OCTOBER 25, 2023

AVEVA™ PI System™ portfolio data connectivity update

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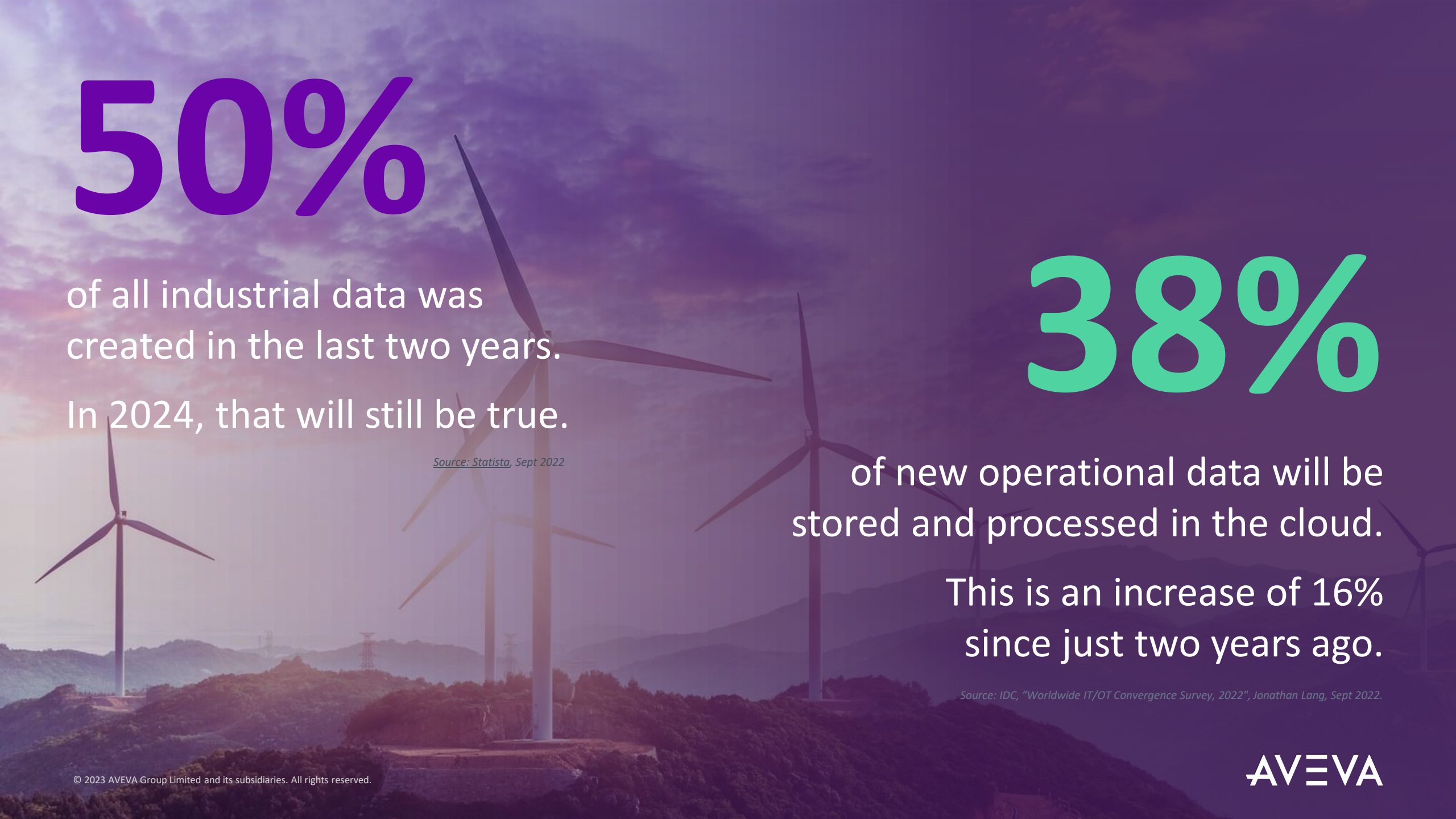


50%

of all industrial data was created in the last two years.

In 2024, that will still be true.

Source: Statista, Sept 2022

38%

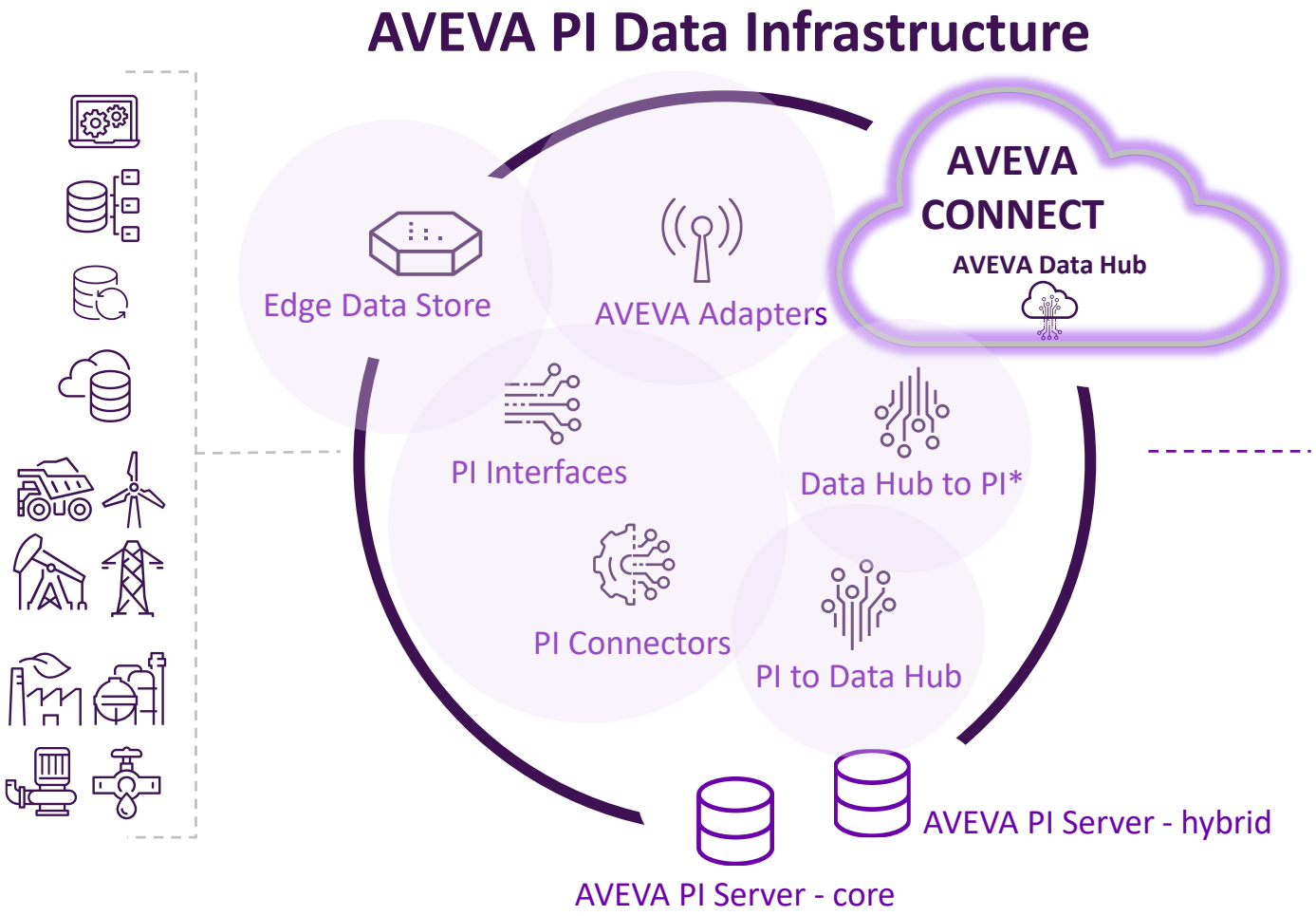
of new operational data will be stored and processed in the cloud.

This is an increase of 16% since just two years ago.

Source: IDC, "Worldwide IT/OT Convergence Survey, 2022", Jonathan Lang, Sept 2022.

