

NOVEMBER 2022

Aggregating data with AVEVA™ Data Hub asset rules and data views for analytics and applications

Victor Zhang, AVEVA Technical Product Manager

Collin Bardini, AVEVA Software Developer II, Product Readiness Guild

AVEVA

Agenda

- Overview – AVEVA Data Hub
- AVEVA Data Hub for Machine Learning
- Capabilities
- Demo
- Customer Success Story
- Summary

Data science



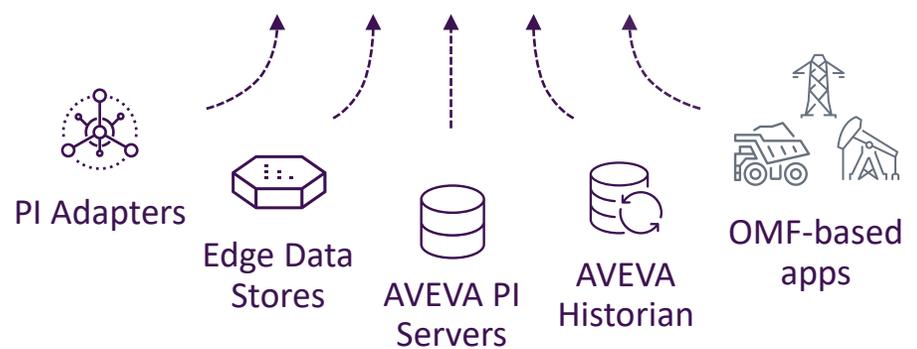
Remote monitoring



Partner apps



Data sharing



Cloud-native industrial platform designed for real-time operations

Managed, secure, multi-tenant platform

Operated & maintained by AVEVA

High speed, scalable, elastic, & resilient

Modern, secure REST APIs

Built & deployed on Microsoft Azure

Why AVEVA Data Hub?

For Data Science/Machine Learning Projects

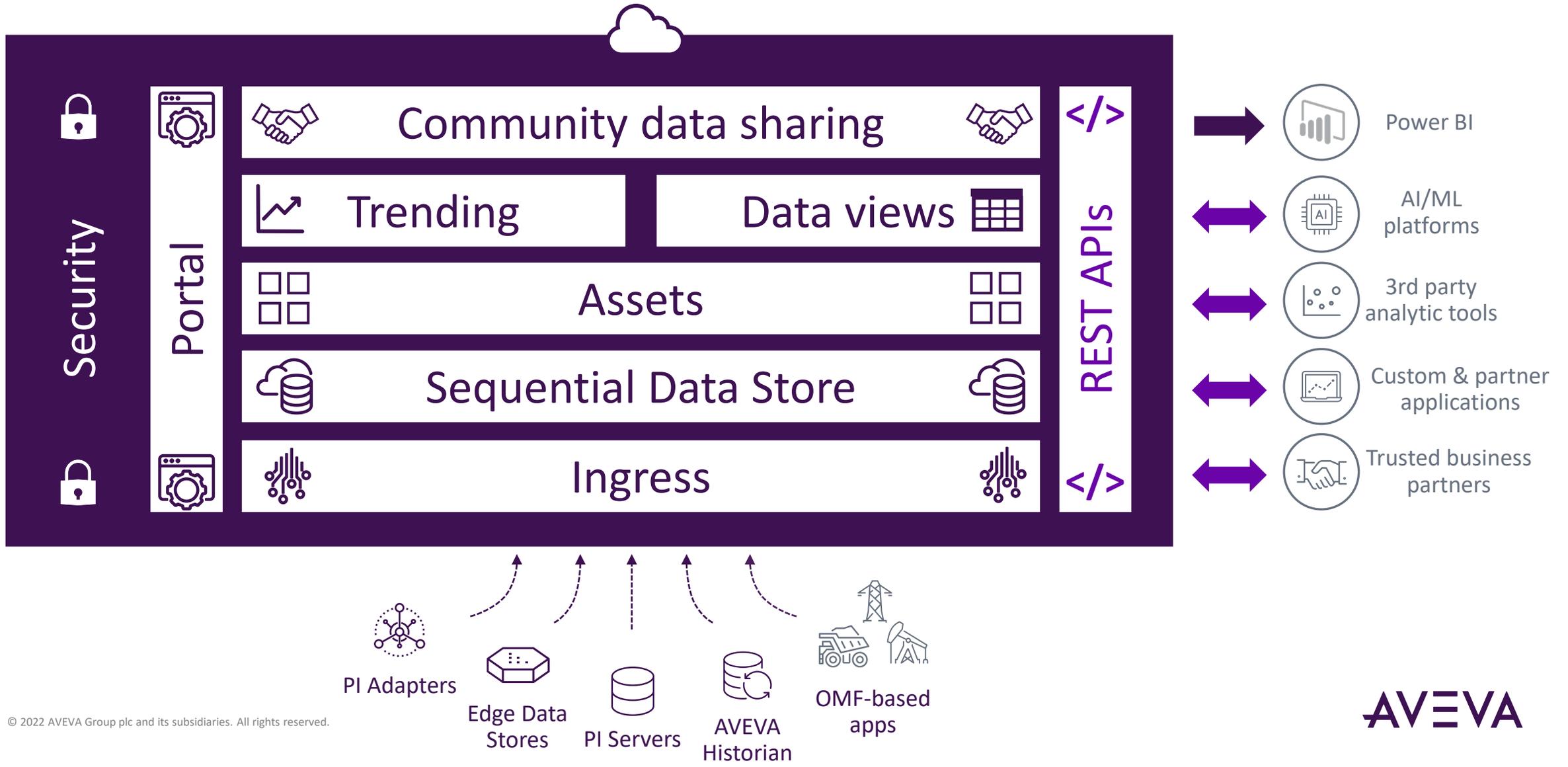
Platform as a
Service – Zero
Maintenance

Contextualization
at Scale

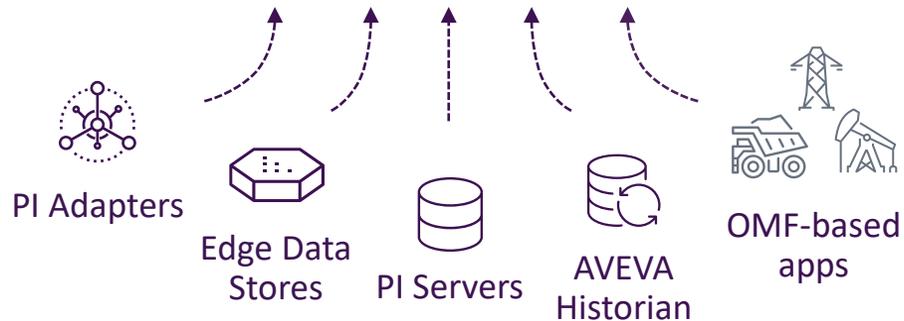
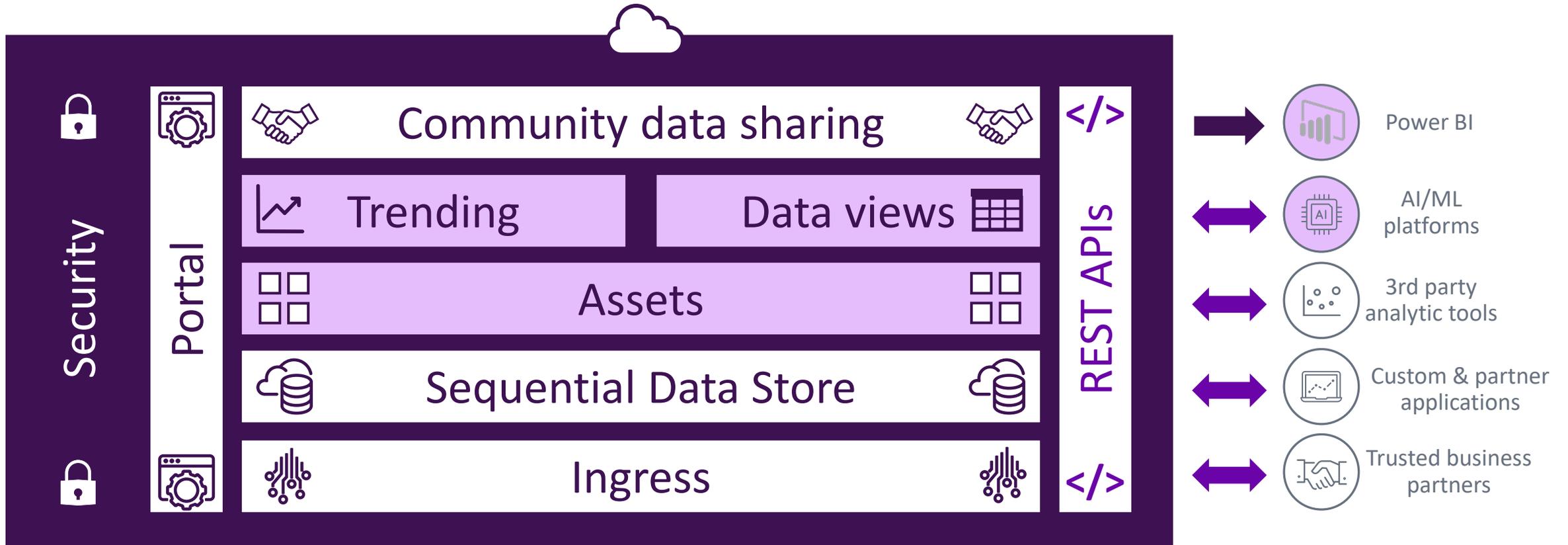
Data Science-
Ready

