



Data Collection at the Edge with OSISoft Message Format

Presented by:

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Our Data Collection Technologies

PI
Connectors



Plants

Edge Data
Store



Assets

Open Edge
Module



Devices

OMF
Application



Sensors

1,000,000's ←

Data Streams



100's

High ←

Compute Resources



Low

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Sensors



ODBC



HTML/XML



IPMI



SNMP



EtherNet/IP

WITSML

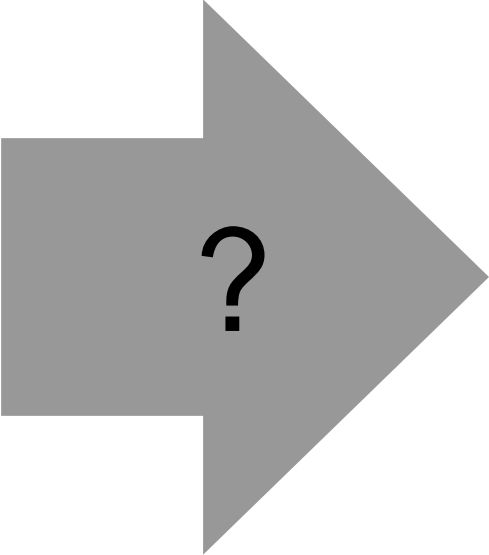
Distributed Network Protocol

CYGNET

a Weatherford Company



How does this help me collect data?



OSISOFT®

O.M.F. OSISOFT Message Format

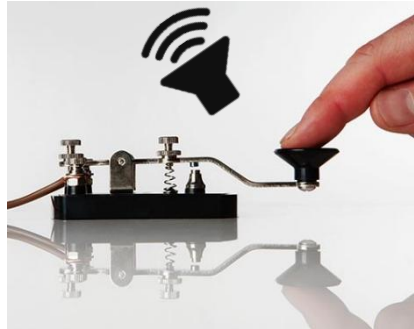
What's the point of creating a specification?



“Flash”



“Beep”






“Tap”



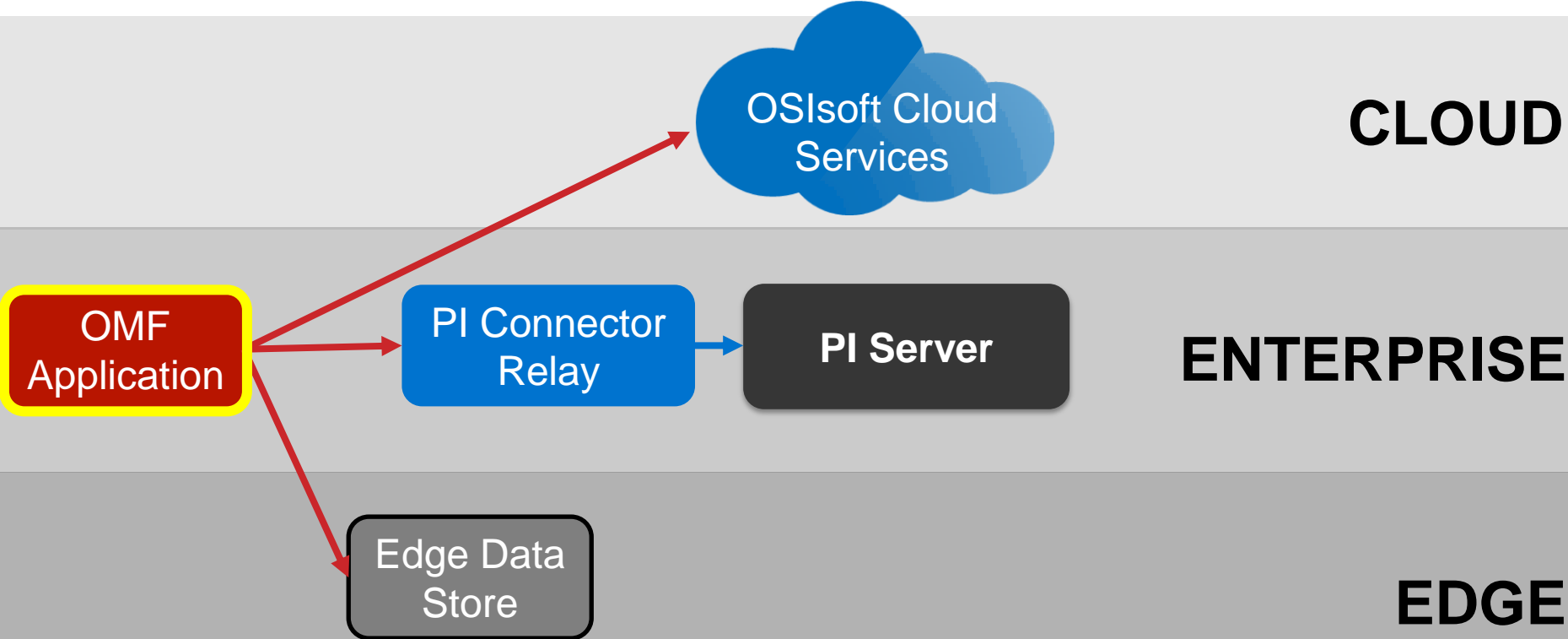
How is OMF different from other dev tools?