AVEVA

A hybrid data infrastructure from edge to plant to community



- AVEVA Connect, visualization services
- AVEVA Advanced Analytics
- AVEVA Data Hub data views
- AVEVA Data Hub community
- AVEVA PI Vision
- AVEVA PI DataLink
- AVEVA PI System Access

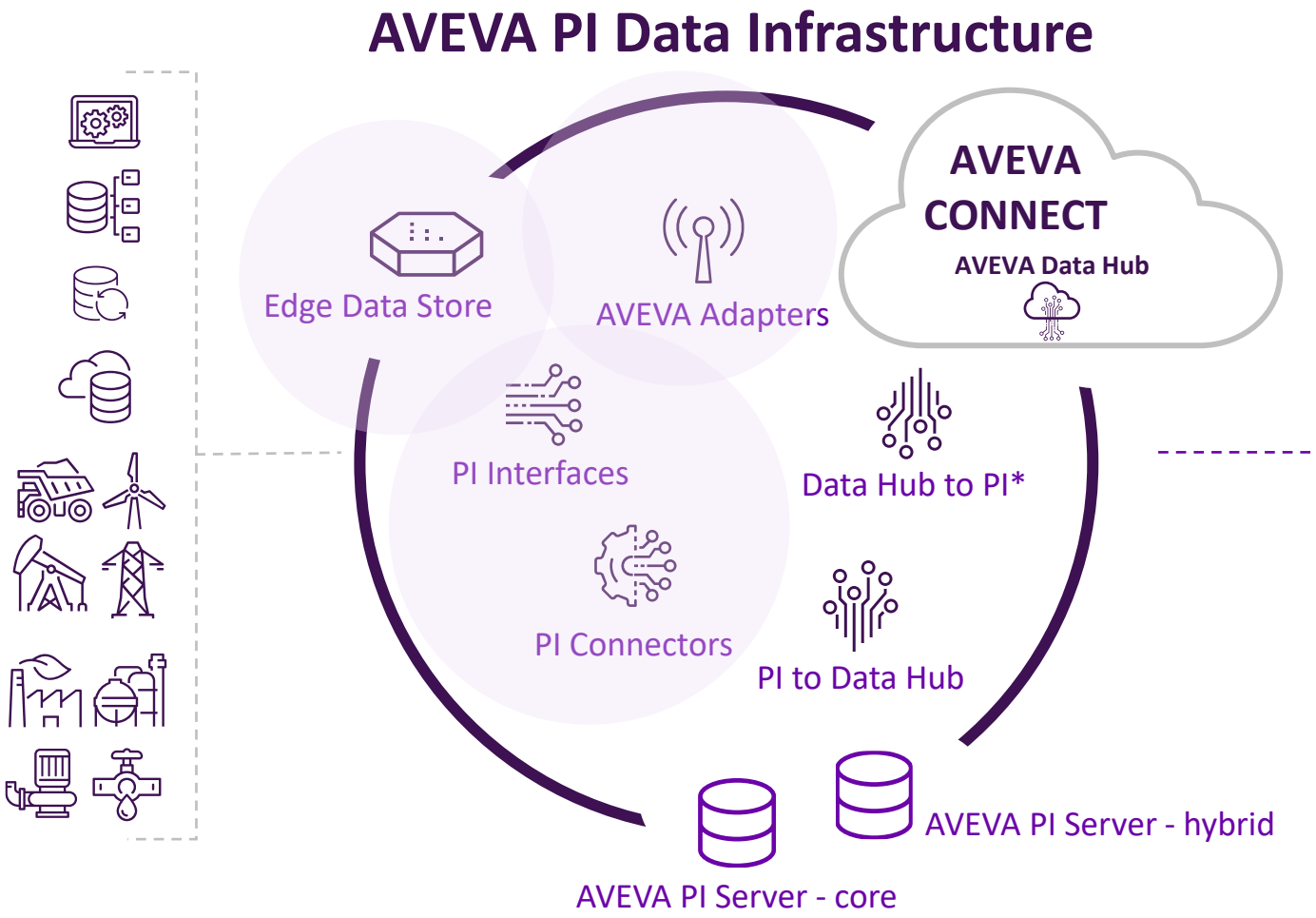
Community

- Field technician
- Service provider
- Reliability engineer
- Equipment manufacturer
- Information systems developer
- Data scientist
- Plant manager
- Process engineer

* In Development

Data collection portfolio

A hybrid data infrastructure from edge to plant to community



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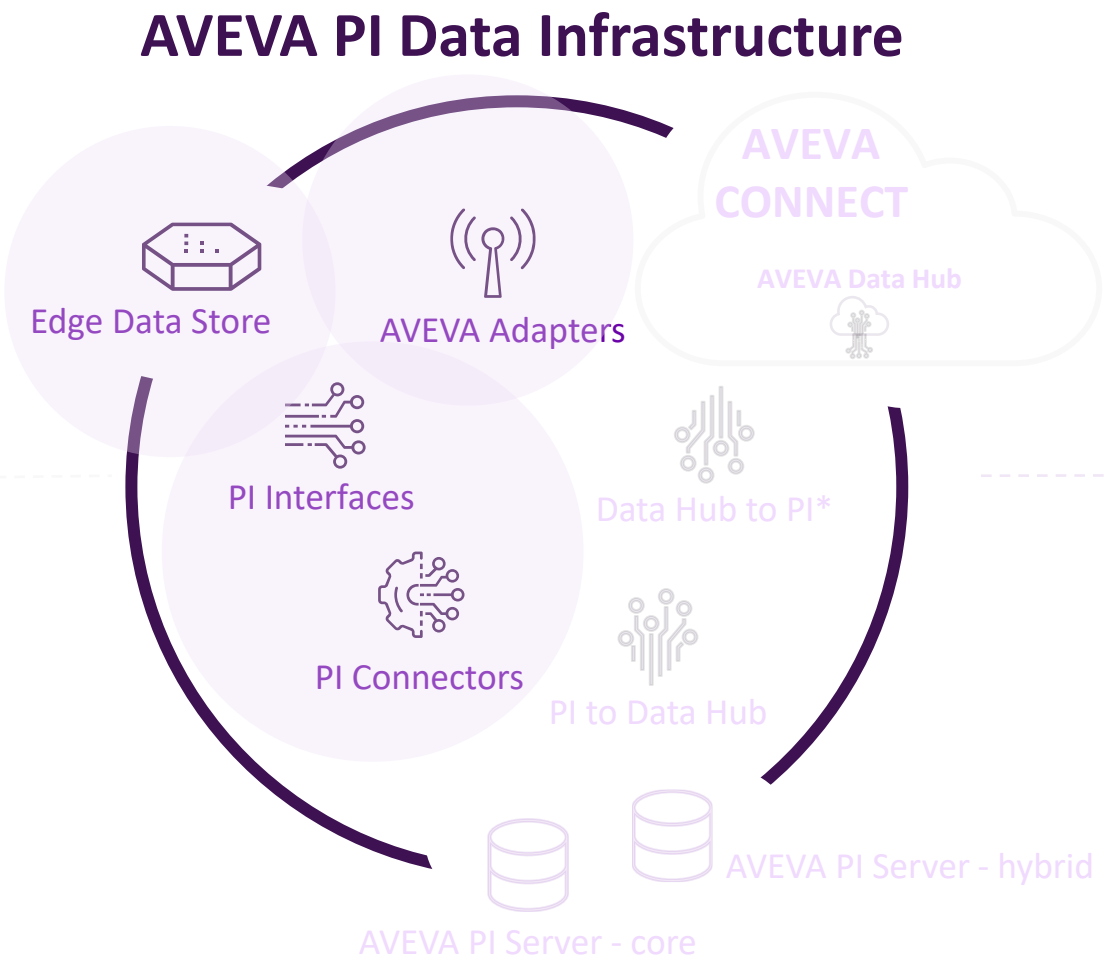
A hybrid data infrastructure from edge to plant to community



