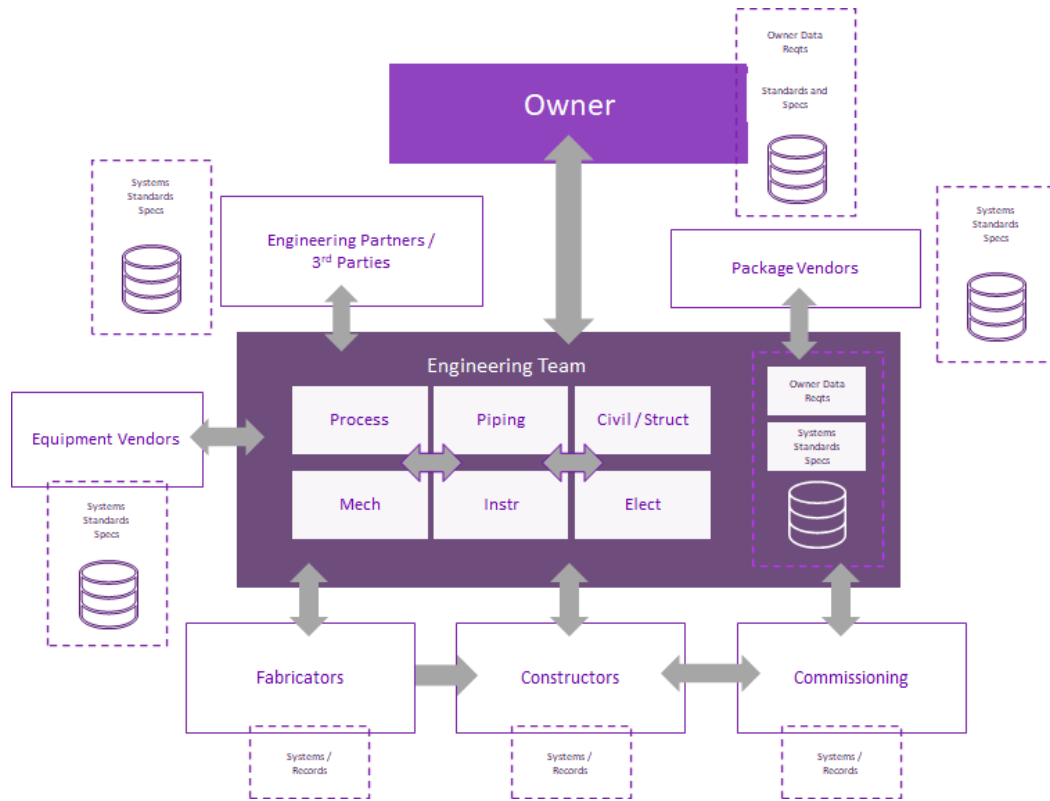OCTOBER 24, 2023

# AVEVA™ Unified Engineering for seamless integration and digital transformation
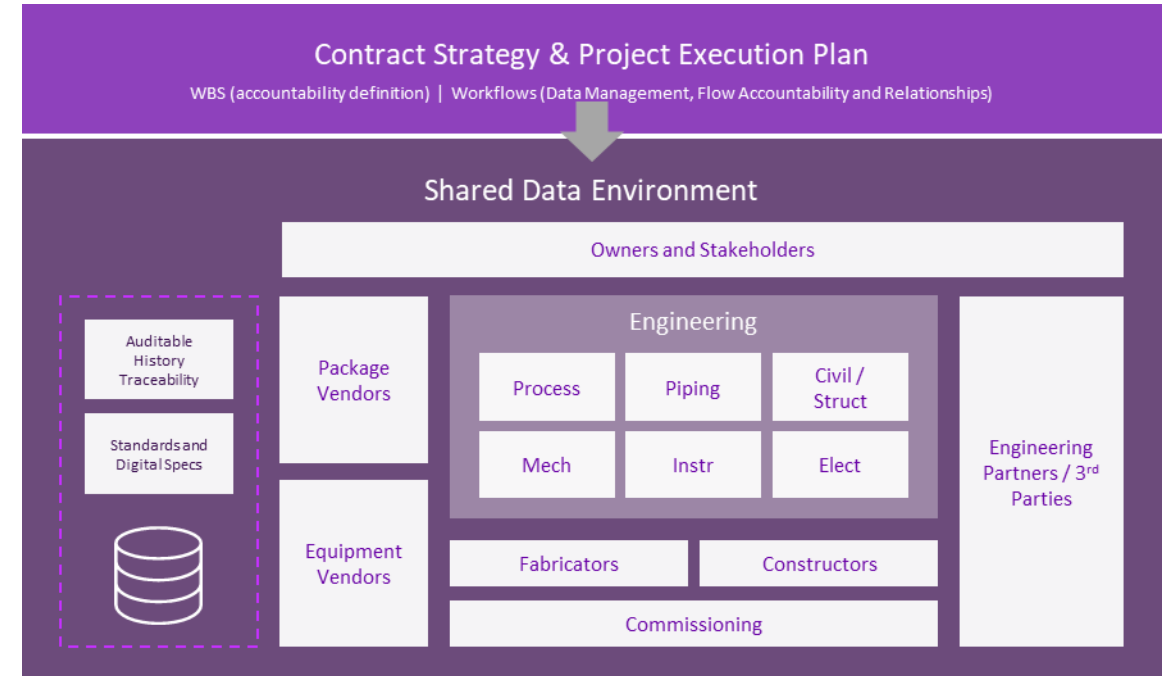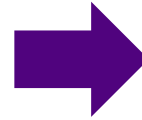
Brian Hughes, Vice President of Portfolio for Engineering

