
Building an edge to cloud operations data infrastructure with AVEVA™ PI System™

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AVEVA

Agenda

1. The evolving operations landscape
2. Requirements for hybrid data architecture
3. Data collection from edge to cloud
4. AVEVA Data Hub: key capabilities & use cases
5. Closing the loop

Industrial operations have expanded to edge and cloud

How do we collect more data, without significant resource costs or impact to existing infrastructure?

How can we leverage our operations data for BI dashboards and data science initiatives? How can we build trust between OT/IT?

Is there a more effective way of aggregating and accessing operations data across my enterprise?

Is there a way to securely engage partners / vendors for expanded expertise and to enable new business models / revenue streams?

Requirements for hybrid data management



Purpose-built, ready for the enterprise

- Vendor-neutral data ingress **from any edge to cloud**
- **Native integration to AVEVA PI Server** – flexibility in where and how you manage, process, and access data
- **Make contextualized, operational data available** to enterprise business apps, IT apps, **data science**



Ready-to-use industrial cloud service

- Be operational in hours, not months, **nothing for you to manage and scale on demand**
- **No DIY assembly**; key capabilities & security functionality already interoperable
- **REST API** that makes it easy to integrate with existing IT cloud applications & investments

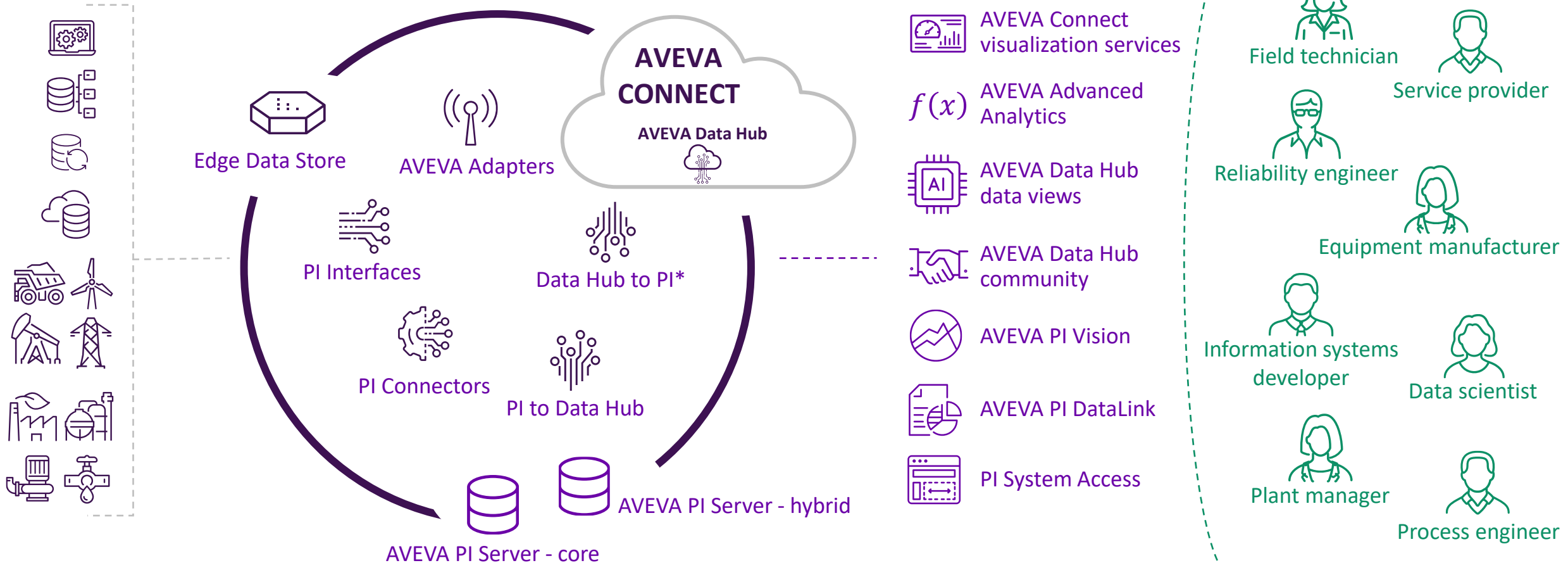


Secure data sharing internally and externally

- Securely engage vendors and partners for **expanded expertise and new insights**
- **Scalable & transparent data sharing** that puts you in control of your data
- **Reduced security risks** with sharing data externally

A hybrid data infrastructure from edge to plant to community

AVEVA PI Data Infrastructure

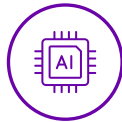


AVEVA™ Data Hub

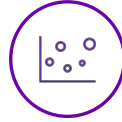
Remote monitoring



Data science & AI/ML platforms



3rd party analytic tools



Custom & partner applications



Data sharing with business partners



Reporting & Dashboards




Production Performance



Self Service Visualization




OMF Apps & Remote assets


AVEVA Adapters


Edge Data Store


AVEVA PI Server


AVEVA Historian


AVEVA MES


AVEVA System Platform


Cloud apps & silos

AVEVA™ Data Hub

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Data sharing with business partners



