OSIsoft IIoT Overview – IIoT in Energy

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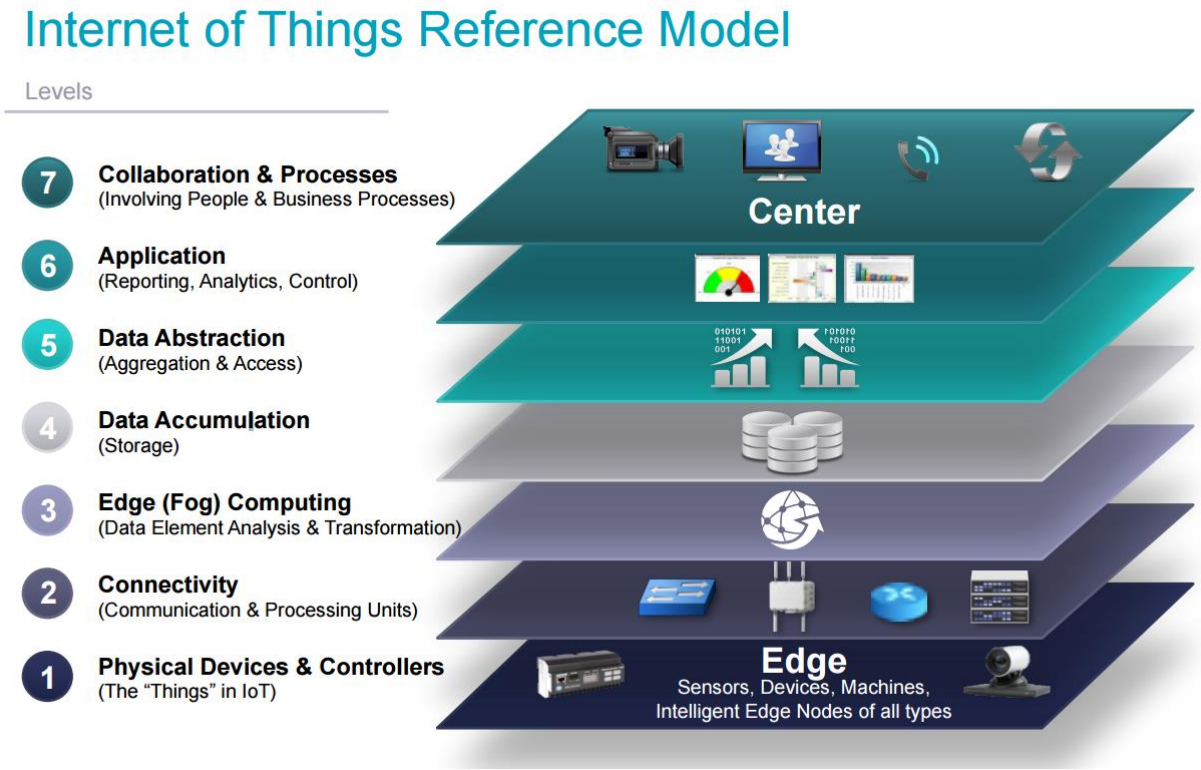
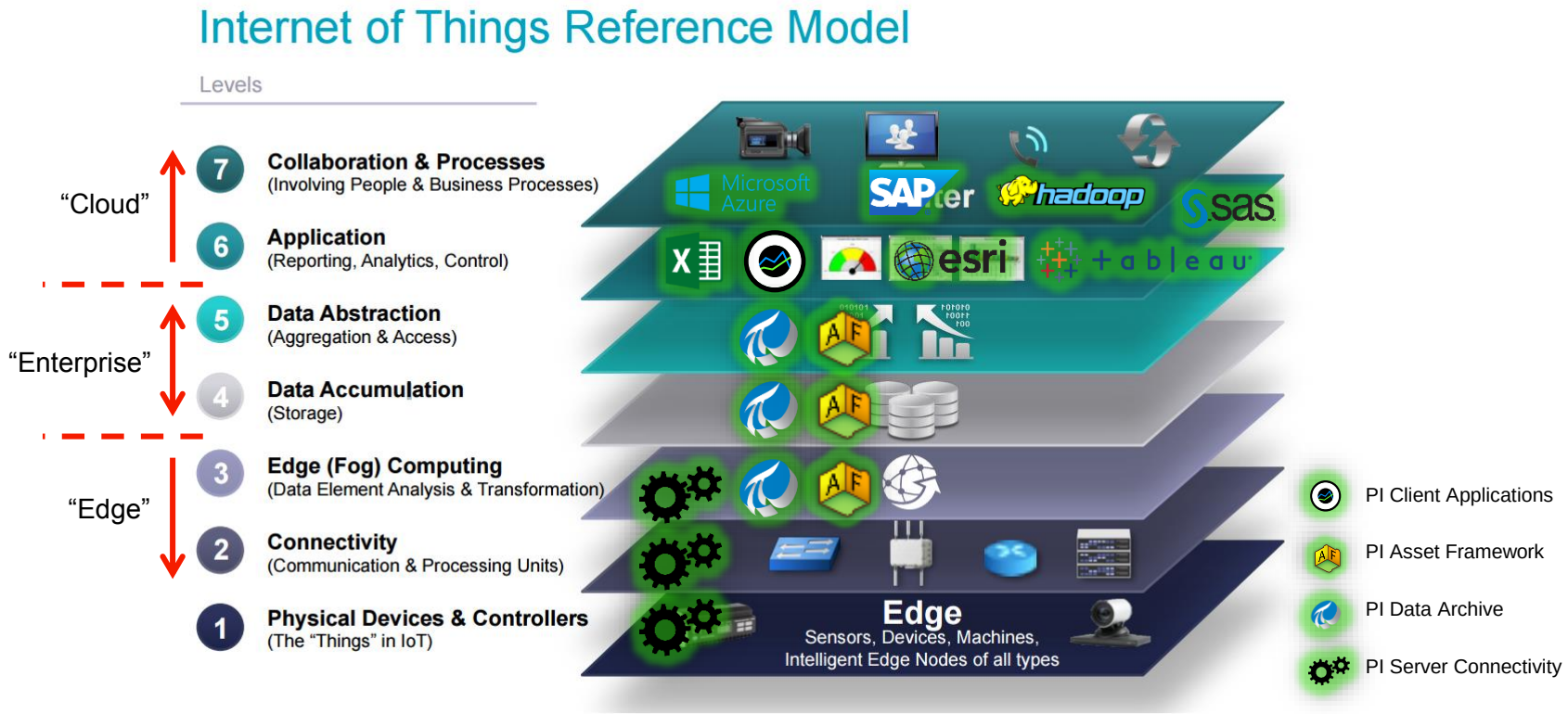
October 12, 2016

IIoT Reference Architecture



Presented by Cisco at the IoT World Forum, October, 2014

PI System in IIoT Reference Architecture



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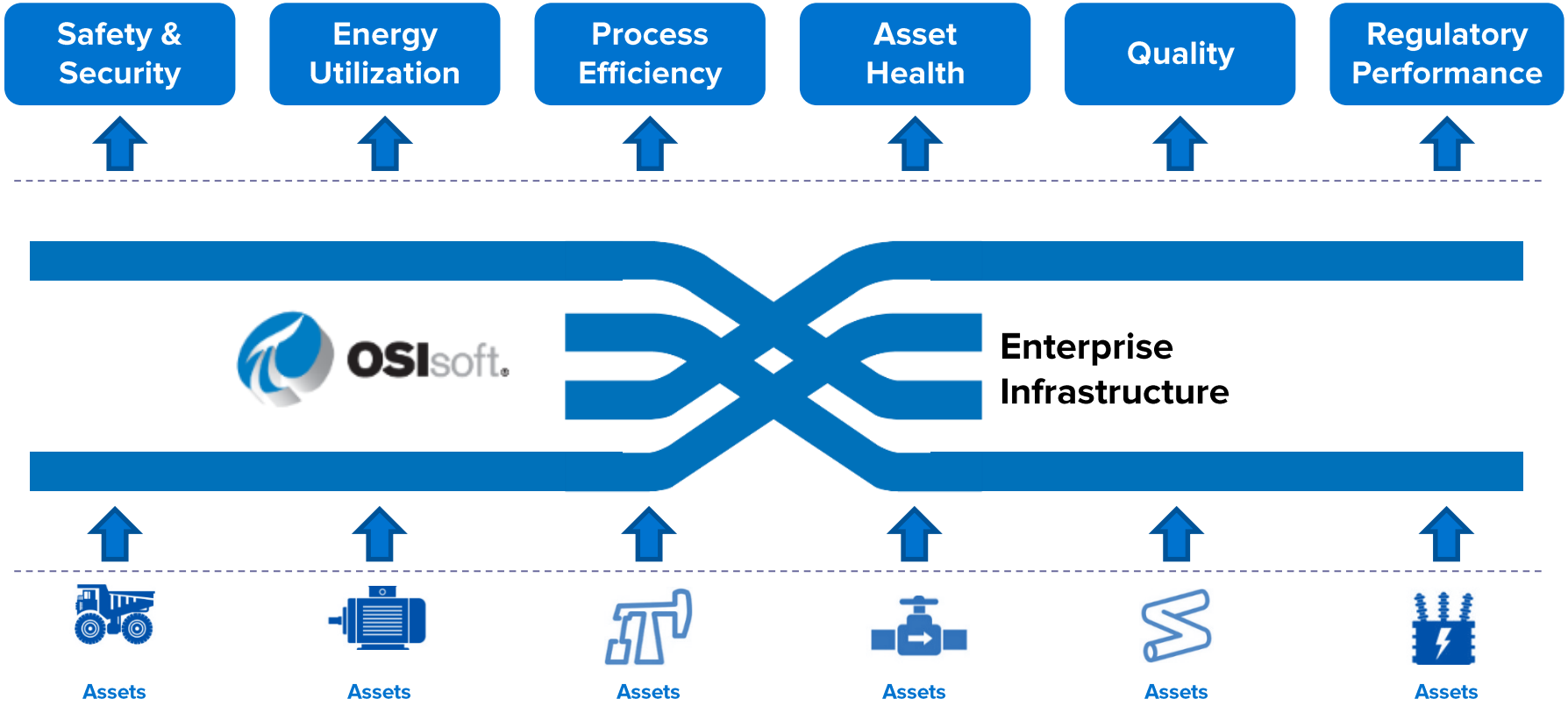
An Infrastructure Connects the Enterprise



