Pervasive Data Collection at the Edge

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Agenda

- Introduction
- Edge Data Store
- Lighthouse Program
- OSIsoft Adapters
- Conclusion

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Seamless Infrastructure

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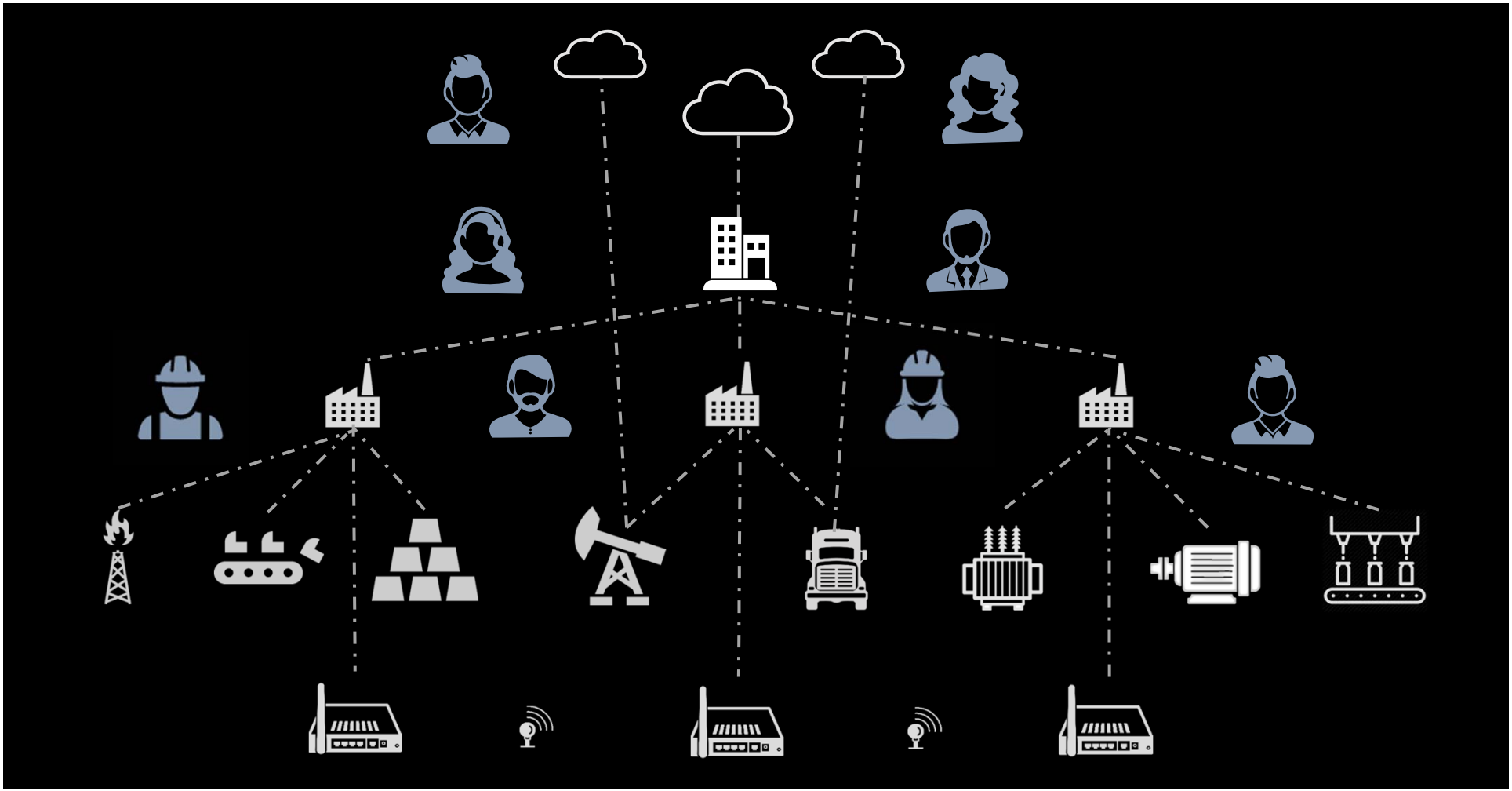

