-02-06

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Enero Solutions

Fend Incorporated

# Partners for industrial cybersecurity



## 35 engineers

- Main Office in Montreal, Canada / Lyon, France / Texas, USA

## Industrial Process / Control Optimization

- Process Control Optimization / APC
- Energy Audit and Optimization
- Process Design Optimization
- High Fidelity Process Simulation (Digital Twin )
- Power Generation (Biomass, Waste to Energy, Gas, etc), Pulp and Paper, Chemical, Petro-Chemical, Mine and Metals, Oil & Gas etc.

## Software Development

- Industrial Data Solutions
- Partnership with Fend for cyber secure solutions.
- Data Acquisitions, Analysis and Control Loop tuning software



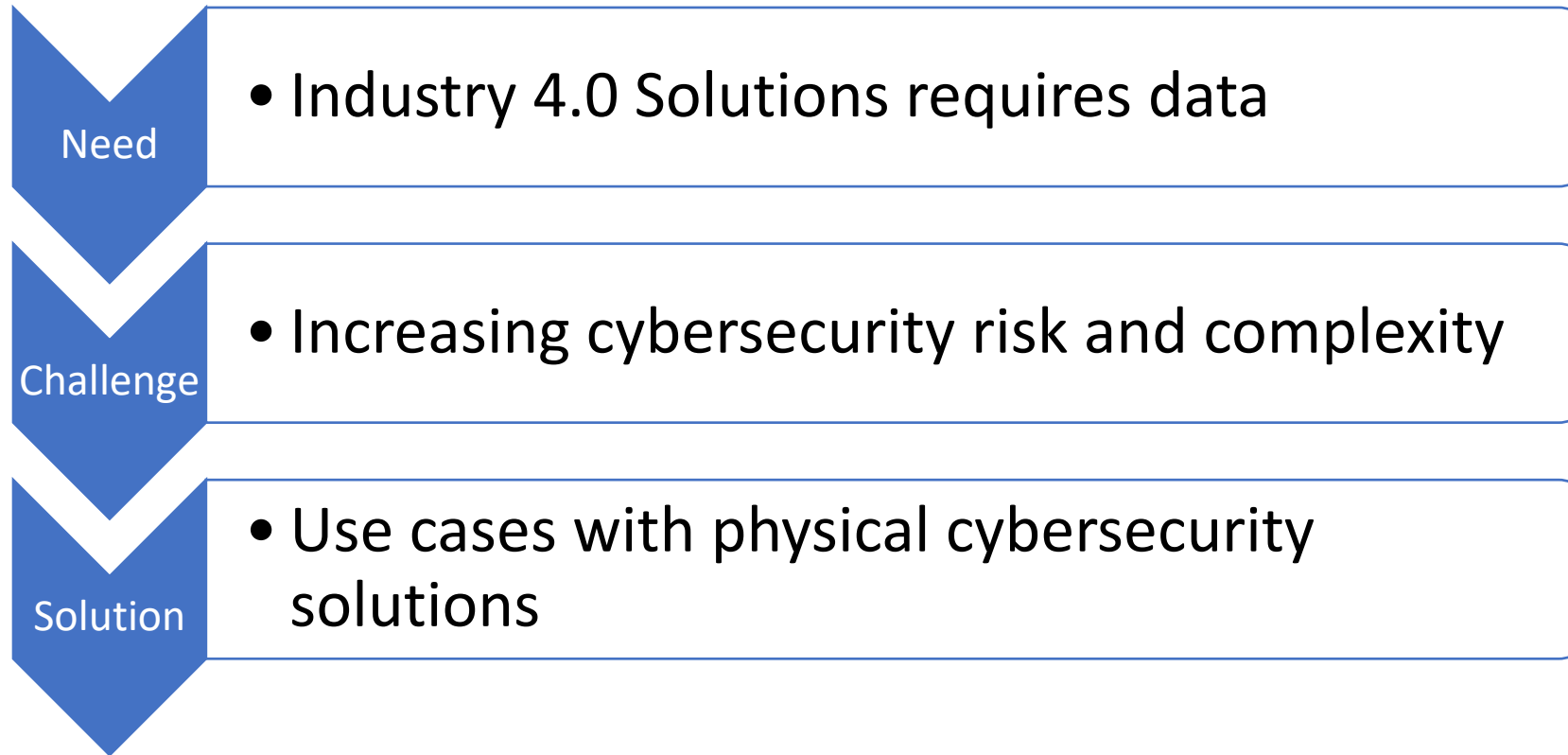
## Fend Protects Customers in Key Industry Sectors Across 12 Countries Today

- OT/IT Segmentation
- Engine room telemetry
- Advanced Plant & Asset monitoring (Utilities, DoD)
- Internal Network Security Monitoring (INSM)
- System Health Reporting

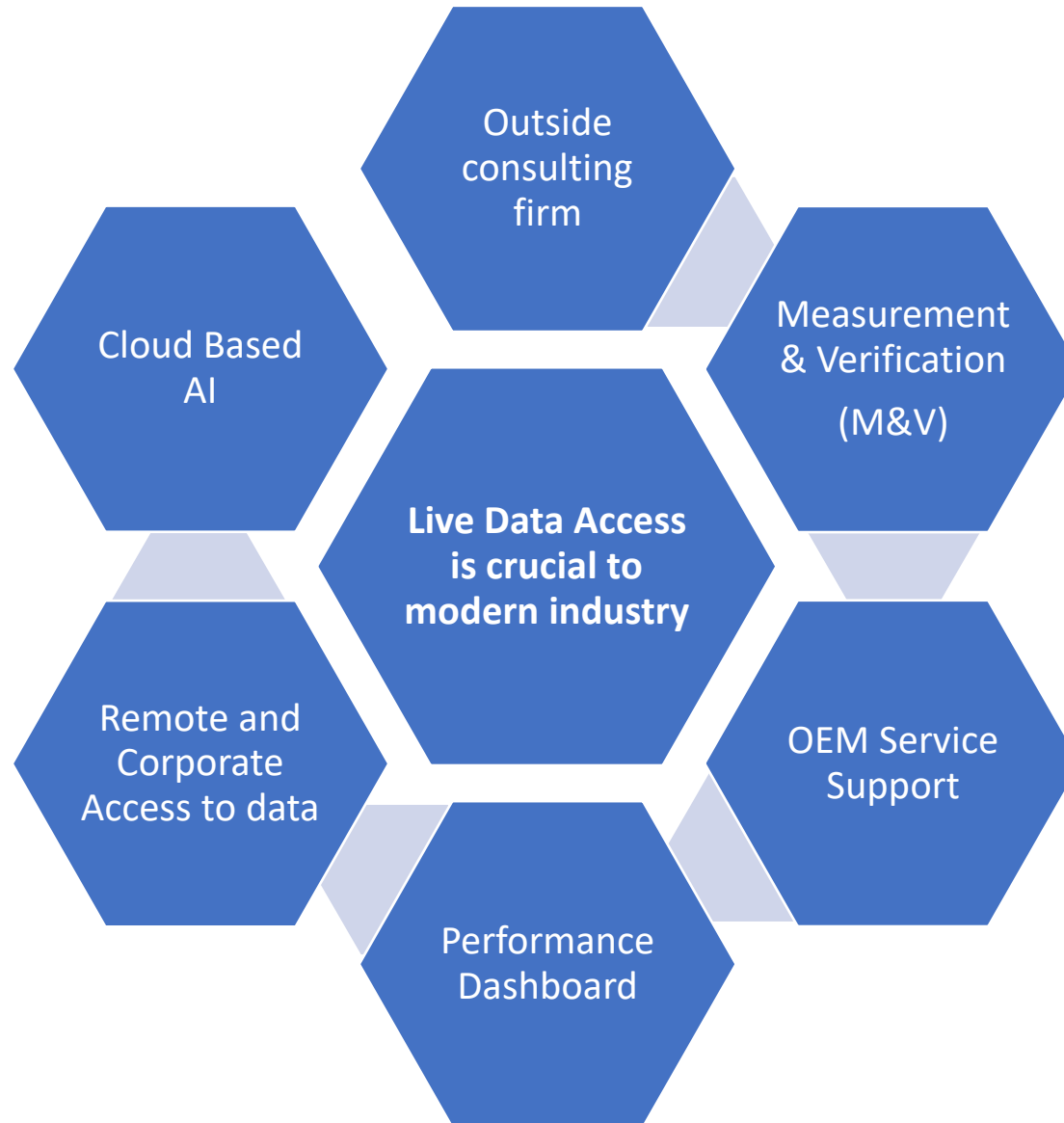
Campus Energy, Manufacturing (Digital twins), Water Infrastructure, Oil & Gas, Energy, Maritime, Research, Defense