The “Edge”

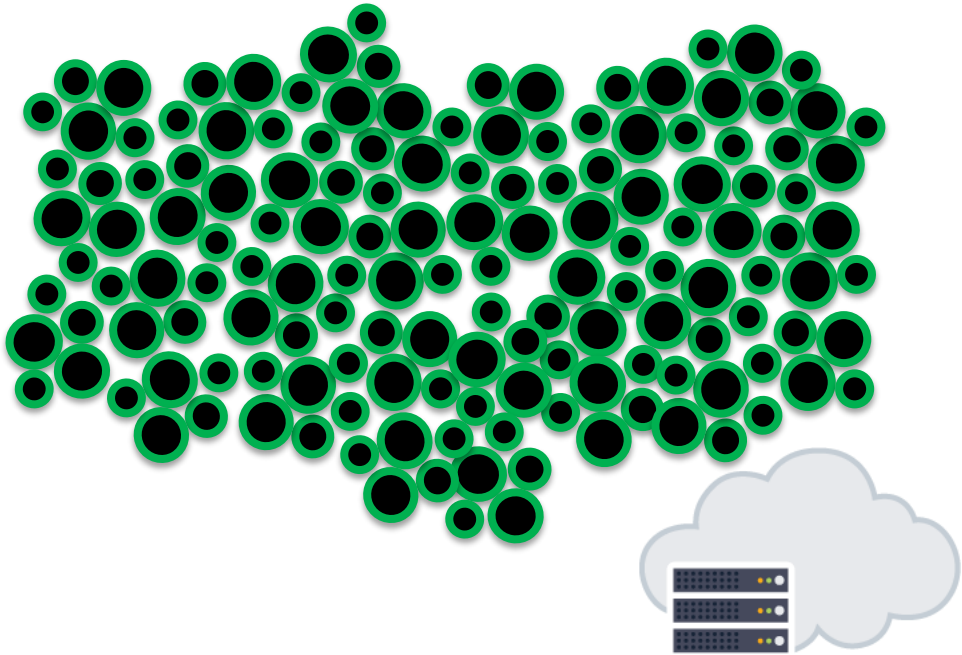
OSIsoft Understands Connectivity

450+ PI interfaces
and connectors;
1.5B+ data streams

What is Different About IIoT?

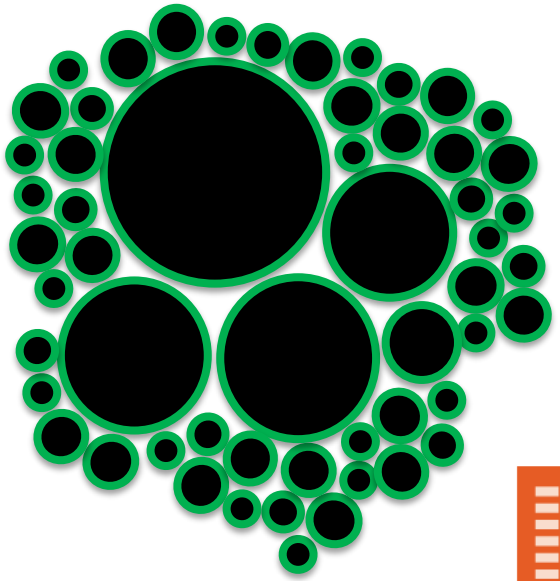
Traditional PI System data pattern

IIoT data pattern



PI System Environment for IIoT

Hybrid of traditional PI System and IIoT data patterns

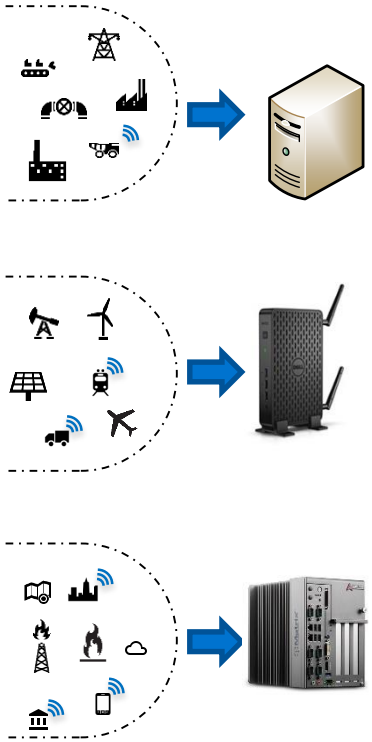


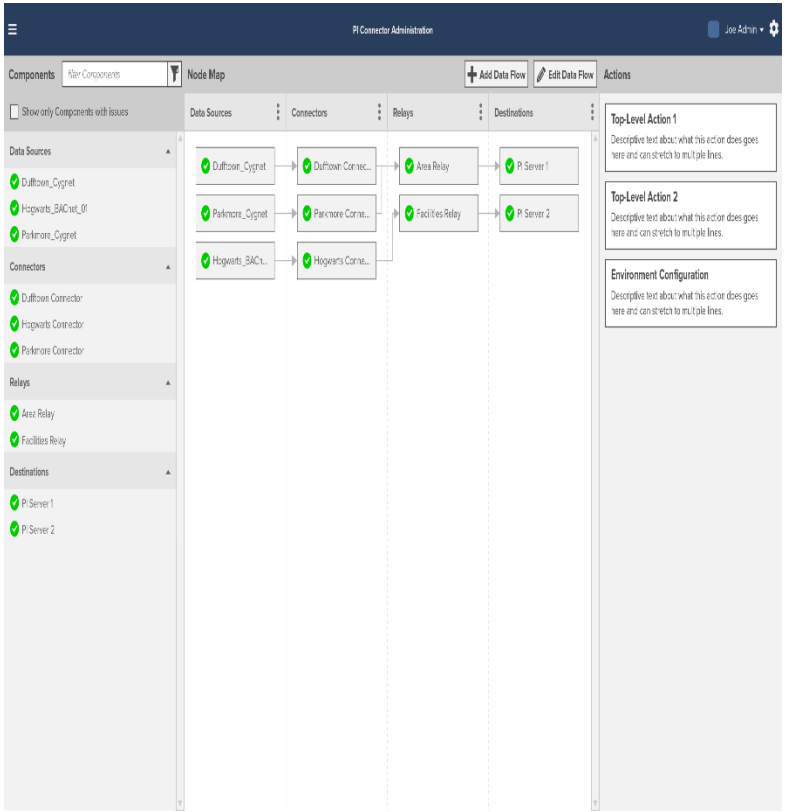
or

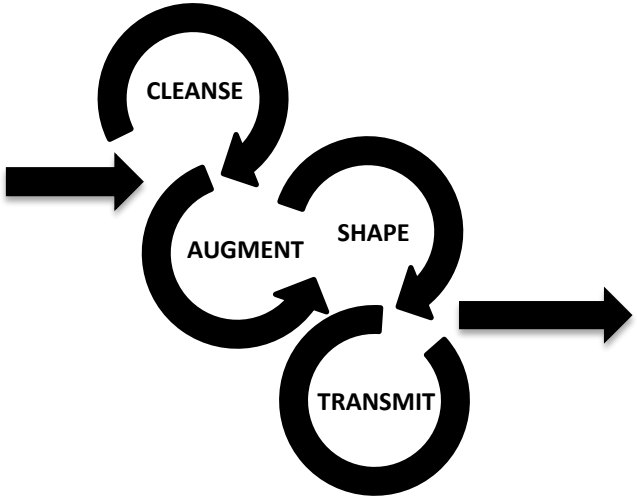
What is OSIsoft Doing Now?

