Deployment Guide

Installing Altair Data Analytics Products

Altair Knowledge Studio® 2025.0

Altair Knowledge Seeker® 2025.0

Altair Knowledge Studio® for Apache Spark™ 2025.0

Table of Contents

1. Introduction

This document provides instructions on deploying Altair Knowledge Studio and Knowledge Seeker products of version 2025.0 for all platforms and configurations.

If you are upgrading from an older version, see [Section 4: Release 2025.0 and Previous Versions](#).

The Architecture White Paper is available upon request.

2. Product Components (Overview)

This guide covers deployment procedures for the desktop and server-based configurations of the following products:

- Knowledge Studio
- Knowledge Seeker
- Knowledge Studio for Apache Spark

Knowledge Studio and Knowledge Seeker include R and Python language integration features and SAS Language integration. If the intended users are going to use these features, R and Python software must be installed first.

The product name and feature set activated for each product are defined by the license applied after the installation.

2.1 Knowledge Studio and Knowledge Seeker

The **Standalone configuration** of Knowledge Studio and Knowledge Seeker for Windows Desktop or Windows Server includes the following installation packages:

- KS Workstation
- KS Library for R
- Altair SLC
- Altair Analytics Workbench

R and Python software are prerequisites. Installation instructions for the Standalone configuration are given in [Section 7](#).

The **Client/Server configuration for Windows Server** includes the following installation packages:

Client side:

- KS Workstation
- Altair Analytics Workbench

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Server side:

- KS Server

- KS Library for R

- Altair SLC

The **Client/Server configuration for Linux** includes KS Workstation, KS Server, and Altair SLC. KS Libraries for R and Python are built in the KS Server package.

Prerequisite software: R and Python software must be installed on the server side if the end users require R or Python code integration features.

The installation procedure for the client/server configuration is described in Section 8.

2.2 Knowledge Studio for Apache Spark

Knowledge Studio for Apache Spark™ is a data science platform integrated with Apache Spark technology to provide predictive analytics on large-scale distributed data structures - Hadoop HDFS, Amazon S3, and other storage types supported by Spark.

For the prerequisites concerning the Apache Spark server and the storage cluster, see "*Requirements for Knowledge Studio for Apache Spark*" in Section 3.2.

The **Standalone configuration** of Knowledge Studio for Apache Spark includes KS Workstation. For installation instructions, see Section 7.

The **Client/Server configuration for Windows or Linux** includes the following installation packages:

Client side:

- KS Workstation

Server side:

- KS Server

The installation procedure for the client/server configuration is described in Section 8.

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3. Supported Hardware and Software Platforms

3.1. Overview: Supported Operating Systems

Altair Data Analytics products version 2025.0 are available in the standalone and client/server configurations for the following operating systems:

KS Workstation (Standalone or Client)	KS Server
Windows on x86-64 platform • Windows 10 • Windows 11 • Windows Server 2016 • Windows Server 2019 • Windows Server 2022	Windows Server on x86-64 platform: • Windows Server 2016 • Windows Server 2019 • Windows Server 2022
	Linux on x86-64 platform: • Red Hat Enterprise Linux 7, 8, and 9 • CentOS 7, CentOS Stream 8 and 9

 ➢ All products are supported only on 64-bit systems.
 ➢ Knowledge Studio for Apache Spark requires Apache Spark server. System requirements for this product are described at the end of Section 3.2 below.

3.2. System Requirements

- **Microsoft .NET Framework 4.6.2 (or higher) and 3.5 Service Pack 1** are required for KS Workstation. The KS Workstation installation package includes the web installer for Microsoft .NET Framework 4.6.2 and installs it unless the same or a higher version is already present. It also enables Microsoft .NET Framework 3.5 if it is not already enabled in Windows features.

- **Microsoft Visual C++ 2015-2022 Redistributable** package is required for KS Workstation and KS Server. Both KS Workstation and KS Server installers include the web installer for Microsoft Visual C++ 2015-2022 Redistributable and installs it unless the same or a higher version is already present.

- KS Workstation includes KS PDF Printer component, which enables the *Copy to PDF* functionality for exporting decision trees, charts, and reports to PDF. The printer uses Amyuni PDF Converter by Amyuni Technologies, Inc.

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The following are the minimum and recommended requirements for all configurations:

1. **Standalone Configuration**

KS Workstation 2025.0 – Standalone

Minimum	Recommended

Windows 10 or 11 (64-bit)
x86-64 CPU, 2 GHz
4 GB RAM
Disk space:
   • 4 GB for program files **
   • 15+ GB for user's projects
Monitor resolution: 1152x864
	Windows 10 or 11 (64-bit)
	Quad-core x86-64 CPU, 2 GHz, or better
	8 GB RAM or more *
	Disk space:
	   • 4 GB for program files **
	   • 20+ GB for user's projects
	Monitor resolution: 1680x1050 or better

* The amount of RAM required for the Standalone configuration depends on the typical size of analytic datasets and the types of models to be built. If the users will be dealing with very large datasets and need help assessing the required amount of RAM, please email dasupport@altair.com.

** If R and Python integration features are required, R and Python program files and packages may take additional 3 GB or more.

2. **Client/Server Configuration**

KS Workstation 2025.0 – Client

Minimum	Recommended
Windows 10 or 11 (64-bit) x86-64 based CPU, 2 GHz 4 GB RAM Disk space: 4 GB for program files Monitor resolution: 1152x864	Windows 10 or 11 (64-bit) x86-64 based CPU, 2 GHz or higher 8 GB RAM or more Disk space: 4 GB for program files Monitor resolution: 1680x1050 or better

KS Server 2025.0

Minimum*	Recommended
Windows Server 2016, 2019, or 2022; Red Hat Enterprise Linux 7, 8, or 9; CentOS 7; CentOS Stream 8 or 9 x86-64 based CPU, 2 GHz 8 GB RAM Disk space: • 3 GB for program files • 10+ GB per user for users' projects**	Windows Server 2016, 2019, or 2022; Red Hat Enterprise Linux 7, 8, or 9; CentOS 7; CentOS Stream 8 or 9 A multi-core x86-64 based CPU(s) with at least 8 cores in total, 2.5 GHz, or better ** 16 GB RAM or more** Disk space: • 3 GB for program files • 15+ GB per user for users' projects**

** **Note:** System requirements for the server depend on the maximum number of users expected to be using KS Server concurrently. The KS Server performance also depends on the typical size of analytic datasets, on whether any other applications run on the same server, and other factors. To ensure that your product is compatible with your environment and delivers expected performance, please fill in the Installation Questionnaire. Contact your account representative or email dasupport@altair.com to request the questionnaire if necessary.

If R and Python integration features are required, the prerequisite R and Python program files and packages may take at least 3 GB of disk space on the KS Server host, depending on the R and Python distributions of your choice.

3. Requirements for Knowledge Studio for Apache Spark

Knowledge Studio for Apache Spark is an application for data mining and predictive analytics on large-scale distributed data structures (HDFS, Amazon S3, etc.) via Apache Spark.

The types of distributed storage supported by Knowledge Studio for Apache Spark are the same as those supported by Apache Spark. The product is supported for any Hadoop distribution satisfying the *Apache Spark server requirements* listed below.

Examples of supported Hadoop distributions:

• **Cloudera Data Platform**. All CDP versions compatible with Apache Spark 2.4, 3.1, 3.3, or 3.5.1: See the requirements for CDS Powered by Apache Spark at https://docs.cloudera.com/

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- **Databricks Platform** on Azure and AWS clouds with Apache Spark 2.4, 3.1, 3.3, or 3.5.1. See Apache Spark on Databricks. See also the Databricks documentation for Azure and AWS at https://databricks.com/documentation.

Note: Spark cluster configurations with dynamic allocation are not supported.

System requirements for the Knowledge Studio software components are described at the beginning of Section 3.2 (see above). The following are the requirements for Apache Spark Server.

Apache Spark server requirements

➢ Apache Spark version 2.4, 3.1, 3.3, or 3.5.1
 	
    ◦ Cluster management system options: Standalone (native Spark cluster) or Hadoop YARN or Apache Mesos
 	
➢ Python version 3.7 or 3.10, 64-bit
 	
➢ The following Python packages:
    ◦ *Pandas*: the Python Data Analysis Library version 2.1.3 provides data structures and analysis tools for Python
    ◦ *NumPy*: the package for scientific computing with Python (version 1.26.0)
    ◦ SciPy: the fundamental library for scientific computing (version 1.11.3)
    ◦ Scikit-learn: tools for data mining and data analysis (version 1.3.2)
    ◦ PyArrow: Python API of Apache Arrow
 	
➢ Jupyter Notebook version 6.5.5
 	
➢ JupyterHub version 4.0.8

For **Jupyter Notebook** prerequisites and installation instructions, see https://jupyter.readthedocs.io/en/latest/install.html

For **JupyterHub** prerequisites and installation instructions, see http://jupyterhub.readthedocs.io/en/latest/

Note: The use of JupyterHub as a multi-user Jupyter notebook server is strongly recommended. If you prefer not to use JupyterHub, you can use basic authentication implemented by other mechanisms and configure them according to your security, authentication, and file system access requirements.

Examples of supported types of distributed storage clusters:

➢ Amazon EMR

➢ Microsoft Azure HDInsight

➢ Custom clusters satisfying the above requirements for Apache Spark, cluster management systems, Python, and Jupyter.

For your convenience, our Customer Support can provide a script for installing the necessary prerequisites, including the required Python packages. The script is provided upon request. You can modify it as you see fit to install the components that you need. Please contact Data Analytics Customer Support at dasupport@altair.com to request the script.

For the client/server configuration of Knowledge Studio for Apache Spark, the range of TCP ports 6060 – 6090 on the server must be open for inbound connections from the client machines. In the standalone (desktop) configuration, Knowledge Studio for Apache Spark also uses ports in this range, but this is confined to localhost.

For more information on the security configuration settings:
- for KS Server on Windows, see Section 8.1.4: "Configuring KS Service".
- for KS Server on Linux, see subsection "Configuring Server Security (Network and Firewall Settings)" in Section 8.2.5: "Configuring KS Server on Linux"

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4. Release 2025.0 and Previous Versions

- Version 2025.0 can be installed and run side by side with any previous version.

- Uninstalling Altair Data Analytics products does not remove the users' data, project files, working directories or licenses.

- If you run version 2025.0 side by side with an older version for a period of evaluation or testing during the upgrade, use a separate working directory for each version, since older projects modified in 2025.0 may no longer be compatible with their original version. See Section 5 for details about the Working Directory.

- Project compatibility:
  - o Altair projects created in versions 9.3 – 2024.2 can be opened and modified in version 2025.0 without any conversion.

    It is recommended to make a backup copy of your old projects before opening them in version 2025.0.
  - o **Forward compatibility is not supported**: models and other objects in projects created or modified in version 2025.0 may not be loaded correctly when opened in older versions.

- KS PDF Printer compatibility:

  When using KS Workstation 2025.0 side by side with an older version, the error "*Printer not activated, error code - 41*" may occur when using the **Copy to PDF** command under the File menu. The solution is to reinstall both versions of KS PDF Printer by executing the following commands in Command Prompt started as administrator. For example, for versions 2025.0 and 2023.1, run the following commands:

  ```
  cd "C:\Program Files\Altair Data Analytics\KS Workstation 2025.0.0\bin"
  Install -s -u "KS PDF Printer"
  Install -s "KS PDF Printer"
  cd "C:\Program Files\Altair Data Analytics\KS Workstation 2023.1.0\bin"
  Install -s -u "KS PDF Printer"
  Install -s "KS PDF Printer"
  ```
  - o Note: In case KS PDF Printer is removed from the system, it can be restored by running `AngossPDFInstall.cmd` from `C:\Program Files\Altair Data Analytics\KS Workstation 2025.0.0\bin`.

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5. Prerequisites

This section describes installation prerequisites for all configurations and platforms.

5.1. Overview

- Ensure that your systems meet the hardware and software requirements. Note that the required hardware resources (CPU, memory) depend on the typical size of analytic datasets, the type of data mining tasks to be performed by the users, the expected number of concurrent users in the case of a server-based configuration.

- Knowledge Studio and Knowledge Seeker features include integration with Tableau® and Qlik® - business intelligence software for interactive data visualization. Tableau integration features in Knowledge Studio and Knowledge Seeker require Tableau Desktop or any Tableau workbook viewer on the user's workstation and, optionally, web access to a Tableau Server from the user's workstation. Tableau components can be installed independently of Altair Data Analytics products. Supported Tableau versions are 2019.1 and higher. Altair does not distribute Tableau software or licenses for it. If you do not use Tableau but would like to know more about it, please visit http://www.tableau.com/.

- R and Python language integration features require R Software for statistical computing and Python software. Install them if the end users need these features. The instructions are given below in Sections 5.2 and 5.3.

- For configurations with multi-user access (client/server or shared standalone software on a server):

  - **For the client/server configuration, TCP port 5470 must be open on the KS Server host for inbound connections from the client machines. Knowledge Studio for Apache Spark also uses TCP port range 6060-6090. See** Section 8.1.4 **for details.**

    You may also need to add KS Server and KS Workstation to the list of authorized applications if such a list is maintained for your antivirus or other security systems.

  - Each user must have a user account recognized by the host machine where KS Server is installed.

  - For each user, a working directory with sufficient space must be allocated for their projects. For example, server administrators can create a directory `KS_Projects` with subdirectories `KS_Projects/<user_name>` for each user. A single shared directory may be used for all users, but it is a less organized way.

    The Working Directory does not have to be on the application server that hosts KS Server. It may be on a network drive, as long as it is on a file system accessible from the application server and the read & write access to this storage is fast enough. In the case of a Windows Server, users can specify a UNC path for the Working Directory. Note that KS Server cannot access mapped drives in the client/server mode on Windows.

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The necessary space to allocate can be calculated based on the average size of analytic datasets (number of rows and columns), the number of datasets in each project, and the number of projects. Assign the appropriate Read & Write permissions for the created directories as required by your security policies. *Note: Any user can change their working directory at any time after the installation using the **Connect** or **Set Working Directory** commands in the **File** menu of KS Workstation.*

o   If users will be importing data from databases, ODBC drivers for the source databases must be installed on the server, and the users must have sufficient permissions on the server to load the drivers.

▪   If you are using self-hosted Altair License Server, you will receive a license file and an installation guide for Altair License Manager. See Section 14.2 for details.

5.2. R Software for Statistical Computing

Knowledge Studio and Knowledge Seeker support integration with the *R* language. *R* software must be installed as a prerequisite if the end users require the *R* integration feature.

R versions 4.0 and higher are supported.

Note: For the Client/Server configuration of Knowledge Studio and Knowledge Seeker, R is only required on the server side.

5.2.1 R for Standalone and Client/Server Configuration on Windows

R software is available at the R Project website http://www.r-project.org/.

On the R Project page, click "download R" and select the preferred mirror site of the R Archive Network. On the next page click "Download R for Windows"

The Comprehensive R Archive Network

Download and Install R

Precompiled binary distributions of the base system and contributed packages, **Windows and Mac** users most likely want one of these versions of R:

- Download R for Linux (Debian, Fedora/Redhat, Ubuntu)
- Download R for macOS
- Download R for Windows

R is part of many Linux distributions, you should check with your Linux package management system in addition to the link above.

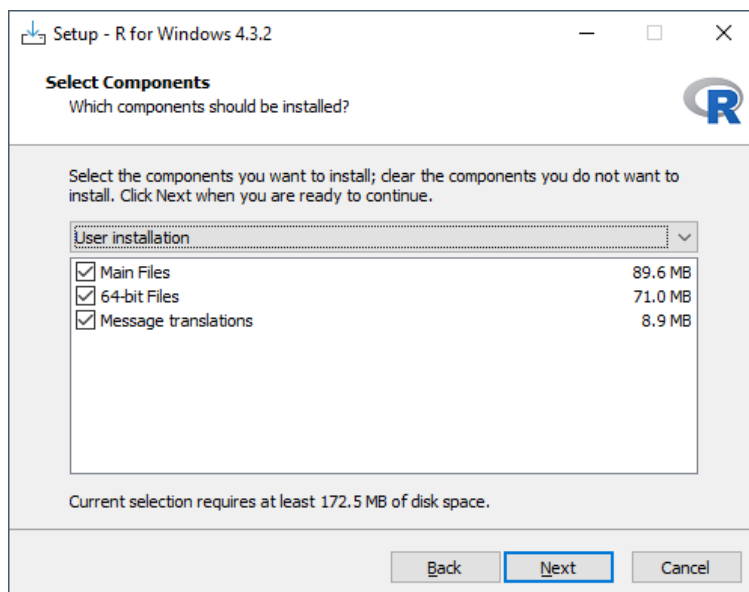On the next page, click "Install R for the first time":

R for Windows

Subdirectories:

base — Binaries for base distribution. This is what you want to install R for the first time.
contrib — Binaries of contributed CRAN packages (for R >= 4.0.x).
old contrib — Binaries of contributed CRAN packages for outdated versions of R (for R < 4.0.x).

On the next page, download the latest version of R software. If you need an older version of R, click the *Previous releases* link on the same page. Note that R versions older than 4.0 are not supported.

Run the downloaded R installer. In the third page of the installation wizard, select at least the **Main Files** and **64-bit Files** components.

Setup - R for Windows 4.3.2

Select Components
Which components should be installed?

Select the components you want to install; clear the components you do not want to install. Click Next when you are ready to continue.

User installation

☑ Main Files	89.6 MB
☑ 64-bit Files	71.0 MB
☑ Message translations	8.9 MB

Current selection requires at least 172.5 MB of disk space.

Back   Next   Cancel

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Choose the remaining options as desired and finish the installation.

5.2.2. R for Client/Server Configuration on Linux

To install R on Linux, use the following examples of R installation steps.

On RHEL 7 and CentOS 7:

```
sudo yum update
sudo yum install epel-release
sudo yum install R
```

On RHEL 8 and 9 or CentOS Stream 8 and 9:

```
sudo dnf install epel-release
sudo dnf config-manager --set-enabled powertools
sudo yum install R
```

The default R installation directory is `/usr/lib64/R.` To verify the installation, use the command

```
R --version
```

For more information on installing R on Linux, see the R project website https://www.r-project.org/ and https://fedoraproject.org/wiki/EPEL

5.2.3. *Rserve* Package for *R*

The **Rserve** package (Binary R server) is required. It must be installed in the *R* library folder used by the **R Code** node in Knowledge Studio and Knowledge Seeker. By default, it is the common library location for *R*. On Windows, it is usually `C:\Program Files\R\R-N.N.N\library`, where N.N.N is the R version. On Linux, it is usually `/usr/lib64/R/library`.

Make sure the common library location for R has **Read** and **Write** permissions for the intended user(s) or group. For example, for R version 4.3.2, it is `C:/Program Files/R/R-4.3.2/library`. For the client/server configuration, you may want to create a user group for KS Server users and assign the permissions to the group.

Windows:

Run the R console and install the Rserve package into the common R library location. The following example assumes that the R version is 4.3.2:

```
install.packages("Rserve", "C:/Program Files/R/R-4.3.2/library")
```

Linux:

- If you are using Amazon Linux AMI, install or update openssl-devel using the command `yum install openssl-devel`

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- Run *R* and install the Rserve package version 1.8-0 or higher. For example, to install Rserve from the repository https://rforge.net, use the following command from the *R* command line:

```
install.packages("Rserve",,"https://rforge.net")
```

The library location can be specified explicitly as follows:

```
install.packages("Rserve","/usr/lib64/R/library","https://rforge.net")
```

Refer to the R documentation for the `install.packages` and `.libPaths` commands, if necessary.