AVEVA

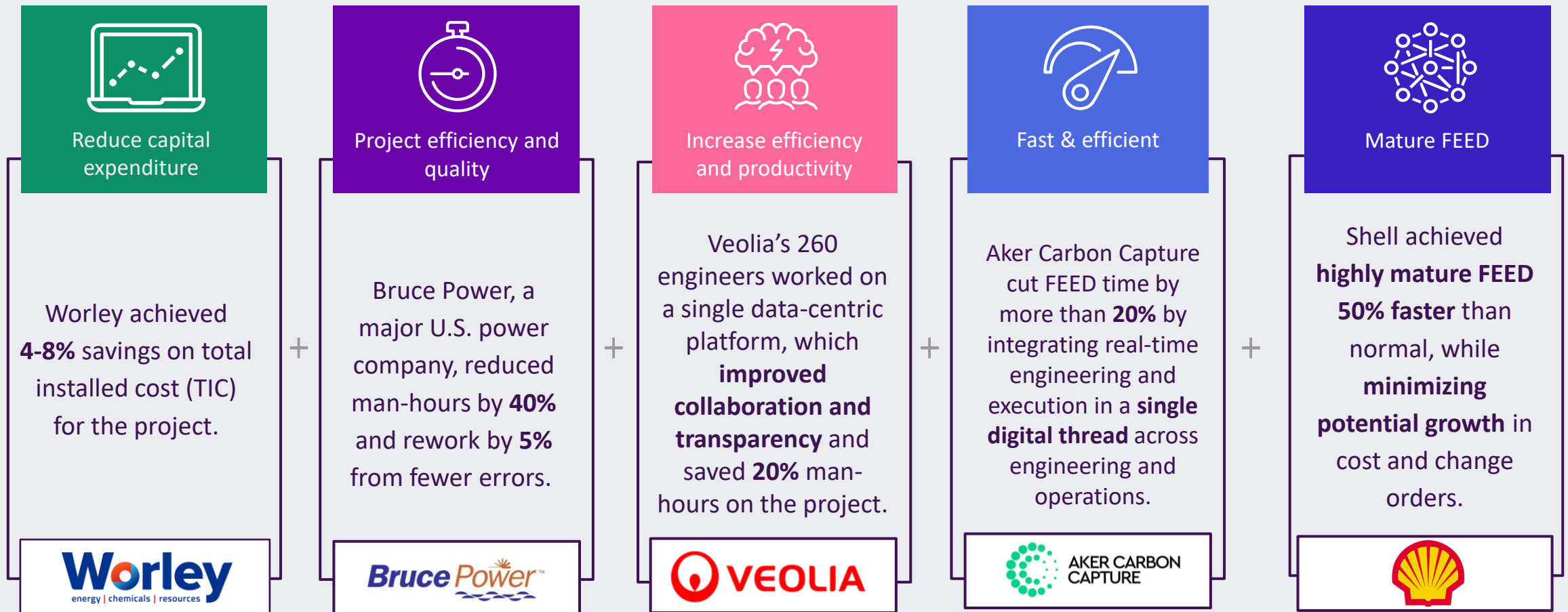# Evolving to a truly digital project environment
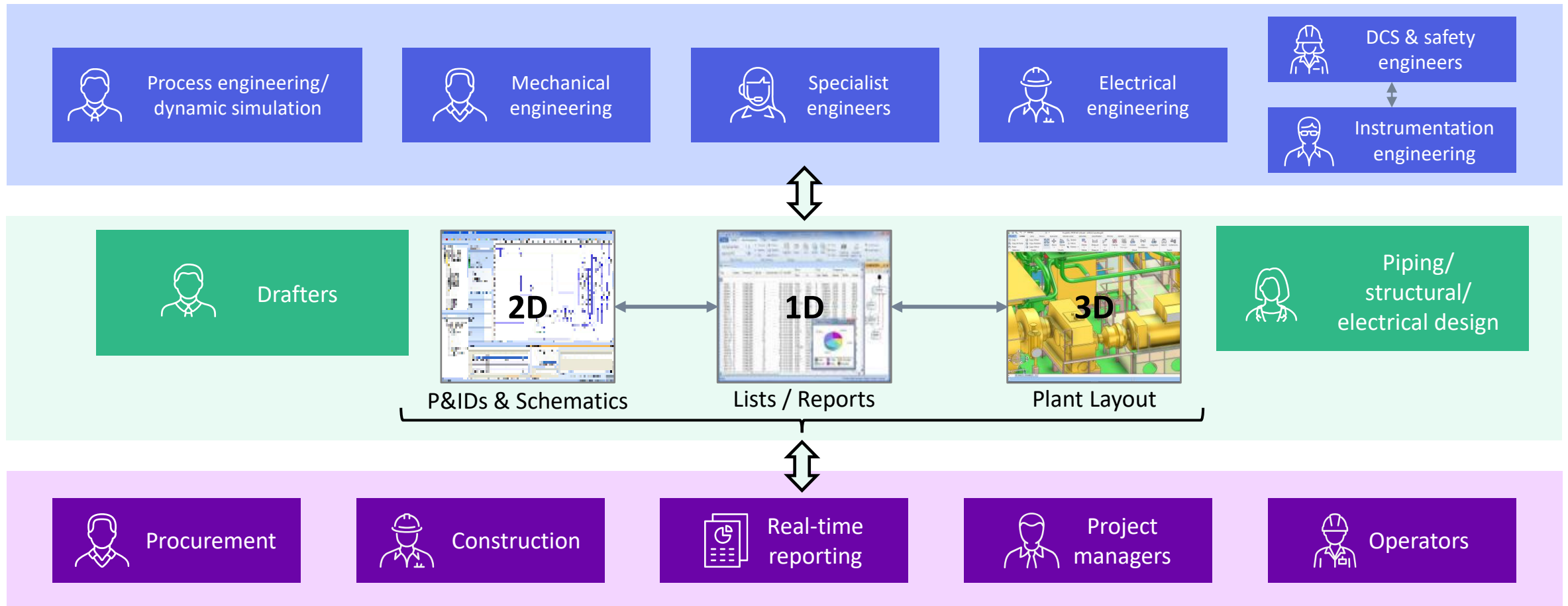


