EMPOWER YOUR ANALYTICS WITH OPERATIONAL DATA

OSIsoft Technology Update

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01/10/2019

Vision & Strategy

OSIsoft Data Infrastructure

PDC/Edge

Classic PI System

OSIsoft
Cloud Services

Sensors	Assets	Plant	Enterprise	Community
				
Millions of **Smart Devices**	Multiple **Sensors**	Multiple **Assets**	Multiple **Plants**	Multiple **Enterprises**

PI Integrators

What Have We Been Working On?

Manageable System

Seamless Infrastructure

Increased Value & Scope of Data

PI Vision 2019

The Benefits of PI Vision

Easy to Use

Intuitive Interface
Easy to use interface that shortens the learning curve

Dynamic Displays
Displays automatically populate with relevant asset-centric data

Easy Display Navigation
Easily explore and navigate by simply double clicking on symbols

Self-Service

Quick Access to Data
Contextualized data makes it easy for any operator or engineer to quickly find the data they need

Fast Display Building
Quickly build your own displays without waiting on other business groups

Mobile Capabilities
Create, edit, or view displays in any desktop or mobile device browser

Scalable

Reduce Number of Displays
With related assets, simply build a single display and reuse it for other assets with the click of a button

Display Organization
Easily organize and manage your displays using folders

Rapid Deployment and Roll-Out
Easily organize and manage your displays using folders as your organization

PI Vision 2019

PI ProcessBook Migration

Ad Hoc Trending

Streamlined Security for XY Plot and Events Table

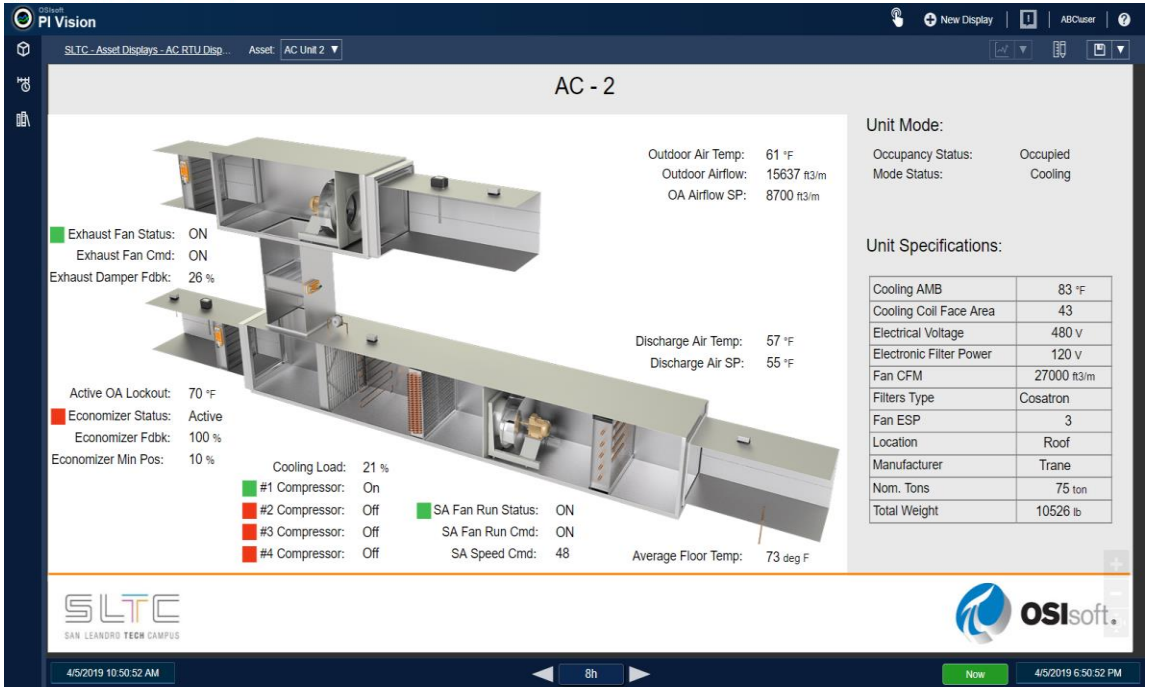
PI ProcessBook Migration

Accelerate your path to the latest visualization tool

Select

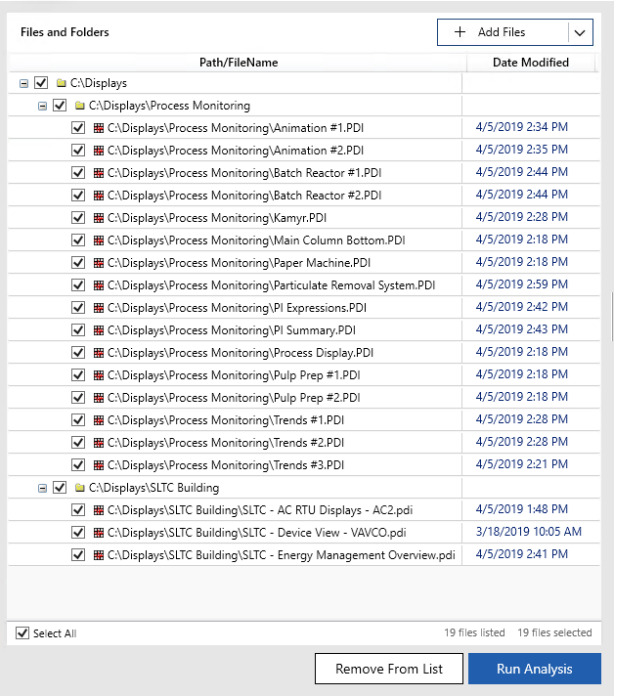
Analyze

Migrate

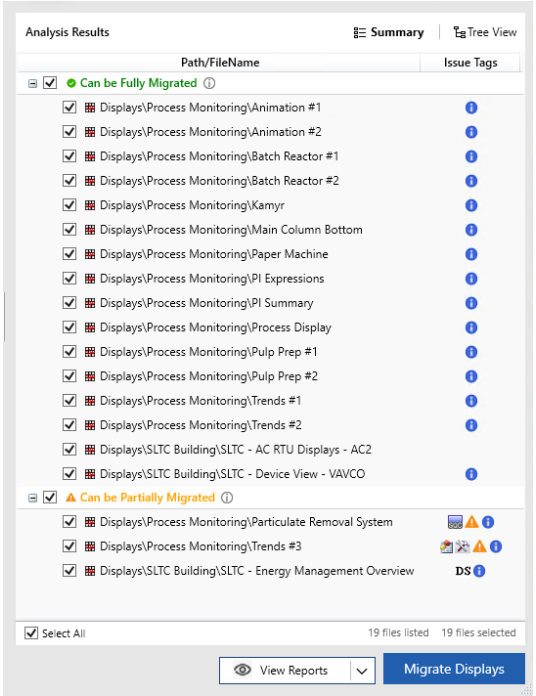


PI ProcessBook Migration

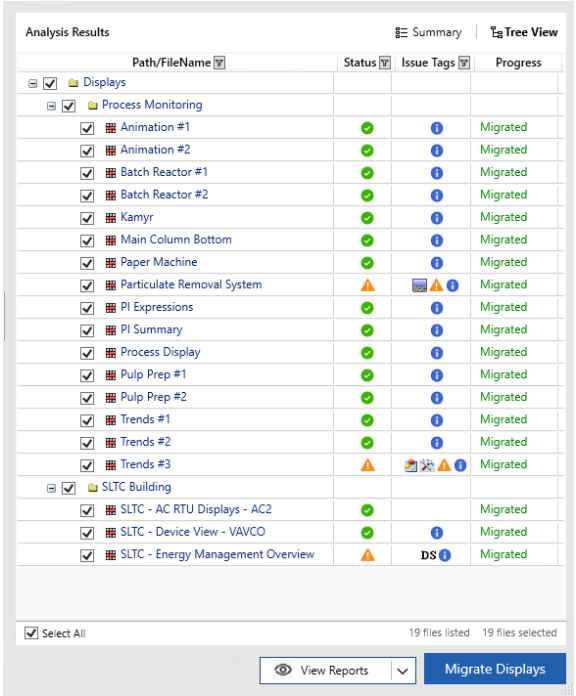
1 Select



2 Analyze



3 Migrate



Ad Hoc Trending

Dive into a real-time investigation of your operations

Select relevant data

Trend and **Explore**

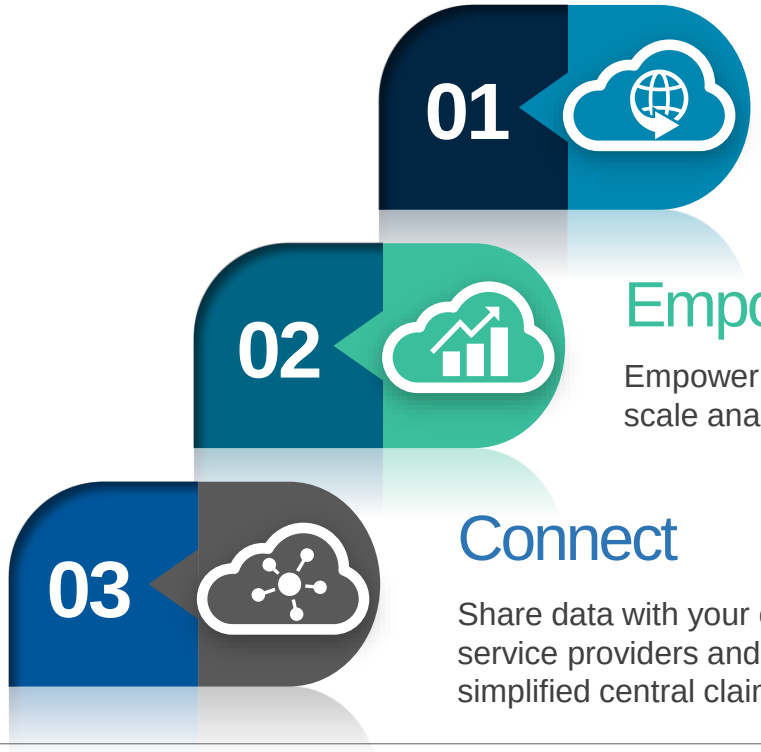
Discover insights

DEMO

PI Vision 2019

OSIsoft Cloud Services

Why OSIsoft Cloud Services?