# Overview




# Industry 4.0 need for data



# Challenge: Increasing Cybersecurity Risk.

Live Data requires constant connection link from the OT / Control network.



Increasing number of cyber attacks in the industrial sector



Increased risk with legacy system



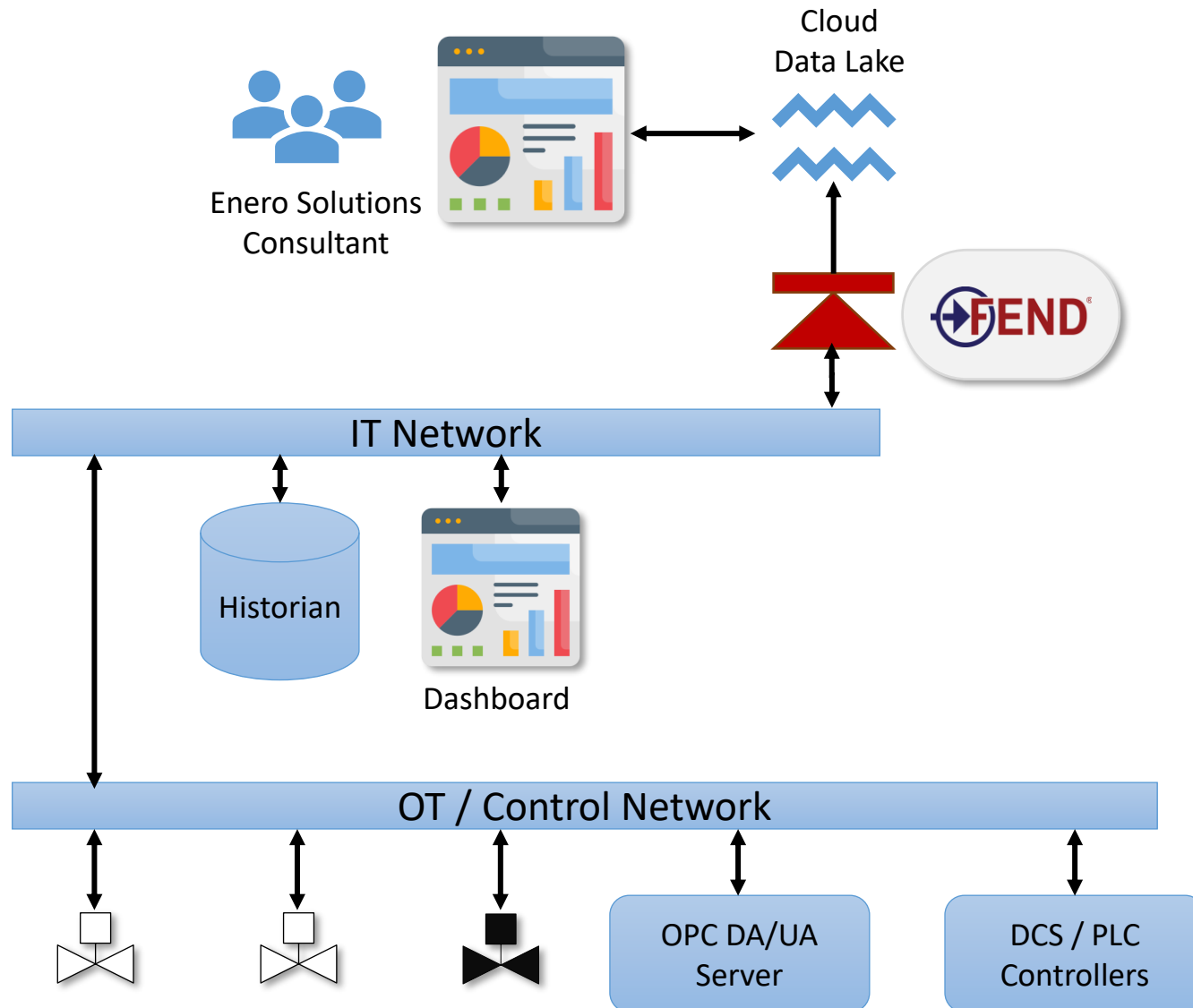
Rapidly evolving cybersecurity requirements



Internal / Corporate IT Policy, significantly reduces capacity to provide live data stream

# Use Case #1 : Steelmaking Industry

Remote access to data by specialized consultant



## Need

Client recently implemented an advisory energy dashboard for their steam cogeneration system and required remote support to assist them in implementing requested action from the dashboard. Client can potentially reduce natural gas usage by 8MM\$ per year.

## Challenge

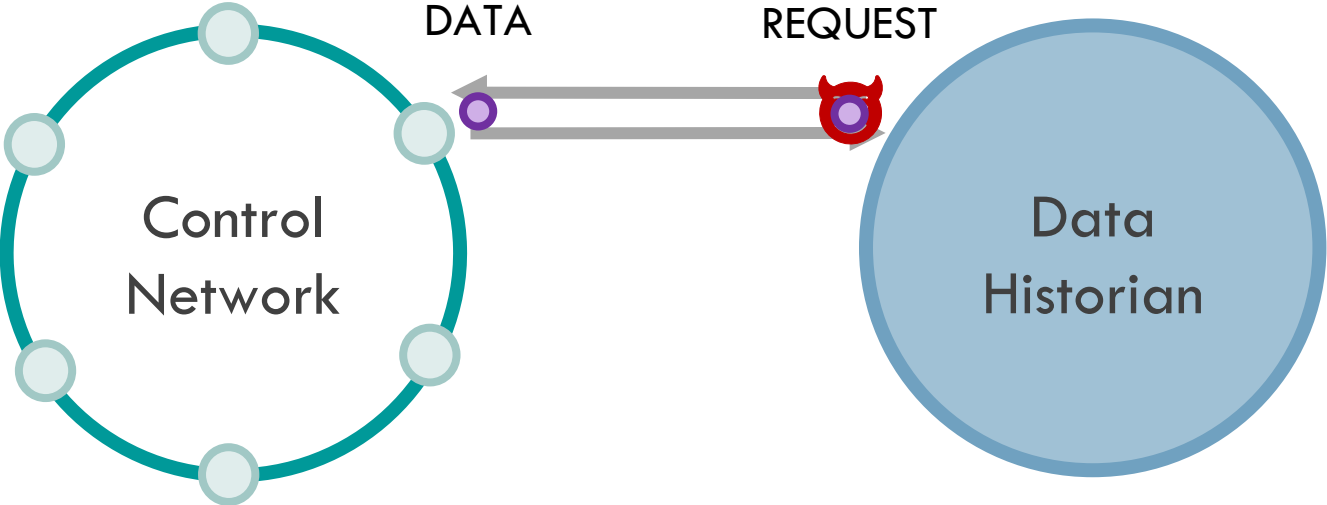
IT Policy does not allow remote connection outside of the corporation.