REST API

AVEVA Data Hub Capabilities



AVEVA Data Hub Capabilities



Assets give useful context to your data streams



Assets

AE01 ✔

Generated Windtopia Wind Turbine Asset

✎
⋮
✕

Asset Type: GE Wind Turbine

| Metadata | Properties | Status |
|-------------------------|----------------|------------|
| Metadata | Value | UOM |
| Altitude | 1,000 | m |
| Gearbox Serial Number | 4800000-0000-0 | |
| Latitude | 44.563149 | ° |
| Longitude | -109.25416 | ° |
| Manufacturer | Truvale | |
| Model | T95-2MW | |
| Overheating delta limit | 60 | °C |
| Power Rated | 1,500 | kW |
| Region | NA | |
| Serial Number | M000000 | |

- **Static metadata** (Region: North America, Wind farm: Big Buffalo Wind Farm, Asset Type: GE Wind Turbine, Manufacturer: Truvale, ...)

✔
⚠
✕

Assets give useful context to your data streams

Assets

AE01



Generated Windtopia Wind Turbine Asset

| Metadata | Properties | Status | |
|--|------------|------------------|--------------------|
| Property | Last Value | UOM | Timestamp |
| <input type="checkbox"/> Auto Stop Reason | 4.000 | | 10/17/22, 7:10 AM |
| <input type="checkbox"/> Apparent Power | 1,514.068 | | 10/17/22, 11:14 AM |
| <input type="checkbox"/> Revenue - Daily | 266.340 | | 10/17/22, 11:03 AM |
| <input type="checkbox"/> Expected Power - 10 min rolling avg | 1,500.011 | | 10/17/22, 11:09 AM |
| <input type="checkbox"/> Energy Production - Monthly | 266.981 | | 10/17/22, 11:03 AM |
| <input type="checkbox"/> Revenue Rate | 53.246 | | 10/17/22, 11:14 AM |
| <input type="checkbox"/> Wind Deviation 1s | -27.461 | ° | 10/17/22, 11:14 AM |
| <input type="checkbox"/> Wind Deviation 10s | -10.698 | ° | 10/17/22, 11:13 AM |
| <input type="checkbox"/> Wind Speed | 14.415 | m/s ² | 10/17/22, 11:14 AM |

- **Static metadata** (Region: North America, Wind farm: Big Buffalo Wind Farm, Asset Type: GE Wind Turbine, Manufacturer: Truvalle, ...)
- **Stream reference properties** (Active power, expected power, operating state, etc.)



Assets give useful context to your data streams



Assets

| Property | Value | Status |
|---|----------------------------|---|
| T Auto Stop Reason Value   | | |
| | System OK → |    |
| | Gear Box Vibration → |    |
| | Pitch Motor → |    |
| | High Gear Box Vibration → |    |
| | High Generator Vibration → |    |

- **Static metadata** (Region: North America, Wind farm: Big Buffalo Wind Farm, Asset Type: GE Wind Turbine, Manufacturer: Truvale, ...)
- **Stream reference properties** (Active power, expected power, operating state, etc.)
- **Asset status** (stream property values mapped to status: good, warning, bad)



Asset status enables real-time monitoring

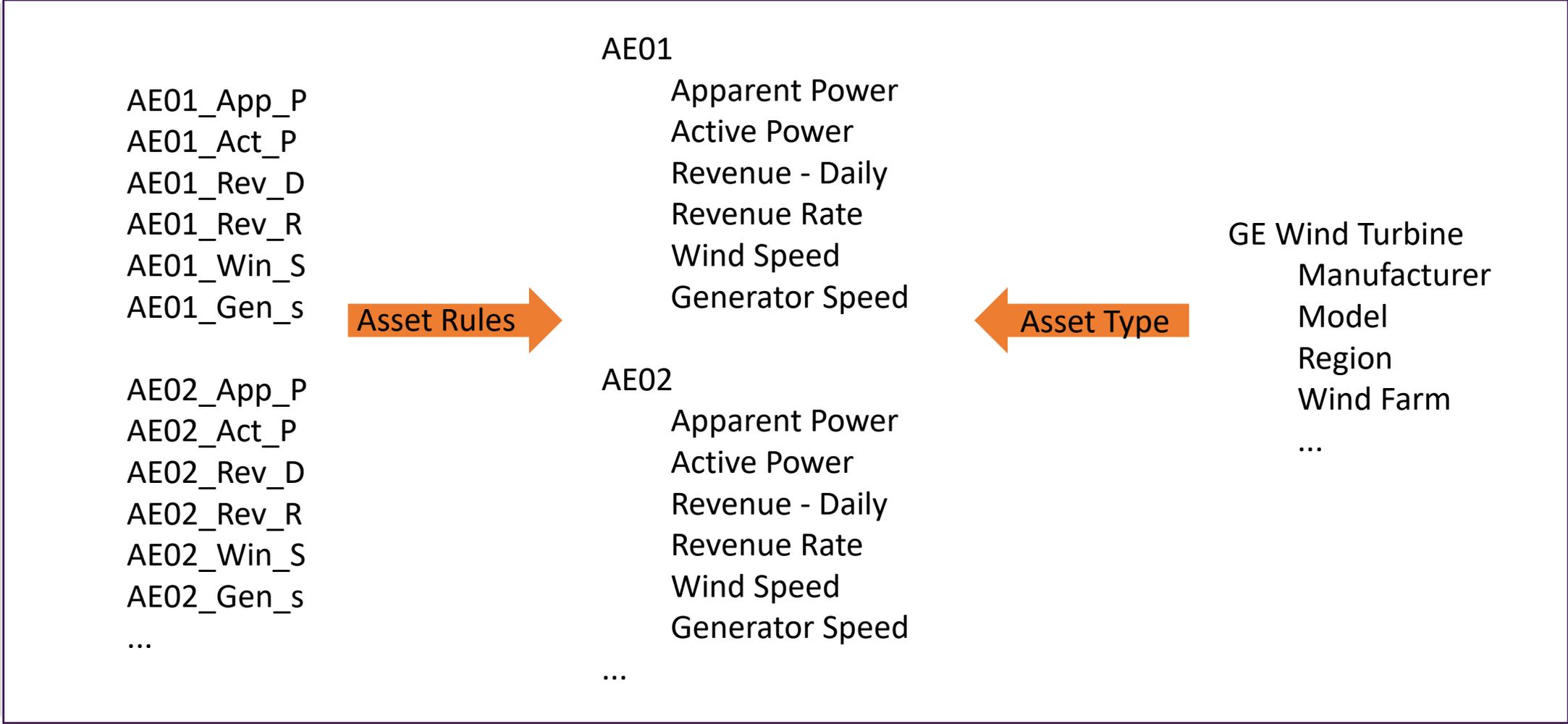
The screenshot displays the AVEVA Assets management interface. On the left, a vertical sidebar contains various icons representing different asset types and functions. The main interface features a search bar at the top, a filter facet for 'Status' (highlighted with a red box), and a filter facet for 'Asset Type' (with 'GE Wind Turbine' selected). The main content area shows a grid of asset cards, each representing a 'Generated Windtopia Wind Turbine' asset (AE01 through AE10). Each card displays a status indicator: a green checkmark for 'Good' status and a red 'X' for 'Bad' status. Assets AE01 through AE06 and AE08, AE09 are in 'Good' status, while AE07 and AE10 are in 'Bad' status. The 'Assets' sidebar is also highlighted with a red box.

