

# Self-directed Analytics and Reporting with OSIsoft Cloud Services

Dustin Johnson & Don Morrison



# OSIsoft and Seeq



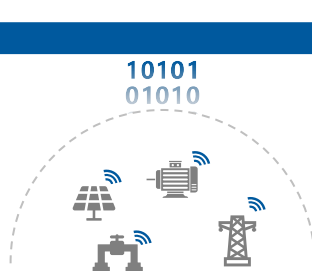
# Advanced Analytics to get more value from OSIsoft PI Systems



Advanced analytics: application of big data, machine learning, and other innovations to derive insights and improve outcomes



Enterprise  
Infrastructure



AUTOMATION/CONTROL SYSTEMS



NEW SENSOR TECHNOLOGY

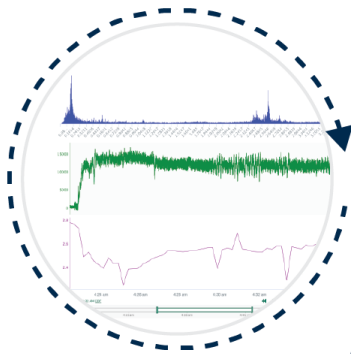


REMOTE AND MOBILE ASSETS

# Seeq Capabilities

## Diagnostic

Why did it happen?

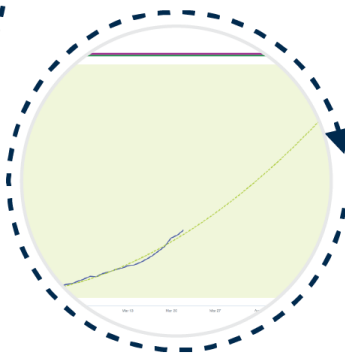


### Benefits

Root cause investigations on/of historical data sets

## Predictive

What will happen?

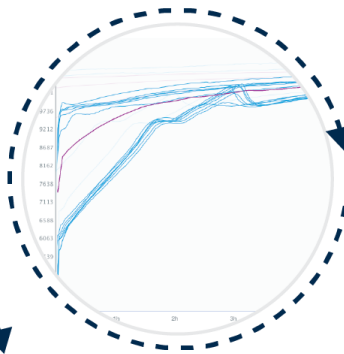


### Benefits

Increase asset availability and improve batch outcomes

## Monitoring

What is happening?

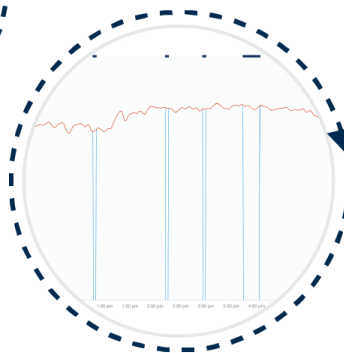


### Benefits

Advisory real-time and prediction view of process and asset status

## Prescriptive

What should happen?