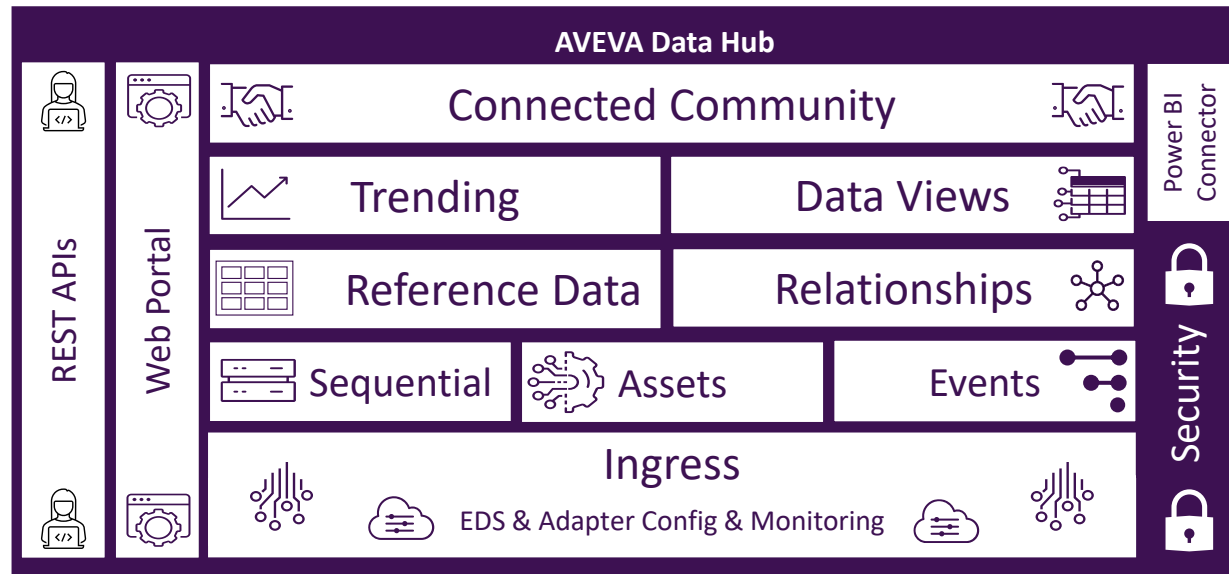
Reporting & Dashboards



Production Performance



Self Service Visualization



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Data sharing with business partners