Maximum Flexibility

- ✓ No libraries to install
- ✓ OS Agnostic   
- ✓ Destination abstraction

Supported Destinations



What if I need to do MORE than just connect?



Common Challenges at the Edge



Limited Bandwidth to transmit data

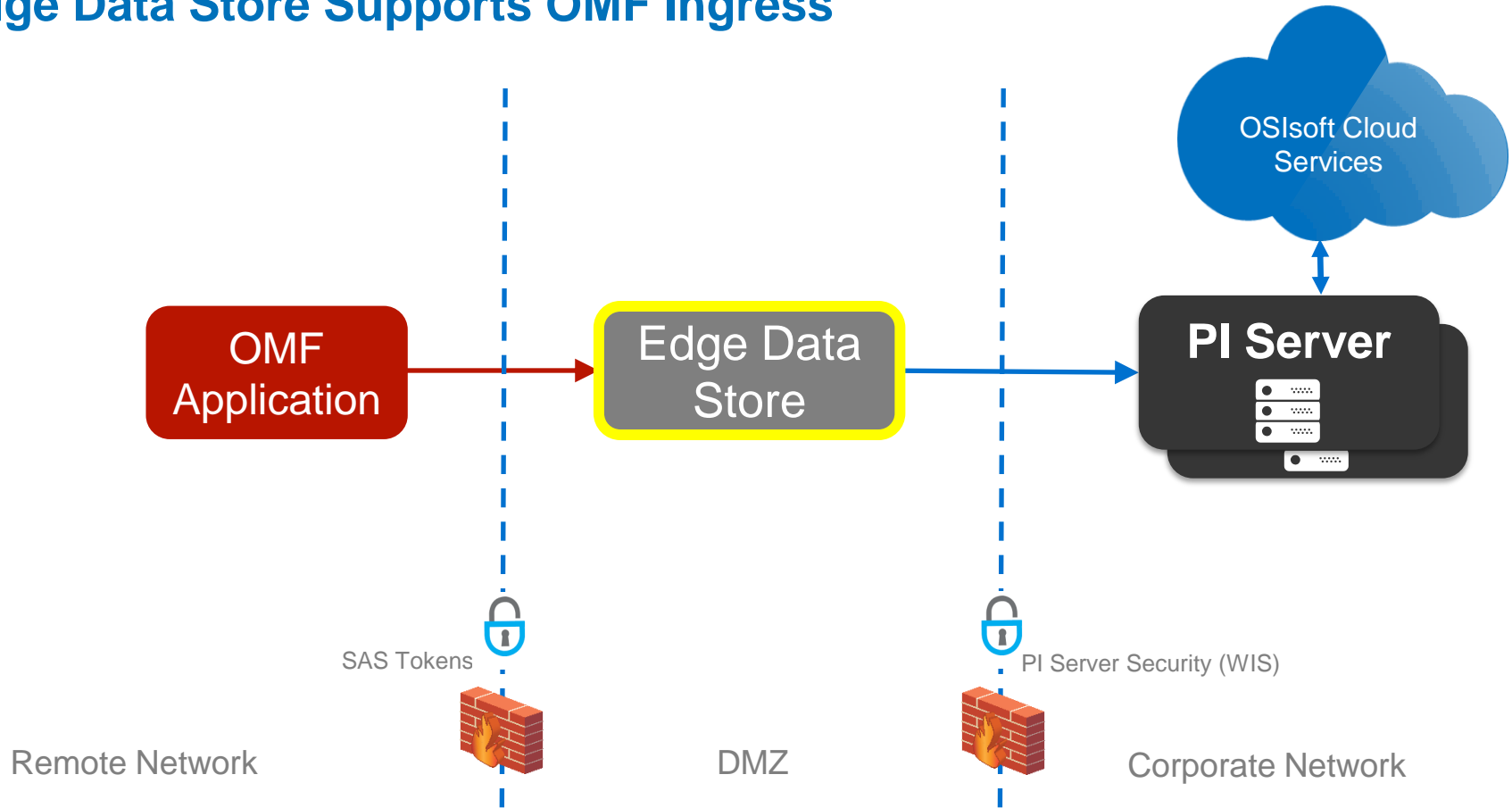


No Data Access for local decision making



Temporary Disconnects from the network

Edge Data Store Supports OMF Ingress



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What is OMF?

- OMF is a specification
- <http://omf-docs.osisoft.com>
- Defines a set of message bodies and headers
- Used to develop data acquisition applications

OMF Type Message Body

- Represents the schema of a sensor reading
- Defined using JSON Schema specification
- JSON array

```
[{
  "id": "SensorReading",
  "version": "1.0.0.0",
  "type": "object",
  "classification": "dynamic",
  "properties": {
    "Time": {
      "type": "string",
      "format": "date-time",
      "index": true
    },
    "Reading": {
      "type": "number"
    }
  }
}]
```


OMF Container Message Body

- Represents a grouping of sensor readings
- Groups data for a single Type
- JSON array

```
[{  
  "id": "Sensor1Readings",  
  "typeid": "SensorReading",  
  "typeversion": "1.0.0.0",  
}]
```

OMF Data Message Body