- Building platform agnostic connectors with flexible deployment options on Windows and Linux based devices
- Enabling partners to development “connector-like” data ingress applications using the OSIsoft Message Format (OMF)
- Creating a new PI Connector Administration Experience
- Developing connectivity to analytics, visualization, and big data applications

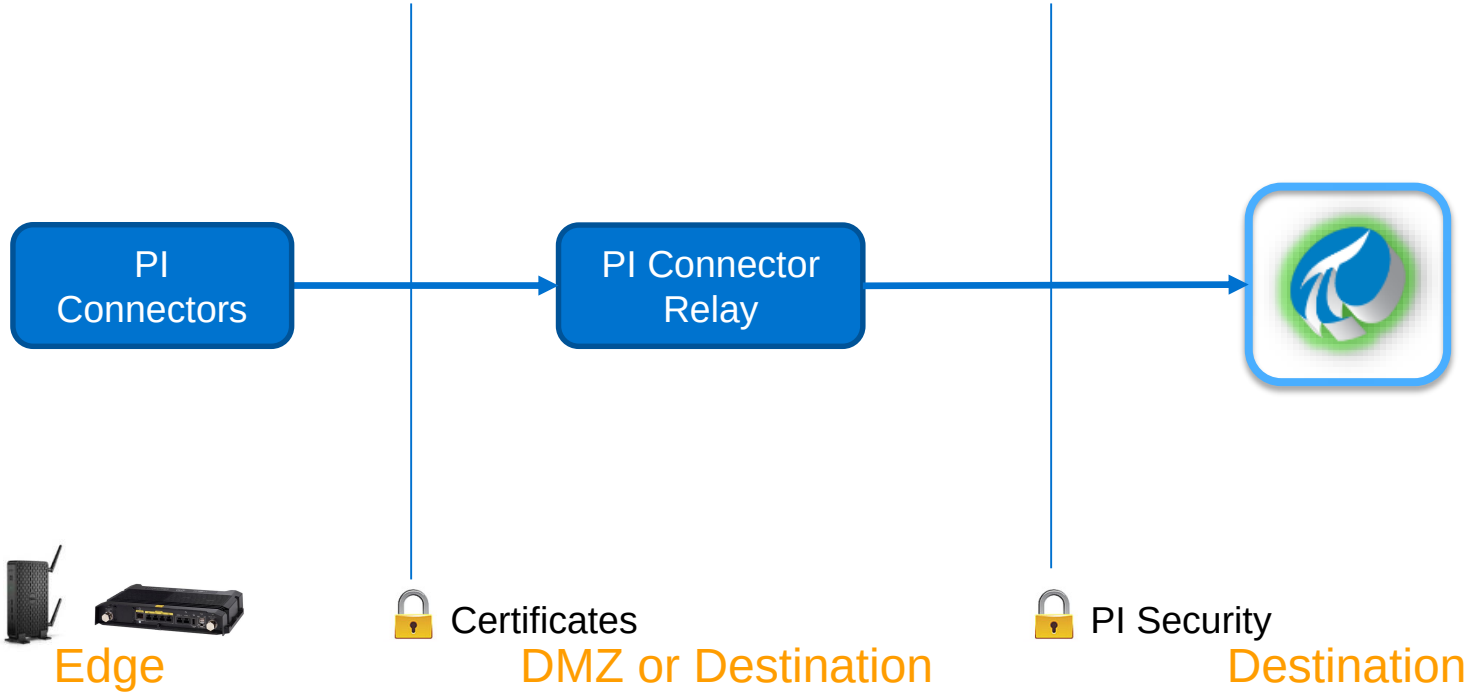
What is OSIsoft Doing Now?