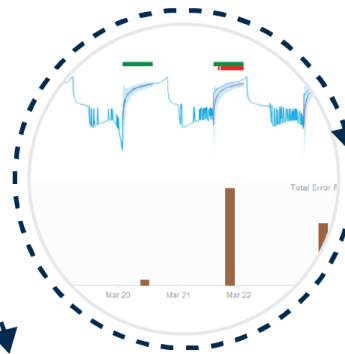


### Benefits

Evaluate options to make decisions that optimize outcomes

## Descriptive

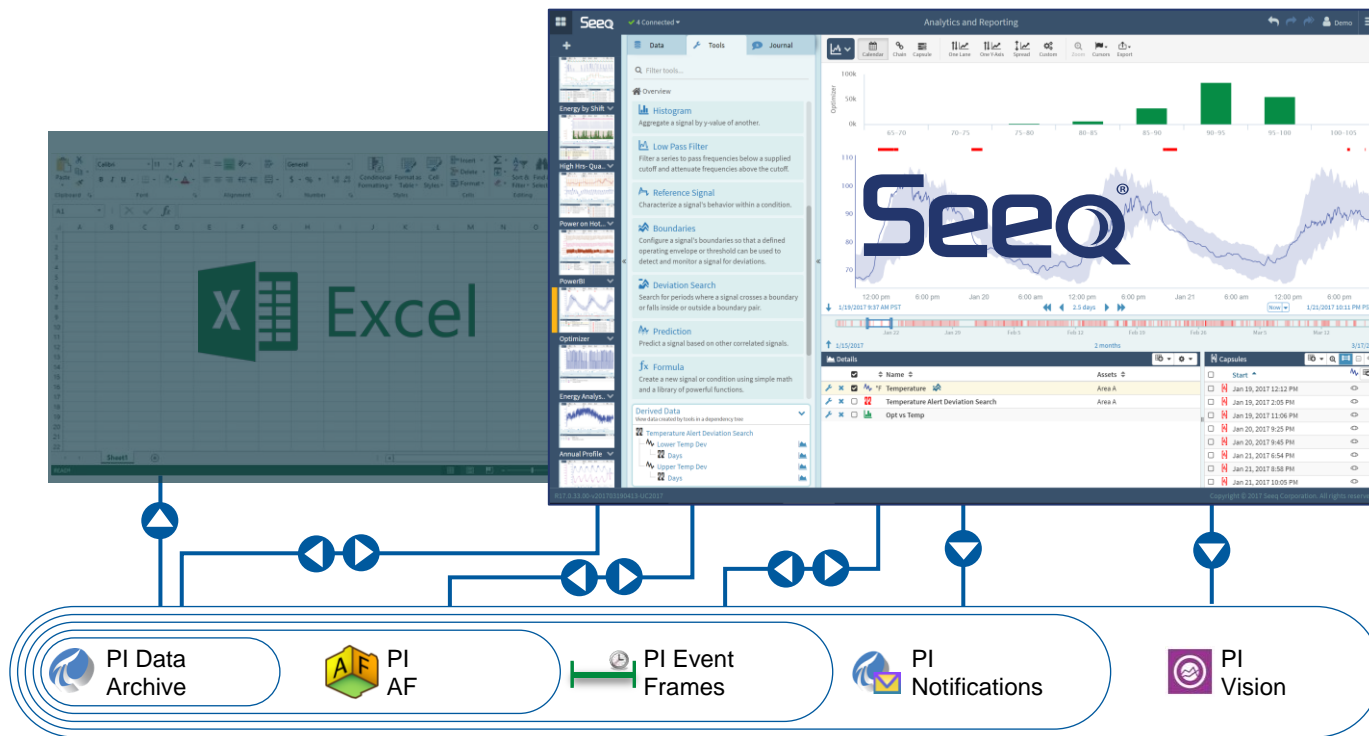
What happened?



### Benefits

Create and share insights to inform decisions plant wide

# OSIsoft and Seeq Integration



Seeq is  
Advanced Analytics  
for OSIsoft PI System

Keeps PI System  
as source of record

Increases value of  
PI System  
investments



Active Directory Integration for LDAP

# Streamlined setup

- Connecting OSIsoft PI System to OCS is straightforward and done almost entirely through the web UI.
- Connecting Seeq to OCS takes minutes.
- Total setup time for this demo was an hour.



# Demo configuration



# DEMO

Getting into Seeq



# Demo configuration



# About Devon Energy

- **Balanced** oil and gas portfolio
- **Industry Leader** in technology
- **Large Inventory** of future projects
- **Culture** of innovation