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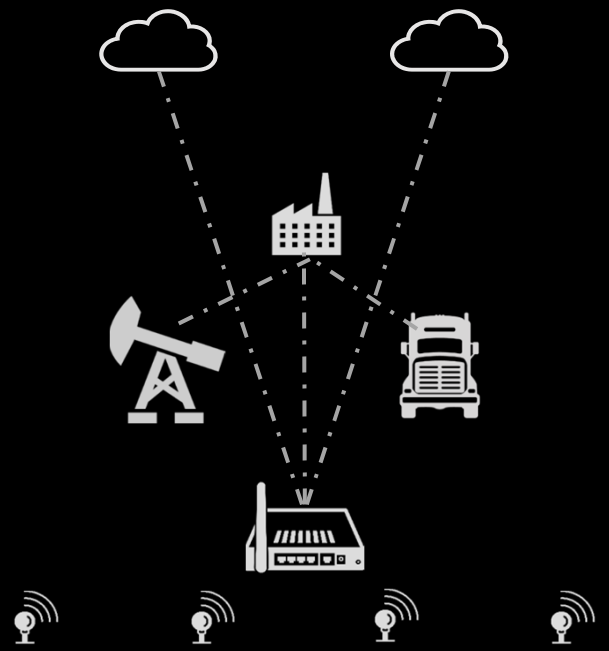
Edge



- Expanding operational datasets
- Enabling asset intelligence at the edge

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Glossary (TLA = Three Letter Acronyms)

- EDS = Edge Data Store
  - Learn more in this presentation!
- OCS = OSIsoft Cloud Services
  - A managed set of platform as a service (PaaS) and software as a service (SaaS) functionalities that extends OSIsoft's operational data infrastructure to the cloud.
  - Learn more about OCS in these PI World SF 2020 presentations:
    - *OSIsoft Cloud Services PaaS & Partner Applications*
    - *Enabling Data Science for the Enterprise with OSIsoft Cloud Services*
    - *Enable Remote Operations Monitoring with OSIsoft Cloud Services Visualization*
- OMF = OSIsoft Message Format
  - A specification that defines a message structure that is used to generate and send data to OSIsoft systems (EDS, OCS and PI Servers)

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Edge Data Store

- Persistent Storage
- Self-Healing Capabilities
- Application Platform

- Cross Platform (Windows, Linux)
- Multiple Data Ingress Options
- Analytics Ready
- Egress to PI Server and OSIsoft Cloud Services
- Developed, Sold, and Supported by OSIsoft

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EDS is unlike a PI Interface / PI Connector

- **Persistent data** available for visualization and edge analytics
- Data transfer options to **optimize bandwidth**

EDS is unlike a PI Server

- Runs **lean**: lightweight, minimal installation and configuration
- Provides **temporary storage**, not a system of record

EDS is

- Supported on **small** hardware and **multiple platforms** *e.g. Linux OS*
- **Resilient**: Self-heals and resumes operations after disruptions

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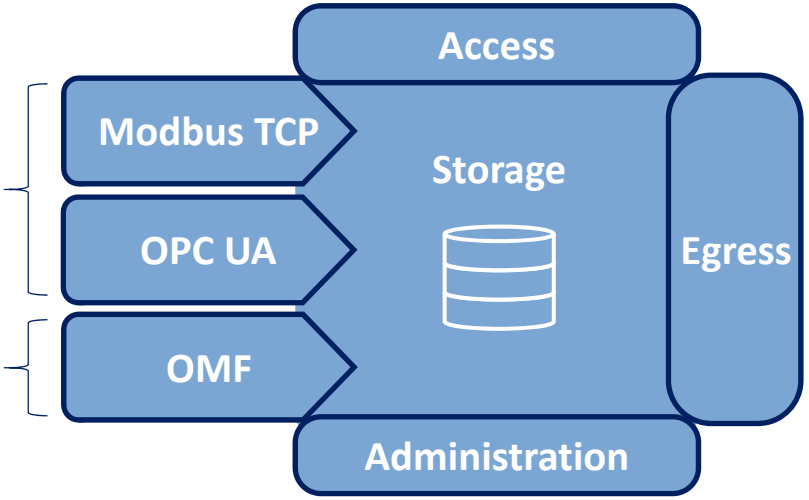
EDS Capabilities (initial release)