5.3. Python

The ***Python Language Integration*** enables embedding Python programs into the visual workflows of Knowledge Studio and Knowledge Seeker projects. For more information on Python, see the Python project website https://www.python.org/.

Prerequisites

- The **Python Code** node feature requires Python version 3.7 or higher, Python Data Analysis Library (pandas), SciPy and NumPy libraries, and the reports package. Python versions 3.7 – 3.12 are supported.

For the Client/Server configuration, Python is only required on the server side. On Linux, Python libraries should be installed for all users rather than in a local user directory.

To enable Jupyter Notebook integration in the Client/Server configuration on Windows:

- Set the following system environment variables on the server. Their values must be set to folders that have Read & Write permissions for all users of the application.

  - `JUPYTER_CONFIG_DIR`
  - `JUPYTER_DATA_DIR`
  - `JUPYTER_RUNTIME_DIR`

- In the Windows Firewall on the server, open a range of TCP ports for Jupyter Notebook users (for example, 8800-8900) and inform each user of the port assigned to them for Jupyter Notebook use.

5.4. unixODBC and openssl for Linux

The following prerequisites are required for KS Server on Linux:

- **unixODBC** driver manager

  To install unixODBC, use the command

  ```
  sudo yum install unixODBC
  ```

To check the version of the installed unixODBC:

```
rpm -qa unixODBC
```

- **openssl** and **openssl-libs** version 1.0.2 or higher

    To install the latest version, use the command

```
sudo yum install openssl openssl-libs
```

6. Supported Installation Modes on Windows

- To install an Altair Data Analytics product on a small number of workstations, run the downloaded MSI package on each workstation. This process is described below in the sections on deploying the standalone and client/server configurations.

- To install the software in the silent mode from the command line without user interaction via the wizard, see Section 9.1, "Silent Install".

- The Altair Data Analytics software installer supports mass deployment on many workstations using automated installation tools. For example, macros can be specified in the installation wizard to customize the Working Directory location for individual users. See Section 9.2, "Customizations to Assist in Repackaging KS Workstation for Deployment".

- To deploy the product in a Citrix environment or use it with Remote Desktop Services, see Section 10.

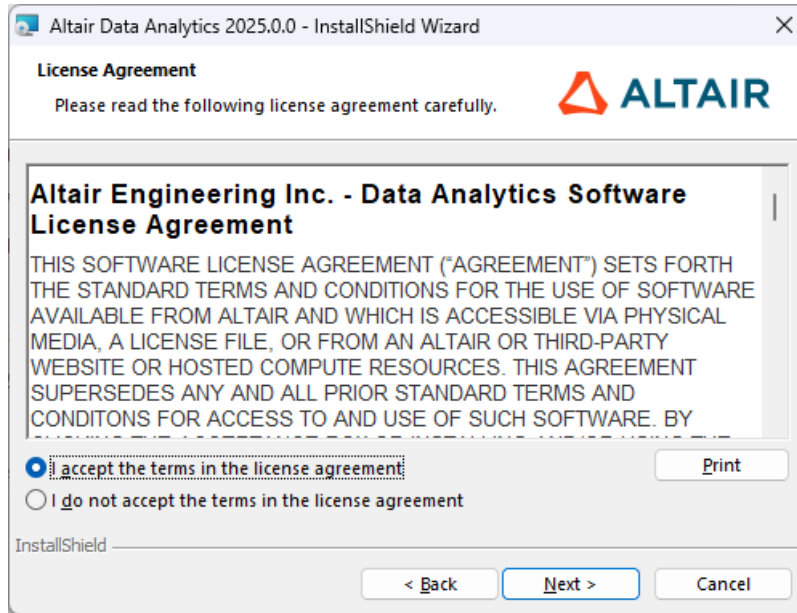# 7. Deploying the Standalone Configuration

- The Standalone configuration can be used by a single user on Windows Desktop or by multiple users on Windows Server via Remote Desktop connection or Citrix.

- **KS Workstation** is the main component of the Standalone configuration of Knowledge Studio and Knowledge Seeker for Windows Desktop or Windows Server. **KS Library for R** is required to enable R language integration features (see Section 5.2.1), while **Altair SLC** and **Altair Analytics Workbench** are required for the SAS Language integration features in Knowledge Studio.

- **KS Workstation** is the only component required for the Standalone configuration of Knowledge Studio for Apache Spark. For the Apache Spark server and Hadoop cluster requirements, see Section 3, Subsection: "*Requirements for Knowledge Studio for Apache Spark*".

## 7.1. Deploying KS Workstation (Standalone)

1. Log in to the computer as a user with sufficient rights to install software.

2. Double-click the downloaded MSI package *KS-Workstation-2025.0-64bit.msi* to start the installation.

3. The installer prepares the InstallShield Wizard, and the Welcome window opens. Click **Next >**.
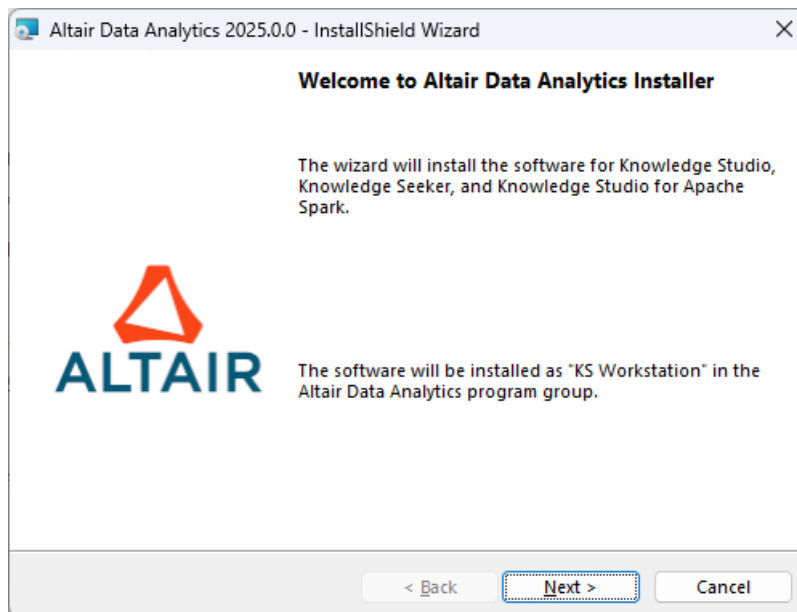
4. The License Agreement window opens. If you accept the terms, select "**I accept**" and click **Next >**.
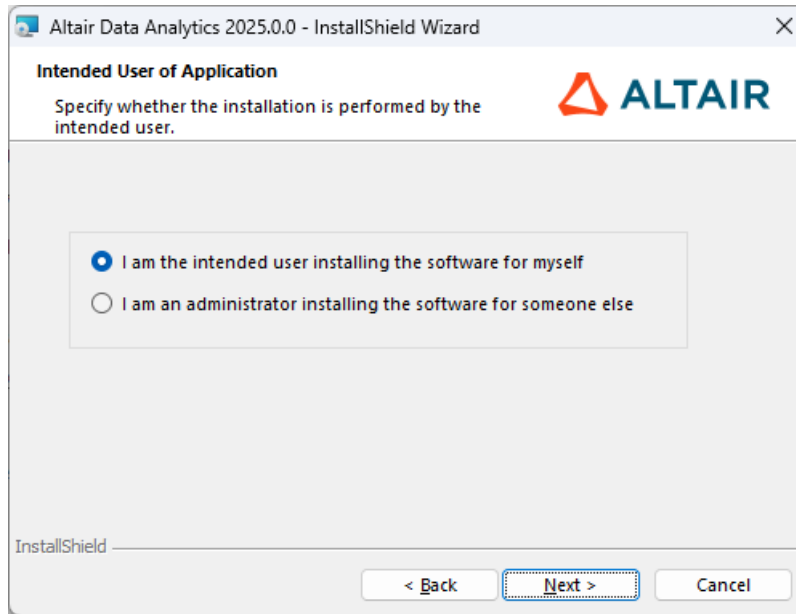
5. The Configuration Type window opens.

- Select the "*Standalone configuration*" option if the software will be run in the standalone mode on this machine.
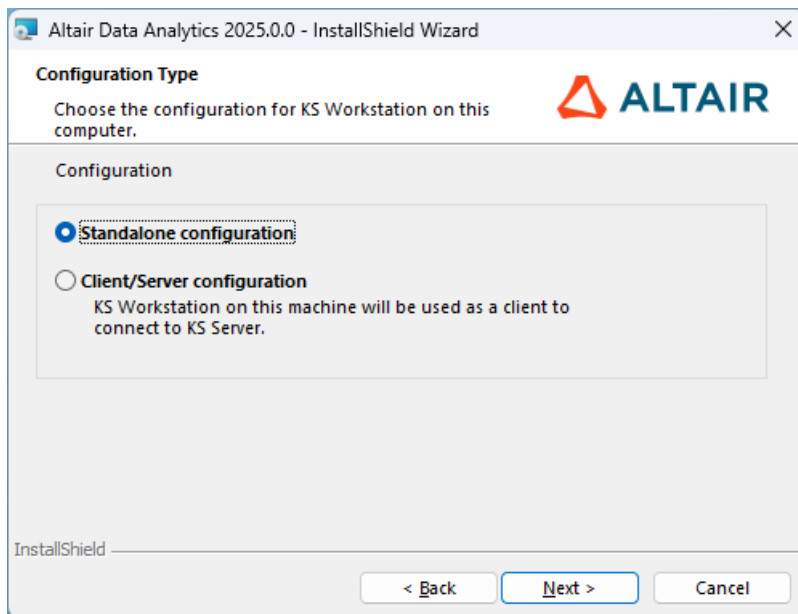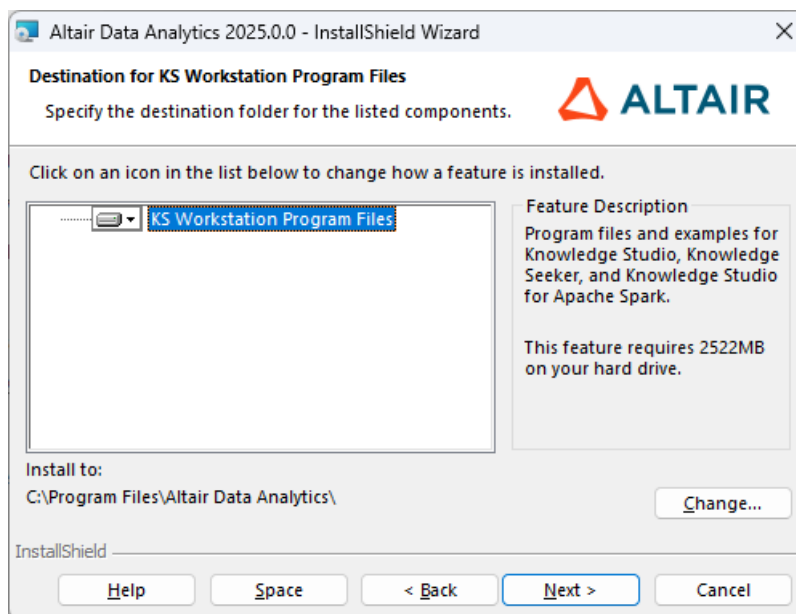

Click **Next >.**

6. Specify whether you are the intended user. (This will define the default Working Directory at one of the next steps.) Click **Next >**.


7. If necessary, change the destination folder for the application program files by clicking the **Change** button and specifying the desired location. The default is C:\Program Files\Altair Data Analytics. Click **Next >**.

8. The Working Directory window opens. Specify the path for the Working Directory for Altair project files. Make sure it has Read & Write permissions for the intended user(s). If necessary, click **Change** and create a new folder.

    *Note 1: If you prefer to use cloud storage, such as OneDrive or Google Drive, select a folder with offline access enabled. For example, if you choose a folder on OneDrive, right-click the folder in Windows Explorer and select option "**Always keep on this device**".*

    Note 2: The Working Directory can be changed after the installation at any time using the Set Working Directory command or the Connect command in the File menu.
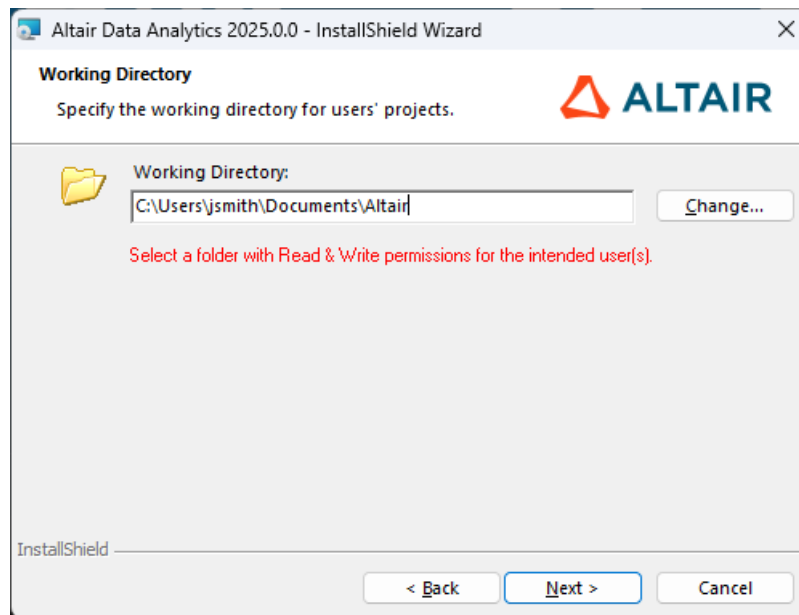

    Click **Next >**

9. The License Configuration window opens.

    - If the host machine has already been configured for Altair licensing, the current values of the environment variables `ALM_HHWU` and/or `ALTAIR_LICENSE_PATH` are displayed. Click **Next >** to accept the existing configuration.

      Example 1: The machine is already configured for **managed Altair Licensing** (`ALM_HHWU=True`):
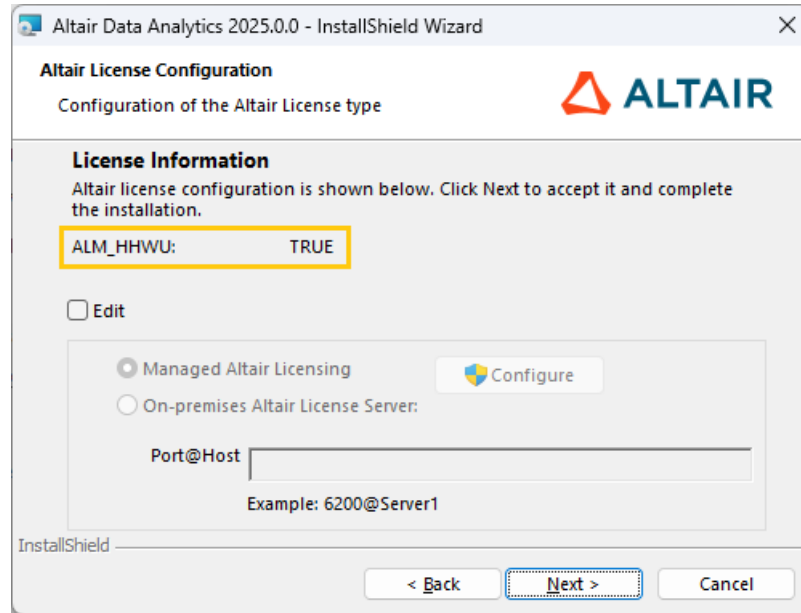
Example 2: The machine is already configured for an **on-premises Altair License Server** (`ALTAIR_LICENSE_PATH=6200@<server_name>; ALM_HHWU=false`):


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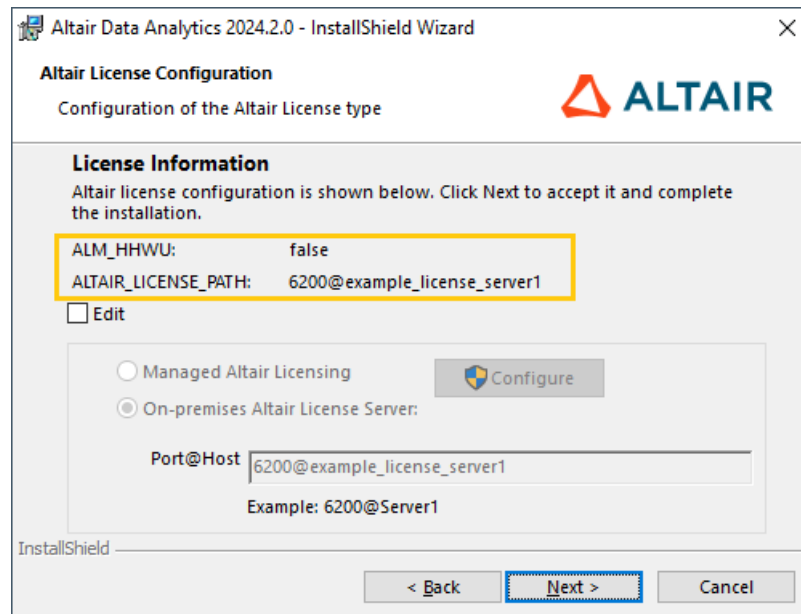
- If the host machine has **not** previously been configured for Altair licensing, select *Edit* and choose the licensing method: *Managed Altair Licensing* or *On-premises Altair License Server*.

  Contact your team members responsible for Altair product licenses if you are not sure which licensing method you need to use.
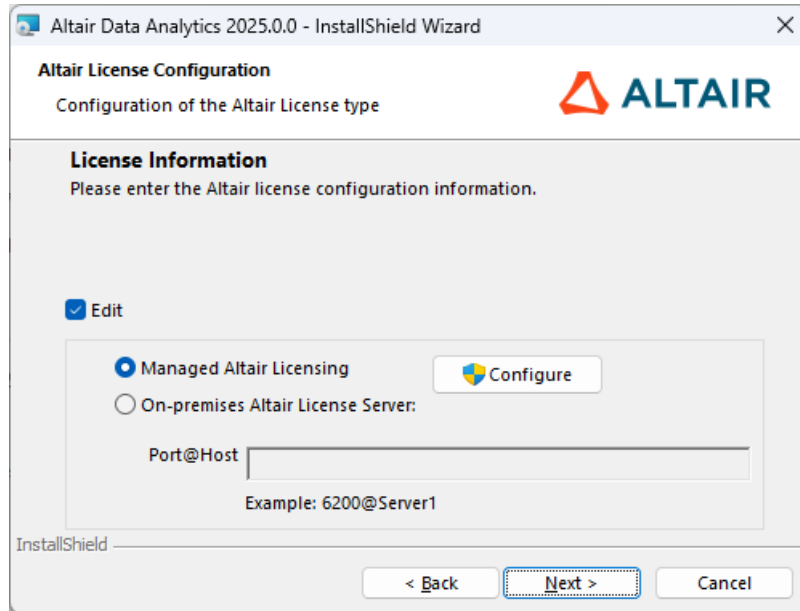

  - If you select *Managed Altair Licensing*, click **Configure** to open Altair License Utility and authorize the machine using the options in the Managed Licensing tab.

