



AVEVA™ Unified Engineering on AVEVA™ Connect

Service Description

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AVEVA Unified Engineering on AVEVA Connect

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Document Purpose and Audience

Document Purpose

This document describes the functional digital services of AVEVA Unified Engineering on AVEVA Connect, including its key features and limitations, as well as the operational parameters.

This document must be read in conjunction with the AVEVA Connect service description which describes the common services available for all functional digital services on AVEVA Connect. Any additions or exceptions to the common services are described in this document.

This document is neither an agreement, nor is a supporting document to the Product Schedules that outline the service commitment available on *the AVEVA site* <https://www.aveva.com/en/legal/>.

Audience

The audience of this document are IT departments and business decision makers who are investigating whether to leverage AVEVA cloud offers in their own IT landscape.

About AVEVA Unified Engineering

AVEVA Unified Engineering helps you control and accelerate the iterative design and engineering process within one integrated set of products.

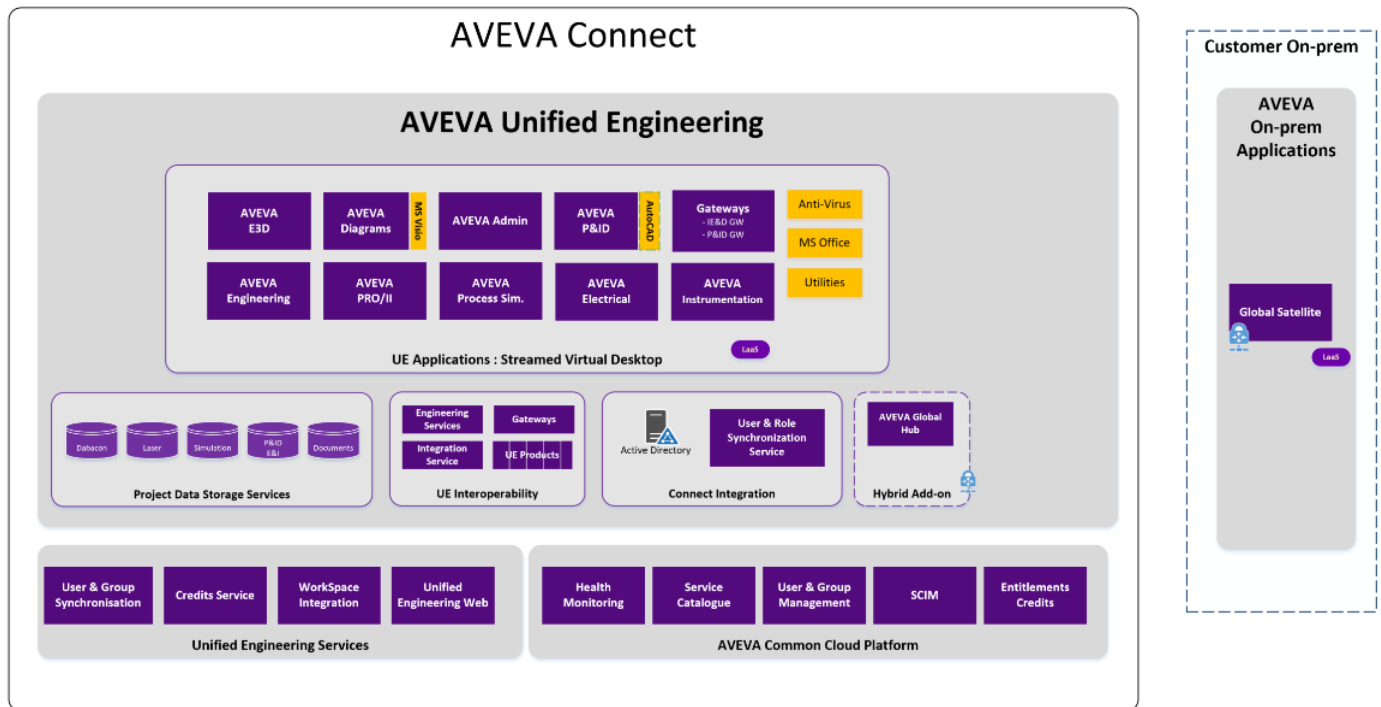
AVEVA Unified Engineering has been created for customers who are investing in capital assets and wish to maintain control and visibility of their digital asset, ensure visibility to on-going engineering and design progress and deliverable.