Storage
- Inbound data persisted in data store
- Configurable data stream limits

Access
- Read / write access via EDS API



Inbound Data
- Standard connectivity
- Custom connectivity

Egress
- Data transfer to PI Server and OCS
- Configurable data selection and transfer rates
- Data compression on transfer

Administration
- Simplified management
- Scalable installation and configuration

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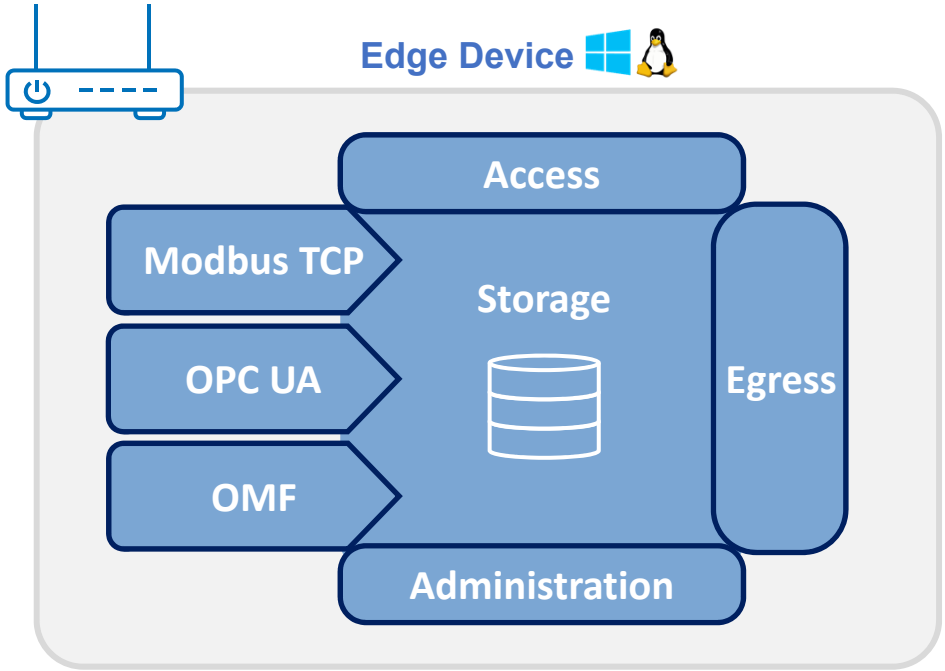
EDS Hardware Compatibility