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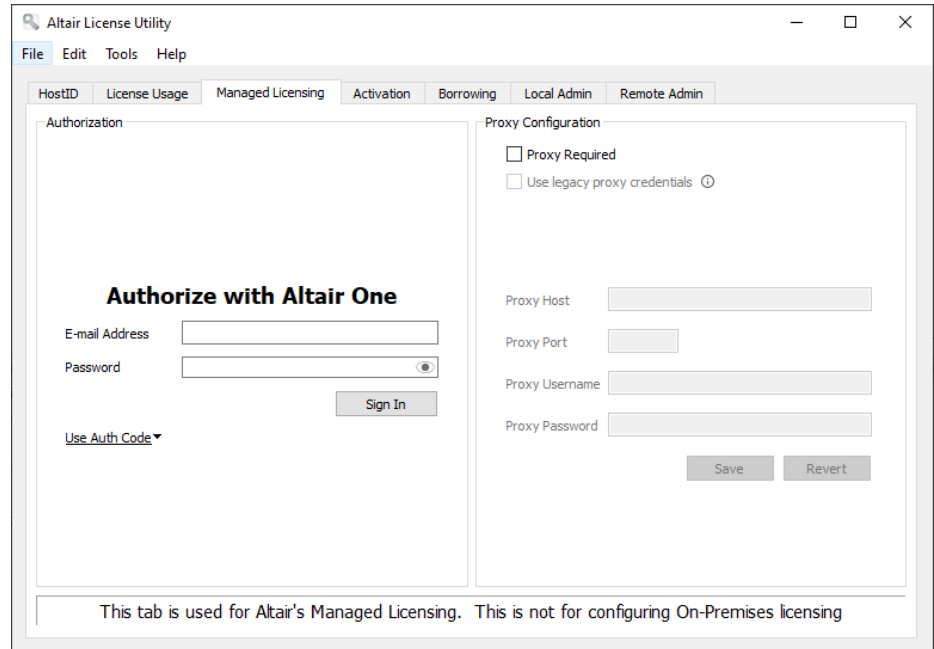
Once you close Altair License Utility and click **Next >**, the system environment variable ALM_HHWU will be created, and its value will be set to *True*.

o If you select *On-premises Altair License Server*, enter the license server address and port in the format `<port>@<host>`, for example, `6200@server1`.
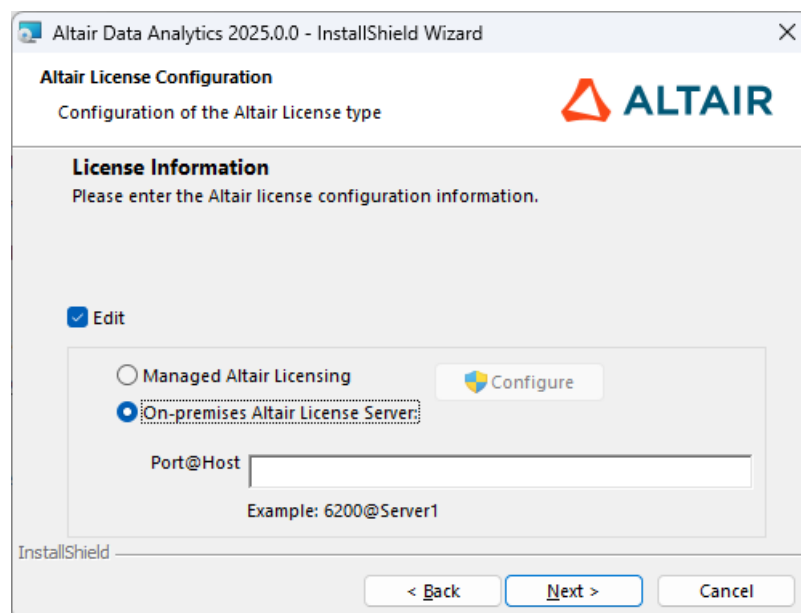

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Once you click **Next >**, the system environment variables `ALTAIR_LICENSE_PATH` and `ALM_HHWU` will be created. The former will be assigned the value you specified, and the latter will be set to *False*.

See for detailed information about the licensing methods.

10. At the final step:

- Choose whether to install the desktop shortcut.

- The option to install KS PDF Printer is selected by default. It enables the function of saving decision trees, tables, charts, and reports as PDF. Leave it selected unless you are already using a PDF printer driver or converter of the same brand.

Click **Install** to start the installation.
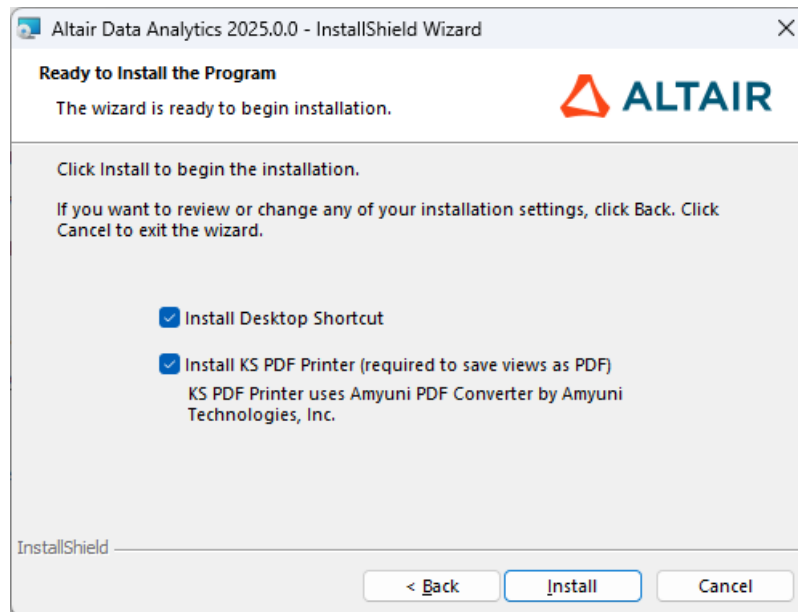
11. The Setup Status window shows the installation progress. When the installation is complete, choose whether to launch the software now and click **Finish**.

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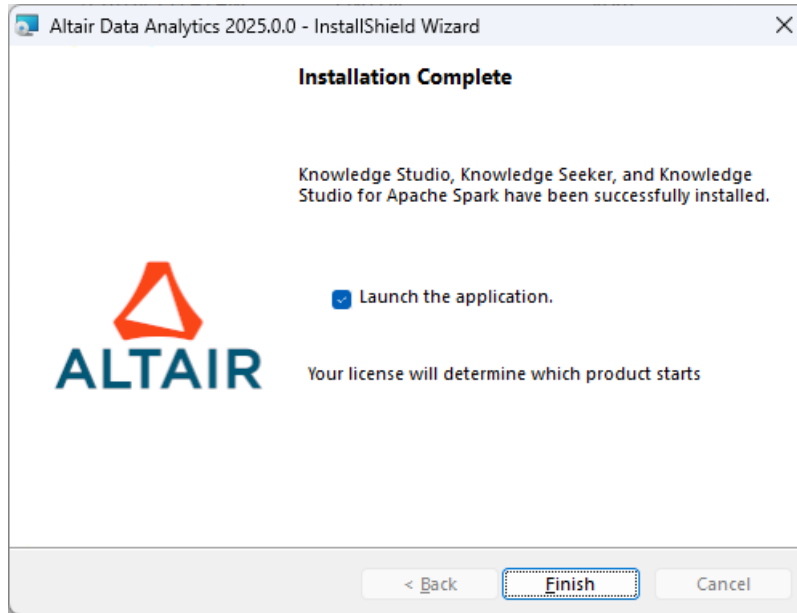
The installed software is now available in the Windows Start menu. Launch the application by double-clicking the desktop shortcut **KS Workstation 2025.0.0** or selecting **Start | All Programs | Altair Data Analytics | KS Workstation 2025.0**.

See Section 14 for detailed information about the licensing methods.

NOTE: The KS Workstation installer enables Microsoft .NET Framework 3.5 if it is not already enabled in Windows features. If the installer fails to enable it, download the offline installer from the Microsoft website https://learn.microsoft.com/en-us/dotnet/framework/install/dotnet-35-windows.

7.2. Advanced Configuration Using KDSConnection.ini

After installing KS Workstation, you can change the initial settings for the mode (Standalone or Client/Server) and the Working Directory using the file `KDSConnection.ini` in `C:\Program Files\Altair Data Analytics\KS Server 2025.0.0\bin`.

Example content of `KDSConnection.ini`:

```
<Config>
<Mode>0</Mode>
<Location>C:\Analytic Workspace\</Location>
<Service></Service>
<User></User>
<Host></Host>
<Port>5470</Port>
<Secure>True</Secure>
</Config>
```

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For example, to change the mode from Standalone to Client/Server, specify **1** for Mode, specify the user ID, the KS Server host name or IP address, and the port number in the appropriate lines as shown in the example below:

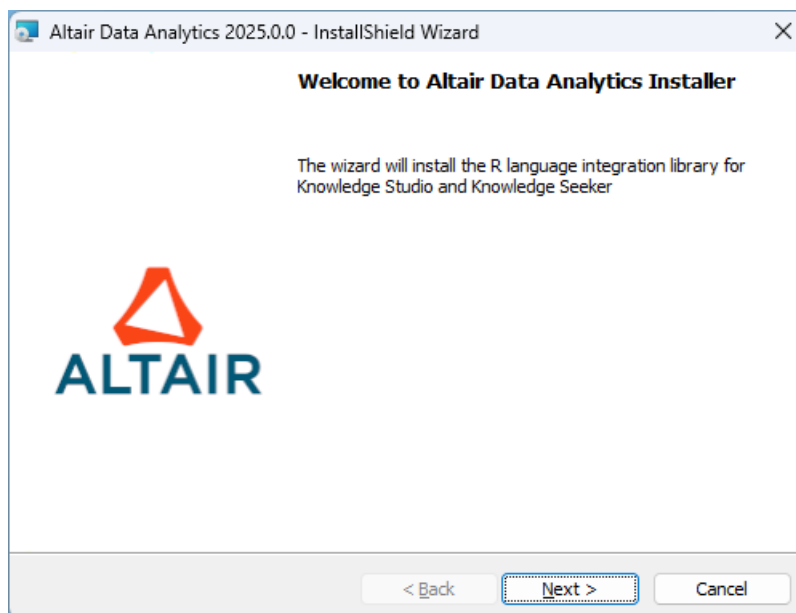```
<Config>
<Mode>1</Mode>
<Location>C:\Analytic Workspace\</Location>
<Service></Service>
<User>jsmith</User>
<Host>ks_server</Host>
<Port>5470</Port>
<Secure>True</Secure>
</Config>
```
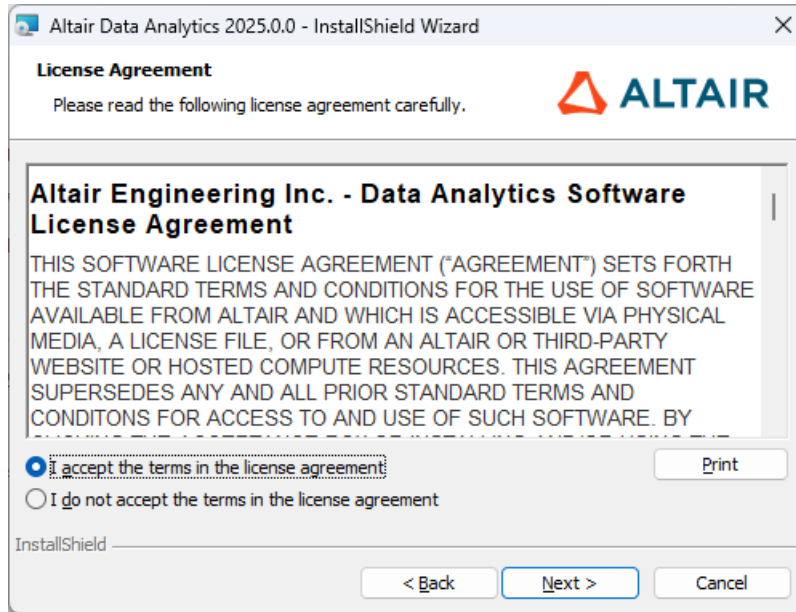
## 7.3. Installing KS Library for R Integration

Knowledge Studio and Knowledge Seeker support integration with R software for statistical computing. If the end users require this feature, install KS Library for R as described below.

In the Prerequisites section above, see Section 5.2: "R Software for Statistical Computing". The Rserve package is required (see Section 5.2.3: "Rserve Package for R").
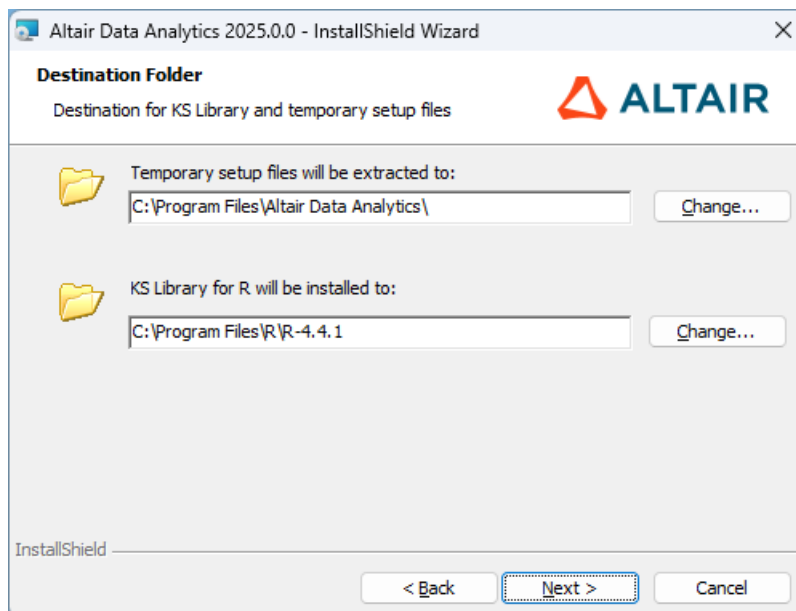
1. Make sure KS Workstation 2025.0 and R v4.0.0 or higher are installed.

2. Download **KS Library 2025.0 for R 4.0 or higher** from the Altair Knowledge Studio Downloads page.

3. Uninstall any previous version of *KS Library for R* from the Programs and Features list in the Windows Control Panel.

4. Double-click the downloaded installer file. Click **Next >** in the Welcome screen.



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5. In the License Agreement window, select "**I accept**" if you accept the terms. Click **Next >**.



6. The Destination Folder window opens. KS library for R will be installed into `<R root folder>\R-X.X\library\`, where R-X.X is the most recent version of R on the host machine. The standard R root folder is `C:\Program Files\R`. The default folder to extract the temporary setup files is `C:\Program Files\Altair Data Analytics`. To change any of these folders, click the **Change** button.



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Click **Next >**.

7.  Click **Install**.



8.  The Setup Status window shows the installation progress. When the installation is complete, click **Finish**.

As a result, three subfolders representing the required *R* integration libraries are created under `<R root folder>\R-X.X\library\`:

- `angoss`
- `KnowledgeSurvival`
- `xtable`

If you are going to use a different R library path, copy the folders `angoss, xtable,` and `KnowledgeSurvival` from `<R program folder>\R-X.X\library\` to the desired R library location.

Note: The **Rserve** package, whose installation was described in Section 5.2.3, must be present in the same R library location.

## 7.4. Installing Altair SLC and Altair Analytics Workbench

Knowledge Studio supports SAS Language. This functionality is powered by Altair SLC and Altair Analytics Workbench (formerly known as WPS Analytics).

1. Download the latest versions of Altair SLC and Altair Analytics Workbench from AltairOne Marketplace. If you don't have an AltairOne account, please reach out to the person managing Altair software licenses at your organization or contact Altair Data Analytics Customer Support at dasupport@support.com.
2. Run the downloaded Altair SLC installation package. Click **Next >** in the Welcome screen.

3.  In the End-User License Agreement window, select "**I accept the terms in the License Agreement**" if you accept the terms. Click **Next >**.
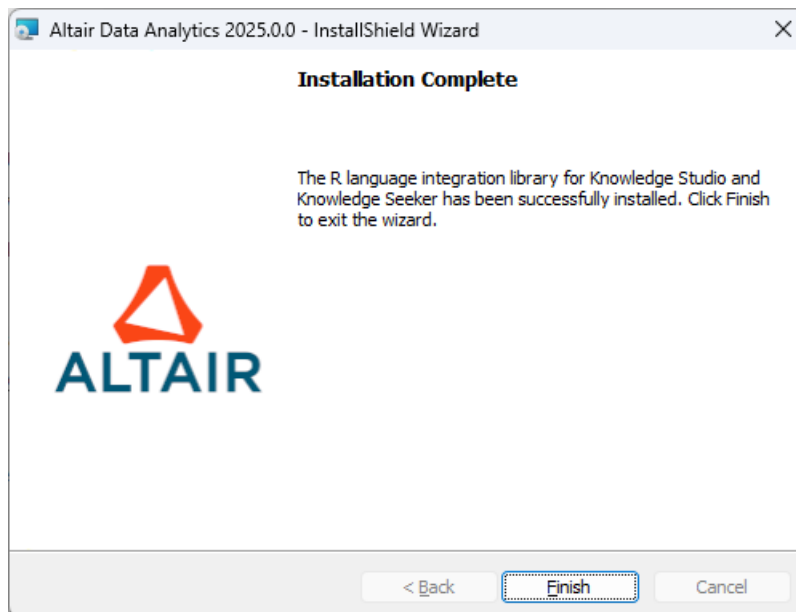


4.  In the Custom Setup page, select all Altair SLC program features, as shown below. To change the destination folder for the application program files, click the **Change** button and specify the desired location. The default is C:\Program Files\Altair\SLC\<version>. Click **Next >**.



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5.  Click **Install** to start the installation.



6.  The Setup Status window shows the installation progress. When the installation is complete, click **Finish**.



7.  Altair SLC provides the engine component (SAS language compiler) with no graphical user interface. Install Altair Analytics Workbench to access a GUI-based integrated

development environment for the SLC engine. Run the Altair Analytics Workbench installation package. Click **Next >** in the Welcome screen.
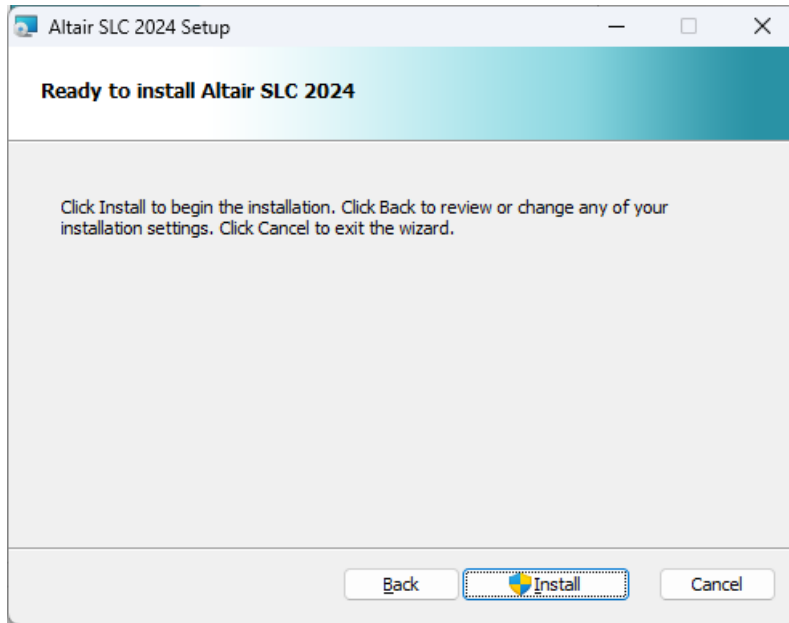


8. In the End-User License Agreement window, select "**I accept the terms in the License Agreement**" if you accept the terms. Click **Next >**.

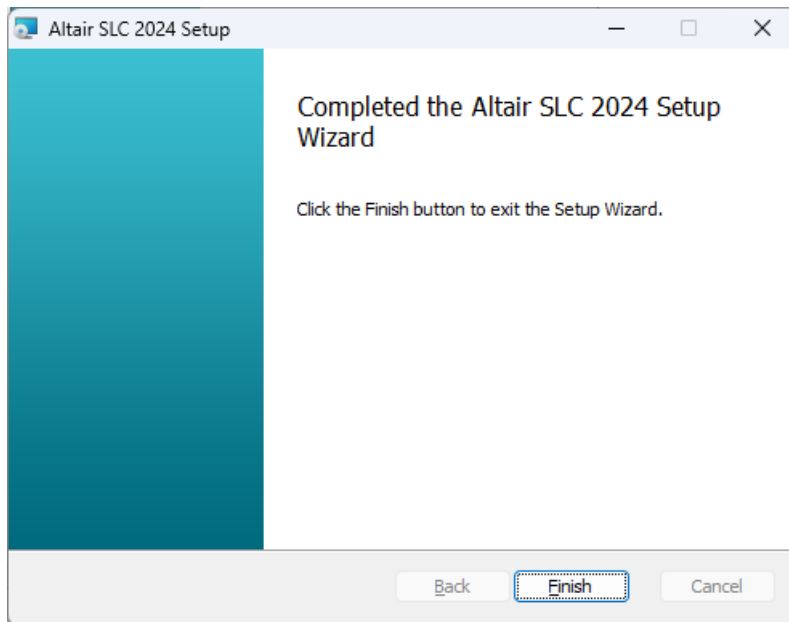9. In the Custom Setup page, select all program features, as shown below. To change the destination folder for the application program files, click the **Change** button and specify the desired location. The default is C:\Program Files\Altair\Analytics Workbench\<version>. Click **Next >**.
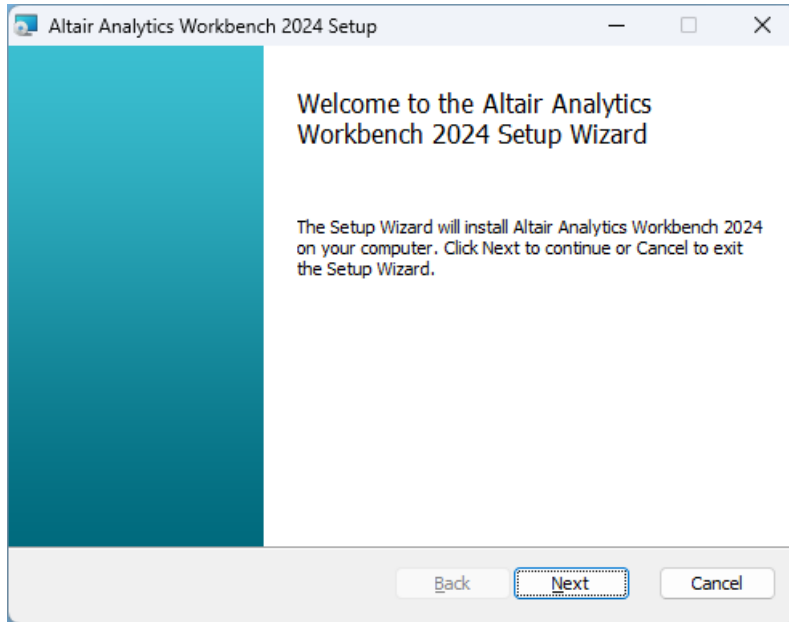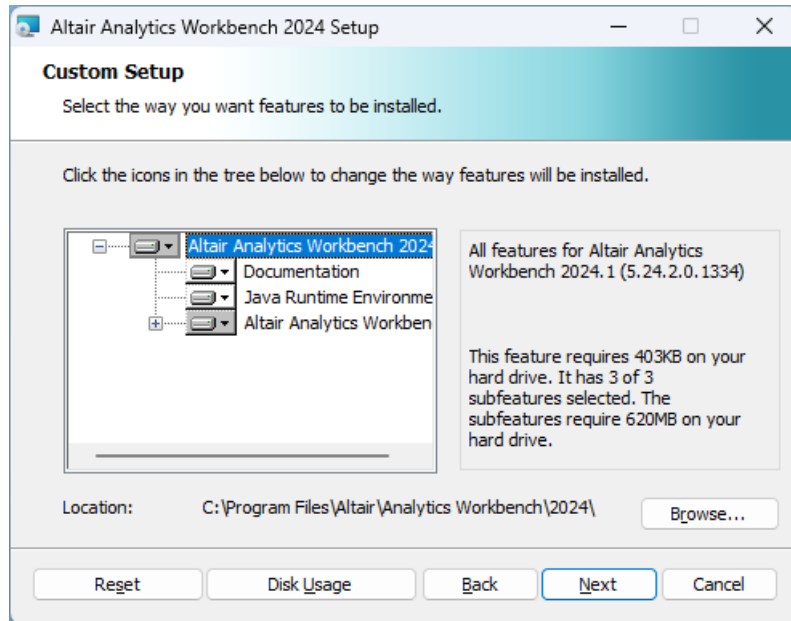


10. Click **Install** to start the installation.

11. The Setup Status window shows the installation progress. When the installation is complete, click **Finish**.
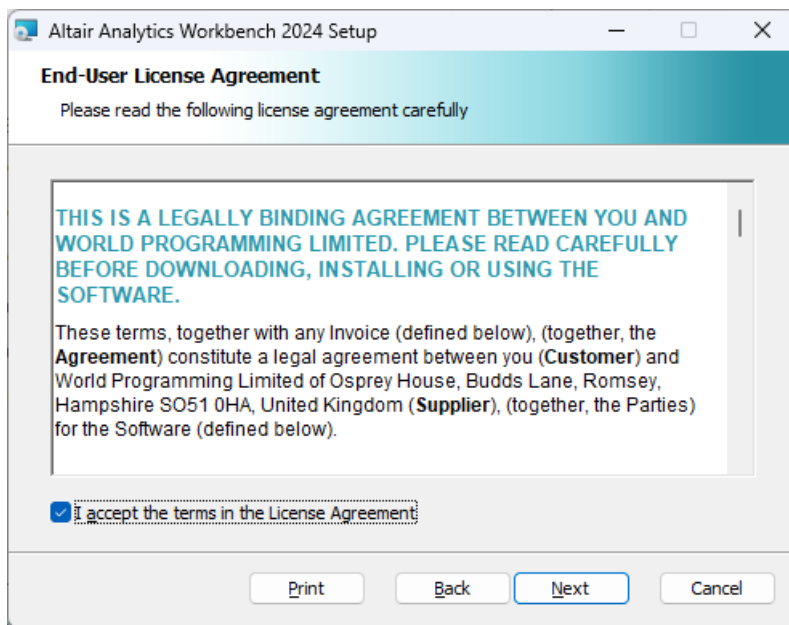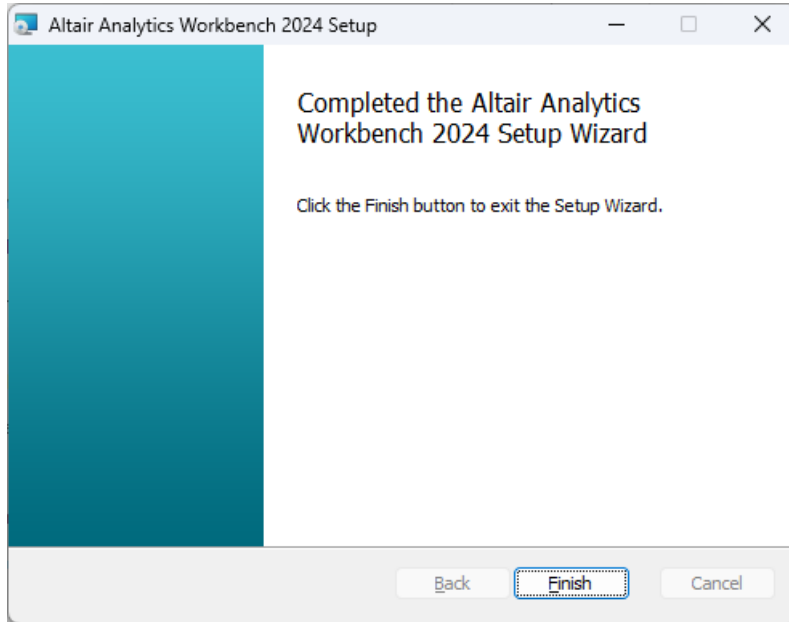


12. Altair Analytics Workbench is now available in the Windows **Start** menu. Launch the application by double-clicking the desktop shortcut "Altair Analytics Workbench" or selecting **Start | Altair | Altair Analytics Workbench**.

    Altair SLC and Analytics Workbench use the same license as Knowledge Studio and Knowledge Seeker. Activating these products with an Altair Units License automatically activates SLC and Analytics Workbench on the same machine.

# 8. Deploying Client/Server Configuration

For the client/server configuration, **KS Workstation** software must be installed on each client machine, and **KS Server** software must be installed on the server.

R Statistical Software, Python software, and KS Library 2025.0 for R must be installed on the server if users need R and Python integration features.

For SAS Language integration features, Altair SLC must be installed on the server, while Altair Analytics Workbench must be installed on the client machines.

