PI World 2019 Lab

Overlay Real-time Operations Data onto Esri ArcGIS Platform for live Situational Awareness and Perform Analysis with Historical Playback



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Published: March 21, 2019

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Introduction

PI Integrator for Esri ArcGIS is a versatile platform that enables real-time geographic data visualization by connecting the PI System with the Esri ArcGIS platform, where you can add dynamic features to functional and geographic maps and continuously update these features as states, values, and location change. In short, PI Integrator for Esri ArcGIS combines the "time" aspect of the PI System with the "space" aspect of the Esri ArcGIS platform to enhance insight over infrastructure processes and increase operational awareness.

This integration has successfully been implemented in many different industry verticals. For example:

- <u>Utilities</u>: For utility companies, keeping customers happy means keeping the power on. That's a
 delicate balance between a host of interwoven factors such as safety, compliance, coordination
 of mobile assets, and preventive maintenance. Having insight into asset history and
 performance, environmental and proximity effects, and analytic tools, will enable your
 organization to meet these demands.
- <u>Facilities</u>: Initial efforts to develop "smarter" cities may have consisted of a collection of uncoordinated projects. By combining data from buildings, transportation and environment with a single view through digital maps, city leaders, government authorities, business owners and tenants have an instant grasp of information they need to navigate a complex urban environment.
- <u>Oil and Gas</u>: In the Oil and Gas industry, both location of assets and their performance status are critical for operations. Layering a map of assets with real-time and historical data enables an evolution toward reliability-centered operations.

This session explores the partnership between Esri's ArcGIS powerful mapping platform and the realtime PI System infrastructure. In this session, you will discover how easy it is to connect your PI System to your Esri ArcGIS platform to create an operational view of critical metrics on your enterprise in a geospatial way. To this end, you will be guided through a few different scenarios to discover the power of real-time data in a mapped world. Together, we will explore how to create insightful WebMap with live PI System data, create the time-enabled feature layer, and create the Augmented time-enabled feature layer that contains data from both the PI System and the existing feature layer that contains geometry, without modifying the existing feature layer. Furthermore, you will learn how you can leverage custom OSIsoft Visualization displays from Esri Webmaps to drill-down into your data.

We have prepared an environment for you that contains both a PI System and the Esri ArcGIS platform installed. Specifically, you will each have access to a virtual machine that consists of a self-contained PI System, PI Integrator for Esri ArcGIS 2017 SP1, ArcGIS Server, Portal for ArcGIS, and ArcGIS GeoEvent Server. You will use this machine to walk through the workflow of creating a dashboard with a live map, populated with live data from the PI System.

Regarding the virtual machine that you will be using: on the OSIsoft side, we've installed the PI System 2017, which includes both the PI Data Archive and the PI Asset Framework. Additionally, that machine is running OSIsoft Visualization, for visualizing data. We have preinstalled and configured the PI Integrator for Esri ArcGIS 2017 SP1 for you, as well, and finally in order to make using the Integrator easier, we have preloaded a PI AF Database for you that already contains PI AF Templates, in addition to preloading all of the required PI points as well, and the requisite simulated data for the scenario. Of course, we will also learn how to create an asset structure from-scratch in PI AF using an already existing layers in Esri's

GIS platform and updating the AF template to bring-in live PI System data to Esri. Lastly, we will also see how to create an augmented time-enabled feature layer that contains data from both the PI System and the existing feature layer that contains geometry, without modifying the existing feature layer.

On the Esri side, on that VM we have installed ArcGIS Server 10.6.1, along with Portal for ArcGIS, and GeoEvent Server 10.6.1.

Your instructors will inform you how to access these machines; after you have access to them, as a class you'll be guided through the following steps:

- 1. Verify that the requisite configuration steps have been performed on the GeoEvent Server and on the PI Integrator for Esri ArcGIS 2017 SP1
- 2. Learn how to create a PI AF database utilizing Asset Extractor utility to bring-in asset information from an already existing feature layer in Esri ArcGIS platform and update the PI AF asset template to include attributes from PI System
- 3. Verify that the PI AF Database is ready for use (that it contains properly structured PI AF Element Templates, and that data for all of the Elements is updating properly)
- 4. Create a Layer based-on the meters PI AF template on Esri ArcGIS via the PI Integrator for Esri ArcGIS
 - Create the feature service in Portal for ArcGIS for the oil wells and connect through the GeoEvent Server
 - Create the feature service in Portal for ArcGIS for the Maintenance vehicles and connect through the GeoEvent Server
- 5. Create a WebMap with both the above feature layers and show how to change symbologies
- 6. Add PI Vision display for a Meter and show its integration with Webmap
- 7. Create an Operations Dashboard view with the above WebMap & integrate it with PI Vision custom dashboard
- 8. Demonstrate the feature in the PI Integrator that would clean-up the GeoEvent connectors and also hosted feature layer when the layer is deleted in the integrator
- 9. Create a time-enabled feature layer using the Oil Wells & Maintenance vehicles
- 10. Create an augmented time-enabled feature layer for the coal plants

If you ever have any questions, feel free to ask an instructor.

Below are the names of the machines that you can use for this class, along with the credentials that you'll use for signing into them and ArcGIS Online. We've included the names and credentials twice, and we recommend tearing out one of the below sections from the book and keeping it close so you can be quickly reminded of what credentials and machine names to use.

Windows Credentials							
Username	pischool\student01						
Password	<pre>password would be provided by your instructor></pre>						
ArcGIS GeoEvent Server Credentials							
Username	portal_admin						
Password	portal_admin1						
Portal for ArcGIS Credentials							
Username	portal_admin						
Password	portal_admin1						
Servers							
PI/AF Server Name	PISRV01						
OSIsoft Visualization Server	https://pisrv01.pischool.int:446/pivision/#/						
PI Integrator for Esri ArcGIS Server	https://pisrv01.pischool.int:444/configuration/#/services						
GeoEvent Server Manager	https://pisrv01.pischool.int:6143/geoevent/manager						

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Tear out this page and keep it nearby as a handy reference.

Windows Credentials					
Username	pischool\student01				
Password					
ArcGIS GeoEvent Server Credentia	als				
Username	portal_admin				
Password	portal_admin1				
Portal for ArcGIS Credentials					
Username	portal_admin				
Password	portal_admin1				
Servers					
PI/AF Server Name	PISRV01				
OSIsoft Visualization Server	https://pisrv01.pischool.int:446/pivision/#/				
PI Integrator for Esri ArcGIS Server	https://pisrv01.pischool.int:444/configuration/#/services				
GeoEvent Server Manager	https://pisrv01.pischool.int:6143/geoevent/manager				

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1. Verify that Prerequisites and Configuration Steps are Complete

We have already installed all of the required software components for you, and after doing that, we have completed the prerequisite configuration steps on both the ArcGIS GeoEvent Server and the PI Integrator for Esri ArcGIS.

The steps that we have already completed for you are:

- 1. Register at least one OSIsoft Visualization Server, Portal for ArcGIS if you are publishing the feature layer to the same, and ArcGIS GeoEvent Server endpoint in the PI Integrator for Esri ArcGIS
- 2. Register at least one valid data store on the GeoEvent Server

We'll together walk through those configuration steps, even though they are already finished, so that you'll be familiar with what will need to be done on a completely new installation.

a) Confirm at least one OSIsoft Visualization Server & ArcGIS GeoEvent Server endpoints in the PI Integrator for Esri ArcGIS

The PI Integrator for Esri ArcGIS allows an OSIsoft Visualization link to be generated for each Layer that is created in the PI Integrator for Esri ArcGIS. That link allows an ad hoc and custom OSIsoft Visualization display to be automatically generated for a specific Esri map Feature. For example, if this link is used in a Feature pop-up, when a user clicks on a particular Feature, then clicks on the Visualization link, the identifying information for that particular clicked Feature will be passed to the PI Integrator for Esri ArcGIS, and the user will be redirected to an automatically generated ad hoc or custom OSIsoft Visualization Visualization display for that specific map Feature.

In order for this functionality to work, an OSIsoft Visualization server must be registered in the Integrator PI Integrator for Esri ArcGIS; moreover, that OSIsoft Visualization server must have access to the PI AF Element data that corresponds to the Esri Features in question. For example, if a Layer was created from a PI AF Element Template for oil wells, then the OSIsoft Visualization server should allow access to the PI AF Element database that contains those oil well Elements. In our case, we have already registered an OSIsoft Visualization server for you, so we'll check now to show you what that should look like.

 Open Internet Explorer web browser and log in to PI Integrator for Esri ArcGIS 2017 by navigating to, for example, <u>https://pisrv01.pischool.int:444/configuration/#/services</u> or by clicking on the bookmark. It should be a bookmark for you in your Internet Explorer web browser using the username and password as pischool\student01 & student, respectively. Note that this credential is also provided in the file URLs_Credentials.txt located in the desktops

PI Integrator for Esri ArcGIS	Services	Administration -	Tools	Help *			100L\student(01
home / services								
Services Services are used to group layers that share of	a common thei	me or purpose. You fi	rst create	a service, then add layers.		+ Create Service	Tile vie	ew
Name II	Description	n		Created	Modified		Layers	
GeoFencingExample	GeoFencin	gExample		03/10/2019 04:40:38	03/10/2019 04:40:38		1	×

2. Select Administration > Systems.



3. Confirm a https-based OSIsoft Visualization endpoint, Portal for ArcGIS, and ArcGIS GeoEvent Server are registered in the PI Integrator for Esri ArcGIS

PI Integrator for Esri Arco	GIS Services	Administration \bullet	Tools	Help 🗸		PISCHOOL\student01
home / systems						
PI Vision server						+ Add PI Vision server
PIVision	PI Vision 2017				https://pisrv01.pischool.int:446/pivision	×
Portal for ArcGIS						+ Add Portal for ArcGIS
Portal105	Portal 10.5				https://pisrv01.pischool.int/portal	×
ArcGIS GeoEvent Server						+ Add ArcGIS GeoEvent Server
GeoEvent	GeoEvent Server 10	0.5			https://pisrv01.pischool.int:6143	×

My organization uses ArcGIS Servers with Oracle based Enterprise GeoDatabase 2

4. Click on the URL for your registered OSIsoft Visualization server in order to launch OSIsoft Visualization. If you are prompted you can enter the same active directory credentials, namely, pischool\student01 & student for the username and password, respectively. As shown below, you would note two custom OSIsoft Visualization displays that we would be leveraging in our upcoming exercise.

PI Vision Show private displays	All Displays (2)
Search All Displays	
Filter by Keyword	5
All Displays	
☆ Favorites	
য় My Displays	
S Recent	
D 0 1	CatCanyonOilField Meters PISCHOOL\student01 PISCHOOL\student01
☆ Home	

O i	Pl Vision
Ø	<u>CatCanyonOilField</u> Asset: CE-08300011 ▼
₩ 100	CE-08300011
	450 300 400 425 426 310 400 375 350 325 300 325 300 325 300 325 300 325 300 326 300 3275 400 300 310/2019 310/2019 143.12 PM 8h 310/2019
	260 260 200 200 Hydrostatic Head 243.01 psi

5. Now click the url for the GeoEvent Server that was registered in the PI Integrator for Esri ArcGIS, namely, <u>https://pisrv01.pischool.int:6143</u> or click the bookmark in the IE browser. If the URL resolves to the GeoEvent Server login screen, then you've indeed successfully registered your GeoEvent Server endpoint.

😌 🙋 https://pisrv01.pischool.int/portal/sharing/oauth2/authorize?client_id=arcgisonline& 🔎 👻 🖨 🖉 🔷	PI Integrator for Esri ArcGIS	Sign in to Portal for ArcGIS ×	Portal for ArcGIS
PL Integrator for Esri ArcGL. A Portal for ArcGIS (M) GenEvent Server Manager (A) PL Connector for UEL Ad	PI Vision		

Sign in to Portal for ArcGIS	() esri
Username	
portal_admin	×
Password	
•••••	
Keep me signed in	
Forgot password?	

b) Register at least one valid data store on the GeoEvent Server

GeoEvent Server data stores are pointers to ArcGIS servers and ArcGIS online accounts, and allow the GeoEvent Server to connect to ArcGIS and read contents such as feature services. The location (ArcGIS server or ArcGIS online account) where the new feature service will be created must be registered as a data store in GeoEvent Server.

 Sign into your GeoEvent Server manager (<u>https://pisrv01.pischool.int:6143/geoevent/manager</u>); a link should already be in the bookmarks bar of your web browser or you can click the URL for the GeoEvent Server from the PI Integrator for Esri ArcGIS 2017. Use the credentials provided, namely, portal_admin & portal_admin1 for username and password, respectively.

ArcGIS GeoEvent Manager						Se	rvices	Site Logs
Monitor Inputs GeoEvent Services Outputs								
Monitor								Reset Statistics
• Geolivent Services 🕨 🔳	In/Out	Count	Rate	Edit Rate	Hax Rate	Time Since Last		
O pigeo-geofencingexample-vehiclesgeofencing-service	In Out	0	0 /sec 0 /sec	1	0 /sec 0 /sec	00:08:09	k	•= 0
O VehicleLocationIncident	In Out	0	0 /sec 0 /sec	1	0 /sec 0 /sec	00:08:09 00:08:09	k:	•= 0
• Inputs								
		Count	Rate	Edit Rate	Max Rate	Time Since Last		
O pipeo-geofencingexample-vehiclesgeofencing-vs-in [Running On: PESRV01]		0	0 /sec	/	0 /sec	00:08:30	ke i	► = 0
- Outputs								
		Count	Rate	Edit Rate	Max Rate	Time Since Last		
O http://www.http://ww		0	0 /sec	/	0 /sec	00:08:30	k:	▶ = 0
O pizeo-ceofencingexample-vehiclesgeofencing-fs-update-out		0	0 /sec	1	0 /sec	00:08:30	ke	► = 0.

2. Navigate to Site > GeoEvent > Data Stores

	ent Processor Manager	Services	Site
GeoEvent Processor	Components Settings		-//
GeoEvent Definitions	Data Stores		
Tags	Data registration provides GeoEve	ent Processor with a list of location	ons where sour
GeoFences	GeoEvent Services originates. Clic accessible.	:k 'Validate All' to determine if Re	egistered Folden
Connectors			
Configuration Store	Validate All		
Data Stores	Registered Folders	Registe	er Folder

3. You should see, under **Registered ArcGIS Server**, the button **Register ArcGIS Server**; go ahead and click it, which will allow us to begin adding a data store. Note that in this case, the data store for the Portal for ArcGIS has already been created successfully.

