FEND®
Physically Block Cyberattacks

Secure Monitoring of Real-Time Turbine Performance with Data Diodes

An electric utility that provides electricity to 3 million customers across nine states in the U.S. needed to receive real-time data from a set of power turbines in a secure fashion.
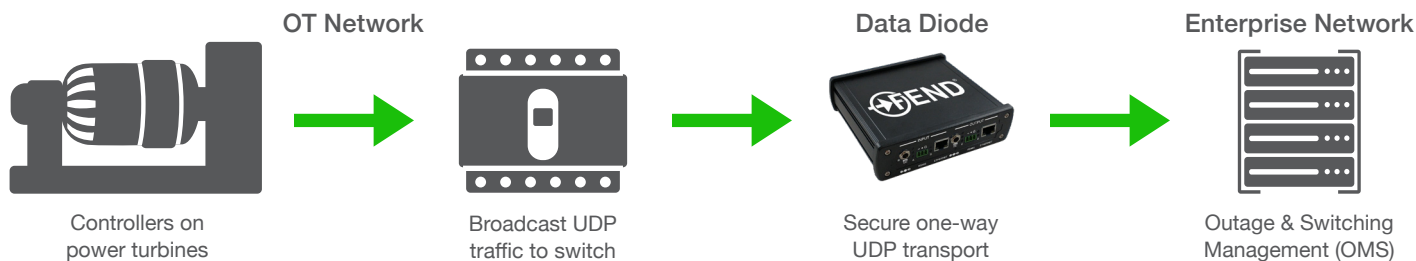
However, the turbines sent their real-time data as broadcast UDP which was being blocked by the utility's firewall. For security reasons, they didn't want to make a firewall exception for this kind of traffic. Doing so could leave systems vulnerable to broadcast amplification attacks and decrease network efficiency. Similarly, circumventing the firewall was not an option without a dedicated hardware alternative that could be installed to keep these critical assets secure.

By adding a Fend data diode in their network topology between the site's central switch and the Outage & Switching Management (OSM) system, broadcast UDP traffic received from each turbine could be securely forwarded to the OSM system in a physically enforced one-way fashion, all without upgrading any of their existing equipment for compatibility. Today, the utility is able to receive operational data from the turbines in real time without compromising their security from remote threat vectors.

Since Fend data diodes cost only a fraction of traditional data diode offerings, fit easily in any equipment cabinet, are easy to configure, and require little-to-no maintenance, this solution makes for a highly scalable and affordable solution for secure visibility of energy assets.

How it Works

- The turbines forward data to every IP address on the subnet in broadcast UDP mode via a switch.
- The input side of the Fend data diode is connected to the switch and configured as a UDP server on the same subnet.
- The input side of the data diode receives the UDP broadcast traffic and forwards it across the internal one-way optical isolation to the output side of the diode.
- The output side of the data diode, acting as a UDP client on the same subnet as the target OSM UDP server, sends UDP traffic directly to the IP address of the target server. Data gets to its destination and nothing gets back into the protected equipment.

OT Network		Data Diode	Enterprise Network
Controllers on power turbines	Broadcast UDP traffic to switch	Secure one-way UDP transport	Outage & Switching Management (OMS)

Best Practice:
Improving Industrial Control System Cybersecurity with Defense-in-Depth Strategies

The US Department of Homeland Security recommends the use of data diodes for the protection of energy infrastructure. In some sectors, like nuclear energy, use of data diodes is required by the Nuclear Regulatory Commission (NRC). Fend's data diodes are an easy-to-deploy and cost-effective way to both comply with requirements and improve security. Learn More