Available

Your data is available everywhere you go, whenever you need it

Empower

Empower your users to connect with Enterprise scale analytics

Connect

Share data with your community of vendors, service providers and business partners through simplified central claims based security

OSIsoft Cloud Services Design

PI System

≠

cloud.osisoft.com

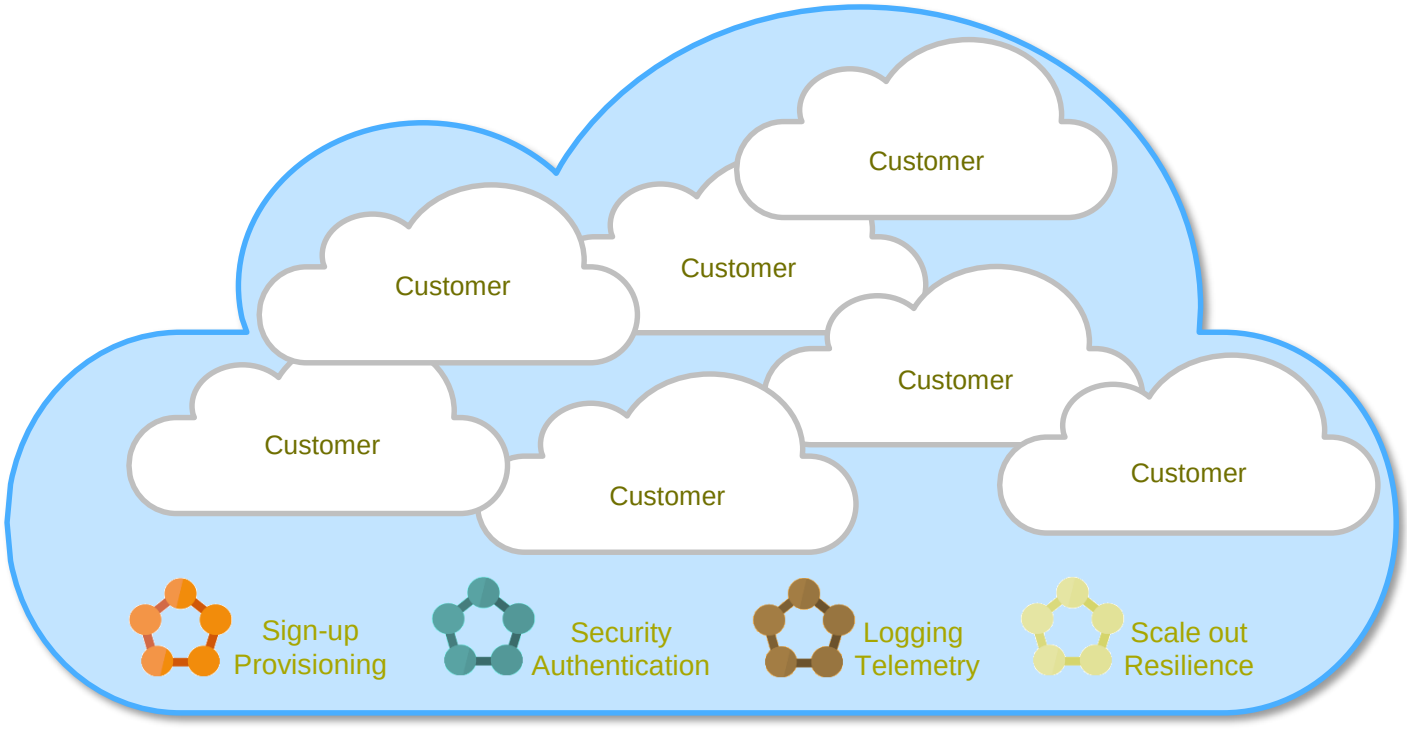
OSIsoft Cloud Services is a newly developed, cloud native platform, built for real time operational data.

OSIsoft Cloud Services are complementary

Operational data is transferred between PI Systems and OCS

… and also between Edge components and OCS.