2018 **Production** mix

47%  
OIL

20%  
NGLs

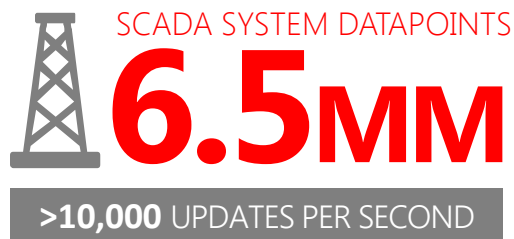
33%  
NATURAL GAS

**Multi-decade** growth platform

>30,000

STACK & DELAWARE  
POTENTIAL LOCATIONS

# Making Better Decisions with Data



**STALE** data

Transmitter **ANOMOLIES**

**INCONSISTENT** data rates

**VENDOR** specific

Data **QUALITY**

**AGGREGATE** summaries

Model **NORMALIZATION**

Enterprise **CAPATIBILITY**

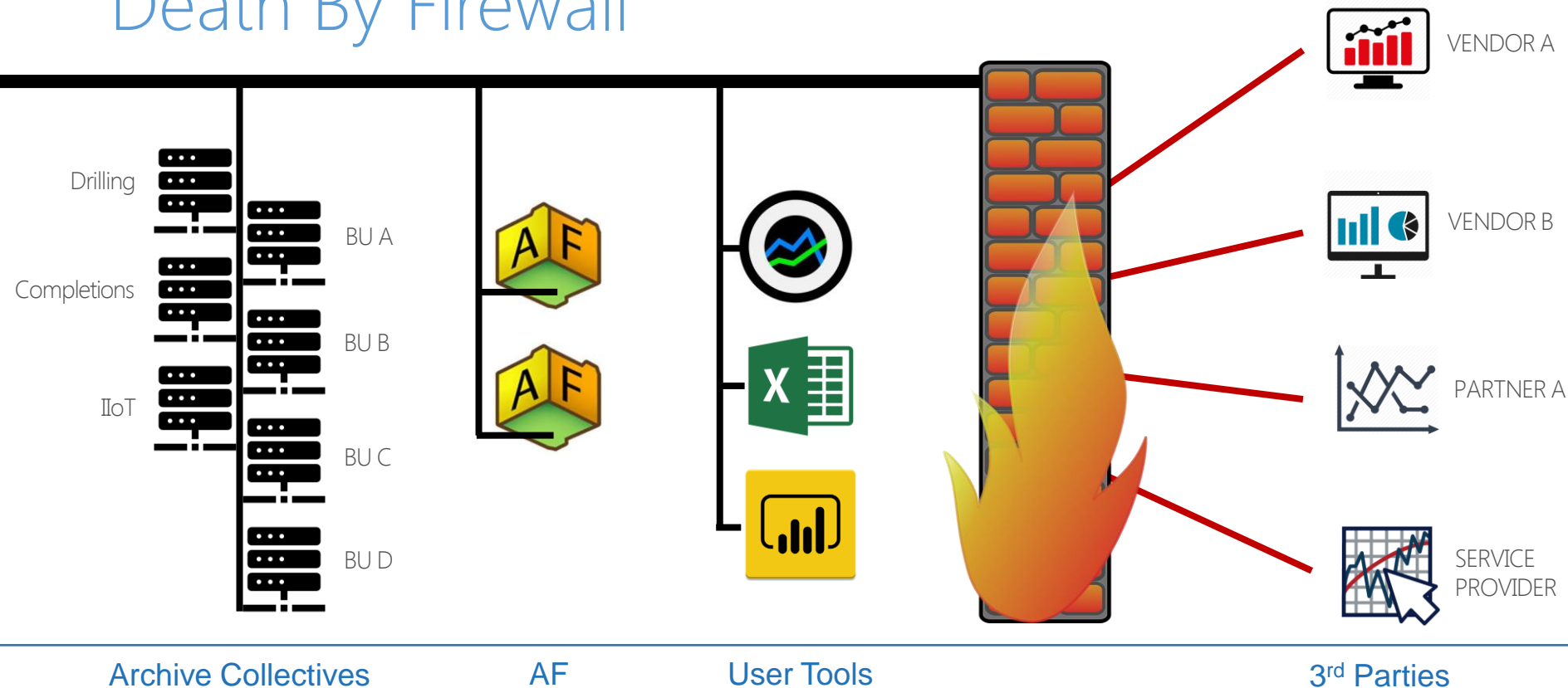
**TRUSTED** data

**ACTIONABLE** intelligence

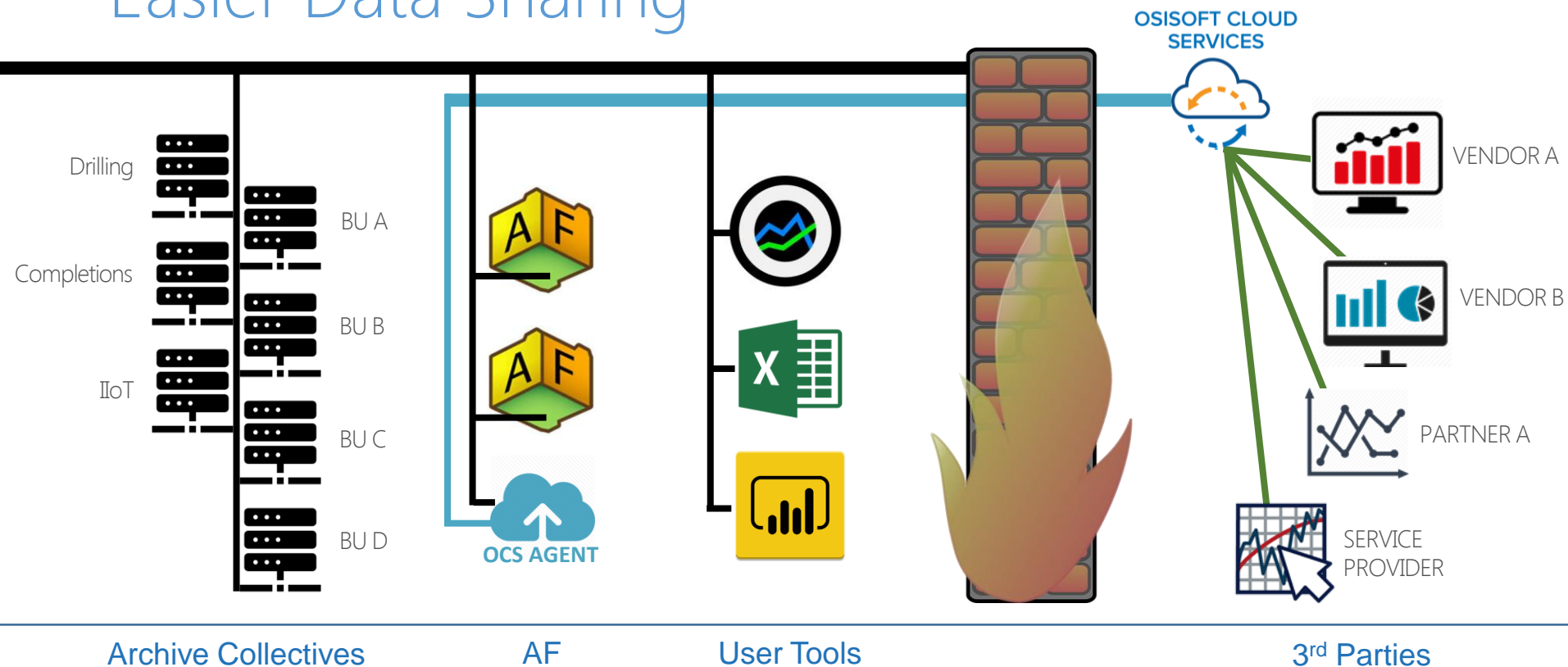
Operate by **EXCEPTION**

Globally **ACCESSIBLE**

# Death By Firewall



# Easier Data Sharing



# OSIsoft Cloud Services Beta **USER EXPERIENCE**

# OCS Menu

OSIsoft Cloud Services

Navigation

Home

Learn & Explore

API Documentation

Code Samples

Trust Center

API Console

OMF Editor

Data Services

Namespaces

Connections

Sequential Data Store

Security

Clients

Users & Roles

Support

Logs

Services Blog

Don MorrisonDevon Energy

Information

Manage Namespaces

Namespaces are the central objects of your OCS portal setup. You create namespaces to serve as the destination for incoming stream data.

See [Understanding namespaces](#) for more information.

To create a new namespace, click **Add** and complete the entry fields in the **Add Namespace** window.

To manage permissions for a namespace, click on the name of an existing namespace, and click **Manage Permissions**.

To edit a namespace, click on the name of an existing namespace, and click **Edit Namespace**.

To view namespace details, click on the name of an existing Namespace, and click **Display Details**.

To remove a namespace, click on the name of an existing namespace, and click **Remove Namespace**.

Filter Namespaces...

+

◀

Description

State

There is no data to display.

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# OCS Namespaces

OSISOFT Cloud Services

Manage Namespaces

Displaying 0 of 0 Namespaces

Filter Namespaces...

Id Description

**Add Namespace**

The **Namespace Id** must be unique across your account. Once finished, click **Add**. All account administrators will receive an email confirming the creation of the new namespace.

**Namespace Ids** are also subject to the following requirements:

- Must contain 260 characters or fewer
- Must only contain alphanumeric characters, underscores, dashes, spaces, and periods
- Must not contain two consecutive periods
- Must not start or end with a period
- Must not start with two consecutive underscores
- Must not contain leading or trailing whitespaces

Account Id: 8f4ceeb-ed3f-4898-aff0-e1d4657d7e01

Namespace Id:

Description:

Region: WestUS

Add Cancel

Information

**Manage Namespaces**

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See [Understanding namespaces](#) for more information.

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# OCS Connections