Disconnected systems, teams, and project data

Connected systems, teams, and project data

# Proven business outcomes

| Reduce capital expenditure | | Project efficiency and quality | | Increase efficiency and productivity | | Fast & efficient | | Mature FEED |
|---|---|---|---|---|---|---|---|---|
| Worley achieved **4-8%** savings on total installed cost (TIC) for the project. | + | Bruce Power, a major U.S. power company, reduced man-hours by **40%** and rework by **5%** from fewer errors. | + | Veolia's 260 engineers worked on a single data-centric platform, which **improved collaboration and transparency** and saved **20%** man-hours on the project. | + | Aker Carbon Capture cut FEED time by more than **20%** by integrating real-time engineering and execution in a **single digital thread** across engineering and operations. | + | Shell achieved **highly mature FEED 50% faster** than normal, while **minimizing potential growth** in cost and change orders. |

# AVEVA Unified Engineering

## 1D, 2D, 3D multi-discipline engineering and design leveraging common data



Process engineering/ dynamic simulation

Mechanical engineering

Specialist engineers

Electrical engineering

DCS & safety engineers

Instrumentation engineering

Drafters

**2D**

P&IDs & Schematics

**1D**

Lists / Reports

**3D**

Plant Layout

Piping/ structural/ electrical design

Procurement

Construction

Real-time reporting

Project managers

Operators

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# AVEVA Unified Engineering enables collaboration in a complex world

**Simplify**—Remove the need for multiple technologies that drive unnecessary costs and limit performance.
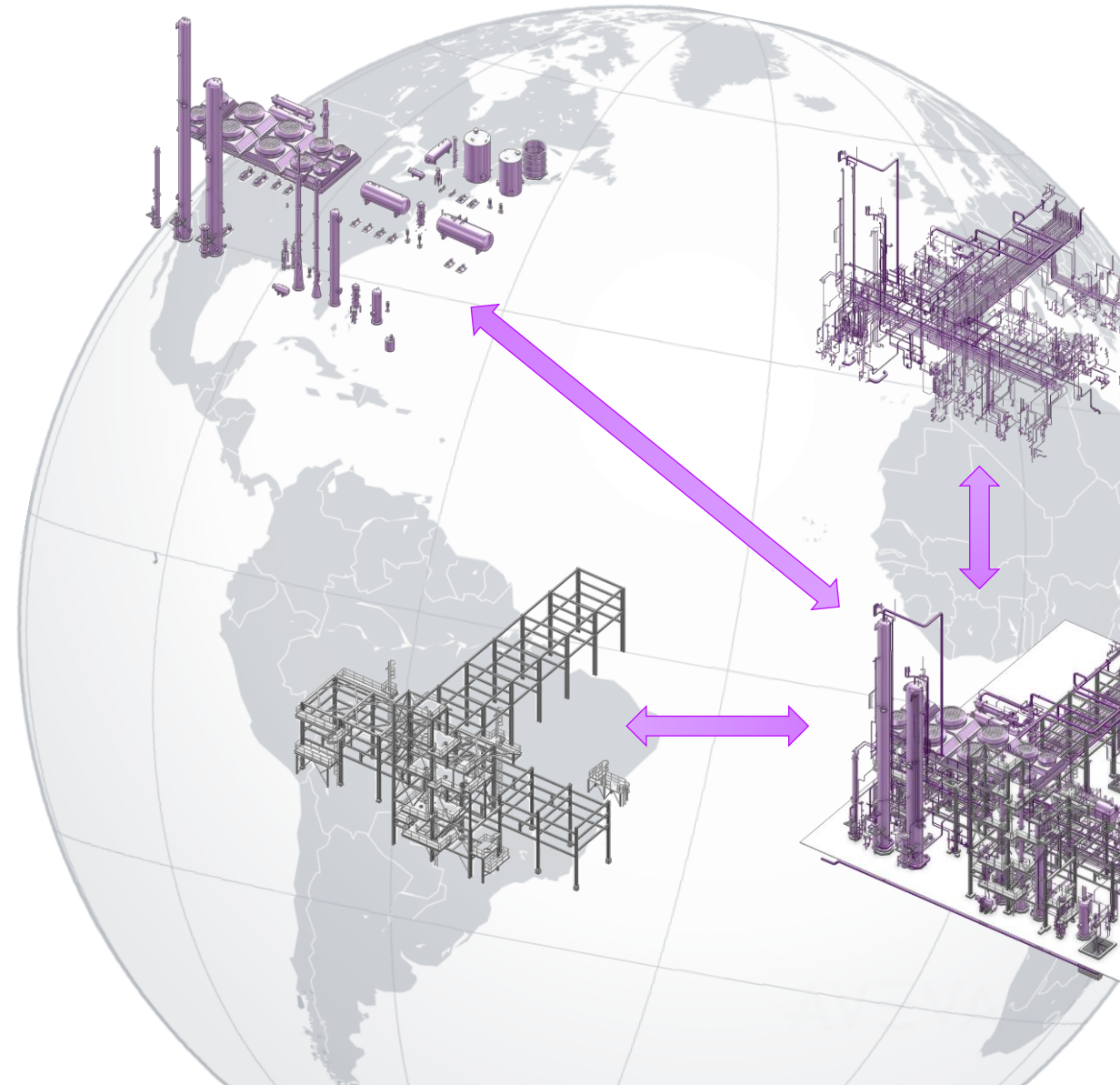
**Drive time to value**—Reduce complexity, time, and cost for setup and maintenance.