AVEVA Connect visualization services

AVEVA Advanced Analytics

AVEVA Data Hub data views

AVEVA Data Hub community

AVEVA PI Vision

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Community

Field technician

Service provider

Reliability engineer

Equipment manufacturer

Information systems developer

Data scientist

Plant manager

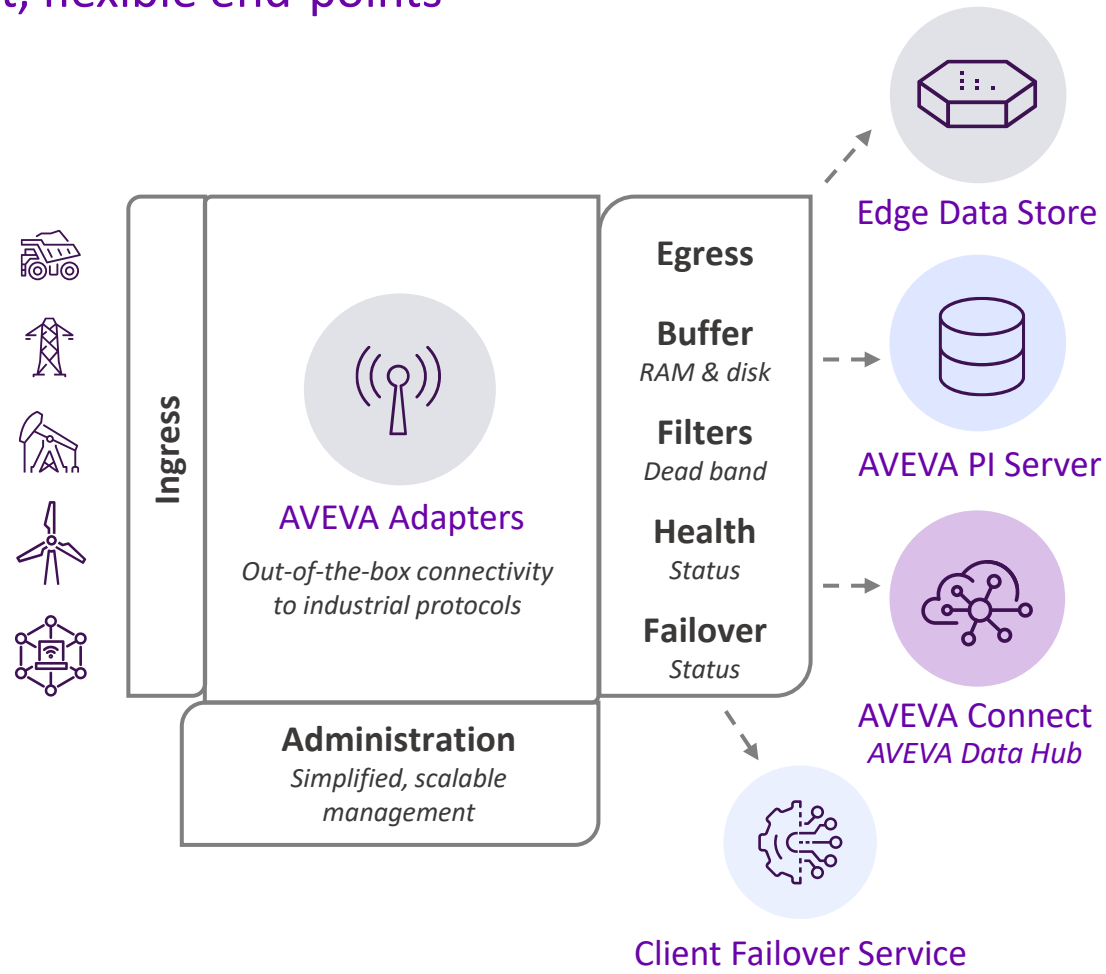
Process engineer

* In Development

Extending real-time data connectivity to remote assets

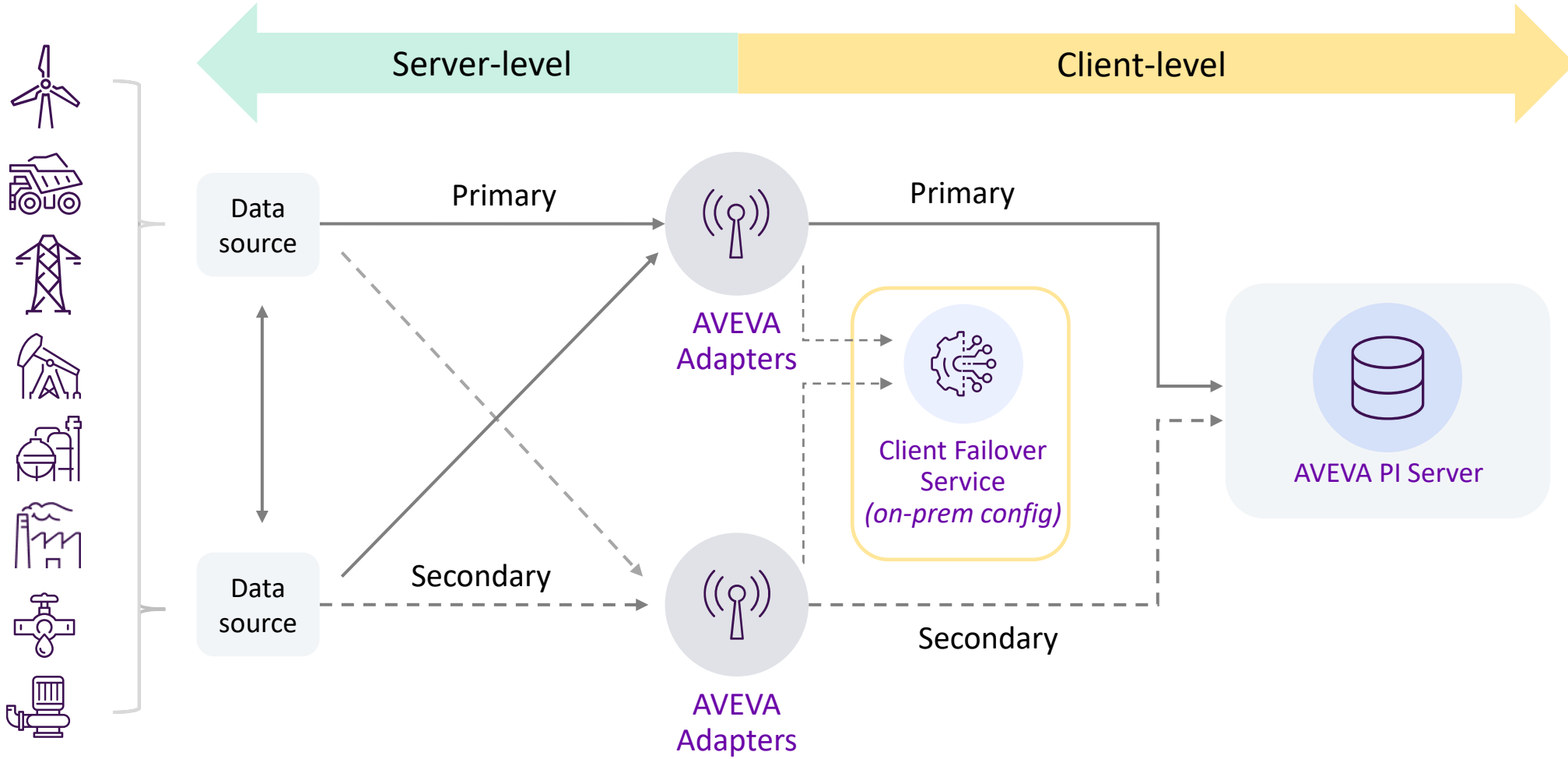
AVEVA Adapters | Ready off-the-shelf, lightweight footprint, flexible end-points

- **Lightweight, robust, real-time data collection,** buffering technology protects data during network outages or unavailability of destination endpoint
- **Out-of-the-box connectivity** to **common industrial protocols:** Azure Event Hubs, BACnet, DNP3, Modbus TCP, MQTT, OPC UA, RDBMS, Structured Data Files
- **Maximize uptime** with **client-side failover; server-side failover** is available as provided by the data source
- **Cross-platform compatible,** installation options for Windows and Linux devices or use Docker containers
- **Simplified management,** cloud-hosted remote installation, configuration management, and health monitoring
- **Multiple data destinations**, transfer data to AVEVA PI Servers, AVEVA Data Hub, and/or Edge Data Store, and use filtering to reduce network bandwidth