The screenshot displays the OSIsoft Cloud Services (OCS) interface. At the top, the header shows 'OSIsoft Cloud Services' and the user 'Don Morrison' from 'Devon Energy'. The main section is titled 'Connections' and shows 'Displaying 0 of 0 Connections'. A dropdown menu for 'Namespace' is set to 'Dev-PIWorld', and there is a 'Filter Connections...' button. Below this is a table with columns 'Connection/Sources' and 'Type'. A modal dialog box titled 'Add PI System Connection' is open in the center. It contains a description: 'A connection consists of one or more data source and one or more destination. Enter a Name and Description for the connection and then select Sources and Destinations to configure the connection. The connection cannot be saved until at least one source and destination has been created.' The dialog has two tabs: '1. Details' and '2. Review'. In the 'Details' tab, the 'Name' field is 'DVN-PIWorld' and the 'Description' field is 'Demo connections for PIWorld'. At the bottom of the dialog are 'Next' and 'Cancel' buttons. On the right side of the interface, there is an 'Information' section titled 'PI System Connections' which explains the feature and lists seven steps to create a connection. The footer of the interface shows '© 2017/2019 - OSIsoft, LLC.' and a row of icons for various functions.

OSIsoft Cloud Services

Connections

Displaying 0 of 0 Connections

Namespace: Dev-PIWorld Filter Connections...

Connection/Sources Type

**Add PI System Connection**

A connection consists of one or more data source and one or more destination. Enter a Name and Description for the connection and then select Sources and Destinations to configure the connection. The connection cannot be saved until at least one source and destination has been created.

**1. Details**

Name: DVN-PIWorld

Description: Demo connections for PIWorld

**2. Review**

Next Cancel

**PI System Connections**

The PI System Connections feature enables you to establish high-throughput data connections from On Premises PI systems into OCS.

Complete the following steps to create a PI system connection:

1. Select from the Namespace droplist the intended destination namespace for the data connection.
2. Click + to display the Add PI System Connection - Details dialog box.
3. Type the name and description for the new connection into the Name and Description fields, and click Next. The Add PI System Connection - Review dialog box displays.
4. Click Save in the Add PI System Connection - Review dialog box, and the Download PI System Connection Install Kit link displays. If you have already installed the PI System Connection software on a computer with access to the intended source PI system, click Cancel.
5. Click the Download the PI System Connection Install Kit link to download the install kit. Run the executable file to install the PI System Connection software on a computer with access to the intended source PI system.
6. Allow several minutes and then refresh the OSI Cloud Services portal page.
7. Click the new connection. In the Details tab, the PI system you specified during the installation process is displayed in the PI System box in the Data Flow Overview section. Click the click here link in the "No PI Point Query exists" statement. The PI Point Query dialog box displays.