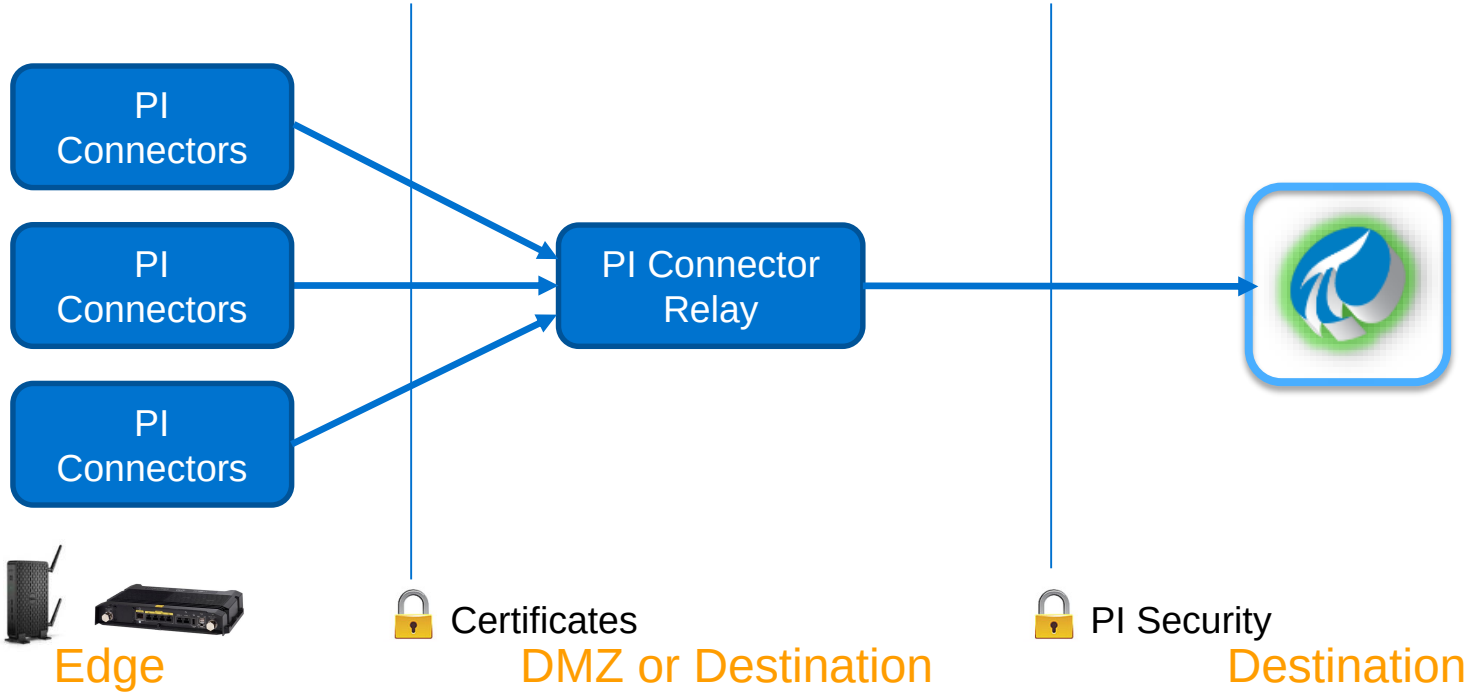




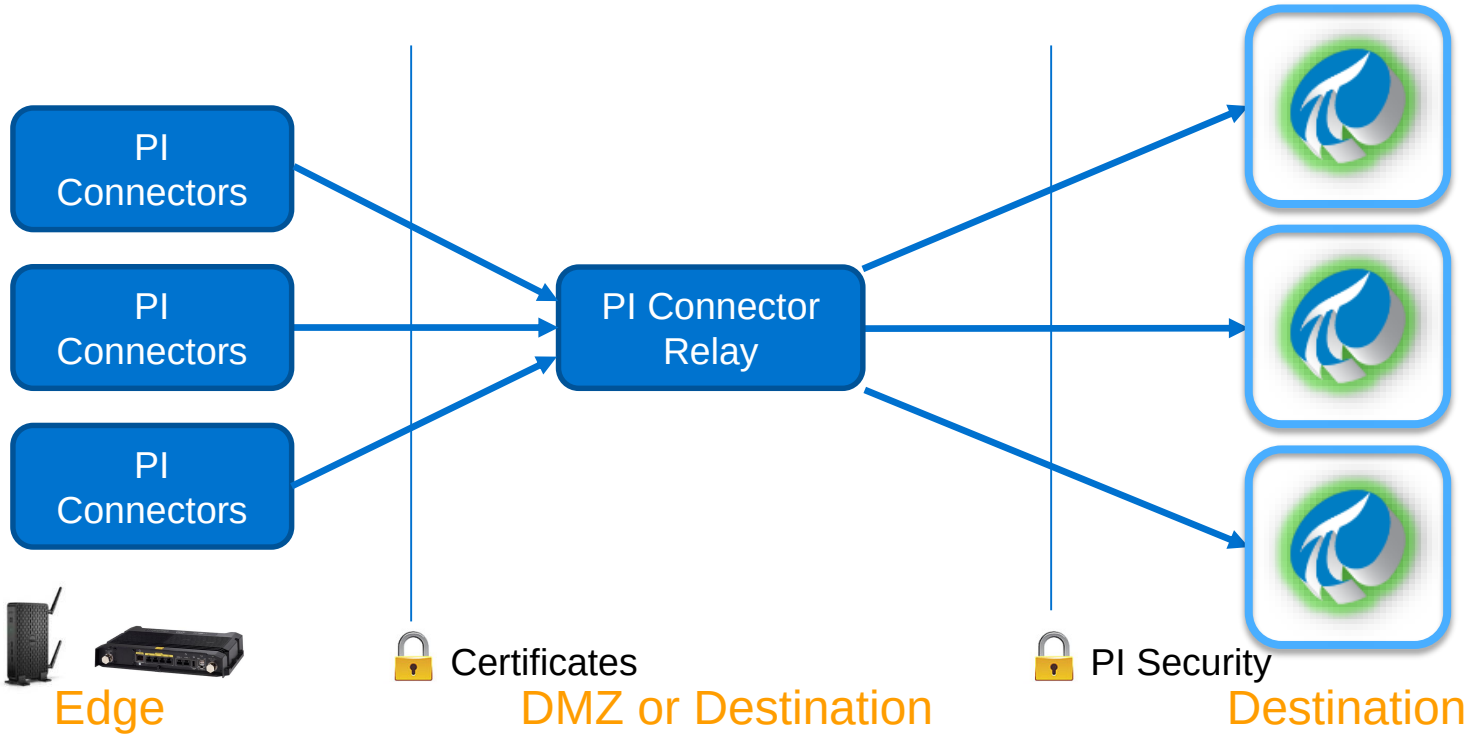
PI Connector Architecture



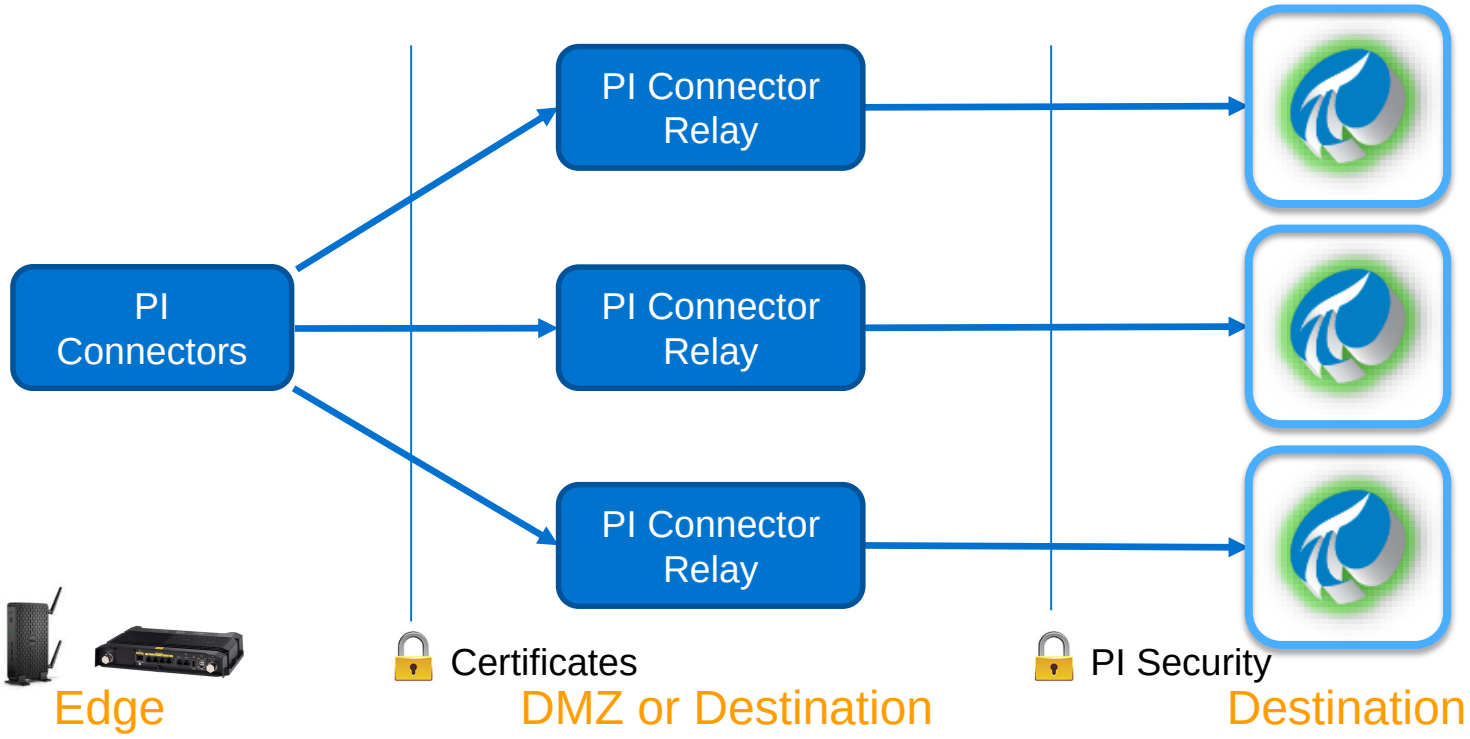
Multiple Connectors per Connector Relay



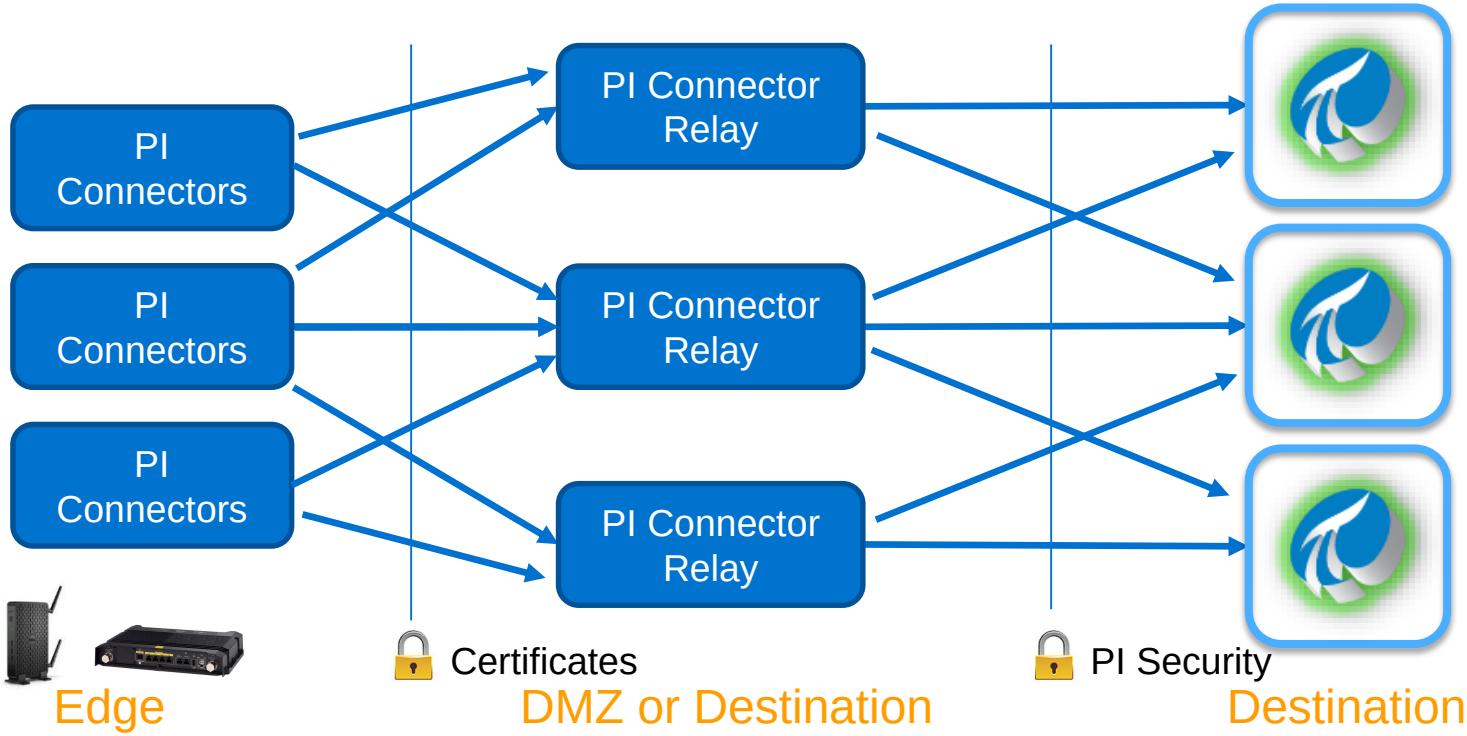
Multiple Connectors with Multiple PI Servers