| Asset ID | Status |
|----------|--------|
| AE01 | Good |
| AE02 | Good |
| AE03 | Good |
| AE04 | Good |
| AE05 | Good |
| AE06 | Good |
| AE07 | Bad |
| AE08 | Good |
| AE09 | Good |
| AE10 | Bad |

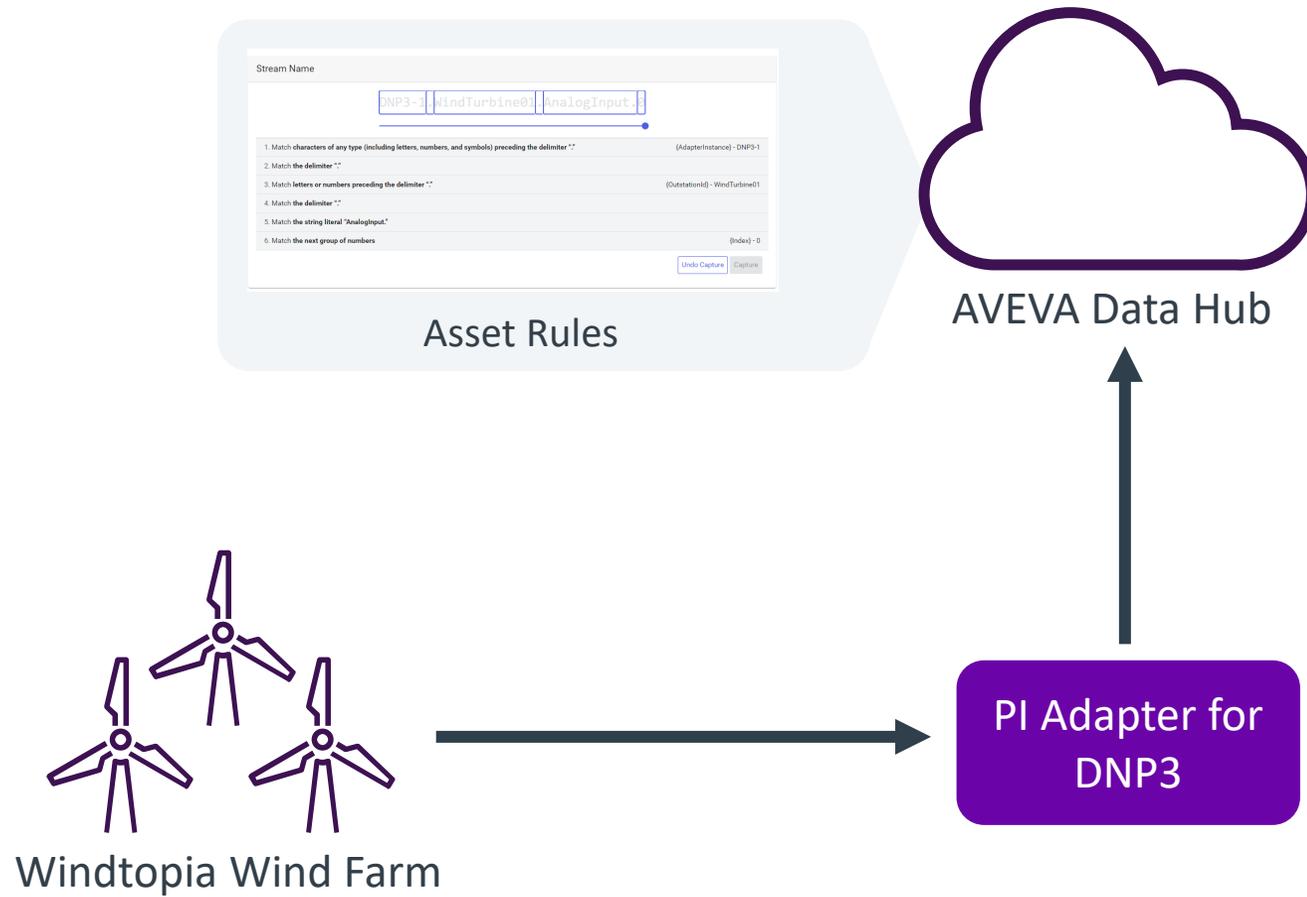
Assets rules automatically create/update assets based on streams' naming conventions



Asset Rules



Demo

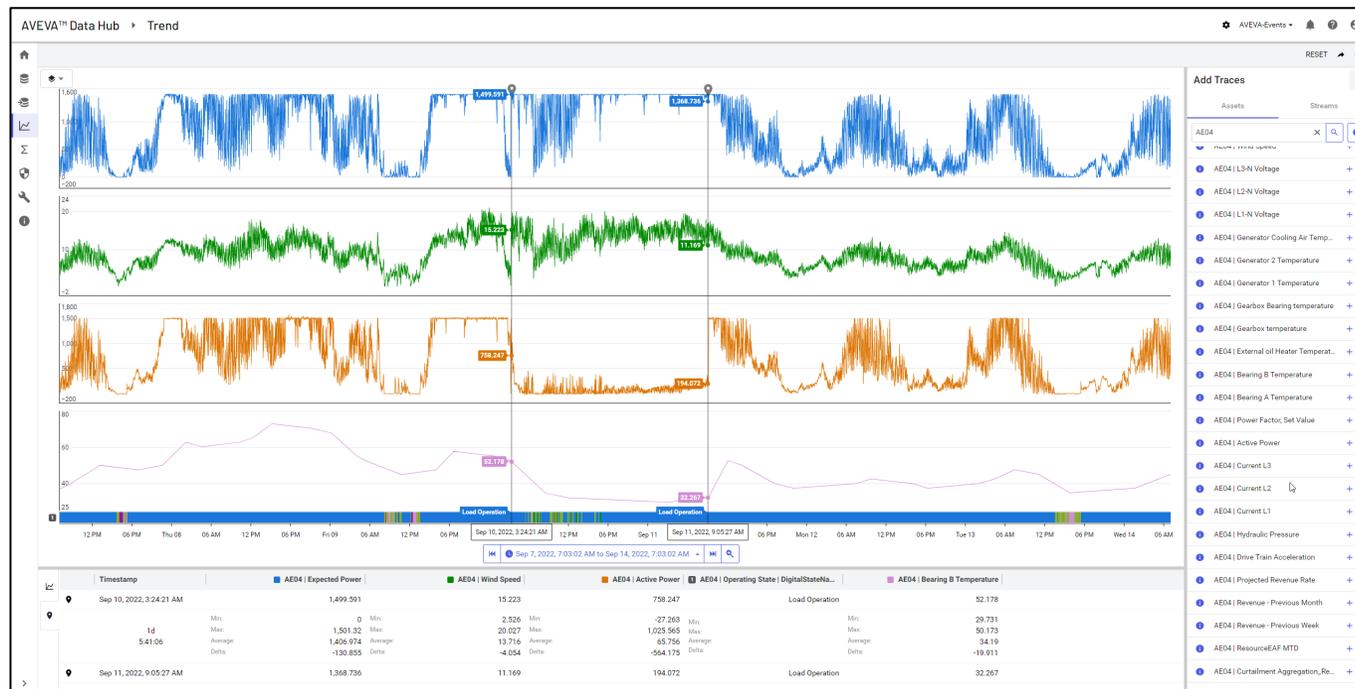


Visual trending enables asset root cause analysis & investigations

Trending

- ✓ Stream & asset search
- ✓ Common trend interactions
- ✓ Stacked trends
- ✓ Trend summary calcs
- ✓ Min/max easy cursors
- ✓ Multiple cursor delta summary calcs
- ✓ Trend sharing
- ✓ URL parameters
- ✓ String & Enum trending
- ✓ Seamless contextual navigation from Asset Explorer
- ✓ Trending asset properties
- ✓ Asset swapping
- ✓ Trending shared streams