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# OCS Agent Registration

OSIsoft Cloud Services

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Connections

Displaying 1 of 1 Connections

Namespace: Dev-PIWorld Filter Connections... + [icon] x

Connection/Sources	Type	Description
▼ DVN-PIWorld	PI System	Demo connections for PIWorld
Displaying 1 of 1 Sources		
azumsapsc035p	PI System	

Details Information

Data Source

PI System Name:	azumsapsc035p
PI System Version:	3.4.405.1198
Data Source Status:	Registering
Data Source Version:	1.0.58.0
Last Communication:	Mar 29, 2019, 5:08:50 PM

Click **Add PI Point Transfer** to search for the collection of PI Points that will be transferred to OCS.

Add PI Point Transfer

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# OCS Agent Connection

The screenshot displays the OCS Agent Connection interface within the OSIsoft Cloud Services environment. The main panel shows a list of connections for the 'Dev-PIWorld' namespace, with one connection named 'DVN-PIWorld' of type 'PI System'. The right-hand sidebar provides detailed information about the selected connection, including its ID, name, and type. Below this, a 'Data Flow Overview' diagram illustrates the connection between the 'PI System' (azumsapsc035p) and the 'Namespace' (Dev-PIWorld). A footer note explains how to view PI System Data Source details by expanding the connection and selecting its Data Source.

OSIsoft Cloud Services

Connections

Displaying 1 of 1 Connections

Namespace: Dev-PIWorld

Filter Connections...

Connection/Sources	Type	Description
> DVN-PIWorld	PI System	Demo connections for PIWorld

PI System Connection

Id: b5b49922-451c-48aa-9159-08d6b...

Name: DVN-PIWorld

Type: PI System

Data Flow Overview

PI System

Namespace

azumsapsc035p

Dev-PIWorld

To view PI System Data Source details, expand the PI System Connection from the **Connections** list and select its Data Source .

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# OCS Point Transfer

The screenshot displays the OCS Point Transfer interface. A modal dialog titled "Add PI Point Transfer" is open, showing the configuration for a new transfer. The background interface shows a list of connections and sources, with "azumsapsc035p" selected under the "DVN-PIWorld" connection.

**Add PI Point Transfer**

The **Point Name Mask** and **Point Source Mask** define the query that is used to select PI Points for transfer. The **Results** list displays the full set of PI Points that will be included in the transfer. The following categories of PI Points are not supported and are excluded from the search:

- **PI Point Classes:** Future Data
- **PI Point Types:** Timestamp, Blob, Float16

Click **Run Query** to generate a list of PI Points using the current masks. After verifying the list of PI Points, select the **Historical Start Time** date and time from which the transfer should begin backfilling data, then click **Add Transfer** to create the PI Point transfer.

Point Name Mask:

Point Source Mask:

Results (1073):

```
WellConFrac.MQTT::Skid 21.BDSEQ
WellConFrac.MQTT::Skid 21.NODE CONTROL.REBIRTH
WellConFrac.MQTT::Skid 21.ONLINE
WellConFrac.MQTT::Skid 21_FracVan.ACTIVE GEL BREAKER
WellConFrac.MQTT::Skid 21_FracVan.Annulus
WellConFrac.MQTT::Skid 21_FracVan.BACKUP TREATING PRE
WellConFrac.MQTT::Skid 21_FracVan.BASE VISCOSITY
```

Historical Start Time:    :

**Details** **Information**

Data Source

PI System Name	azumsapsc035p
PI System Version	3.4.405.1198
Data Source Status	Registering
Data Source Version	1.0.58.0
Last Communication	Mar 29, 2019, 5:08:50 PM

Click **Add PI Point Transfer** to search for the collection of PI Points that will be transferred to OCS.

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# OCS Data Transfer

OSIsoft Cloud Services

Connections

Displaying 1 of 1 Connections

Namespace: Dev-PIWorld

Filter Connections...

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Connection/Sources	Type	Description
▼ DVN-PIWorld	PI System	Demo connections for PIWorld
Displaying 1 of 1 Sources		
azumsapsc035p	PI System	

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Details Information

Data Source

PI System Name: azumsapsc035p

PI System Version: 3.4.405.1198

Data Source Status: Registering

Data Source Version: 1.0.58.0

Last Communication: Mar 29, 2019, 5:08:50 PM

Data Transfer

Start

Description: Point Name Mask: WellConFrac.\*.S.  
Point Source Mask: MQTT  
PI Points: 1073

Status: Stopped

Current Activity: Idle

Last Streaming Read: -

Historical Transfer: 0%

Historical Start: Jan 1, 2019, 12:00:00 AM

Historical End: -

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.

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# OCS Notifications

OSIsoft Cloud Services

Connections

Displaying 1 of 1 Connections

Namespace: Dev-PIWorld

Filter Connections...

