

Oil & Gas
(Midstream)



Shedding Light on “Dark Data”

Compressor Data with OMF and Monico's
mCore®SDR at MPLX Gathering & Processing



MARKWEST
Energy Partners, L.P.

Oil & Gas
(Midstream)



Ron Sprengeler - MPLX G&P Doyle Taylor - President - Monico



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Energy Partners, L.P.

About US

MPLX Gathering and Processing

- Subsidiary of **Marathon Petroleum**
- **Midstream Gas** Gathering and Processing Business
- 45 facility locations
- 7.5 BCF/Day processing capacity
- 325,000 BPD Fractionation Capacity

About US



- We're in the business of **Industrial Data** communications
- Monico is a **Preconfigured Solutions** Company
- We offer superior Customer **Service and Support**

Monico is a supplier to end users and their integrators for **industrial data acquisition, protocol conversion, data analysis**, and custom **monitoring** solutions

History with OSIsoft

MPLX G&P History with PI System

- Customer since 2012
- Non EA License Agreement
- 350,000 tag license (always growing)
- 70 OPC Interfaces
 - All plant facilities
 - All Field SCADA systems
 - 115 individual compressors via Modbus

History with OSIsoft

Monico's History with PI System



OSIsoft.
Partner

- OMF Protocol embedded into **mCore®SDR**
- **MonicoLive™** Remote Monitoring
 - Web Based OSIsoft PI System Solutions
 - Cloud Analytics Capability
 - Subject Matter Expertise

Business Case

What we wanted to do:

Capture operational data from compressors
Leverage our existing OSIsoft PI System Solution

Why we wanted to do it:

Improve reliability management
Increase utilization and efficiency

What we needed to do:

Determine how to get data from all of the compressor sites
Integrate compressor site data into OSIsoft PI System



Business Challenge

Different models of engines and compressors, with varying industrial protocols made capturing data from the edge environment a challenge

- 850+ compressor units across large geographic footprint
- Different systems (e.g., engines, controllers) report different data
- Most compressor data not reported at all
- Need consistent data across the fleet to improve efficiency and utilization
- Don't burden SCADA network!

Solution Details - Expectations

- Provide **consistent data** from all units (~250 tags)
- Utilize **modern protocols**
- Provide **consistent calculations** for all units
 - 12 AF compressor templates
 - 20 unique analyses, 3,000 total and growing
 - 150 instances, growing to 850

Solution Details - Expectations

- OMF creates AF structure and PI server tags
- Solution is **tolerant** of data connection outages
- All compressors have identical tags and AF structure
- **AF SDK** will be used to incorporate manufacturer compressor calculations

Solution Details – Data Acquisition

What is mCore®SDR?

mCore®SDR is Monico's Flagship *Next Generation* hardware platform for remote monitoring, telematics applications, and **edge analytics**.



mCore®SDR is a:

- Protocol Translator
- Secure Edge Device Gateway
- Edge Analytics Device

Features:

- Industrial Cybersecurity
- a Rugged Package (IP66 and IP67)
- Haz. Loc. Approved (Class I, Div II) Maximum
- Computing Power, Speed, and Efficiency

Solution Details – Data Acquisition

What does mCore®SDR provide?

mCore®SDR provides a gateway for collecting multiple sources of data through physical ports and routing that data to the appropriate places



Physical Ports

(1) Proprietary CAT Data Link (CDL) Port

(2) CANbus Ports

(1) RS-232 Serial Port

(1) RS-485 Half Duplex Serial Port

(2) Physically separated Ethernet Ports

MULTIPLE PROTOCOLS INPUT AND OUTPUT SIMULTANEOUSLY

Solution Details – Data Acquisition

What does mCore®SDR do?



Supported Protocols

- Cat® Data Link input with Write Capability
- S.A.E. J1939 Input and Output
- Modbus RTU and RCP / Master and Slave
- OSI Message Format (OMF) for OSIsoft PI System
 - Supports Data Buffering for Data Fidelity and Compression
- MQTT Sparkplug B
 - Supports Data Buffering for Data Fidelity
- MQTT for Amazon Web Services
 - Supports Data Buffering for Data Fidelity
- Rockwell Allen Bradley Controller Tag Read and Write

Solution Details – Data Acquisition

How was mCore®SDR used?