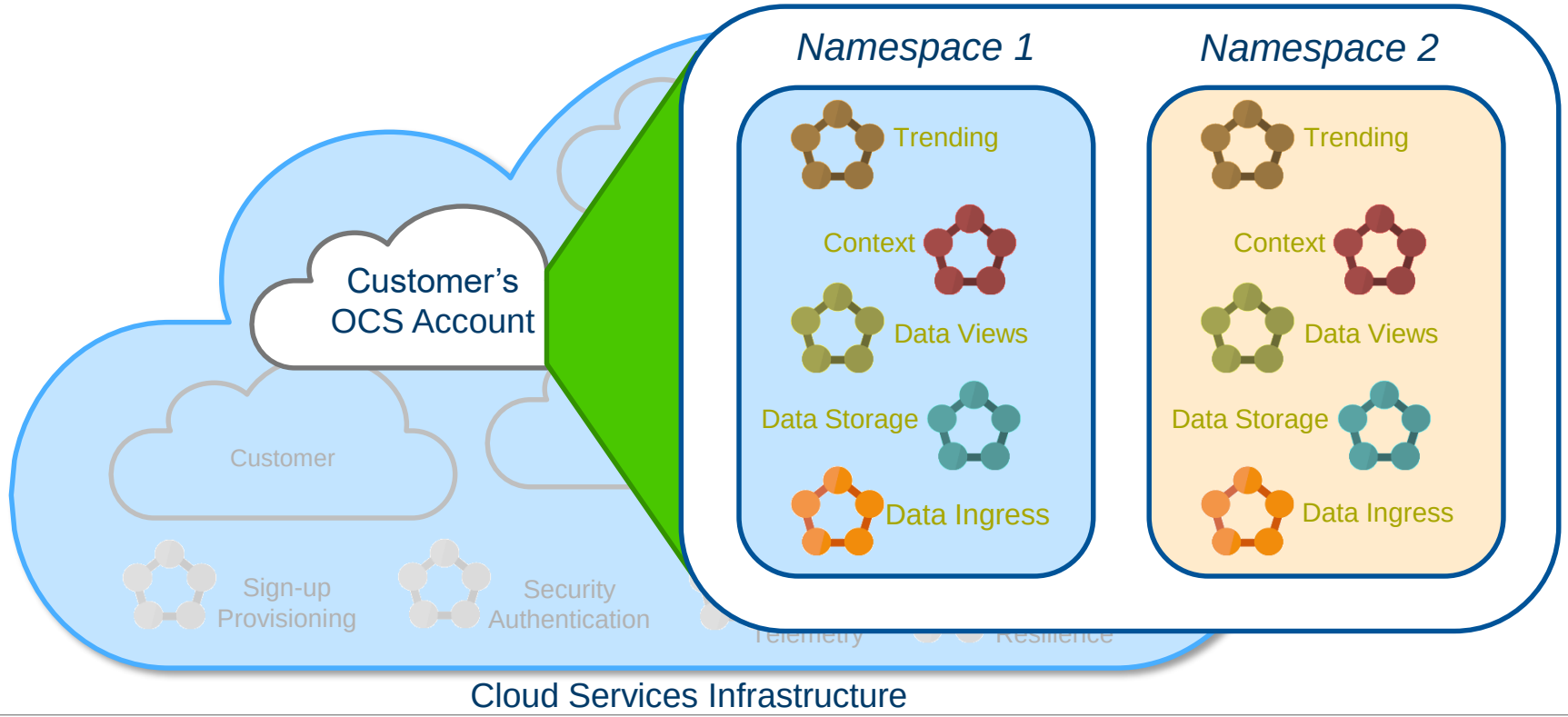
OCS Infrastructure – Components



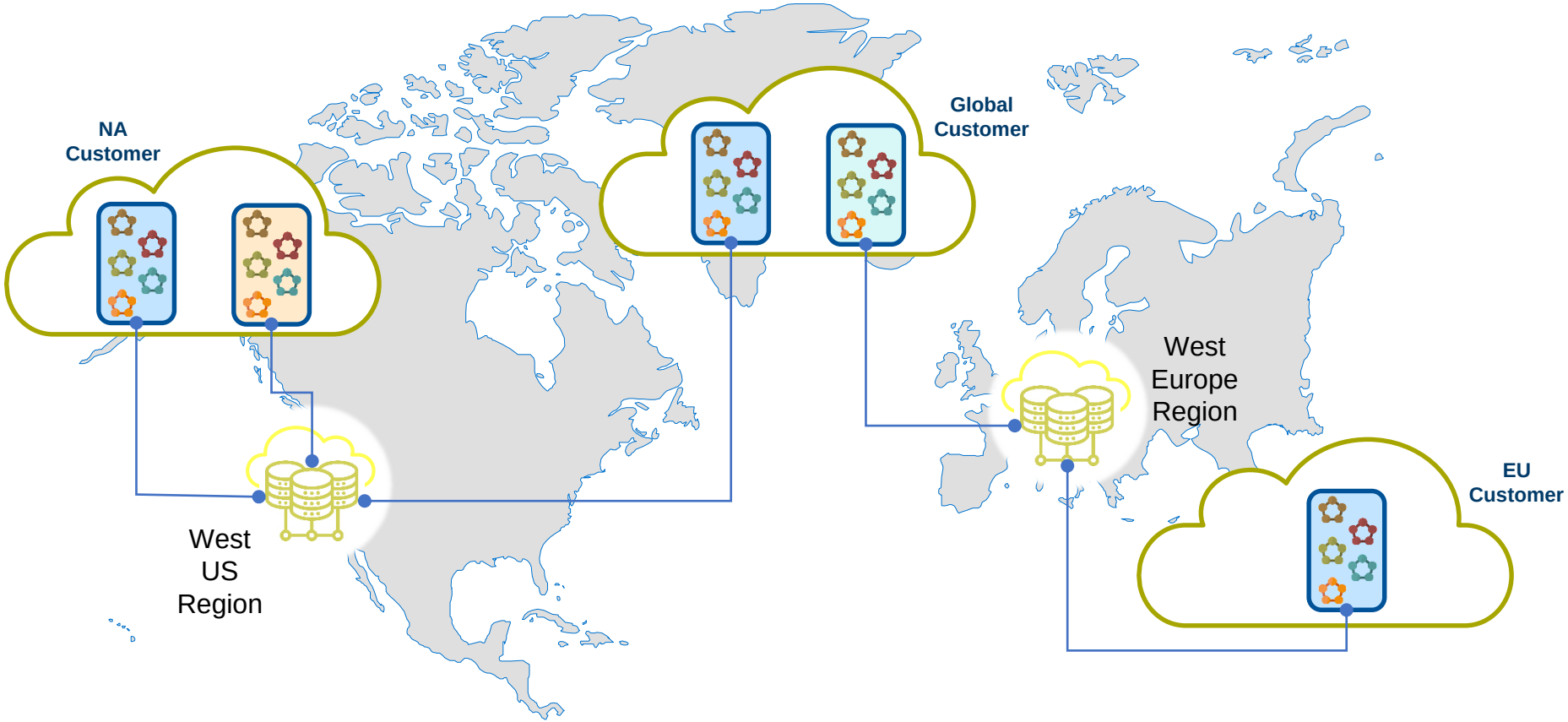
micro services

OCS Accounts – Data Services

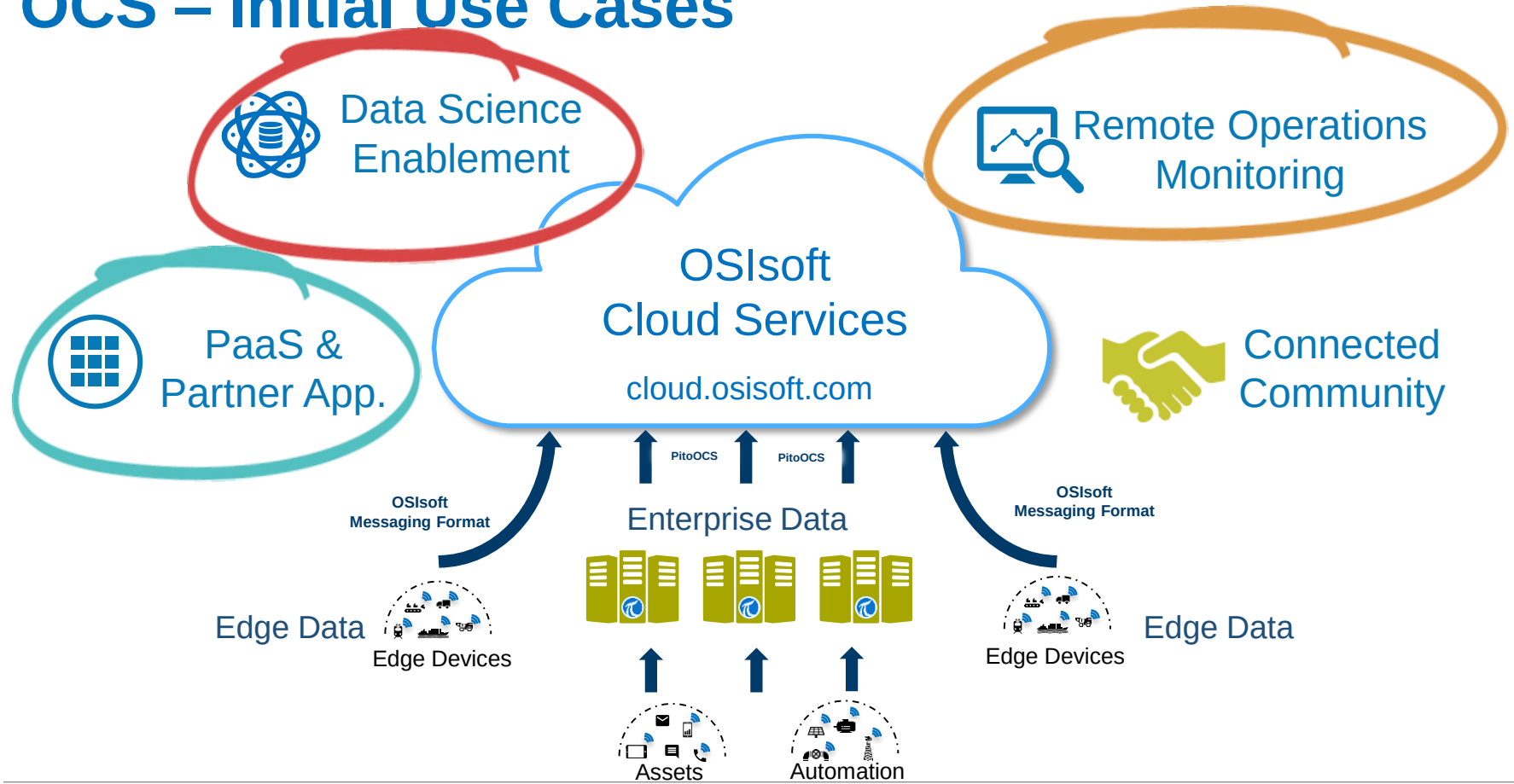
micro services



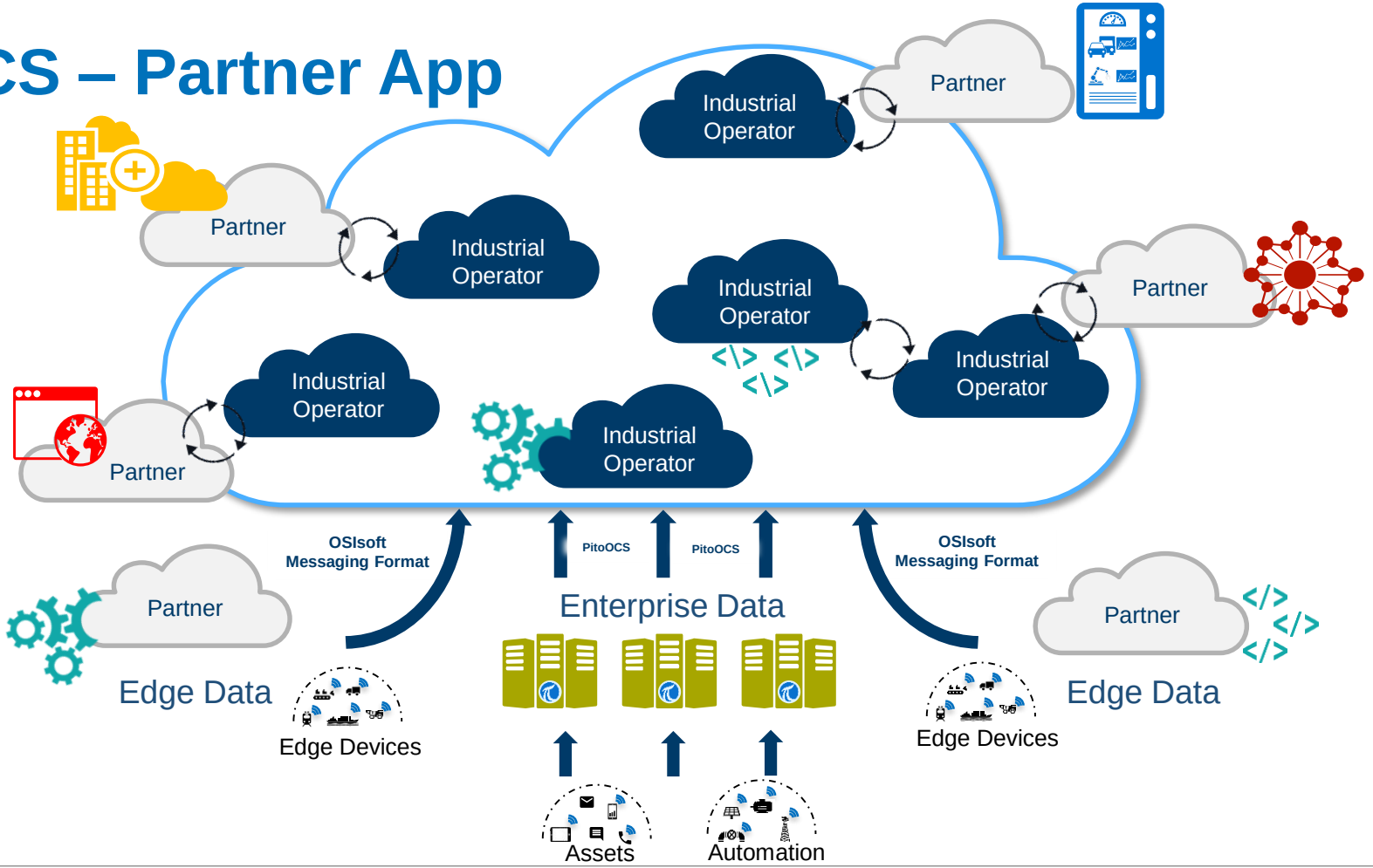
OCS Accounts – Deployments



OCS – Initial Use Cases



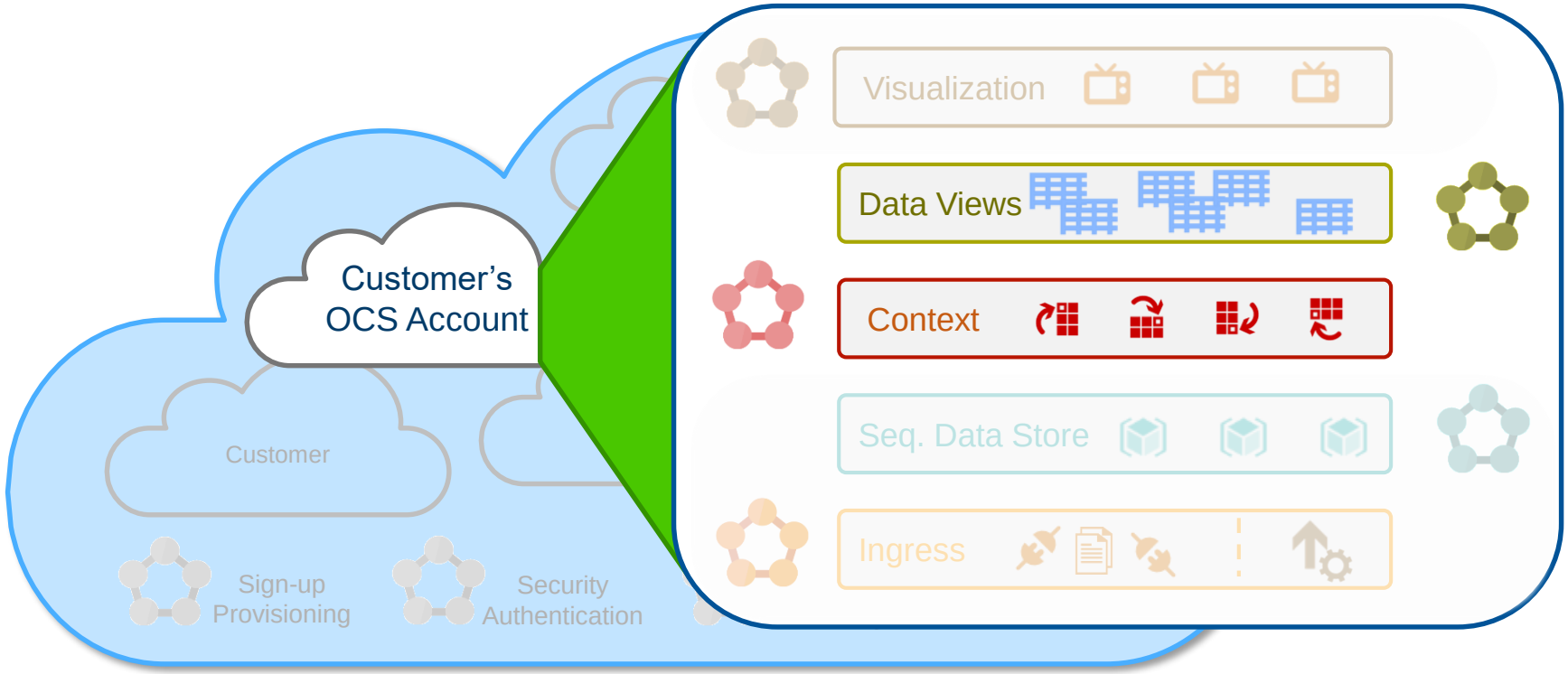
OCS – Partner App



OCS – Partners

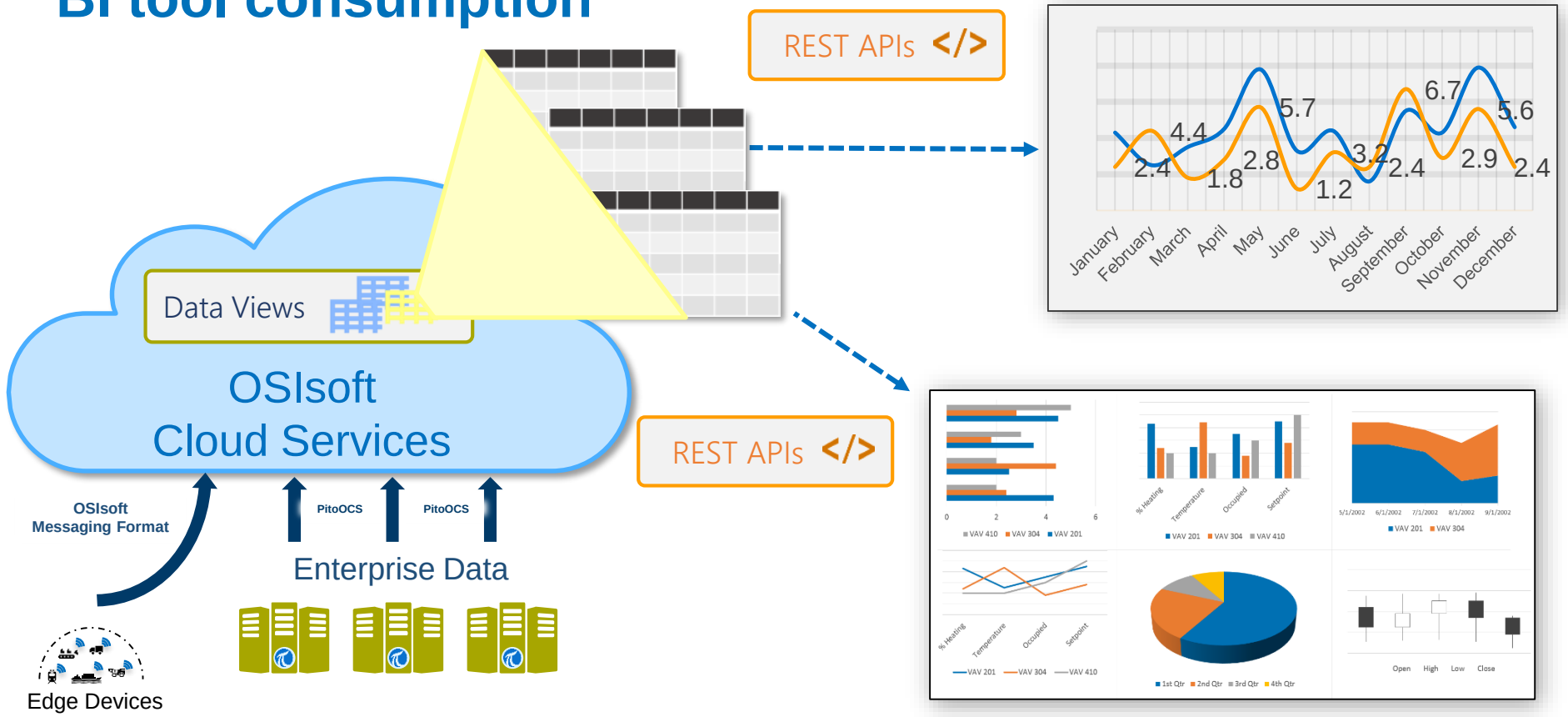
OCS Accounts – Services

micro services



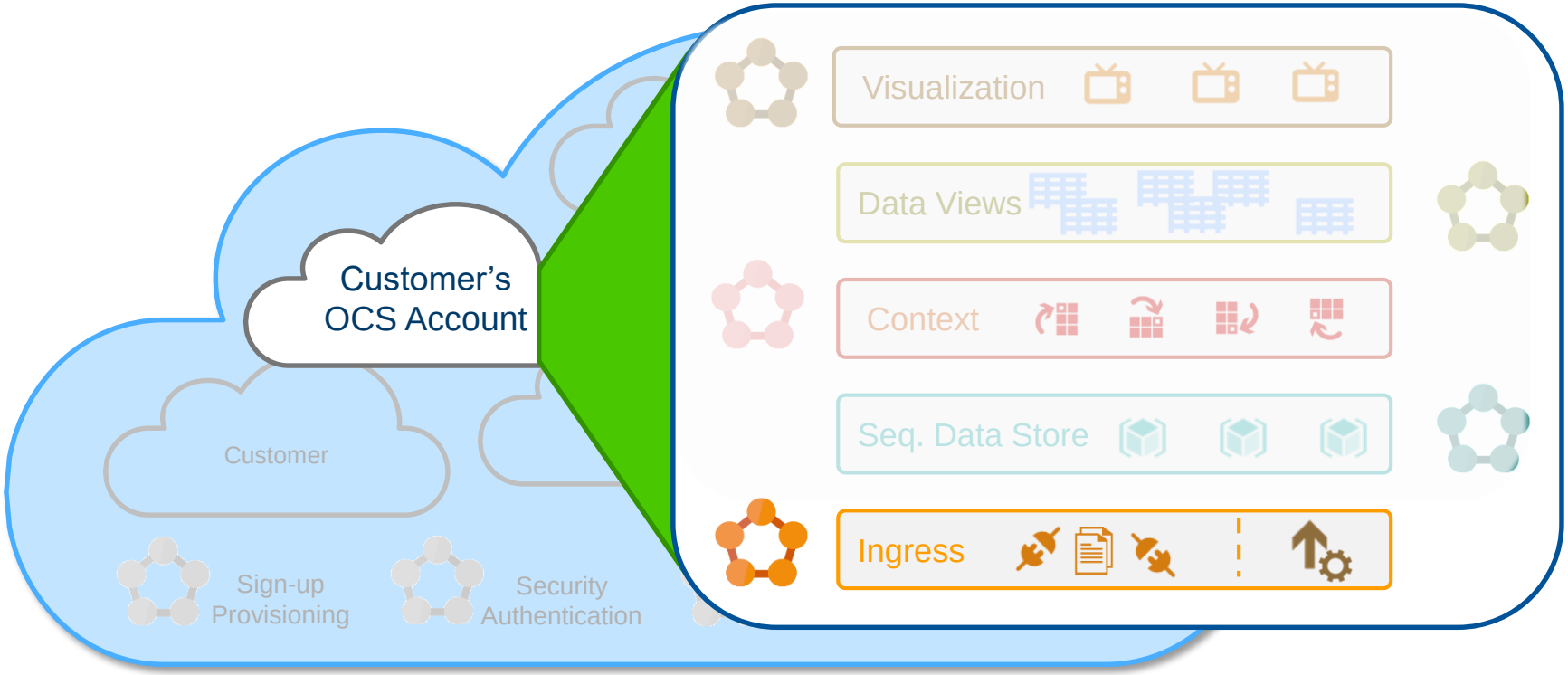
Cloud Services Infrastructure

Data Views: Pre-configured data sets for algorithm and BI tool consumption

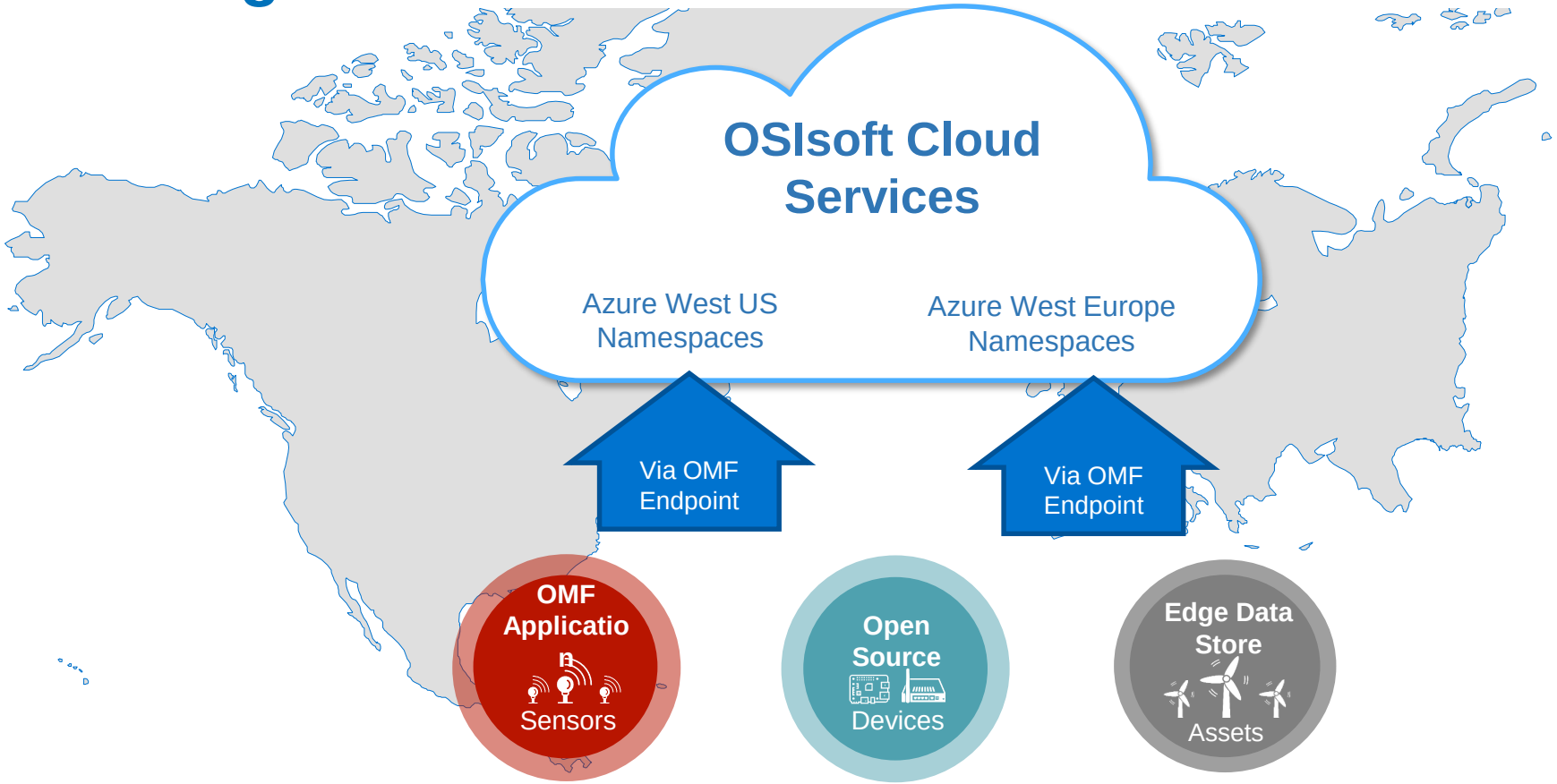


OCS Accounts – Services

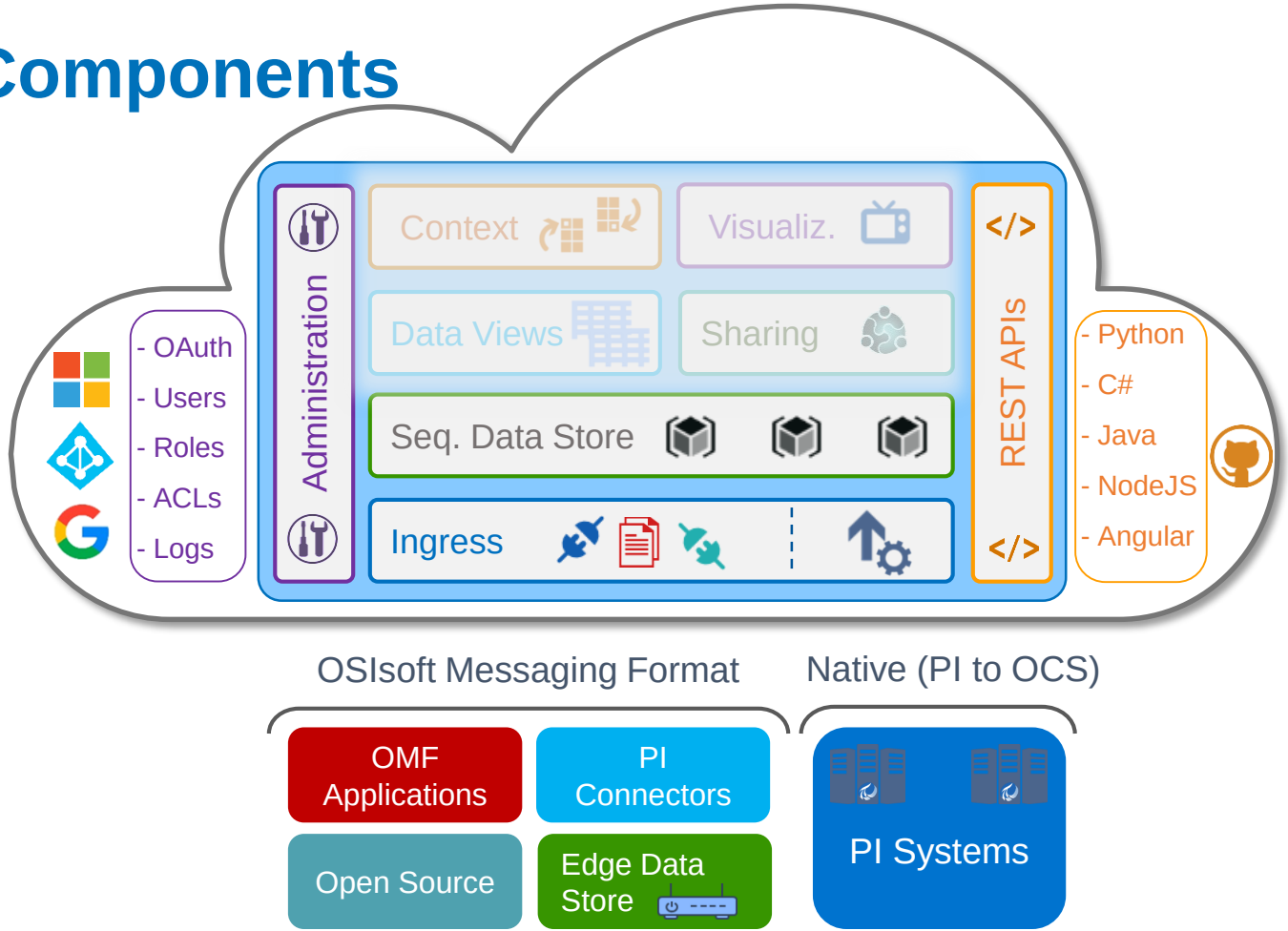