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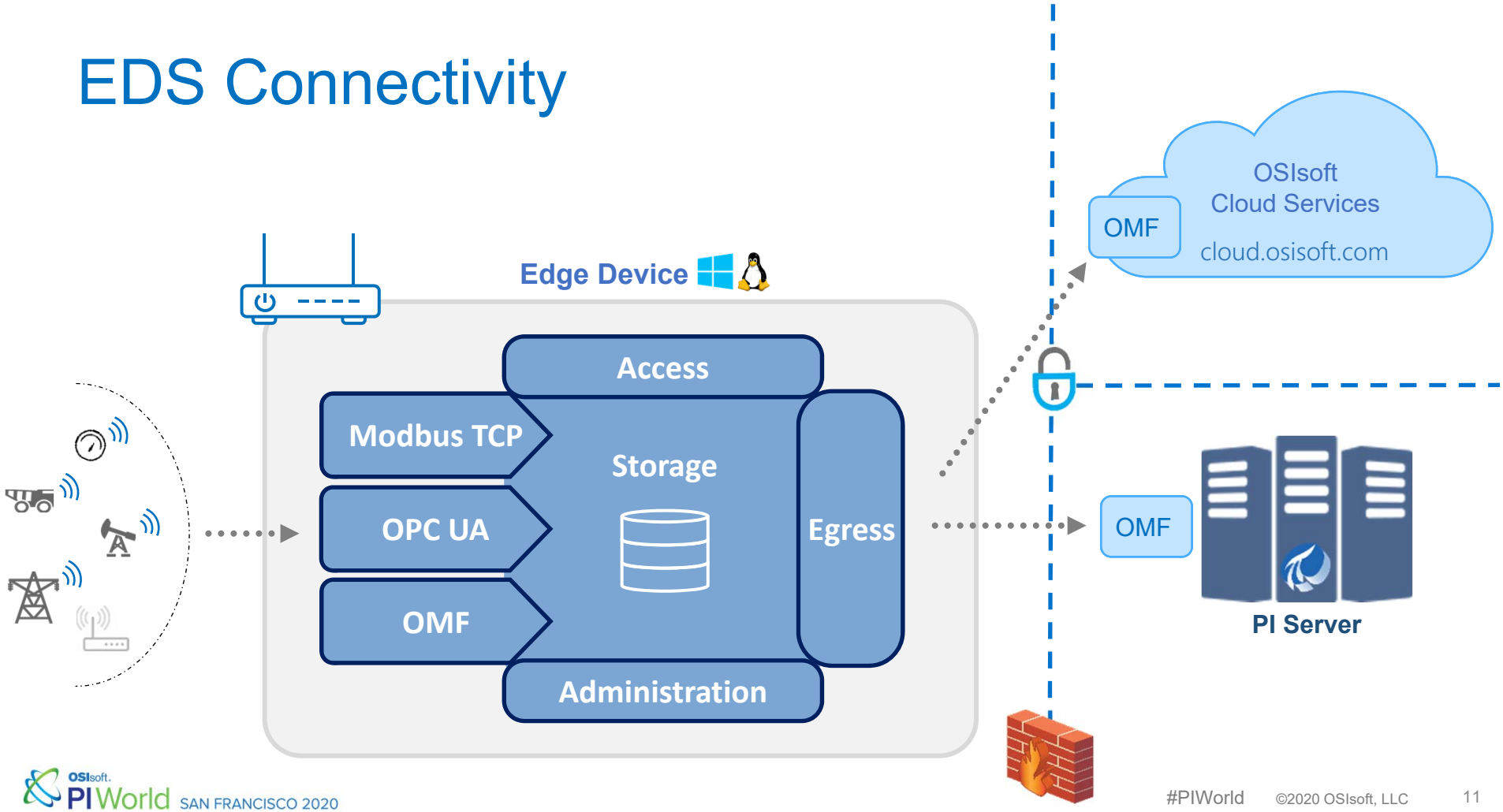
EDS Connectivity



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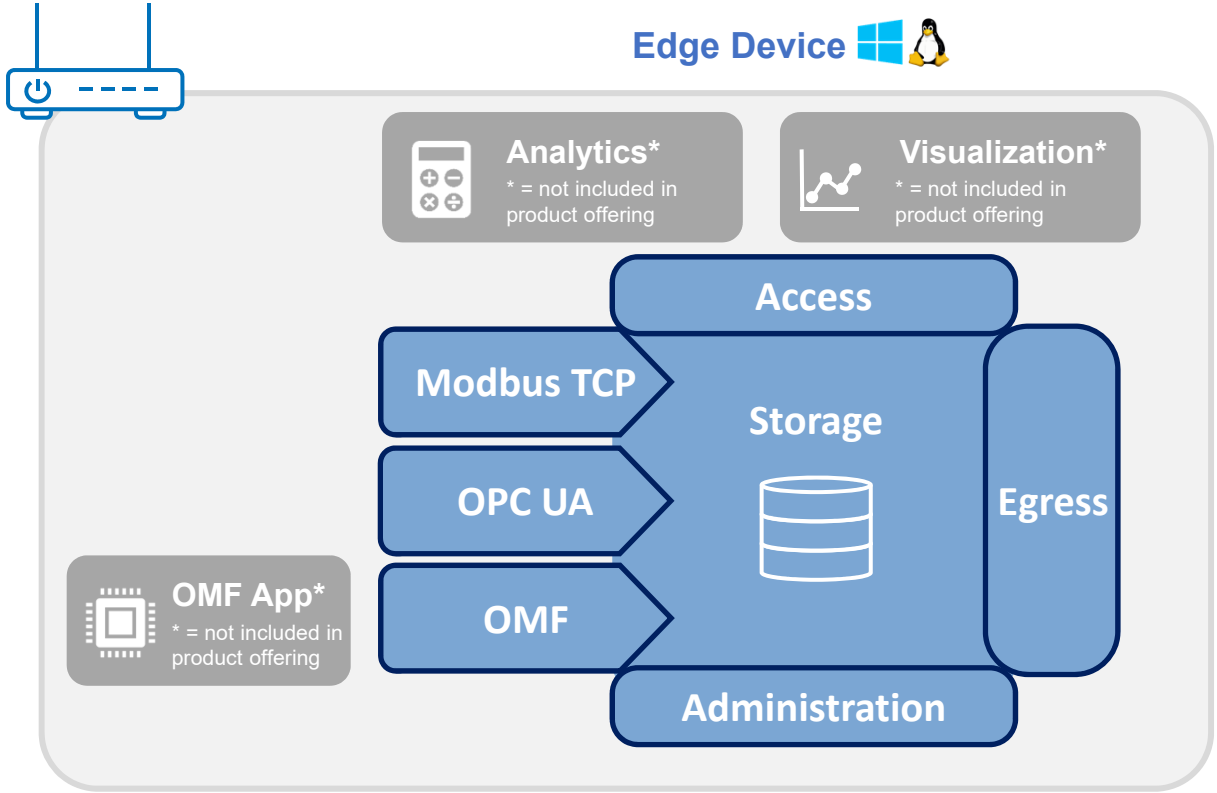
EDS Application Development