**Note:** TCP port 5470 must be open for inbound connections on the KS Server host. The application can be configured to use a different port if necessary. Additional ports need to be open for Knowledge Studio for Apache Spark. The details are provided in the sections below.

**Security protocols**: In the client/server mode, **TLS1.2** is used by default. The older versions TLS1.1, TLS1.0, and SSL are never used.

Make sure all the installation prerequisites listed in <u>Section 5</u> are met. Allocate the necessary disk space on the server and create Working Directories for the users following the guidelines in <u>Section 5</u>.

Prior to installing KS Server on a machine that has a previous version of KS Server running, notify the users to exit the application, as the installer will shut down all KS user processes.

For deploying KS Server on Windows, follow the instructions in <u>Section 8.1</u>. For deploying KS Server on Linux, follow the instructions in <u>Section 8.2</u>.

After installing KS Server, proceed to <u>Section 8.3</u>, which describes the process of deploying KS Workstation as part of the client/server configuration.

**Note:** *In the client/server configuration, both KS Workstation and KS Server must be of the same major version. For example, KS Workstation 2025.0 works only with KS Server 2025.0 and does not work with KS Server 2024.1. When upgrading, you must upgrade the clients and the server to the new version.*

## *8.1. Deploying KS Server and Dependent Components on Windows Server*

This section describes the process of installing and configuring KS Server and dependent components on Windows Server platforms.

### 8.1.1. Install KS Server on Windows

1. Log in as an administrator to the machine that will host KS Server.

2. It is assumed you have downloaded the KS Server package following the instructions in the email from the License Administrator. Double-click the downloaded MSI package *KS-Server-2025.0-64bit.msi*.

3. The setup prepares the InstallShield Wizard, and the Welcome window opens. Click **Next >**.
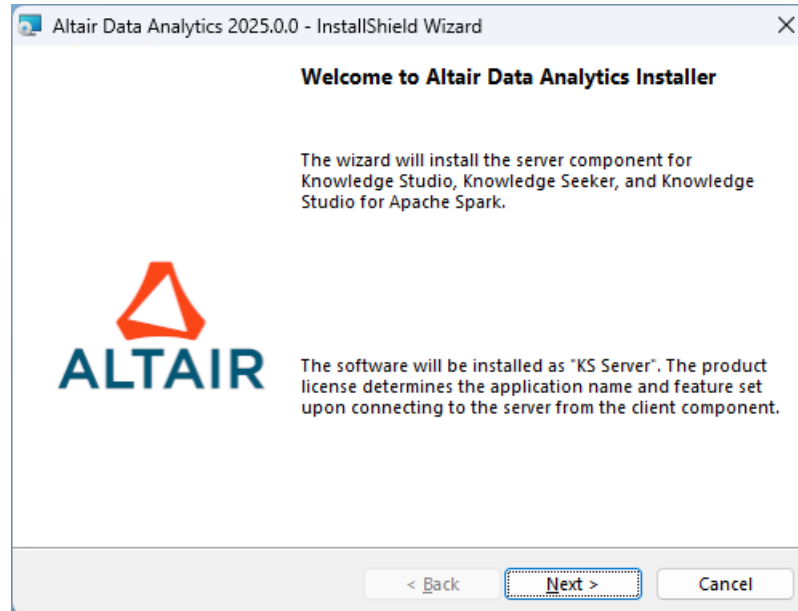
4. The License Agreement window opens. If you accept the terms, select "I accept".
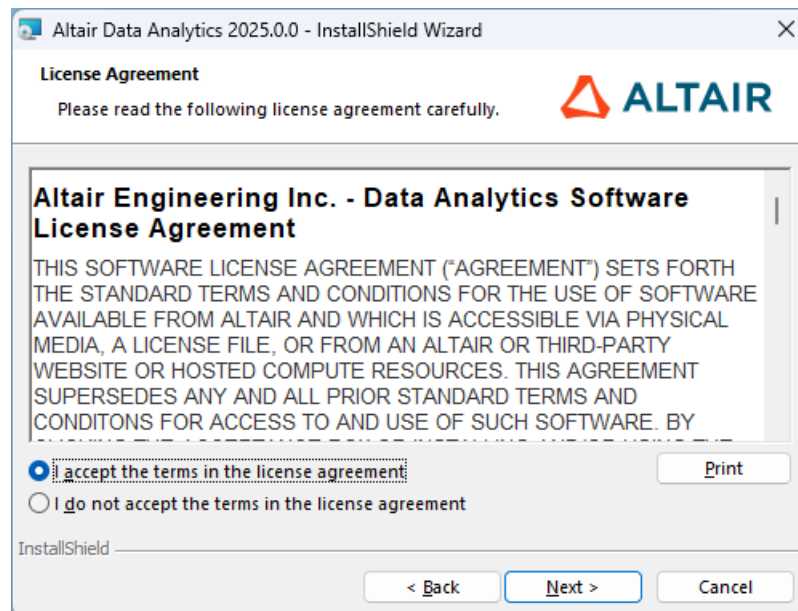


Click **Next >**.

5. The Setup Type window opens:
   - To install KS Server program files to the default location with default settings, select the **Express** option.

The application program files will be installed in `C:\Program Files\Altair Data Analytics`. A Windows Service called *KSWinLoginService2025.0_64* will be installed and started automatically.
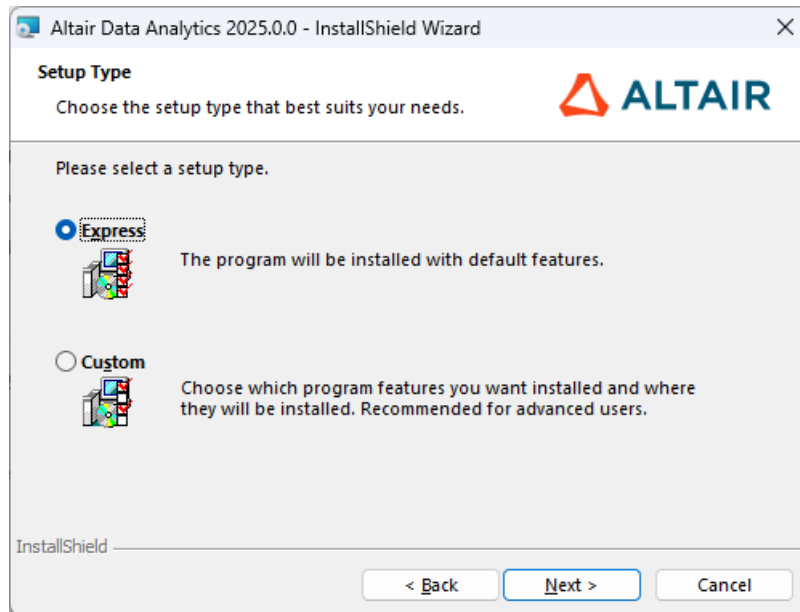


Click **Next >** and proceed to Step 7.

- To change the destination for KS Server program files or KS service properties such as the TCP port for the service to listen on, select the **Custom** option.
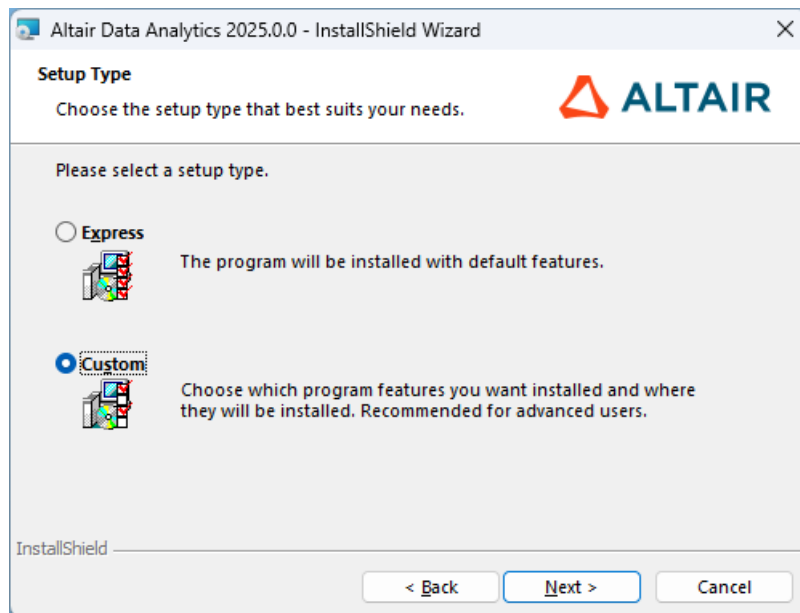
Click **Next >**.

6. If you select the **Custom** option, the Custom Setup window opens. To change the destination folder for the program, click the **Change** button and specify the desired location. The default is `C:\Program Files\Altair Data Analytics`.
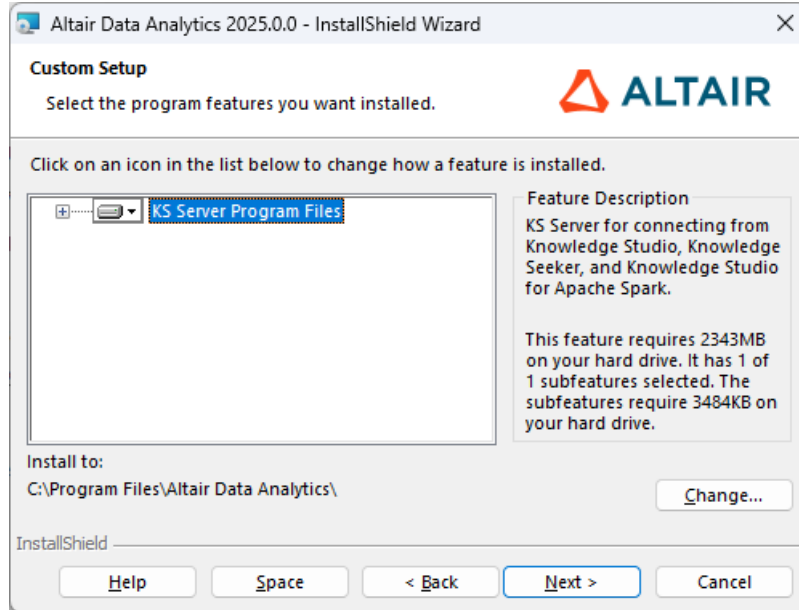


Click **Next >**.

7. The Altair License Configuration window opens.

- If the server has previously been configured for Altair licensing, the values of the environment variables `ALM_HHWU` and/or `ALTAIR_LICENSE_PATH` are displayed. Click **Next >** to accept the existing configuration.

  Example 1: The machine is already configured for **managed Altair Licensing** (`ALM_HHWU=True`):
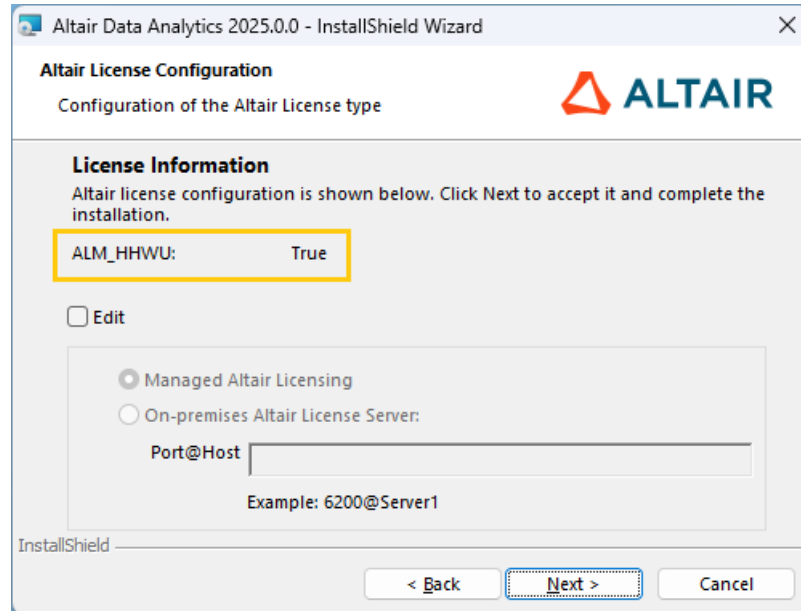
Example 2: The machine is already configured for an **on-premises Altair License Server** licensing (`ALTAIR_LICENSE_PATH=6200@<server_name>; ALM_HHWU=false`):
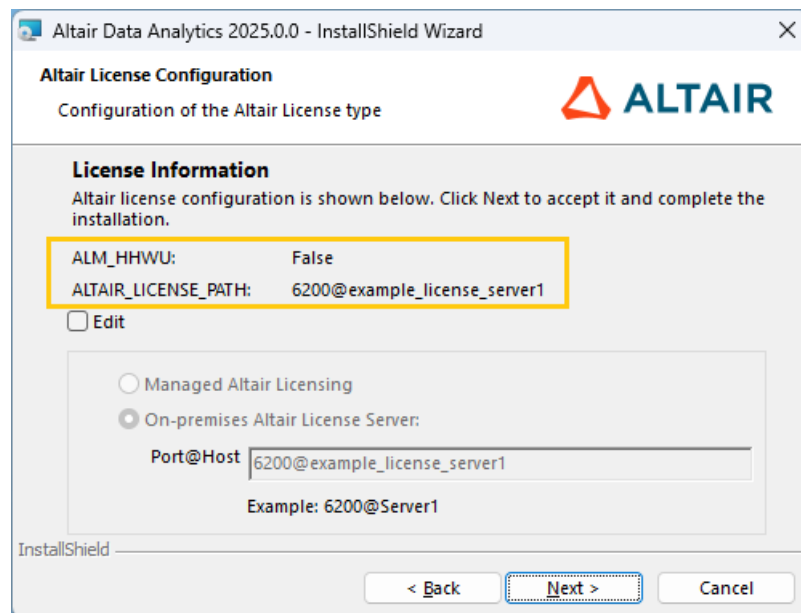


- If the host machine has not previously been configured for Altair licensing, enter the license configuration information. Choose the licensing method: *Managed Altair Licensing* or *On-premises Altair License Server*.

  *Contact your team members responsible for Altair product licenses if you are not sure which licensing method is going to be used.*

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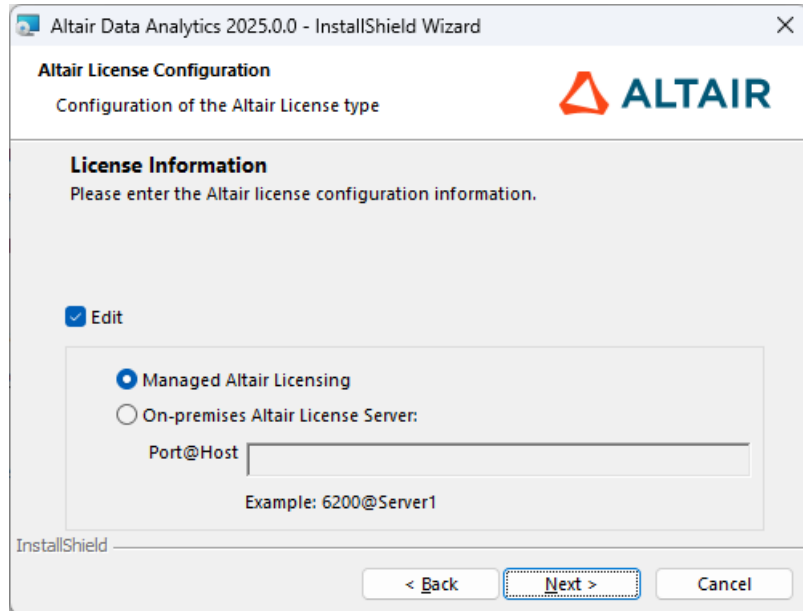
- o  If you select Managed Altair Licensing, once you click **Next >**, the system environment variable `ALM_HHWU` will be created, and its value will be set to *True.*

- o  If you select *On-premises Altair License Server*, specify the license server address and port in the format `<port>@<host>`, for example, `6200@server1`.
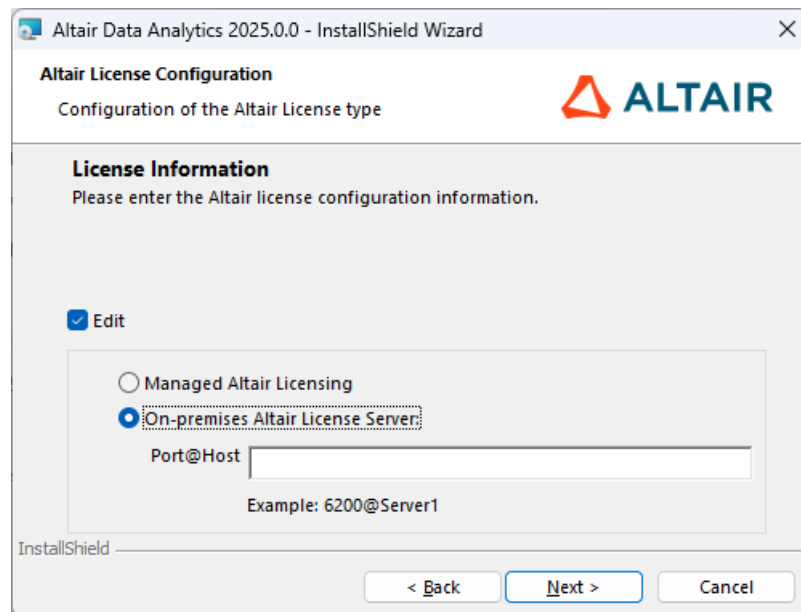


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Once you click **Next >**, the system environment variables `ALTAIR_LICENSE_PATH` and `ALM_HHWU` will be created. The former will be assigned the value you specified, and the latter will be set to *False*.

See Section 14 for detailed information about the licensing methods.

**8.** The Windows Service Setup window opens.

The option ***Install KSWinLoginService as a Windows Service*** is selected by default. Leave it selected unless you are installing KS Server for Real-Time Scoring Web API only. If you deselect it, you will have to start KS Server manually from the command line, and it will not be restarted automatically after the server is rebooted.

Specify the TCP port for the service. The default is **5470**. The port must be open for inbound connections on the server, as described in Section 8.1.4, "Configuring KS Service".
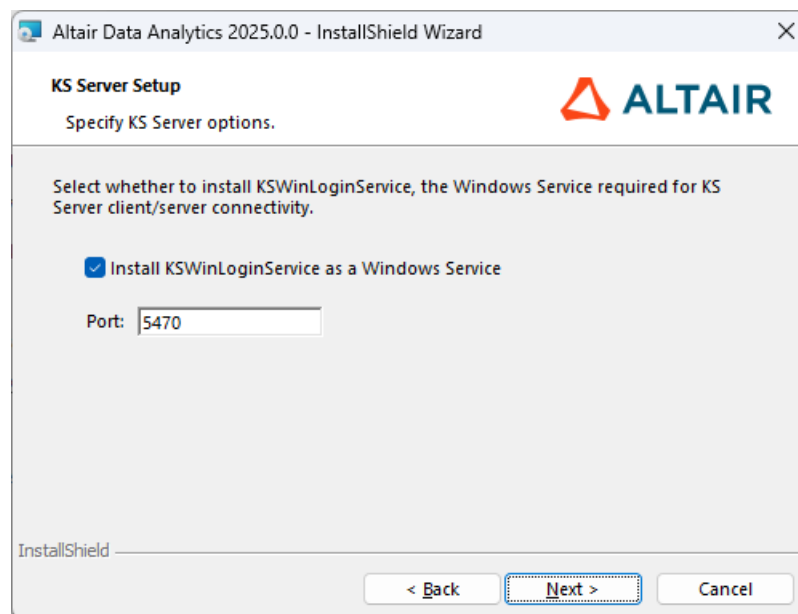


Click **Next >**

**9.** Click **Install** to start the installation.
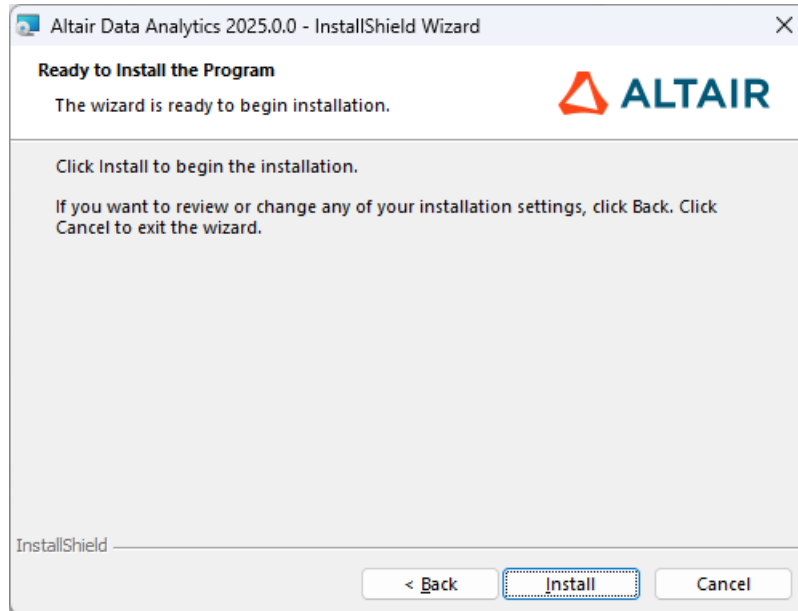
**10.** The Setup Status window shows the installation progress. When the installation is complete, click **Finish**.
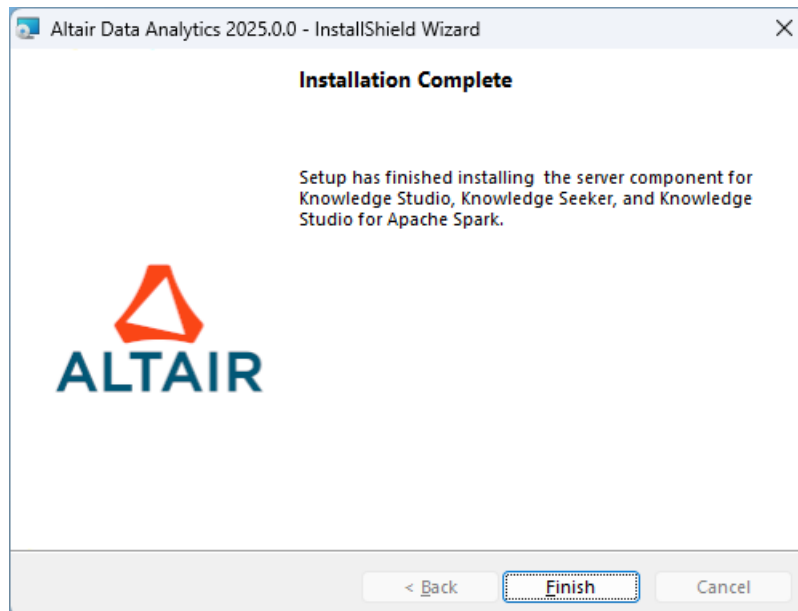


After the installation, open Windows Services and verify that the service **KSWinLoginService2025.0_64** is running, and its Startup Type is 'Automatic'.
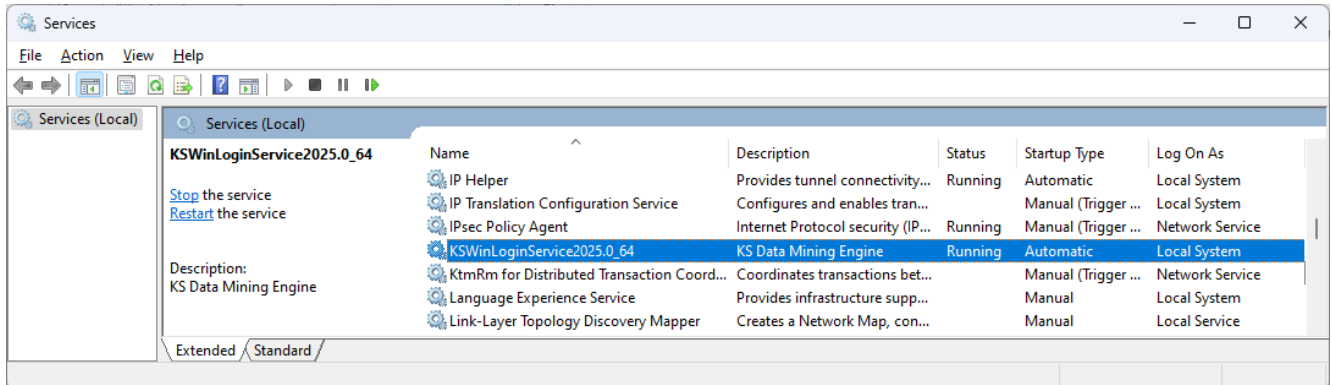
**11.** If you select the Managed Altair Licensing option at Step 7, authorize the server for the Managed license as follows:

- Run Command Prompt as administrator.

- Change to the folder `C:\Program Files\Altair Data Analytics\KS Server 2025.0.0\security`

- Run the following command, where `<username>` is your Altair One login ID:

  ```
  almutil -a1auth -system -username <username> -passwd
  ```

You will be prompted for your password to log in to Altair One. The successful login will automatically authorize the machine.

If you are not registered at Altair One, ask a registered user to generate and send you an authorization code at Altair One, then use the following command:

```
almutil -a1auth -system -code <auth_code>
```

For detailed information on the almutil usage and advanced options including proxy configuration, run almutil with no arguments. See also Section 14.

8.1.2. Install KS Library for *R* Integration on Windows Server

Knowledge Studio and Knowledge Seeker support integration with R software environment for statistical computing. If the intended users are going to use this feature, install KS Library for R on the server as described below.

Prerequisites: R software and KS Server. R is only required on the server side. In the Prerequisites section above, see Subsection 5.2: "*R Software for Statistical Computing*".

1. Make sure KS Server 2025.0 and R v4.0.0 or higher are installed.

2. Download *KS Library 2025.0 for R 4.0 or higher* from the Altair software download site.

3. Uninstall any previous version of KS Library for R from the Programs and Features list in the Windows Control Panel.

4. Double-click the downloaded package for KS Library for R. Click **Next >** in the Welcome screen.
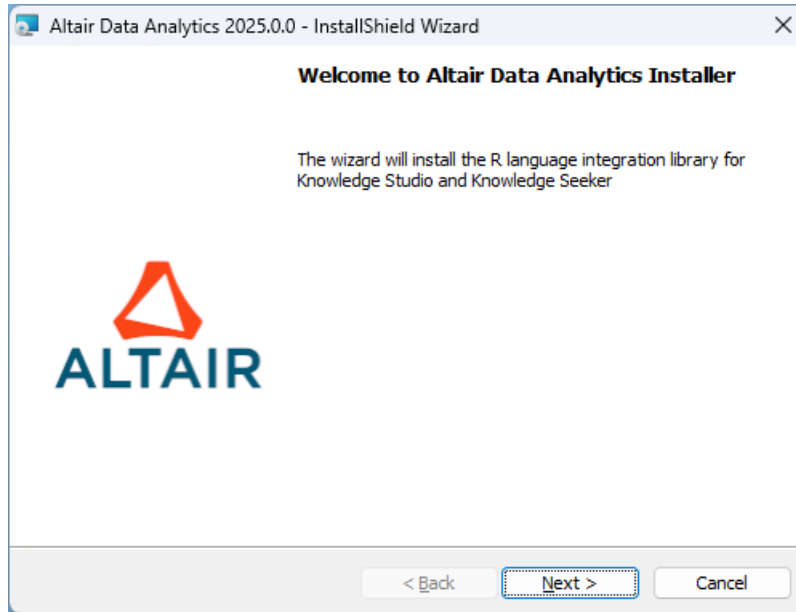
5. In the License Agreement window, select "**I accept**" if you accept the terms and click **Next >**.
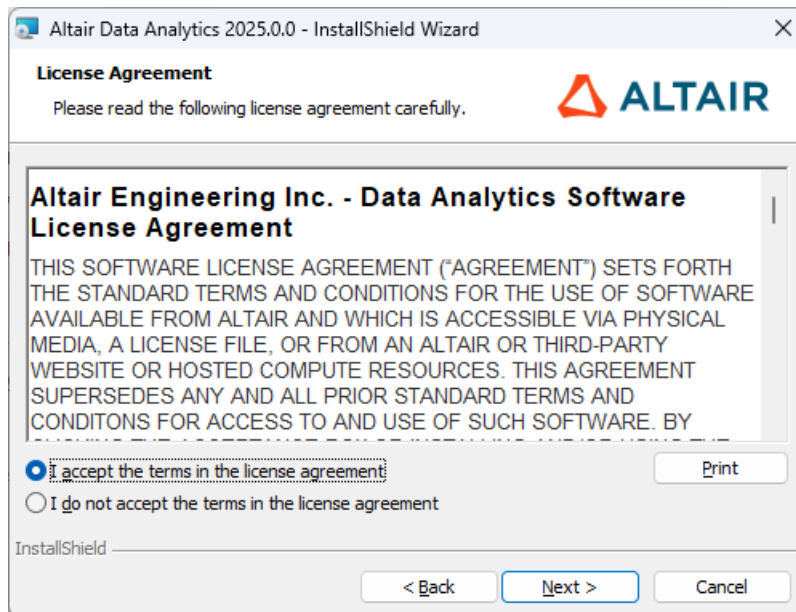
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6. The Destination Folder window opens. KS library for R will be installed into `<R root folder>\R-X.X\library\`, where R-X.X is the most recent version of R on the host machine. The standard R root folder is `C:\Program Files\R`. The default folder to extract the temporary setup files is `C:\Program Files\Altair Data Analytics`. To change any of these folders, click the **Change** button.
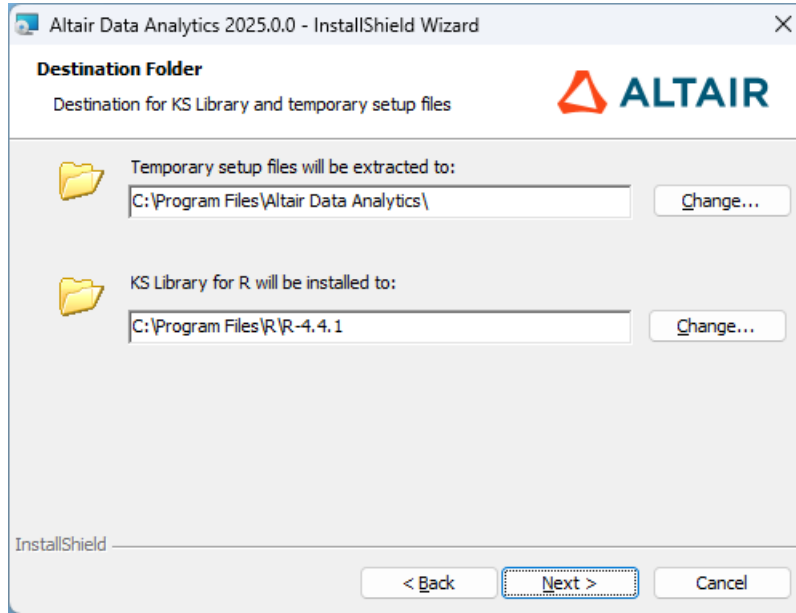

Click **Next >**.
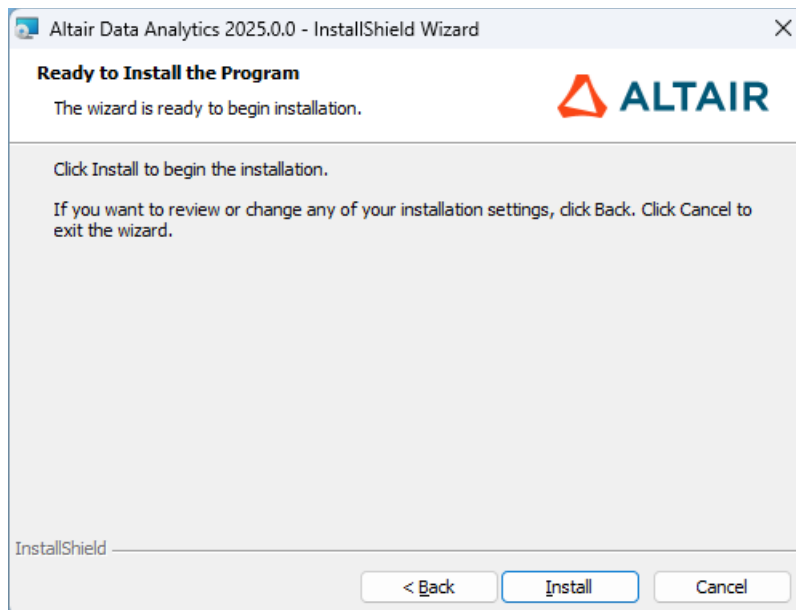
7. Click **Install**.

8. The Setup Status window shows the installation progress. When the installation is complete, click **Finish**.
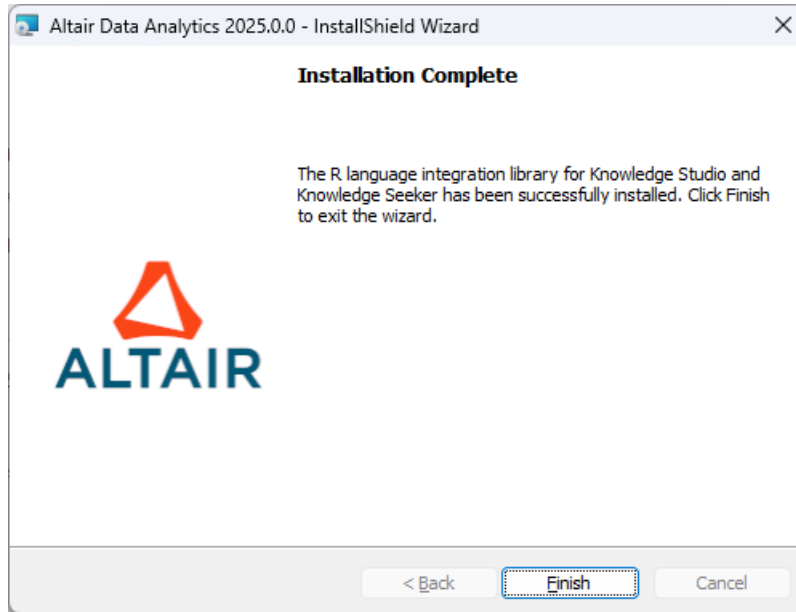
As a result, three subfolders containing the required *R* integration libraries are created under `<R root folder>\R-X.X\library\` :

- `angoss`

- `KnowledgeSurvival`

- `xtable`

If users are required to use a different *R* library path, copy the folders `angoss,` `xtable,` and `KnowledgeSurvival` to the desired *R* library location.

Note: The **Rserve** package, whose installation was described in Section 5.2.3, must be present in the same R library location.

8.1.3. Installing Altair SLC

1. Download the latest versions of Altair SLC from AltairOne Marketplace. If you don't have an AltairOne account, please reach out to the person managing Altair software licenses at your organization or contact Altair Data Analytics Customer Support at dasupport@support.com.
2. Run the downloaded Altair SLC installation package. Click **Next >** in the Welcome screen.

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3. In the End-User License Agreement window, select "**I accept the terms in the License Agreement**" if you accept the terms. Click **Next >**.

4. In the Custom Setup page, select all Altair SLC program features, as shown below. To change the destination folder for the application program files, click the **Change** button and specify the desired location. The default is C:\Program Files\Altair\SLC\<version>. Click **Next >**.

5. Click **Install** to start the installation.

6. The Setup Status window shows the installation progress. When the installation is complete, click **Finish**.

7. Altair SLC only contains the compiler engine without graphical user interface components. The graphical user interface is provided by the Altair Analytics Workbench on the client side.

Altair SLC uses the same license as Knowledge Studio Server. Activating KS Server with an Altair Units License automatically activates Altair SLC on the same machine.

8.1.4. Configure KS Service (KSWinLogin Service)

The Windows service **KSWinLoginService2025.0_64** is installed and started automatically if you chose the default Windows Service Setup option in the KS Server installation wizard.

The service is listening on the port that was specified in the wizard. The default is **5470**. If you want to change the default port for KSWinLogin Service, specify the desired port number in the KS Server configuration file **KSWinLogin.conf**, whose default location is `C:\Program Files\Altair Data Analytics\KS Server 2025.0.0\bin`.

For example, to change the default port to 5480, open the file KSWinLogin.conf in a text editor and add the following line:

```
port 5480
```

Then open *Services* from the Windows Control Panel | Administrative Tools and restart KSWinLoginService2025.0_64.

Upon each client connection from KS Workstation, KS Server creates a process called **KSWinLogin.exe**. Server administrators can monitor these processes in the Task Manager. Connection attempts are logged in the Windows Server Event Viewer in the *Application* and *Security* logs in the *Windows Logs* folder.

Cryptographic Protocols:

TLS1.2 is used by default. The older versions TLS1.1, TLS1.0, and SSL are never used.

Windows Firewall configuration

Create a new inbound rule for the KS Server TCP port.

In your Windows Server Control Panel, open *System and Security* → *Administrative Tools* → ***Windows Firewall with Advanced Security***
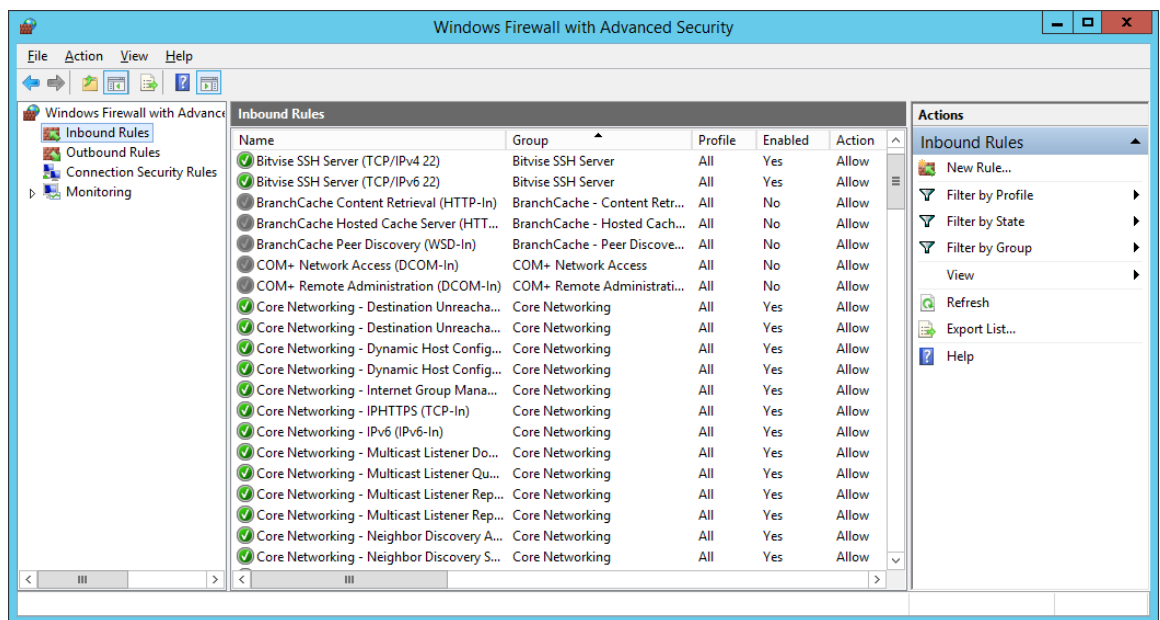
Expand the top item in the left panel and open ***Inbound Rules***. In the Actions panel on the right, click **New Rule…**

In the New Inbound Rule Wizard, select the **Port** option.

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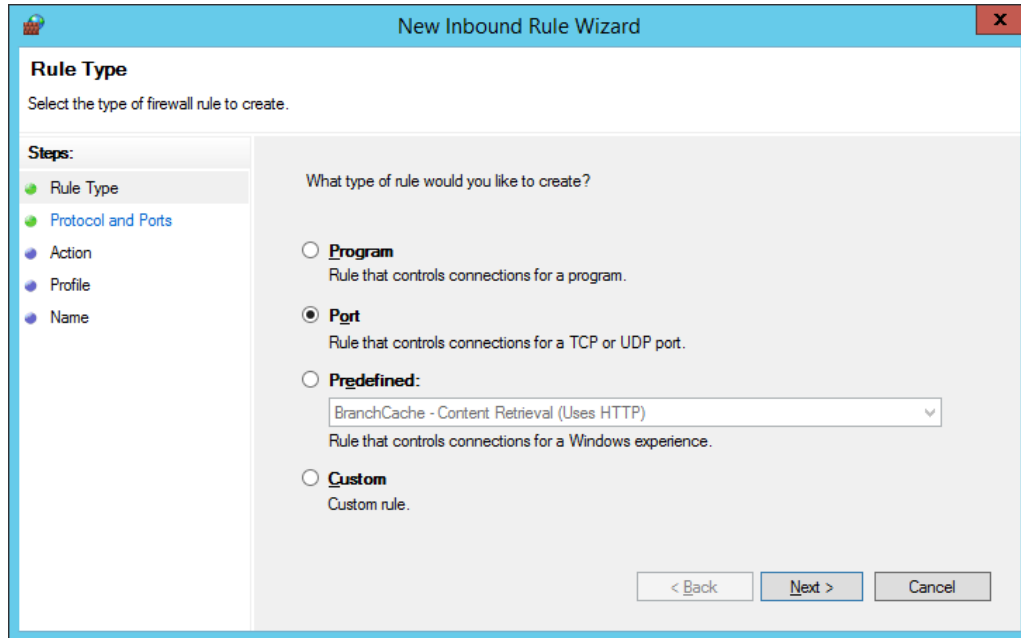
At the next step, select the **TCP** option and choose "***Specific local ports***". Then specify the port(s) to open for inbound connection from the client machines. *Note: If you configured KS Server to run on a non-default port, replace "5470" below with the port number you specified in KSWinLogin.conf.*

- For Knowledge Seeker or Knowledge Studio:
    - enter port number **5470**
    - if users require the Jupyter Notebook integration feature, in addition to 5470, specify the range of TCP ports to be used by Jupyter Notebook users (for example, 8800-8900)
- For Knowledge Studio for Apache Spark, open port **5470** and the port range **6060–6090**.

See the example screenshot below.
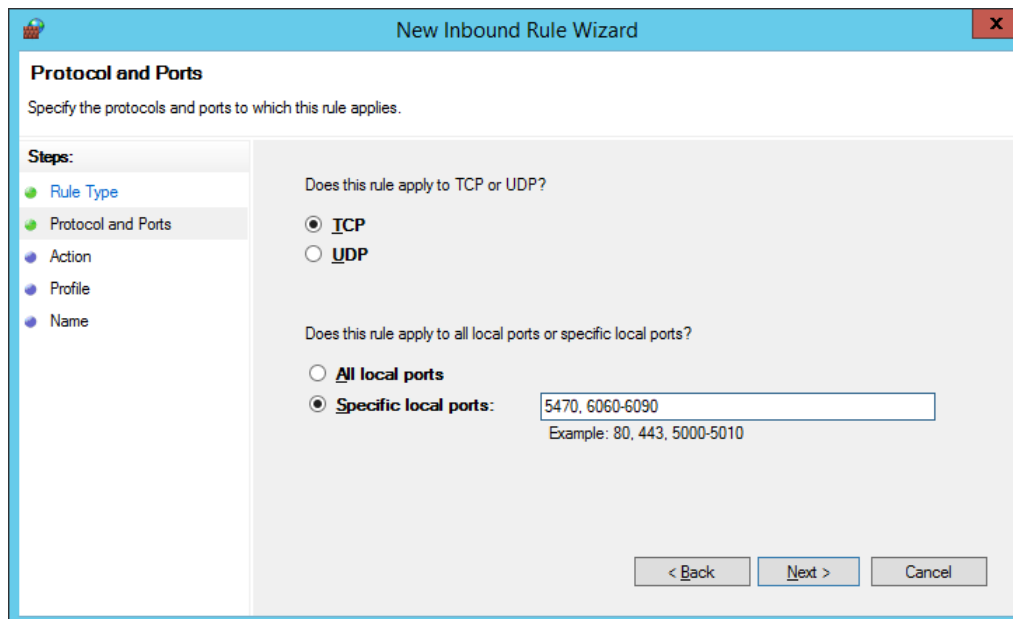
At the next step, select the option "*Allow the connection*" or "*Allow the connection if it is secure*", depending on your security requirements.
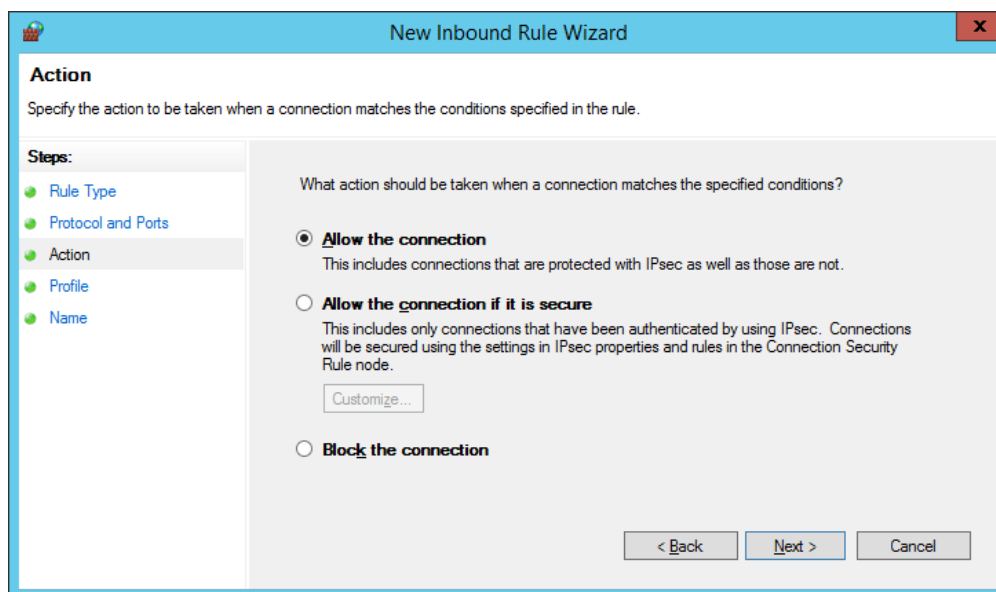
At the next step, select the desired profiles depending on your security requirements. At least the **Domain** profile is usually required.
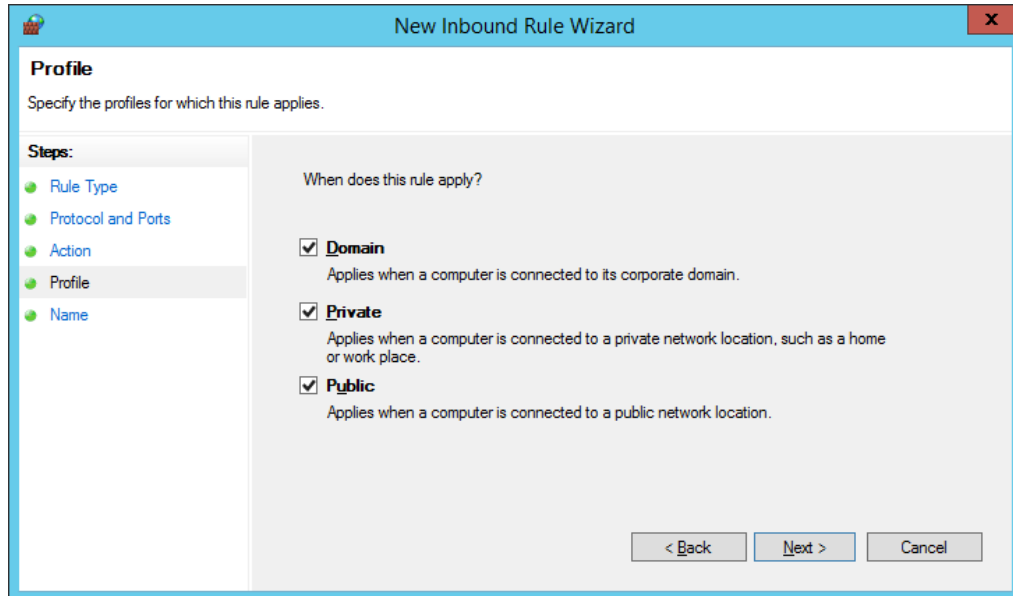
At the next step, enter the name for the new rule (for example, "*Altair KS Server*") and optional description.
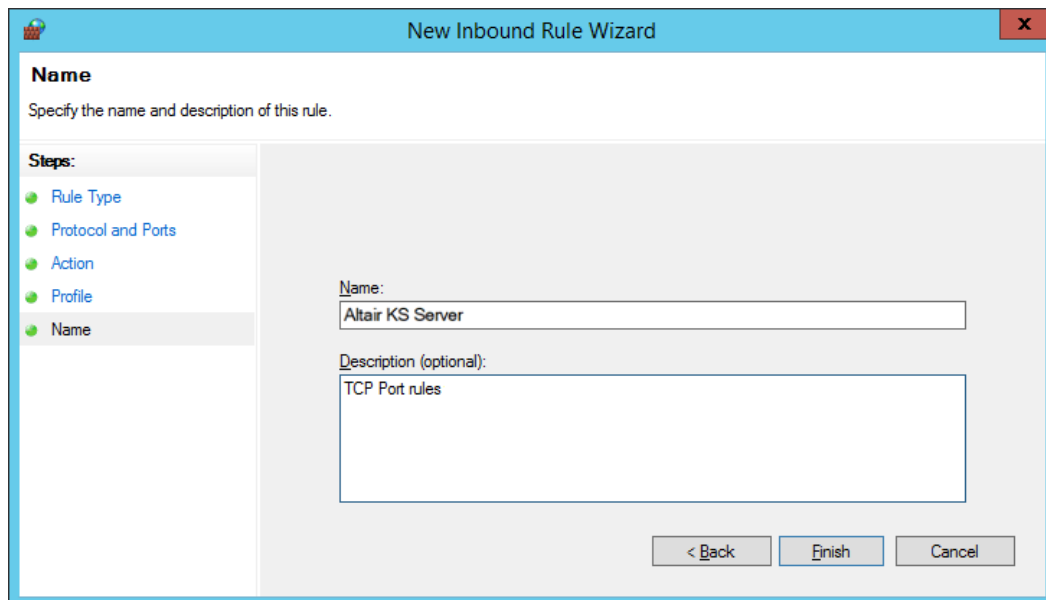
Click **Finish**. The new rule will be created in the Windows Firewall with Advanced Security configuration.
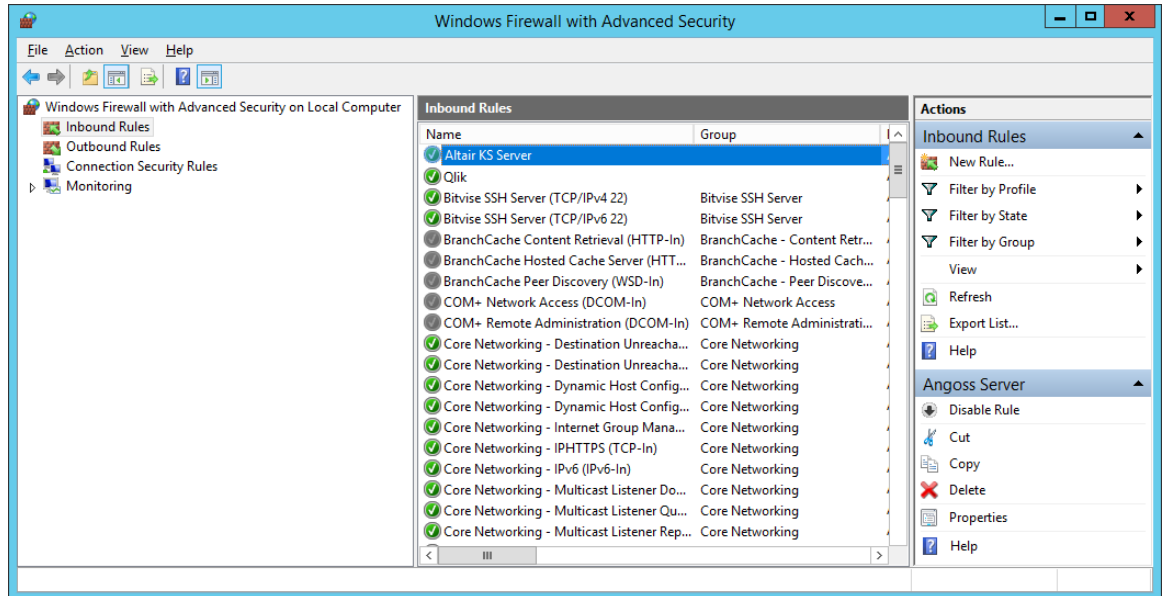
8.1.5. Configure User Rights on the Server

Create a user group that includes all intended users of KS Server in the client/server mode. For example, call it **KS_Users**. Note: Creating the group is optional. You may choose to add permissions to an existing user group that includes all potential KS Server users, or to individual users instead.

- Open the **Local Security Policy** or Local Security Settings item of the Server Administrative Tools. Open **Local Policies** and select **User Rights Assignment**.

- Edit the following policies to add the KS user group or individual users:

  - ➢ **Access *this computer from the network***

  - ➢ Either ***Allow Log on locally*** OR ***Log on as a batch job***, depending on the security requirements in your network.

55
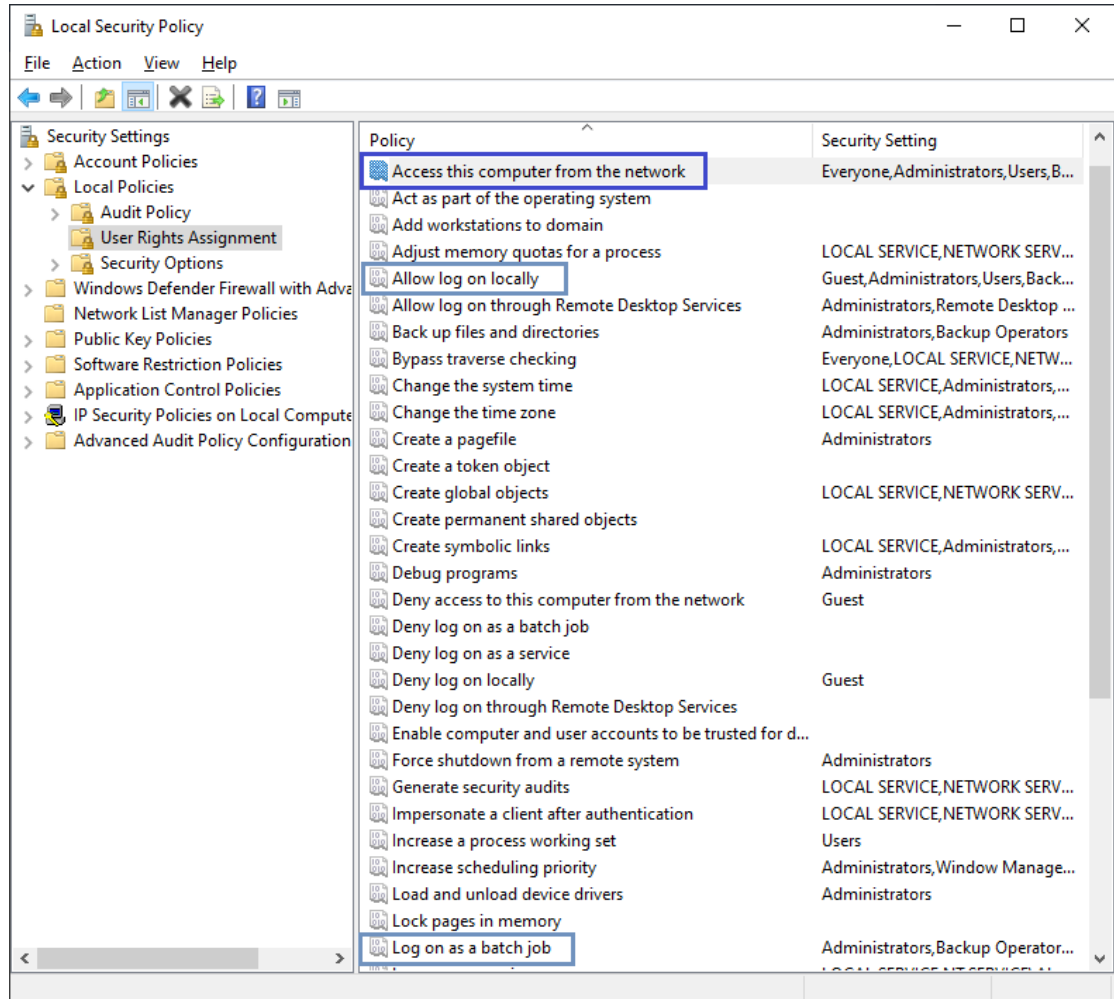
- If you choose the option **Log on as a batch job**, update the KS Server configuration file **KSWinLogin.conf.** Its default location is `C:\Program Files\Altair Data Analytics\KS Server 2025.0.0\bin.` Open the file `KSWinLogin.conf` in a text editor and add the line