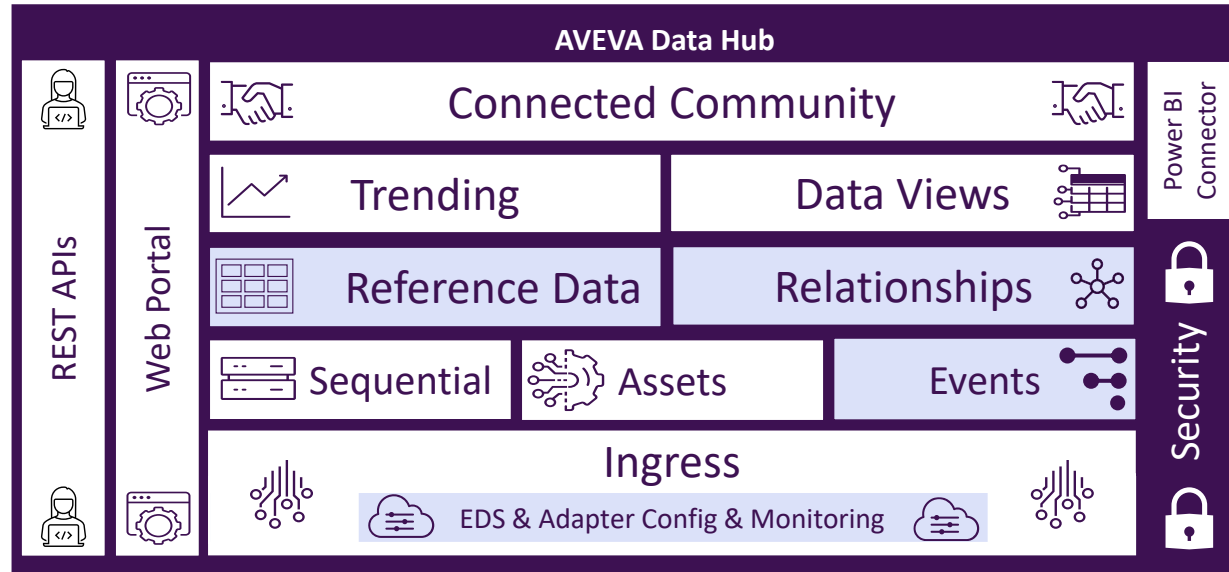
Reporting & Dashboards



Production Performance



Self Service Visualization



OMF Apps & Remote assets



AVEVA Adapters



Edge Data Store



AVEVA PI Server



AVEVA Historian



AVEVA MES



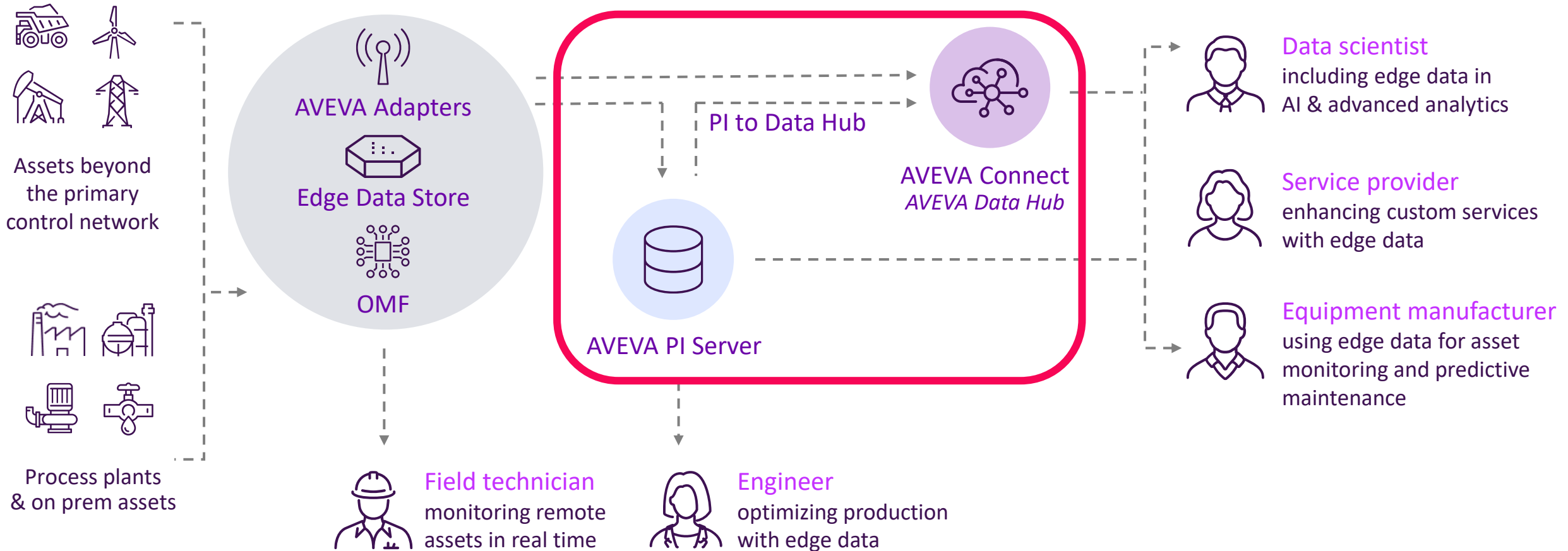
AVEVA System Platform



Cloud apps & silos

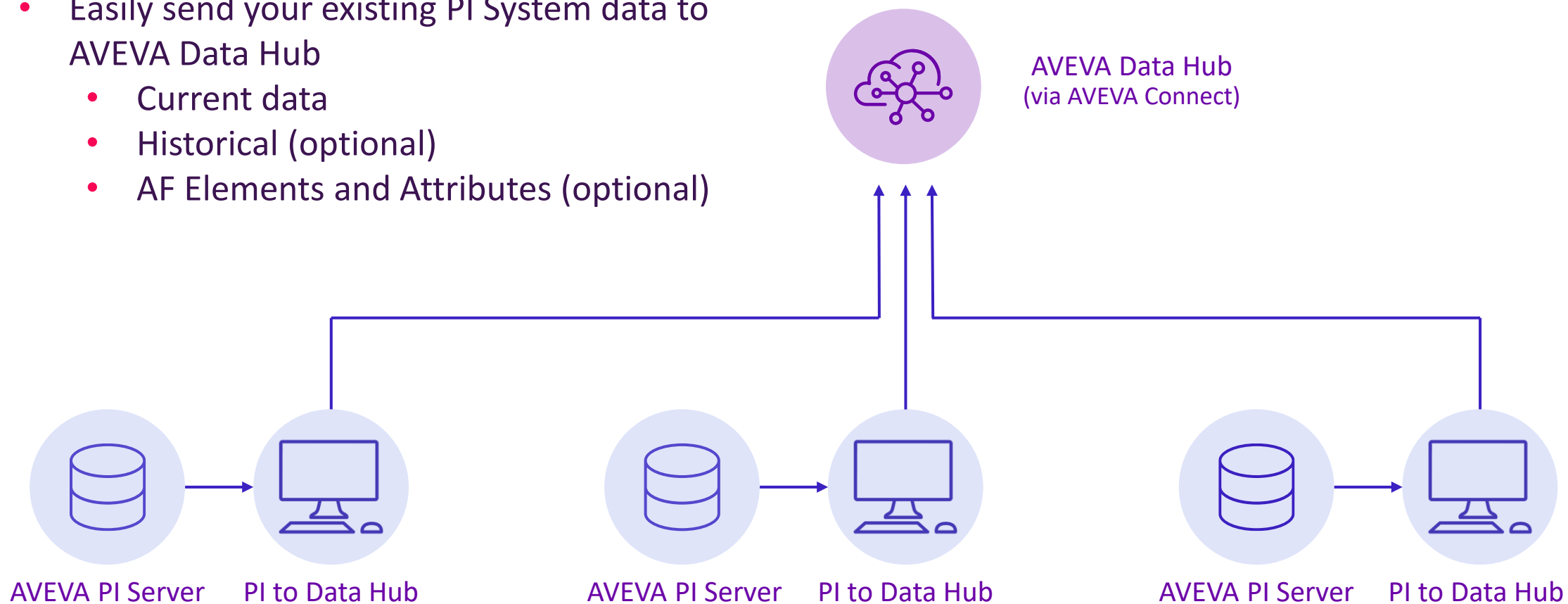


Data collection from edge to cloud



PI to Data Hub Agent

- Easily send your existing PI System data to AVEVA Data Hub
 - Current data
 - Historical (optional)
 - AF Elements and Attributes (optional)



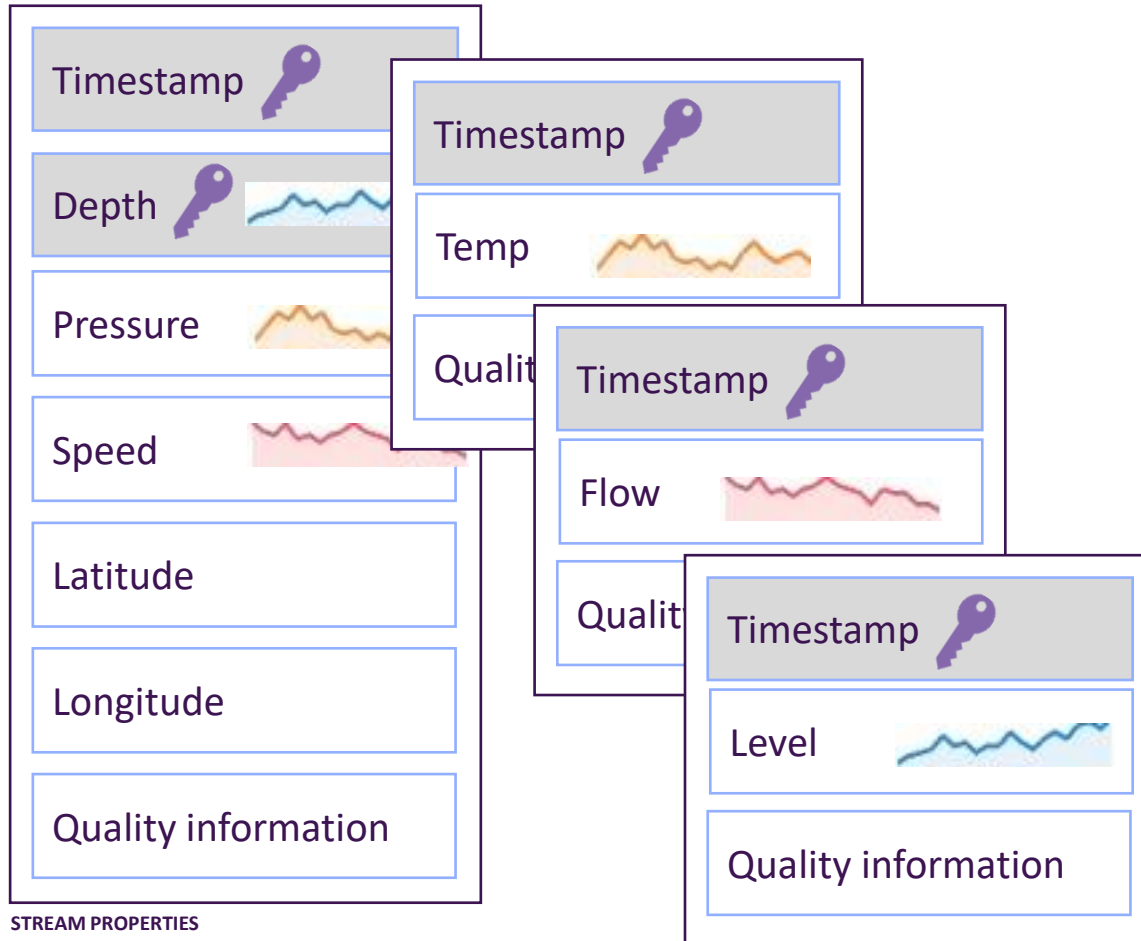
AVEVA™ Data Hub: key capabilities and use cases