micro services



Data Ingress – OMF to OCS



OCS Components



Native Ingress: PI to OCS

Transfer PI System Time Series Data to OCS: Central, Simple, Secure.

Secure

Secure authentication in the cloud

Windows accounts authenticate against On-Prem PI Server(s)

Best of Breed

Moves time series data from On-Prem PI Server to OCS

Easy to Use

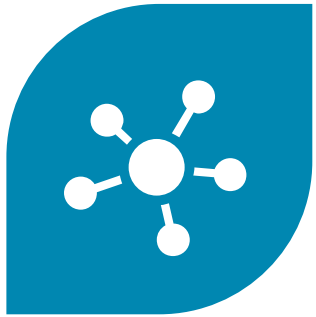
Simple to install

Runs On-Prem

Off the shelf software

Central Configuration

Configure and Manage connections, data transfers, and security from PI OCS Portal



Connections

Namespace: Production

Type: PI System | Filter Connections... | + Add Connection | Manage Permissions | Edit Connection | × Remove Connection

Displaying 3 of 3 Connections

Connection	Description	Status
777 Davis building data	Historical data of 777 Davis building in San Leandro	Update Recommended
IT Data from OSIsoft PHL	Data from our servers in Philadelphia	Update Recommended
SLTC data from OSIsoft OAK	Anonymized data from OSIsoft building in San Lean...	

Details | Information

Download Install Kit | Getting Started Guide

Overview

Id:	ddcf0de0-acac-4558-956c-08d6eddd2c6d
Name:	IT Data from OSIsoft PHL
PI System Name:	PHLMON1
PI System Version:	3.4.405.1198
Data Source Status:	Registered
Agent Version:	1.0.246.0 Install latest version (1.0.311.0)
Last Communication:	Sep 15, 2019, 1:55:50 PM

The PI to OCS Agent for this connection is out of date and should be updated.