- Represents readings from the sensor
- Multiple readings in one message
- Values conform to OMF Type schema
- JSON array

```
[{  
  "containerid": "Sensor1Readings",  
  "values": [{  
    "Time": "2017-01-01T00:01:00.000Z",  
    "Reading": "14.0"  
  }, {  
    "Time": "2017-01-01T00:02:00.000Z",  
    "Reading": "15.1"  
  }  
}]
```

OMF Headers

- ProducerToken: Security token used for authentication
- MessageType: Type, Container, Data
- MessageFormat: JSON
- Compression: GZip, optional
- Action: Create, Update, Delete

OSIsoft products using OMF

- Planned support for OCS Data Store ingress
- Planned support for Edge Data Store ingress
- Beta release for PI Server ingress through PI Connector Relay targeting Q4 2017
- At the UC Day 3:
 - Developer Lab: IoT Device Integration Using the OSIsoft Message Format
 - Product Talk: Pervasive Data Collection for Industry 4.0

OMF can be used with Message Behaviors

- Messaging Behaviors
 - disconnected
 - publish / subscribe
 - fire and forget



OMF does not replace OSIssoft APIs

- OMF currently limited to data ingress
- Backend systems expose a single endpoint
- Data contract is the spec
- Messages can be used across backend systems
 - A particular backend system chooses how it interprets OMF