Registered ArcGIS Server					Register ArcGIS Server	
Status	Name	Туре	Sync	Edit	Delete	
•	Default	PORTAL	0	1	×	
v	Default Server	SERVER	0	1	×	
v	portalcredentials	PORTAL	0	1	×	

If a green check-mark appears next to your data store, then you're all ready to proceed to the next section.

2. Learn how to create a PI AF database utilizing Asset Extractor utility to bring-in asset information from an already existing feature layer in Esri ArcGIS platform and update the PI AF asset template to include attributes from PI System

To create a feature layer in Esri ArcGIS that is fed with live data from the PI System, it is critical to have an asset structure in PI AF where the assets are based on an asset template. It is not uncommon to face a situation where a well-developed asset structure is not present. No worries! If one has the assets information, though with only some static information in Esri ArcGIS, you can create an asset structure quite easily using a utility called 'Asset Extractor' provided along with the PI Integrator for Esri ArcGIS. Kindly note that running the Asset Extractor is not essential for the functionality of the PI Integrator for Esri ArcGIS, but it is added utility that is available towards the creation of an AF database, when you are faced with a situation, as mentioned above.

In this example, we would be creating an asset structure for a set of oil wells based on a feature layer that already exists in Esri ArcGIS.

 Open Internet Explorer web browser and log in to PI Integrator for Esri ArcGIS 2017 by navigating to, for example, <u>https://pisrv01.pischool.int:444/configuration/#/services</u> or by clicking on the bookmark. It should be a bookmark for you in your Internet Explorer web browser using the username and password as *pischool\student01* & *<password>*, respectively.

PI Integrator for Esri ArcGIS Services Administration - Tools Help -	L PISCHOOL\student01
home / services	
Services	
Services are used to group layers that share a common theme or purpose. You first create a service, then add layers.	+ Create Service
You do not have any services defined. Click here to start adding services.	
2 Click Tools and select 'Asset Extractor'	
🛞 🗣 https://pisr.01.jpischool.int-144/configuration/#/tools 🖉 ~ 🔒 Č 🔷 PI Integrator for Est ArcGS × 🔟 PI Correspt	
💠 P Integrator for Esn ArcGL. 👩 Portal for ArcGIS 🚯 ArcGIS GeoEvent Manager 💽 PI Corresight 🍘 ArcGIS Online 👸 PI Connector for UFL Ac	
PI Integrator for Esri ArcGIS Services Administration - Tools	
home / tools	
Tools	

- 3. Click on 'Asset Extractor'
- 4. Open the URLs_Credentials.txt file located in the desktop
 - 5. Copy the URL specified in this file under 'CoalPowerPlant Feature Layer Rest Endpoint'. This is the rest end point contains the static information pertaining to the oil wells that already exists in ArcGIS Online

URLs_Cred	entials.txt - Notepad
File Edit Format View Help	
<pre>CoalPowerPlant Feature Layer Rest Endpoint: https://pisrv01.pischool.int/server/rest/services/Hosted/CoalPowerStations,</pre>	/FeatureServer/0
Paste the above mentioned URL in the Address field in the Asset Extractor features'. Once all features are loaded, click Next	or and click 'Load
🛞 PI Integrator for Esri ArcGIS Services Administration + Tools Help +	PISCHOOL\student01
home / tools / extractor	
PI Asset Extractor for Esri ArcGIS Desktop edition also available for download Load features Read assets automatically from a Feature Layer URL This should be an address to an ArcGIS Feature Layer within a MapServer or FeatureServer. The address can include an Esri-defined query to restrict elements. For example, if you are extracting oil well data, you might want to restrict the of located in a particular state or region.	query to show only those wells that are
Address https://pisrv01.pischool.int/server/rest/services/Hosted/CoalPowerStations/FeatureServer/0	
Authenticate necessary for non-public map layers	
All features loaded!	
Apply Next Or, manually provide feature JSON (advanced)	

7. Once the feature layer is loaded, choose 'name' from the drop-down menu. This would be the *unique element name* that would be identified for all the assets in PI AF. Click 'Save as XML'

😵 PI Integrator for Esri ArcGIS Services Administration - Tools Help -	PISCHOOL\student01
home / tools / extractor	
PI Asset Extractor for Esri ArcGIS Desktop edition also available for download ③	
AF output preferences	
Must have a value that is unique to each asset. If possible, the value should be descriptive. Field to use as AF Field to use as AF Element name	
Back Next	

- 8. Save the xml file in the 'LabContent' folder located on the desktop
- 9. Open PI System Explorer. The shortcut for the same is provided for you in the toolbar





10. This would open an empty AF database called 'CoalPowerPlants'

11. Click File -> Import from file and select the xml file that you downloaded to the LabContent folder on your desktop and click ok

Import from File				
File:	C: \Users \student0 1\Desktop \LabContent \CoalPowerStation database.xml Import Options Allow Create Create or Update PI Points Allow Update Automatic Check In			
	OK Cancel			

12. Once the import is complete, click Close

Import from File)	C
Operations Completed: 31		
Processing AFElement 'CoalPowerStations' Processing AFElement 'Rio Bravo Jasmin Cogeneration' Processing AFElement 'Stockton Cogen' Processing AFElement 'Colton Plant' Processing AFElement 'Ace Cogeneration Co. Trona' Processing AFElement 'Rio Bravo Poso' Processing AFElement 'Hydrogen Energy California' Processing AFElement 'Argus' Processing AFElement 'Argus'		
The requested action is complete.	\sim	
< >>		
Close		-

13. Clicking on one the elements and selecting the Attributes tab exposes all the attributes, which are currently all the static attribute obtained from Esri ArcGIS

•	\\PIS	RV01\CoalPowerPlants - Pl	System Explorer Legacy 32-bit (Admini
File Search View Go Tools Help			
🔕 Database 🛅 Query Date 🔹 🔇 🥥 Back 🏐 🖉	Check In 🧐 🗸	👔 Refresh 🏾 词 New Element	New Attribute
Elements	Rio Bravo Jasmi	n Cogeneration	
	General Child E	Elements Attributes Ports Anal	yses Notification Rules Version
CoalPowerStations			
🗊 Stockton Cogen	Filter		َ م
Colton Plant	/: • •	R Name	▲ Value
🗇 Rio Bravo Poso	🗆 🖻 Categ	ory: Geometry	
🗊 Hydrogen Energy California		ArcGIS feature shape	{"x":-13253617.3663,"y":4221638.460900
Riverside Cement Co. Power House		I ArcGIS feature shape type	Point
C, Element Searches		Coordinate projection ID	102100
		Coordinate system ID	4326
		Coordinate system name	GCS_WGS_1984
		💷 Latitude0	35.4239054200011 °
		Longitude0	-119.059270500192 °
	🗉 📄 Categ	ory: Metadata	
		💷 capacity	38.2
		💷 latitude	35.42390542
		💷 longitude	-119.0592705
		💷 name	Rio Bravo Jasmin Cogeneration
Elements		💷 objectid	1
		💷 operator	IHI Power Services Corp.
jjj Library		i owner	IHI Corporation
🚥 Unit of Measure		i primefuel	Coal
Sa Contacts		primemover	Steam
💥 Management		·····	100001 0.17.00 000 04

14. Note that each element is based on an element template



15. Now we will update the Element Template to bring in additional attribute based on PI System data. To do this, you are already provided with the necessary script. Kindly open the Excel spreadsheet

🛺 l 💽 🛄 👳 l		LabContent		
File Home Sha	ire View			
€ 🕘 ד ↑ 퉬 ו	LabContent			v Ċ Se
🔆 Favorites	Name	Date modified	Туре	Size
📃 Desktop	CoalPowerPlantAFTemplate.xlsx	3/21/2018 11:21 PM	Microsoft Excel Wor	13 KB
Downloads	CoalPowerS database.xml	3/10/2019 9:48 PM	XML File	17 KB

16. We will use PI Builder (Excel plugin to interact with PI System) to update the Element Template and add new assets for Maintenance Vehicles. First make sure that you are on the Templates worksheet tab in Excel spreadsheet. Click on 'PI Builder'

T &	Calibri - 11	• A* A* = =	🗞 - 📑 Wrap	Text	General		🐘 🖤 📮		∑ AutoSum - A Z ▼
iste 💉	B I <u>U</u> - 🗄 -	☆・▲・ ≡ ≡ 3	E € E B Merge	e & Center 🔹	\$ - %	• *** •** C	onditional Format as Cel ormatting * Table * Style	I insert Delete Format	♥ Fill * Sort & Find & Clear * Filter * Select
pboard 12	Font	5	Alignment	5	Num	ber 🕫	Styles	Cells	Editing
A	В	с	D	E		F	G		
							Att II. A. D. A. D. A.	or AttributeConflectring	
Selected	I(x) Parent	Name	ObjectType	AttributeDef	faultUOM	AttributeType	AttributeDatakeferen	ce Attributeconfigsuing	
Selected	I(x) Parent	Name CoalPowerStations	ObjectType ElementTemplate	AttributeDel	faultUOM	AttributeType	AttributeDatakeleren	C Attributeconfigstring	

17. Click Publish and click OK

\$ Publish Options
Edit Mode: Freate and Edit V
 Create or update PI points Automatically createmissing categories
OK Cancel

18. Once complete click Close

	Publish Selected Objects	
Operations Complete	:d: 2	
Processing ElementTe Processing AttributeT The requested action	mplate 'CoalPowerStations' 'emplate 'MW' is complete.	4

19. Now open the PI System Explorer and click 'Refresh'.



3. Verify that the PI AF Database is ready

We have loaded a PI AF Database for you that already contains Elements, based on PI AF Element Templates (which are required by the PI Integrator for Esri ArcGIS) for both Wells and maintenance vehicles. We are going to examine what we have created for you.

1. Open PI System Explorer, and connect to the AF Database called **Cat Canyon Oil Fields**.

	Select Database		×
🍋 New Database 🗙 Delete Database 😁 Da	tabase Properties 🛛 🔒 Edit Secur	ity	
Asset server: 🂖 PISRV01			🗸 🚥 🚰 Connect
Databases:			
Filter			+ م
Name	Description	Last Modified	
CatCanyon Oil Fields	Cat Canyon includes EsriGeo	3/10/2019 2:44:57 PM	
CoalPlants		3/22/2018 2:34:53 AM	
CoalPowerPlants		3/10/2019 9:52:54 PM	
Configuration	A store for configuration data.	3/10/2019 9:53:53 PM	
GeoFence Testing		10/5/2017 1:57:33 PM	
OSIsoft Mineral Processing	Asset Based PI Example Kit f	3/10/2019 2:27:37 PM	
Test		3/10/2019 5:22:16 PM	
Transmission & Distribution		4/6/2018 3:32:39 PM	
WaterGauges		2/25/2016 3:52:52 PM	

2. We'll start by looking at our Element Templates. Via the navigator pane in the lower left, select **Library**.

Elements	
H Event Frames	
🕌 Library	
Init of Measure	

3. Examine one of the two Templates that we'll use to create a live-updating Esri Feature Service; click on it, and then on the right, click the **Attribute Templates** tab.

Notice (spoiler alert) that the Wells Element Template contain Attributes that are of type "Double", for **Longitude** and **Latitude**. These will allow instances of this Template to be positioned correctly on a map. Notice that besides that, there is nothing at all special about these Elements—that's right; any PI AF Element Template can be used, so long as it supplies location information¹.

¹ And technically, the PI AF Element template doesn't need to provide location information at all. Using the Augmented feature layer functionality in the PI Integrator for Esri ArcGIS, we can create the time-enabled augmented feature layer that contains data from both PI System and the existing feature layer that contains geometry, without modifying the existing feature layer.



Wells	s							
Gen	eral Attri	bute Templates	Ports	Analysis Ter	nplates	Notificati	on Rule Templates	
Filte	er							
		Name			Descrip	tion	Default Value	
	🖻 Cate	gory: Geometry						
		📑 ArcGIS fea	ature sha	ape				
		ArcGIS fea	ature sha	ape type			Point	
		Coordinate	e project	ion ID			102100	
		Coordinate	e system	ID			4326	
		Coordinate	e system	name			GCS_WGS_1984	
		🔄 Latitude					0 °	
		E Longitude					0 °	
	🖻 Cate	gory: Metadata						
		ActiveWel			Active\	Vell		
		E API			APINur	nber		
		📑 Asset Nam	ne		AssetN	ame		
		County			County	Name		
		📑 Field			FieldNa	ime		
		E Lease			LeaseN	lame		
					OBJEC	TID	0	
		🔄 Operator			Operat	orNa		
		📑 Туре			ТуреТе	ext		
		📑 Well Type			Well_T	ype		
	🖻 Cate	gory: PI Data						
		Kan Bottom Ha	le Pressi	ure			0 psi	
		Kan Bottom Ho	le Tempe	erature			0 ℉	
		K Flow Rate					0	
		K Flow Tubir	ng Pressu	ıre			0	
		K Hydrostat	ic Head				0	
11								

4. Now use the navigator pane to click Elements, and browse down to the Wells -> CE-08300011 Element. Examine it's Attributes under the Attributes tab, and verify that the Latitude and Longitude Attributes are updating every few seconds (you can click the Refresh button on the top toolbar; the other Attributes won't update as frequently, but they will update).