Data Transfer

Stop

Description:	Point Name Mask: * Point Source Mask: * PI Points: 18605
Status:	Started
Current Activity:	SendingStreamingData
Events Per Second:	Historical: 0 Streaming: 44.3
Last Streaming Read:	Sep 15, 2019, 1:56:17 PM
Historical Transfer:	100.0%
Historical Start:	Jan 1, 2017, 9:00:00 AM
Historical End:	Jun 11, 2019, 5:52:06 PM

Click **Start** to start the Data Transfer or **Stop** to stop the Data Transfer. After historical data transfer has completed, current data will continue to be transferred. To create a different Data Transfer you must first stop and remove the current Data Transfer. Note that this will not remove any data already transferred.

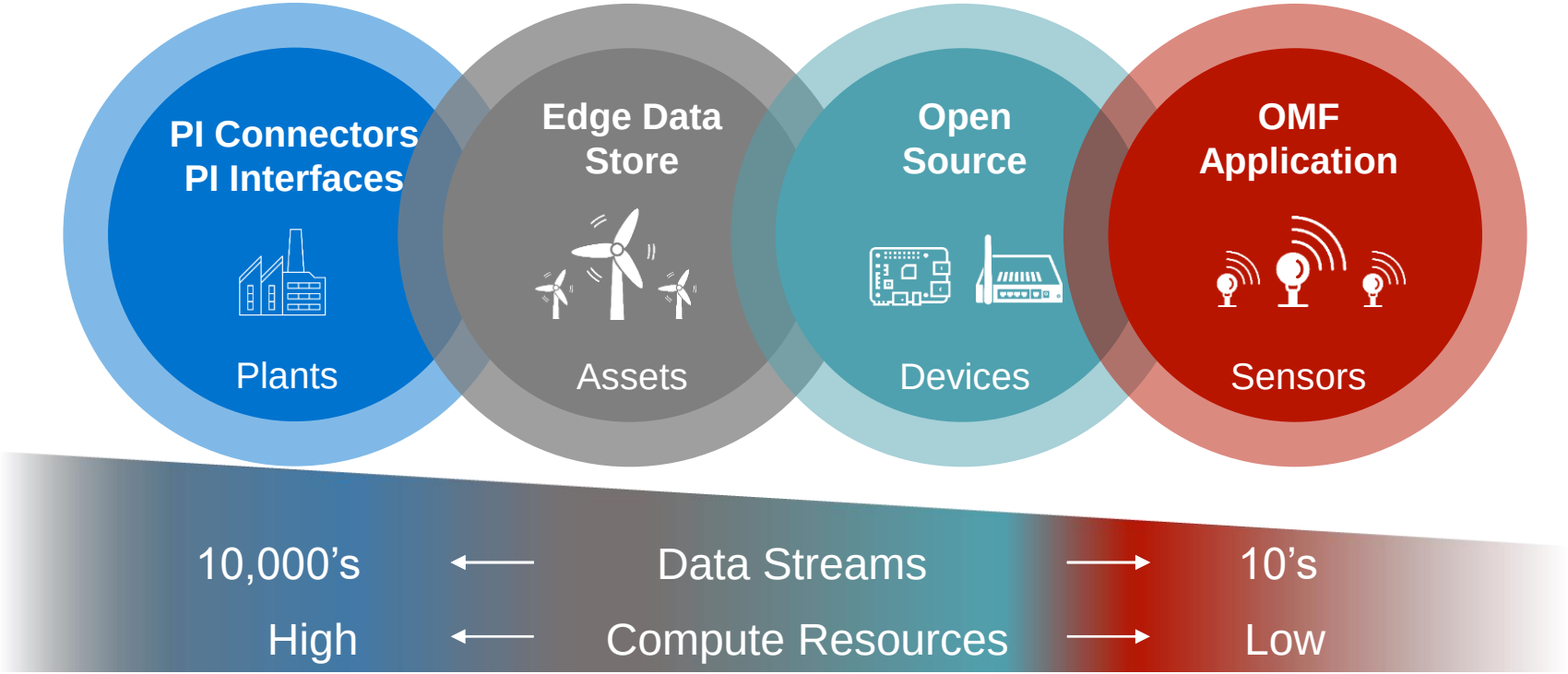
DEMO

Pervasive Data Collection

OSIsoft Pervasive Data Collection

Ensuring no matter where your operational data resides, there are OSIsoft technologies available to collect and store this data

Pervasive Data Collection Products and Technologies



PI Connectors and PI Interfaces

- Flexible Deployment
- Cross Platform (Windows, Linux)
- Robust data collection (Data Buffering)
- Intelligent Data Selection and Data Transfer
- Developed, Sold, and Supported by OSIsoft

PI Interface Updates – 2019 Highlights

- **OMF Health Messages**
  - OPC DA, OPC HAD, PItoPI, UFL, Modbus, RDBMS, DNP3
  - Device Status and Next Health Message Expected
  - Interoperable with PI Server and OCS

- **PI Batch / MES Interfaces**
  - EFGen
  - Emerson DeltaV and Syncade
  - Wonderware InBatch

PI Connectors Available Today

Uses PI Connector Relay and PI Data Collection Manager

NEW! New PI Connector!

PI Connector	Market	PI Connector	Market
BACnet	Facilities	WITSML	Upstream, drilling
CygNet	Upstream Oil & Gas	oBIX NEW!	Facilities
DC Systems RTscada	T&D	IEC 61850	T&D Substations
EtherNet/IP	High-speed PLC data	PI System Connector	Many
Wonderware Historian	Many	FANUC Focas	Discrete
HART-IP	Wireless sensors	Redfish	Data centers
IEC 60870-5-104	T&D Substations	Siemens SINUMERIK	Discrete
Ping	IT infrastructure	MQTT Sparkplug NEW!	All
IPMI	Datacenters	MTConnect NEW!	Discrete
UFL	Many	GE e-terra NEW!	T&D
Siemens SIMATIC PCS 7	Many		

New PI Connectors in Development

Uses PI Connector Relay and PI Data Collection Manager

Beta — Currently in Beta

PI Connector	Market	Status
Honeywell PHD Beta	Many	Beta
WITSML PASON Beta	O&G	Beta
Siemens Spectrum 7	T&D	Development

New Features in Development for Existing PI Connectors

PI Connector	Market	Status
IEC 61850 Beta	T&D, Substations	Beta
OPC UA	Many	Development
CygNet	Upstream Oil & Gas	Development

Pervasive Data Collection - Roadmap

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Developing Now

Expand Data Connectivity
Several more connectivity options including Honeywell PHD, WITSML PASON, etc.

Tag Naming and Mapping
BETA

Ability to control PI tag naming convention and use exiting PI tag names for OPC UA.

Flexible Deployment
Enhancements to improve PI Connector configuration and installation flexibility.

Considering Next

Multiplatform Compatibility
Enable customers to run OSIsoft developed connectivity cross-platform.

Lightweight and Scalable
Reduce installation footprint and optimize resource consumption.

Expand Interoperability
Data connectivity options for the PI Server, OCS and EDS.

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

Researching Future

Additional Data Connectivity

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

OSIsoft Message Format

- Any Hardware
- Any Operating System
- Any Development Tools
- Data Ingress to Edge Data Store, PI Server and OSIsoft Cloud Services
- Finished Product Developed, Sold and Supported by 3rd Parties

OMF Accelerates Data Connectivity Through Partner Enablement

What is the OSIsoft Message Format (OMF)?

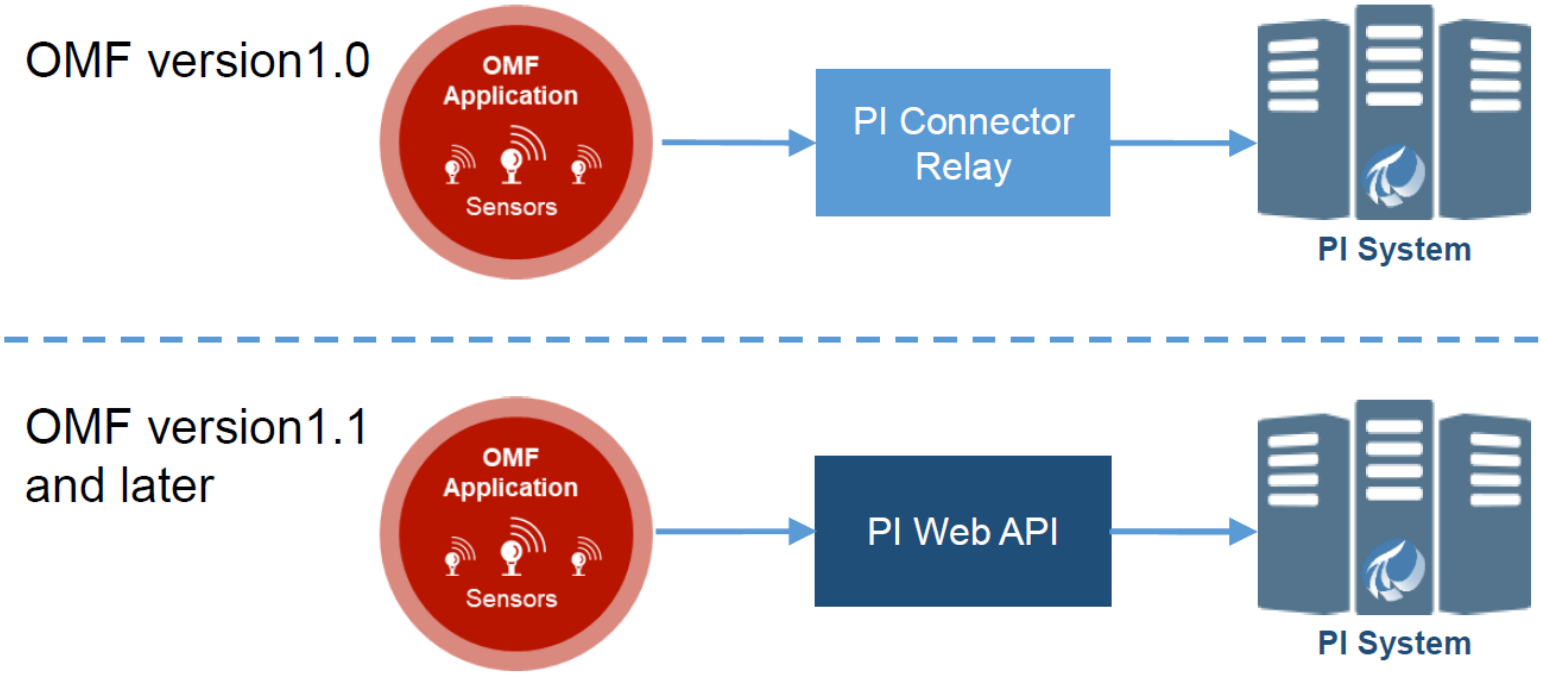
- Contract based message format for data ingress
- Well documented specification & sample code
- 0111001 0010010 1111010 0100111 — Supports streaming data & metadata
- Connectivity to on-premises PI Servers and OSIsoft Cloud Services
- Enables application development by partners, end customers and 3rd parties
- Independent of operating system & programming language