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Living on the Edge

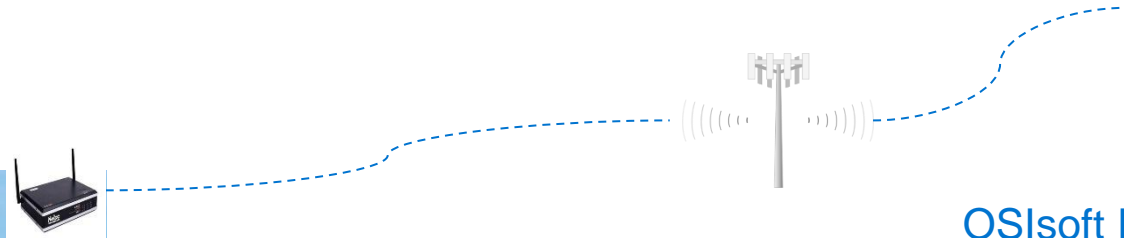
administration Services restful
OS|soft transfer
hardware data Windows
storage self persistent
docker small footprint
PIX robust OS
linux deploy healing
Enterprise Support
application Cloud
API



OSIsoft Data Storage at the Edge



OSIsoft Enterprise Integration



- Robust, self-healing, persistent storage
- Deploy on small footprint hardware
- Linux and Windows OS
- Docker Support
- Data transfer to PI Enterprise and OSIsoft Cloud Services
- Restful application & administration API

Edge Data Store Hardware Requirements

- Targeting gateway devices
 - 1 GB RAM
 - ARM or x64 CPU, 1.2 GHz quad core
 - Internal Storage
 - Linux (Ubuntu 16.04)
 - Windows - IoT Core, Windows 10
 - Docker Support



What is the Edge Data Store (Edge DS)?

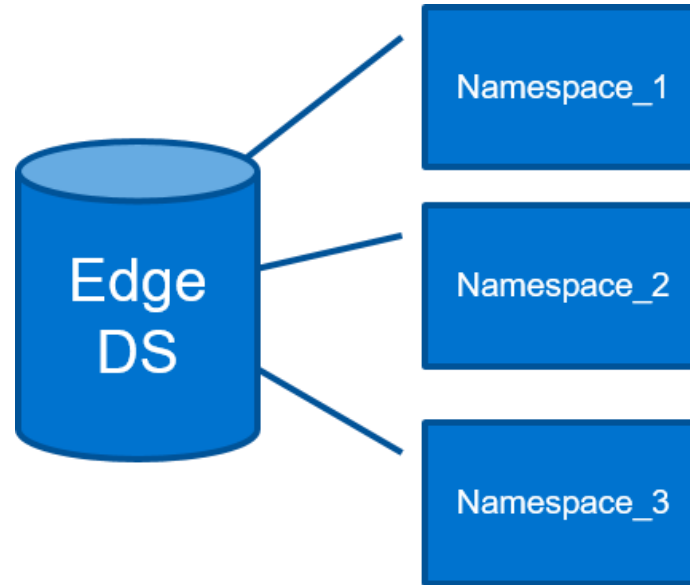
- Edge DS is not a PI Data Archive Replacement
- Edge DS is a “sequential” database
 - Anything that can be ordered can be stored
 - Simple or Complex data types can be stored
 - Multiple indexes can be assigned
 - Non-time series
 - Compound
 - Secondary
 - No distinction between future and past data
 - Unbounded Event Size
 - High – precision timestamps (100ns)



Edge DS Namespaces

Namespaces separate data into logical entities

- Example:
 - Production
 - QA
 - Development



Data Types

- QiTypes describe the kinds of data you can store in QiStreams.
 - Simple Types such as integer, float, string
 - Complex Types – Nested simple types to create richer models
 - Types must have a Key which is indexed (primary)
 - Streams can contain secondary indexes