Elements	CE-0	8300011							
🗄 ···· 🜍 Wells	Gen	eral Chi	ld Elemen	nts Attributes p	orts Analys	ses Notifica	tion Rules Ver	sion	
CE-08300011									
🗇 CE-08300083	Filte	er	1 = 1			1			
			🗢 🧏 Nar	me		Value			
🗇 CE-08300171		🖂 Cat	tegory: G	Geometry					
1 CE-08300279 1 CE-08300303		T	j.	ArcGIS feature s	hape	{"x":-1339	2076.89283501	2,"y":4140968.858997538	7}
@ CE-08300324		E		ArcGIS feature s	hape type	Point			
CE-08300340 CE-08300378				Coordinate proje	ection ID	102100			
				Coordinate syste	em ID	4326			
		T		Coordinate syste	em name	GCS_WGS_	1984		
CE-08300632 CE-08300647				Latitude		34.831224	8174666°		
🗇 CE-08300683] Longitude		-120.3030	73589376 °		
CE-08300693		🖻 Cat	tegory: M	/letadata					
@ CE-08300719				J ActiveWell		Y			
				API		08300011			
CE-08301156 CE-08301245				Asset Name		CE-083000	11		
OE-08301247] County		Santa Barb	ara		
🔂 CE-08301248] Field		Cat Canyo	ı		
CE-08301292		T		Lease		Williams Ho	lding		
🧃 CE-08301295		T		OBJECTID		1			
] Operator		Clancy Ene	rgy		
CE-08301298] Туре		Oil & Gas S	how		
				Well Type		SC,OG			
🗇 CE-08301301 🗇 CE-08301302		Cat	tegory: P	PI Data					
CE-08301312		ø .	<i>~</i>	⁵ Bottom Hole Pres	sure	241.68562	3168945 psi		
		0 🔳	<i>~</i>	^{\$} Bottom Hole Tem	perature	119.16715	2404785 ℉		
		0 🗉	ø	Flow Rate		289.86318	969726562		
🗇 CE-08301430		ø 🗉	4	Flow Tubing Pres	sure	270.15805	053710938		
🗇 CE-08301509 🗇 CE-08301516		ø 🗉	<i>(</i>	⁵ Hydrostatic Hea	ł	239.89054	870605469		
	111								
Flomente			T_101						
Elements			1-101		. Attrib	utes s			
📄 Elements			Gener	ral Child Elem	ents Attrib	outes Por	ts Analyse	s Notification Rules	Version
🗊 T-101			Filter						
T-102			1 1100				1		
T-105					ame		۵	Value	
🕣 T-105				Category:	Location				
					芦 Latitude			34.8669059114516 °	
					🏸 Longitud	e		-120.332806004934	»/////////////////////////////////////
				Category:	Vehicle Info	ormation			
					Driver			J. Lee	
					Truck ID			т-101	

It's worth noting again that you don't have to use just latitude and longitude geometry; you can instead, for example, create a brand new Feature Service that has complex geometry, such as for a meandering pipeline, by specifying that geometry in an AF attribute. In short, in this scenario, we are using latitudes and longitudes, but complex geometries like polylines and polygons are supported too.

4. Create a Service and Layers via the PI Integrator for Esri ArcGIS

The software has been installed, the configuration steps are done, and our PI AF Database (**Cat Canyon Oil Fields**) is ready for us to use as a data source to create live Esri Feature Services. Next, we'll proceed through the steps to use all that we have created and prepared: actually using the PI Integrator for Esri ArcGIS to create Esri Feature Services that update in real-time with PI System data. Later on, we'll create a map-based dashboard using those Feature Services. For now, let's get started in the PI Integrator for Esri ArcGIS—that's where all of this work is done.

First, let's create a Service to hold both of the Layers that we will create (note: this "Service", which we will create in the PI Integrator for Esri ArcGIS, is different from an ArcGIS "Feature Service", which is what we'll later add to a map).

Create a feature service to bring-in all the Oil Wells based-on AF element template

- 1. Access the link to the PI Integrator for Esri ArcGIS home screen using the bookmark link to <u>https://pisrv01.pischool.int:444/configuration/#/services</u>.
- 2. Click the Create Service button to add a new Service.

PI Integrator for Esri ArcGIS	Services Admir	nistration - Tools	Help+	👤 PISCHOOL\stu	udent01
home / services					
Services Services allow you to group map layers that s find more on creating services here .	ihare a common then	ne or use. You can crea	te a service first, and add map layers to it later. You can	+ Create Service	Tile view

The **Create new service** page opens. Fill in the fields as shown below. Please note that you cannot use special characters in the name field

🧇 Pl Integ	rator for Esri ArcGIS	Services	Administration -	Tools	Help +	L PISCHOOL\student01
home / ser	vices / new					
Createu	new service					
Name*	CatCanyonOilCo					
Description*	CatCanyonOilCo				×	< Comparison of the second sec
	Create Cancel					

Having finished this step, we will a create layer within this Service based-on a PI AF Element Template, namely, 'Meter'. We will first begin with the *creation of the layer for the meters by connecting through the GeoEvent Server*.

- 3. Examine the Service details page. Click the **Create Layer** button.
- 4. In the Name Field, enter a name for the new Layer. The name is required and must be unique. In addition, the name must contain a minimum of five characters, may contain only lowercase and uppercase alphanumeric characters, hyphens, and underscores, and cannot include spaces or special characters. Uncheck 'Time-enabled feature layer' and check 'Connect through ArcGIS GeoEvent Server' option and then click the **Continue** button

PI Integrator for Estimate of the second	sri ArcGIS Services	Administration -	Tools Help -		PISCHOOL\student01
home / services / Cato	CanyonOilCo / new				
Creating new Basic information	ayer (CatCar	iyonOilWells)	in servio	ce CatCanyonOilCo	Step 1 of 4
Name*	CatCanyonOilWells]
Description*	CatCanyonOilWells]
	Time-enabled Featu Create item in ArcGIS Online	re Layer. This option crea	ates an item in Po	ortal for ArcGIS or in ArcGIS Online. These layers suppor	t historical data access.
	Connect through Ar layers enable real-tim	cGIS GeoEvent Server. The spatial analytics in ArcG	his option allows iIS GeoEvent Ser	you to publish data to a feature service in ArcGIS Onlir ver.	e or Portal for ArcGIS. These

5. For the Data Source, kindly choose PISRV01, CatCanyon Oil Fields, and Wells Template as the AF Server, AF Database, and Template, respectively.

source	ayer (Culcuriyo	n Ouvveus,	III SEIVICE (LatCariyOn	OIICO		Step
AF Server*	PISRV01	\checkmark					
AF Database*	CatCanyon Oil Fields	~					
Template*	Wells	~					
Category		\checkmark					
Max count		1000000					
Search root	CatCanyon Oil Fields					Select	
	Q, Preview						Back Con

Creating new layer (CatCanyonOilWells) in service CatCanyonOilCo

6. There is also a **Preview** button that you can click to see the results of your Layer search.

Using the Preview is an important step that you should always do, as it helps you verify that your Layer is indeed referencing data from the intended PI AF Elements. Click **Preview** and make sure that the PI AF data that you expect is returned by your Layer.

Selection preview (PI AF Elements) Filter preview:				preview limited to first 10 elements found
				currently showing to PLAT clements
CE-08300011		CE-08300073		
API	08300011	API	08300073	
ActiveWell	Ŷ	ActiveWell	Y	
ArcGIS feature shape	{'x':-13392076.892835012,'y':4140968.8589975387}	ArcGIS feature shape	{"x":-13391832.323874447,"y":4140960.9932389036}	
ArcGIS feature shape type	Point	ArcGIS feature shape type	Point	
Asset Name	CE-08300011	Asset Name	CE-08300073	
Bottom Hole Pressure	240.59408569335937	Bottom Hole Pressure	241.17677307128906	
Bottom Hole Temperature	118.1285629272461	Bottom Hole Temperature	94.55162048339844	
Coordinate projection ID	102100	Coordinate projection ID	102100	
Coordinate system ID	4326	Coordinate system ID	4326	
Coordinate system name	GC5_WG5_1984	Coordinate system name	GCS_WGS_1984	
County	Santa Barbara	County	Santa Barbara	
Field	Cat Canyon	Field	Cat Canyon	
Flow Rate	287.79449462890625	Flow Rate	278.235595703125	
Flow Tubing Pressure	269.134521484375	Flow Tubing Pressure	269.134521484375	
Hydrostatic Head	238.84600830078125	Hydrostatic Head	238.84600830078125	
Latitude	34.8312248174666	Latitude	34.8311668175934	
Lease	Williams Holding	Lease	Williams Holding	
Longitude	-120.303073589376	Longitude	-120.300876589023	
OBJECTID	1	OBJECTID	2	
Operator	Clancy Energy	Operator	Clancy Energy	
Туре	Oil & Gas Show	Туре	Oil & Gas Show	
Well Type	SC,OG	Well Type	SC,OG	
CE-08300083		CE-08300101		
API	08300083	API	08300101	
ActiveWell	Υ	ActiveWell	Y	
ArcGIS feature shape	("x":-13391702.080058172,"y":4141078.7092430666)	ArcGIS feature shape	{"x":-13394080.309984719,"y":4140376.0931738541}	
ArcGIS feature shape type	Point	ArcGIS feature shape type	Point	

7. Click the **Continue** button.

Next, we will configure all of the Fields for this Layer.

You configure Fields for a Layer to determine which AF Attributes will be published as Fields in your Layer. To begin, the **Template Attribute Fields** section of the Layer definition screen shows all of the Attributes found using the AF Template.

ll field nam	es are converted automaticall	y to lowercase					
emplate	attribute fields [Show less 1	h				A - Z Z - A	Show catego
Select all	Name	Attribute Name	Типе	Source	Units	Function	
Category	/: Metadata	Activate Name	iype.	Source	UIIB	Tunction	
\	well_type	Well Type	String	static		None	
	type	Туре	String	static		None	
	operator	Operator	String	static		None	
	obiectid	OBJECTID	Int64	static		None	
	lare	Lease	String	static		None	
	icose	Field	String	static		None	
	lield	County	String	ctatic		None	-
\checkmark	county	County	Sinng	Statuc		None	
\checkmark	asset_name	Asset Name	String	static		None	
\checkmark	api	API	String	static		None	×
\checkmark	activewell	ActiveWell	String	static		None	
Category	y: Geometry						
\checkmark	longitude	Longitude	Double	static	۰	х	~
\checkmark	latitude	Latitude	Double	static		Y	
✓	coordinate_system_nam	Coordinate system name	String	static		None	
\checkmark	coordinate_system_id	Coordinate system ID	Int32	static		None	
✓	coordinate_projection_i	id Coordinate projection ID	Int32	static		None	
✓	arcgis_feature_shape_ty	ArcGIS feature shape type	e String	static		None	
	arcgis_feature_shape	ArcGIS feature shape	String	static		None	
tegory: Pl	Data						
	hydrostatic_head	Hydrostatic Head	Double	Pl Point		None	
	flow tubing pressure	Flow Tubing Pressure	Double	PI Point		None	
	flow rate	Flow Rate	Double	Pl Point		None	5
✓	now_rate	Bottom Hole Temperature	Double	Pl Point	۰F	None	
	bottom_hole_temperatur		0.11	210 : L		None	
\checkmark	bottom_hole_pressure	Bottom Hole Pressure	Double	PI Point	psi	None	
ent fields	[Show less 1]						
ded	Name	Function					
	name	Key	Include AF Eleme	nt name			
	elementpath	None	Include AF Eleme	nt path			
	guid	None	Include AF Eleme	ent ID (GUID)			
	description	None	Include AF Eleme	nt description			
	template		Include AF Eleme	nt Template name			
	comprise.]	Include retrieval	time (Always included)			
	retrievaltime		and use retrieval t	anne (minuys included)			

Creating new layer (CatCanyonOilWells) in service CatCanyonOilCo

Specifying the coordinates

The X and Y functions are pre-selected if the application finds any Attribute name that contains the words **longitude** or **latitude**, or X or Y; if so, the application assigns them to the X and Y function (if desired, you can select a different function: **None**, X, Y, **Key** or **Geometry**). Generally, you specify X and

Y functions for Attributes that indicate geographic positions, including positions that move over time. Only one **X** and **Y** pair can be specified. In our case, we will accept the default **X** and **Y** assignments.

Specifying a geometry

Another option (which we won't use here), rather than specifying **X** and **Y**, is to specify the geometry for a map Feature by defining it in Esri Feature Geometry Json. Specifying a geometry allows for much more complex areas to be defined, such as polylines or polygons. Geometry function Fields must be of type string.

Specifying a key function

Element fie	elds [Show less 🕇]		
Included	Name	Function	
	name	Key 🔒	▼ Include AF Element name
		1	

In our case, under **Element fields**, set the element **name** Field to have the **key** function. The **key** function specifies a unique identifier for a particular map Feature; the **key** function is used when updating specific map Features in a Feature Service with the right data from the corresponding AF Elements, and also when generating OSIsoft Visualization displays.

- 8. Press **Continue** when finished configuring Fields.
- 9. Set Geometry Type to Polyline.

home / services / CatC	anyonOilCo / new		
Creating new la	ayer (CatCanyonOilV	<i>Wells)</i> in service CatCanyonOilCo	
Geometry information		-	Step 4 of 4
Geometry type 🕄	Point 💟		
Spatial reference 🕄	GCS_WGS_1984 (4326)	Q (5256)	
			Back Create Layer

This allows you to specify a different **Geometry Type**, if you're using Features that aren't points, such as polylines; we are only using points in our case, so we'll use the defaults that appear. You can also specify the **Spatial reference**, if you know that your latitude and longitude values were obtained using a particular spatial reference model for the world. In most cases, though, the default reference, **GCS_WGS_1984 (4326)** should suffice, so in summary, leave all of these settings as is. Go ahead and click **Create Layer**.

10. Click Next

Welcome to the ArcGIS Feature Service and GeoEvent Extension Configuration Wizard.

This wizard walks you through the steps to:

 Create a Feature Service for ArcGIS Online or for ArcGIS Portal Extension · Configure your ArcGIS GeoEvent Extension to stream the data defined in your PI Integrator for Esri ArcGIS layer

Before starting this configuration process, you should:

- Have an ArcGIS Online or ArcGIS Portal Extension account that has privileges to publish hosted Feature Services.
 Verify that your ArcGIS GeoEvent Extension is running and is configured as a known ArcGIS GeoEvent Extension in PI Integrator for Esri ArcGIS.
 Have administrator credentials for your ArcGIS GeoEvent Extension.
 Ensure that your ArcGIS Online account or ArcGIS Portal Extension account is registered as a Data Store in ArcGIS GeoEvent Extension.



11. Since we are going to the publishing this as a feature layer to Portal for ArcGIS, select 'ArcGIS Enterprise' button



12. When prompted for the credentials, enter the username and password portal_admin & portal_admin1, respectively and click Verify Credentials

1. Feature Service Environment 2. Create Feature Service 3. Configure GeoEvent Server 4. Advanced Settings 5. Summary

rovide your Portal for ArcGIS credentials to create a feature	service:
Portal for ArcGIS 🕄	
Portal105	
User name	
portal_admin	
Password	
••••••	ক
Varify sectortials	
verify credentials	

Provide your Portal for ArcGIS credentials to , 13. Once your Portal for ArcGIS credentials are validated, the wizard shows a suggested Service and Layer name, with description Fields.