Storage, context, data science enablement, and data sharing



Flexible Sequential Data Store that keeps related data together

Stream types & Streams: Define simple or complex schemas



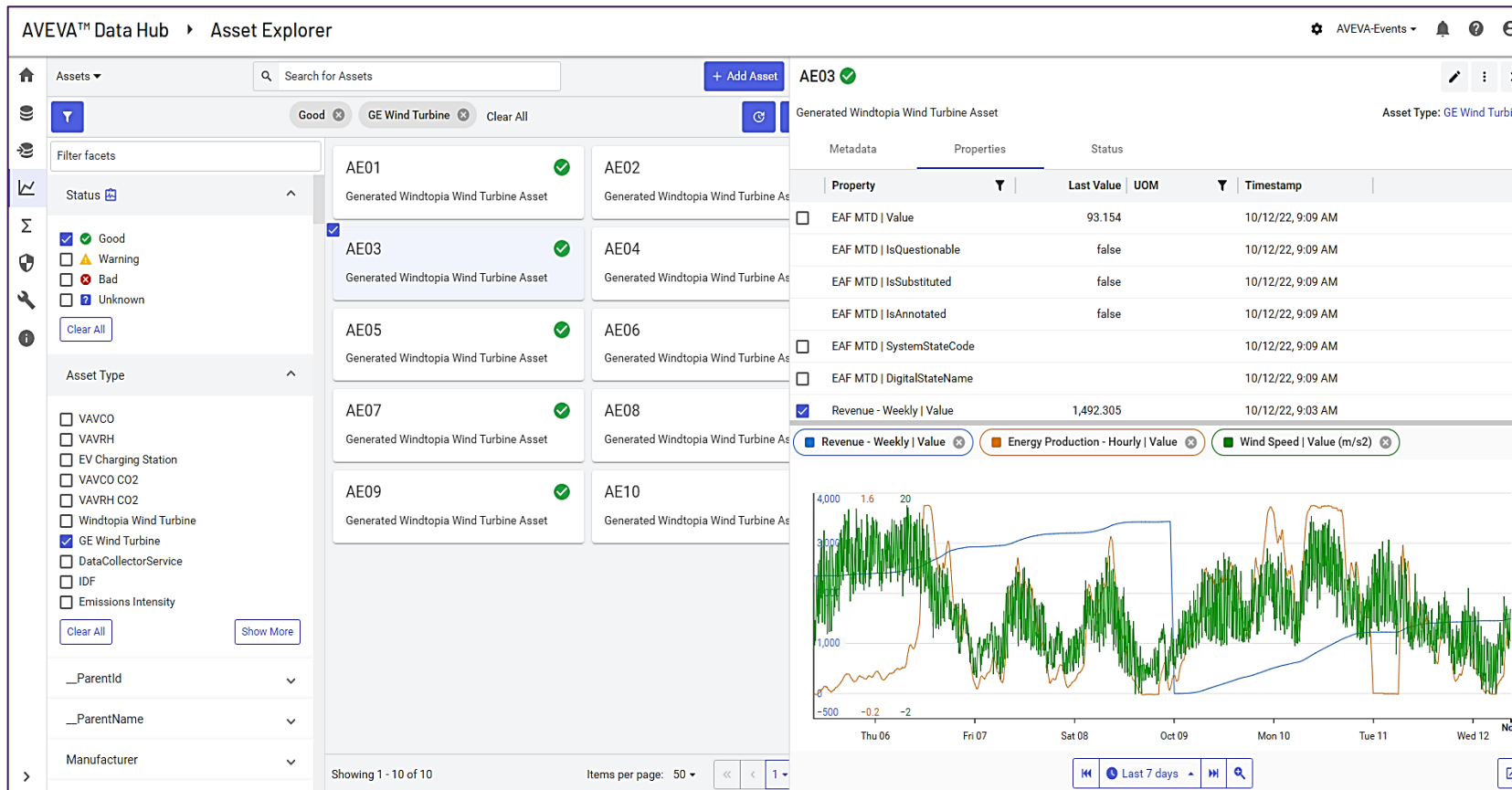
HOUS.SensorUnit9.PM25 (HOUS.SensorUnit9.PM25) + Add Event

Timestamp	ParticleCount0.3	ParticleCount0.5	ParticleCount1.0
Feb 1, 2022, 6:18:12 PM	24	6	0
Feb 1, 2022, 6:18:18 PM	18	4	0
Feb 1, 2022, 6:18:25 PM	18	4	0
Feb 1, 2022, 6:18:31 PM	24	6	0
Feb 1, 2022, 6:18:37 PM	18	6	0
Feb 1, 2022, 6:18:43 PM	45	15	0
Feb 1, 2022, 6:18:49 PM	45	15	0
Feb 1, 2022, 6:18:54 PM	57	19	0
Feb 1, 2022, 6:19:00 PM	18	6	0
Feb 1, 2022, 6:19:06 PM	33	11	0
Feb 1, 2022, 6:19:13 PM	42	14	0
Feb 1, 2022, 6:19:19 PM	27	9	0