High availability for mitigating data loss

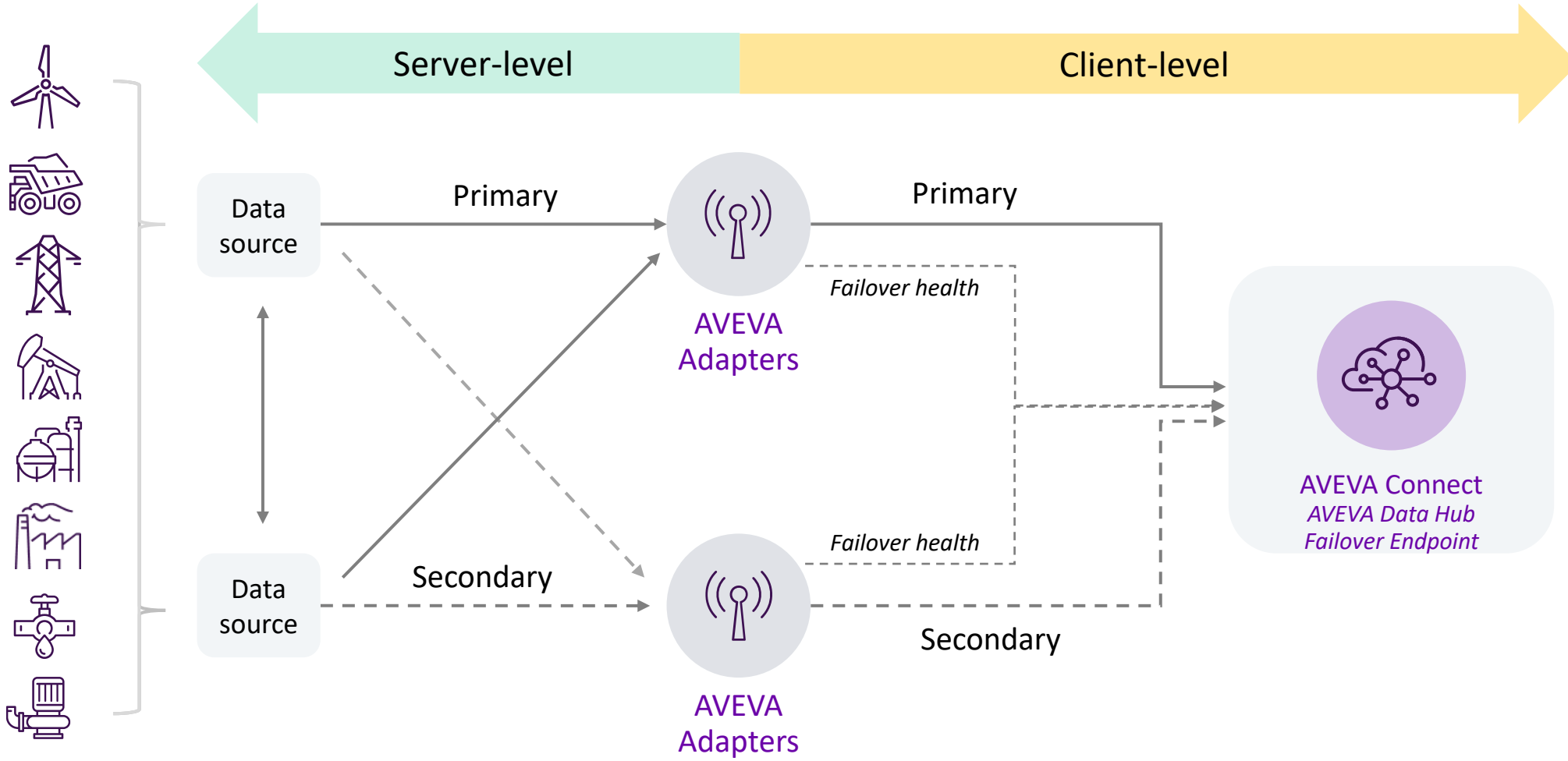
Client-side and server-side failover for AVEVA PI Server and AVEVA Data Hub



Client and server failover modes:

- Hot
- Warm
- Cold

Failover support for edge/cloud environments



Client and server failover modes:

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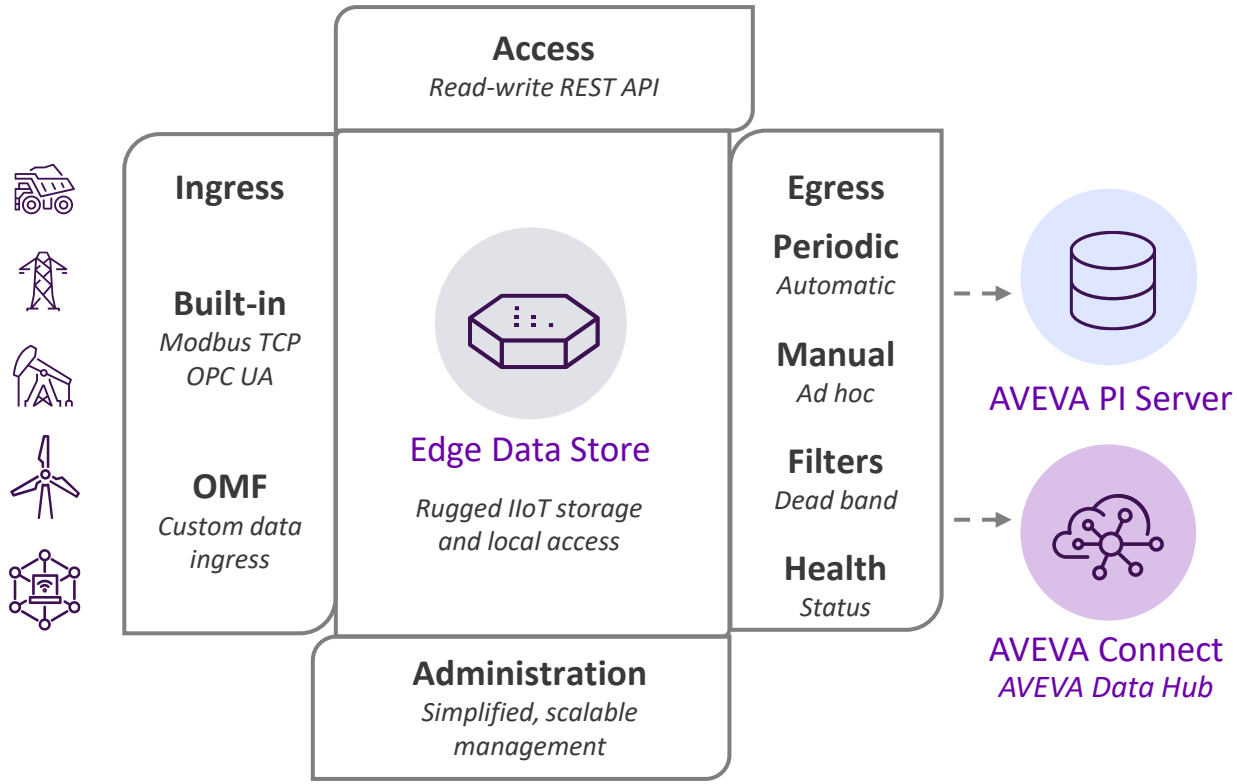
Lightweight data storage and integration at the industrial edge

Edge Data Store | Local storage, self-healing, application platform

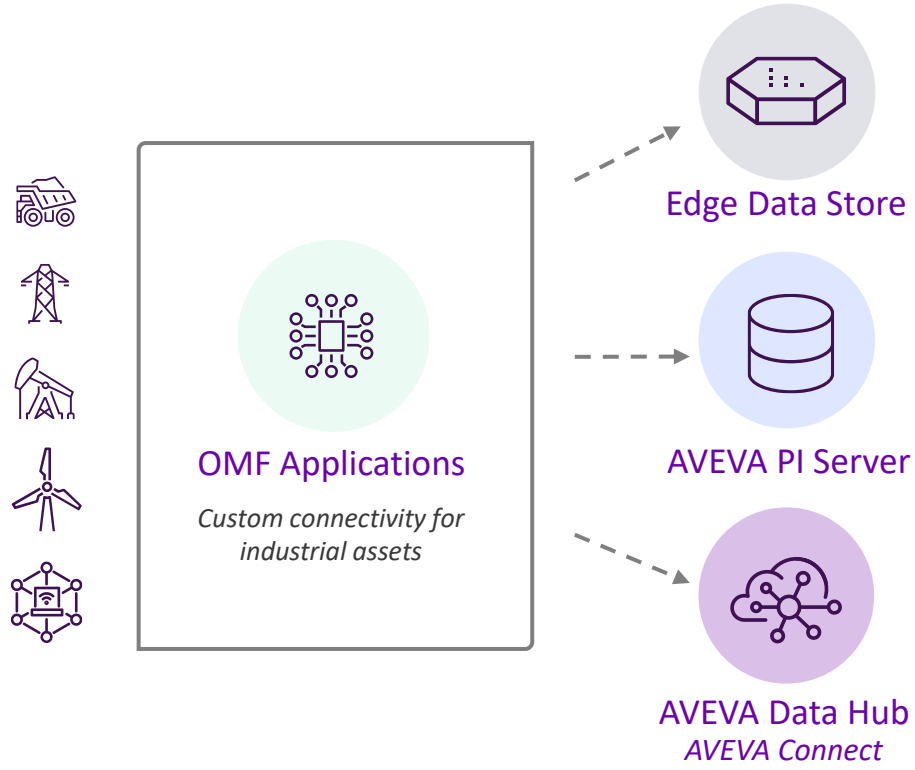
- **Lightweight, resilient data storage, purpose-built** for **harsh and/or uncrewed environments** – self-healing to survive power loss to the device, network outages, and unavailability of destination endpoints
- **Out-of-the-box connectivity** to **Modbus TCP** and **OPC UA servers**, custom application connectivity available through an **OMF endpoint**
- **Feature-rich, programmatic API** for custom application development such as **local analytics or visualization**
- **Cross-platform compatible,** installation options for Windows and Linux devices or use Docker containers
- **Simplified management,** cloud-hosted remote installation, configuration management, and health monitoring
- **Multiple data destinations,** directly integrate with AVEVA PI Servers and AVEVA Data Hub and use filtering to reduce network bandwidth