## Solution

A data diode was installed on their IT network, physically isolating this connection against outside threats. Data is read from the Historian OPC UA server and sent to an Influx Cloud database. Dashboard is replicated in the cloud application, so that Consultants can remotely support operations.

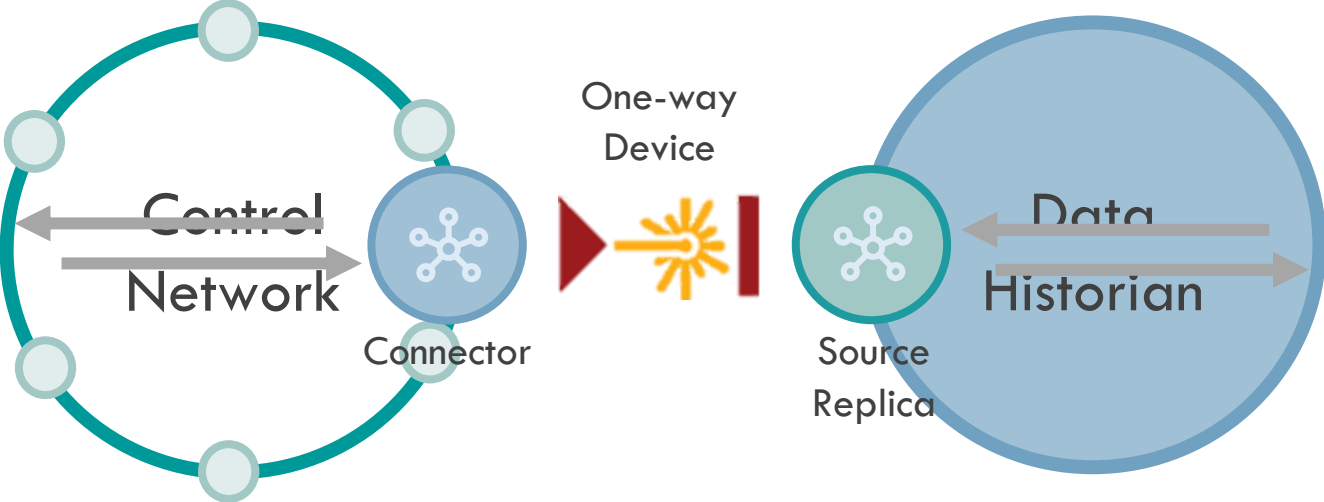
# Common Problem

Typical Bi-directional Communication



# Solution

## Physically Secure Solution

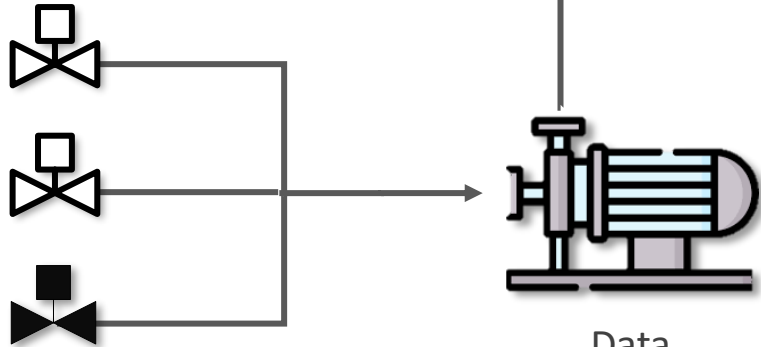