Showing 1 - 50 of 100 Items per page: 50 < 1 >

COMPLEX STREAM EXAMPLE

Assets give useful context to your data streams



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

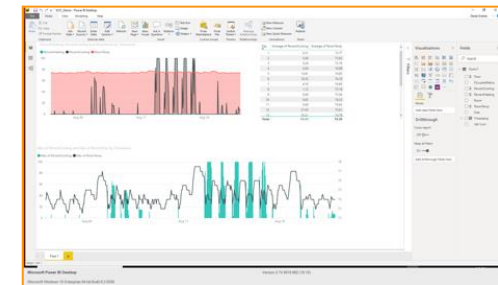
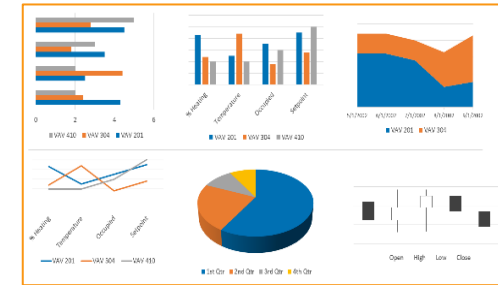
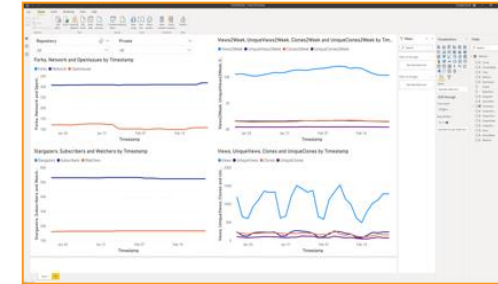
✓ **Stream reference properties** (Active power, expected power, operating state, wind speed, etc.)

✓ **Asset status** (stream property values mapped to status: good, warning, bad)



Data Views curate operational data for external consumption

Timestamp	Name	Wind Farm	Active Power Value	Active Power Value Maximum
Sep 9, 2021, 2:00:00 AM	GE02	Big Buffalo Wind Farm	745.68536	1210.29345703125
Sep 9, 2021, 3:00:00 AM	GE02	Big Buffalo Wind Farm	981.8095	1013.7664184570312
Sep 9, 2021, 4:00:00 AM	GE02	Big Buffalo Wind Farm	101.67014	172.8572540283203
Sep 9, 2021, 5:00:00 AM	GE02	Big Buffalo Wind Farm	75.169075	126.84657287597656
Sep 9, 2021, 6:00:00 AM	GE02	Big Buffalo Wind Farm	24.525969	230.16708374023438
Sep 9, 2021, 7:00:00 AM	GE02	Big Buffalo Wind Farm	108.42154	245.31785583496094
Sep 9, 2021, 8:00:00 AM	GE02	Big Buffalo Wind Farm	154.62201	263.4127197265625
Sep 9, 2021, 9:00:00 AM	GE02	Big Buffalo Wind Farm	268.26007	729.2237548828125
Sep 9, 2021, 10:00:00 AM	GE02	Big Buffalo Wind Farm	681.8332	707.7183837890625
Sep 9, 2021, 11:00:00 AM	GE02	Big Buffalo Wind Farm	212.40373	652.9362182617188
Sep 9, 2021, 12:00:00 PM	GE02	Big Buffalo Wind Farm	505.0232	806.93701171875
Sep 9, 2021, 1:00:00 PM	GE02	Big Buffalo Wind Farm	526.1119	1412.8525390625



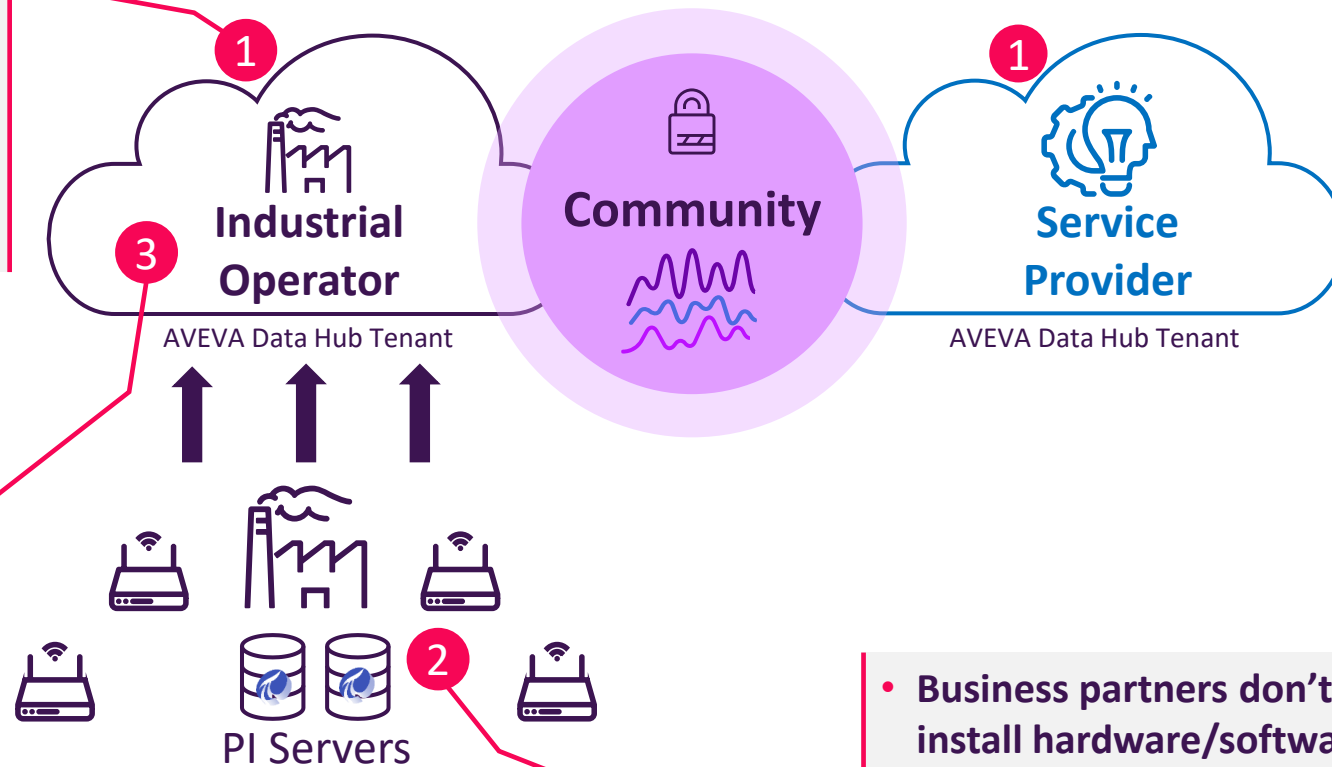
REST API

Third-party applications

A more secure way to share operational data

- True multi-tenant system
- **Natural separation of authentication, users, and data**
- Each tenant manages their own authentication & users
- No external users logging directly into your tenant
- Better protection of Intellectual Property (IP)