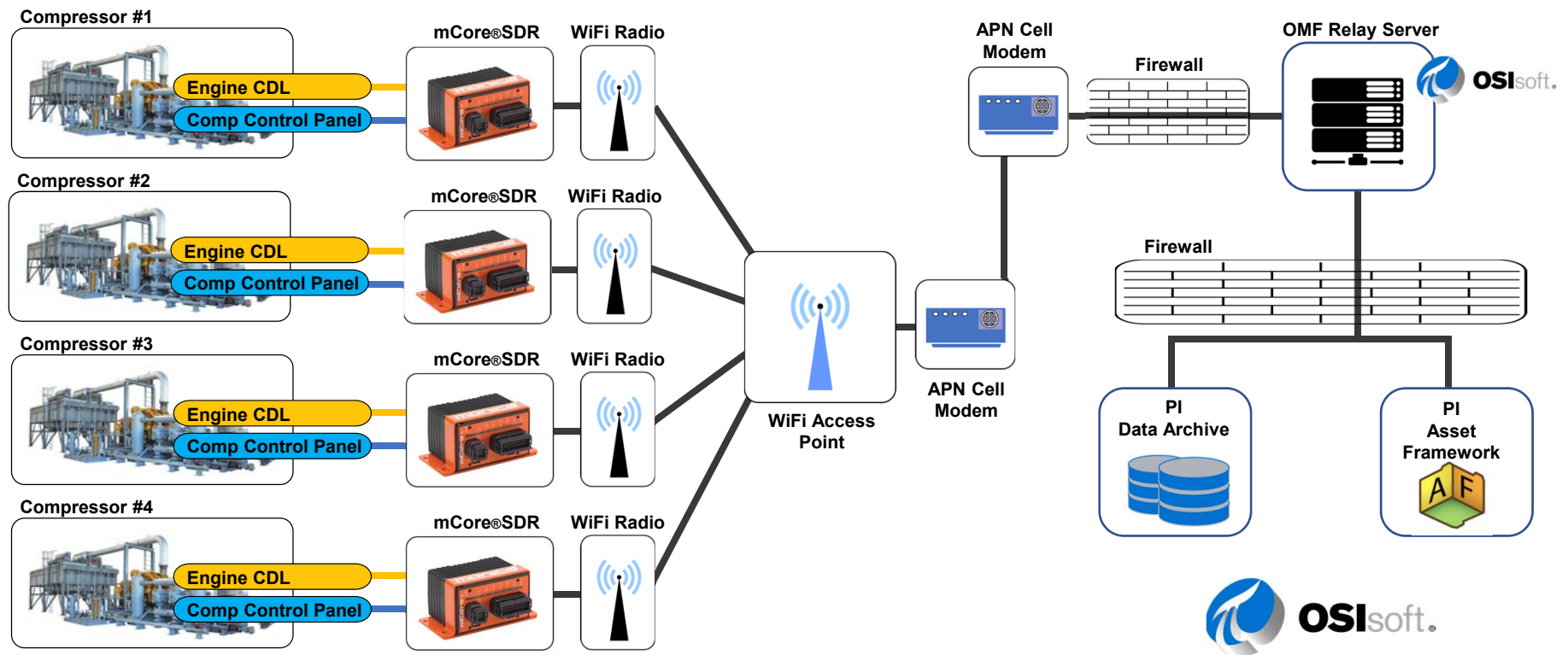
MPLX G&P Data Stream

262	Engine Parameters
94	Compressor parameters
10	Event Codes
10	Diagnostic Codes
	Compressor First Out Code

Report Parameters

- All parameters sent at startup
- All parameters evaluated for Exception each second
- Each Parameter Time-Stamped and Buffered

Solution Details - Topology



mCore®SDR Data Flow (Compression)

Step 1: Edge Data Acquisition

Example for illustrative purposes



Edge Networks/Sensors

External Sensors

Compressor PLC

Engine Network

RS232 (Analog/Digital)

RS485 (ModBus)

J1939

Cat® Data Link (CDL)