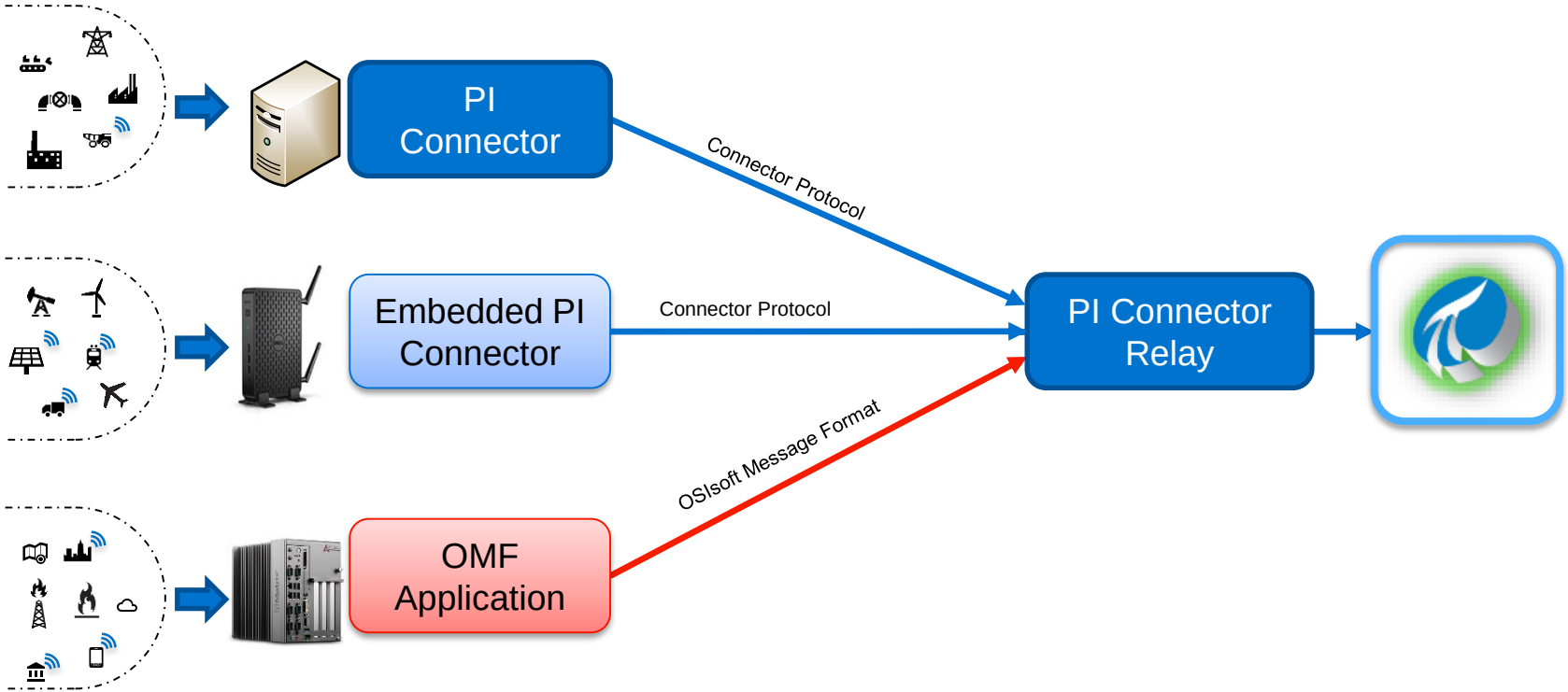
Multiple Connectors Relays per Connector



Multiple Connectors, Relays, and PI Servers



Multiple Data Ingress Options with Connector Relay



Edge Device Connectivity

Cisco IR829 router
Cisco IOx (Linux)

Cisco IR809 router
Cisco IOx (Linux)

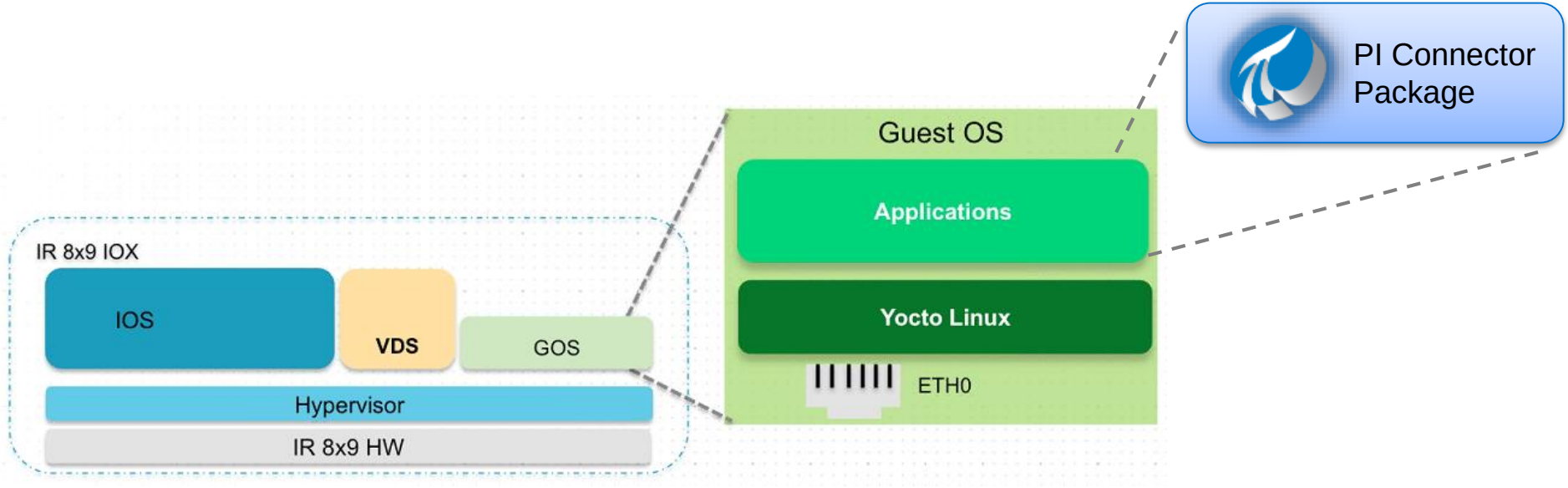
Embedded PI Connector

Embedded PI Connector

Embedded PI Connector

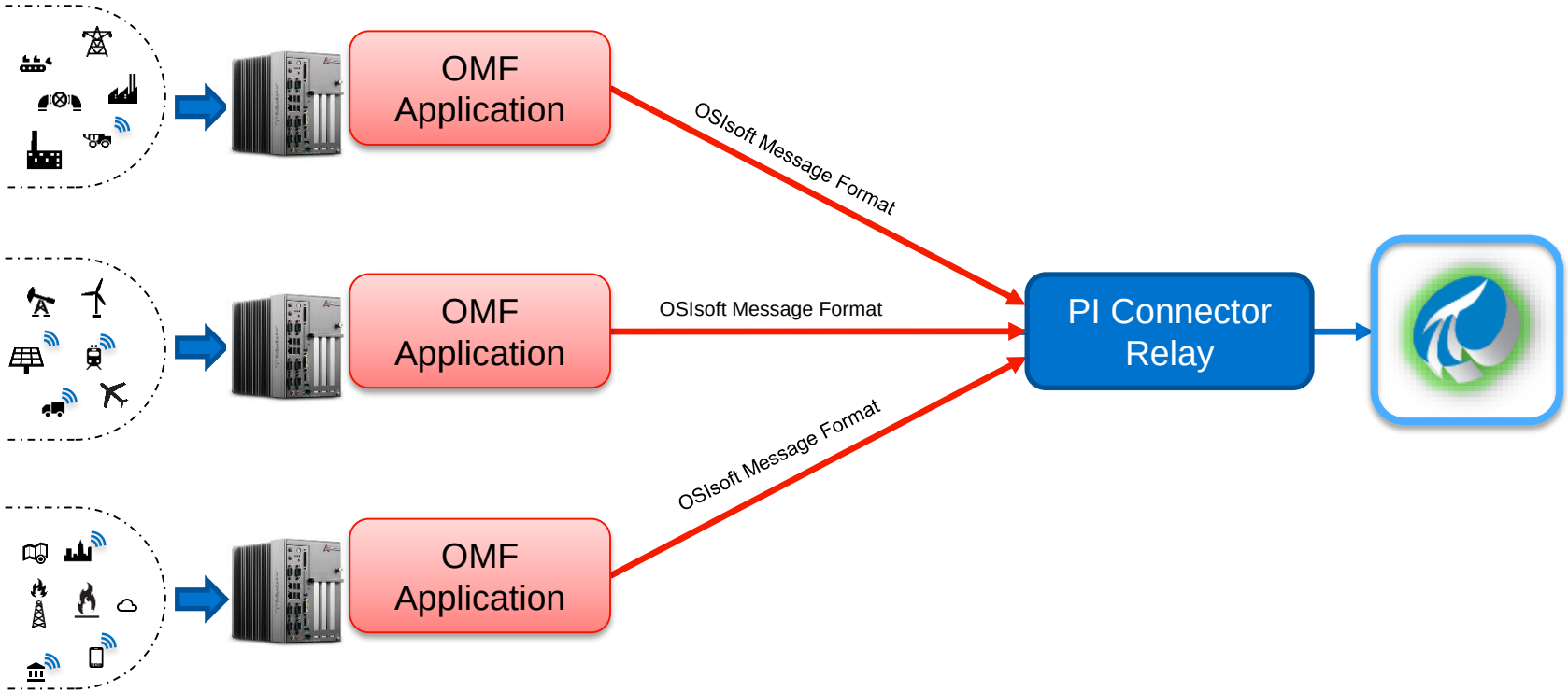
PI Connector Relay

Cisco IOx Architecture with Embedded PI Connector



Cisco IR829/809 router
Cisco IOx (Linux)

OMF Extends Edge Device Connectivity



What is OMF?