Trending



Sharing with URL Parameters

<https://datahub.connect.aveva.com/tenant/cee3a3fd-aeb2-4950-80f5-4b72c77322b1/trend?origin=1;cee3a3fd-aeb2-4950-80f5-4b72c77322b1;uswe.datahub.connect.aveva.com;ed809cce-0e64-446f-a4c3-ada80bcf3367&trace=a;1;d68f33a8-0bc8-43a6-a9b4-9aadd041ed1f;Expected%2520Power;Value;%25231A76D9&trace=a;1;d68f33a8-0bc8-43a6-a9b4-9aadd041ed1f;Wind%2520Speed;Value;%2523008A00&trace=a;1;d68f33a8-0bc8-43a6-a9b4-9aadd041ed1f;Active%2520Power;Value;%2523DC7300&trace=a;1;d68f33a8-0bc8-43a6-a9b4-9aadd041ed1f;Operating%2520State;DigitalStateName&trace=a;1;d68f33a8-0bc8-43a6-a9b4-9aadd041ed1f;Bearing%2520B%2520Temperature;Value;%2523D28CD2&mode=stacked&cursor=2022-09-10T07:24:21.7972&cursor=2022-09-11T13:05:27.1272&selectedTrace=null;&startIndex=2022-09-07T11:03:02.7142&endIndex=2022-09-14T11:03:02.7152>

Data Views curate operational data for external consumption



Data Views

Data View

Enabling data exploration, integration, & data science

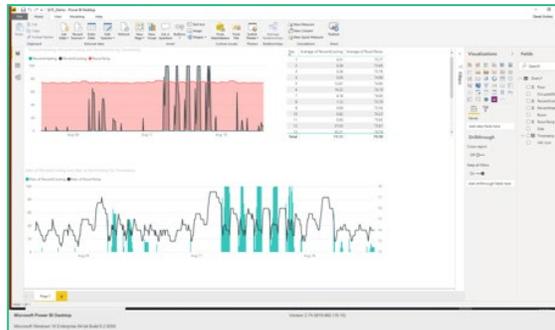
| Timestamp | Name | Wind Farm | Active Power Value kW | Manufacturer | Revenue Rate - 10 min rolling avg Value | Expected Power Value | Revenue - Monthly Value | Revenue - Daily Value | Power Rated kW | Availability Flag Value |
|---------------------------|------|-----------------------|-----------------------|--------------|---|----------------------|-------------------------|-----------------------|----------------|-------------------------|
| Sep 12, 2022, 12:00:00 AM | 6601 | Big Buffalo Wind Farm | 88.75869 | Tosulae | 1.75969787547179 | 65.5480398906089 | 5541.56820647392 | 420.021172670693 | 1500 | 1 |
| Sep 12, 2022, 1:00:00 AM | 6601 | Big Buffalo Wind Farm | 164.03222 | Tosulae | 0.57660251835343 | 160.7307020901437 | 5328.04895729966 | 422.486546080507 | 1500 | 1 |
| Sep 12, 2022, 2:00:00 AM | 6601 | Big Buffalo Wind Farm | 246.43189 | Tosulae | 7.18647814781081 | 228.1283781978912 | 8515.31742483883 | 428.873407986706 | 1500 | 1 |
| Sep 12, 2022, 3:00:00 AM | 6601 | Big Buffalo Wind Farm | 242.89338 | Tosulae | 6.05012923320162 | 180.12819882135712 | 5598.08800714333 | 31.8720848001976 | 1500 | 1 |
| Sep 12, 2022, 4:00:00 AM | 6601 | Big Buffalo Wind Farm | 87.32086 | Tosulae | 2.011336761377593 | 8.32881838872411 | 5488.188937135071 | 5.64451300758425 | 1500 | 1 |
| Sep 12, 2022, 5:00:00 AM | 6601 | Big Buffalo Wind Farm | 186.50237 | Tosulae | 8.40916991465026 | 230.914202197992 | 5487.42913842419 | 19.64244680011448 | 1500 | 1 |
| Sep 12, 2022, 6:00:00 AM | 6601 | Big Buffalo Wind Farm | 212.218 | Tosulae | 12.22817322262899 | 118.8886015402146 | 5483.64260208991 | 24.4217918803872 | 1500 | 1 |
| Sep 12, 2022, 7:00:00 AM | 6601 | Big Buffalo Wind Farm | 389.42375 | Tosulae | 25.77224200182034 | 700.341420219101 | 3221.22176435865 | 31.784705198482274 | 1500 | 1 |
| Sep 12, 2022, 8:00:00 AM | 6601 | Big Buffalo Wind Farm | 891.92348 | Tosulae | 34.9514627819263 | 932.282821273719 | 3871.335801208474 | 84.28916002001 | 1500 | 1 |
| Sep 12, 2022, 9:00:00 AM | 6601 | Big Buffalo Wind Farm | 1279.4958 | Tosulae | 39.120807234622 | 1442.194891324828 | 3612.94003710383 | 113.1029483789389 | 1500 | 1 |
| Sep 12, 2022, 10:00:00 AM | 6601 | Big Buffalo Wind Farm | 722.9357 | Tosulae | 27.4120071891647 | 738.854838260077 | 3637.16488386833 | 147.648227001814 | 1500 | 1 |
| Sep 12, 2022, 11:00:00 AM | 6601 | Big Buffalo Wind Farm | 1314.9314 | Tosulae | 28.84616446603404 | 1421.95642184818 | 5642.1389956431 | 170.5720862701902 | 1500 | 1 |
| Sep 12, 2022, 12:00:00 PM | 6601 | Big Buffalo Wind Farm | 740.54814 | Tosulae | 20.02440208197465 | 791.891844040689 | 3738.89249797375 | 164.4722444930405 | 1500 | 1 |
| Sep 12, 2022, 1:00:00 PM | 6601 | Big Buffalo Wind Farm | 262.73896 | Tosulae | 16.5020844636165 | 209.144054446302 | 3729.945767608995 | 215.434454414767 | 1500 | 1 |
| Sep 12, 2022, 2:00:00 PM | 6601 | Big Buffalo Wind Farm | 296.9541 | Tosulae | 17.433807115661717 | 254.810221338453 | 3737.49275607993 | 229.538219627919 | 1500 | 1 |
| Sep 12, 2022, 3:00:00 PM | 6601 | Big Buffalo Wind Farm | 239.28228 | Tosulae | 8.11832828796235 | 226.3718428944023 | 3734.608823274995 | 248.3998002320102 | 1500 | 1 |
| Sep 12, 2022, 4:00:00 PM | 6601 | Big Buffalo Wind Farm | 174.40239 | Tosulae | 4.72181192220872 | 182.168555329267 | 3746.232389712566 | 263.8879683419707 | 1500 | 1 |
| Sep 12, 2022, 5:00:00 PM | 6601 | Big Buffalo Wind Farm | 180.1483 | Tosulae | 4.42857412477072 | 170.2481111621618 | 3750.66017462361 | 280.287596600000 | 1500 | 1 |
| Sep 12, 2022, 6:00:00 PM | 6601 | Big Buffalo Wind Farm | 149.39136 | Tosulae | 3.42350589979739 | 196.2289144403774 | 3744.5397248464 | 294.216443474719 | 1500 | 1 |
| Sep 12, 2022, 7:00:00 PM | 6601 | Big Buffalo Wind Farm | 138.32001 | Tosulae | 3.74614613656584 | 205.4232051272135 | 3687.03839181942 | 311.103886177064 | 1500 | 1 |
| Sep 12, 2022, 8:00:00 PM | 6601 | Big Buffalo Wind Farm | 109.78678 | Tosulae | 3.82237878818179 | 129.035042430025 | 3617.80262993548 | 324.28134531987 | 1500 | 1 |
| Sep 12, 2022, 9:00:00 PM | 6601 | Big Buffalo Wind Farm | 78.799214 | Tosulae | 1.61421893119823 | 34.872341386481 | 3623.17803991763 | 333.5042918909174 | 1500 | 1 |
| Sep 12, 2022, 10:00:00 PM | 6601 | Big Buffalo Wind Farm | 124.63382 | Tosulae | 1.684440744027923 | 108.8839887454318 | 3637.1058331346 | 347.757163402073 | 1500 | 1 |
| Sep 12, 2022, 11:00:00 PM | 6601 | Big Buffalo Wind Farm | 185.22001 | Tosulae | 2.739674603474624 | 144.23648898451706 | 3649.727464048411 | 360.89118008174204 | 1500 | 1 |
| Sep 13, 2022, 12:00:00 AM | 6601 | Big Buffalo Wind Farm | 344.9632 | Tosulae | 6.45107695548751 | 389.8980118199024 | 3644.053720561548 | 374.765022403783 | 1500 | 1 |