What OMF is not:

- A replacement for PI Web API, PI AF SDK or other OSIsoft API
- An application development framework

http://omf-docs.readthedocs.io/en/v1.0/

PI Server OMF Endpoint Migration



- *PI Web API with OMF endpoint delivered with PI Server 2018 SP3*

Open Source Technologies

Examples…

- ***FogLAMP*** – an open source platform for data ingress to PI Servers, Edge Data Stores and OSIsoft Cloud Services
- ***ARM & Mbed*** – a community with 250,000 developers

Edge Data Store

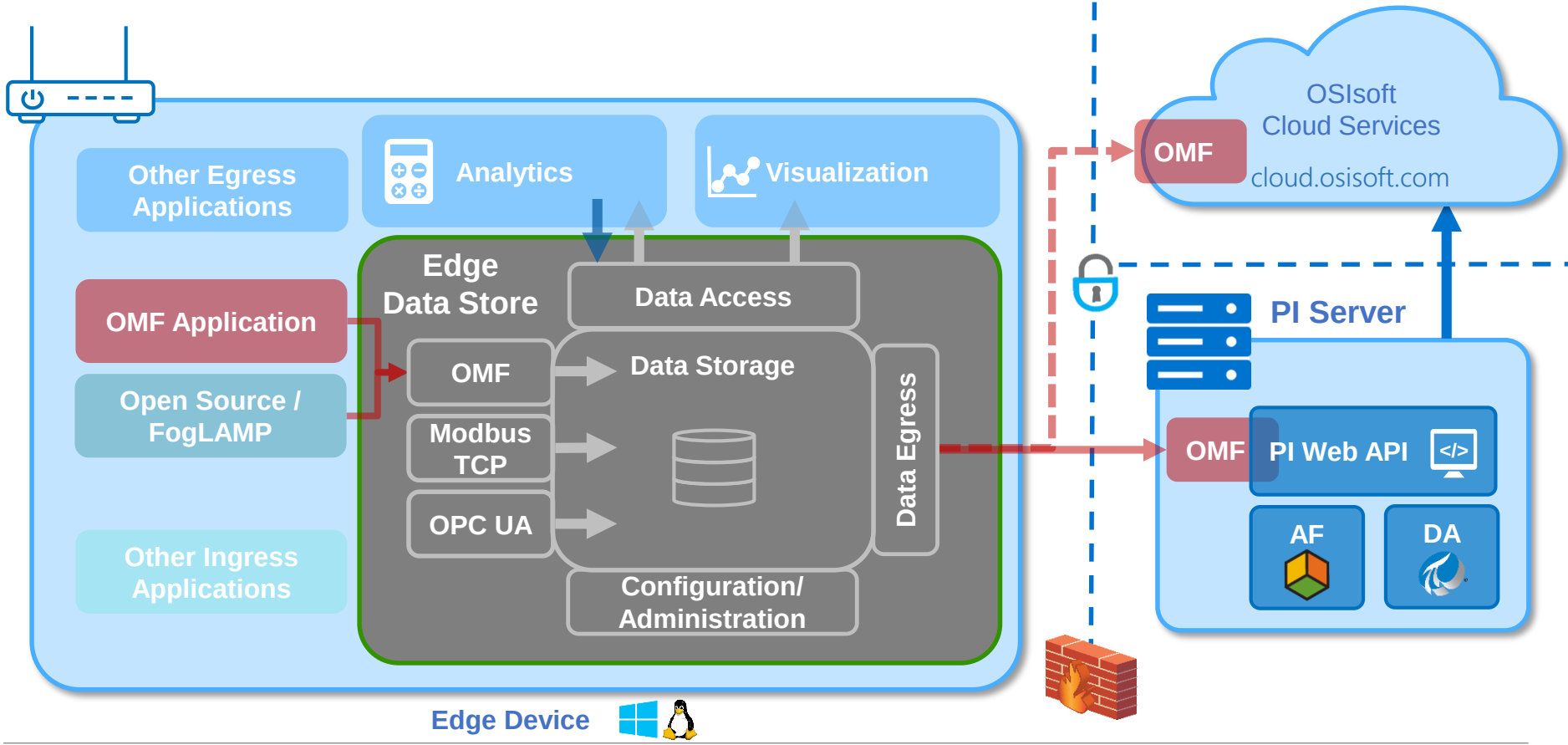
- Cross Platform (Windows, Linux)
- Multiple Data Ingress Options
- Analytics Ready
- Egress to PI Server and OSIsoft Cloud Services
- Developed, Sold, and Supported by OSIsoft

Edge Data Store Overview

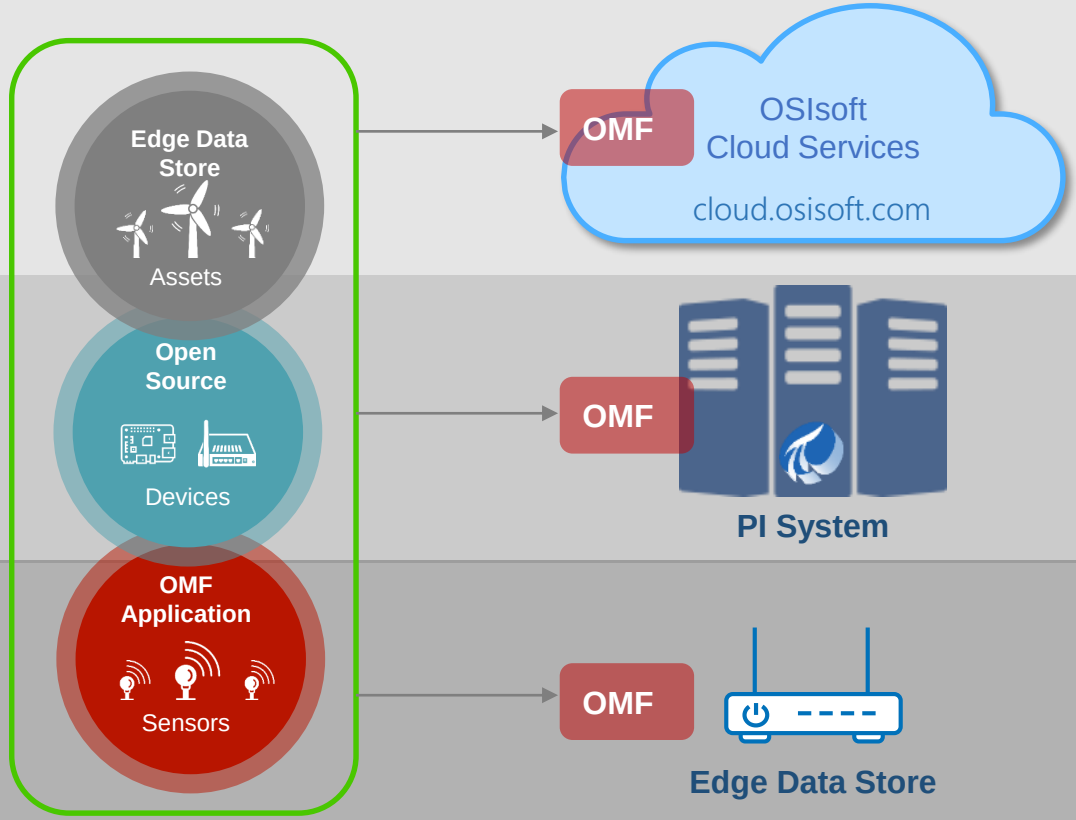
- A new OSIsoft product built for:
  - Remote, unmanned deployments
  - In harsh environments
  - On lightweight Windows and Linux devices
- A "**sequential**" database
  - Anything that can be ordered can be stored
- Shares the same storage technology and API as **OSIsoft Cloud Services**

- Product features
  - Simple and Complex data types
  - Multiple indexes
    - Non-time series
    - Compound
    - Secondary
  - No distinction between future and past data
  - Unbounded Event Size
  - Ingress via OMF, API, and selected PI Connectors
  - Egress to PI Servers and/or OSIsoft Cloud Services
  - High precision timestamps (100ns)

Edge Data Store: Third Party Application Development



Extending Connectivity to All OSIsoft Systems



CLOUD

ENTERPRISE

EDGE

Edge Data Store – Roadmap

Developing Now

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

Inbound Connectivity BETA
Modbus TCP, OPC UA, OMF and EDS API.

Data Storage BETA
Persistent, resilient, self-healing.

Application Platform BETA
Fully documented RESTful API for third party application development.