- **Accessible via AVEVA Connect:** AVEVA Unified Engineering applications are securely accessible over the Internet via AVEVA Connect, integrated with the AWS WorkSpaces client for Windows, to deliver a streamed virtual desktop environment to end users.
- **Virtual desktop:** AVEVA Unified Engineering includes a suite of the Windows desktop engineering and design authoring tools and simulation applications available from AVEVA along with any necessary Microsoft Office applications as an integrated virtual desktop solution. This enables users to collaborate on a centralized cloud-based digital asset.
- **Complete control over networking environment:** AVEVA Unified Engineering is provided to customers on a private instance basis, where each customer's environment is provisioned using dedicated cloud infrastructure that isolates their resources and data, and restricts administrative access to AVEVA named team members.

- Collaboration:** To support collaboration on a shared digital asset, highly resilient dedicated cloud infrastructure is used for the storage of application data on either AVEVA proprietary fileserver based Dabacon storage or relational data in Microsoft SQL Server databases. AVEVA Unified Engineering server applications running on virtualized server infrastructure enable the interoperability and data sharing between the Unified Engineering desktop applications.

Architecture

The illustration below shows the AVEVA Unified Engineering infrastructure, applications and supporting back-end services making up a single AVEVA Unified Engineering environment.



The service architecture adheres to a separation of concerns principle where each AVEVA server component is deployed on dedicated virtual infrastructure instance(s). The associated client software needs to be located on accessible virtual desktops delivered using the WorkSpaces service.

WorkSpaces for AVEVA Unified Engineering Application Desktops

AVEVA Unified Engineering on AVEVA Connect delivers the end-user applications using an advanced streaming technology from Amazon Web Services (AWS) called WorkSpaces.

WorkSpaces is a managed cloud desktop-as-a-service (DaaS) which provides a robust, secure, and managed cloud-based virtual desktop experience to meet the demanding needs of end-users accessing the AVEVA Unified Engineering applications, while ensuring optimal performance due to the high-bandwidth, low-latency product requirements.

For AVEVA Unified Engineering applications such as E3D that have specific requirements for a GPU processor to provide the best user experience, AWS provides a specific high-end WorkSpace graphics types that will be allocated to E3D users.

All AVEVA Unified Engineering WorkSpaces are created and managed using a custom golden image which represents the blueprint for the managed and maintained software installation and configurations of the AVEVA Unified Engineering version the customer has subscribed to.

This golden image is used as part of the automated provisioning and allocation of a standard WorkSpace instance for all new AVEVA Unified Engineering users. The provisioning process creates a dedicated desktop that is optimized to deliver the approved AVEVA Unified Engineering applications within the virtualized customer infrastructure on the AVEVA cloud.

Two WorkSpaces specifications are used:

- Graphics WorkSpaces with Plus bundle (8 CPU, 15GB RAM, 1 vGPU) for 3D user type
- Power WorkSpaces with Plus bundle (4 CPU, 16GB RAM) for all other AVEVA Unified Engineering user type

WorkSpaces Plus bundles include Microsoft Windows licensing, Microsoft Office Professional, Trend Micro Security and Utilities (IE11, Firefox)

Applications Included in AVEVA Unified Engineering

In addition to improvements to the underlying cloud platform, each AVEVA Unified Engineering on AVEVA Connect release provides updates and additions to the AVEVA Unified Engineering applications that are included with each release, and consequently the additional functionality from each application.

All other features and functionality are the same.

- **AVEVA Unified Engineering 2020**
 - AVEVA E3D 2.1
 - AVEVA Engineering 15.4
 - AVEVA Electrical and Instrumentation (SQL) 12.2
 - AVEVA PRO/II Simulation 2020.1
 - AVEVA Process Simulation 5.1
 - AVEVA Diagrams 14.1.3
 - AVEVA P&ID 12.2
- **AVEVA Unified Engineering 2021**
 - ○ AVEVA E3D 3.1
 - ○ AVEVA Engineering 15.2
 - ○ AVEVA PRO/II Simulation 10.2
 - ○ AVEVA Process Simulation 4.1 (formerly SimCentral 4.1)
 - ○ AVEVA Diagrams 14.1
 - ○ AVEVA P&ID 12.2

Service Overview

The AVEVA Unified Engineering on AVEVA Connect managed service provides access to geographically dispersed users, often including multiple collaborating EPCs, with an on-demand desktop which is optimized for design and engineering tasks using AVEVA applications all operating on a shared digital asset.