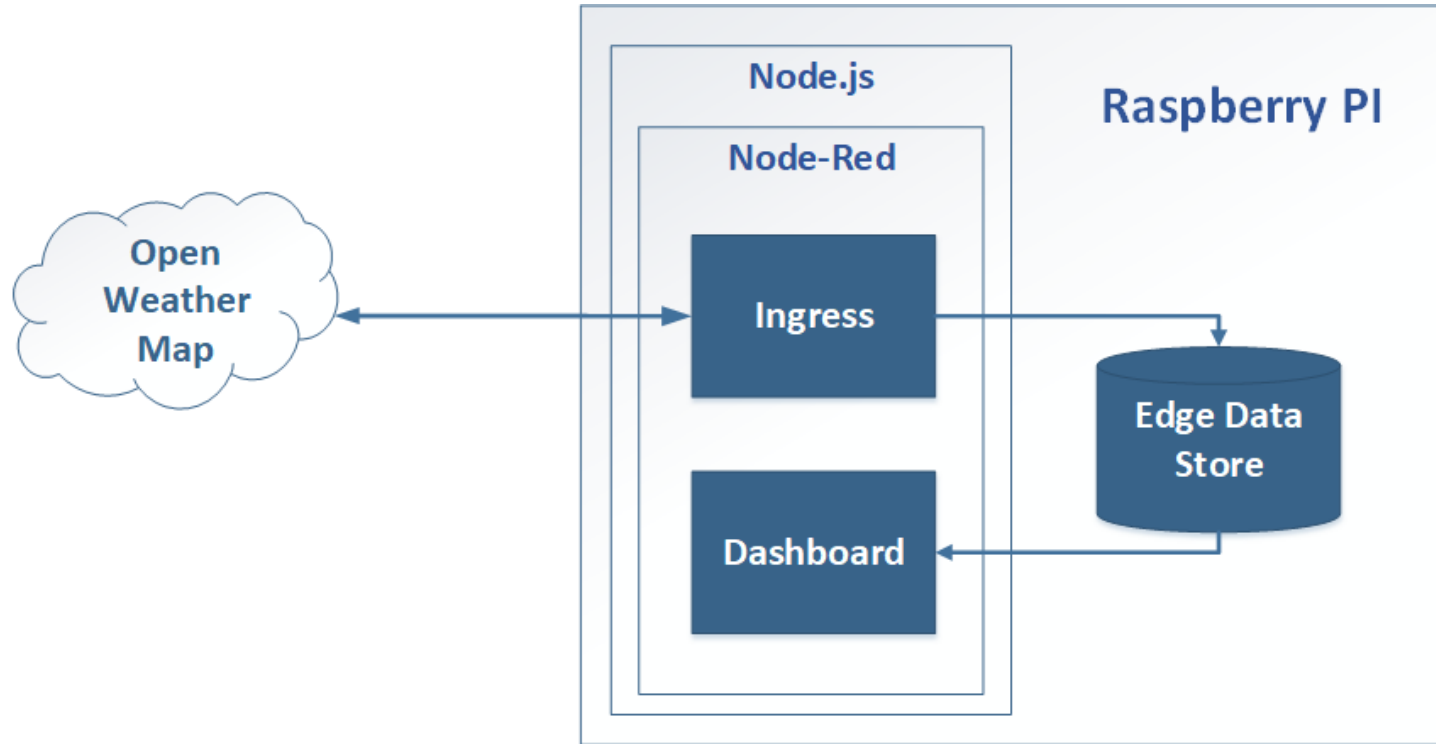
<https://cloud.osisoft.com/documentation>

Security

- Encrypted Communication
 - HTTPS for Endpoint communication
 - Bring your own certificates
- Authentication and Access Control
 - Client Certificate Authentication
 - Edge has two internal roles, Administrator and User

OMF Demo

Demo



Call to Action



OMF

Looking for interested partners and developers to join BETA program



Edge Data Store

Looking for partners to join technology preview for Q1 of 2018

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Edge Products Group Lead



Questions

Please wait for the **microphone** before asking your questions

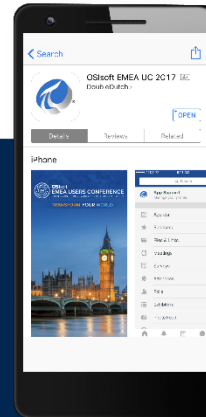


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감사합니다

Danke

谢谢

Merci

Gracias

Thank You

ありがとう

Спасибо

Obrigado