Homogenous connectivity to AVEVA systems

Open Message Format (OMF) | Scalable application development for edge, on premises, and cloud

- **Maximum developer flexibility**, any hardware platform, any operating system, any development tools
- Internet-friendly, secure **REST API endpoints,** no VPNs required!
- Inbound connectivity to **Edge Data Store, AVEVA PI Servers, AVEVA Data Hub**
- **Outbound connectivity by Edge Data Store, AVEVA Adapters, and AVEVA Historian** provides interoperability with AVEVA PI Servers and AVEVA Data Hub
- Specification is **public and available to all**



Enabling plant-wide real-time data connectivity

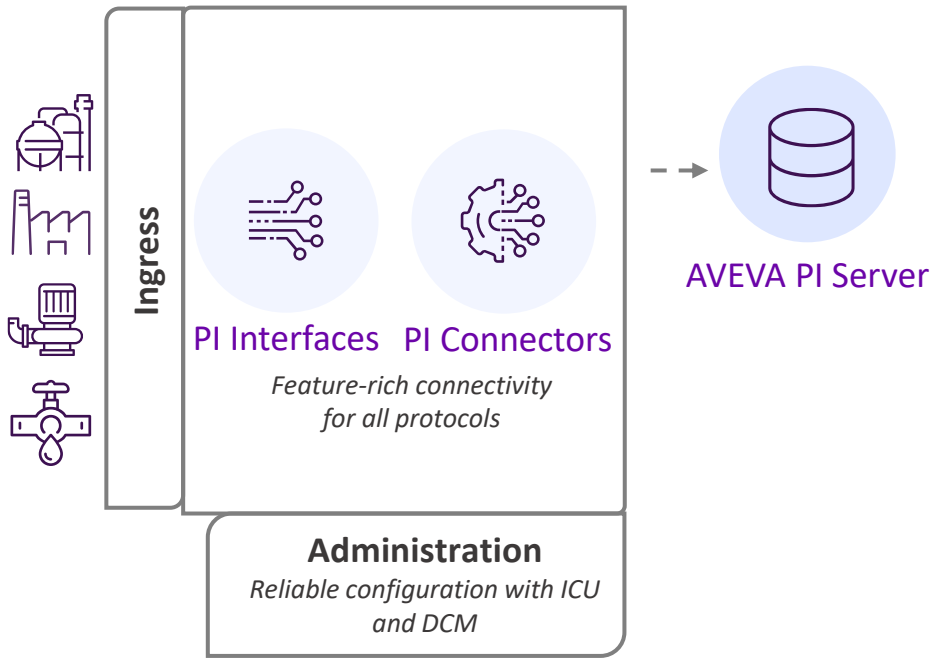
PI Interfaces and PI Connectors | Supporting numerous protocols and large data throughput

PI Interfaces

- More than **30 years** of **development and support**, enabling robust and stable data collection
- **Optimized for time-series data,** allowing for highly configurable tag data
- **Hundreds of available protocols** readily available: OPC DA, OPC HDA, UFL, RDBMS, PI-To-PI
- Exclusive connectivity to **PI Data Archive**

PI Connectors

- **Streamlined Configuration** facilitating PI Point creation with rules-based data selection
- Auto-discover data with **data source discovery**
- **Unified administration experience,** enabling a one-stop shop to manage all connectors
- **Automatically create elements and attributes** with PI AF Connectivity



No matter where your operational data resides, AVEVA has the technologies available to collect and store that data

Remote operations monitoring with AVEVA™ PI Data Infrastructure

3x

Number of IoT devices exist in 2030 compared to number in 2020. Data from these devices will grow even faster.

Source: Gartner: Predicts 2022: The distributed enterprise drives computing to the edge

AVEVA

AVEVA™ Connect

- Home
- Folder management
- User management
- Integrations
- Flex credits
- Reports
- Audit
- Services catalog
- Settings

My folders > AVEVA-Events

AVEVA-Events

AVEVA-Events-SaaS

Development

Europe

Data Hub

A cloud-native platform for aggregating, storing, enriching, accessing and analyzing real-time operations data from historians, edge devices and more.

Edge Management

Register and pair device twins with physical edge devices. Remotely provision, configure, maintain, deploy, and monitor AVEVA edge modules.

Insight

Operations and asset management platform: unlock critical data, increase collaboration, improve asset reliability and drive operational performance.

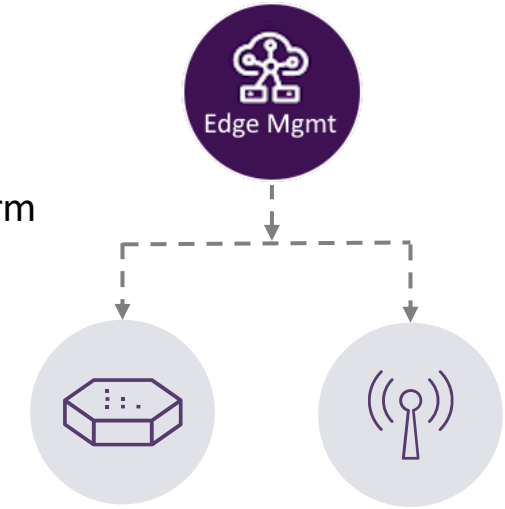
Visualization

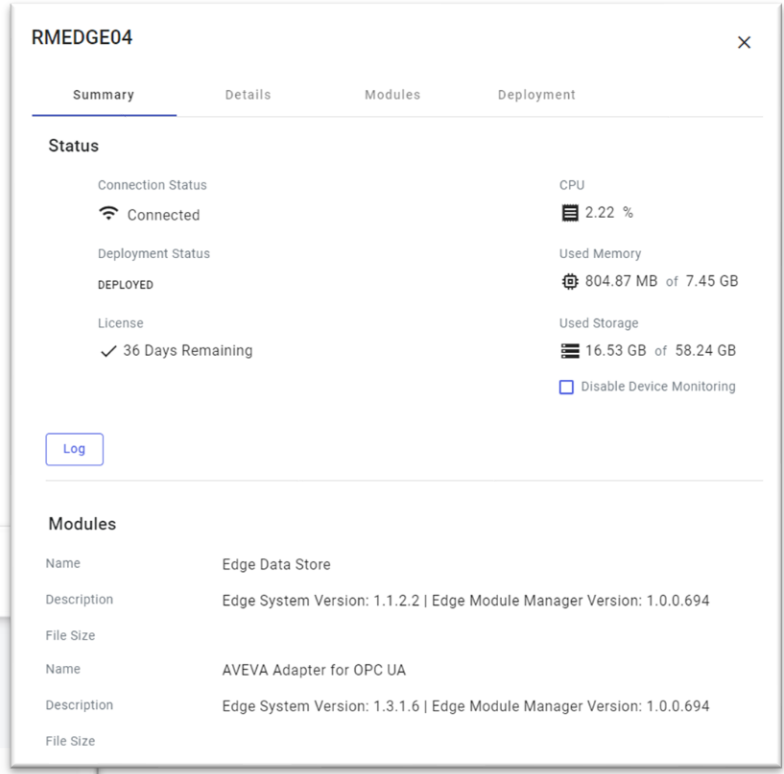
Composable dashboards using custom and pre-defined content for visualizing AVEVA Data Hub and other data sources