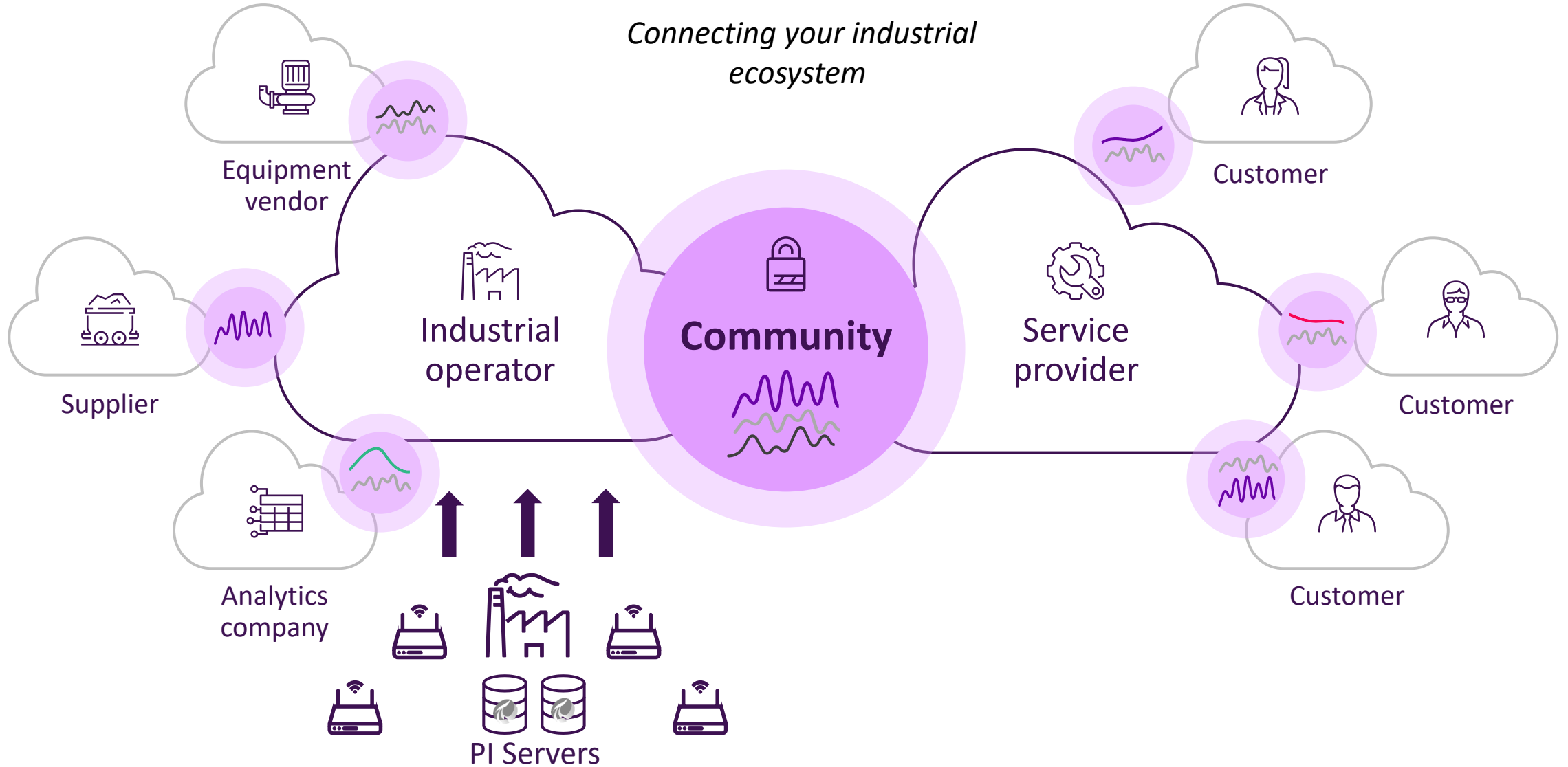
- Sharing provides *access* to data stored in your tenant
- **Data is not copied outside of your tenant** by AVEVA Data Hub



- **Business partners don't need to install hardware/software** within your site to get access to your data

AVEVA™ Data Hub

Connecting your industrial ecosystem





THE INTERNATIONAL GROUP, INC.

IGI Wax, along with its partner Lityx, uses AVEVA Data Hub to simplify real-time data sharing and improve wax yields

IGI reduced crude waste by 49% and eliminated 20 hours of off-specification processing every two weeks