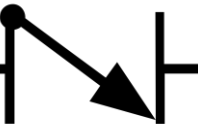
# Solution

## Physically Secure Solution

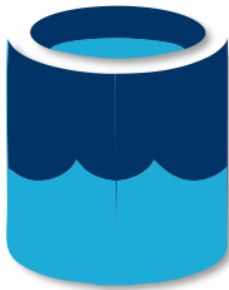
Data Streams



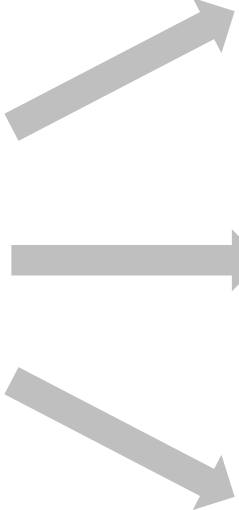
Data Pump



One-way Device



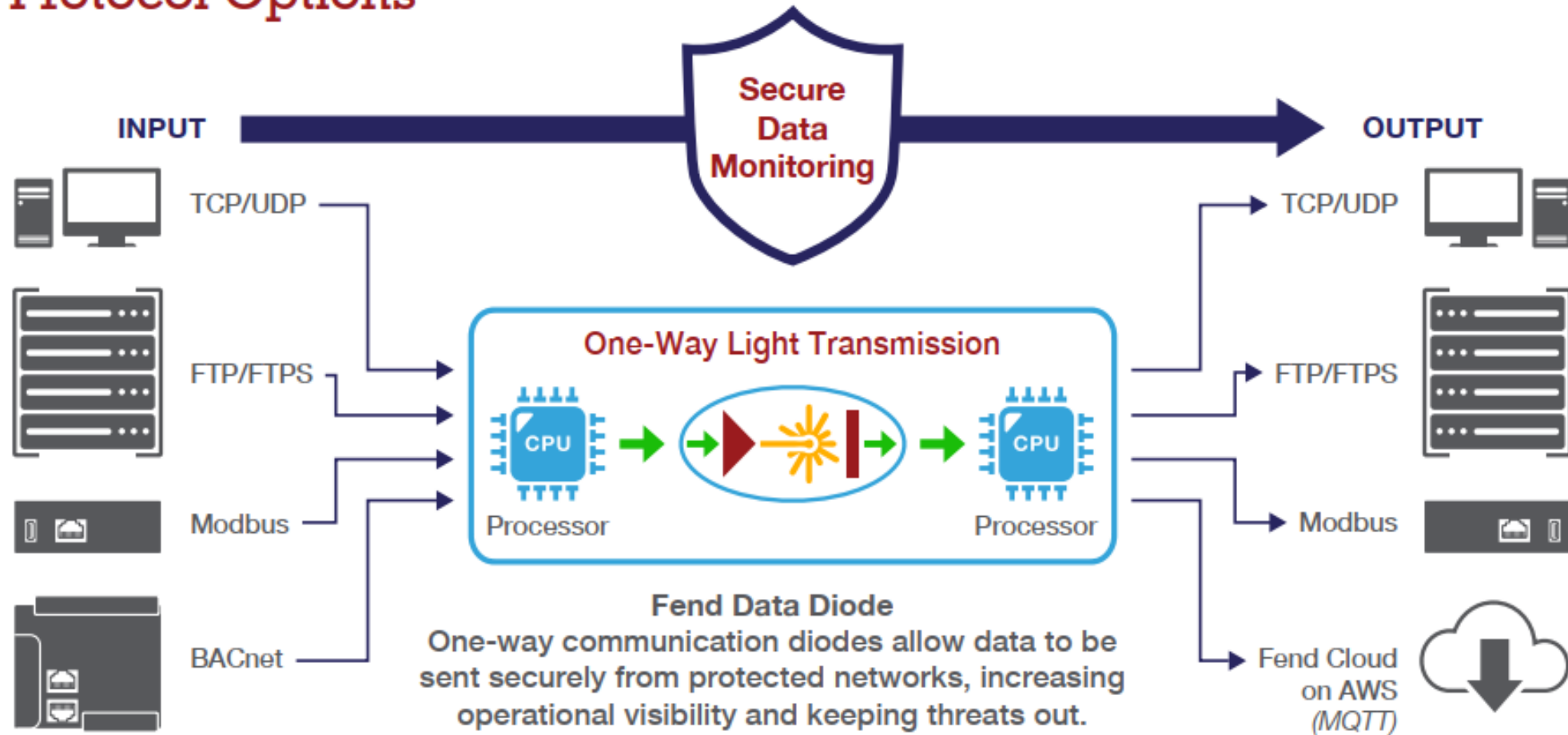
Read-Only Data pool



# Fend Data Diode

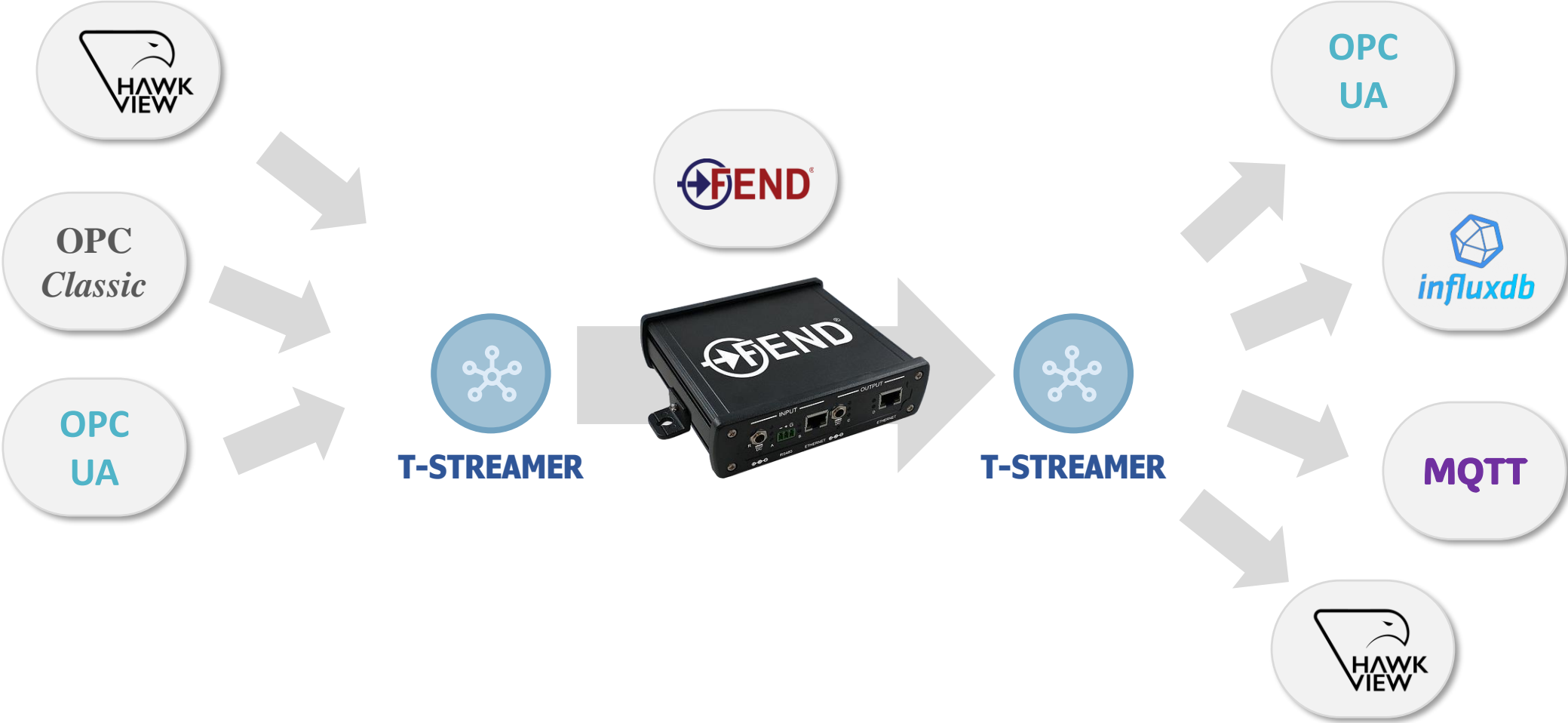
Physically Cybersecure

## Protocol Options



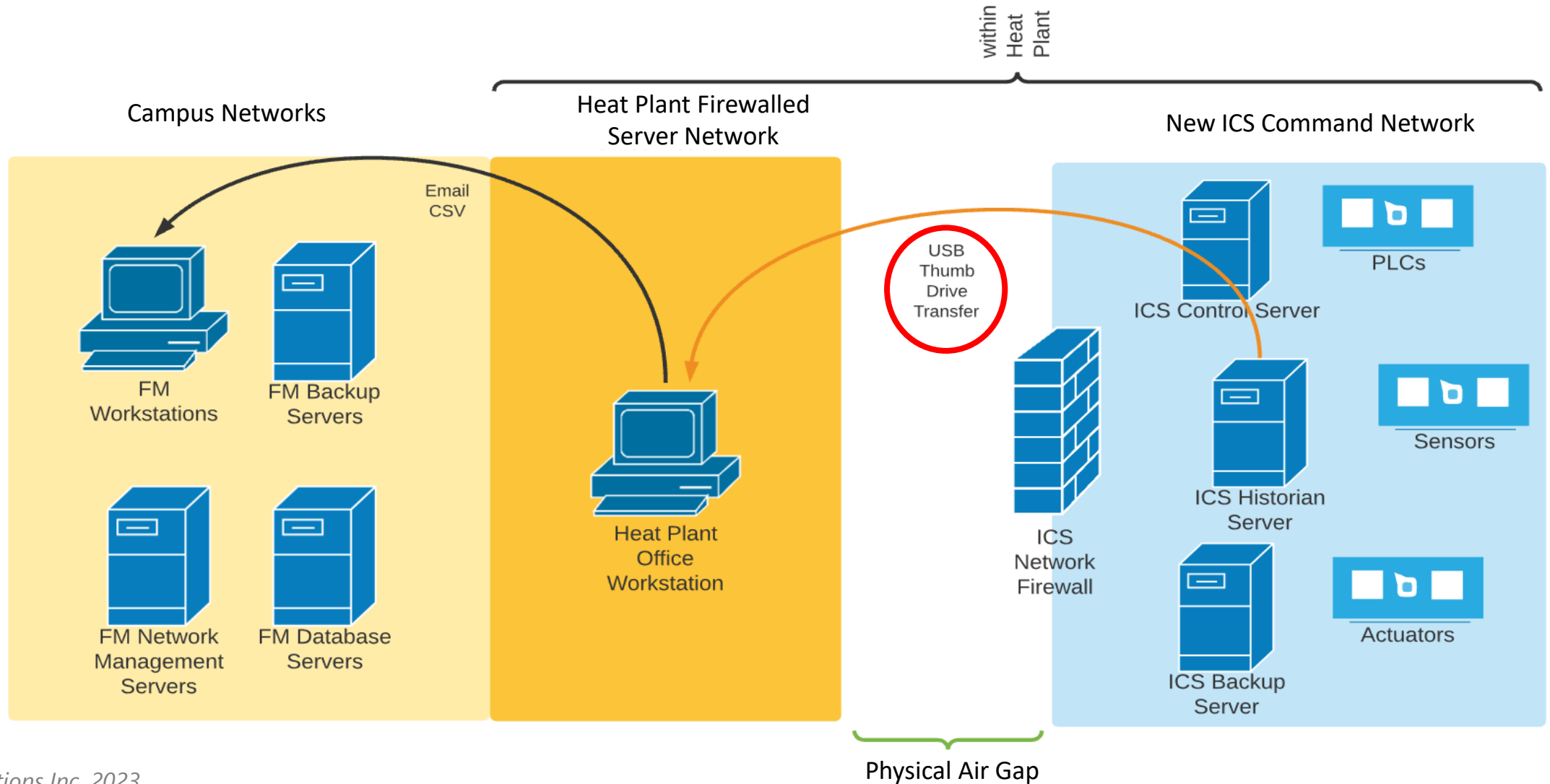
# Enero Solutions Cyber Secure T-Streamer

