



# OSIsoft Cloud Services

**Part 2 of 4**

**- Data Acquisition -**

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# Extend the Platform and Add New Offerings

More Commercial Offerings

Cloud Connect



Data Sharing



Display Sharing



Partners App.



Cloud Services Platform

# Data Acquisition Workflow

- Register with OSIssoft Cloud Services (OCS)
- Obtain a security token from OCS Portal
- Compose messages using OSIssoft Message Format (OMF)
- Send messages to OCS via HTTPS
- Access the data in the OCS Data Store

# OMF is a specification

- OMF is not an API
- Defines a set of message headers and bodies
- Used to develop data acquisition applications
- <http://omf-docs.osisoft.com>

# Example of an 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",
      "isindex": true
    },
    "Reading": {
      "type": "number"
    }
  }
}]
```

# Example of an OMF Container Message Body

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

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

# Example of an 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"
  }
]}
```

## Notable OMF Headers

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



## OSIsoft products use OMF

- Unreleased for OCS Data Store ingress
- Limited release for PI Server ingress through PI Connector Relay
- At the UC Day 3:
  - Developer Lab: Develop Data Ingress Applications on Your Favorite Edge Devices Using the OSIsoft Message Format
  - Product Talk: PI System Distributed Data Collection

# OMF can be used with Message Queues

- Message Queueing is
  - disconnected
  - asynchronous
  - fire and forget



# OMF is not a replacement for OSIssoft APIs

- 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

# How does OMF map to OCS Data Store Structures?

- In OCS Data Store:
  - A QiType describes the form of the data to be stored
  - A QiStream represents an ordered series of events
- OMF Type -> QiType
- OMF Container -> QiStream
- OMF Data -> QiValue



# Fictitious Scenario

## Unified Petroleum

# Fictitious Scenario for OSIsoft Cloud Services (OCS)

## The Story of Unified Petroleum's Digital Transformation

Desire to improve safety and reduce cost

- Optimize drilling
- Share across regions
- Discourage isolation
- Smooth interaction w/ latest technologies
- Available everywhere
- Do not want to maintain an IT staff

# Fictitious Scenario for OSIsoft Cloud Services (OCS)

- Data source
  - Wellsite Information Transfer Standard Markup Language (WITSML)
    - “*Standard*” for sharing well data in the petroleum industry.
- Unified Petroleum is actively drilling in...
  - Gulf of Mexico
  - North Sea
  - Lookout, Oklahoma