Outbound Connectivity BETA
Automatic data transfer to PI Servers and/or OCS using configurable egress rules.

Considering Next

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

Additional Data Connectivity
More inbound data connectivity options.

Researching Future

Calculations

Trending Experience

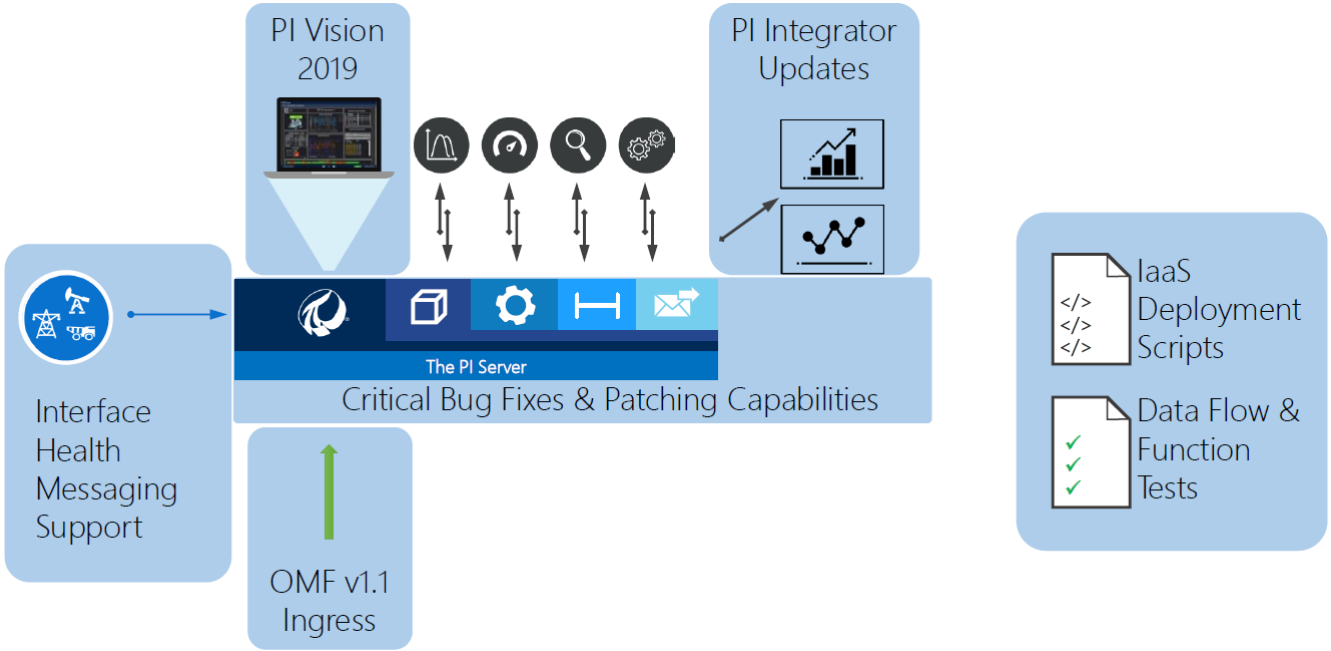
Available today through the Edge Data Store Lighthouse Program!

PI Server 2018

PI Server 2018 SP2

- Released on the 8th of April
- Most secure and reliable PI Server to date
- Supported for extended period of time
- Focus on:
  - Fixing critical bugs
  - Fixing security vulnerabilities
  - Easing deployment
  - Improving manageability

PI Server 2018 SP3

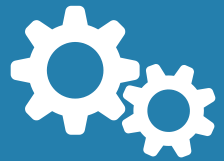


PI System - 2019 and Beyond

Harden
the core

Focus on **security** & **reliability** of data infrastructure

Ease
the management



Bring more **manageability** & **control** to deployments

Extend
the reach

Grow **collection, integration** & **access** capabilities

Hardening the Core of the PI System

1 Harden
the core

Focus on **security** & **reliability** of data infrastructure

- PI Server and critical operations
- Supported for extended period of time
- Critical software bugs & security vulnerabilities
- Select PI Interfaces & health of data flow
- PI Interfaces health data sent to PI Server & OCS, simultaneously

PI Server – Roadmap

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Developing Now

Usability and Performance Improvements
Released

Improved search performance, query PI Analysis Service runtime information, improved functions for calculations

Improved Reliability
Released

Focusing on bug fixes and quality updates.

More Control over Upgrades and Deployments

Providing ways for system administrators to keep their PI System current on fixes for critical bugs and security vulnerabilities, without requiring additional resources.

Considering Next

Performance and Memory Improvements

Improve performance for large number of concurrent clients

Support for Modern Authentication

Alternatives beyond Active Directory

Streamlined Deployment

Enabling users to deploy more PI Systems faster

Researching Future

Manageability

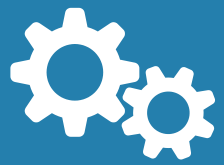
Management of the configuration, deployment and maintenance of large number of PI System components

Last Updated: 2019-09

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

Easing Deployments & Improving Manageability

2 Ease
the management



Bring more **manageability & control** to deployments

- Patches vs full upgrades
- End to end test samples for PI System deployment
- PI System Deployment samples for Amazon Web Services and Microsoft Azure

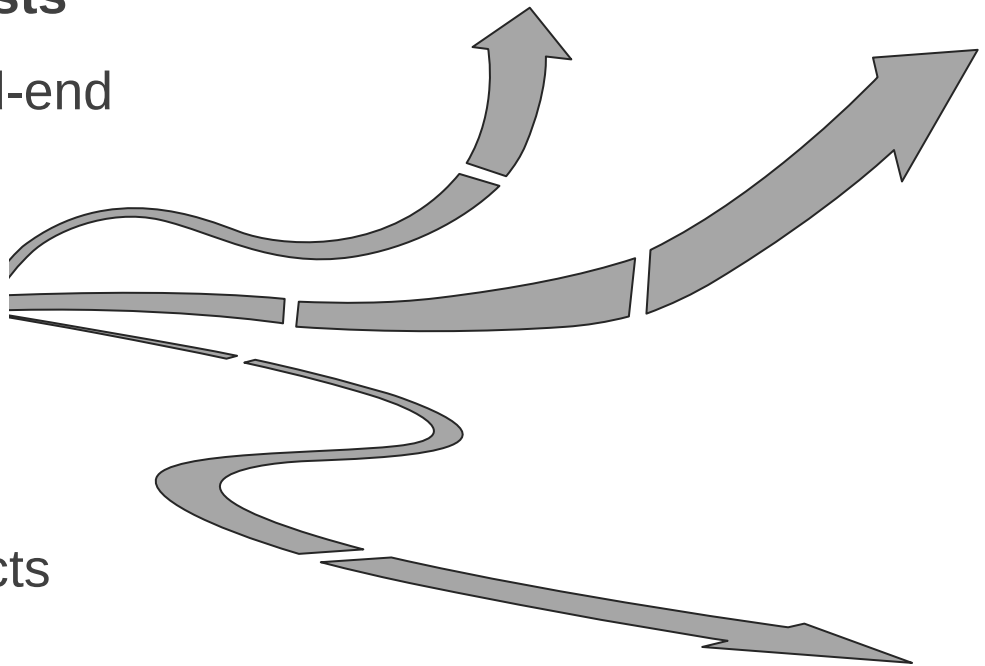
Test Latest Versions in Your Environment

PI System Deployment Tests

Framework and a set of end-end test samples

Expand to meet the testing needs of your PI System

Starting point for assessing deployments to the latest version of PI System products



Extending the Reach across the Enterprise

3 Extend
the reach

Grow
collection, integration & access
capabilities

Data Collection

Increase portfolio of PI Connectors

Visualization

Enable data insight

Developer Technologies

Enable 3rd party applications writing data to PI System via OMF

Seamless Infrastructure

Support data needs from edge to PI System to cloud

Integration

Enable business intelligence and advanced analytics

Communicate with OSIsoft Product Managers

https://feedback.osisoft.com

PI System – Roadmap Highlights

Developing Now

PI Server
More Control over Upgrades and Deployments

PI Vision
Ad Hoc Trending

PI Vision
PI ProcessBook Migration

PI Web API
Ingress data via OSIsoft Message Format

Considering Next

PI Server
Performance and Memory Improvements

PI Integrators
Google Cloud Platform Integration

Researching Future

PI Server, PI Vision, PI Integrators, and PI Web API
Support for Modern Authentication

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

Pervasive Data Collection – Roadmap Highlights

Developing Now

PI Connectors (BETA)
Expand Data Connectivity
(MQTT Sparkplug, Honeywell PHD, WITSML PASON, etc.)

PI Connectors
Ability to control tag naming convention

Edge Data Store (BETA)
Data ingress (Modbus TCP, OPC UA, OMF, and EDS API), storage, API

Edge Data Store (BETA)
PI System and OCS Integration

Considering Next

Edge Data Store
Optimize experience of managing and deploying many connectivity solutions

OSIsoft Message Format
Usability enhancements

Researching Future

Edge Data Store
Trending Experience, Calculations, Additional Data Connectivity

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

OSIsoft Cloud Services (OCS) – Roadmap Highlights

Developing Now

OCS: PaaS & Partner App (RELEASED)
PaaS solution with API access to operational data across the enterprise

PI Server to OCS (RELEASED)
Transfer PI Systems time-series data to OCS

OSIsoft Message Format (RELEASED)
Data Ingress to OCS from large numbers of data sources and devices

OCS: Data Views (BETA)
Enable users to define tabular datasets that can be queried by data scientists

Considering Next

OCS
Trending Experience and Data Sharing

OCS
EMEA Data Center Deployment

PI Server to OCS
Allow backfilled data and other point updates to be transferred

Researching Future

OCS
Visualization for Remote Operations Monitoring

OCS
Context

PI Server to OCS
Automatic Upgrade of on-prem agents

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

Organiser

Co-host