Data Science Tools & Data Exploration

Data Science via Code

Partners & Apps

Cloud Platforms



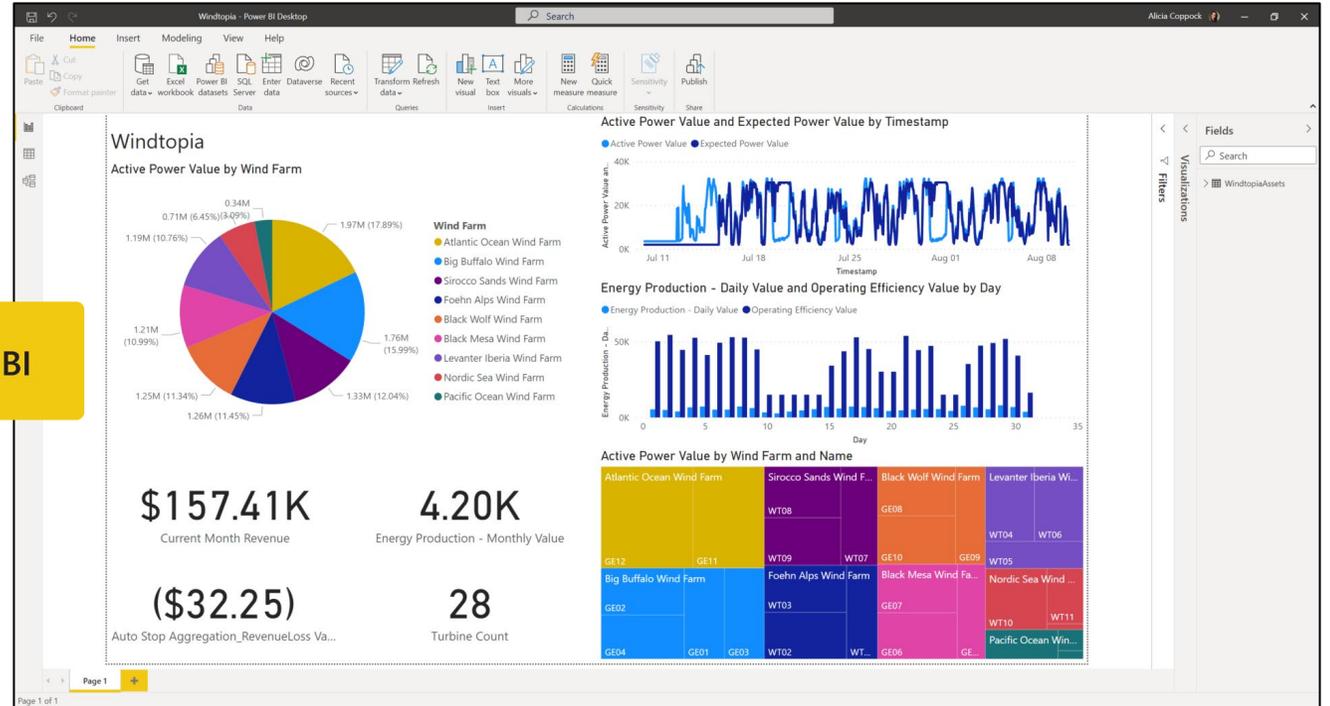
Easily slice & dice your AVEVA Data Hub data in Power BI



Power BI Connector



AVEVA Data Hub Power BI Connector



- ✓ Import AVEVA Data Hub Data Views into Power BI
- ✓ Stored & Interpolated retrieval modes

- ✓ No coding required
- ✓ Power BI Desktop and Power BI Service (through On-Premises Data Gateway)

Modern REST API to enable your applications



REST API

AVEVA™ Data Hub API Console

Full Path: v1 | uswe.datahub.connect.aveva.com/api/v1/Tenants/cee3a3fd-aeb2-4950-80f5-4b72c77322b1/Namespaces/ed809cce-0e64-446f-a4c3-ada80bcf3367/DataViews/Wind Turbine Analysis/Data/Interpolated?startIndex=2022-09-15T04:00:00.000Z

URI: GET /Namespaces/ed809cce-0e64-446f-a4c3-ada80bcf3367/DataViews/Wind Turbine Analysis/Data/Interpolated?startIndex=2022-09-15T04:00:00.000Z

Parameters:

- startIndex: 2022-09-15T04:00:00.000Z
- endIndex: 2022-09-15T04:00:00.000Z
- count:
- interval: 00:01:00:00
- continuationToken:
- cache:

Return tabular data (form=tableh)

GET

URI Path: GET uswe.datahub.connect.aveva.com/api/v1/Tenants/cee3a3fd-aeb2-4950-80f5-4b72c77322b1/Namespaces/ed809cce-0e64-446f-a4c3-ada80bcf3367/DataViews/Wind Turbine Analysis/Data/Interpolated?startIndex=2022-09-15T04:00:00.000Z&form=tableh&interval=00:01:00:00