## Connectivity Options



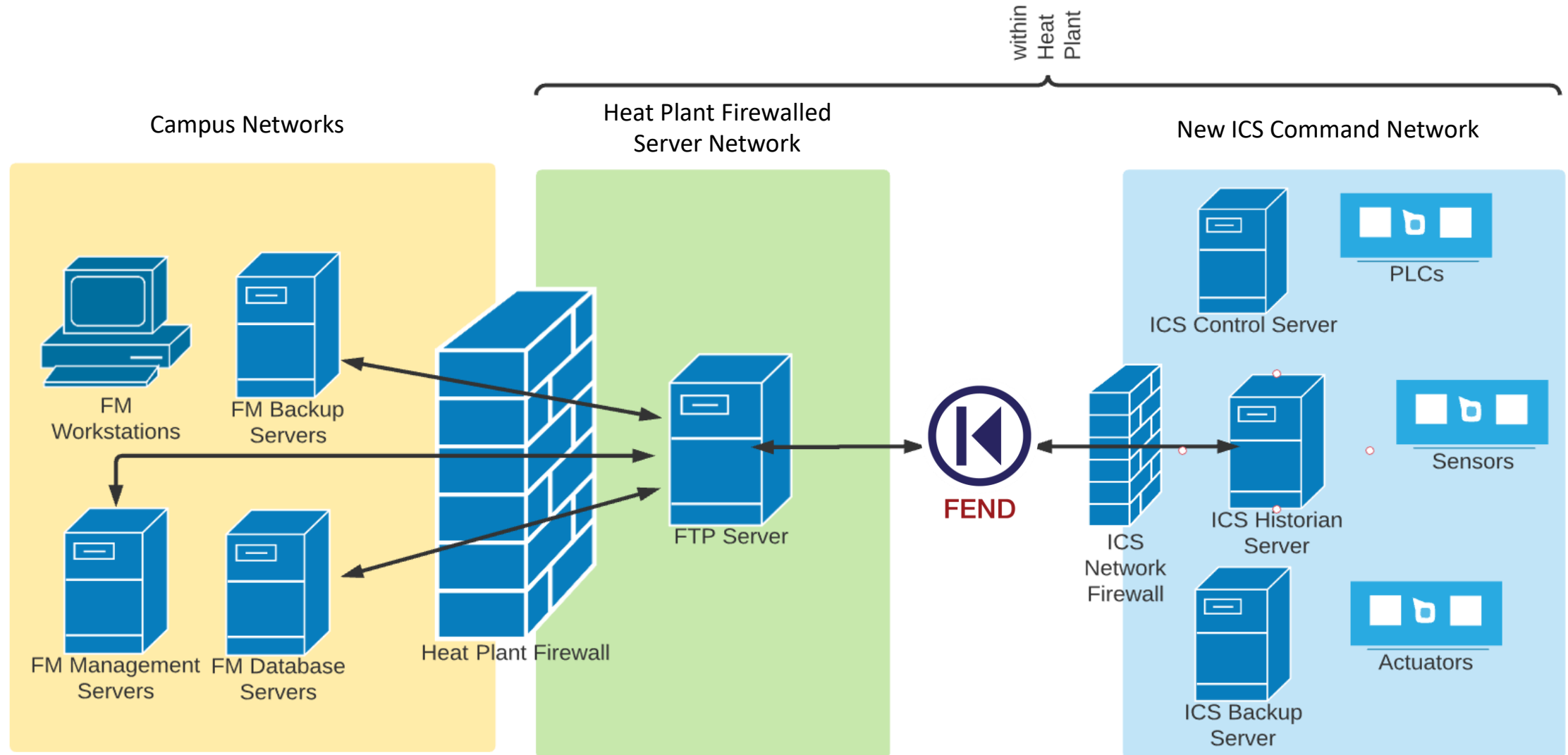
# Use Case #2: University Heat Plant

Original Oversimplified Network Topology: Heat Plant **New ICS** Data Transfer



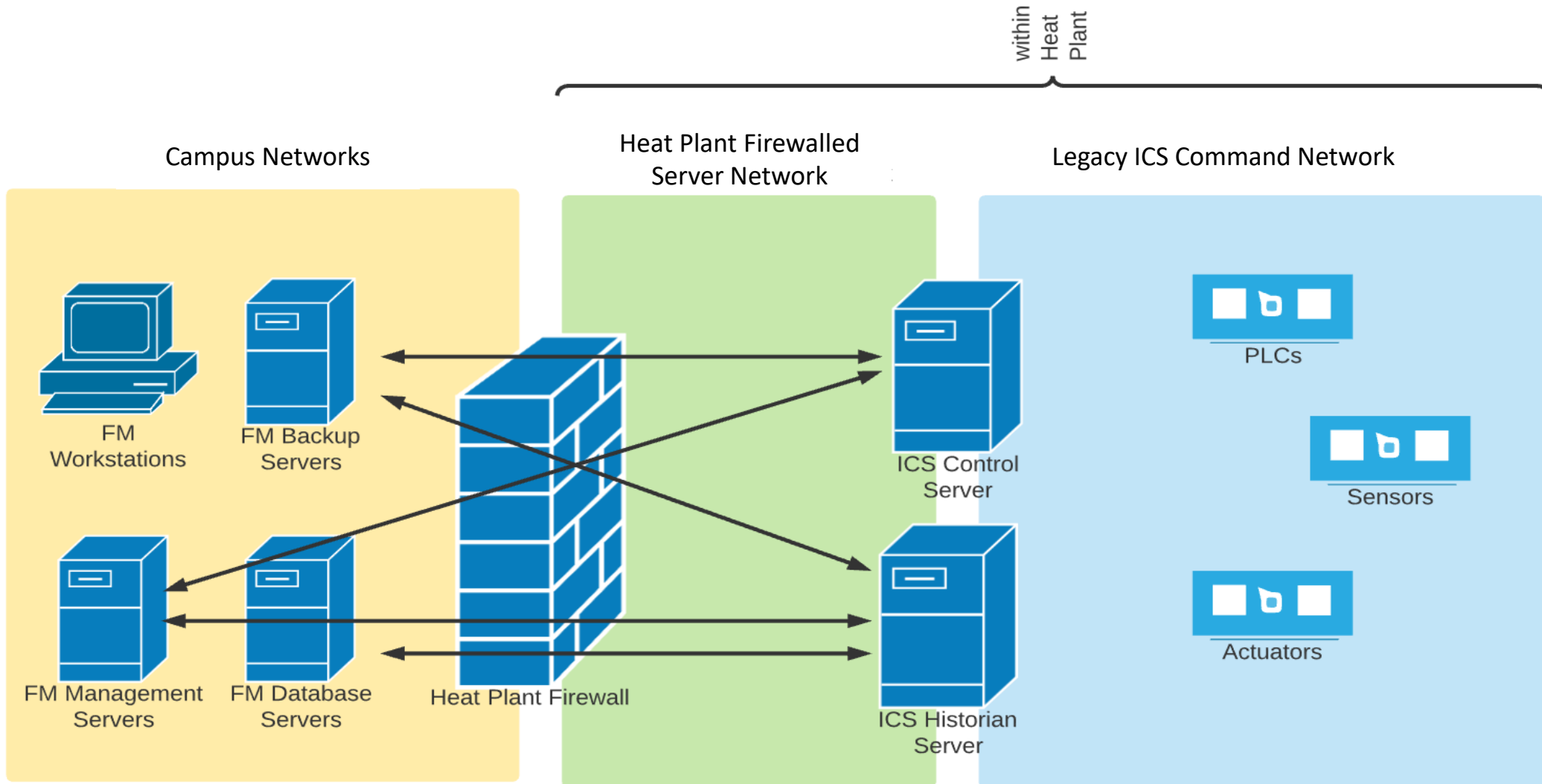