×

- 1. Leave the default Service description (you could, if you want, enter a new description).
- 2. Leave the default Layer name and description (you could, if you want, enter a new name and description).
- 3. Make sure that the Feature service name is the same as Feature layer name
- 4. Click Create. When you select Create, the Service and Layer are created in Portal for ArcGIS.

If successful, the "Feature Service Created" message is displayed.

Feature Service created

14. Note: you could then, in a separate browser window tab, log in to Portal for ArcGIS to view and verify the creation of the feature service. To do this, you can click on the Portal for ArcGIS bookmark, as shown below

÷	🔿 🔷 https://pisrv01.pischo	ol.int:444/configurati	on/#/services/StaticAndMobileAs	ssets/Mai 🔎 🗕 d	ArcGIS GeoEvent Manager	🚸 Pl Integ
	🚸 PI Integrator for Esri ArcGI 💧	Portal for ArcGIS	🚱 ArcGIS GeoEvent Manager 🧕	Pl Coresight A	rcGIS Online 🧧 PI Connector for UFL A	d

15. Enter the Portal for ArcGIS user credentials, namely, enter the username and password *portal_admin* & *portal_admin*1, respectively. Note that if you had already logged-on to GeoEvent Server in another tab, you would be auto logged-in using the above-mentioned credential



16. Clicking on '**My Content**' would show you the feature layer that was created. You would note there are 2 with the same name. One is a feature service and another is a feature collection

Content			
My Content My Favorites My Groups	My Organization Living Atlas		
- Add Item 🗸 🛛 👔 Create 🗸	Q Search portal_admin		:: :
Folders 🔐 New	2 selected Clear Selection	齸 Move 🧏 Change Owner 🚸 Share 🔰	🗙 Dele
Q Filter folders	Title	Modified	
All My Content	Catcanyonoilwells	Feature Layer (hosted) 👚 🖈 🚥 Mar 10, 2019	
h portal_admin	Catcanyonoilwells	Feature Layer 🗈 🖈 🚥 Mar 10, 2019	

Check both the layers, click Share and share it with Everyone

Content											
My Content My Favorites My Groups My Orga	anization Living Atlas										
+ Add Item V 📲 Create V Q. Search portal_admin											
Folders 🖴 New	2 selected Clear Selection	🖬 Move	🤏 Change Owner 🔹 Share	🗙 Delete							
Q Filter folders	Title		Modified								
All My Content	Catcanyonoilwells	Feature Layer (hosted)	🕆 🕂 Mar 10, 2019								
portal_admin	🗹 🚇 a	ayer aver	🗄 ★ 🚥 Mar 10, 2019								
	Share the item(s) with:	ayer (hosted)	🗄 ★ 🚥 Mar 10, 2019								
✓ Categories	🗌 🗎 G 🗹 Everyone		🗄 ★ 🚥 Mar 10, 2019								
No Categories Yet	Portal for ArcGIS	ayer (hosted)	ⓓ ★ ··· Mar 10, 2019								
Categories allow members to organize	Featured Maps and Apps	ayer	🕝 ★ … Mar 10, 2019								

17. Now go back to your PI Integrator for Esri ArcGIS 2017 SP1, which you would have on another tab. Having created your Feature Service, click **Next** to display the Configure GeoEvent Server screen; that will allow you to configure the GeoEvent Server to accept the streamed data from the PI Integrator for Esri ArcGIS 2017 SP1 and output it to the Feature Service that you just created.

home / services / CatCanyonOilCo / CatCanyonOilWells / cor	nnect-wizard	
1. Feature Service Environment 2. Create Feature Service 3. Config	gure GeoEvent Server 4. Advanced Settings 5. Summary	
Portal for ArcGIS credentials verified. Provide feature service configuration	on details.	
Feature service name 📀		
catcanyonoilwells		
There already is a feature service named 'catcanyonoilwells'		
Feature service description 😣		
Generated from: catcanyonoilco		
Feature layer name 3		
catcanyonoilwells		
Feature layer description 😣		
CatCanyonOilWells		
Geometry type:		
Point (from layer configuration)		
Spatial reference:		
GCS_WGS_1984 (from layer configuration)		
Create Feature service created		
	Previous	t Cancel

18. Configure the GeoEvent Server: After creating the Feature Service, you can connect the Service to the GeoEvent Server. The Feature Service that was created previously should be selected automatically for you. Enter the User ID and password for the GeoEvent Server (username and password *portal_admin* & *portal_admin*1, respectively) and click **Validate credentials**.

home / services / CatCanyonOilCo / CatCanyonOilWells / connect-wizard

1. Feature Service Environment 2. Create Feature Service 3. Configure GeoEvent Server 4. Advanced Settings 5. Summary

6 F I		
Geotvent	~	🔗 manager
Use the same credentials that you use for log https://pisrv01.pischool.int/portal 3	ging into P	ortal for ArcGIS
User name		
portal_admin		
Password		

19. Since you used the Wizard to create your Feature Service, then after clicking Validate credentials, the Wizard begins polling the GeoEvent Server to detect the newly created Feature Service in one of the GeoEvent Server's data stores (which you verified earlier), which can take a few minutes. You will be notified when the process is complete, after which you may proceed to the next step. Click Next

1. Feature Service Environment 2. Create Feature Service 3. Configure GeoEvent Server 4. Advanced Settings 5. Summary

✓ You are connected to GeoEvent Server GEE105. Click here to change your connection.

 \preceq Success; GeoEvent Server has registered the target feature service. Continue to the **next** step.

20. In the **Input**, **Output**, and **Service** Fields, verify that the appropriate input, output, and Service values are displayed. Make sure to **UNCHECK** 'Use Https (Secure)' checkbox

home / services / CatCanyonOilCo / CatCanyonOilWells / connect-wizard

1. Feature Service Environment 2. Create Feature Service 3. Configure GeoEvent Server 4. Advanced Settings 5. Summary

Review the advanced settings. Generally, changes are needed only when multiple GeoEvent Servers are configured to use this PI Integrator for Esri ArcGIS layer.

Input ()	
pigeo-catcanyonoilco-catcanyonoilwells-ws-in	
Output 🥹	
pigeo-catcanyonoilco-catcanyonoilwells-fs-update-out	
Service 🧿	
pigeo-catcanyonoilco-catcanyonoilwells-service	
ldentity (Key)Field 😌	
name (String)	
Refresh Interval (seconds) 😏	
5	
iession Inactivity Timeout (seconds) 🥹	
330	
🛄 Use HTTPS (secure) 🥹	
Create Service Connected	

21. Click Create Service. If the Service was created without errors, the following message is displayed: Service Created – Done!

Create Service	Service created - Done!
	.0

22. Click Next. The following message is displayed: You have successfully configured GeoEvent Server to receive data from PI Integrator for Esri ArcGIS.

1. Feature Service Environment 2. Create Feature Service 3. Configure GeoEvent Server 4. Advanced Settings 5. Summary

You have successfully configured ArcGIS GeoEvent Server to receive data from PI Integrator for Esri ArcGIS

Ensure the following:

A connection exists between your ArcGIS GeoEvent Server and this PI Integrator for Esri ArcGIS layer.
 Your ArcGIS GeoEvent Server is receiving events from PI Integrator for Esri ArcGIS. To verify, go to the *O* ArcGIS GeoEvent Manager

- 23. Click Finish. You will return to the Layer details page.
- 24. You should next ensure the following:
- a. Click on the **GeoEvent Connections** tab, and verify that an opened connection from your ArcGIS GeoEvent Server is made to this layer, which is displayed when the wizard is closed.

h	nome / services / CatCanyonOliCo / CatCanyonOliWells												
ayer CatCanyonOilWells atCanyonOilWells eated on 03/10/2019 10:05:24 (7 minutes ago)													
A	ll Feat	ures Fi	elds Geo	Event connecti	ons Vis	ualization	ArcGl	s					
зу	ayer connections Show: All 🗸 Time: *-1d 💙 🗹 Automatic refresh												
_	Status	Updates	Total data	Address	Scheme	Secure	Created	Updated	Total time	Time since last	Avg update rate	Avg data rate	
1	Opened	268	230.0 kB	192.168.0.5	http		just now	just now	00:00:15	00:00:02	16.89 updates/s	14.5 kB/s	🛱 Close

b. Your ArcGIS GeoEvent Server is receiving events from PI Integrator for Esri ArcGIS. If you have closed the GeoEvent Manager tab on your browser, use the ArcGIS GeoEvent Manager to check whether events are received by clicking the bookmark in IE for the same

Attps://pisrv01.pischool.int:444/configurat	tion/#/services/StaticAndMobileAssets/Mai 🔎 🖛 🖨 🖒	🚱 ArcGIS GeoEvent Mana
🚖 💠 PI Integrator for Esri ArcGI 🧃 Portal for ArcGIS	🚱 GeoEvent Server Manager 🔘 PI Coresight 🗃 PI C	onnector for UFL Ad

After signing in, you can scroll down to find the Input, GeoEvent Service, and Output; their names are the values you saw in step 1. You should verify that the **Count** of updates for those objects is indeed increasing. If they are, then you can proceed further.

A http://pics/ll.picebool.int-51.82/newsent/manager/index.html		Audio Carloret Ma	anne X Cantant	P 0116-1	an CalCanan OilEistd			
A Di lateanter far Erzi Arcii . Dastal far Arciit O Geoforet Senar Manaer D D C	apparter for IELAd	Arcors debevent ma	rager A Content	C PI VIS	on - CatcanyonOliPield			
Vintegration for San Arcon E Portanter Arcon Groecever Server manager E Pro-	Presidenti de Laura					esri.com []	Veb GIS Server	Manager Sign Out
ArcGIS GeoEvent Manager						Set	doss	Site Log
Menitor Inputs GeoEvent Services Outputs							Note 1	Site Cog.
Ionitor								Reset Stati
• GeoEvent Services 🕞 🔳								
	In/Out	Count 536	Rate 8 /cer	Edit Rate	Max Rate 27 /cpc	Time Since Last 00:00:26		
pigeo-catcanyonolico-catcanyonolixelle-service	Out	536	8 /sec	1	27 /sec	00:00:36	l≃.	> = C
pigeo:geofen.cingesemple:wehiclesgeofen.cing:service	In	0	0 /sec	1	0 /sec	00:39:47	k	► = 0
	10	0	0/sec		0/sec	00:39:47		
VehicleLocationIncident	Out	0	0 /sec	1	0 /sec	00:39:47	ke i	•= 0
Tanuts								
		Count	Rato	Edit Rate	Max Rate	Time Since Last		
piges:catcanyonolico-catcanyonolivella-us-in [Running On: PISRV01]		536	8 /sec	/	18 /sec	00:00:36	k	► = Q
ciaes asofencinoexample vehiclesgeofencing var.in [Running On: PISRV01]		0	0 /sec	/	0 /sec	00:40:08	ke	► = 0
Outputs S								
		Count	Rate	Edit Rato	Max Rato	Time Since Last		
http-external-out2		0	0 /sec	/	0 /sec	00:40:08	k	► = 0
pigeo-catcanyongiko-catcanyongilwells-fs-update-out		536	8 /sec	1	22 /sec	00:00:36	le:	► = Q
D pigeo-geofencingexemple-vehiclesgeofencing-fs-update-out		0	0 /sec	1	0/sec	00:40:08	ke -	► = 0.

Congratulations! It's worth mentioning that what we have done is an incredibly powerful ability of the Integrator. You can actually click on each of these objects that was created, and you can see that a lot of configuration values have been automatically entered in for you by the Integrator.

5. Create a WebMap and add OSIsoft Visualization integration to the Portal for ArcGIS Web Map

Next we'll add OSIsoft Visualization integration, so that in addition to seeing a map with live locations, and with pop-ups that feature live values from the PI System, you can also click a pop-up image to automatically open an ad hoc OSIsoft Visualization display.

1. On a separate browser tab, connect to the Portal for ArcGIS by clicking on the bookmark

()	Ð 🧭 I	nttps://	pisrv01.	pischool.	int/portal/home	/content.html	Q	- ≙ ¢	ArcGIS GeoEvent
۵ 🔄	PI Integra	tor for	Esri Arc(51 🗿	Portal for ArcGIS	🗧 🚱 GeoEvent Server Man	ager 🔘 PI Coresight	PI C	onnector for UFL Ad
2	Thon	click	ί Μιν Cu	ontent	,				
Home	Gallery	Мар	Scene	Groups	My Content	My Organization			
	13	100							

3. You would note two items called 'Catcanyonoilwells'. Click on the dropdown arrow next to one of them. The feature layer that shows 6 options is the feature service that we are interested in. Then select 'Add layer to new map with full editing control'

ome Gallery Map Scene Groups Content (Organization		Rajesh 🗸 🔍	
My Content My Favorites My Groups My	Organization Living Atlas		and the second	
- Add Item 🗸 🛛 🖹 Create 🗸	Q Search portal_admin			
Folders 📔 New	1 - 10 of 10 in portal_admin		Sor	t by: Date Modified \checkmark \downarrow
Q, Filter folders	Title			Modified 🔻
All My Content	catcanyonoilwells	Feature Layer (hosted)	@ *···	Mar 10, 2019
portal admin	catcanyonoilwells	Feature Layer	m details	Mar 10, 2019
	CatCanyonGeoFence	Open in Feature Layer (hosted)	Map Viewer	Mar 10, 2019
✓ Categories	GeofencePolygon	CSV Add to n	new map	Mar 10, 2019
No Categories Yet	vehiclesgeofencing	Feature Layer (hoste) editing of	new map with full	Mar 10, 2019
Categories allow members to organize items consistently and provide a simple	. vehiclesgeofencing	Feature Layer Open in	Scene Viewer	Mar 10, 2019
way to browse content in the organization.	GeoFence	Feature Layer (hosted) Open in	ArcGIS Desktop	Mar 10, 2019
	CoalPowerStations	Feature Layer	0 * ···	Feb 25, 2019
✓ Item Type	PI Integrator for Esri ArcGIS 2017 - Widgets A Operations Dashboard for Esri ArcGIS	dd-in to Operations Dashboard Add-In	0 * …	Mar 22, 2018
Maps Layers	CoalPowerStations	CSV	0 * ···	Mar 18, 2018
Scenes				



4. Now click on the ... next to the layer on the map and select 'Zoom to'

5. Similarly, select the refresh rate and specify 0.1 minutes

Home
→ catcanyonoilwells



6. Select **Configure Pop-up** from the drop-down list; you'll see the list of pop-up properties that we visited earlier.