Status: Code: 200 Text: OK

JSON Table

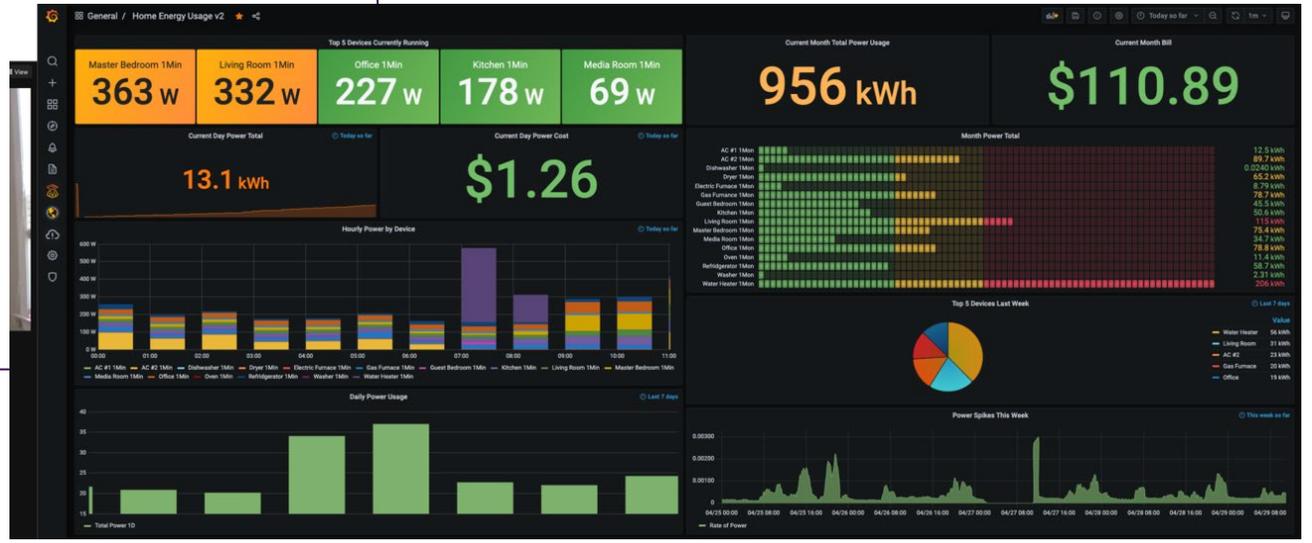
730 Total Response Values

| Tim... | Name | Win... | Acti... | Man... | Rev... | Exp... | Rev... | Rev... | Pow... | Avai... |
|-------------|------|-------------|-----------|---------|-----------|-----------|-----------|-----------|--------|---------|
| Sep 15, ... | GE01 | Big Buff... | 1520.4... | Truvale | 26.085... | 1470.5... | 6754.1... | 520.30... | 1900 | 1 |
| Sep 15, ... | GE02 | Big Buff... | 1446.1... | ACME | 25.054... | 1479.3... | 6764.6... | 533.47... | 1500 | 1 |
| Sep 15, ... | GE03 | Big Buff... | 1513.7... | ACME | 26.361... | 1500.2... | 6480.9... | 534.57... | 1500 | 1 |
| Sep 15, ... | GE04 | Big Buff... | 1507.8... | Truvale | 26.519... | 1498.3... | 6544.2... | 572.81... | 1500 | 1 |
| Sep 15, ... | GE05 | Black M... | 777.45... | Truvale | 15.561... | 1437.1... | 4178.8... | 454.24... | 800 | 1 |
| Sep 15, ... | GE06 | Black M... | 1500.8... | Truvale | 27.083... | 1488.9... | 6394.6... | 660.46... | 1500 | 1 |
| Sep 15, ... | GE07 | Black M... | 953.48... | ACME | 20.621... | 845.80... | 6094.1... | 629.93... | 1500 | 1 |

C#
Python
Java
NodeJS
Angular



<https://github.com/osisoft>



Demo

Data Views

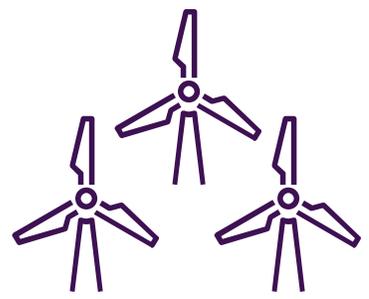
| Timestamp | Name | Turbine Name | Active Power Value | Turbine State Value | Health Problem Value | Active Power Value |
|------------------------|-----------------|--------------|--------------------|---------------------|----------------------|--------------------|
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.1200000000000 | 19 | 19.1200000000000 | 825.187154000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.1400000000000 | 19 | 19.1400000000000 | 825.340200000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.1600000000000 | 19 | 19.1600000000000 | 825.493246000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.1800000000000 | 19 | 19.1800000000000 | 825.646292000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.2000000000000 | 19 | 19.2000000000000 | 825.799338000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.2200000000000 | 19 | 19.2200000000000 | 825.952384000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.2400000000000 | 19 | 19.2400000000000 | 826.105430000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.2600000000000 | 19 | 19.2600000000000 | 826.258476000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.2800000000000 | 19 | 19.2800000000000 | 826.411522000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.3000000000000 | 19 | 19.3000000000000 | 826.564568000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.3200000000000 | 19 | 19.3200000000000 | 826.717614000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.3400000000000 | 19 | 19.3400000000000 | 826.870660000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.3600000000000 | 19 | 19.3600000000000 | 827.023706000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.3800000000000 | 19 | 19.3800000000000 | 827.176752000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.4000000000000 | 19 | 19.4000000000000 | 827.329798000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.4200000000000 | 19 | 19.4200000000000 | 827.482844000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.4400000000000 | 19 | 19.4400000000000 | 827.635890000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.4600000000000 | 19 | 19.4600000000000 | 827.788936000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.4800000000000 | 19 | 19.4800000000000 | 827.941982000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.5000000000000 | 19 | 19.5000000000000 | 828.095028000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.5200000000000 | 19 | 19.5200000000000 | 828.248074000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.5400000000000 | 19 | 19.5400000000000 | 828.401120000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.5600000000000 | 19 | 19.5600000000000 | 828.554166000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.5800000000000 | 19 | 19.5800000000000 | 828.707212000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.6000000000000 | 19 | 19.6000000000000 | 828.860258000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.6200000000000 | 19 | 19.6200000000000 | 829.013304000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.6400000000000 | 19 | 19.6400000000000 | 829.166350000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.6600000000000 | 19 | 19.6600000000000 | 829.319396000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.6800000000000 | 19 | 19.6800000000000 | 829.472442000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.7000000000000 | 19 | 19.7000000000000 | 829.625488000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.7200000000000 | 19 | 19.7200000000000 | 829.778534000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.7400000000000 | 19 | 19.7400000000000 | 829.931580000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.7600000000000 | 19 | 19.7600000000000 | 830.084626000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.7800000000000 | 19 | 19.7800000000000 | 830.237672000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.8000000000000 | 19 | 19.8000000000000 | 830.390718000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.8200000000000 | 19 | 19.8200000000000 | 830.543764000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.8400000000000 | 19 | 19.8400000000000 | 830.696810000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.8600000000000 | 19 | 19.8600000000000 | 830.849856000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.8800000000000 | 19 | 19.8800000000000 | 831.002902000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.9000000000000 | 19 | 19.9000000000000 | 831.155948000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.9200000000000 | 19 | 19.9200000000000 | 831.308994000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.9400000000000 | 19 | 19.9400000000000 | 831.462040000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.9600000000000 | 19 | 19.9600000000000 | 831.615086000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 19.9800000000000 | 19 | 19.9800000000000 | 831.768132000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT01 | 20.0000000000000 | 19 | 20.0000000000000 | 831.921178000000 |



AVEVA Data Hub



Power BI



Windtopia Wind Farm



PI Adapter for DNP3



- Home
- Data Management
- Data Collection
- Visualization
- Analytics
- Security
- Developer Tools
- Support

Retrieve Data Views in Microsoft Power BI for advanced data visualization and analysis: [Download Power BI Connector](#)

Filter Data Views... + Add Data View

| Id ↑ | Name | Description | Query Sources |
|------|-----------------------|-------------|-------------------|
| | Wind Turbine Analysis | | AVEVA-Events-SaaS |

Showing 1 - 1 of 1

Wind Turbine Analysis

Id
Wind Turbine Analysis

Name
Wind Turbine Analysis

Shape
Standard

API URL
<https://uswe.datahub.connect.aveva.com/api/v1/Tenants/cee3a3fd-aeb2-4950-80f5-4b72c77322b1/Namespaces/250ba352-e3f3-4eb0-a50f-21bde8d301bc/DataViews/Wind%20Turbine%20Analysis>

Queries

Query1 AVEVA-Events-SaaS Assets

Query Value
assetTypeName: "DNP3 Windtopia Wind Turbine"

Fields

- IdentifyingValue Turbine Name Uom
Metadata · Turbine Name
- IdentifyingValue Rotor Speed Value Uom
Property Id · Rotor Speed | Value
- IdentifyingValue Turbine State Value Uom
Property Id · Turbine State | Value
- IdentifyingValue Nacelle Position Value Uom
Property Id · Nacelle Position | Value
- IdentifyingValue Active Power Value Uom
Property Id · Active Power | Value
- IdentifyingValue Generator Cooling Air Temperature Value Uom
Property Id · Generator Cooling Air Temperature | Value
- IdentifyingValue Wind Speed Value Uom