# Use Case #2: University Heat Plant

New Oversimplified Network Topology: Heat Plant **New ICS** Data Transfer



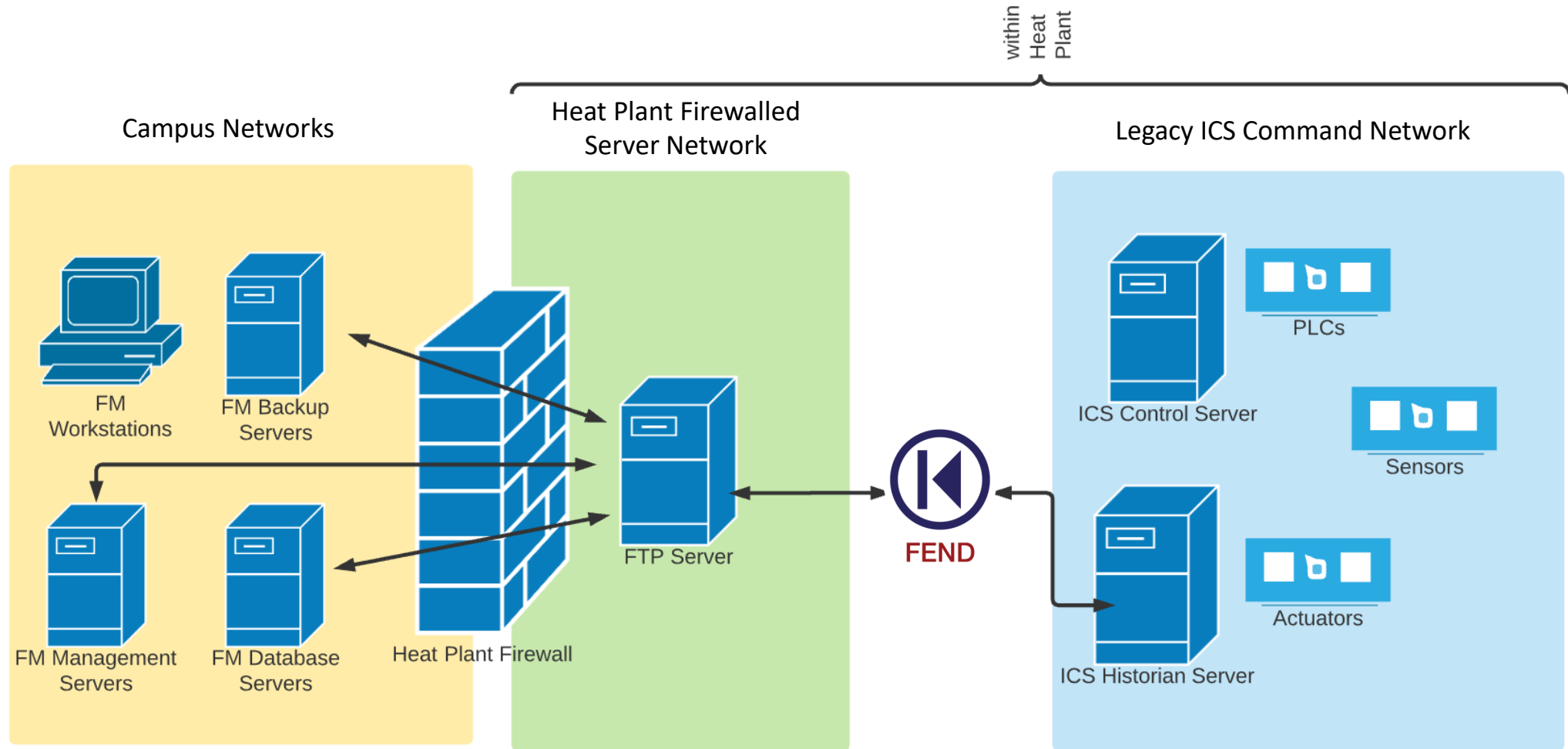
# Use Case #3: University Heat Plant Legacy Equipment

Original Oversimplified Network Topology: Heat Plant **Legacy ICS** Data Transfer