7. Select Image from the ADD drop-down list in the Pop-up Media section.

Configure Pop-up	4
catcanyonoilwells	
✓ Show Pop-ups	
Pop-up Title	
catcanyonoilwells: {name}	÷
^P op-up Contents	
Display: A list of field attributes 👻	
These field attributes will display:	
well_type {well_type}	•
type (type) operator (operator)	
longitude {longitude}	
Configure Attributes	
Attribute Expressions	
Adding expressions allows you to create new information from existing fields	for use
n pop-ups.	
ADD	
No expressions.	
Click 'Add' to add one.	
	-
	38
°op-up Media	
Display images and charts in the pop-up:	
ADD -	
Image .	-
Pie Chart rder.	
Bar Chart	22
Column Chart	L L
Line Chart	V

8. In the **Configure Image** window, as a title, you can enter "Analyze!"

Configure Image	
Specify the title, caption and URL for this image. Ins names to derive the display from attribute values.	ert field
Title:	
Analyze in Pl Vision	\pm
Caption	
	÷
URL	
	÷
Link (optional)	
	÷
Refresh Interval Refresh image every 0 minutes.	
ок сл	NCEL

For the URL, we'll need to go back to the PI Integrator for Esri ArcGIS. Either go back to the PI Integrator tab or if you had closed that browser tab, in a separate browser tab, open the PI Integrator for Esri ArcGIS.

9. Click on Services from the PI Integrator for Esri ArcGIS 2017 SP1. Then select CatcanyonOilwells layer under CatCanyonOilCo Service

PI Integrator for Esri ArcGIS	Services	Administration -	Tools	Help +			👤 PISC	HOOL\studen	it01
home / services									
Services									
Services									
Services are used to group layers that share a	common thei	me or purpose. You f	îrst create a	service, then add laye	275.		+ Create Service	Tile v	iew
Name 🕂	Description	n		Created		Modified		Layers	
CatCanyonOilCo	CatCanyon	iOilCo		03/10/2019 10:01:27		03/10/2019 10:01:27		1	×
GeoFencingExample	GeoFencin	aExample		03/10/2019 04:40:38		03/10/2019 04:40:38		1	×
10. Click on Catcany	onOilw	ells laver							
10. Click on Catcany	ronOilw	ells layer							
10. Click on Catcany home / services / CatCanyonOilCo	onOilw	ells layer							
10. Click on Catcany home / services / CatCanyonOilCo	ronOilw	ells layer							
10. Click on Catcany home / services / CatCanyonOilCo Service CatCanyonOilCo CatCanyonOilCo reated on 03/10/2019 10:01:27 (20 minutes ago) .ayers (1) .ayers are used to select PI System data to ca	ronOilw	ells layer	ı can config	ure multiple layers w	thin a single seri	ńce.	+ Create La	yer 🔡 Til	e vie
10. Click on Catcany home / services / CatCanyonOilCo Service CatCanyonOilCo CatCanyonOilCo Created on 03/10/2019 10:01:27 (20 minutes ago) .ayers (1) .ayers are used to select PI System data to ca Name 4	ronOilw onnect to the A Descriptio	ells layer ArcGIS platform. You	ı can config Created	ure multiple layers w	thin a single sen Modified	ice. Tim	+ Create La e-enabled	yer III Til	e vie
11. Click the **Visualization** tab for that Layer.

home / services / Cat	anyonOilCo / CatCanyonC	liWells		
Layer CatCanyonC CatCanyonOilWells Created on 03/10/2019 10:05:24 (1 All Features Field	DilWells X 7 minutes ago) s GeoEvent connections	Visualization	ArcGIS	
		1		
Configuration PI Vision server	PIVision			
	Allow ad-hoc Pl Vision dis	plays		
Displays				
Ad-hoc	Copy URL to clipboard			
Custom	Add			
lCONS PI AF Button Image	Copy URL to clipboard		Analyze	
OSIsoft Button Image	Copy URL to clipboard	e e	Analyze	
PI Vision Button Image	Copy URL to clipboard		Analyze	

12. Now we will use the custom OSIsoft Visualization displays as shown on page 10. Click on Add next to Custom

13. Select the Custom Meters display and click Close

Add PI Vision displays from server "PIVision" https://pisrv01.pischool.int:446/pivision	
Q	
CatCanyonOilField 🗹	Meters 🕑

14. Layer CatCanya	Click o CatCany onOilWells	n Co yonOi :05:24 (18	py URL to clipbo IWells 🗙	ard			
All	Features	Fields	GeoEvent connections	Visualization	ArcGIS		
Confiau	iration						
	PI Vision se	rver	PIVision		~		
			Allow ad-hoc PI Vision dis	plays			
Displays	5						
Ad-hoc			Copy URL to clipboard				
Custom			Add				
		l	CatCanyonOilField X)			
lcons PI AF Butto	on Image		Copy URL to clipboard		🎙 Analyze		
OSIsoft But	tton Image		Copy URL to clipboard		Analyze		
Pl Vision B	utton Image		Copy URL to clipboard	C	Analyze		
15.	Copy t	he U	RL by CTRL+C			 	

Below is a clipboard-friendly view of your selection. To copy to the clipboard, either right-click and choose 'Copy' from the browser's context menu or enter CTRL-C.

https://pisrv01.pischool.int-444/api/v1/services/catcanyonoiico/catcanyonoiico/displayserver/0/displays/37mapfeaturekey=[name]

- None = catagyonolivelis

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 O
- 16. Now go back to your WebMap and paste the URL to the Link (Optional) field

17. Now go back to your PI Integrator for Esri ArcGIS and copy the URL for the OSIsoft Visualization Button Image



18. Paste it in the URL field and click OK. The click OK again.

Configure Image	
Specify the title, caption and URL for this image. Ins names to derive the display from attribute values.	ert field
Title:	
Analyze in PI Vision	Ŧ
Caption	
	Ŧ
ORL	
int:444/content/img/display/analyse-pivision.png	+
Link (optional)	
isplayserver/0/displays/3?mapfeaturekey={name}	÷
Defects lateral	
Refresh Interval	
Refresh image every 0 minutes.	
ОК СА	NCEL

19. Now clicking on any one of the maintenance vehicles would open the popup window. Then click on the Analyze





20. This would open up the OSIsoft Visualization custom display for this maintenance vehicle

21. Now let's add the symbology to indicate the status of the Meters

Home
v catcanyonoilwells



22. Select 'bottom_hole_pressure' for item # 1. Acknowledge 'Yes' if prompted and click Done



23. Select the 'Save As' from Save dropdown menu. Specify the Title and Tags mentioned below and click 'Save Map'

Save Map		
Title:	CatCanyonOilFieldWebMap]
Tags:	CatCanyonOilField X Add tag(s)	
Summary:	Description of the map.	
Save in folder:	portal_admin 👻	-
	SAVE MAP CANCEL	

24. Now kindly try to create the layer using the PI Integrator for Esri ArcGIS 2017 SP1 for vehicles based-on the 'Vehicle Template' that is present in the same AF databases

Elements	T-101	
■ Elements ■ ●	General Child Elements Attributes Ports Analyses Notification Rules Version Name:	
Element Searches	Extended Properties (0) Annotations (0) Location Security Find: <u>Parents Children Event Frames</u> <u>Models Layers Connections</u>	

25. Click Create Layer button to commence creating the feature layer for the vehicles.

	t <u>CanyonOilCo</u>					
Service CatCanyc CatCanyonOilCo Greated on 03/10/2019 10:01:27	0nOilCo 🗙					
Layers (1) Layers are used to select PI S	ystem data to connect to	the ArcGIS platform. You c	an configure multiple layers w	ithin a single service.	+ Creat	e Layer 🔡 Tile view
Name 🕂	Desc	ription	Created	Modified	Time-enabled	GeoEvent
CatCanyonOilWells	CatC	anyonOilWells	03/10/2019 10:05:24	03/10/2019 10:05:24		× 3
Name*	MaintenanceVehicle	5				
Description*	MaintenanceVehicle	5				
	Time-enabled Feat Create item in	ture Layer. This option crea	tes an item in Portal for ArcGI	S or in ArcGIS Online. These lay	vers support historical	data access.
	Create item in	ArcGIS Enterprise	tes an item in Portal for ArcGI	5 or in ArcGIS Online. These lay	vers support historical	data access.

Creating new layer (MaintenanceVehicles) in service CatCanyonOilCo

Data source						Step 2 of 4
AF Server*	PISRV01	~				
AF Database*	CatCanyon Oil Fields	~				
Template*	Vehicle Template	~				
Category		\checkmark				
Max count		1000000				
Search root	CatCanyon Oil Fields			Select		
	Q. Preview				Back	Continue

Creating new layer (*MaintenanceVehicles*) in service CatCanyonOilCo

All field name	s are converted automa	tically to lowercase					
Template a	ttribute fields [Show	ess 🕇]			А	.ZZ_Z_A ☑ Sh	ow categories
☑ Select all							
Included	Name	Attribute Name	Туре	Source	Units	Function	
★ Category:	Vehicle Information						
\checkmark	driver	Driver	String	String Builder		None	\checkmark
\checkmark	truck_id	Truck ID	String	String Builder		None	\checkmark
★ Category:	Location						
\checkmark	latitude	Latitude	Double	PI Point	٥	Y	\checkmark
\checkmark	longitude	Longitude	Double	PI Point	8	х	\checkmark

Element fields [Show less 1]

Included	Name	Function	
\checkmark	name	Key 💌	Include AF Element name
	elementpath	None	Include AF Element path
	guid	None	Include AF Element ID (GUID)
	description	None 🕑	Include AF Element description
	template		Include AF Element Template name
\checkmark	retrievaltime		Include retrieval time (Always included)

Back Continue

•	•	•	•	•	•	•

•••••

.....

Step 3 of 4

home / services / CatCanyonOilCo / MaintenanceVehicle	es / connect-wizard	
1. Feature Service Environment 2. Create Feature Service 3.	Configure GeoEvent Server 4. Advanced Settings 5. Summary	,
Portal for ArcGIS credentials verified. Provide feature service config	guration details.	
Feature service name 9		
maintenancevehicles	×	
Feature service description 9		
Generated from: catcanyonoilco		
Feature layer name 9		
maintenancevehicles		
Feature layer description 🥹		
MaintenanceVehicles		
Geometry type:		
Point (from layer configuration)		
Spatial reference:		
GCS_WGS_1984 (from layer configuration)		
Create		
		Previous Next Cancel
Content		
ing content ing ravonica ing croups ing organization ing		
+ Add Item V 📲 Create V Q. Search p	ortal_admin	
Folders 😫 New 2 selected	Clear Selection	🕍 Move 🦂 Change Owner 🜵 Share 🗙 Delet

Folders 🔐 New	2 selected Clear Selection	Move	a 🔏 Change Owner	🕸 Share 🗙 Delete
Q. Filter folders	Title			Modified 💌
All My Content	M maintenancevehicles	Feature Layer (hosted)	≞ ★ ···	Mar 10, 2019
n portal_admin	Sharo	ayer		Mar 10, 2019
	Share the item(s) with:		≞ ★ …	Mar 10, 2019
✓ Categories	Everyone	ayer (hosted)	0 * ···	Mar 10, 2019
No Categories Yet	Portal for ArcGIS	ayer	0 * ···	Mar 10, 2019
Categories allow members to organize items consistently and provide a simple	Featured Maps and Apps	ayer (hosted)	≞ ★ ···	Mar 10, 2019
way to browse content in the organization.	🗆 🗎 G		≙ ★ …	Mar 10, 2019

home / services / CatCanyonOilCo / Main	tenanceVehicles / connect-wizard
---	----------------------------------

1. Feature Service Environment 2. Create Feature Service 3. Configure GeoEvent Server 4. Advanced Settings 5. Summary

Review the advanced settings. Generally, changes are needed only when multiple GeoEvent Servers are configured to use this PI Integrator for Esri ArcGIS layer.