Demo

Data Views

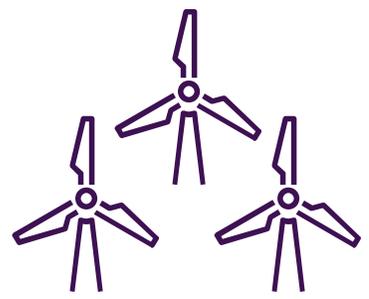
| Timestamp | Name | Turbine Name | Turbine Speed Value | Turbine State Value | Health Problem Value | Active Power Value |
|------------------------|-----------------|--------------|---------------------|---------------------|----------------------|--------------------|
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT1 | 19.1200000000000 | 19 | 19.2100000000000 | 825.187150000000 |
| 04/14/2022 1:00:00 AM | Wind Turbine #1 | WT1 | 19.1400000000000 | 19 | 19.1400000000000 | 825.340200000000 |
| 04/14/2022 2:00:00 AM | Wind Turbine #1 | WT1 | 19.1600000000000 | 19 | 19.1600000000000 | 825.493250000000 |
| 04/14/2022 3:00:00 AM | Wind Turbine #1 | WT1 | 19.1800000000000 | 19 | 19.1800000000000 | 825.646300000000 |
| 04/14/2022 4:00:00 AM | Wind Turbine #1 | WT1 | 19.2000000000000 | 19 | 19.2000000000000 | 825.799350000000 |
| 04/14/2022 5:00:00 AM | Wind Turbine #1 | WT1 | 19.2200000000000 | 19 | 19.2200000000000 | 825.952400000000 |
| 04/14/2022 6:00:00 AM | Wind Turbine #1 | WT1 | 19.2400000000000 | 19 | 19.2400000000000 | 826.105450000000 |
| 04/14/2022 7:00:00 AM | Wind Turbine #1 | WT1 | 19.2600000000000 | 19 | 19.2600000000000 | 826.258500000000 |
| 04/14/2022 8:00:00 AM | Wind Turbine #1 | WT1 | 19.2800000000000 | 19 | 19.2800000000000 | 826.411550000000 |
| 04/14/2022 9:00:00 AM | Wind Turbine #1 | WT1 | 19.3000000000000 | 19 | 19.3000000000000 | 826.564600000000 |
| 04/14/2022 10:00:00 AM | Wind Turbine #1 | WT1 | 19.3200000000000 | 19 | 19.3200000000000 | 826.717650000000 |
| 04/14/2022 11:00:00 AM | Wind Turbine #1 | WT1 | 19.3400000000000 | 19 | 19.3400000000000 | 826.870700000000 |
| 04/14/2022 12:00:00 PM | Wind Turbine #1 | WT1 | 19.3600000000000 | 19 | 19.3600000000000 | 827.023750000000 |
| 04/14/2022 1:00:00 PM | Wind Turbine #1 | WT1 | 19.3800000000000 | 19 | 19.3800000000000 | 827.176800000000 |
| 04/14/2022 2:00:00 PM | Wind Turbine #1 | WT1 | 19.4000000000000 | 19 | 19.4000000000000 | 827.329850000000 |
| 04/14/2022 3:00:00 PM | Wind Turbine #1 | WT1 | 19.4200000000000 | 19 | 19.4200000000000 | 827.482900000000 |
| 04/14/2022 4:00:00 PM | Wind Turbine #1 | WT1 | 19.4400000000000 | 19 | 19.4400000000000 | 827.635950000000 |
| 04/14/2022 5:00:00 PM | Wind Turbine #1 | WT1 | 19.4600000000000 | 19 | 19.4600000000000 | 827.789000000000 |
| 04/14/2022 6:00:00 PM | Wind Turbine #1 | WT1 | 19.4800000000000 | 19 | 19.4800000000000 | 827.942050000000 |
| 04/14/2022 7:00:00 PM | Wind Turbine #1 | WT1 | 19.5000000000000 | 19 | 19.5000000000000 | 828.095100000000 |
| 04/14/2022 8:00:00 PM | Wind Turbine #1 | WT1 | 19.5200000000000 | 19 | 19.5200000000000 | 828.248150000000 |
| 04/14/2022 9:00:00 PM | Wind Turbine #1 | WT1 | 19.5400000000000 | 19 | 19.5400000000000 | 828.401200000000 |
| 04/14/2022 10:00:00 PM | Wind Turbine #1 | WT1 | 19.5600000000000 | 19 | 19.5600000000000 | 828.554250000000 |
| 04/14/2022 11:00:00 PM | Wind Turbine #1 | WT1 | 19.5800000000000 | 19 | 19.5800000000000 | 828.707300000000 |
| 04/14/2022 12:00:00 AM | Wind Turbine #1 | WT1 | 19.6000000000000 | 19 | 19.6000000000000 | 828.860350000000 |



AVEVA Data Hub



databricks



Windtopia Wind Farm

PI Adapter for DNP3

AVEVA DATA HUB

Customer Success Story

Machine Learning Using AVEVA PI System Data w/ AVEVA Data Hub



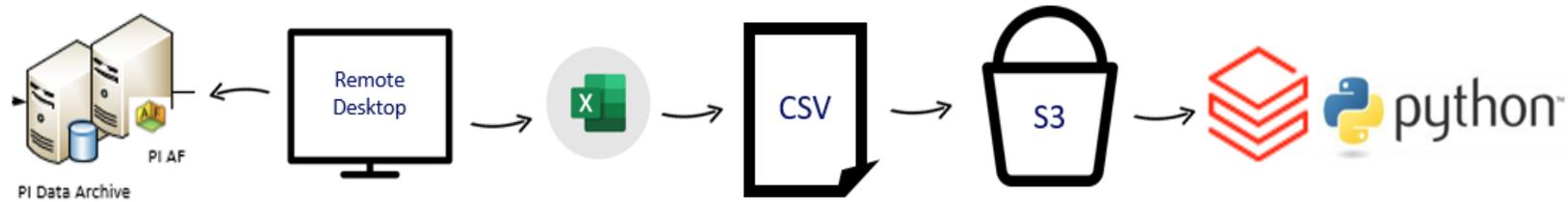
Minimizing downtime with smart maintenance



Challenge

- 'Gas in Coolant' leaks can cause unpredicted downtime, resulting in significant loss per incident.
- Generators are taken out for service too early due to lack of visibility of generator defects.
- Fuel mill blockages impose significant cost of outages & repairs.
- No tools available to work with live data on predictive functionalities.

From...



- Remote desktop used to access Drax systems
- PI Datalink on remote machine used to pull data into CSV
- CSV saved on Sharepoint
- CSV downloaded locally
- CSV uploaded to S3
- CSV now accessible from S3 and usable in Databricks

Entire process takes a **minimum of 30 minutes** much longer for large data pulls (repeated often).



Minimizing downtime with smart maintenance

Challenge

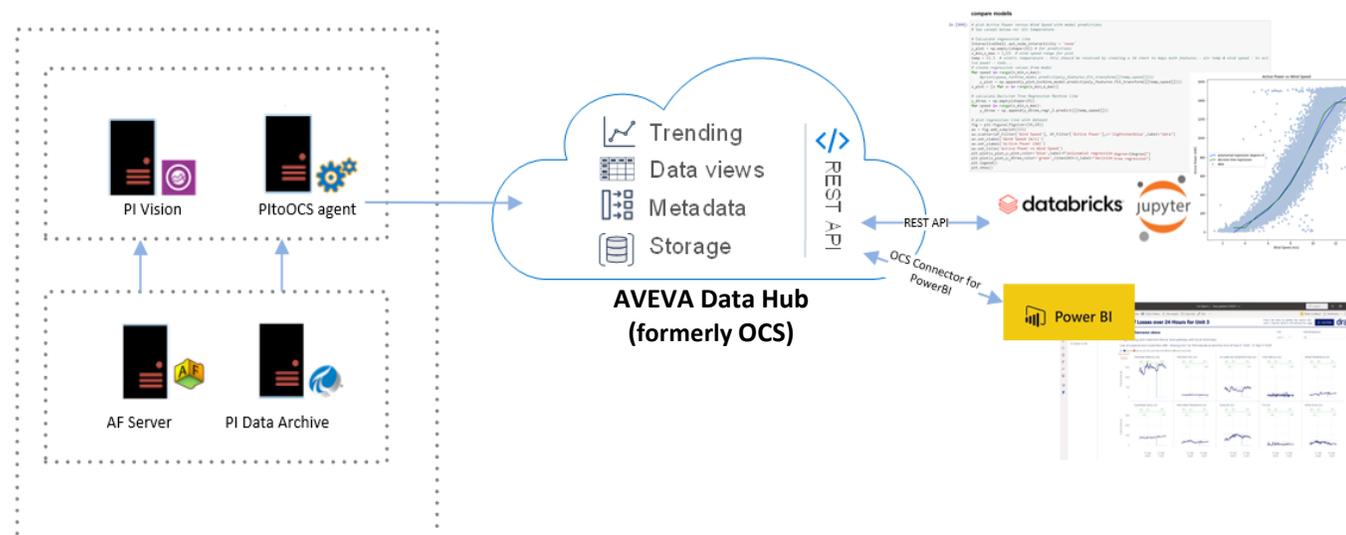


Solution

- ‘Gas in Coolant’ leaks can cause unpredicted downtime, resulting in significant loss per incident.
 - Generators are taken out for service too early due to lack of visibility of generator defects.
 - Fuel mill blockages impose significant cost of outages & repairs.
 - No tools available to work with live data on predictive functionalities.
- Lighthouse: deploy AVEVA Data Hub as a cloud data platform to make PI data available to Drax’s data science teams & tools - automated and at scale. (was a manual workload for small data sets before)
 - Enables predictive analytics on historical and fresh data.
 - Calculate lead time predictions for Generator ‘Gas in Coolant’ leaks as well as for Fuel Mill blockages, to enable longer service times (postpone maintenance based on data).