**Collaborative**—Make data-sharing easy, while meeting IT security and data access control demands.

**Dynamic**—Leverage flexible configurations that can be adjusted as projects, facilities, and businesses mature.

# Unified Engineering Roadmap

## Key initiatives

### All authoring solutions on Dabacon

AVEVA Electrical and Instrumentation Next-generation P&ID

### Unified Engineering

Multi-Site, multi-region, multi-organization

Phased Release with 3D first UE released July

1D/2D added UE Q4 2024.
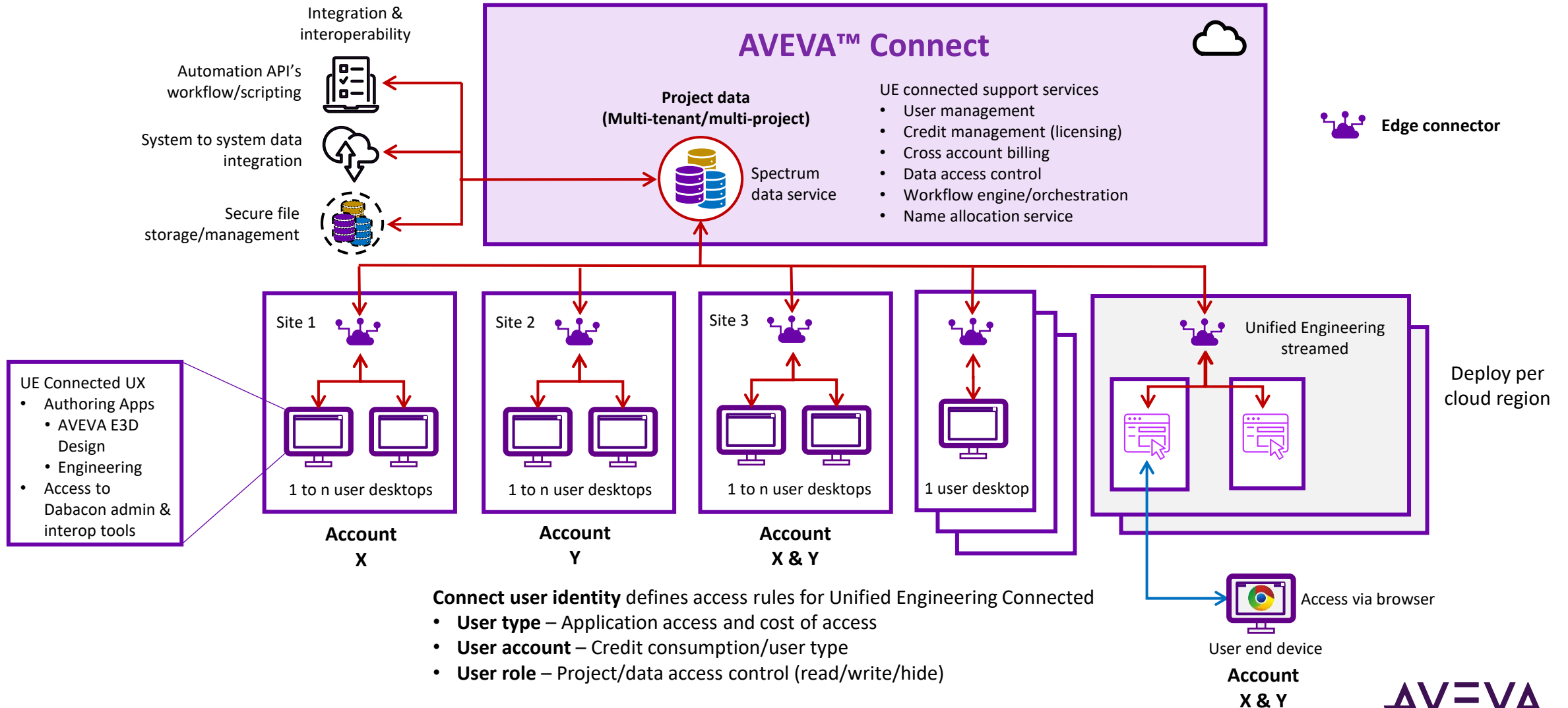
### Cloud UE / AVEVA™ Connect evolution