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Connection/Sources	Type	Description
▼ DVN-PIWorld	PI System	Demo connections for PIWorld
Displaying 1 of 1 Sources		
azumsapsc035p	PI System	

Details

Don Morrison

Devon Energy

Transfer Added

The transfer has been saved.

Connection Added

Connection DVN-PIWorld has been added.

Data Source Status

Registering

Data Source Version

1.0.58.0

Last Communication

Mar 29, 2019, 5:08:50 PM

Data Transfer

Stop

Description

Point Name Mask: WellConfTag.\*;3.  
Point Source Mask: MQTT  
PI Points: 10/73

Status

Started

Current Activity

Idle

Last Streaming Read

—

Historical Transfer

0%

Historical Start

Jan 1, 2019, 12:00:00 AM

Historical End

—

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.

Mark All as Read

Clear All

2 Unread Notifications

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# OCS Transfer Status

OSIsoft Cloud Services

Connections

Displaying 2 of 2 Connections

Namespace: Dev-PIWorld

Filter Connections...

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Connection/Sources	Type	Description
▼ AZU-VDI	PI System	Don's Azure VDI
Displaying 1 of 1 Sources		
artesiapiprimary.dvn.com	PI System	
▼ DVN-PIWorld	PI System	Demo connections for PIWorld
Displaying 1 of 1 Sources		
azumsapsc035p	PI System	

Don Morrison Devon Energy

Details Information

Data Source

PI System Name: artesiapiprimary.dvn.com

PI System Version: 3.4.405.1198

Data Source Status: Registered

Data Source Version: 1.0.58.0

Last Communication: Mar 31, 2019, 1:57:08 PM

Data Transfer

Stop

Description: Point Name Mask: ARTESIA.\*;\*.OILHAULVO...  
Point Source Mask: \*  
PI Points: 388

Status: Started

Current Activity: SendingStreamingData

Last Streaming Read: -

Historical Transfer: 

100.0%

Historical Start: Jan 1, 2019, 12:00:00 AM

Historical End: Mar 31, 2019, 1:59:03 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.

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# OCS Streams

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Sequential Data Store

Namespace: Dev-PIWorld

Storage Explorer

Displaying 100 of 100 Streams

Search: Click to search...

Id	Name	Description	Typeld
PI_azumsapsc035p_5385	WellConFrac.MQTT::Skid 26.ONLINE	Connectivity health of rem...	PI-Int16
PI_azumsapsc035p_5035	WellConFrac.MQTT::Skid 25.ONLINE	Connectivity health of rem...	PI-Int16
PI_azumsapsc035p_5598	WellConFrac.MQTT::Skid 24_FracVan.ONLINE	Connectivity health of rem...	PI-Int16
PI_azumsapsc035p_5699	WellConFrac.MQTT::Skid 30_SpeedTest.ISP		PI-String
PI_azumsapsc035p_5811	WellConFrac.MQTT::Skid 30_FracVan.Wellhead Pressure 2		PI-Float64
PI_azumsapsc035p_5809	WellConFrac.MQTT::Skid 30_FracVan.Treating Pressure		PI-Float64
PI_azumsapsc035p_5804	WellConFrac.MQTT::Skid 30_FracVan.Surface Casing Pres...		PI-Float64
PI_azumsapsc035p_6323	WellConFrac.MQTT::Skid 30_FracVan.STREAMS.CH9		PI-Float64
PI_azumsapsc035p_6322	WellConFrac.MQTT::Skid 30_FracVan.STREAMS.CH8		PI-Float64
PI_azumsapsc035p_6355	WellConFrac.MQTT::Skid 30_FracVan.STREAMS.CH41		PI-Float64
PI_azumsapsc035p_6345	WellConFrac.MQTT::Skid 30_FracVan.STREAMS.CH31		PI-Float64
PI_azumsapsc035p_6342	WellConFrac.MQTT::Skid 30_FracVan.STREAMS.CH28		PI-Float64
PI_azumsapsc035p_5793	WellConFrac.MQTT::Skid 30_FracVan.Oxygen Scavenger		PI-Float64
PI_azumsapsc035p_5781	WellConFrac.MQTT::Skid 30_FracVan.Inline Prop Conc		PI-Float64
PI_azumsapsc035p_5757	WellConFrac.MQTT::Skid 30_FracVan.Blender Prop Total		PI-Float64
PI_azumsapsc035p_5756	WellConFrac.MQTT::Skid 30_FracVan.Blender Prop Conc		PI-Float64
PI_azumsapsc035p_6267	WellConFrac.MQTT::Skid 26_SpeedTest.UPLOAD		PI-Float64

Dev-PIWorld

Types

Streams

Information

### Manage Streams data

You create and manage types and streams on this page. You first create a type in order to create a stream. The type defines the structure of the data you want to stream into a namespace.

See [Types](#) and [streams](#) for more information.

### Search

You can search for types or streams based on any combination of identifying criteria you specify.