AVEVA Unified Engineering is made up of three components:

1. Standard Platform Services

Consists of one single AVEVA Unified Engineering environment per AVEVA Connect account in one region. In addition, this service includes integration of the AVEVA Unified Engineering application and management of project data flow for user collaboration. The default storage space is 500 GB but this can be extended to 1 TB without any further cost via a customer support request. Anything above that is considered as an add-on service, and comes in blocks of 2 TB.

A special storage type is required for laser data storage. It is available as a part of add-on services.

2. User Services

AVEVA Unified Engineering roles are assigned to user and groups in AVEVA Connect that need to access the AVEVA Unified Engineering solution. The roles provide the user with access to one of the four services via their allocated AVEVA Unified Engineering virtual desktop and appropriate type.

Services ->	1D	2D	Simulation	3D
Access To ->	AVEVA Engineering	1D application + AVEVA Electrical, AVEVA Instrumentation, AVEVA P&ID, AVEVA Diagrams	1D, 2D applications + AVEVA PRO/II, AVEVA Process Simulation	All + AVEVA E3D

3. Add-On Services

These services can be added on top of the standard platform if needed. The available add-ons are:

- Global Services: Option enabling synchronization of project data between on-premises and cloud using the AVEVA Global technology for the following use-case scenarios:
 - Synchronisation of E3D-based project data for on-premises deliverable production (such as isometrics and reports) using 3rd-party products and processes.
 - Project workshare for E3D-based project data configured as primary (writeable) at any single location.
 - Use of AVEVA Global extracts for multi-write project workshare for E3D-based project data.
- Incremental AVEVA Unified Engineering environment: Addition of a new region. For example, the client default base is in Europe, and an additional team of the client’s company in APAC needs a second environment to be provisioned in APAC.
- Additional project data storage of 2TB
- Optional laser data storage of 1 TB or 5 TB

To ensure a client’s desired project configuration is achieved, a strategy to correctly configure and maintain configuration for AVEVA Unified Engineering is required. This can be coordinated through AVEVA service delivery teams or by the client’s own project administration team, or with the help of a third-party system integrator with domain expertise of AVEVA products and projects.

Service Limitations

Limitations

- User management - AVEVA Connect enables federation with your corporate identity service for user management. Users can access their WorkSpaces if they have the subscription and appropriate roles assigned to them.
- Users do not have Windows administrative access to the WorkSpaces desktop environment.
- The AVEVA Unified Engineering service can be accessed on Windows devices only via the WorkSpaces desktop client.
- The Graphics Workspace has a limitation of single monitor display. Dual displays are not supported.
- Global Services Add-On Limitations:
 - One Cloud AVEVA Unified Engineering (hub) location supporting up to two on-premises (satellite) locations
 - Multi-layered (parent-child) satellites are not supported
 - Globalization of databases for E3D-based project data only is supported
 - Shared services functionality (Shared Manager & Scheduler) for project workshare is not supported
- .NET customization of the AVEVA Unified Engineering application user interface is not supported. The use of PML1 and PML2 customization are supported.
- Integration with external 3rd party applications - Out-of-the-box integration with on-premises deployments of AVEVA applications and databases, or other vendor products either on-premises or cloud based is not supported.

Regional Cloud Availability

AVEVA Unified Engineering is accessed via the public Internet using HTTPS/TLS and PCoIP (secure transport mechanisms).

AVEVA Unified Engineering focuses on delivery of our solutions from the following public cloud regions:

- Americas - Northern Virginia
- Americas - Oregon
- EMEA - Ireland
- APAC - Singapore
- APAC - Sydney

NOTE: AVEVA Unified Engineering is not available from any China cloud regions as these are autonomous facilities operated in isolation from cloud regions outside of China. Cross-region replication and operations between China regions and outside of China are not supported.

Users inside China can expect high network latency when connection to any web services outside of China. As such, AVEVA Unified Engineering cannot formally support users inside China.