# Use Case #3: University Heat Plant Legacy Equipment

New Oversimplified Network Topology: Heat Plant Legacy ICS Data Transfer



# Use Case #4: Corrugated Box Plant, Quebec

Isolate Control (OT) Network from Business (IT) Networks

## Need

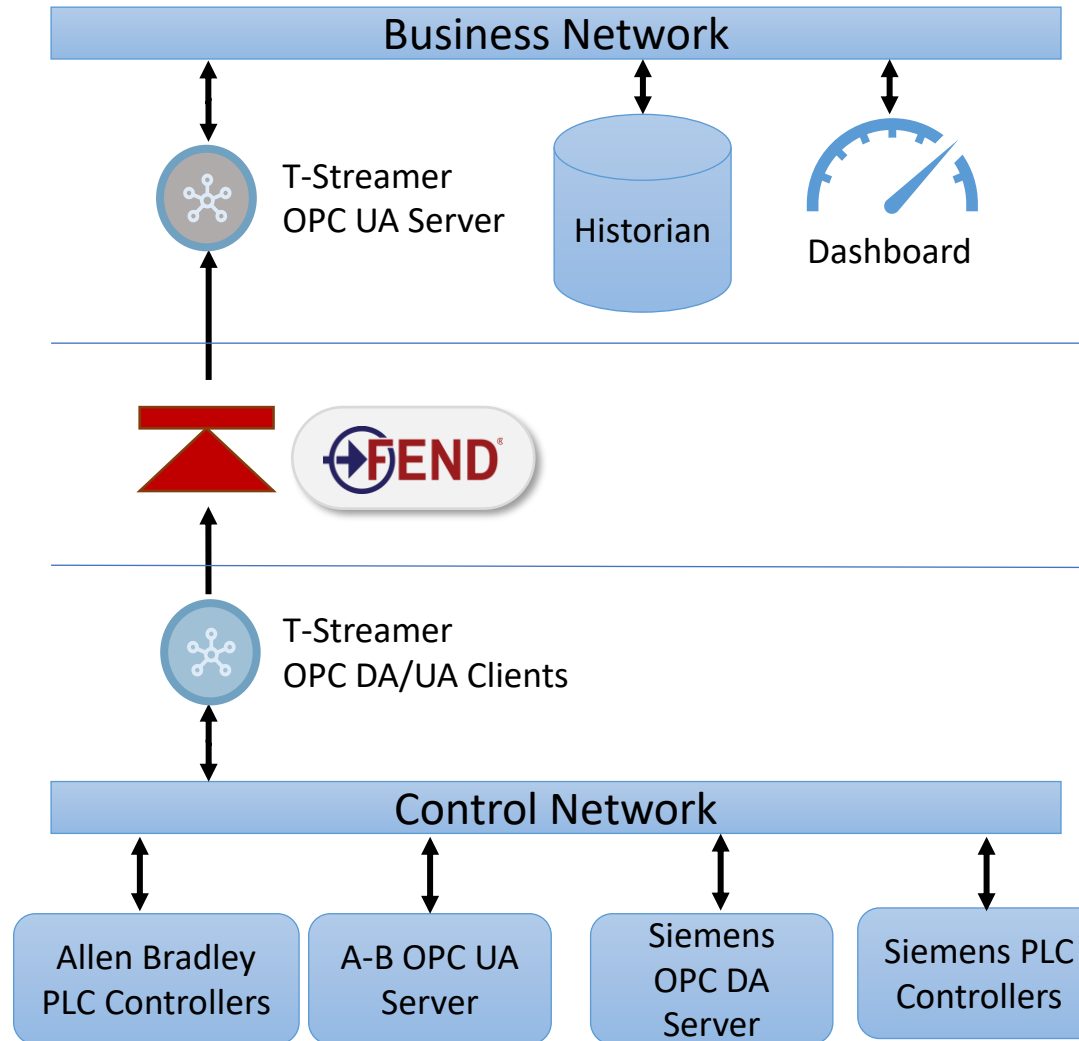
Equipment was purchased from many vendors without data aggregation or historical data collection capability.

## Challenge

Legacy System.  
Very limited IT capability on-site.  
Corporate IT policy were very limiting, and resources were not available for support.

## Solution

Use a data diode in order to collect the information from the different equipment.  
Mill Manager and Process Control Engineer were able to challenge corporate IT.



## Business Network

Vulnerable

Hosts an internet access point to allow communication with outside sources

## Data Diode

Prevents bad actors from accessing the Control Network

## Control Network

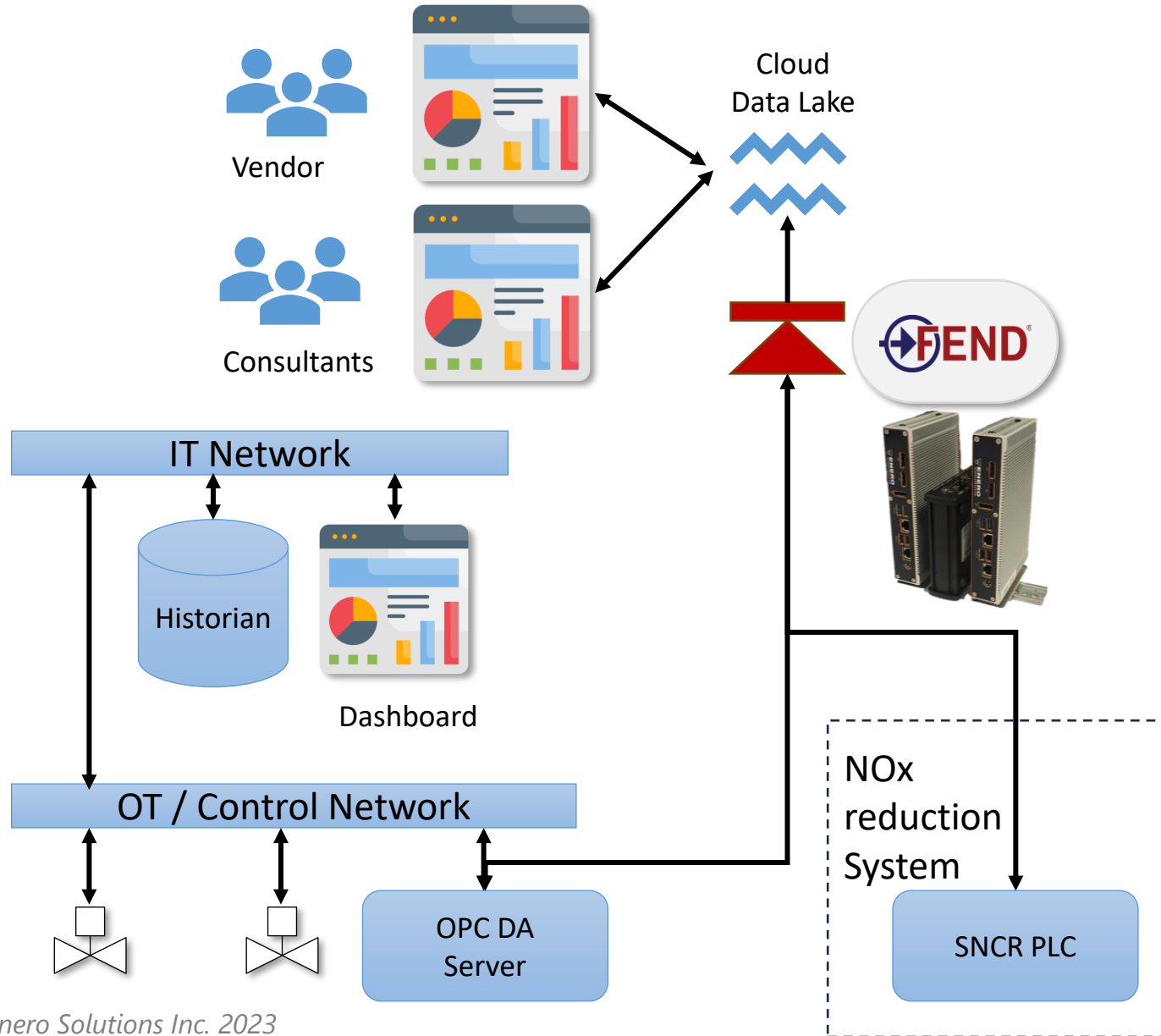
Secured

Communication between the Control Systems and the OPC DA/UA server.



# Use Case #5 : Biomass Power Generation / SNCR Skid

Remote access to data by equipment vendor / outside consultant



## Need

Client recently installed a NOx reduction system. System came on a skid, not integrated with the rest of the DCS architecture. Availability was lower than expected, but issues could not be replicated during site visit. Vendor required data in order to further help the client.

## Challenge

IT Policy does not allow remote connection outside of the corporation and other operating data must not be shared with vendor.