Higher yields generated \$10M in profit over a single year

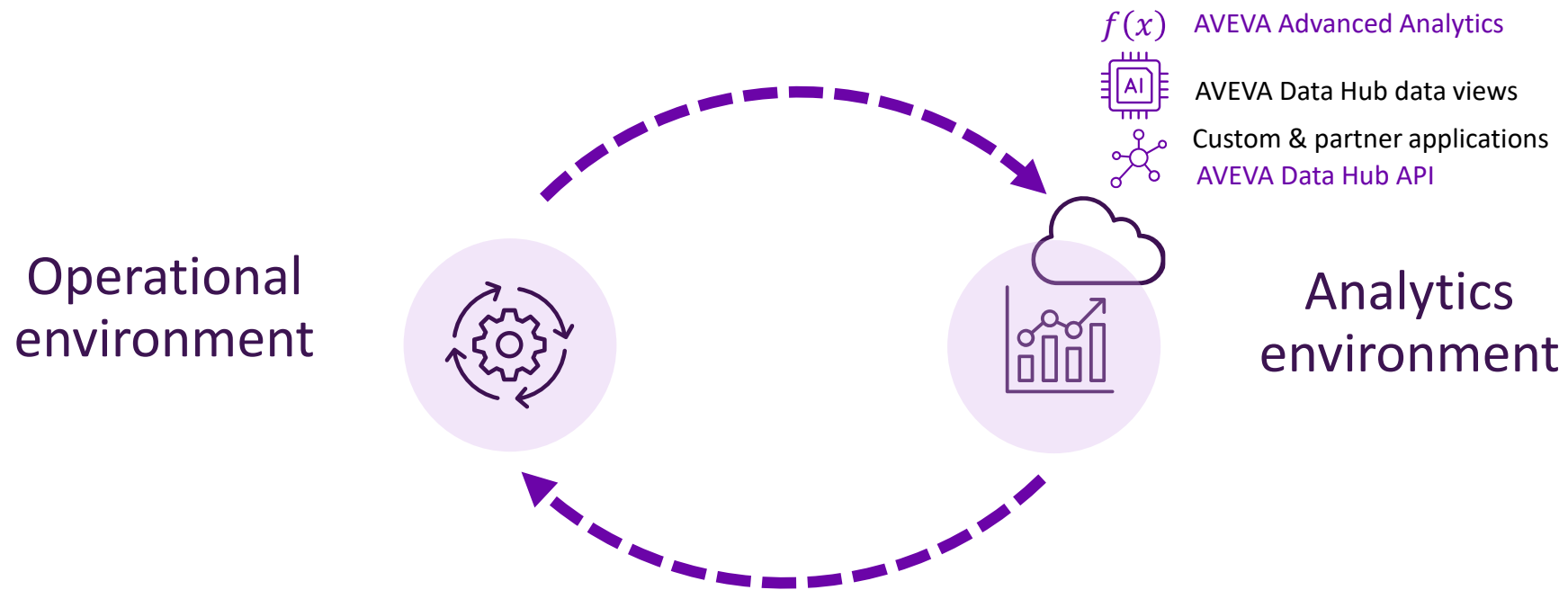


Closing the loop



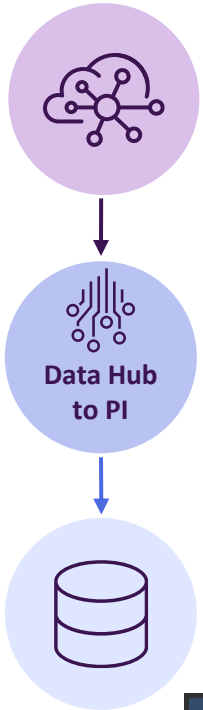
Underutilized data is a gold mine for data scientists...

...but the real value is found when you return it to operations.



In Development

Sneak Peek at Data Hub to PI



AVEVA™ Data Hub ▶ PI Agents

Filter Agents [Download Agent](#)

Name	Status	Version	Namespaces	Data Archive	Transfer Count	Hostname
US Headquarters	Good	1.0.0.0	USProduction	Houston	1	houston.windcorp.i...
EU Headquarters	Good	1.0.0.0	EUProduction	London	1	london.windcorp.int
Australia Headquar...	Good	1.0.0.0	AUProduction	Sydney	2	sydney.windcorp.int

Wind Forecast

Search: Forecast

Id	Name	Description	Type	Create Future PI Point?
PI_pitooocsaf_1710	GE04.Wind Speed Forecast...		PI-Float64	Yes
PI_pitooocsaf_1545	GE01.Wind Speed Forecast...		PI-Float64	Yes
PI_pitooocsaf_1815	GE05.Wind Speed Forecast...		PI-Float64	Yes
PI_pitooocsaf_1600	GE02.Wind Speed Forecast...		PI-Float64	Yes
PI_pitooocsaf_1655	GE03.Wind Speed Forecast...		PI-Float64	Yes

US Headquarters

Name: US Headquarters

Status: Good

Configuration Namespace: USProduction

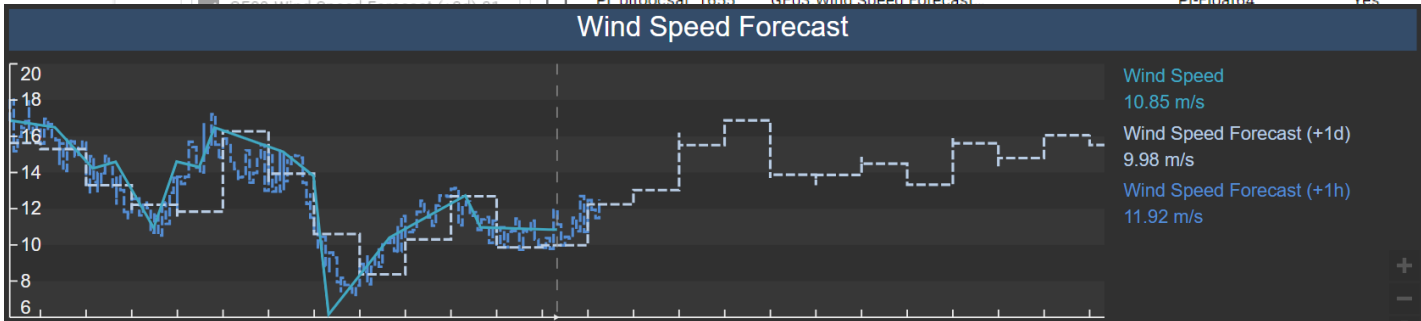
Version: 1.0.0

Last Contacted: a minute ago

Transfers: [Add Transfer](#)

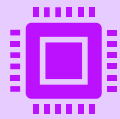
Wind Forecast

Status	Good
Namespace	USProduction
PI Data Archive	Houston
Stream Count	10
Streaming Rate	21 events / sec
Error Rate	0 errors / sec
Last Contacted	a minute ago



'Low hanging fruits' & 'food for thought'

Where are your opportunities?



Ask impactful and focused questions this is the key for valuable data science outcomes
What are your impactful questions? Build trust between stakeholders. Proving the value of the process helps validate technology choices



Start connecting your ecosystem. Industry leaders are already capitalizing... think of possibilities afforded by secure and efficient data sharing across your value-chain.



Illuminate your dark data. Remote operations monitoring can generate large savings & create new business models. Where in your operations can you gain better real-time awareness? ... Start small for PoC but think about scalability!