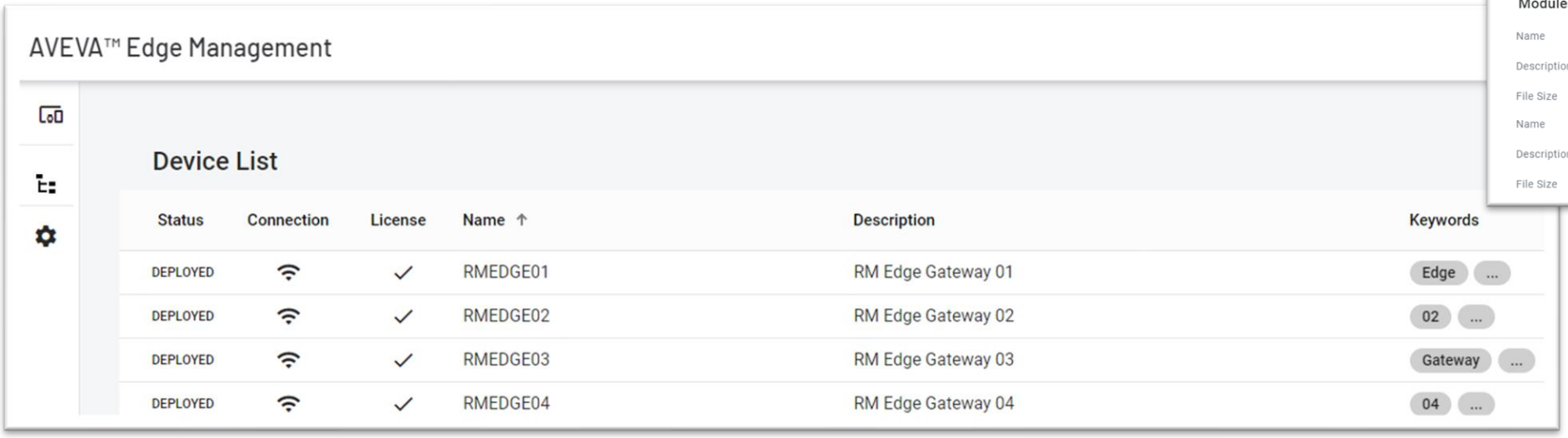
Manage software deployments at scale

Edge management | Cloud-hosted, centralized software installation and monitoring

- Create and configure a **device digital twin**
- **Pair and bootstrap** each device to **establish secure communications** with AVEVA Connect, common cloud platform
- **Remotely install** AVEVA application software on each device
- **Monitor** device diagnostics and software logs
- **Manage** devices, software configuration, and versions



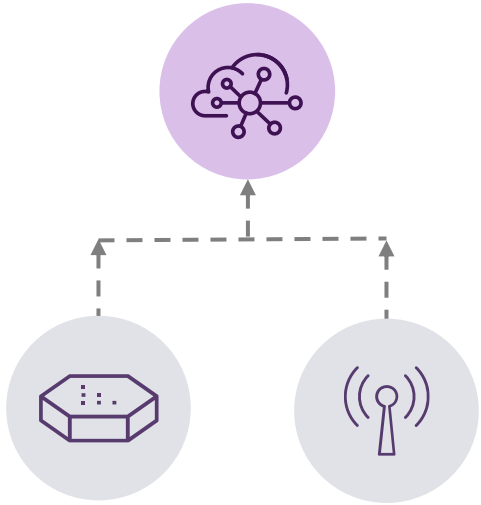


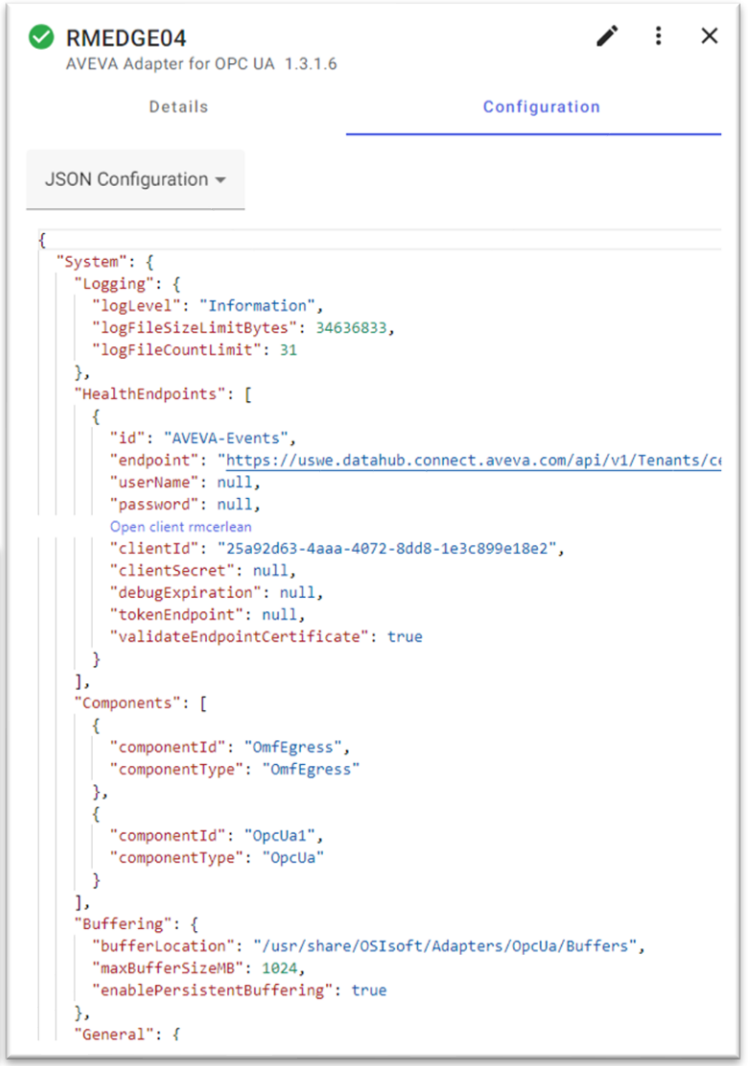


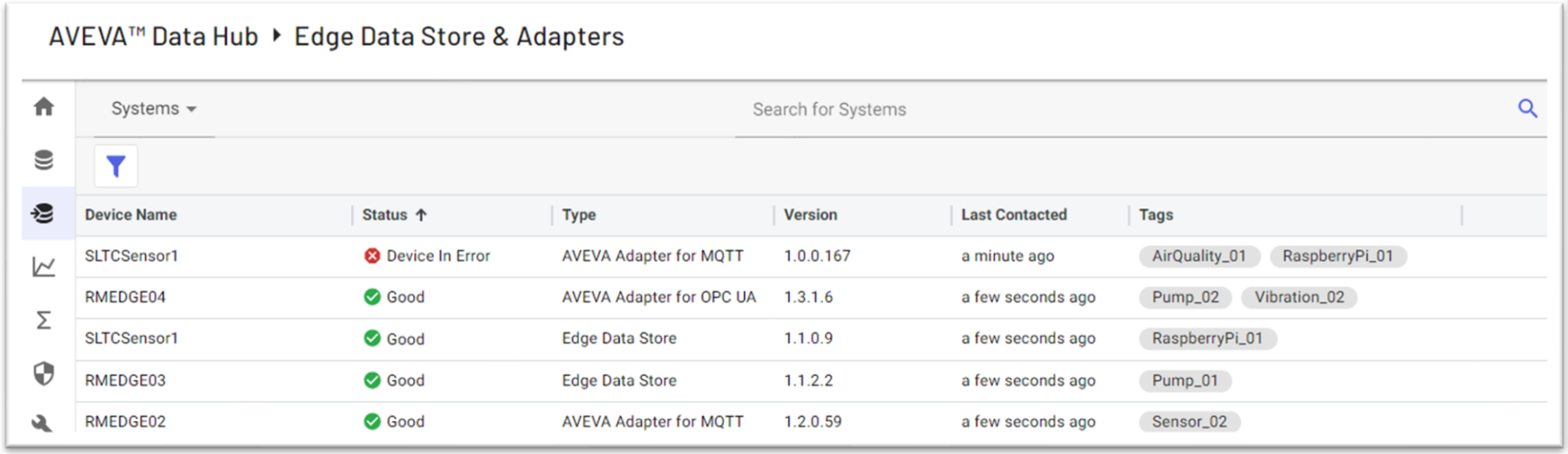
Centralized monitoring and configuration management