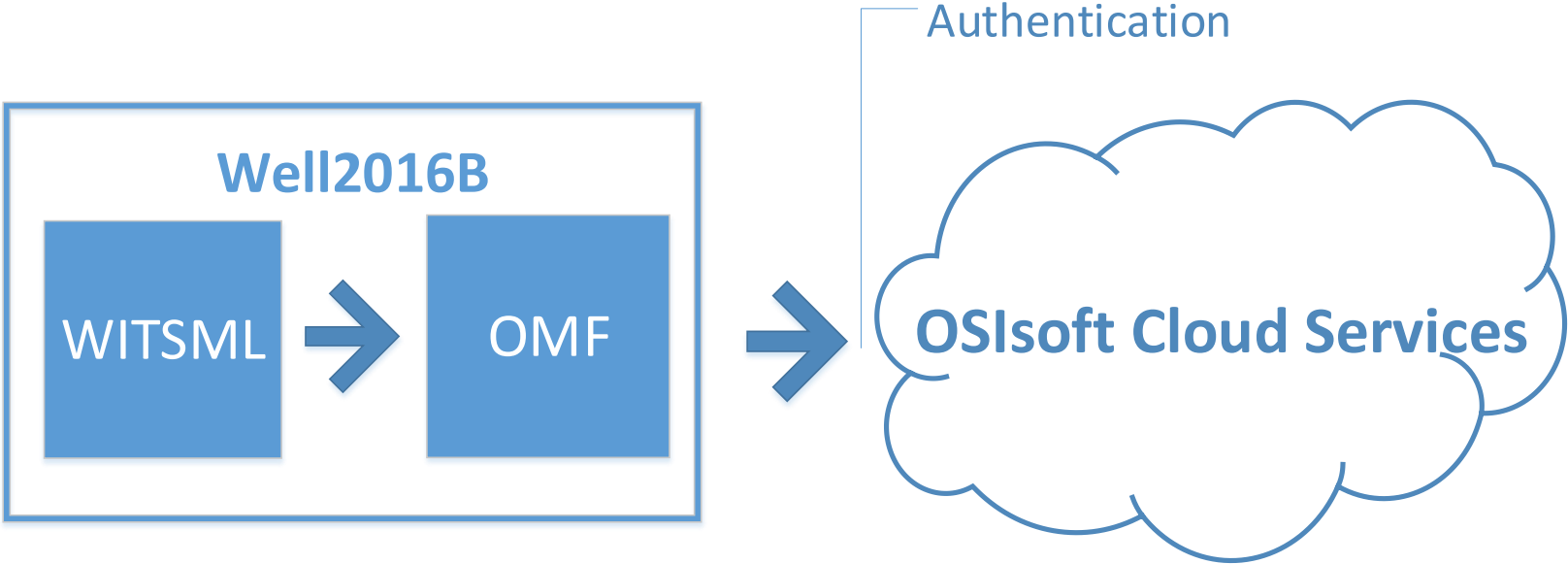


# An example of WITSML data

```
<?xml version="1.0" encoding="UTF-8"?>
- <logs version="1.4.1.1" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://www.witsml.org/schemas/1series">
  - <log uid="L-3610903-Time" uidWellbore="6ed5bb6b-f6e6-465b-9879-d87220f8" uidWell="b04e88c7-72c1-443e-aecc-8ea3c6">
    <nameWell>EnergisticsWell2016-B</nameWell>
    <nameWellbore>EnergisticsWellbore2016-B</nameWellbore>
    <name>8.5x9.5in_drilling_run01 - Time Log</name>
    <objectGrowing>false</objectGrowing>
    <serviceCompany>Schlumberger</serviceCompany>
    <runNumber>3</runNumber>
    <pass>Drilling</pass>
    <creationDate>2015-11-17T14:21:59.000Z</creationDate>
    <indexType>date time</indexType>
    <startDateTimeIndex>2015-11-22T05:21:42.000Z</startDateTimeIndex>
    <endDateTimeIndex>2015-11-22T10:50:03.000Z</endDateTimeIndex>
    <direction>increasing</direction>
    <indexCurve>TIME</indexCurve>
  - <logCurveInfo uid="P16H_UNC_RT">
    <mnemonic>P16H_UNC_RT</mnemonic>
    <unit>ohm.m</unit>
    <minDateTimeIndex>1900-01-01T00:00:00.000Z</minDateTimeIndex>
    <maxDateTimeIndex>1900-01-01T00:00:00.000Z</maxDateTimeIndex>
    <curveDescription>IMP/ARC Non-BHcorr Phase-Shift Resistivity 16-in. at 2 MHz</curveDescription>
    <dataSource>IMP_ARC</dataSource>
    <typeLogData>double</typeLogData>
  </logCurveInfo>
  - <logCurveInfo uid="TRPM">
    <mnemonic>TRPM</mnemonic>
    <unit>rpm</unit>
    <minDateTimeIndex>1900-01-01T00:00:00.000Z</minDateTimeIndex>
    <maxDateTimeIndex>1900-01-01T00:00:00.000Z</maxDateTimeIndex>
    <curveDescription>CRS Turbine RPM</curveDescription>
    <dataSource>CRS</dataSource>
    <typeLogData>double</typeLogData>
  </logCurveInfo>
  - <logCurveInfo uid="CURFSL">
    <mnemonic>CURFSL</mnemonic>
```



# Overview of end-to-end data flow



# How to obtain a security token

Home Learn Manage Visualize Admin IngressUser

> Data Ingress

Devices Publications Subscriptions

Displaying 0 of 0 Devices Filter Devices... + Add

Device Name	Device ID	Status
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A Device is a logical construct which is used by OSISOFT Cloud Services (OCS) to authenticate and categorize OSISOFT Message Format (OMF) messages. When a device is registered using the API, a security token is generated and returned to the caller. The token must be added to the headers of OMF messages that are sent to OCS. If a device is revoked, all security tokens generated for the Device become invalid.

While OMF messages may be sent to OCS immediately after

✓ The service is operating normally © 2017 - OSISOFT, LLC. Support & Feedback ^

# OMF Messages generated from WITSML

- Drilling Measurement Type message
  - Sent with Fiddler
- Container message
  - Sent with Raspberry Pi
- Data messages
  - Sent with Raspberry Pi

# Sending OMF to an OSIsoft Cloud Services endpoint

The screenshot shows the Telerik Fiddler Web Debugger interface. The main window displays a request configuration for a POST method to the endpoint `https://omf-historianmain.osipi.com/api/data` using HTTP/1.1. The request headers are as follows:

```
producttoken: 1/6f4f7ac7c72d48c39e7d48933c61fae9/c2dbab06-ee40-4b23-bb20-c7bdd7cc3637/65202004800/gé
omfversion: 1.0
messagetype: type
messageformat: json
action: create
Content-Type: application/json
Host: omf-historianmain.osipi.com
```

The request body is a JSON object:

```
{
  "id": "drilling_measureddepth",
  "name": "WITSML Depth Stream Type",
  "description": "A generic WITSML Depth Stream Type based on some common mnemonics",
  "type": "object",
  "classification": "dynamic",
  "properties": {
    "CreationDate": {
      "name": "CreationDateIndex",
      "description": "Creation DateTime for use as compound index in Depth Stream",
      "isindex": true,
      "indexorder": 1,

```

The interface also shows a 'No Sessions captured' message on the left and 'No Requests logged' on the right. The status bar at the bottom indicates 'All Processes' and '0'.

# Message routing within OSIssoft Cloud Services

- Per-account queue
  - At-least-once delivery
- Publish/subscribe pattern
- Interpreted for OCS Data Store
- Written to the OCS Data Store

# Next Steps...

UC NA 2017  
San Francisco



UC EMEA 2017  
London



uservoice

UC NA 2018  
San Francisco



uservoice

UC EMEA 2018



uservoice

## Open Beta

- Storage
- Ingress
- Calculations
- Visualization

## CTP

- Data Sharing
- Display Sharing

## Gen. Av.

- Data Sharing
- Display Sharing
- Partners App.

# Contact Information

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## Questions

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



State your **name & company**

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谢谢

Danke

Merci

Gracias

**Thank You**

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Спасибо

Obrigado