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Hardware Specs and License Sizing

Operating Systems:
- Linux Debian 9 or later
- Linux Ubuntu 16.04 or later
- Windows 10 IoT Enterprise
- Docker Container

CPU:
- Intel x64, Linux & Windows
- ARM 32, Linux & Windows
- ARM 64, Linux

- Solid State Drive (SSD) recommended for data storage
- Maximum data collection frequency = 60 Hz

SMALL
- License: up to 50 data streams or 50 events / sec
- Hardware: e.g. 1 core CPU, 0.5GB RAM

MEDIUM
- License: up to 500 data streams or 500 events / sec
- Hardware: e.g. 2 core CPU, 2GB RAM

LARGE
- License: up to 3,000 data streams or 3,000 events / sec
- Hardware: e.g. 4 core CPU, 4GB RAM

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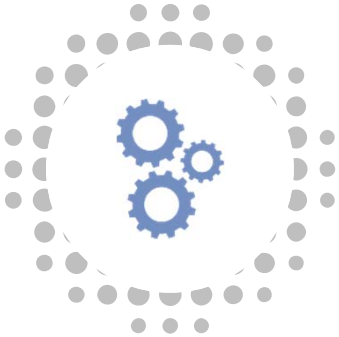
Emerging Data Patterns

Less Critical Assets

Previously cost prohibitive, but possible with IoT

Mobile Assets

Moving in and out of connectivity



Edge Analytics

Enables local decision making

Increased Revenue

New business models and service offerings

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EDS Lighthouse Asset Examples

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OSIsoft Edge Data Store – Roadmap

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Developing Now

Additional Data Connectivity
More inbound data connectivity options using OSIsoft Adapters

Remote Management
Installation, configuration and administration from a remote, centralized location

Considering Next

Additional Data Connectivity
More inbound data connectivity options

Researching Future

Calculations

Trending Experience

Stream Metadata

Last Updated: 2020-03

Roadmap themes: Manageable Systems | Seamless Infrastructure | Increased Value & Scope of Data

OSIsoft's Product Roadmap is for INFORMATIONAL PURPOSES ONLY and is SUBJECT TO CHANGE.

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OSIsoft Lighthouse Program

A hands on engagement that provides the participant with early access to unreleased OSIsoft software to help solve an identified business or operational problem and provides OSIsoft with valuable feedback on this software

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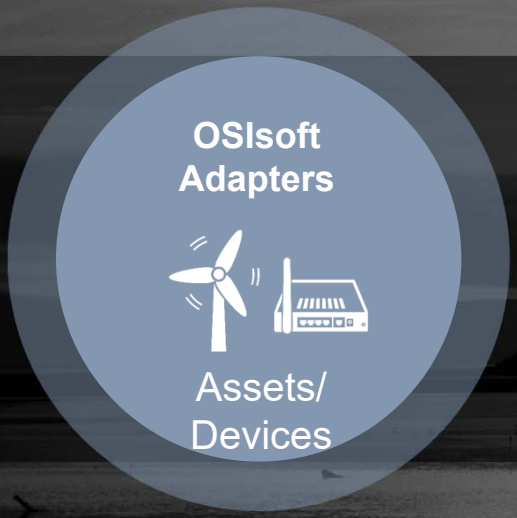
OSIsoft Adapters