- OMF is/does:
  - A simple, message based contract for data ingress
  - A written specification and sample code
  - Support data and metadata for streaming data
  - Operating system and programming language agnostic
  - Support multiple binary formats and protocol bindings
  - Enable partners to ingress data directly into OSIsoft software
  - Meant for both on premises and cloud services scenarios
  - Supplemental to existing and new PI interfaces and PI Connectors
- OMF is not:
  - A replacement for PI Web API, AF SDK, or any other OSIsoft API
  - An application development framework

PI Connector Administration

Joe Admin

Components | filter Components

Node Map

Add Data Flow | Edit Data Flow

Actions

Show only Components with issues

Data Sources
- Dufftown_Cygnet
- Hogwarts_BACnet_01
- Parkmore_Cygnet

Connectors
- Dufftown Connector
- Hogwarts Connector
- Parkmore Connector

Relays
- Area Relay
- Facilities Relay

Destinations
- PI Server 1
- PI Server 2

Data Sources	Connectors	Relays	Destinations
Dufftown_Cygnet	Dufftown Connec...	Area Relay	PI Server 1
Parkmore_Cygnet	Parkmore Conne...	Facilities Relay	PI Server 2
Hogwarts_BACn...	Hogwarts Conne...		

Top-Level Action 1
Descriptive text about what this action does goes here and can stretch to multiple lines.

Top-Level Action 2
Descriptive text about what this action does goes here and can stretch to multiple lines.

Environment Configuration
Descriptive text about what this action does goes here and can stretch to multiple lines.

PI Connector Administration

Joe Admin

Components | filter Components | Node Map | Add Data Flow | Edit Data Flow | Actions

Show only Con

Data Sources
- Dufftown_Cygr
- Hogwarts_BAC
- Parkmore_Cyg

Connectors
- Dufftown Conn
- Hogwarts Conr
- Parkmore Conr

Relays
- Area Relay
- Facilities Relay

Destinations
- PI Server 1
- PI Server 2

PI Connector Administration

Joe Admin

Select Data for Data Source Hogwarts_BACnet_01

Selection Query Builder

Show Selection History

Select | Selection | Constraint

Selection
- Any object
- Elements
- Attributes and Tags
- Attributes
- Tags
- Elements of Type / Template
- Attributes and Tags of Type / Template
- Attributes of Type / Template
- Tags of Type / Template

Clear Selection Query | Run Selection Query

Selected Data | Hide Metadata

Name | Description | Object Name | Object Type | Instance Number | Units

- Network Number: 10 at IP: 12
  - Classroom 1A — Classroom 1A — Device
  - Classroom 1B — Classroom 1B — Device
  - AUX (BI 0) — RelayAUX (AUX) — AUX — BinaryInput — 0
    - Acked Transitions
    - Active Text
    - Alarm Value
    - Description
    - Device Type
    - Event Algorithm Inhibit
    - Event Algorithm Inhibit Reference
    - Event Detection Enable
    - Event Enable — To_OffNormal, To_...
    - Event Message Texts
    - Event Message Texts Config
    - Event State
    - Inactive Text
    - Notification Class
    - Notify Type
    - Object Identifier

Global Selectors
- Element Type / Template
- Attribute Type / Template
- Description
- Object Name

RECTM

SBMAX

0 of 105,551 items selected (0 PI Tags)

Show Selection Count as PI Tags

Cancel | Next

PI Connector Administration

Joe Admin

Components

Actions

Data Sources	Connectors	Relays	Destinations
Dufftown_Cygnet	Dufftown Connector	Area Relay	PI Server 1
Parkmore_Cygnet	Parkmore Connector	Facilities Relay	PI Server 2
Hogwarts_BACnet_01	Hogwarts Connector		

Events Per Second

0 50 100

Rolling average

Global Rolling Average

-24h -21h -18h -15h -12h -9h -6h -3h Now

Global Events Per Second

0 50 100

IIoT Gateway Examples

Monico
(PI Server connectivity - OMF)

Dell
(complete PI System)

HPE
(complete PI System)

Cisco
(PI Server connectivity – Embedded Connector)

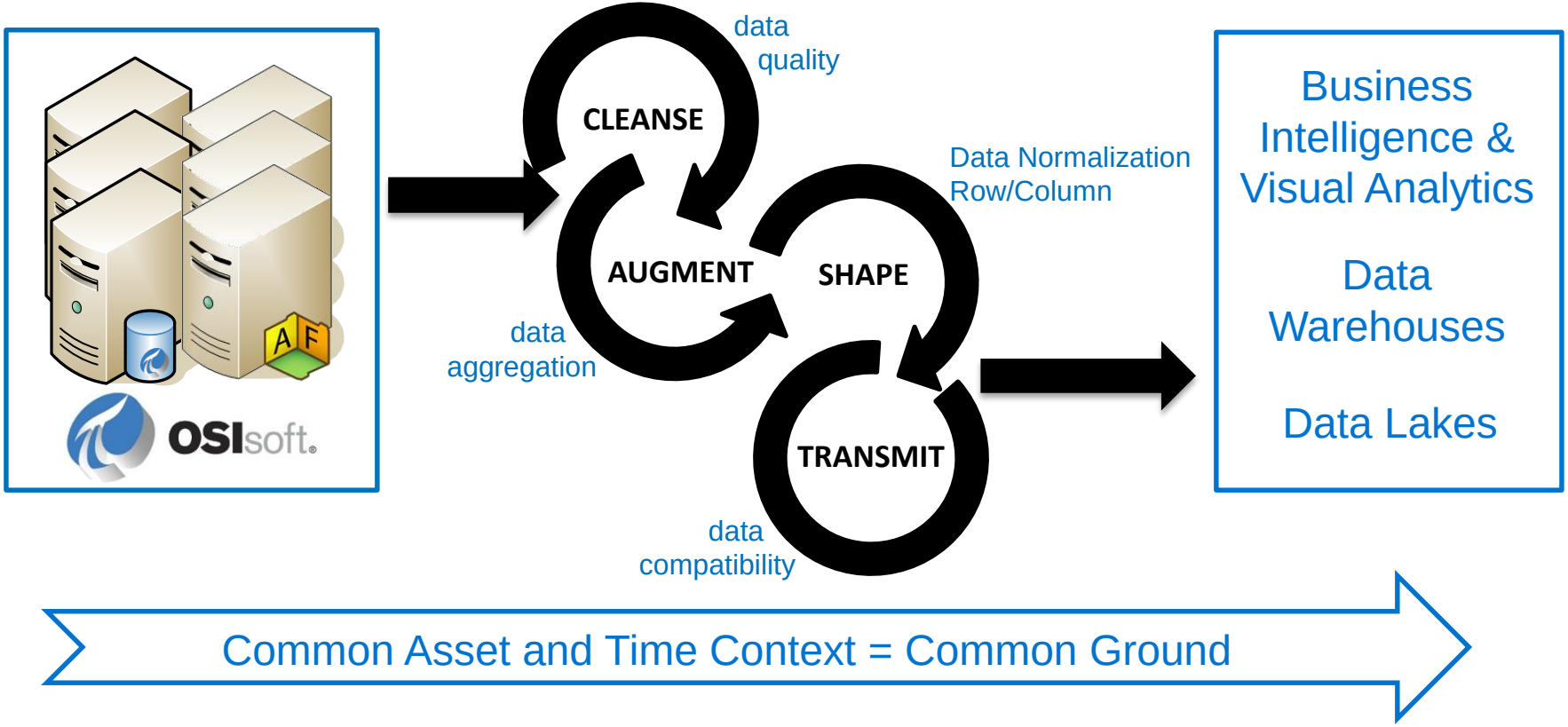
Stratus IoT Solutions
(PI Server connectivity – OMF)

Intel / ODM
(PI Server connectivity - TBD)

The “Enterprise”