- Click either the **Types** or **Streams** button.
- Click inside the **Search** window. The search criteria dialog displays.
- Click the left hand droplist and select **Name**, **Description**, or **ID**, for the criteria on which you are basing your query.
- Click the middle droplist and select the relationship (**Equals**, **Contains**, etc.) between the criteria type selected in Step 3 and the value you will enter in Step 5.
- Type into the right hand entry field the value on which you are basing your query.
- Click the **Add Rule** button to define additional criteria, and then select **AND** or **OR** from the Rule Relationship droplist.
- For more complex queries, you can also click the **Add Group** button, which will sequester the first group of search criteria from subsequent groups.

When you create rules in an additional group, you must select **AND** or **OR** from the Rule Relationship droplist, to define both

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# OCS Clients

OISoft Cloud Services

Manage Clients

Displaying 7 of 7 Client-Credentials

Client Type: Client-Credentials

Filter Client-Credentials...

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Name
PI To OCS - 0c677f1d-6928-4ddc-915b-08d6b4928788
PI To OCS - 9fd30b32-77ea-458c-8dfc-08d6b225c292
PI To OCS - afb3940e-2404-40d5-915a-08d6b4928788
PI To OCS - afb3940e-2404-40d5-915a-08d6b4928788
PI To OCS - afb3940e-2404-40d5-915a-08d6b4928788
PI To OCS - b5b49922-451c-48aa-9159-08d6b4928788

SeeqAgent

Don Morrison Devon Energy

Details Information

Client Details

Client Id:	40701685-5f60-4ecf-8842-41c71e47b90a	🔗
Name:	SeeqAgent	
Status:	Enabled	

A Client Id and Client Secret are used to authenticate and retrieve a token that provides access to OISoft Cloud Services. Any client that presents the Client Id and Client Secret will be able to authenticate and access data, assuming the Client Id and Client Secret are valid. A Client Id is not confidential but a Client Secret is. Hence, it is imperative that the Client Secret be stored in a secure location that is accessible only to the client that needs to use it to authenticate and access OISoft Cloud Services. If the Client Secret is ever compromised, it would be possible for an unauthorized application to impersonate the client and gain access to data.

Client Secret Details

1 of 1

Filter Secrets...

+ ✎ ✕

Status:	Active
Description:	DVN-Seeq-PIWorld
Expiration Date:	Jan 1, 2020, 12:00:00 AM

⚠️ Secret values are only accessible during creation time.

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## Business **EXAMPLES**

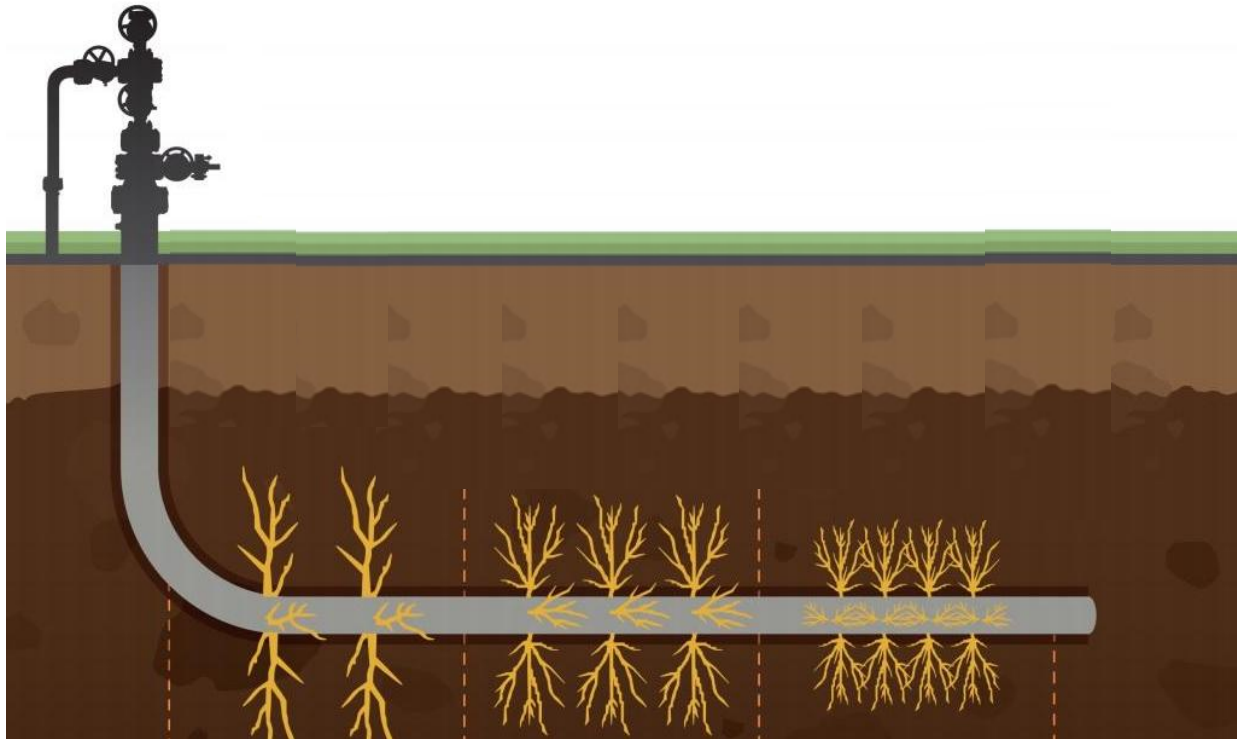
- WELL STIMULATION DATA ENHANCEMENT
- OIL TANK HAULING DETECTION
- SUBMERSIBLE PUMP CYCLE DETECTION