Cross Platform

Lightweight Footprint

Ready Off-The-Shelf

- Windows and Linux device interoperability
- Robust data collection (Data Buffering)
- Scalable architecture
- Connectivity to Edge Data Store, PI Server and OSIsoft Cloud Services
- Sold, and Supported by OSIsoft

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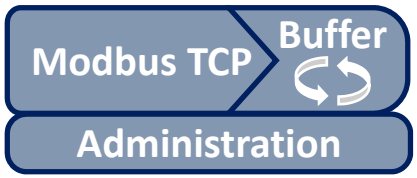
Adapter Capabilities (initial release)

In Development

Data Transfer
- PI Servers, OCS and EDS
- Data filters

Inbound Data
- Common industrial protocols



Buffering
- Overcome network and system disruptions

Administration
- Simplified management
- Scalable installation and configuration

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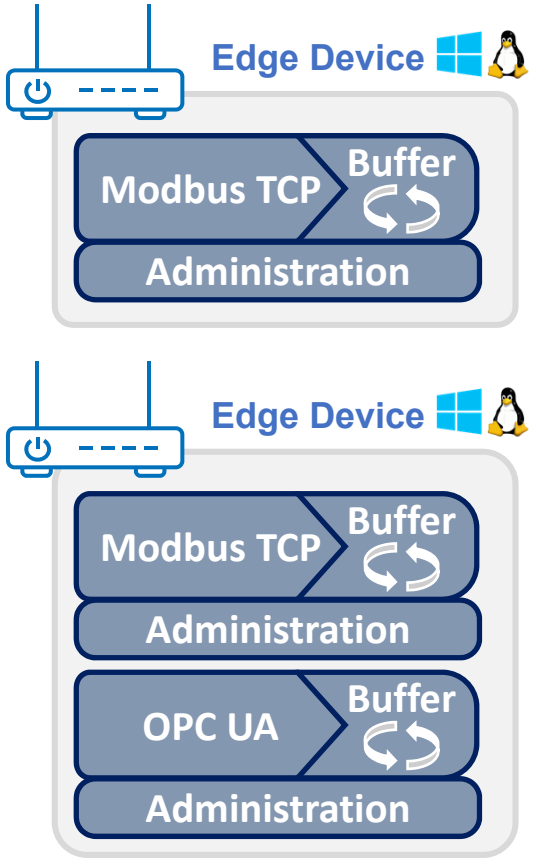
Adapter Hardware Compatibility