Appstream vs AWS Workspaces – Enable cloud UE option in more regions and support for data residency in countries
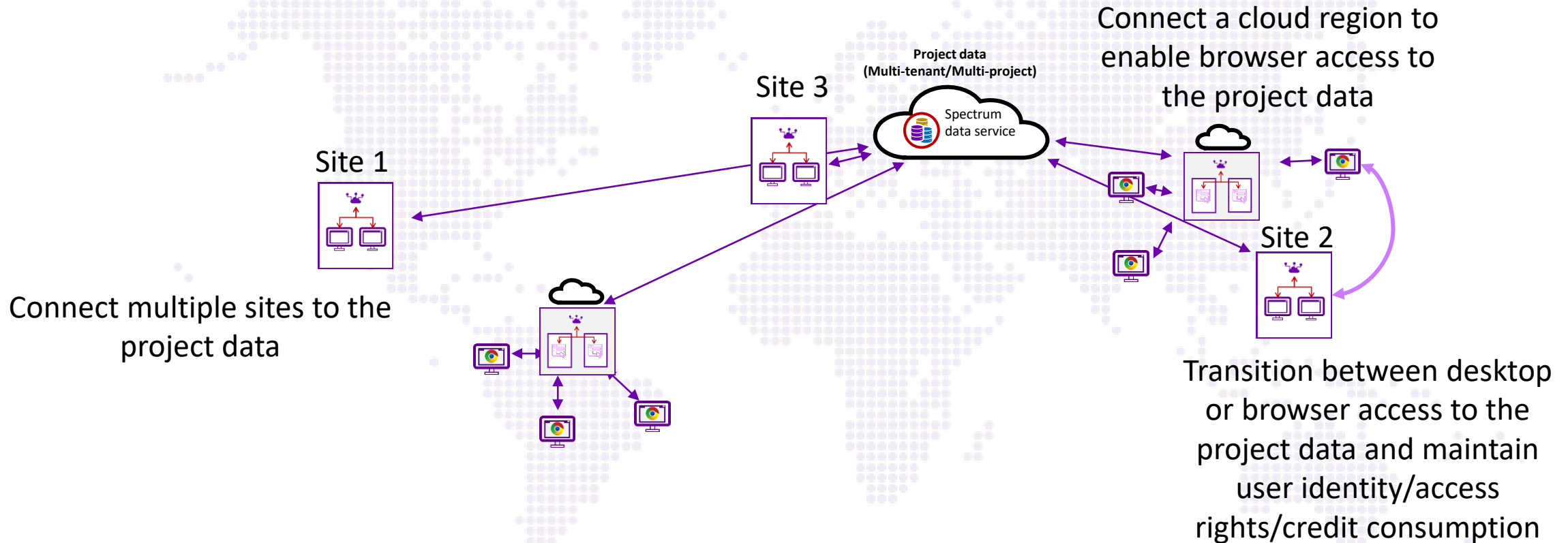
### Integration enhancements

Secure Cloud File Share AVEVA Integration Service Evolution Rest API of Data Source to Data Source mapping – Q4 2023 Cloud Configuration and Cloud Connector for AIS REST API – Q4 2023

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# AVEVA Unified Engineering—Next-gen solution (@ September 24)



Integration & interoperability

Automation API's workflow/scripting

System to system data integration

Secure file storage/management

**AVEVA™ Connect**

**Project data (Multi-tenant/multi-project)**

Spectrum data service

UE connected support services
- User management
- Credit management (licensing)
- Cross account billing
- Data access control
- Workflow engine/orchestration
- Name allocation service

**Edge connector**

UE Connected UX
- Authoring Apps
  - AVEVA E3D Design
  - Engineering
- Access to Dabacon admin & interop tools

Site 1
1 to n user desktops
**Account X**

Site 2
1 to n user desktops
**Account Y**

Site 3
1 to n user desktops
**Account X & Y**

1 user desktop

Unified Engineering streamed

Deploy per cloud region

Access via browser

User end device

**Account X & Y**

**Connect user identity** defines access rules for Unified Engineering Connected
- **User type** – Application access and cost of access
- **User account** – Credit consumption/user type
- **User role** – Project/data access control (read/write/hide)

# AVEVA Unified Engineering



**Project data (Multi-tenant/Multi-project)**

Spectrum data service

Site 3

Site 1

Connect a cloud region to enable browser access to the project data

Connect multiple sites to the project data

Site 2

Transition between desktop or browser access to the project data and maintain user identity/access rights/credit consumption

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# Unified Engineering API – Development direction