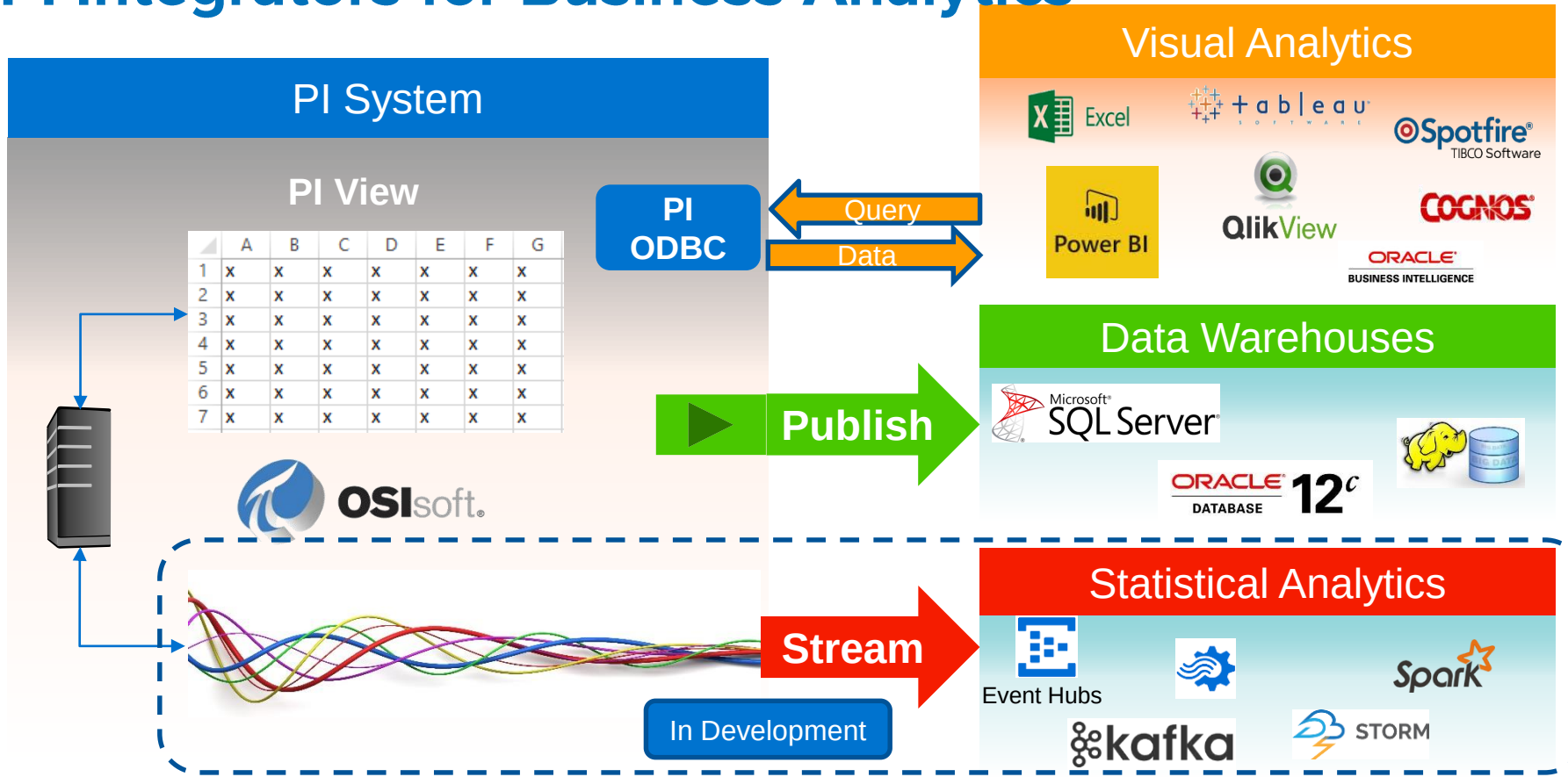
PI Integrators

PI Integrators Enable Deep Data Analytics



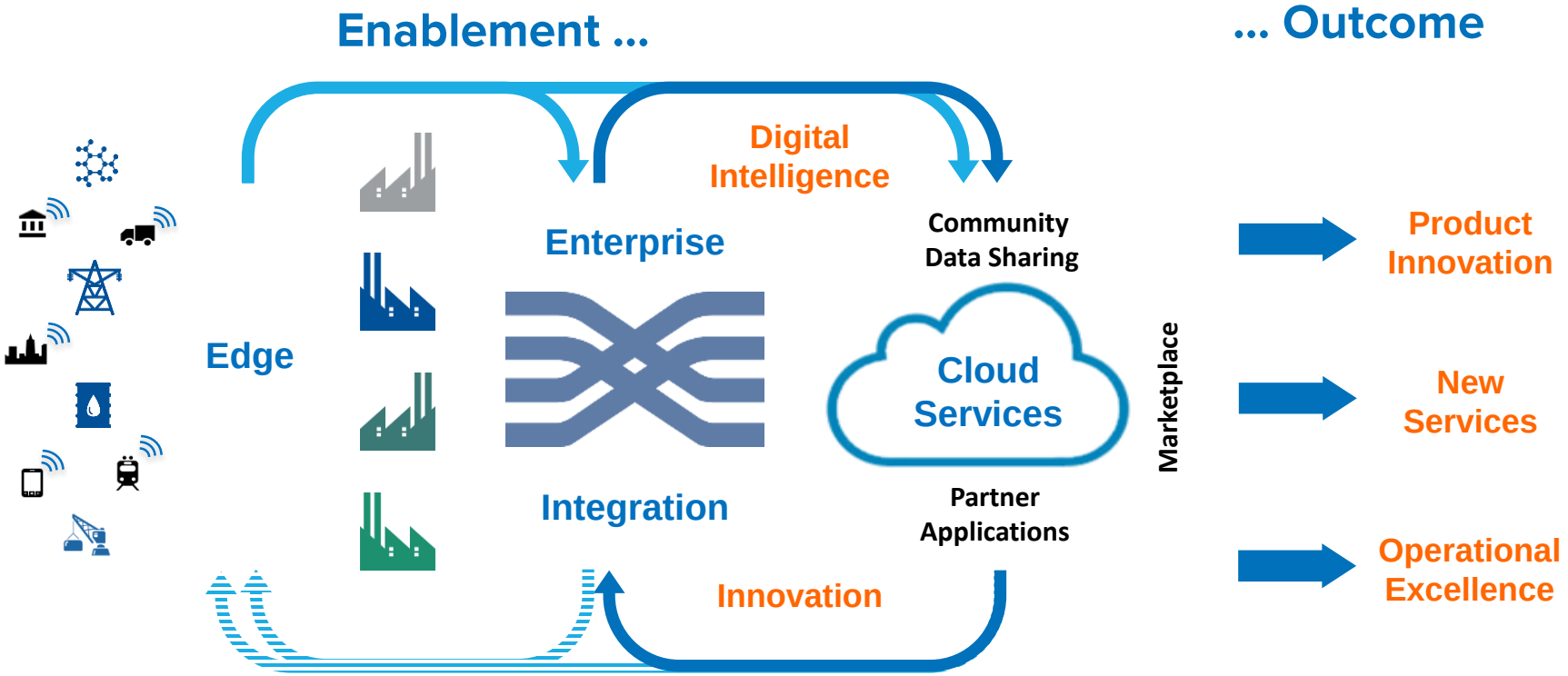
Common Asset and Time Context = Common Ground

PI Integrators for Business Analytics



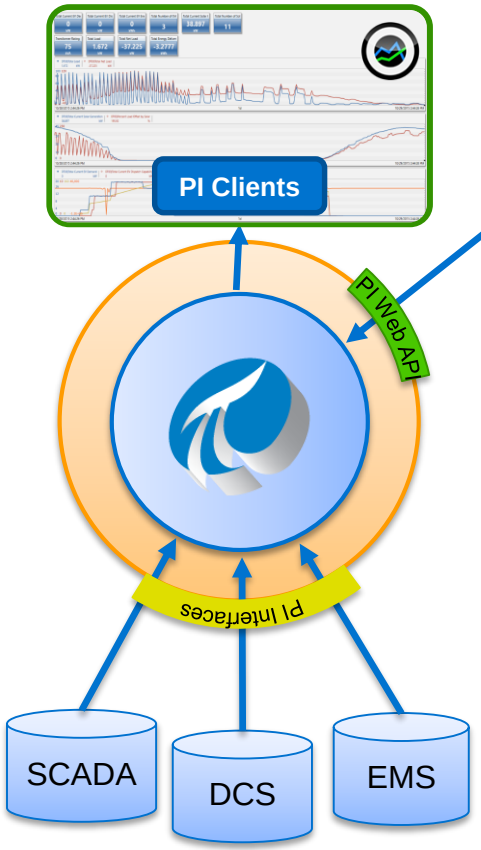
The “Cloud”

OSIsoft Cloud Services Vision



IIoT Architecture

PI System Architecture (typical)