Input 😌	
pigeo-catcanyonoilco-maintenancevehicles-ws-in	
Dutput 📀	
pigeo-catcanyonoilco-maintenancevehicles-fs-update-out	
iervice 9	
pigeo-catcanyonoilco-maintenancevehicles-service	
dentity (Key)Field 💿	
name (String)	\checkmark
Refresh Interval (seconds) 🥹	
5	
Session Inactivity Timeout (seconds) 😧	
330	
Use HTTPS (secure) 📀	
Create Service Created - Done!	
	Previous Next

ArcGIS GeoEvent Manager						Service	s	Site Logs
Monitor Inputs GetEvent Services Outputs								
Monitor								Reset Statis
GeoEvent Services	In/Out	Count	Rate	EdR. Rate	Mox Bate	Time Since Last		
piese-catcanyonolice-catcanyonolivelic-service	In Out	5,092	4 /sec 4 /sec	1	27 /sec 27 /sec	00:00:03	ke	⊢≡ 0
ajgez-catcanyonolica-maintenancevehiclez-service	In Out	20 20	1 /sec 1 /sec	1	1/sec 1/sec	00:00:04 00:00:04	k	⊢ = 0
O ziges-gestfentingexample-vehiclesges/encing-service	In Out	0	0 /sec 0 /sec	1	0 /sec 0 /sec	01:06:17 01:06:17	k	► = G
VehicleLocationInsident	In Out	0	0 /sec 0 /sec	1	0 /sec 0 /sec	01:06:16 01:06:16	ke	► = 0
• Inputs								
		Count	Rate	Edit Rate	Hex Rate	Time Since Last		
pigeo-catcanyonolico-catcanyonoliwelis-ws-in [Running On: PISRV01]		5,092	4 /sec	/	18 /sec	00:00:03	ke -	⊳ = 0
O pigeo-catcanyonolico-maintenance/abicles-us-in [Running On: PISRV01]		20	1/sec	/	1/sec	00:00:04		⊳ = G
O piece-ceofencineexample-vehiclesgeofencine-wo-in (Running On: PISRV01)		0	0 /sec	1	0/sec	01:06:37	ke	▶ = 0
• Outputs								
		Count	Rate	Edit Rate	Hax Rate	Time Since Last		
O http-asternal-out2		0	0 /sec	/	0/sec	01:06:37	ke	► = 13
O pipeo-catcanyonolico-catcanyonolivells-fs-update-out		5,092	4 /sec	1	22 /sec	00:00:03	k	> = 0
O pieso-catcanyonolico-maintenancevehicles-fs-update-out		20	1 /sec	1	1 /sec	00:00:04	ke	► ■ 0
O place-sectendingexemple-vehiclesgeofencing-fs-update-out		0	0 /sec	/	0 /sec	01:06:37	ke -	► = 0

Now add the maintenancevehicles to the map by selecting 'open in Map Viewer'

Content			
My Content My Favorites My Groups	My Organization Living Atlas	A la facture and	
+ Add Item 🗸 🛛 👔 Create 🗸	Q Search portal_admin		
Folders 🔐 Ne	w 1 - 13 of 13 in portal_admin		Sort by: Date Modified \checkmark \downarrow
Q Filter folders	Title		Modified 🔻
All My Content	maintenancevehicles	Feature Layer (hosted)	3 🖈 🚥 Mar 10, 2019
portal_admin	🗌 🚇 maintenancevehicles	Feature Layer	item details Mar 10, 2019
	CatCanyonOilFieldWebMap	Oper Web Map	n in Map Viewer Mar 10, 2019
✓ Categories	Catcanyonoilwells	Feature Layer (hosted)	co new map Mar 10, 2019
No Categories Yet	catcanyonoilwells	Add 1 Feature Layer editir	io new map with full Ig control Mar 10, 2019
Categories allow members to organize items consistently and provide a simple	CatCanyonGeoFence	Feature Layer (hosted) Oper	n in Scene Viewer Mar 10, 2019
way to browse content in the organization.	GeofencePolygon	CSV Oper	n in ArcGIS Desktop Mar 10, 2019

Click **Options**



Click 'Symbol'

Change Style maintenancevehicles		4
Showing Location Only		
Transparency	50%	100%
Visible Range ⊪Ç====== World ⊮	v	Suggest Room v

Change the image and symbol size as shown below

🗈 Details 🍈 Add - 🖍 Edit 昭和Basemap 罰 Analysis	
Change Style ************************************	×
Showing Location Only	SHAPE FILL OUTLINE OUTLINE
Symbols	Transportation •
Transparency	
ด้ระ รอริเล 100%	
Visible Range Suggest	
World - Room -	🛆 🕰 📲 🗣 🛓
	🕌 🍂 📵 🖻 👼 🎽 🎽
	Use an Image
	Symbol Size
	OK CANCEL





Finally, save the WebMap

Save Map		×
Title:	CatCanyonOilFeildsWebMap]
Tags:	CatCanyonOilFeilds x Add tag(s)]
Summary:	Description of the map.]
Save in folder:	portal_admin 👻	-
	SAVE MAP CANCEL	

Content	19A / Falland	CVB234	
My Content My Favorites My Groups	My Organization Living Atlas	he was a find	
+ Add Item 🗸 🛛 🖹 Create 🗸	Q Search portal_admin		
Folders 🔐 New	1 - 13 of 13 in portal_admin		Sort by: Date Modified \checkmark $~~\downarrow$
Q Filter folders	□ Title		Modified
All My Content	CatCanyonOilFeildsWebMap	Web Map	🗄 ★ 🚥 Mar 10, 2019
portal admin	a intenancevehicles	Feature Layer (hosted)	③ ★ ··· Mar 10, 2019
	maintenancevehicles	Feature Laver	🖓 🛨 Mar 10 2019

6. Create an Operations View with PI Vision Integration

1. Click 'CatCanyonOilFieldsWebMap' from the Portals 'Content' page

Content			
My Content My Favorites My Groups	My Organization Living Atlas	he was he for	
+ Add Item 🗸 🛛 🝸 Create 🗸	Q, Search portal_admin		III II II
Folders 📔 New	1 - 13 of 13 in portal_admin		Sort by: Date Modified \checkmark \downarrow
Q Filter folders	Title		Modified 💌
All My Content	CatCanyonOilFeildsWebMap	Web Map	🛱 ★ 🚥 Mar 10, 2019
portal admin	maintenancevehicles	Feature Layer (hosted)	𝞯 ★ ··· Mar 10, 2019
	[®] maintenancevehicles	Feature Laver	🕼 🛨 🚥 Mar 10 2019

2. Select 'Using Operations Dashboard' from 'Create Web App' dropdown

CatCanyonOi	lFeildsWebMap ∠ ⊑att		
Overview Settings		he had been t	
🖋 Edit Thumbnail			Open in Map Viewer
and the second	Add a brief summary about the item.	🖋 Edit	
	🔣 Web Map by portal_admin		Open in ArcGIS Desktop
	Created: Mar 10, 2019 Updated: Mar 10, 2019 View Count: 0		Create Presentation
★ Add to Favorites			Create Web App 🗸
Description		/ Edit	Using a Template
Description			Using the Web AppBuilder
Add an in-depth description of	of the item.	lte	em Informat ^{Using Operations Dashboard}

3. Provide a suitable name and click OK

Specify a title, tags, ar	nd summary for the new Opera	ations Dashboard
Title:		
CatCanyonOilFeildsO	perationsView	
Tags:		
CatCanyonOilFeilds	×	
Add tag(s)		
Summary: (Optional)		
Enter a summary		
Save in folder:		
portal_admin		•

4. Select List from as shown below



5. Select CatCanyonOilWells Layer

List

er
2

	Select Lay
Layers from 'CatCanyonOilFeildsWebMap' map:	
-1- maintenancevehicles -1- cstcanyonoilwells	
	Cancel

6. Under the Data tab, select a value of 1 for 'Maximum Features Displayed'

Data	Data Options		Show data table		CE-08322083
List	Using 'catcanyonoilwells' la	iyer	Change	F	
General					
Actions	Filter	+ Filter			
	Maximum Features Displayed	1			
	Sort By	+ Sort			

7. Then click on the list tab and then click Edit, and click Source

Data	List Options			•	CE-08322083
List	Line Item Text		/ Edit		
General			_		
Actions	Line Item Icon	None Symbol			



8. Copy the following string from the URLs_Credentials.txt file that is provided in your desktop



9. Paste it in the edit box as show below

Data	List Options	•	CE-08322083
List	Line Item Text Minimize		
General	B I U A- M- ≥ ≐ ≝ ≡ = = = ∞ ∞ ∞ ∞ ∞		
Actions	Format \sim Size $+$ \mathcal{I}_{K} (.) $-$ \textcircled{O} Source		
	<pre><iframe height="400" id="MyFrame" name="MyFrame" runat="server" src="https://pisrv01.pischool.int:444/api/v1/services/catcany onoilco/catcanyonoilco/displayserver/0/displays/3? mapfeaturekey=(name)&hidetoolbar&hidetimebar" width="600"></iframe></pre>		
	Line Item Icon Symbol		

10. Click 'Source'

Data	List Options	
List	Line Item Text Minimize	
General	B 7 型 ▲· □· ■ 章 章 章 章 章 章 章 章 章 章 章 章 章 章 章 章 章 章	
Actions	Format \sim Size \rightarrow $\underline{\mathcal{I}}_{K}$ {.} \rightarrow \bigcirc Source	
	<pre><iframe height="400" id="MyFrame" name="MyFrame" rumat="server" src="https://pisrv01.pischool.int:444/api/v1/services/catcany onoilco/catcanyonoilco/displayserver/0/displays/3? mapfeaturekey={name}shidetoolbarshidetimebar" width="600"></iframe> Line ltem lcon None Symbol</pre>	
Data	List Options	
List	Line Item Text Minimize	Ø
General	B I U A- M- ≞ ≞ ≣ ≔ # # # ∞ ∞ ⊑ ⊞	ot ∎

Object reference not set to an instance of an object.



11. Click 'Done' from bottom RHS

Format \bullet | Size \bullet | \underline{I}_{x} | {.} \bullet | \underline{O} Source

None

<

Line Item Icon



 $\hat{}$

~

>

	- 0 X
🗲 🛞 😨 https://pin/01.pischool.int/portal/apps/opsdashboard/index.html#/def46ad#40c44b3 🖉 = 🔒 🖒 🔷 PI Integrator for Ess ArcGIS 🛛 🕸 ArcGIS GeoEvent Manager	🕼 🕼 🗘 🕼 😨 CatCanyonDiFieldsOperati × 🔘 PI Vision - CatCanyonOilField 🔘 PI Vision - CatCanyonDiField
🎪 💠 Pl Integrator for Esri ArcGL. 👩 Portal for ArcGIS 🚳 GeoEvent Server Manager 👸 Pl Connector for UFL Ad 🔞 Pl Vision	
Home 🗵 🔯 CatCanyonOilFeildsOperationsView	+ 🗢 🔯 🗸
	🗏 🍖 😯 😘 1108 PM
	32 W/2019

12. Now to create a map action, select 'Configure' button as shown below

13. From the 'Layer Actions' tab, select 'Filter; from 'Add Action' dropdown menu

CatCanyonOilFeildsWebMap

Settings General Map Actions	Layer Actions	
When Selection Changes For:		
+ maintenancevehicles	No Actions Defined	Add Action 🗸
+ catcanyonoilwells	No Actions Defined	Add Action ✓
		@, Zoom
		ा riaan हिं Filter

14. Now select List from the 'Add Target' dropdown menu. Then click Done.

atCanyonOilFeildsWebMap					
Bettings General Map Actions Layer Action	ina				
Vhen Selection Changes For:					
∲ maintenancevehicles	No Actions Define	ed		Add A	ction 🗸
∲- catcanyonoilwells				Add A	ction 🗸
Filter				Add Ta	rget 🗸
	No Targets Define	ed		Map (1)	
				-0- maintenancevehi	cles
			[List(1)	⊜

Мар

Rettings General Map Actions Laver Actions	
When Selection Changes For:	
+- maintenancevehicles	Add Action 🗸
No Actions Defined	
catcanyonoilwells	Add Action 🗸
Filter	Add Target 🗸
I = 11	a



15. Select 'Point' from the menu shown below





17. Again, select 'Gauge' as another widget to add to the dashboard



18. Select 'catcanyonoilwells' as the layer

Gauge

Select a layer

	Select Layer
Layers from 'CatCanyonOilFeildsWebMap' map:	
-q- maintenancevehicles -q- catcanyonoilwella	
	Cancel

19. Select Average, bottom_hole_temperature, and 500 as values for Statistics, Field, and Value fields, respectively. Then click Done.

Data	Data Options		Show data table	
Gauge	Value			
General	Using 'catcanyonoilwells' la	ayer	Change	
	Filter	+ Filter		104
	Value Type	Statistic Feature		
	Statistic	Average	\bigtriangledown	0 500 Lest update: a few seconds aggi
	Field	bottom_hole_temperature	decimal 🗢	
	Value Conversion			
	Minimum Value			
	Value Type	Fixed Value Statistic		
	Value	0		
	Maximum Value			
	Value Type	Fixed Value Statistic		
	Value	500	O]

20. Select 'Drag item' to drag this widget and place it below the PI Vision dashboard





21. Select Draw a circle option as shown below and draw a circle for a group of oil well to render the calculated averages shown using the gauge.
 Home v G CatCanyonOilFeildsOperationsView







Demonstration of the feature in the PI Integrator for Esri ArcGIS 2017 SP1 that would delete the associated GeoEvent Server connectors

Now we would like to demonstrate a new feature in the Esri Integrator 2017 that will delete the associated GeoEvent objects, when deleting the layer from the PI Integrator for Esri ArcGIS 2017 SP1.

1. Go to the PI Integrator for Esri ArcGIS 2017 SP1 and click on the service 'CatCanyonOilCo'

PI Integrator for Esri ArcGIS	Services	Administration -	Tools	Help -			PISCHOOL\stude	nt01
home / services / <u>CatCanyonOilCo</u>								
Service CatCanyonOilCo × <i>CatCanyonOilCo</i> Created on 03/10/2019 10:01:27 (2 hours ago)								
Layers (2) Layers are used to select PI System data to co	onnect to the A	ArcGIS platform. You	can configi	ure multiple layers wit	hin a single service.	+ Create	Layer 🔡 Tile	view
Name +	Descriptio	n	Create	d	Modified	Time-enabled	GeoEvent	
CatCanyonOilWells	CatCanyo	nOilWells	03/10/2	019 10:05:24	03/10/2019 10:05:24		1	×
MaintenanceVehicles	Maintenar	nceVehicles	03/10/2	019 10:37:01	03/10/2019 10:37:01		×	×

 Now we will delete the CatCanyonOilWells layer. Click on the X icon in the last column next to Meter layer. This will open up another dialog box and click OK to acknowledge that you wish to delete this layer, which would delete the associated ArcGIS feature service, GeoEvent Server Objects, and this Integrator layer.