Network, Bandwidth, Client and Other Software Requirements

Requirements for Standard Platform Services

- **Minimum Network and Bandwidth Requirements**

WorkSpaces client applications rely on access to resources in the cloud and require a connection which provides at least 1.0 Mbps of download bandwidth for power users at least 3.0 Mbps of download bandwidth for graphics users and with a recommended maximum round trip time of 250 ms.

The best user experience is achieved with a maximum round trip time of 150 ms. AVEVA 3D applications are recommended to have a round trip time of no more than 120 ms.

If your device has an intermittent connection to the network, the WorkSpaces client application may report an issue with the network.

AVEVA recommends the use of quality of service (QoS) to meet the traffic requirements and reduce packet loss and latency on the network.

- **Supported Clients**

Using WorkSpaces requires a native client application to be installed on the end-user device to enable a user to securely connect to their personal WorkSpaces. Each WorkSpaces user is granted a unique login to a persistent desktop environment as part of the integration with the AVEVA Connect account.

Supported Client: Windows Client Application (Microsoft Windows 7, Windows 8, or Windows 10.)

- **Firewall Port Requirements**

The following firewall ports are required for the WorkSpaces Windows client application:

- TCP Ports 443

This port is used for client application updates, registration, and authentication. This port must be open to a range of Amazon IP address for the region where AVEVA Unified Engineering service is delivered from.

- UDP and TCP Port 4172

This port is used for streaming the WorkSpace desktop and health checks and must be open to the Amazon PCoIP Gateway IP address ranges and health check servers in the region that the WorkSpace is in.

If required, most firewalls can support a configuration to only allow access to these ports from specific IP addresses/ranges on a corporate LAN, and not open these ports to all IP addresses.

- **Proxy Server Configuration Requirements**

If the client network requires use of a proxy server to access the Internet, you can enable the WorkSpaces client application to use a proxy for HTTPS (port 443) traffic. Proxy with authentication is not currently supported.

Requirements For Global Services Add-On

- Secure site-to-site VPN tunnels between customer on-premises network and AVEVA Unified Engineering on AVEVA Connect (tunnels are deployed as part of the managed service provided by AVEVA).
- Installation and configuration of AVEVA Global satellites on-premises in customer network domain:

- For configuration modifications of on-premises Customer Gateway Device (VPN endpoint), AVEVA will provide configuration changes as part of the managed service
- For configuration modifications of on-premises firewalls to permit site to site communications, AVEVA will provide the IP addresses of the AVEVA Unified Engineering on Connect global server
- Alignment of AVEVA product versions on-premises with those deployed in AVEVA Unified Engineering on AVEVA Connect in strict accordance with AVEVA Unified Engineering on AVEVA Connect update cadence (approximately 4 times per year).
- Actual network requirements will vary depending on the amount of data updates and frequency of updates.

Third Party Software Licenses

To provide customers with standard ready-to-go desktop services for users, additional software packages are required for some AVEVA Unified Engineering applications.

The following software licenses are included as part of AVEVA Unified Engineering as needed:

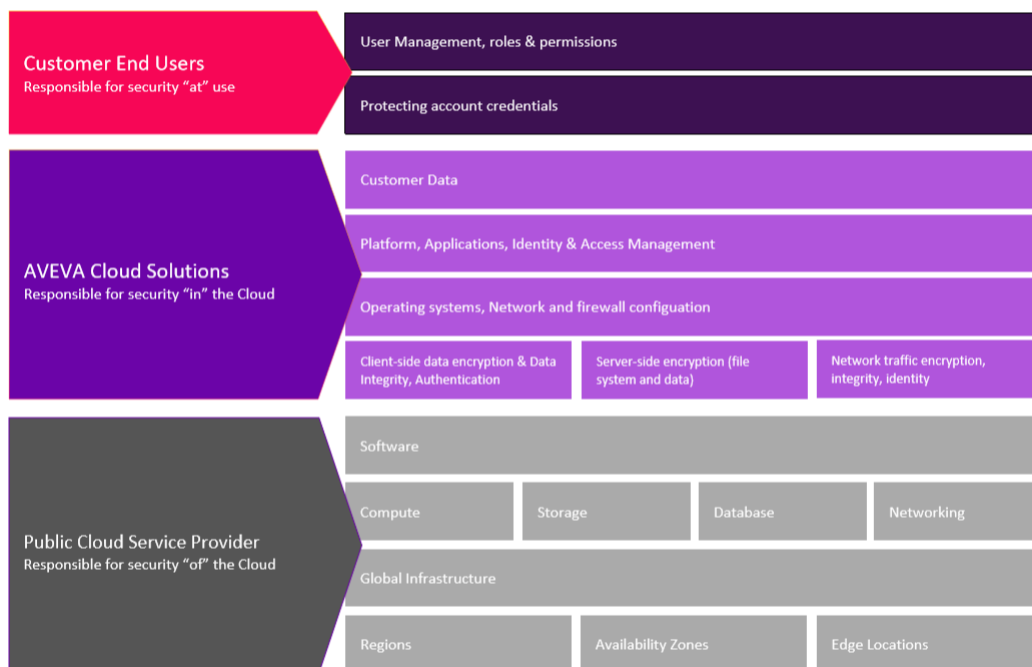
- AVEVA software as required for all services
- Microsoft Office Professional is bundled with all WorkSpace instances
- Microsoft Visio Standard 2016 for AVEVA Diagrams – Diagrams Module. Microsoft Visio is only made available on AVEVA Unified Engineering workspaces upon prior agreement with AVEVA.

Where required, the customer must provide the following software licenses for use:

- Autodesk AutoCAD (The customer should purchase stand-alone/single-user AutoCAD licenses directly from Autodesk.)

Security Standards and Compliance

AVEVA Unified Engineering leverages a Shared Responsibility Model to clearly define the responsibilities and scope operational responsibility.



With this model as the framework, AVEVA Unified Engineering implements the following to ensure high level of security.

Separation of Environments, Access Control and Administrative Privileges

Separation of Environments

Segregation of development and operational activities, and the separation of customer data is ensured by providing isolated, separate cloud environments for different functions.

Separate cloud environments are used for development, test and production purposes to provide a high level of isolation. AVEVA Unified Engineering uses isolated cloud networks for each customer.

AVEVA development teams have established testing QA/AA processes which include the use of public cloud security, monitoring and analysis tools, checks for compliance to the AVEVA Privacy Policy. Products and components are cloud cleared from a licensing perspective, and security testing to confirm web-application security implementation is aligned with OWASP recommendations.

Administrative Access

To enable the secure management and configuration of AVEVA Unified Engineering applications and services, authorized members of the AVEVA Services and Cloud DevOps teams use Microsoft Remote Desktop Protocol (RDP) to access specific cloud server instances. This access is granted to named users via a bastion server which acts as a jump server allowing authorized AVEVA team members (Cloud DevOps team) to establish a second RDP session to jump onto the relevant private subnet server(s) to carry out administration and configuration tasks.

WorkSpaces Security

Registration Security

As part of the AVEVA Unified Engineering managed service, each new WorkSpaces is provisioned for a user as part of the self-service user and role management functionality of AVEVA Connect, and the integrated Unified Engineering services. User identity is managed by AVEVA Connect and the integrated AVEVA Unified Engineering single sign-on (SSO), eliminating the need for a separate registration process.

Microsoft Active Directory for User Identity

Integration of the AVEVA Connect user identify management services and the dedicated Microsoft Active Directory instance within each customer's AVEVA Unified Engineering environment is used to control user access, privileges and permissions across the AVEVA Unified Engineering service. This aligns with the standard identity repository on Windows-based networks. Microsoft Active Directory is a highly available managed service provided by the cloud service provider.

Access Control

To control user access, for example if the user leaves the company or for some other reason needs to be blocked permanently or temporarily, the user account can be disabled by the process of AVEVA Connect account disabling/removal.

WorkSpaces Network Encryption

The device running the WorkSpaces client will use the same two ports for connectivity to the WorkSpaces service. Traffic on both ports is encrypted.

The WorkSpaces client uses HTTPS over port 443 for all authentication and session-related information, and leverages TLS 1.2 for encrypting traffic.

The WorkSpaces client uses port 4172 (PcoIP) with both TCP and UDP for encrypted pixel streaming to a given WorkSpaces and for network health checks. Pixel streaming traffic leverages AES-256-bit encryption for communication between the desktop client and the AWS WorkSpaces service, via the streaming gateway.