**3rd-party REST client**

**AVEVA Unified Engineering public REST APIs**

**Data transfer APIs**
- Publish & read data
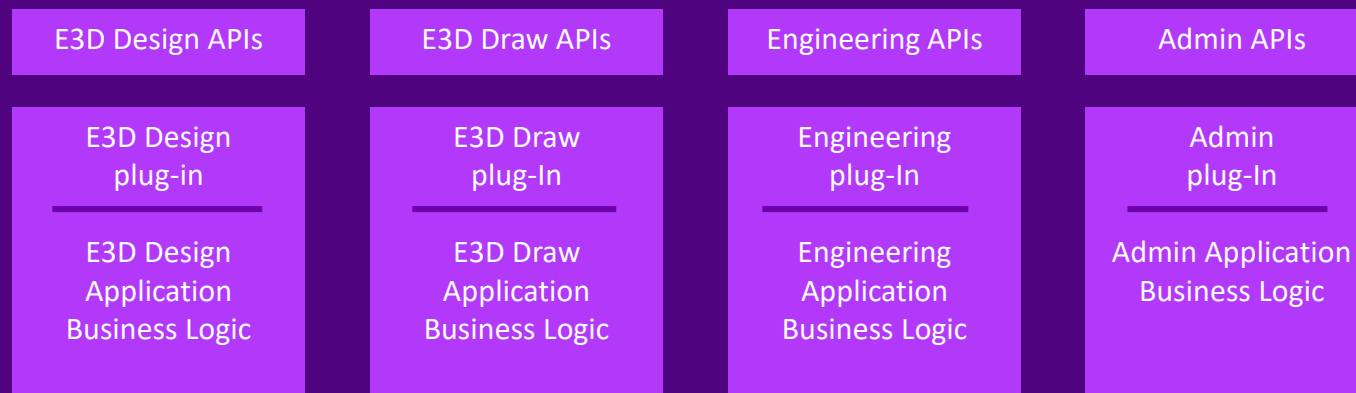- Pub/sub
- Notifications

**Action APIs**
- Create & modify objects
- Design automation
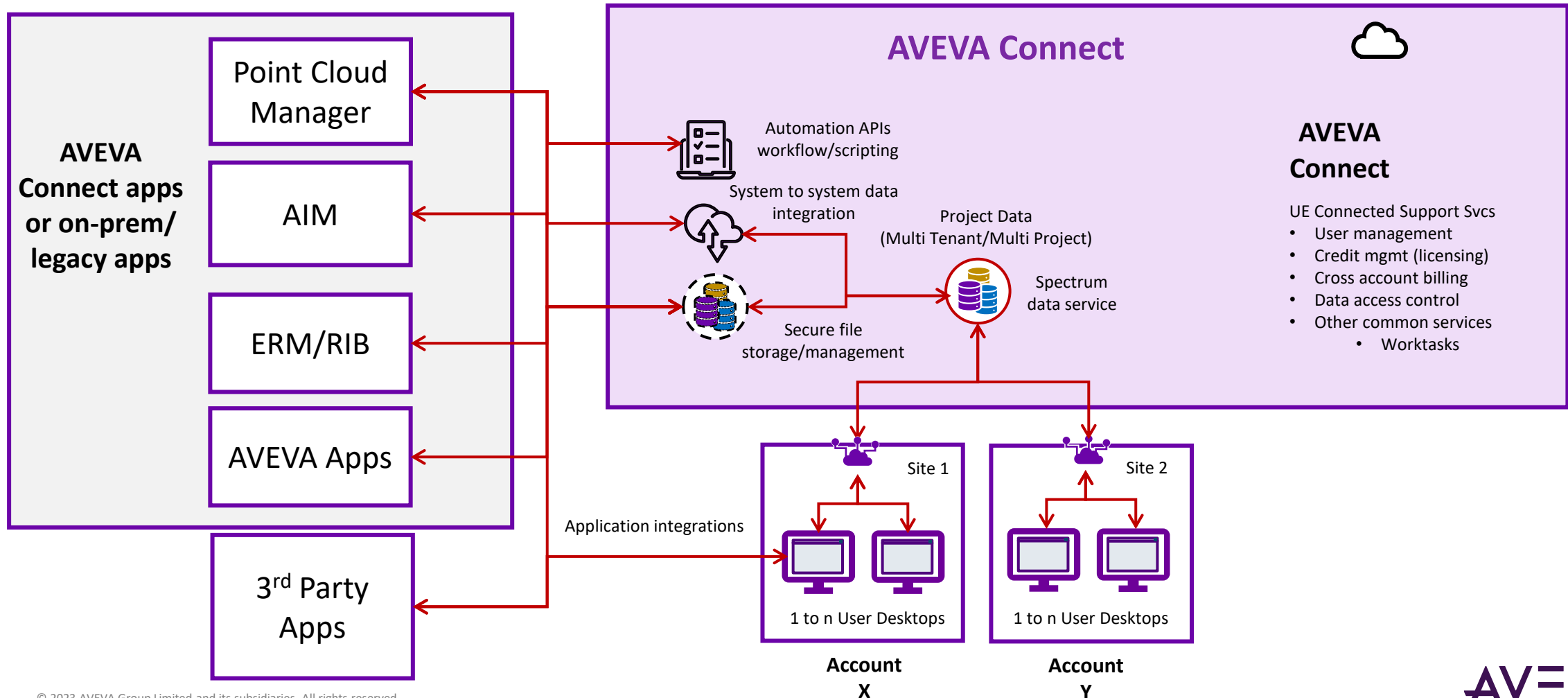- Batch processing, e.g. deliverable creation etc.