- 3. Click Next
- 4. Enter the password for the Portal for ArcGIS, namely, portal_admin1 and click Verify Credentials

mer / services / CatCanyonOBCo / CatCanyonOWells / delete-wizard sature Service Environment 2. GeoBrent Server Environment 3. Confirmation 4. Summary GeoVent Fature Layor the decis for the teature service associated with your Arcid's GeoBrent Tayor a tor Arcid 9 Tarilos (Service) CatCanyonOBLCo / CatCanyonOBLCO	PI Integrator for Esri ArcGIS Services Administration				PISCHOOL\student01
ature Service Environment 2. Geofernt Server Environment 3. Confirmation 4. Summary GoOvern Fasture Layu RevGoS Portal reservice associated with your AcGS Geobern Tays: Historgin Tarlos Windon Caschoolum/Dortal Tame Taj.comin My centrolise Previous Service Servi	home / services / CatCanyonOilCo / CatCanyonOilWells / d	elete-wizard			
Geotent fature tays the ActS Shorta recentais for the feature service associated with your ActS Geotent tys: this tags tartes faultion faultion tags mod mod mod mod mod My centrolis My centrolis My centrolis My centrolis My centrolis My centrolis My centrolis	1. Feature Service Environment 2. GeoEvent Server Environment	3. Confirmation 4. Summary			
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the ArcGS Charlo codentials for the feature service associated with your ArcGS Geobern tays: this tagen and KarcGS Table	GIS GeoEvent Feature Layer				
af ce ArcoS® traffio3 (yoord) cachoolutiyonta mane traj.dmin med med try cachendos try c	ify the ArcGIS Portal credentials for the feature service associated with yo	ur ArcGIS GeoEvent layer.	Hide Login		
rati03 //pon01gacouthyonts mme tal_aonin verd	Portal for ArcGIS 9				
V/Reviou2.Inf2portal Tabalitie Tabalitie Technology Control Co	Portal105				
nane tal_odnih seed fiy cederetkiks Previou: Sigi Net Cancel	https://pisrv01.pischool.int/portal				
vord	User name				
word inty constraints Previous Soip Next Cancel	portal_admin				
ny createdads Previous Sop Not Cancel	Password				
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Previous Sop Not Cancel					
Previous Stip Not Cancel					
Previous Scip Next Cancel					
Previous Sop Next Cancel					
Previous Skip Next Cancel					
				Previous Ski	p Next Cancel



Previous Skip Next Cancel

6. Enter the password for the GeoEvent Server, namely, portal_admin1 and click Verify Credentials

home / services / CatCanyonOilCo / CatCanyonOilWells / delete-wizard

. Feature Service Environment 2. GeoEvent Server Environment 3. Confirmation 4. Summary

GeoEvent Server
GeoEvent
Use the same credentials that you use for logging into Portal for ArcGIS: https://pisrv01.pischool.int/portal 3
User name
portal_admin
Password
•••••

7. Click Next

home / services / CatCanyonOilCo / CatCanyonOilWells / delete-wizard

1. Feature Service Environment 2. GeoEvent Server Environment 3. Confirmation 4. Summary

You are connected to GeoEvent Server GeoEvent.

GeoEvent Server objects can be deleted from 'https://pisrv01.pischool.int:6143'

The following GeoEvent Server objects can be deleted from this layer:

Service: pigeo-catcanyonoilco-catcanyonoilwells-service

Input: pigeo-catcanyonoilco-catcanyonoilwells-ws-in

Output: pigeo-catcanyonoilco-catcanyonoilwells-fs-update-out

GeoEvent Definition: pigeo-catcanyonoilco-catcanyonoilwells-ws-in

8	Click Delete
ο.	CIICK Delete

home / services / CatCanyonOilCo	o / CatCanyonOilWells / delete-wizard					
. Feature Service Environment 2. Geo	Event Server Environment 3. Confirmation	4. Summary				
tatus of the Layer Delete Wizard:						
eature Service Environment						
rcGIS GeoEvent: 'catcanyonoilwells' can b	e deleted from 'https://pisrv01.pischool.int/portal	r				
eoEvent Server Environment						
GeoEvent Server objects can be deleted fro	m 'https://pisrv01.pischool.int:6143'					
ntegrator Environment						
ayer is ready to delete.						
After you click Delete, the process might ta	ike several minutes to complete. Do not close the	browser or navigate away from this pa	ge until the process is complete.			
Delete						
9. Once you s	ee the Green checkma	ark in the Delete 9	Summary, click F	inish		
home / services / TransmissionAndDistrib	oution / Meters / delete-wizard					
1. Feature Service Environment 2. GeoEvent Se	erver Environment 3. Confirmation 4. Summary					
Delete Summary:						
 eature Service Environment ArcGIS GeoEvent: 'meters' was deleted successfi 	ully for 'https://pisrv01.pischool.int/portal'					
GeoEvent Server Environment						
GeoEvent Server Environment GeoEvent Server: All GeoEvent Server objects fo	r this layer were deleted successfully on 'https://pisrv01.pisc	chool.int:6143°.				
GeoEvent Server Environment ✓ GeoEvent Server: All GeoEvent Server objects for integrator Environment ✓ Layer: Meters' was deleted successfully for 'PI in home / services / CatCanyo Service CatCanyonOi	r this layer were deleted successfully on "https://pisrv01.pisc tegrator for Est ArcGIS onOilCo	choolint6143'.				
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- 8. Create Time-enabled Feature Layer for the Oil Wells & Maintenance Vehicles
- 1. Click on Services and then click on 'CatCanyonOilCo' service on the PI Integrator for Esri ArcGIS 2017 SP1.
- 2. Now to create a new layer for the Oil Wells and click Create Layer button
- 3. Enter **CatCanyonOilWellsTE** for both Name and descriptions fields. Kindly make sure that you have checked ONLY 'time-enabled Feature Layer' option and click **Continue**

	/ 1	
home / services / Cat	ttCanyonOilCo / new	
Creating new Basic information	layer (CatCanyonOilWellsTE) in service CatCanyonOilCo	p1of4
Name*	CatCanyonOliWellsTE	
Description*	CatCanyonOilWellsTE ×	
	 ☑ Time-enabled Feature Layer. This option creates an item in Portal for ArcGIS or in ArcGIS Online. These layers support historical data access. Create item in ▲ Select one and provide your credentials. ▲ ArcGIS Online ▲ ArcGIS Enterprise □ Connect through ArcGIS GeoEvent Server. This option allows you to publish data to a feature service in ArcGIS Online or Portal for ArcGIS. The layers enable real-time spatial analytics in ArcGIS GeoEvent Server. 	ese ntinue

- 4. Click on 'ArcGIS Enterprise' button
- 5. Enter the username and password as portal_admin and portal_admin1, respectively, and click Login

🚸 PI Integrator for E	sri ArcGIS	Services Administration - Tools Help -	L PISCHOOL\student01
home / services / Cat	CanyonOilCo	Login to ArcGIS Enterprise ×	
Creating new I Basic information	layer (C	Portal Portal105 Portal 105 User name	O Step 1 of 4
Name*	CatCanyor	portal_admin	
Description*	CatCanyor	- assworu	
	☑ Time-ena Create item i	Login	layers support historical data access.
	ArcGIS C	Online ArcGIS Enterprise	
	Connect t layers enal	hrough ArcGIS GeoEvent Server. This option allows you to publish data to a feature servic ple real-time spatial analytics in ArcGIS GeoEvent Server.	e in ArcGIS Online or Portal for ArcGIS. These

6. Click Continue

home / services / Cat	CanyonOilCo / new			
Creating new Basic information	layer (CatCar	nyon0ilWellsTl	E) in service CatCanyonOilCo	Step 1 of 4
Name*	CatCanyonOilWellsTE			
Description*	CatCanyonOilWellsTE			
	Time-enabled Featu Create item in ArcGIS Online	re Layer. This option create	is an item in Portal for ArcGIS or in ArcGIS Online. These layers support	t historical data access.
	Connect through Arr layers enable real-tin	cGIS GeoEvent Server. This e spatial analytics in ArcGIS	s option allows you to publish data to a feature service in ArcGIS Onlin GeoEvent Server.	e or Portal for ArcGIS. These

7. Select now 'Wells' for the Template field. Make sure to select 'CatCanyon Oil Fields' as the AF database and click **Continue**

eating new la	ayer (CatCanyo	nOilWellsT	E) in service	e CatCanyonOi	ICo		
a source							Step 2 of
AF Server*	PISRV01	V					
AF Database*	CatCanyon Oil Fields	V					
Template*	Wells						
Category		~					
Max count		1000000					
Search root	CatCanyon Oil Fields				Select		
	Q, Preview					Back	Continue

Step 3 of 4

8.	Accept all the defa	ault attributes and	d click Continue.

Creating new layer (CatCanyonOilWellsTE) in service CatCanyonOilCo	
Layer fields	

ncluded	Namo	Attribute Name	Type	Courses	Unite	Function	
r Category	Name	Attribute Name	Туре	Source	Units	Function	
	well_type	Well Type	String	static		None	\checkmark
✓	type	Туре	String	static		None	\checkmark
✓	operator	Operator	String	static		None	\checkmark
	objectid	OBJECTID	Int64	static		None	\checkmark
✓	lease	Lease	String	static		None	\checkmark
✓	field	Field	String	static		None	\checkmark
\checkmark	county	County	String	static		None	\checkmark
\checkmark	asset_name	Asset Name	String	static		None	\checkmark
✓	api	API	String	static		None	\checkmark
\checkmark	activewell	ActiveWell	String	static		None	\checkmark
Category:	Geometry						
✓	longitude	Longitude	Double	static	0	х	~
✓	latitude	Latitude	Double	static	0	Y	~
\checkmark	coordinate_system_name	Coordinate system name	String	static		None	\checkmark
✓	coordinate_system_id	Coordinate system ID	Int32	static		None	\checkmark
\checkmark	coordinate_projection_id	Coordinate projection ID	Int32	static		None	\checkmark
✓	arcgis_feature_shape_typ	ArcGIS feature shape type	String	static		None	\checkmark
\checkmark	arcgis_feature_shape	ArcGIS feature shape	String	static		None	\checkmark
tegory: Pl	Data						
\checkmark	hydrostatic_head	Hydrostatic Head	Double	Pl Point		None	\checkmark
\checkmark	flow_tubing_pressure	Flow Tubing Pressure	Double	Pl Point		None	\checkmark
\checkmark	flow_rate	Flow Rate	Double	Pl Point		None	\checkmark
\checkmark	bottom_hole_temperatur	Bottom Hole Temperature	Double	Pl Point	°F	None	\checkmark
\checkmark	bottom_hole_pressure	Bottom Hole Pressure	Double	Pl Point	psi	None	\checkmark
nent field	S [Show less 1]						
ıded	Name	Function					
\checkmark	name	Key 🔽	Include AF Element	name			
	elementpath	None 🗸	Include AF Element	path			
	guid	None 🗸	Include AF Element	D (GUID)			
	description	None 🗸	Include AF Element	description			
	template		Include AF Element	Template name			
	retrievaltime		Include retrieval tim	e (Always included)			

9. Then in the next screen click Create Layer

home / services / CatCanyonOilCo / new Creating new layer (CatCanyonOilWellsTE) in service CatCanyonOilCo Geometry information Step 4 of 4 \checkmark Geometry type 📀 Point ✓ Q (5256) Spatial reference 📀 GCS_WGS_1984 (4326) Back Create Layer home / services / CatCanyonOilCo / CatCanyonOilWellsTE Layer CatCanyonOilWellsTE 🗙 View Item in Portal for ArcGIS CatCanyonOilWellsTE verify and repair Created on 03/10/2019 11:45:35 (just now) C Reinitialize Initialized All Features Fields Visualization Feature Layer This layer exposes PI AF Elements using the following search parameters PISRV01 AF Server Categories AF Database CatCanyon Oil Fields Search root Template Wells Max count 1000000 Geometry settings Geometry type Point Spatial reference GC5_WG5_1984

10. Now you can also create a time-enabled layer for the maintenance vehicles, as well

Creating new Basic information	ayer (<i>MaintenanceVehiclesTE</i>) in service CatCanyonOilCo	Step 1 of 4	
Name*	MaintenanceVehiclesTE		
Description*	Description* MaintenanceVehiclesTE		
	☑ Time-enabled Feature Layer. This option creates an item in Portal for ArcGIS or in ArcGIS Online. These layers support Create item in	historical data access.	
	ArcGIS Online ArcGIS Enterprise		
	Connect through ArcGIS GeoEvent Server. This option allows you to publish data to a feature service in ArcGIS Online layers enable real-time spatial analytics in ArcGIS GeoEvent Server.	e or Portal for ArcGIS. These Continue	

Step 2 of 4

Creating new layer (MaintenanceVehiclesTE) in service CatCanyonOilCo

Data source

AF Server*	PISRV01				
AF Database*	CatCanyon Oil Fields				
Template*	Vehicle Template				
Category	\checkmark				
Max count	100000				
Search root	CatCanyon Oil Fields	Select]		
	Q. Preview			Back	Continue

Creating new layer (MaintenanceVehiclesTE) in service CatCanyonOilCo

Layer field	s						Step 3 of 4
All field name	es are converted automaticall	y to lowercase					
Template a	attribute fields [Show less 1	h			А	-Z Z-A 🗹 Sh	ow categories
🗹 Select all							
Included	Name	Attribute Name	Туре	Source	Units	Function	
★ Category:	Vehicle Information						
\checkmark	driver	Driver	String	String Builder		None	\checkmark
\checkmark	truck_id	Truck ID	String	String Builder		None	\checkmark
★ Category:	Location						
\checkmark	latitude	Latitude	Double	PI Point	۵	Y	~
\checkmark	longitude	Longitude	Double	Pl Point	٥	х	~
Element fie	elds [Show less 1]						

Included	Name	Function	
\checkmark	name	Key 🔽	Include AF Element name
	elementpath	None 🗸	Include AF Element path
	guid	None 🗸	Include AF Element ID (GUID)
	description	None 🗸	Include AF Element description
	template		Include AF Element Template name
\checkmark	retrievaltime		Include retrieval time (Always included)

Back Continue

Creating new layer (MaintenanceVehiclesTE) in service CatCanyonOilCo

Geometry information				Step 4 of 4
Geometry type 😧 Spatial reference 🕄	Point GCS_WGS_1984 (4326)	✓ Q	(5256)	
				Back Create Layer
home / services / CatC	anyonOilCo / MaintenanceVehiclesTE			
Layer Maintenance MaintenanceVehiclesTE Created on 03/10/2019 11:48:13 (2	eVehiclesTE 🗙		View Item in Portal for ArcGIS	View in Map Viewer verify and repair
✓ Initialized				C Reinitialize
All Features Fields	s Visualization Feature Layer			
This layer exposes PI AF Elerner	nts using the following search parameters			
AF Server	PISRV01	Categories		
Template	Vehicle Template	Max count	1000	000
Geometry settings				
Geometry type	Point			
Spatial reference	GCS_WGS_1984			

11. You would note 2 buttons at the top, namely, 'View Item in Portal for ArcGIS' and another one 'View in Map Viewer'. If you click 'View in Map Viewer' button, it would open another tab on the browser, where you can see the layer in the Portal for ArcGIS. Enter the ArcGIS credentials and click OK

Home *			
About Content I Legend Contents Topographic		Sign In ×	
		on https://pischool.int:444/sp i(CatCanyonOilCo) Username: portal_admin Password: OK CANCEL	