# Well Stim Operations



\* <https://corporate.exxonmobil.com>

# Well Stim Operations



# Well Stim – Data Enhancement



# DEMO

Well Stim



# Oil Hauling – Event Detection



# Oil Hauling – Event Detection



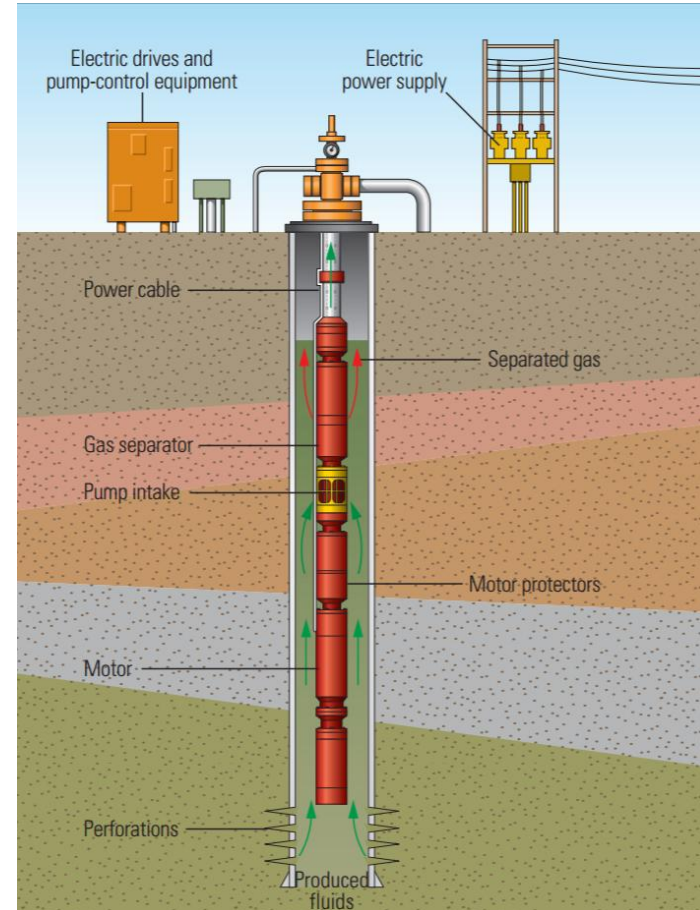


# DEMO

Haul Off

# Electric Submersible Pump

- Extract lots of fluid!
- Expensive equipment
- Frequent On/Off Cycles cause premature motor failure
- Expensive to replace/repair



# ESP – Cycle Detection



# DEMO

## ESP High Cycles

# Questions?

Please wait for  
the **microphone**

State your  
**name & company**



# Please remember

TO DOWNLOAD  
APP, SEARCH  
OSISOFT



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App Store



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謝謝 KEA LEBONA  
 TAPADH LEIBH 고맙습니다  
 БАЯРЛАЛАА MISAOTRA ANAO  
 DZIĘKUJĘ CI NGIYABONGA TEŞEKKÜR EDERIM GRACIES  
 OBRIGADO شڪرا SALAMAT  
 DANKON TANK TAPADH LEAT  
 KÖSZÖNÖM DANKIE TERIMA KASIH GRACIES  
 СПАСИБО MULTUMESC  
 PAKMET CIZGE FAAFETA  
 GO RAIBH MAITH AGAT ESKERRIK ASKO  
 БЛАГОДАРЯ GRACIAS HVALA ХВАЛА ВАМ  
 ТЕШЕККÜR EDERIM  
 TI БЛАГОДАРАМ MAHADSANID  
 TAK DANKE  
 RAHMAT MERCI  
 HATUR NUHUN  
 DANK JE ΕΥΧΑΡΙΣΤΩ GRATIAS TIBI  
 AČIŮ SALAMAT MAHALO IĀ 'OE TAKK SKALDU HA  
 GRAZZI PAKKA PĒR  
 PAXMAT CAĞA  
 CẢM ƠN BẠN ありがとうございました  
 WAZVIITA SIPAS JI WERE TERIMA KASIH  
 UA TSAUG RAU KOJ  
 TI БЛАГОДАРАМ  
 СИПОС



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PIWorld

THANK YOU

HVALA

ДЗЯКУЙ

GRAZIE



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