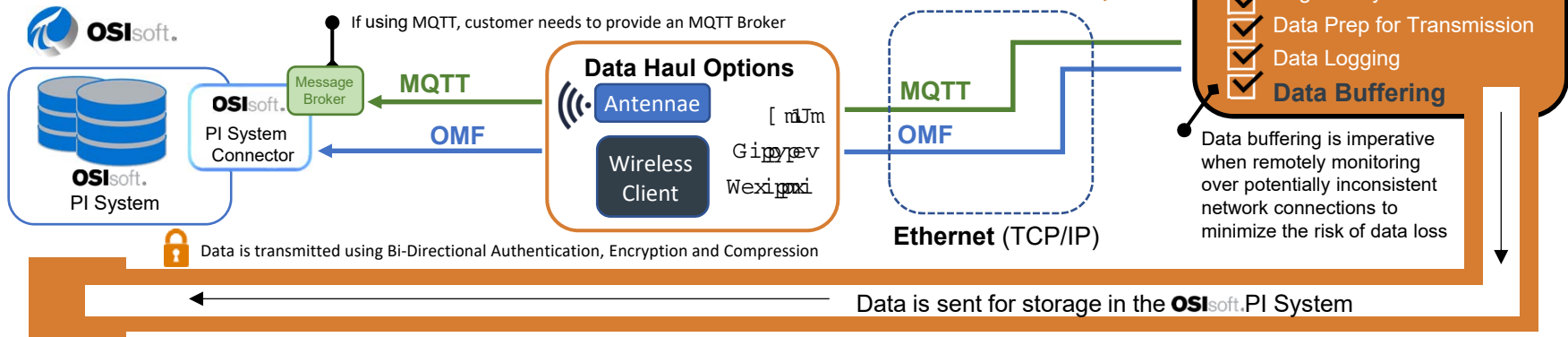
mCore®SDR



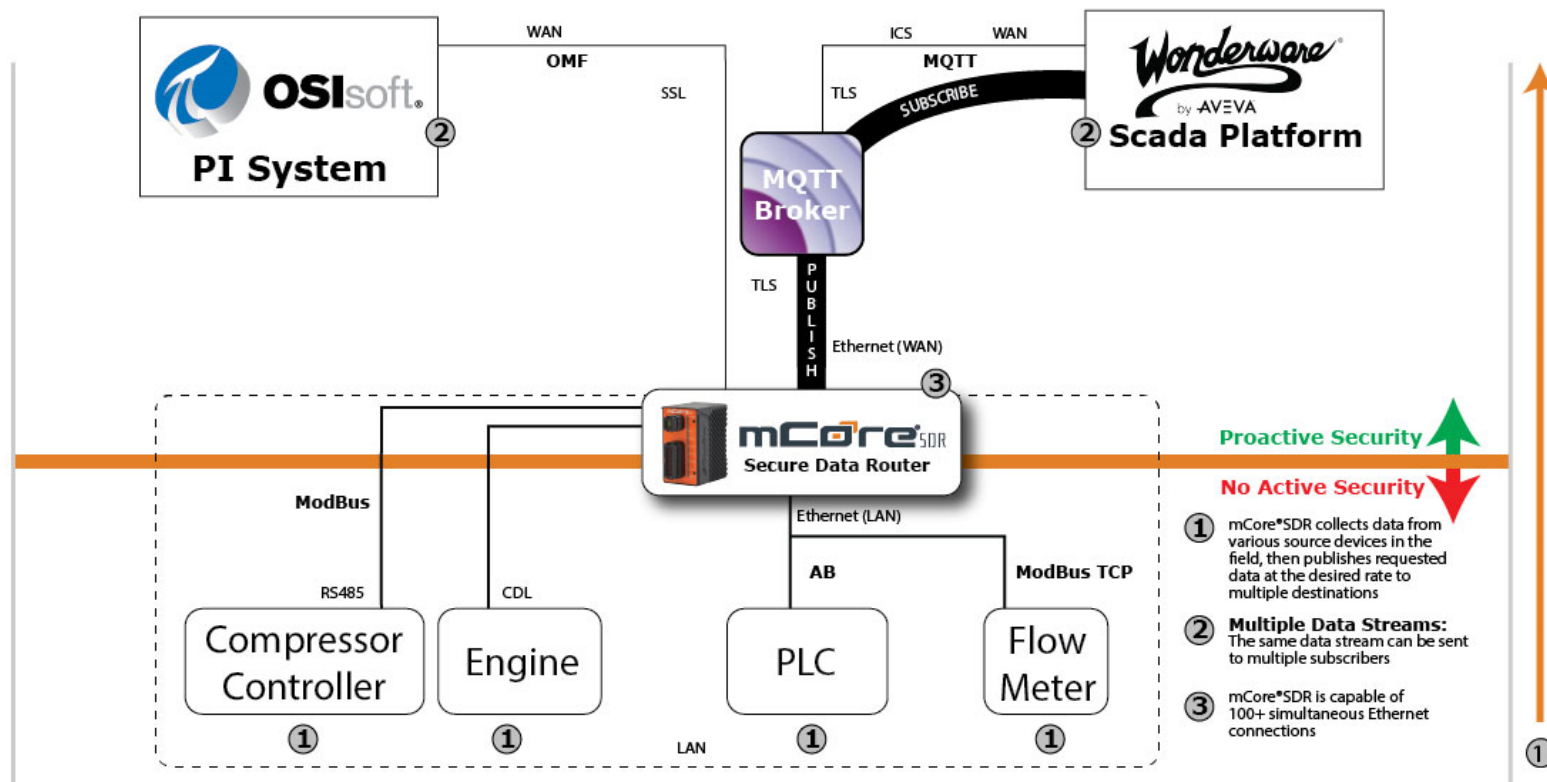
Start Here ►

Data generated on the **Asset** can be collected from multiple sources

Step 2: Edge Data Transmission



What's the future of ICS Network Security?



Solution - Benefits

- ✓ Consistent data across fleet
- ✓ Consistent analysis of unit data
- ✓ Improved utilization and efficiency of units
- ✓ Integration with existing OSIsoft Solution
- ✓ Improved visibility of compressor site operations
- ✓ Reduction in field equipment required to collect data

Replaced industrial PCs, Protocol convertors, etc.



CHALLENGES

- 850+ Compressors with stranded data
- No visibility into performance
- Sporadic visits to tune performance
- Separate reliability data from control

SOLUTION

- Monico mCore on each unit
- Radio network at station
- Dedicated cell APN data backhaul

BENEFITS

- Consistent data across fleet
- Consistent analysis of unit data
- Improved utilization and efficiency of units



*Provide **consistent data** from all units utilizing a solution which is **tolerant** of data connection outages*



Presenters/Speakers

- Ron Sprengeler
- Special Projects Manager
- MPLX G&P
- RRSprengeler@marathonpetroleum.com



- Doyle Taylor
- President/CEO
- Monico Monitoring, Inc
- dtaylor@monicoinc.com

Questions?

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the **microphone**

State your
name & company



Save the Date...



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