12. Now search for the 'CatCanyonOilWellsTE' layer by selecting 'search for Layers' and selecting the relevant layer.

Home - CatCanyonOilCo-MaintenanceVehiclesTE

Details Add + BBBasemap	🕅 Analysis		
Browse Living Atlas Layers Add Layer from Web CatCany Topor Add Layer from File	E - MaintenanceVehiclesTE	+ 0	
			Arotic Ocean
			NORTH
			Pacific Ocean

Home - CatCanyonOilCo-MaintenanceVehiclesTE

🖹 Details 🛛 🖄 Add 👻 🔠 Basemap 🛐 Analysis			
← My Content ▼		+	
Q. Search for layers			
9 layers	≣ ≣ ≒ ≒	\bigcirc	
CatCanyonOilCo-MaintenanceVehiclesTE One portal_admin Updated: 3/10/19	î		Aretic
	\oplus		
CatCanyonOilCo-CatCanyonOilWellsTE by portal_admin Updated: 3/10/19	Add		
maintenancevehicles M by portal_admin Updated: 3/10/19			NO
	\oplus		1 Kata 1 (1 Kata)
maintenancevehicles			The second second

13. Click <- from the top as shown below

Home ▽ CatCanyonOilCo-MaintenanceVehiclesTE

🕃 Details 📑 Add 👻 🚟 Basemap 🛐 Anal	ysis
← My Content ◄	+
Q. Search for layers	ίω [*]
9 layers	
CatCanyonOilCo-MaintenanceVe	chiclesTE ^
	\oplus
CatCanyonOilCo-CatCanyonOilV by portal_admin Updated: 3/10/19	VellsTE
	Θ
maintenancevehicles	

14. Click SHIFT on your keyboard and draw a rectangle around the area where you see the assets

Home ▽ CatCanyonOilCo-MaintenanceVehiclesTE



15. Add the symbologies and refresh rates for both the layers as show earlier (instructor would also go over the part)

O Al

V C

₽ Ca



16. Now we would see the ability of the time-slider, which you can see at the bottom of the WebMap and click on the Setting button as shown below



17. Click on the setting icon, which is highlighted below



18. This would open up the Time Settings dialog box. Click on 'Show advanced options'

Fime Sett	ings 🛛			
Playback Spee	d		0	
Slower		1	~	Faster
Show advanced	ontions			

19. Change 'Display Data in' to 1 hr and click OK

Time Settings 🖉)
Playback Speed	
Slower Faster	
Time Span Drag the slider handles or click a layer time line to set the Start and End time.	
Layers Layer Time Lines	
CatCanyonOilCo-Mai CatCanyonOilCo-Cat	-
Start Time: 3/9/2019 * 11:50 PM *	
Time Display Specify the amount of data to display at one time.	
Display data in 1 Hour rintervals.	
As time passes (a) only display the data in the current time interval. () progressively display all the data. Start playback at (a) start time. () playback position saved with map.	
OK CANCEL	

20. Now click the play bottom to render the historical playback of the events for the past 1 day in 1 hr increment




9. Create an Augmented Time-enabled Feature Layer that contains data from both the PI System and the existing feature layer that contains geometry, without modifying the existing feature layer

In this exercise, we would like to also highlight the point that it's easy to join real-time data from PI System with data from an existing ArcGIS feature layer in a new time-enabled feature layer.

1. For this example, we have a feature layer present in Portal for ArcGIS called Coal Power Plants. Currently, it does not have any live PI data



2. Each coal power plant has an unique attribute called name



3. Now in order to feed this layer with live PI system values, we will create an AF database that contains all the Coal Power Plants with live PI attributes along with the power plant's unique identifier, namely, PlantID. To accomplish this, we have already created an AF database based on the layers rest endpoint using the Asset Extractor and updating the AF Element template

٥	\\PISRV01\CoalPlants - PI System Explorer Legacy 32-bit (Adr	ministrator
File Search View Go Tools Help		
🟮 Database 🛗 Query Date 👻 🕔 🥥 🚳 Back 💿 🖳	🗸 Check In 🧐 🖌 😰 Refresh 🛅 New Element 👻 🔟 New Attribute 🛛	
Elements	Ace Cogeneration Co. Trona	
Elements CoalPowerStations	General Child Elements Attributes Ports Analyses Notification Rules Version	
🗇 Argus 🗇 Colton Plant 🌍 Hydrogen Energy California 🜍 Rio Bravo Jasmin Cogeneration	Filter Image: State S	 ↓ <li< td=""></li<>
🗊 Rio Bravo Poso 🗊 Riverside Cement Co. Power House	0 🔟 🍼 MW 108 MW	
Stockton Cogen	Category: Metadata	
	PlantID Ace Cogeneration Co. Trona	

4. Go to PI Integrator for Esri ArcGIS 2017 and click Services

https://pisrv01.piscl	nool.int:444/configuration/#/services	D + 8¢	ArcGIS GeoEvent Manager		PI Integrator for	Esri ArcGIS ×	🧭 StaticAr
Integrator for Esri ArcGI	📄 Portal for ArcGIS 🚳 ArcGIS GeoEvent Manager 🔘 P	'l Coresight 🎯 Arco	5IS Online 🗃 PI Conn	ector for UFL Ad			
	🛞 PI Integrat	or for Esri Arc	GIS Services	Administration	- Tools	Help -	

5. Click 'Create Service'

6. Enter 'Coal Plants' for both Name and Description. Then click Create

Pl Integrator for Esri ArcGIS	Services	Administration -	Tools	Help↓
home / services / new				

Create new service

Name*	CoalPlants	
Description*	CoalPlants	×
	Create Cancel	

7. Click Create Layer button

home / services / CoalPlants

nome / services / Coarriants						
Service CoalPlants X <i>coalPlants</i> Created on 03/22/2018 02:31:30 (just now)						
Layers					+ Create Layer	Tile view
Layers are used to select PI System data to	connect to the ArcGIS plat	form. You can configure i	multiple layers within	a single service.		
You don't have any layers defined for th	is service. Click here to s	art adding layers				
Name 🖡	Description	Created	Modified	Time-enabled	GeoEvent	

8. Enter 'CoalPlantsWithLivePIData' for both Name and Description.

eating new l	ayer (CoalPla	antsWithLivePi	Data) in service CoalPlants		Step 1
					Step 14
Name*	CoalPlantsWithLivePl	Data			
Description*	CoalPlantsWithLivePl	×			
	✓ Time-enabled Featu Create item in <u>A</u> Selec	are Layer. This option create t one and provide your cred	es an item in Portal for ArcGIS or in ArcGIS Online. These layers entials.	support his	torical data access.
	ArcGIS Online	ArcGIS Enterprise			
	Connect through A layers enable real-tir	rcGIS GeoEvent Server. Thi ne spatial analytics in ArcGIS	s option allows you to publish data to a feature service in ArcG i GeoEvent Server.	IS Online or	r Portal for ArcGIS. These

9. Click 'ArcGIS Enterprise' button

PI Integrator for Esri ArcGIS	Services Administration+ Tools Help+	L PISCHOOL\student01
home / services / CoalPlants / new	Login to ArcGIS Enterprise	×
	Portal	
Creating new layer (C	Portal105	
Basic information	Portal 10.5	Step 1 of 4
	User name	
Name* CoalPlants	portal_admin	
	Password	
Description* CoalPlants	•••••••	
☑ Time-ena		layers support historical data access.
Create item i	Login	
ArcGIS O	nline ArcGIS Enterprise	_
Connect th layers enab	rough ArcGIS GeoEvent Server. This option allows you to publish data to a feature serv le real-time spatial analytics in ArcGIS GeoEvent Server.	rice in ArcGIS Online or Portal for ArcGIS. These

10. Enter portal_admin & portal_admin1 for username and password, respectively

11. Click Continue

home / services / Coa	alPlants / new					
Creating new	laver (CoalPla	ntsWithI ivePi	(Data) in service CoalPlants			
		ATTLS V ILLTLIVCT T	Data/ In service coali lants	Charles A. a. f. A.		
sasic information				Step 1 of 4		
Name*	CoalPlantsWithLivePl	Data				
Description*	CoalPlantsWithI ivePIData					
	🗹 Time-enabled Featu	ire Layer. This option create	es an item in Portal for ArcGIS or in ArcGIS Online. These layers su	pport historical data access.		
	Create item in					
	-	_				
	ArcGIS Online	ArcGIS Enterprise				
	Connect through An	rcGIS GeoEvent Server. Thi	is option allows you to publish data to a feature service in ArcGIS	Online or Portal for ArcGIS. These		
	luyers enable rear an	ie spatiar analytics in Precis	societation and	Continue		

12. Select CoalPlants and CoalPowerStations for AF Databases and Templates, respectively and then click Continue

ata source						Step 2 of 4
AF Server*	PISRV01	~				
AF Database*	CoalPlants	~				
Template*	CoalPowerStations	~				
Category		\checkmark				
Max count		1000000				
Search root	CoalPlants			Select		
	Q Preview				Back	Continue

Creating new layer (CoalPlantsWithLivePIData) in service CoalPlants

13. Select PlantID as the Key, and click Continue

All field name	s are converted automatic	ally to lowercase							
Template a	ttribute fields [Show les	s 🕇]					A - Z	Z - A 🗹	Show categories
✓ Select all									
Included	Name	Attribute Name		Туре	Source	Units		Function	
★ No catego	ry								
\checkmark	mw	MW		Double	PI Point	MW		None	~
★ Category:	Metadata								
\checkmark	plantid	PlantID		String	static			Кеу	~
Element fiel	ds [Show less 1								
Included	Name	Function							
	name	Key	~	Include AF Element nar	ne				
	elementpath	None	~	Include AF Element pat	h				
	guid	None	~	Include AF Element ID ((GUID)				
	description	None	~	Include AF Element des	cription				
	template			Include AF Element Ter	nplate name				
\checkmark	retrievaltime			Include retrieval time (A	Always included)				

14. Now you need to fill-in 2 parameters, namely, 'Geometry feature layer URL', and 'Feature layer join field'

Step 4 of 4

home / services / CoalPlants / new

```
Creating new layer (CoalPlantsWithLivePIData) in service CoalPlants
```

Geometry information

You have not specified any fields that supply	y geometry information.				
To link this time-enabled feature layer with the defined key field.	geometry that is specified in an existing ArcC	SIS feature layer, provide a feature layer URL and specify a fe	ature la	yer field t	hat joins with
Geometry feature layer URL 📀					Connect
Feature layer join field 🥑	\checkmark	Populate			
PI System key 🕗	PlantID				
		Complete all required fields and fix any invali	id fields.	Back	Create Layer

15. Open the file 'URLs_Credentials.txt' file in the Desktop and copy first the URL highlighted below and paste it under the field 'Geometry feature layer URL' shown in the screenshot above. Likewise, copy the field under 'Feature Layer Join Field' from the text file and paste it under the 'Feature Layer Join Field' shown in the screenshot above. Click 'Create Layer'

URLs_Credentials.txt - Notepad
File Edit Format View Help
CoalPowerPlant Feature Layer Rest Endpoint: https://pisrv01.pischool.int/server/rest/services/Hosted/CoalPowerStations/FeatureServer/0
GEE Credentials:
username: portal_admin
password: portal_admin1
Portal for ArcGIS Server: username: portal_admin password: portal_admin1
PI Integrator for Esri ArcGIS URL: https://pisrv01.pischool.int:444/configuration#/services
PI Integrator for Esr ArcGIS Application Server: username: pischool\student01 password:
Advanced Exercise: (GEE Input) Parameter: ?f=json&id=9eb1c20e-de79-a4b4-5c4c-19a2b24a6a93&timeout=330&latestValuesOnly=true
PI WebAPI Link: https://pisrv01.pischool.int//piwebapi/admin/search/database.html
Water Gauges: Geomerty feature layer URL: http://pisrv01.pischool.int/server/rest/services/Hosted/CoalPowerStations/FeatureServer/0

Enter the URL into 'Geometry feature layer URL' and click 'Connect' button and then click 'Populate' button. Select name as 'Feature layer join field'. Then click 'Create Layer'

Creating new layer (CoalPlantsWithLivePIData) in service CoalPlants Geometry information Step 4 of 4 You have not specified any fields that supply geometry information. To link this time-enab the defined key field. abled feature layer with geometry that is specified in an existing ArcGIS feature layer, provide a feature layer URL and specify a feature layer field that joins with Geometry feature layer URL 🕗 http://pisrv01.pischool.int/server/rest/services/Hosted/CoalPowerStations/FeatureServer/0 Connect Feature layer join field 📀 \checkmark Populate name PI System key 🥝 PlantID Back Create Layer 😵 PI Integrator for Esri ArcGIS Services Administration+ Tools Help+ home / services / CoalPlants / CoalPlantsWithLivePIData Layer CoalPlantsWithLivePIData 🗙 CoalPlantsWithLivePlData Treated on 03/22/2018 02:40:57 (just now) erify and re ✓ Initialized C Reinitialize All Features Fields Visualization Feature Layer This layer exposes PI AF Elements using the following search parameters AF Server PISRV01 Categories AF Database CoalPlants Search root Template CoalPowerStations Max count 1000000 Augmented Feature Layer Feature layer URL http://pisrv01.pischool.int/server/rest/services/Hosted/CoalPowerStations/FeatureServer/0 Feature layer join field name PI System key PlantID

16. Go to the Portal for ArcGIS and click 'View in Map Viewer' and enter the credentials for ArcGIS Enterprise



17. Zoom-into the location and you would note the Augmented time-enabled feature layer containing 'MW' attribute, as well.

Home
CoalPlants-CoalPlantsWithLivePIData



Conclusion

Congratulations!

It's been quite a lot--thanks for your attention and participation. If you've any questions, feel free to bring them up with your instructors—we'd be glad to help. And if ever have any future questions, remember to consult the handy OSIsoft Live Library, available for anyone, for free, at anyone at <u>livelibrary.osisoft.com</u>; click the "Integrators" section to see the full user manual for the PI Integrator for Esri ArcGIS 2017 SP1.





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OSIsoft PI World Users Conference in Gothenburg, Sweden. September 16-19, 2019. Register your interest now to receive updates and notification early bird registration opening.

<u>https://pages.osisoft.com/UC-EMEA-Q3-19-PIWorldGBG-</u> <u>RegisterYourInterest_RegisterYourInterest-LP.html?_ga=2.20661553.86037572.1539782043-</u> <u>591736536.1533567354</u>