High Availability, Business Continuity, and Data Protection

To ensure high availability, business continuity, and data protection, AVEVA Unified Engineering follows the time intervals given below.

- **Data Storage:** The AVEVA Unified Engineering applications use either the Dabacon platform and file-based datastore, or Microsoft SQL Server.
- **Data Backup**
 - Backups are created on a daily schedule.
 - All backup data is stored in the same cloud region as the cloud service. All backups are held on secondary storage which is replicated across multiple data centers within the same region.

NOTE: Production environment data backup retention exceeds the requirement to meet the defined recovery targets and service levels.

- **User Profile and Data**
 - When a WorkSpaces client is provisioned, a separate volume (D:) is created for the user and all profile data is committed to these separate volumes (D:\Users\%username%). As the volume is a virtual disk which remains attached to the user's WorkSpaces client, there is no overhead on the logon process. This also makes WorkSpaces persistent to the user; a 1-to-1 relationship. As such, there is no roaming of profiles between WorkSpaces.
 - The user volume is protected by snapshotting it every 12 hours. This snapshot is independent of the OS volume (C:) and when a WorkSpaces client is rebuilt, a new user volume is created from the latest snapshot only.

- **Disaster Recovery**

In a disaster situation, infrastructure and services shall be provisioned to an alternate, unaffected location. Data shall be restored from backup or retrieved from replicas where available for the specific solution and service.

Cloud Service	Recovery Point Objective (RPO)
AVEVA Unified Engineering	24 hours

Cloud Service	Recovery Time Objective (RTO)
AVEVA Unified Engineering	48 hours

Service Level Commitment

AVEVA Cloud Services are governed by the Cloud Service Agreement available on the AVEVA Legal site *AVEVA Cloud Services Agreement* <https://www.aveva.com/en/legal/cloud-services/>.

The *Service Level Commitment for AVEVA Cloud Services* <https://www.aveva.com/en/legal/trust/servicelevel/> is a supporting document that describes the service level commitment for all available AVEVA Cloud Services.

Exclusions

- Infrastructure Availability: The Service Level Agreement (SLA) does not include non-availability due to scheduled or emergency maintenance of the application services or AVEVA Connect.
- Service levels are applicable to production environments only.
- For production environments employing the Global Services Add-On hybrid project-sharing service (using AVEVA Global), the service level commitment is not applicable to services dependent either directly or indirectly on on-premises processes or configurations.

For example, under the following scenarios the service level commitment is not applicable to related services:

- Site-to-site VPN tunnel availability affected by on-premises Keepalived scripts failing
- AVEVA Global update availability affected by changes to any on-premises component failure (such as infrastructure, networking, compute, firewalls, routing etc.)

Decommission of the Service

Upon request and confirmation from the customer to decommission the service, AVEVA initiates the following:

- Deletion of all customer data held in databases, file storage and back-ups
- Removal of all user WorkSpaces and any data stored on user drives
- Removal of all cloud infrastructure and serverless resources associated with the customer tenant

A backup of the Dabacon databases, last full SQL Server back-up and file-based data may be provided (for an additional fee) upon request from the customer as part of the request for decommissioning.

Additional Services

AVEVA offers an extensive collection of Customer Success Accelerators, well-defined, outcome-based services that are designed to ensure you realize the maximum benefit from your investment in our software through all the lifecycle stages of your software application.

For more details, visit the *Customer Success Accelerators site* <https://www.aveva.com/en/support/customer-first/success-accelerators/>.

The following services can be provided for AVEVA Unified Engineering:

Administrative Services

The following administrative services are available on recurring or subscription basis:

- Application administration
- Database administration (Dabacon)

- Data cleansing, project and data validation, data consistency checking
- Routine data updates
- Corporate standards implementation
- Routine deliverables for drawing production, report generation
- Standard reporting, suite of best-practice reports

Content Creation

Content creation projects are scoped and priced per customer requirements, to identify and provide application content to:

- Accelerate implementations for customers by having a library of ready-made content available
- Reduce duplication by our customers having to repeatedly build these items
- Provide an "out of the box" solution with standard content

Content varies by application, but it is generally defined as:

- Catalogue items and specifications
- Datasheets and symbols
- Data model, UDETs/UDAs

Further information is available on request.