Custom Applications

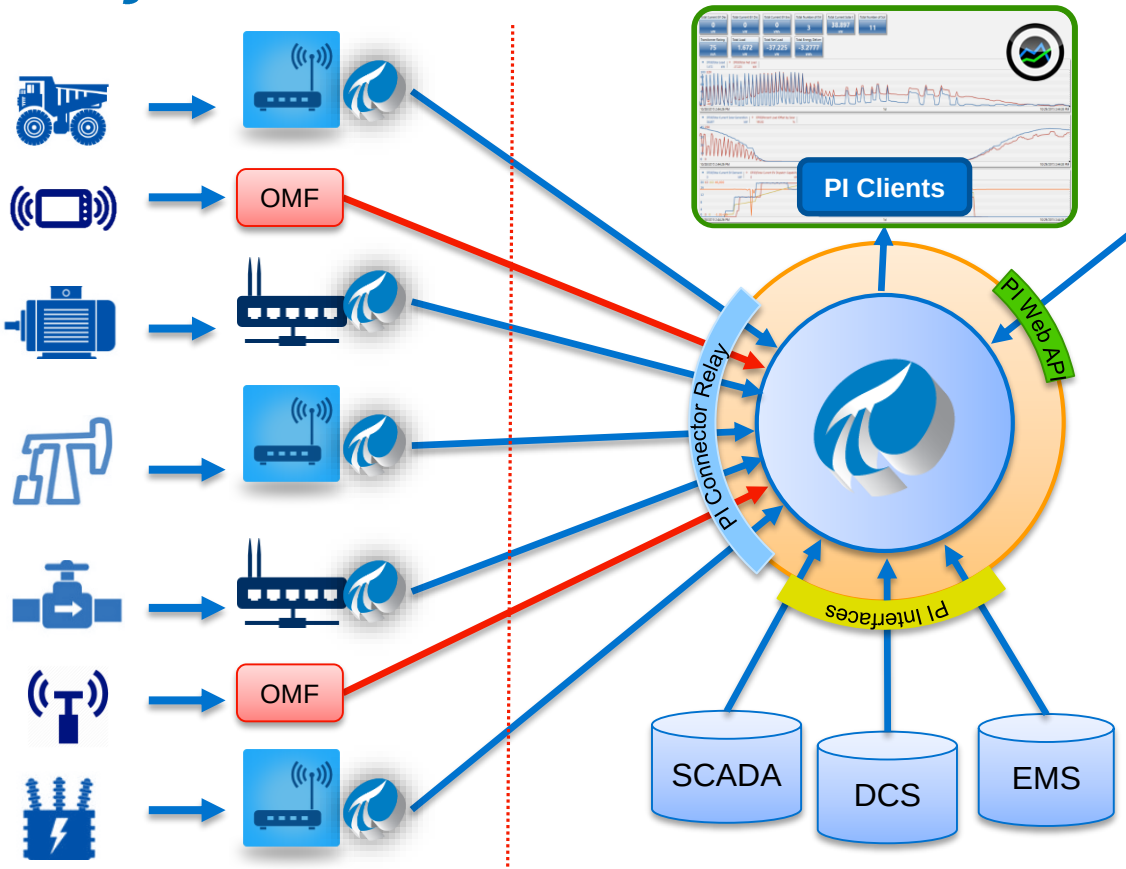
Cloud or On Premises

Essential Asset Monitoring

Condition Based Maintenance

…

PI System IIoT Architecture



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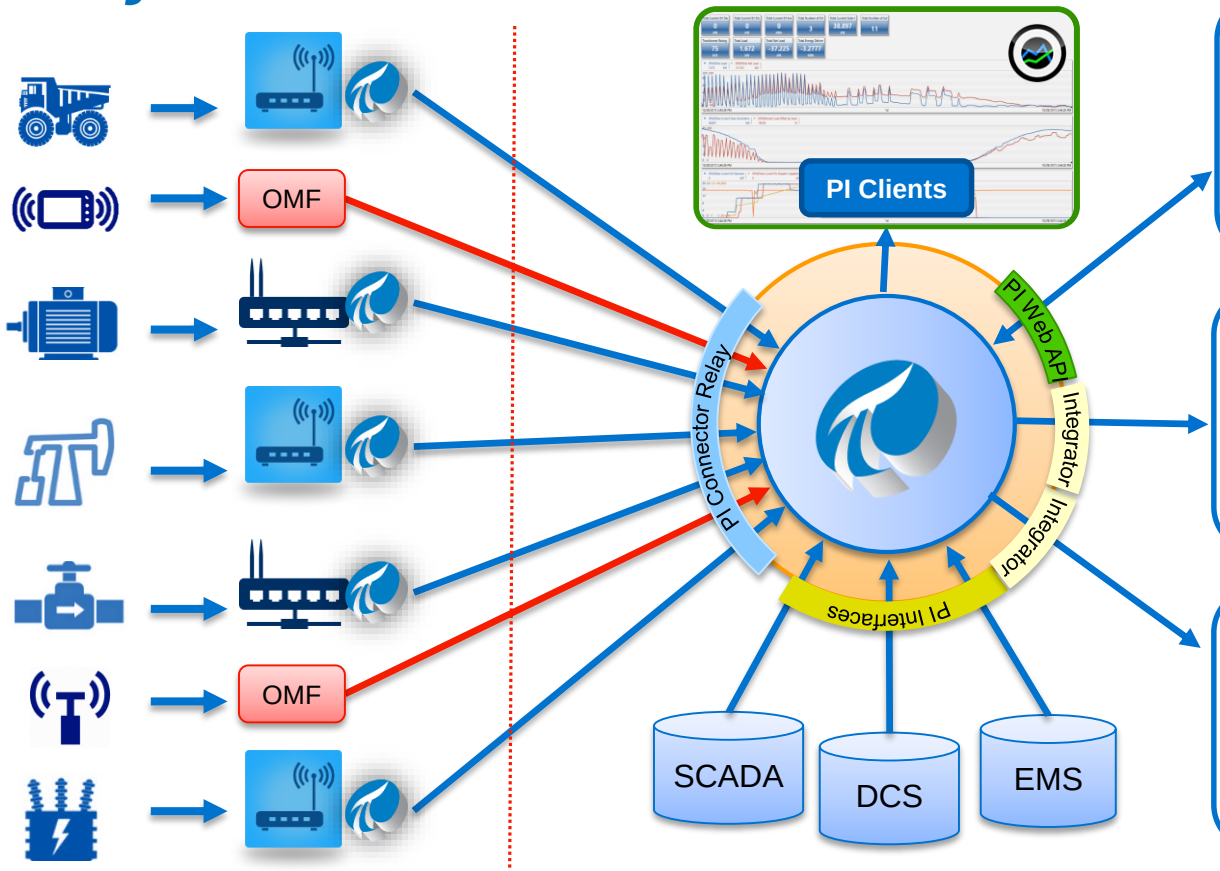
PI System IIoT Architecture



Custom Applications

Cloud or On Premises

Essential Asset Monitoring

Condition Based Maintenance

…

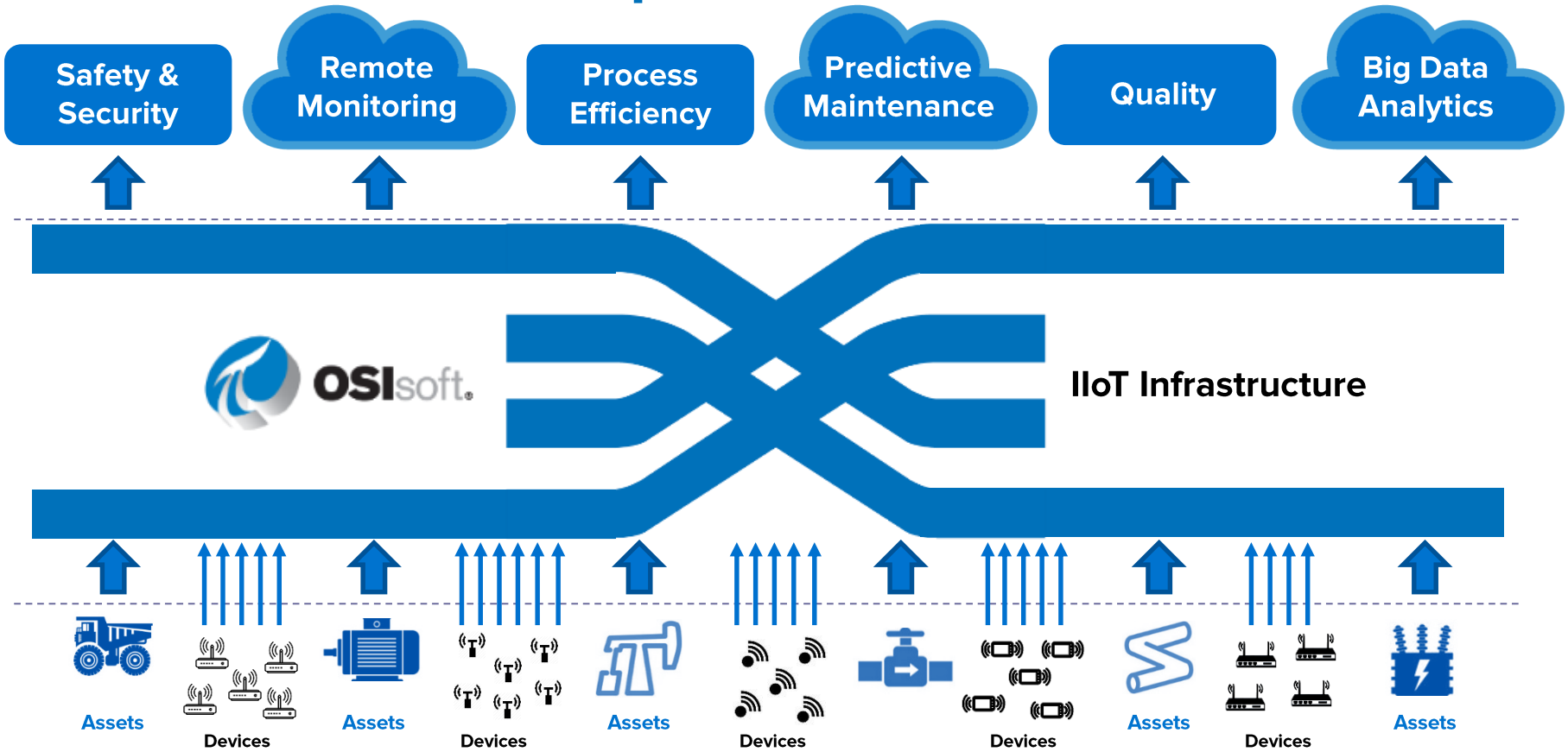
Visual Analytics

Excel, tableau, Spotfire TIBCO Software, COGNOS, QlikView

Statistical Analytics

hadoop MapReduce, SAS, SAP, R, python

IIoT Extends the Enterprise Infrastructure



감사합니다

谢谢

Danke

Gracias

Merci

Thank You

ありがとう

Спасибо

Obrigado