## AVEVA integration service (on-prem & cloud)

### AIS

Published data

Pub / sub

Pub / sub

AVEVA data sources

AVEVA & 3rd-party data sources

Direct / online
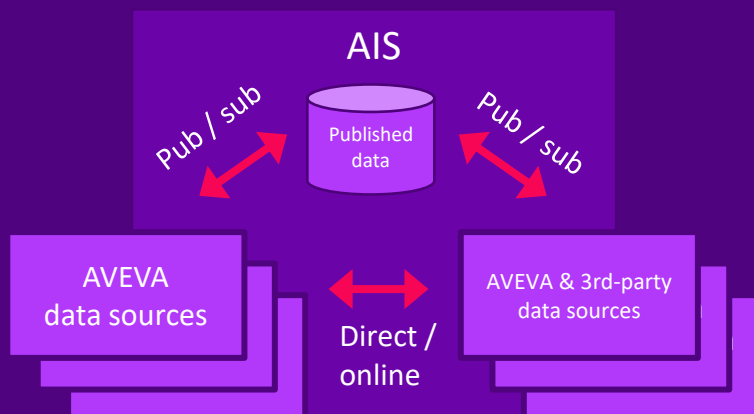
## AVEVA application service (API host service – Cloud/spectrum projects only)

| E3D Design APIs | E3D Draw APIs | Engineering APIs | Admin APIs |
|---|---|---|---|
| E3D Design plug-in | E3D Draw plug-In | Engineering plug-In | Admin plug-In |
| E3D Design Application Business Logic | E3D Draw Application Business Logic | Engineering Application Business Logic | Admin Application Business Logic |

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# AVEVA Unified Engineering connectivity to other AVEVA apps



**AVEVA Connect apps or on-prem/ legacy apps**

- Point Cloud Manager
- AIM
- ERM/RIB
- AVEVA Apps
- 3rd Party Apps

Application integrations

**AVEVA Connect**

- Automation APIs workflow/scripting
- System to system data integration
- Secure file storage/management

Project Data (Multi Tenant/Multi Project)

Spectrum data service

Site 1 — 1 to n User Desktops — **Account X**

Site 2 — 1 to n User Desktops — **Account Y**

**AVEVA Connect**

UE Connected Support Svcs
- User management
- Credit mgmt (licensing)
- Cross account billing
- Data access control
- Other common services
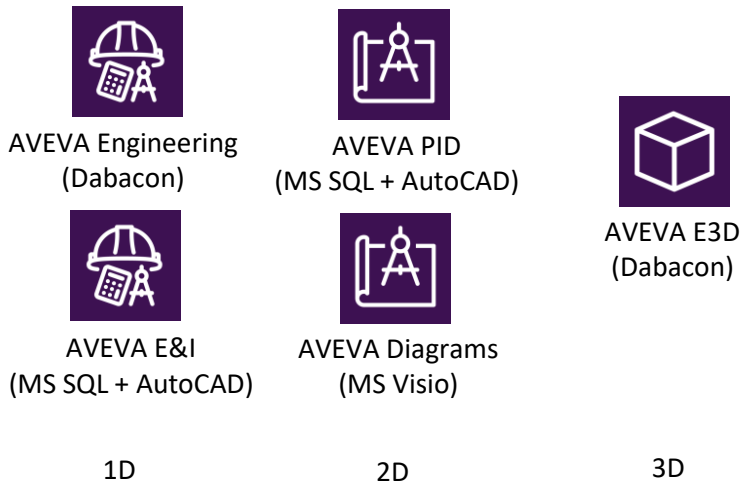  - Worktasks

# Unified Engineering evolution – Connecting on-prem to cloud



**Products**

Word | Excel | Outlook
Powerpoint | OneNote | Publisher
Access | OneDrive | Skype

**Suite**

Office

**Hybrid**

Office 365

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AVEVA Engineering
(Dabacon)

AVEVA PID
(MS SQL + AutoCAD)

AVEVA E3D
(Dabacon)

AVEVA E&I
(MS SQL + AutoCAD)

AVEVA Diagrams
(MS Visio)

1D          2D          3D

**Unified Engineering (a la carte)**

1D          2D          3D
(Dabacon + SQL + Visio + AutoCAD)

**UE Cloud (VM)**

(Dabacon + SQL + Visio + AutoCAD)

**Unified Engineering**

2D
1D          3D

(Dabacon)
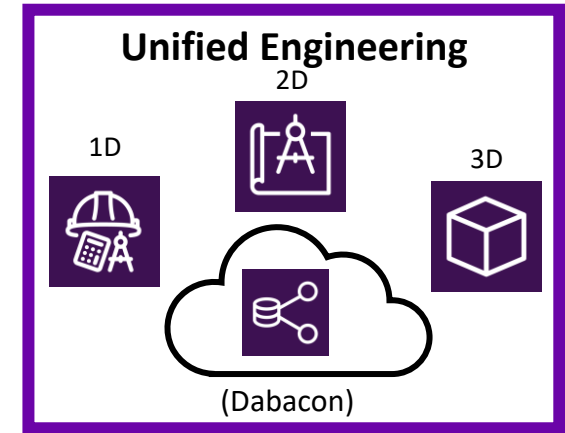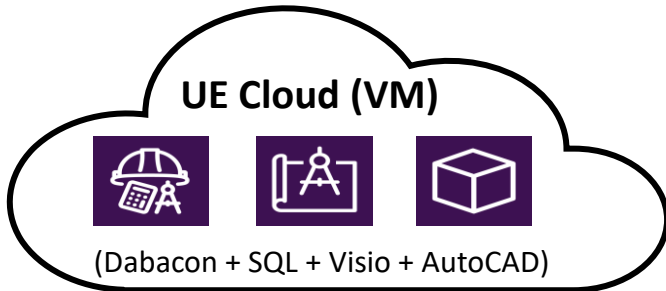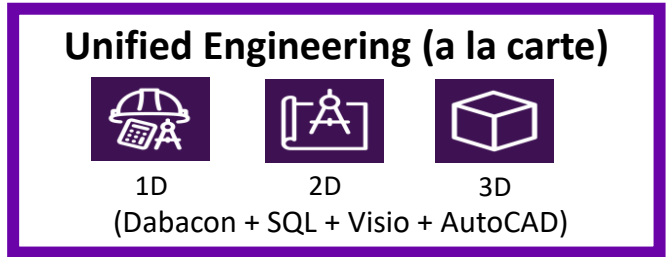
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# Previously -> Today -> Future