To: AVEVA Data Hub greatly improves Drax's Data Pipeline

The Data Science team can now access PI Data from Databricks, Drax's chosen Data Science platform.



- Data ingested from AVEVA PI System by AVEVA Data Hub agent
- Data Views to prep data
- AVEVA Data Hub Rest API queried from Databricks notebook
- Small repeated queries made to Data Hub using Databricks for close to live data
- Large queries made to Data Hub and saved to S3 for repeated use (Large data set for training ML models)



Minimizing downtime with smart maintenance

Challenge



Solution



Benefits

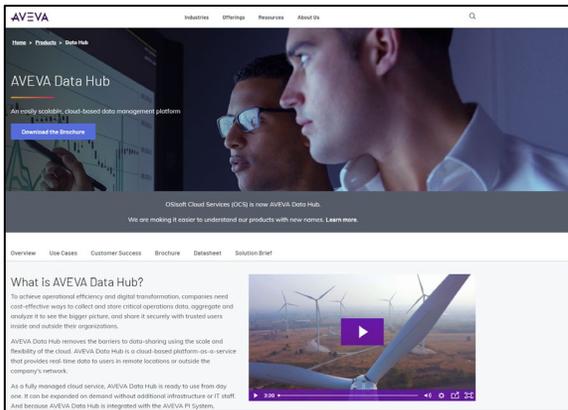
- ‘Gas in Coolant’ leaks can cause unpredicted downtime, resulting in significant loss per incident.
- Generators are taken out for service too early due to lack of visibility of generator defects.
- Fuel mill blockages impose significant cost of outages & repairs.
- No tools available to work with live data on predictive functionalities.

- Lighthouse: deploy AVEVA Data Hub as a cloud data platform to make PI data available to Drax’s data science teams & tools - automated and at scale. (was a manual workload for small data sets before)
- Enables predictive analytics on historical and fresh data.
- Calculate lead time predictions for Generator ‘Gas in Coolant’ leaks as well as for Fuel Mill blockages, to enable longer service times (postpone maintenance based on data).

- Outages can be avoided, service times prolonged and repairs planned more efficiently. Significant savings per day due to maintenance reduction, and production output de-risked through analytics driven alarms and improved dome scheduling.
- Standardized, off the shelf SAAS environment to enable data science scenarios at scale - without impacting on-premise operations systems. This solution is now available to enable more use cases and business value.

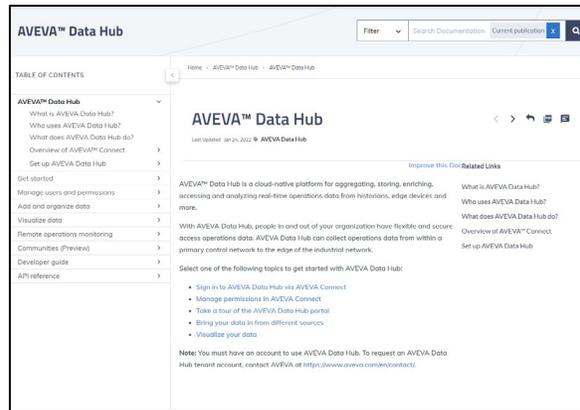
Where to find more information on AVEVA Data Hub

Overview & Resources



<https://www.aveva.com/en/products/data-hub/>

Documentation



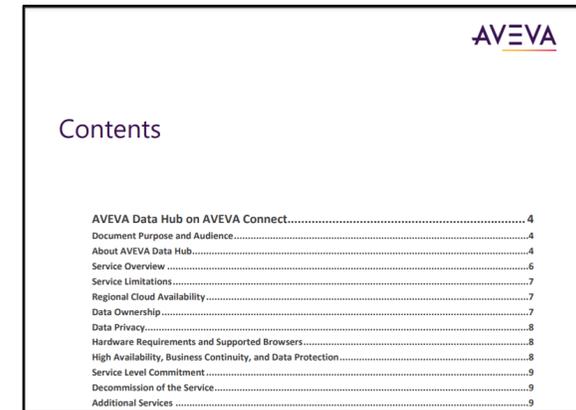
<https://docs.osisoft.com/bundle/data-hub/page/adh-content-portal-overview.html>

Security & Trust Center



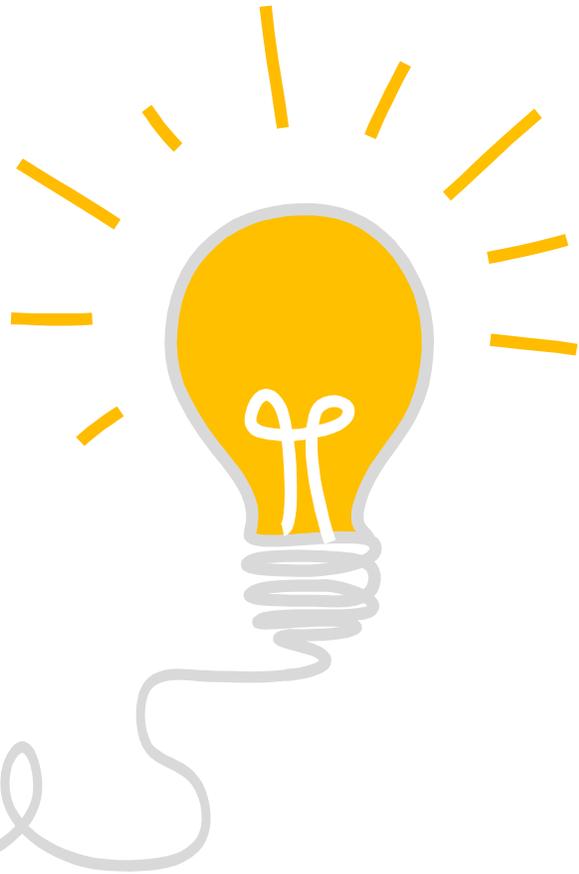
<https://www.aveva.com/en/legal/trust/>

Service Description



https://www.aveva.com/content/dam/aveva/documents/legal/service-documents/AVEVA-Data-Hub-on-AVEVA-Connect_v1-0.pdf

How can you influence the AVEVA Data Hub roadmap?



<https://feedback.aveva.com>

Let us know your product feedback!



Victor Zhang

Technical Product Manager

- AVEVA
- victor.zhang@aveva.com



Collin Bardini

Sr. Software Developer, Product Readiness Guild

- AVEVA
- collin.bardini@aveva.com

Questions?

Please wait for the microphone
State your name and company



Please remember to...

Navigate to this session in the mobile
app to complete the survey.



Thank you

AVEVA

This presentation may include predictions, estimates, intentions, beliefs and other statements that are or may be construed as being forward-looking. While these forward-looking statements represent our current judgment on what the future holds, they are subject to risks and uncertainties that could result in actual outcomes differing materially from those projected in these statements. No statement contained herein constitutes a commitment by AVEVA to perform any particular action or to deliver any particular product or product features. Readers are cautioned not to place undue reliance on these forward-looking statements, which reflect our opinions only as of the date of this presentation.

The Company shall not be obliged to disclose any revision to these forward-looking statements to reflect events or circumstances occurring after the date on which they are made or to reflect the occurrence of future events.

 [linkedin.com/company/aveva](https://www.linkedin.com/company/aveva)

 [@avevagroup](https://twitter.com/avevagroup)

ABOUT AVEVA

AVEVA is a global leader in industrial software, sparking ingenuity to drive responsible use of the world's resources. The company's secure industrial cloud platform and applications enable businesses to harness the power of their information and improve collaboration with customers, suppliers and partners.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. With operations around the globe, we are headquartered in Cambridge, UK and listed on the London Stock Exchange's FTSE 100.

Learn more at www.aveva.com