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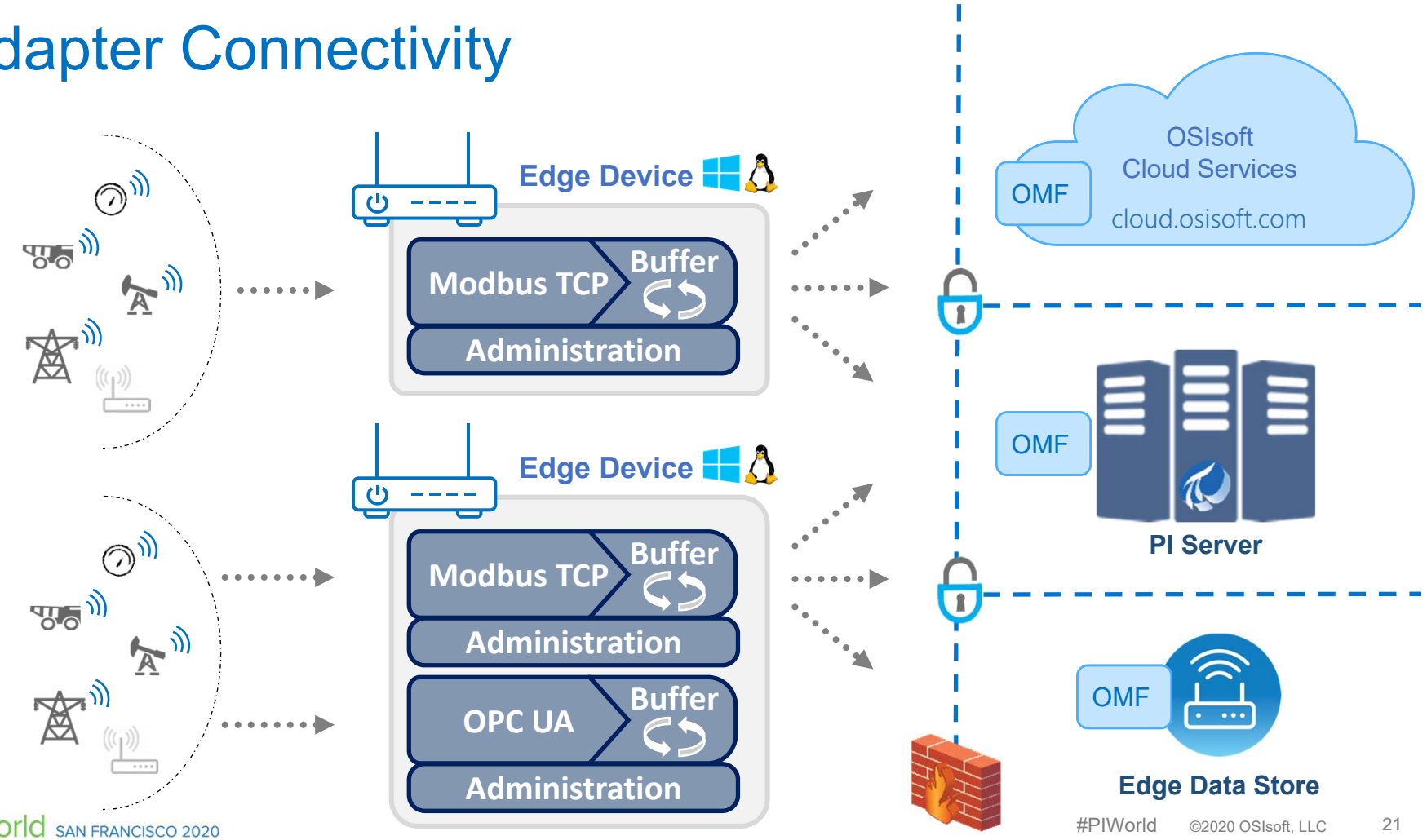
Adapter Connectivity



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OSIsoft Adapter – Roadmap
(integrated in the Connectivity Roadmap)

Developing Now

Lightweight & Flexible
Optimized for operation on low powered, lightweight Windows and Linux devices.

Real-time Connectivity
Modbus TCP, OPC UA, DNP3, BACnet.

Multiple Destinations
Data transfer to EDS, PI and/or OCS.

Considering Next

Remote Management
Installation, configuration and administration from a centralized location.

Additional Connectivity
More data source connectivity options.

Failover
Robust data collection and transfer.

Researching Future

Asset Metadata

Additional Connectivity

Available now through the OSIsoft Adapter Lighthouse Program

Roadmap themes: Manageable Systems | Seamless Infrastructure | Increased Value & Scope of Data

OSIsoft's Product Roadmap is for INFORMATIONAL PURPOSES ONLY and is SUBJECT TO CHANGE.