## Previously

A la carte products **(on-premise)**

- 3D:  AVEVA E3D Design
- 2D:  AVEVA P&ID or Diagrams,
- 1D:  AVEVA Engineering (including E&I disciplines)
- Simulation: AVEVA PRO/II, AVEVA Process Simulation

### OR

**AVEVA Unified Engineering on Connect (Cloud UE SaaS)**

- Standardized solutions as an AVEVA-managed cloud service
- Sold only with AVEVA™ FLEX cloud credits
- All the same products available as on-prem
- Utilizing AWS Workspaces today and transitioning to AWS streaming technology later this year

## Today (Summer 2023)

**In addition to what we have today...**

AVEVA Unified Engineering  (M1)

- Contains 3D product ONLY
- Project data stored in the  hybrid cloud (Spectrum data service)
- Available July 2023
- Access via AVEVA Flex cloud credits

## Future (Fall 2024)

AVEVA Unified Engineering (M2)

- Only available through consumption of AVEVA Flex cloud credits
- This solution will eventually replace AVEVA Unified Engineering on AVEVA Connect Cloud UE solution we are selling today.
- Data residency issues resolved (multiple countries supported)
- Hosting options:
  - All on-premise – Software and data fully hosted by customer
  - Hybrid cloud – Software installed on-prem, project data in the cloud using the Spectrum data service
  - Online – All applications are accessible via online access. Fully Hosted SaaS.

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# Unified Engineering Roadmap

Delivery types

## On-premises

All on-premise – software and data are fully hosted by customer.

## Hybrid

Hybrid cloud – software installed on-prem and project data stored in the cloud, using the Spectrum data service.

## Online

Online – all applications are accessible via online access. Fully Hosted SaaS.

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# AVEVA Unified Engineering

## 2023/24 Projected Feature Delivery

**AVEVA Unified Engineering 1.0 (incl. E3D Design 4.0.0)**

- AVEVA™ E3D Design: Spectrum enabled
- 64-bit
- Structures: Bent Plate
- Draw: Intelligent Tables
- Draw: AVEVA Whitespace Optimizer support
- Draw: Single Line Representation
- Piping: PCF interface
- Piping: AVEVA Process Simulation Export Interface
- Inclusion of Pointcloud Manager 23.1
- MultiCAD Import: Support for new CAD format versions
- BuildingSmart IFC certified 2x3 Export

**AVEVA Unified Engineering 2.0**

- Structures: Analysis Interface
- Mining: Conveyor Improvements
- HVAC Redesign (for production)
- MultiCAD Import: Support for new CAD format versions

**AVEVA Unified Engineering 3.0**

- Browser Access Option
- Communities/Data Sharing X-Account Permissions
- Isometrics: Draw based deliverable
- Piping: Sub-components
- Piping: Improved P&ID design integration
- Piping & Structures: Auto-Generative Design
- Inclusion of Pointcloud Manager x.x
- Engineering: Spectrum enabled
- Engineering: E&I On Dabacon Updates
- Engineering: Next Gen P&ID

| **Q2 2023** | **Q3 2023** | **Q4 2023** | **Q1 2024** | **Q2 2024** | **Q3 2024** | **Q4 2024** | **Q1 2025** |
|---|---|---|---|---|---|---|---|
| Apr-Jun | Jul-Sept | Oct-Dec | Jan-Mar | Apr-Jun | Jul-Sept | Oct – Dec | Jan-Mar |

**Roadmap based upon current requirement understanding and feature scope.**

**Please note delivery targets are subject to PO/Stakeholder verification of feature and passing of quality gateways.**

# Why use AVEVA Unified Engineering?

Where we add value

## Drive new digital business

Pursue new digital business deliverables in the market with a unified engineering platform developed to help you gain a competitive edge.

## Streamline collaboration

Enable engineers to complete deliverables faster and with greater transparency and maturity to deliver projects on time and on budget.

## Reduce cost, risk, and delays

Minimize engineering errors and accelerate project execution to deliver:

- 50% faster FEED stage.
- 30% increase in engineering efficiency.
- 5% reduction in TIC.

## Maximize margins

Reduce cost throughout capital projects, while improving the quality and reliability of engineering deliverables.

AVEVA

# Brian Hughes

## Vice President of Portfolio for Engineering
## AVEVA

- AVEVA
- Brian.hughes@aveva.com

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

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