AVEVA Data Hub | Software monitoring, configuration and version management

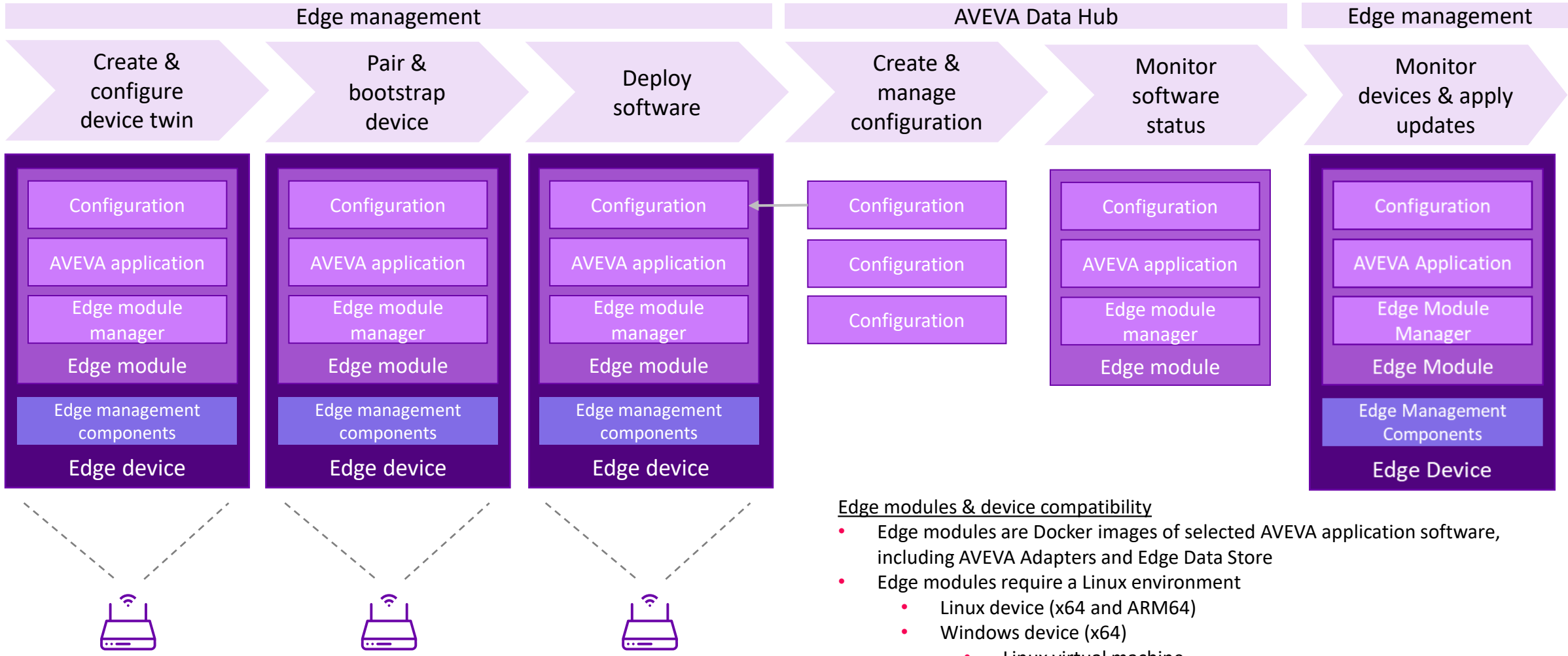
- **Create** and **manage** software configuration
- **Monitor** Edge Data Store and AVEVA Adapter **health**
- **View** and **trend** device and software **diagnostics**
- **Synchronize field configuration** using import/export
- **Troubleshoot** device and software issues







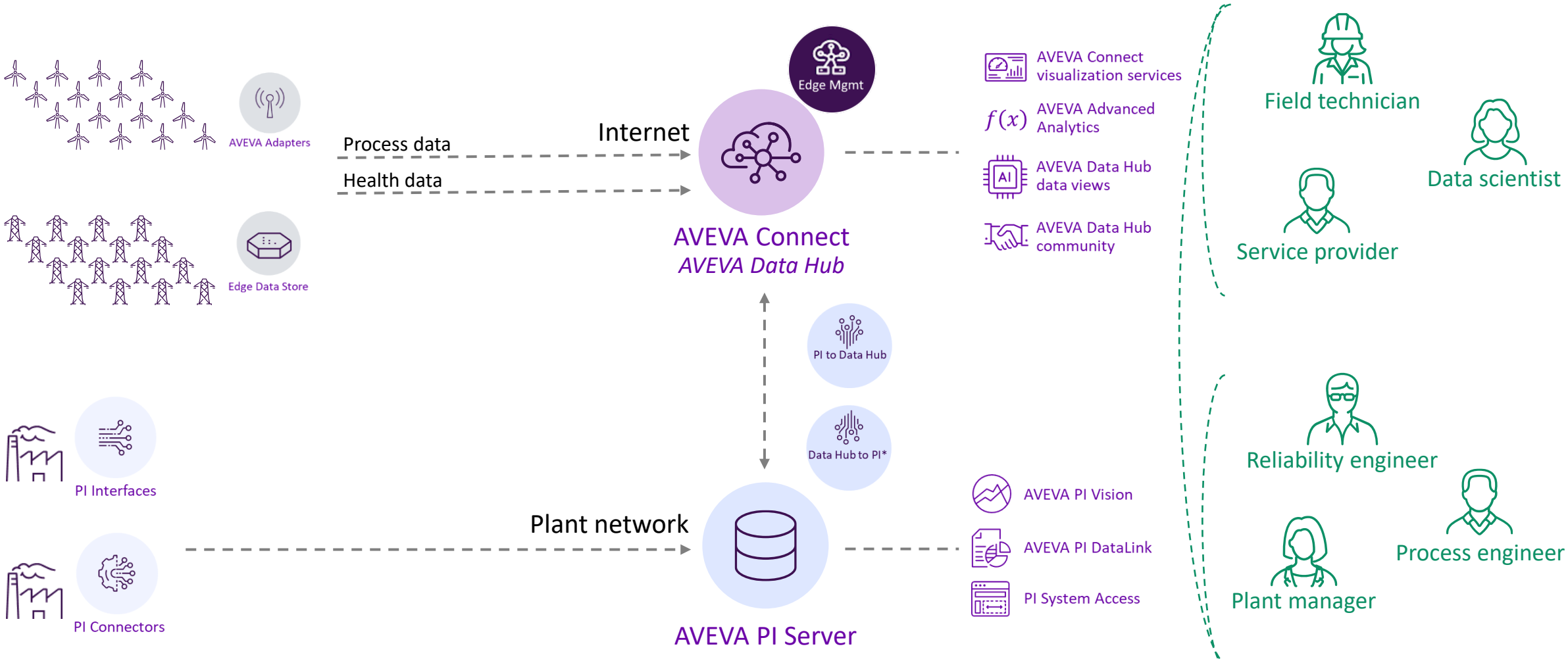
Remote device, configuration, & software management



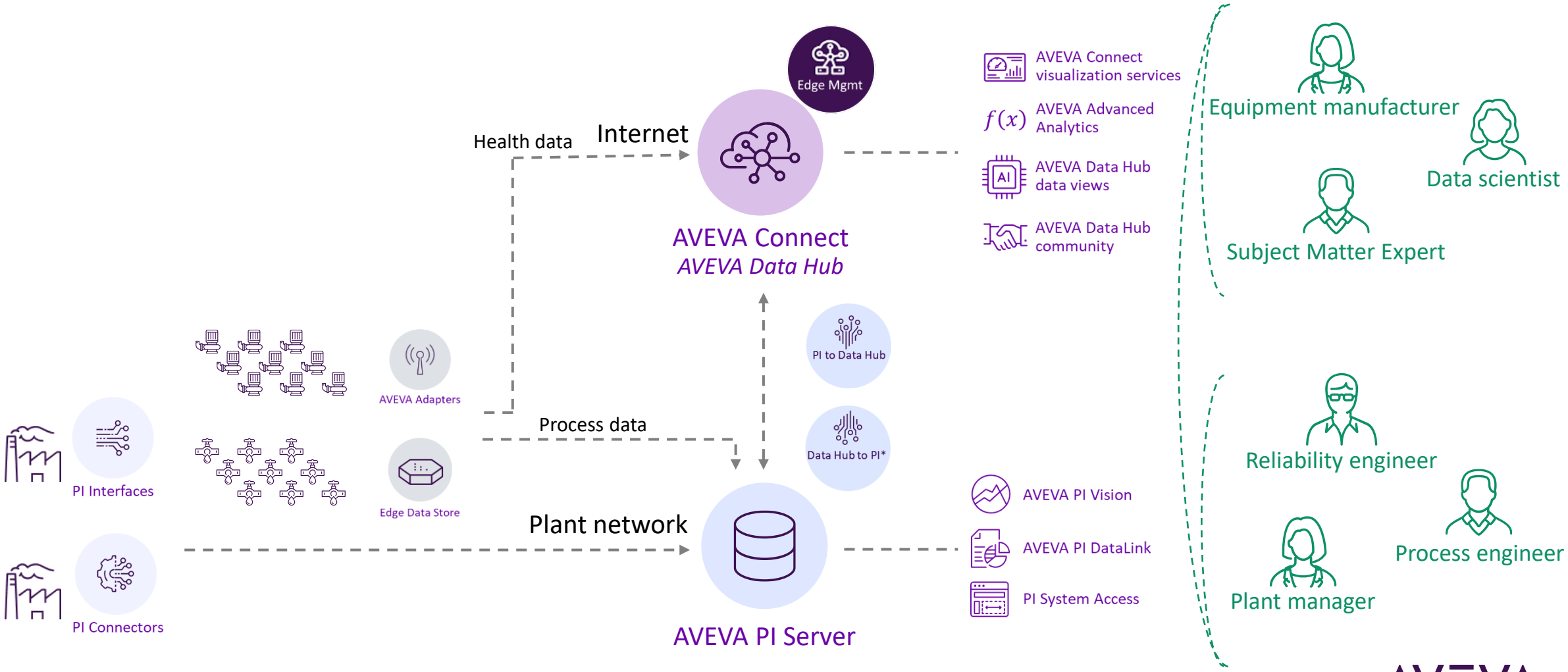
Edge modules & device compatibility

- Edge modules are Docker images of selected AVEVA application software, including AVEVA Adapters and Edge Data Store
- Edge modules require a Linux environment
  - Linux device (x64 and ARM64)
  - Windows device (x64)
    - Linux virtual machine
    - Azure IoT Edge for Linux on Windows (EFLOW)