Recommended Sessions

Secure data sharing at scale with the AVEVA Data Hub Community

Tuesday, October 24 @ 2:50pm
Room 2004

Unlocking the power of AIOps for IIoT with AVEVA Data Hub and AVEVA Advanced Analytics *Accenture*

Tuesday, October 24 @ 3:50pm
Room 2004

Data Collection and Remote Operations Monitoring from Edge to Cloud

Wednesday, October 25 @ 8:00am
Room 2004

Enabling end-to-end continuous biomanufacturing by leveraging real-time data in the cloud

Biosana

Wednesday, October 25 @ 8:40am
Room 2004

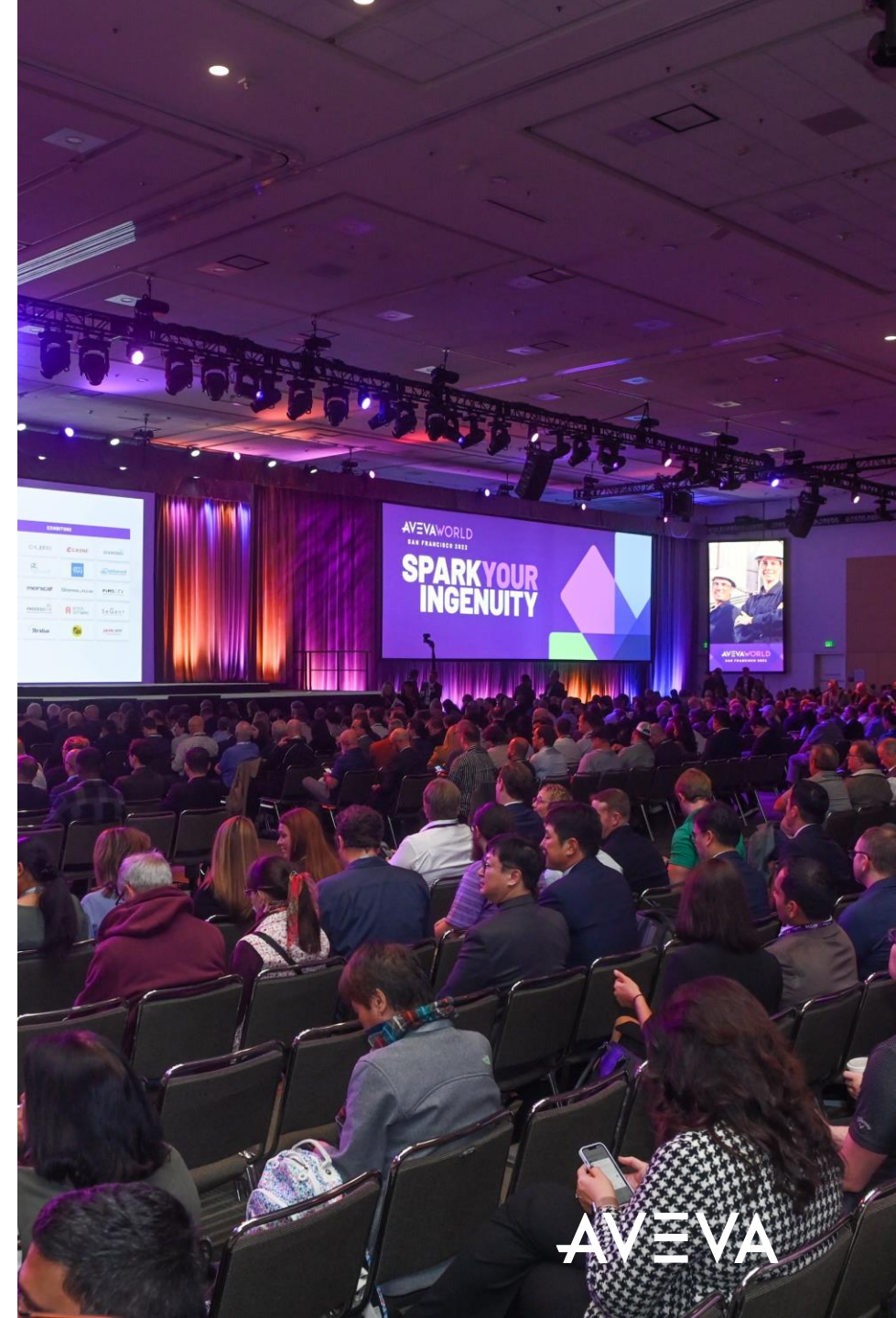
Sharing data across Quebec Iron Ore's IT and OT ecosystem with AVEVA's cloud technologies

Quebec Iron Ore

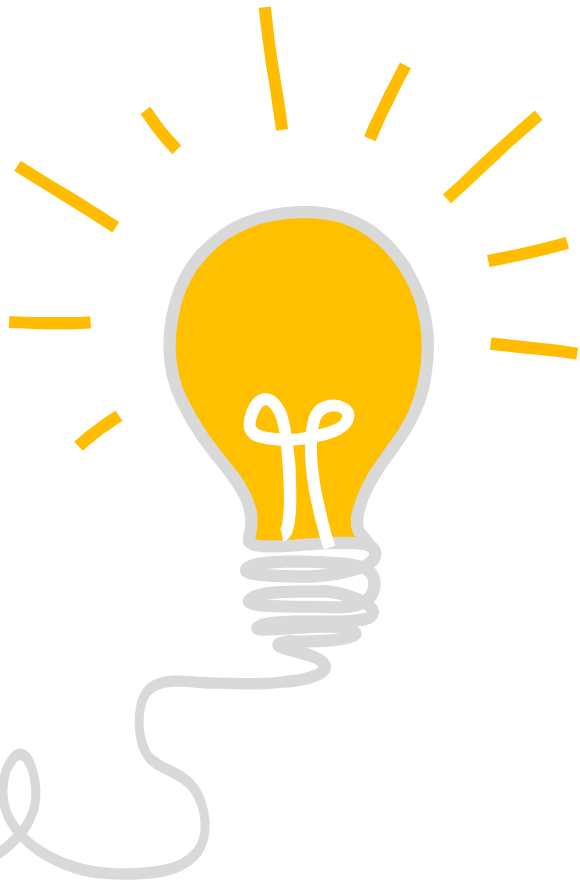
Wednesday, October 25 @ 1:30pm
Room 2004

Bringing industrial operations data into your analytics platform with AVEVA Data Hub Data Views

Thursday, October 26 @ 10:45am
Room 2004



Influence the AVEVA product roadmaps



<https://feedback.aveva.com>

Let us know your product feedback!



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Strategic Product Manger

- AVEVA
- jonathan.pegg@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!

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ABOUT AVEVA

AVEVA is a world leader in industrial software, providing engineering and operational solutions across multiple industries, including oil and gas, chemical, pharmaceutical, power and utilities, marine, renewables, and food and beverage. Our agnostic and open architecture helps organizations design, build, operate, maintain and optimize the complete lifecycle of complex industrial assets, from production plants and offshore platforms to manufactured consumer goods.

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. The company is headquartered in Cambridge, UK.

Learn more at www.aveva.com