Last Updated: 2019-09

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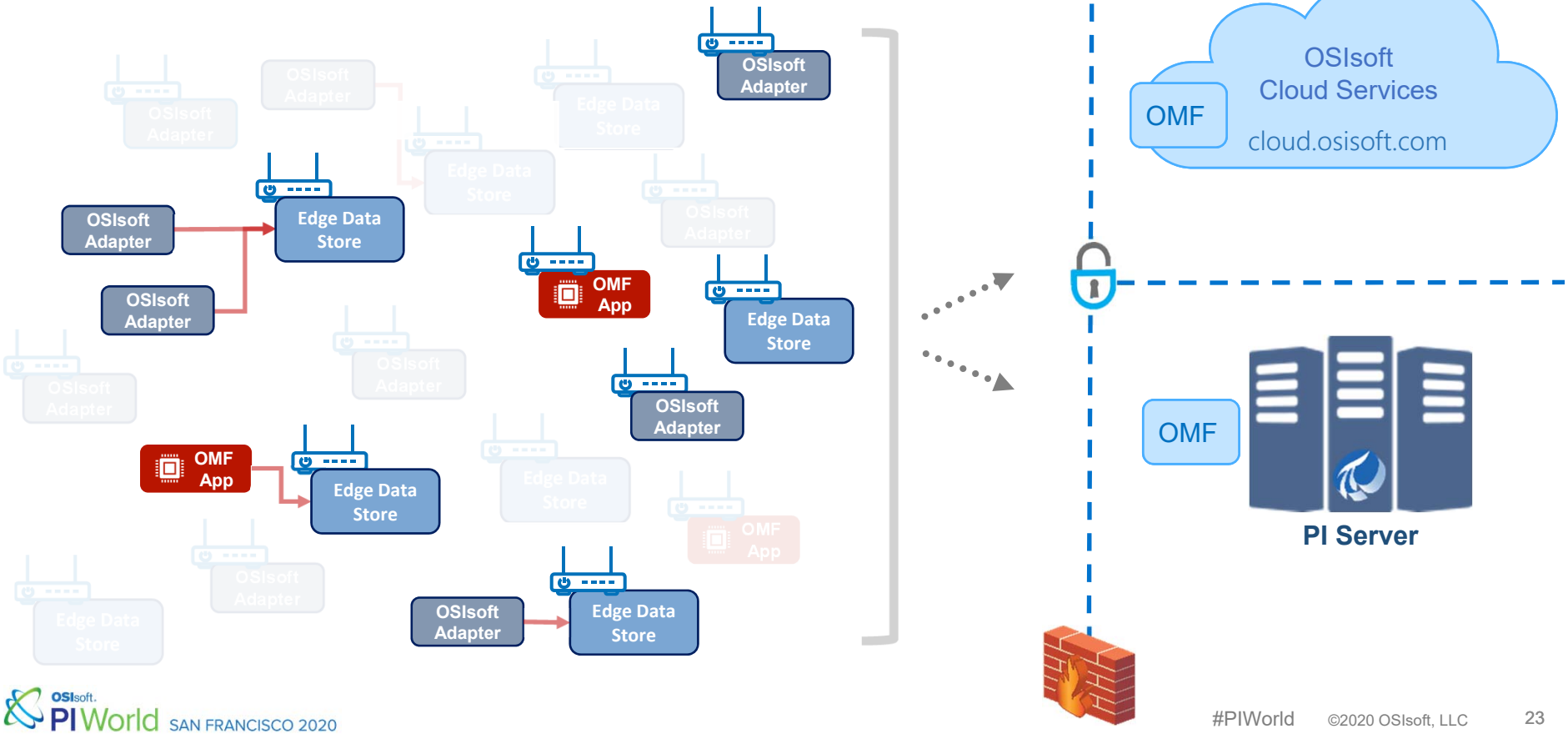
Expanding Operational Data Sets Enabling Asset Intelligence at the Edge



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Resources

- EDS User Guide
  - https://osisoft.github.io/Edge-Data-Store-Docs/V1/
- OSIsoft Adapters User Guides
  - Modbus TCP: https://osisoft.github.io/OSIsoft-Adapter-Modbus-Docs/V1/OSIsoft_Adapter_for_Modbus_TCP_overview.html
  - OPC UA: https://osisoft.github.io/OSIsoft-Adapter-OPC-UA-Docs/V1/OSIsoft_Adapter_for_OPC_UA_overview.html
- Presentations from PI World Gothenburg 2019
  - *Pervasive Data Collection* – a product session that provides an overview of OSIsoft's traditional and edge connectivity options: https://www.osisoft.com/presentations/pervasive-data-collection-1x/
  - *Drilling Red Zone Detection a Journey from Edge to Cloud* – a partner showcase session that describes how EDS is used to improve oil drilling operations: https://www.osisoft.com/presentations/drilling-rig-redzone-detection-a-journey-from-edge-to-cloud/
- Presentations from PI World San Francisco 2019
  - *Gather: Data Connectivity Options for the PI System and the Cloud* – a product track session that details OSIsoft's traditional and edge data connectivity options and includes demos from three EDS early adopter partners: https://www.osisoft.com/Presentations/Gather--Data-connectivity-options-for-the-PI-System-and-the-Cloud/
  - *Edge Analytics with the PI System* – a developer session on the development of analytics and visualization applications with EDS: https://www.osisoft.com/Presentations/Edge-Analytics-with-the-PI-System--EDSx--OSIsoftx
- OMF v1.1 specification
  - https://omf-docs.readthedocs.io/en/v1.1/

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name & company

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AMSTERDAM
October 26-29, 2020

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