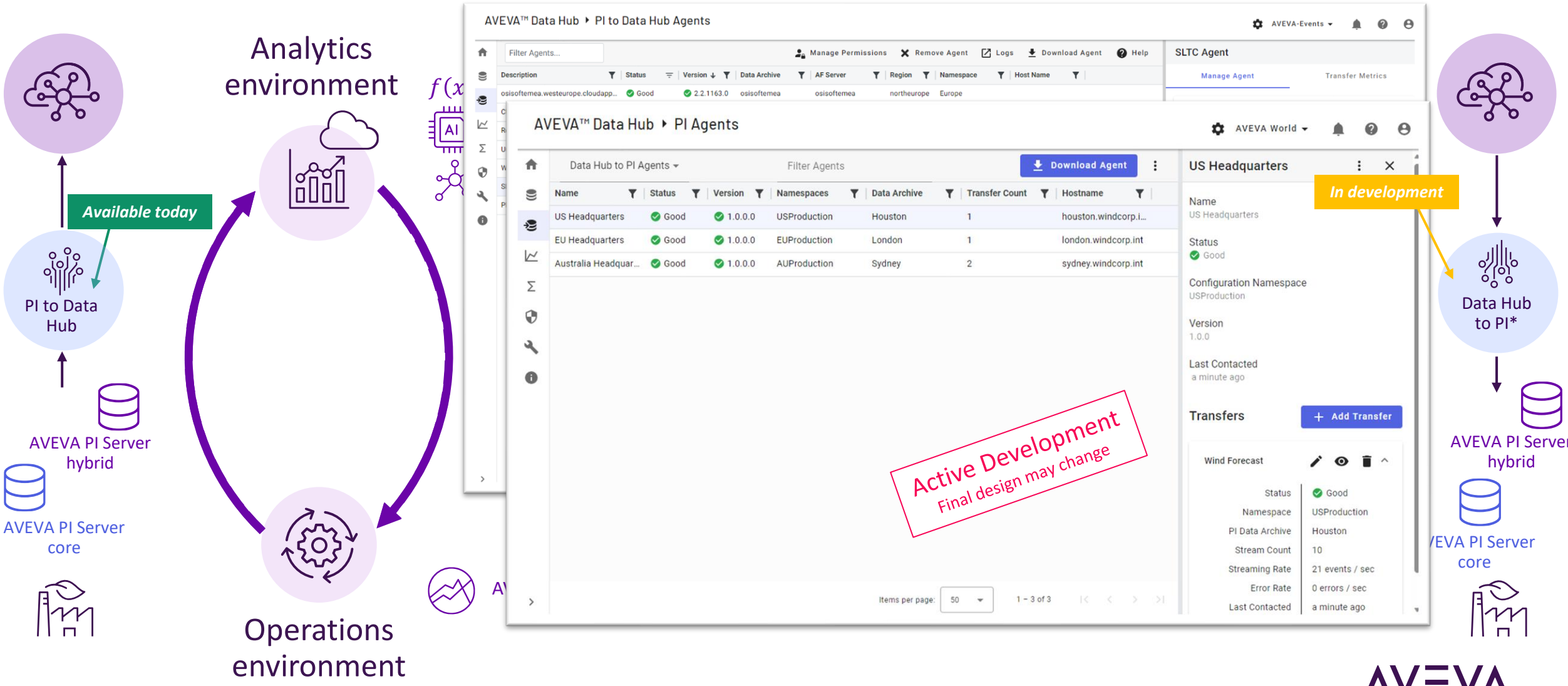
Remote operations monitoring use case



“Remote” operations monitoring use case



Connect your operations domain experts and data scientists



* In Development

Roadmap

Manageable software
Seamless infrastructure
Increased value and scope of data

What is next for data collection?

Released

Remote device management
Install & monitor edge modules using AVEVA Edge Management

Edge Data Store and AVEVA Adapter Edge Modules
Docker images that support remote device management; includes OPC UA & MQTT

AVEVA Adapter failover
Available with OPC UA and MQTT Adapters

Stability, performance, and security updates
PI System Connector
Batch, PItoPI, OPC DA, OPC A&E Interfaces

In Development

Remote software management Lighthouse
Configure & monitor edge modules using AVEVA Data Hub

More edge modules
Release more AVEVA Adapters as edge modules to configure and monitor via AVEVA Edge Management

Extend failover to more AVEVA Adapters
Release more Adapters with failover capability

Continued Support and Investment
Connectors: Relay, PI System, OPC UA
Various Interfaces

Researching

Data connectivity
Even more inbound options using AVEVA Adapters

Asset handling
Collection, storage, and transfer of asset metadata

Event handling
Collection, storage, and transfer of event data

Digital twin
Collect and transfer 1D data

OMF Endpoint Updates
Assets, events, 1D data, and relationships

Upcoming sessions

Facilitating digitalization in extra-small Cargill Facilities using Edge Data Store

Cargill

Wednesday, October 25 @ 2:50pm
Room 10

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

Thursday, October 26 @ 10:45am
Room 10

AVEVA Adapters and Edge Data Store IIoT configuration workshop

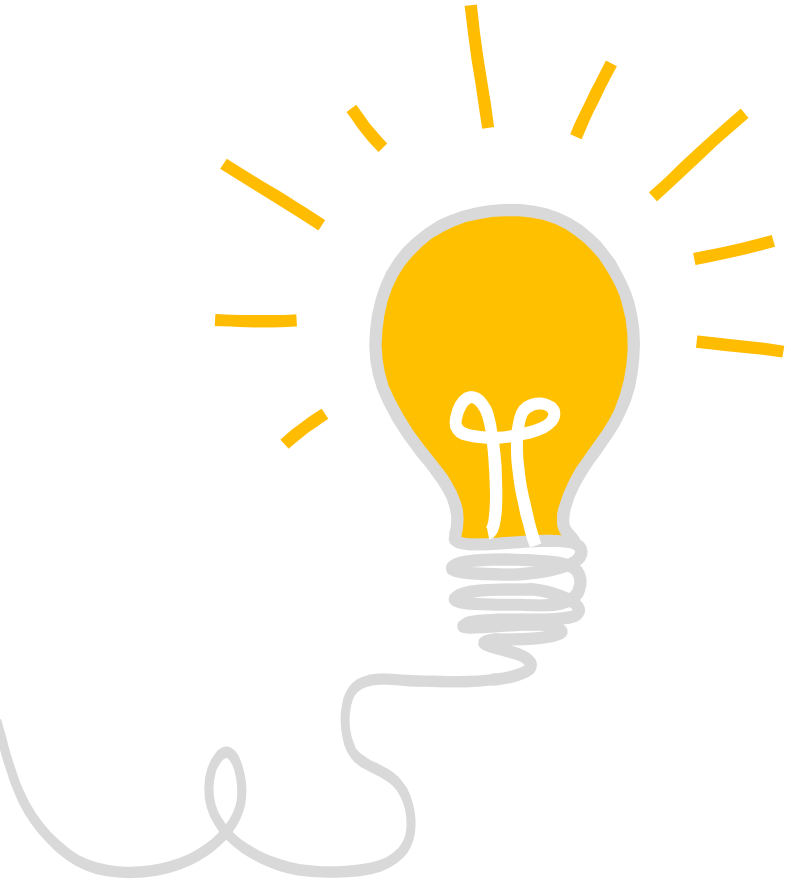
PI Geek Track

Thursday, October 26 @ 10:45am
Room 12

Extending your AVEVA PI System infrastructure to edge and cloud

Thursday, October 26 @ 1:30pm
Room 8

How can you influence the AVEVA product roadmap?



https://feedback.aveva.com

Let us know your product feedback!

Chris Felts

Staff Strategic Product Manager

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- AVEVA
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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

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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

AVEVA