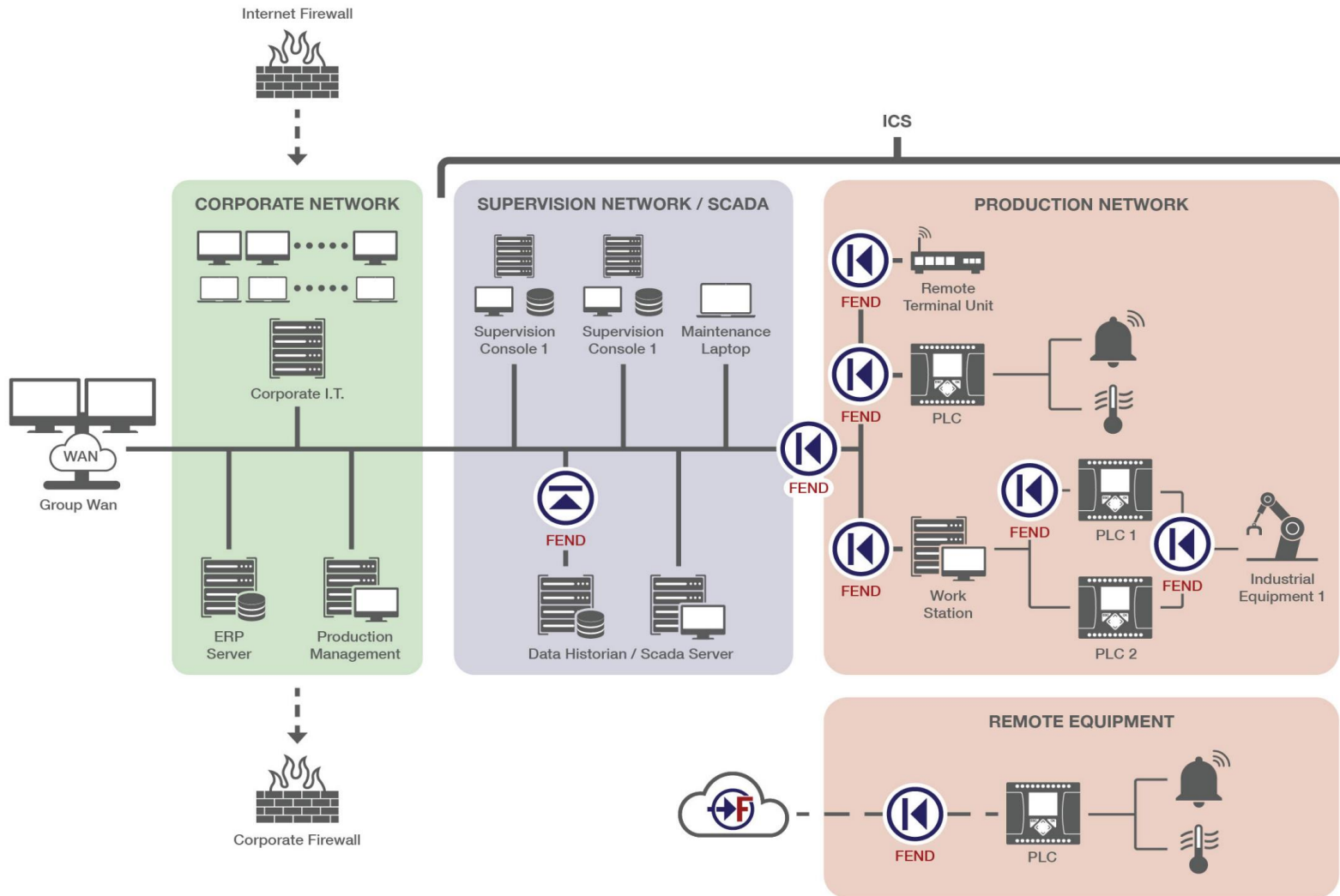
## Solution

A data diode was installed on the system's PLC and data was sent to a cloud data lake available to the Vendor and other outside consultant hired by the client. Some relevant data was also read from the site DCS OPC Server.

Only a specific subset of data was available to the Vendor and the outside consultants.

# Example:

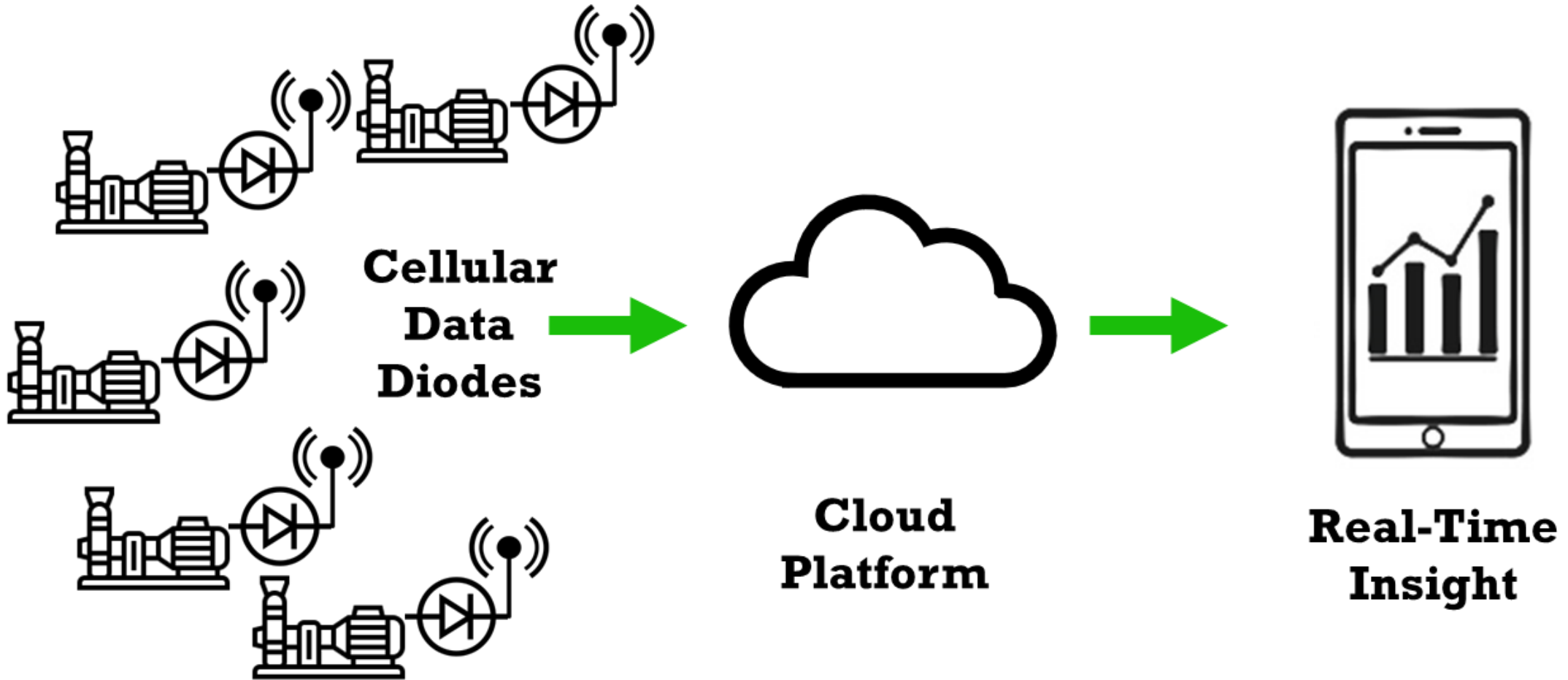
Potential data diode use case in an Industrial Control System (ICS)



**Physically  
isolate networks  
or key  
equipment**

# Example:

Send Telemetry with Data Diodes to Cloud-based analytics platform



# Q & A Session



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