  ```
  logon_type batch
  ```

- Restart the service KSWinLoginService2025.0_64

8.1.6. Configure Altair SLC and SSH Server

Configure Altair SLC

1. Create a new parent folder on the server for the Altair SLC standard libraries SASUSER and WORK. The WORK library is for temporary files. It is recommended to use the same drive where the Knowledge Studio users' working

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directories are set up. For example, create a new folder **D:\ALTAIRSLC_HOME**. This folder must have Read & Write permissions for all KS Server users.

2. Edit the configuration file **altairslc.cfg** located in the Altair SLC root folder C:\Program Files\Altair\SLC\<version_number>. Change the values of the SASUSER and WORK parameters in altairslc.cfg. For example, if the folder you created is D:\ALTAIRSLC_HOME, then specify:

```
-SASUSER 'D:\ALTAIRSLC_HOME\!USERNAME\My SLC Files'
-WORK 'D:\ALTAIRSLC_HOME\!USERNAME\TEMP'
```

Save the changes in altairslc.cfg.

Note: In case of any issues with user-specific subfolders, you may omit the `!USERNAME` variable referring to user-specific locations and define common SASUSER and WORK locations as follows (*not recommended, as this is a less organized way*):

```
-SASUSER 'D:\ALTAIRSLC_HOME'
-WORK 'D:\ALTAIRSLC_HOME\TEMP'
```

3. Set the environment variables for the Altair SLC integration: From the Windows Server Control Panel, open System → Advanced System Settings, go to the Advanced tab and click Environment Variables.

   a) In the System Variables section, click New and add an environment variable **ANGOSS_DLL** with the value **AngossData64-2025.0.dll**

   b) In the System Variables section, select the PATH variable, click Edit, and add the path to the KS Server bin folder at the end. For example, if KS Server is installed in the default location, this is `C:\Program Files\Altair Data Analytics\KS Workstation 2025.0.0\bin`

Install and Configure Bitvise SSH Server

Bitvise SSH server is required for Altair SLC integration for Knowledge Studio in the client/server mode. It can be downloaded from https://www.bitvise.com/ssh-server-download. Install and configure the standard, fully functional Bitvise SSH server edition. The detailed configuration instructions are available here: https://www.bitvise.com/configuring-ssh-server-for-sftp. Below is a brief description of the installation and configuration steps suitable for most cases:

1. Download the file **BvSshServer-Inst.exe** and run the downloaded executable. In the installation wizard, make sure you select the standard, fully functional Bitvise SSH server edition that supports domain accounts.

2. When the installation is complete, the Bitvise SSH Server Easy Settings window appears. In the **Server Settings** tab, select the desired option for "*Open Windows Firewall*". If you choose any option other than "Open port(s) to any computer", make sure the listening port is accessible to the computers of all KS Server users.

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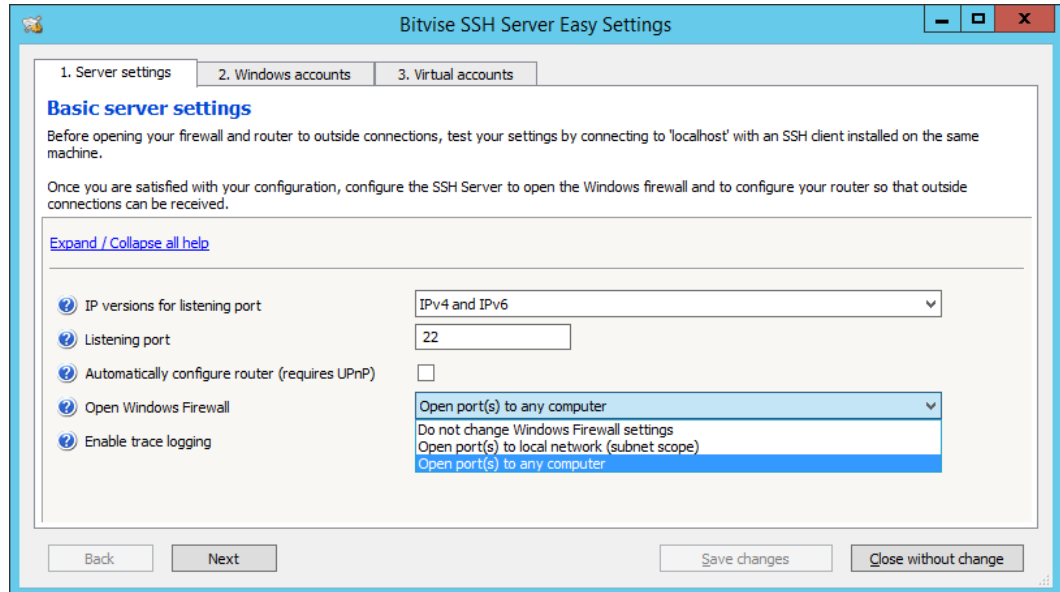
Check *the* settings in the Windows accounts tab and modify them if necessary (see the next screenshot). Make sure that logging in to Windows domain accounts of KS Server users is allowed.
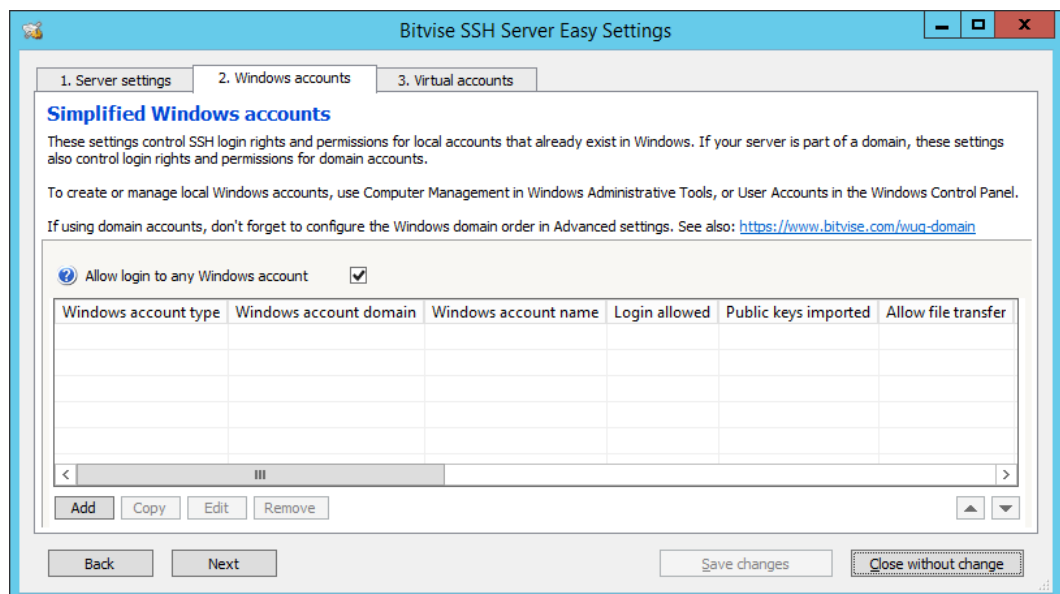
If required, configure access for the Virtual accounts in the third tab.

3. If you choose not to start the server upon closing the Easy Settings dialog, start it from the Bitvise SSH Server Control Panel, as shown below. Easy Settings and Advanced Settings are also available in the same Control Panel dialog. For

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detailed description of advanced settings, see
https://www.bitvise.com/configuring-ssh-server-for-sftp
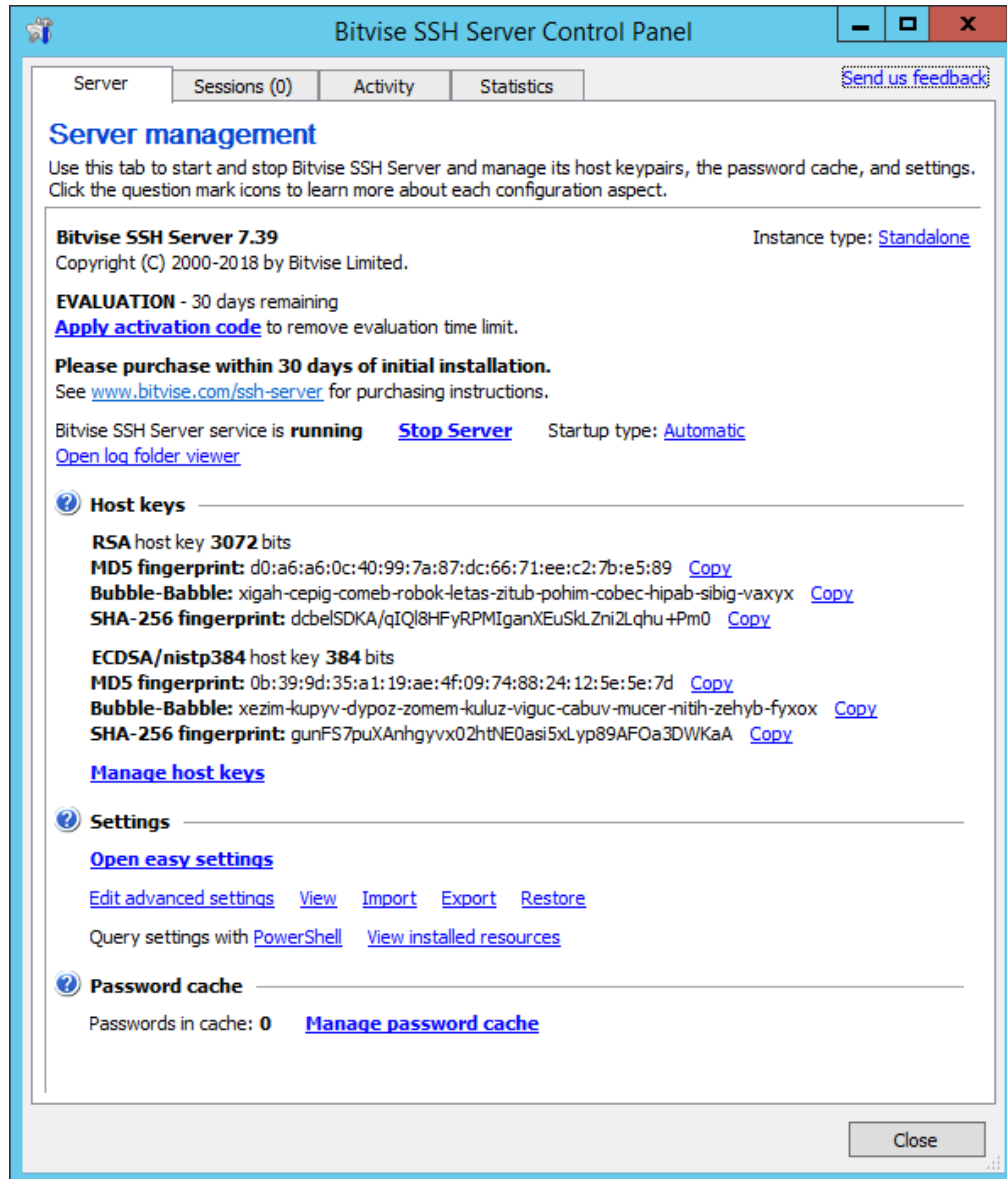
4. <u>Windows Firewall configuration for Bitvise SSH Server</u>: Depending on your Windows Firewall configuration and security rules, you may need to edit the default Inbound rules for Bitvise SSH Server. In your Windows Server Control Panel, open *System and Security → Administrative Tools → **Windows Firewall with Advanced Security***

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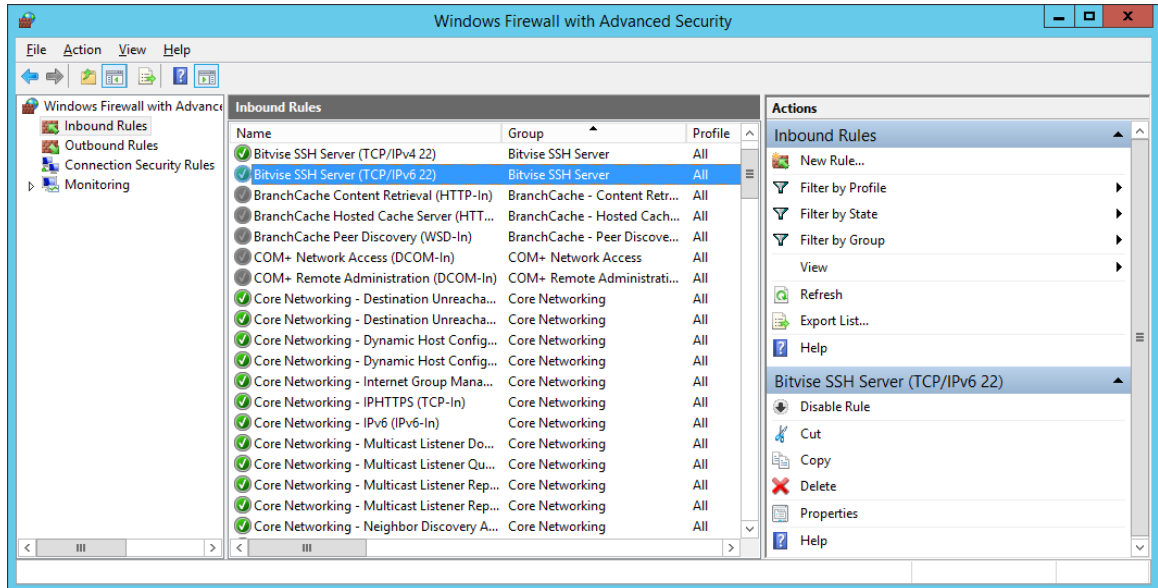
5. Expand the top item in the left panel and open **Inbound Rules**. Double-click the rule "*Bitvise SSH Server (TCP/IPv6 22)*" to open its properties. Go to the Scope tab of the Properties dialog and specify the desired Remote IP address range for computers allowed to access the SSH server. Make sure the users' computers are within this range.
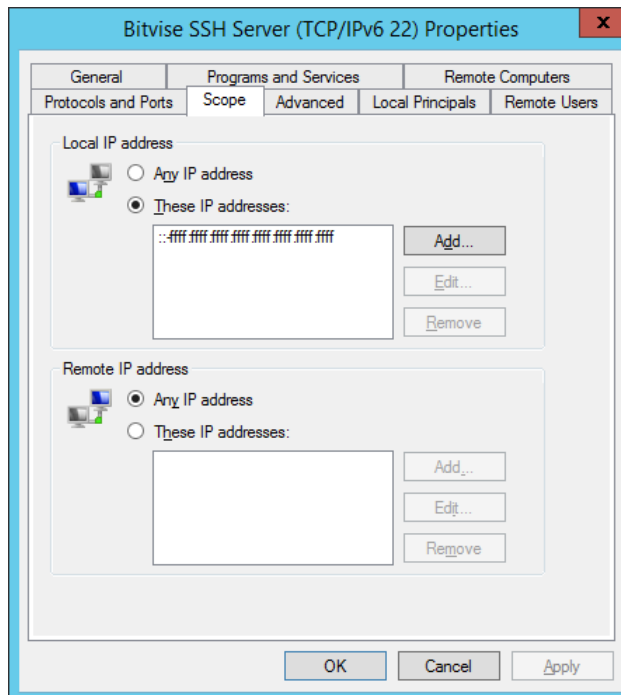
6. Go to the Advanced tab of the Properties dialog and specify the desired profiles to which the rule applies. Make sure the computers of the KS Server users fit at least one of these profiles.
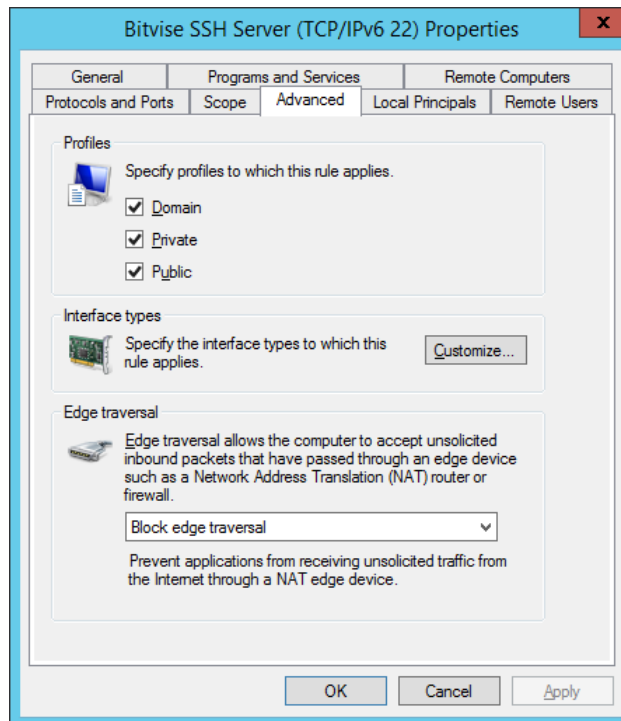
7. Set the same properties for the rule "*Bitvise SSH Server (TCP/IPv4 22)*".

8.2. KS Server Installation and Configuration on Linux

This section describes the process of installing and configuring KS Server and dependent components on Linux. For system requirements and prerequisites, see Section 3 and Section 5. Follow the steps below.

8.2.1. Configure Pluggable Authentication Modules (PAM) for KS Service

Define the authentication rules for KS Server by creating the KS Service configuration file **kslogin** in /etc/pam.d/. Since these rules should normally be the same as those for the standard **login** service, create *kslogin* by copying the *login* configuration file:

```
cp /etc/pam.d/login /etc/pam.d/kslogin
```

For more information about PAM modules and options, see the system-level administration guide in your Linux OS documentation and http://www.linux-pam.org/.

8.2.2. Install KS Server on Linux

1. Download the KS Server installation package for your Linux system from the Altair software download site. For example, for Red Hat enterprise Linux 8, the file name is *KS-Server-2025.0-rhel8_x64.rpm*. Copy the downloaded file to a directory on the server.

2. Log in to the server as **root**.

3. If you are upgrading from a previous version of KS Server, note that the installer will shut down all current KS Server processes. Notify the users if necessary. To check if any KS user processes are running, use the command

```
ps -ef | grep kslogin
```

4. Run the installer. For example, on Red Hat Enterprise Linux 8, run the command

```
rpm -ivh KS-Server-2025.0-rhel8_x64.rpm
```

This installs KS Server to `/opt/Altair-Data-Analytics` and starts the KS service *kslogin*.

To install to a different directory, specify the desired path after the `--prefix` switch. For example, this command installs KS Server to `/apps/Altair-Data-Analytics` on Red Hat Enterprise Linux 8:

```
rpm -ivh --prefix=/apps KS-Server-2025.0-rhel8_x64.rpm
```

5. Verify that the KS service has started successfully. The following messages indicate the successful start:

```
/opt/Altair-Data-Analytics/KS-Server-
2025.0/lib/kslogin(service_pid=2951,server_pid=2952) 2024-
08-09 23:33:06 server start: port 5470
```

```
/opt/Altair-Data-Analytics/KS-Server-2025.0/lib/kslogin:
logging to kslogin.log
```

8.2.3. KS Libraries for R and Python

This section describes the steps to install and configure R and Python integration libraries.

Install and configure KS Library for R

If the R integration features are required, make sure that R version 4.0.0 or higher is installed as described in [Section 5.2](link).

In the examples below, it is assumed that R is installed under `/usr/lib64/R`.

1. Edit the KS Server startup script **ks_start**, whose default location is `/opt/Altair-Data-Analytics/KS-Server-2025.0`. In the R environment section, specify the value for the `R_HOME` environment variable if the R home directory on your server is different from the default specified here:

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```
R_HOME=/usr/lib64/R

export R_HOME
```

2. Uninstall any previous version of KS Library for R as follows:

```
R CMD REMOVE angoss

R CMD REMOVE KnowledgeSurvival
```

3. Install KS Library for R:

```
cd /opt/Altair-Data-Analytics/KS-Server-2025.0/R

Rscript angossSetupR.R
```

This will create three directories under the R library location
`/usr/lib64/R/library/`:

- `angoss`
- `KnowledgeSurvival`
- `xtable`

If any users need to use a different R library path, copy the directories `angoss`, `KnowledgeSurvival`, and `xtable` to the desired R library location. Note that the [Rserve](#) library must exist in the same R library location (see [Section 5.2.3](#)).

Configure KS Library for Python

If Python integration features are required, make sure that Python or one of its distribution packages has been installed as described in [Section 5.3](#).

Edit the KS Server startup script ks_start in `/opt/Altair-Data-Analytics/KS-Server-2025.0`. In the Python environment section, specify the value for the `PYTHON_HOME` environment variable. It must point to the parent directory of the Python `bin` and `lib` directories. For example, if your Python is a part of Miniforge installed in `/opt/miniforge3`, then set `PYTHON_HOME` to `/opt/miniforge3`:

```
PYTHON_HOME=/opt/miniforge3

export PYTHON_HOME
```

8.2.4. Install and Configure Altair SLC

1. Download the installation package for Altair SLC for Linux (x64) from the [Altair Marketplace](#) and copy it to the server where KS Server is installed. If you don't have an AltairOne account, please reach out to the person managing Altair software licenses at your organization.

2. Install Altair SLC for Linux by running the command

```
rpm --install <slc-installation-file>.rpm
```

The default installation location is `/opt/altair/slc/2024`

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3. Create a symbolic link `/opt/altairslc` pointing to the Altair SLC root directory. For example, if Altair SLC is installed in `/opt/altair/slc/2024`, then link it as follows:

```
ln -s /opt/altair/slc/2024 /opt/altairslc
```

If creating a symbolic link in /opt is not desirable, define the environment variable WPS_HOME in ks_start: `export WPS_HOME=/opt/altair/slc/2024`

4. Edit the configuration file `altairslc.cfg` in `/opt/altair/slc/2024` and modify the SASUSER and WORK attributes as follows:

```
-SASUSER '!HOME/altairslc'

-WORK '!HOME/altairslc/tmp'
```

(note: you can choose any name instead of 'altairslc').

5. Make sure that the OpenSSH server process (`sshd`) is running. Refer to the Linux documentation for the information on the *openssh-server* and *openssh* packages and starting the `sshd` daemon. For example, for RHEL 7, see [OpenSSH for RHEL 7](#).

6. Create the **altairslcenv.sh** shell script for SLC environment in the ALTAIR SLC root directory `/opt/altair/slc/2024` and define the following environment variables in this script (in this example, KS Server is assumed to be installed in `/opt`):

```
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/opt/Altair-Data-
Analytics/KS-Server-2025.0/lib

export ANGOSS_DLL="libAngossData.so"
```

For a [self-hosted Altair License Server](#), define the ALTAIR_LICENSE_PATH variable (for `altair_license_server`, substitute the name or IP address of the Altair License Server host machine):

```
export ALTAIR_LICENSE_PATH=6200@altair_license_server
```

For a [Managed license](#) hosted in the Altair cloud, the define ALM_HHWU variable:

```
export ALM_HHWU=true
```

8.2.5. Configure KS Service and Security

This section describes the steps to configure KS service, the firewall for KS Server security, set KS service runtime parameters, and configure database connections. KS Server must be restarted as described in the next section for any configuration change to take effect.

Configure KS Service

The KS Server configuration file **kslogin.conf** defines the runtime parameters of the service such as the port number for the KS service to listen on, the log file name and location, etc. The default location of the service configuration file is

```
/opt/Altair-Data-Analytics/KS-Server-2025.0/lib
```

Example configuration file kslogin.conf:

```
port      5470
backlog   10
log       kslogin.log
ssl_cert  ssl_cert.pem
ssl_key   ssl_key.pem
```

- The default port number for KS service is **5470**. The port number is defined by the **port** parameter. Specify a different port if necessary.

- The **backlog** parameter is related to the socket configuration. It defines the maximum length that the queue of pending connections may grow to. The default value (10) is suitable in most cases.

- The **log** parameter defines the name of the KS service authentication log file. When its name is specified without the full path, it is located in `<install_dir>/Altair-Data-Analytics/KS-Server-2025.0`. To keep the log in a different location, specify the full path, for example: `/opt/Altair-Data-Analytics/logs/kslogin.auth.log`

- The **ssl_options** parameter determines the cryptographic protocol to be used by KS Server. TLS1.2 is used by default.

  Deprecated protocol versions TLS1.1, TLS1.0, and SSL are never used.

- The **ssl_cert** and **ssl_key** parameters name the files containing the SSL certificate and key, respectively. Their default values are ssl_cert.pem and ssl_key.pem, and the designated location for these files is the KS Server **lib** directory, which also contains kslogin.conf. These files must exist, and the OpenSSL library must approve of them, otherwise any connection attempt will fail. If necessary, generate your own certificate/key pair and copy it to the KS Server lib directory. An example command to generate the SSL certificate and key:

  ```
  openssl req -x509 -nodes -days 10000 -subj '/' -newkey
  rsa:4096 -keyout ssl_key.pem -out ssl_cert.pem
  ```

- The **authenticator** parameter defines the authentication mechanism. The default authenticator is **PAM**. If you are using other authentication methods where users do not necessarily have entries in `/etc/passwd`, specify an alternative authentication mechanism, for example:

  ```
  authenticator pw
  ```

For setting optional advanced runtime parameters, see Chapter 12.

Configure Firewall for TCP Port Connections

Create inbound rules in the Linux firewall for the TCP ports used by KS Server. Inbound connections to the KS Server host must be allowed on these ports from the KS Workstation client machines.

- For Knowledge Studio or Knowledge Seeker, open the port specified in kslogin.conf (the default is **5470**)

- For Knowledge Studio for Apache Spark, open the port specified in kslogin.conf (the default is **5470**) and the port range **6060–6090**. Ensure the network connectivity between the KS Server host and the Apache Spark Server.

8.2.6. Environment for Database Connectivity

This step is necessary only if the users need to import data from databases. See Section 5.5 for prerequisites.

1. Install the ODBC drivers for the required databases. Native ODBC drivers are recommended. For example, for Apache Hadoop, use the Hortonworks or Cloudera ODBC drivers available for free from the respective vendors.

2. Edit the file **ks_odbc** in the KS Server home directory to set the ODBC environment if necessary. The example below assumes that your unixODBC libraries are in `/usr/lib64` and odbc.ini is in `/etc`. If you do not define ODBCINI and ODBCSYSINI in ks_odbc, the unixODBC defaults will be used.

```
export ODBCINI=/etc/odbc.ini
export ODBCSYSINI=/etc
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/usr/lib64
```

3. You may need to add other environment variables depending on the requirements for the ODBC driver and the source databases. Please refer to the ODBC driver documentation. For example, for the Cloudera native ODBC driver for Apache Hive, define the `CLOUDERAHIVEINI` variable.

4. Edit the **odbc.ini** file of unixODBC to configure the Data Source Names (DSN) for the desired databases. You may need the help of the database administrator to get the host name for the database server, the database name, port number, or other connection parameters. An example odbc.ini is provided below. For the detailed guide to configuring odbc.ini for data access, refer to http://www.unixodbc.org/ and your ODBC driver documentation.

DSN Configuration Example:

The following **odbc.ini** example file defines Data Source Names (DSN) for Teradata, Oracle, MySQL, SQL Server, and Apache Hive databases.

```
[ODBC Data Sources]
TeradataDB=Teradata ODBC Driver
OracleDB=Oracle Native ODBC driver
SQL_Server=Microsoft ODBC Driver 13 for SQL Server
```

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```
MySQL=MyODBC 5.3.10 Driver DSN
HortonWorksHive64=Hortonworks Hive ODBC Driver 64-bit

[ODBC]
# Specify any global ODBC config here such as ODBC tracing.

[TeradataDB]
Driver = /opt/teradata/client/ODBC_64/lib/tdataodbc_sb64.so
DBCName = tddb.us.cloudapp.azure.com

[OracleDB]
Driver = /usr/lib/oracle/12.2/client64/lib/libsqora.so.12.1
ServerName = db_server_name
Database   = SAMPLE
SID        = orcldb.company.com

[SQL_Server_1]
Description=Microsoft ODBC Driver 13 for SQL Server
Driver=/opt/microsoft/msodbcsql/lib64/libmsodbcsql-
13.1.so.9.2
Database=sample_db
Server=db_server_name,1433
UID=
PWD=

[MySQL]
Driver        = /usr/lib64/libmyodbc5a.so
Description   = Connector/ODBC 5.3.10 Driver DSN
SERVER        = mysqldb_server_name
PORT          = 3306
USER          = dbuser1
Password      =
Database      = db_name
OPTION        = 3
SOCKET        =

[HortonworksHive64]
Description=Hortonworks Hive ODBC Driver (64-bit) DSN
Driver=/usr/lib/hive/lib/native/Linux-amd64-
64/libhortonworkshiveodbc64.so
HOST=hdp_server_name
PORT=10000
Schema=default
ServiceDiscoveryMode=0
ZKNamespace=
HiveServerType=2
AuthMech=2
ThriftTransport=1
UseNativeQuery=0
UID=
KrbHostFQDN=_HOST
```

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```
KrbServiceName=hive
KrbRealm=
SSL=0
TwoWaySSL=0
ClientCert=
ClientPrivateKey=
ClientPrivateKeyPassword=
```

8.2.7. Starting and Stopping KS Service

The KS service *kslogin* starts automatically upon the KS Server installation and listens to KS client connections. This section describes the use of KS Server scripts for starting and stopping the KS service.

Starting KS service using ks_start:

1. Log in as **root**.

2. Change to the KS Server home directory. For example:

    ```
    cd /opt/Altair-Data-Analytics/KS-Server-2025.0
    ```

3. Run ks_start:

    ```
    ./ks_start
    ```

    The following messages confirm that the KS service started successfully:

    ```
    /opt/Altair-Data-Analytics/KS-Server-
    2025.0/lib/kslogin(service_pid=2951,server_pid=2952) 2024-
    01-02 23:33:06 server start: port 5470
    ```

    ```
    /opt/Altair-Data-Analytics/KS-Server-2025.0/lib/kslogin:
    logging to kslogin.log
    ```

    The service is now ready to accept connections from KS Workstation clients. You will be able to test the client/server connection and install the license after deploying KS Workstation on Windows (see Section 8.3).

    If any errors are reported, see Section 8.2.8, "Troubleshooting".

Stopping the service using ks_shutdown:

To stop the KS service and all KS users' kslogin processes on the server, use the **ks_shutdown** command in the KS Server home directory:

```
cd /opt/Altair-Data-Analytics/KS-Server-2025.0
```

```
./ks_shutdown
```

To restart the KS service, use ks_shutdown first and then run ks_start.

To stop only a particular user's process rather than the entire KS service, list all kslogin processes first, then kill the process running under this specific user ID:

```
ps -ef | grep kslogin
```

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get the process ID of the user

```
kill -9 <process ID>
```

8.2.8. Automating KS Server Startup with Linux Service Management Tools

This section describes how to make the KS Server service start automatically at boot time and use service management commands to start and stop KS Server.

KS service can be managed using *systemd* and *systemctl*. The examples below assume that KS Server is installed in the default location under `/opt`.

1. Make sure that KS service can be started successfully using `ks_start` as described in the preceding section.

2. Copy the file `ks.service` from the KS Server home directory to `/etc/systemd/system`

   ```
   cd /opt/Altair-Data-Analytics/KS-Server-2025.0
   cp ks.service /etc/systemd/system
   ```

3. Create a symbolic link "`KS-Server`" to the KS-Server-2025.0.0 directory in the Altair-Data-Analytics directory:

   ```
   cd /opt/Altair-Data-Analytics
   ln -s KS-Server-2025.0.0 KS-Server
   ```

4. Enable the *ks* service by running the command:

   ```
   systemctl enable ks
   ```

   This will make KS Server start at boot time.

- To start KS Service, run the command

  ```
  systemctl start ks
  ```

- To stop KS Service at any time, run the command

  ```
  systemctl stop ks
  ```

- To check if KS Server is running, run the command

  ```
  ps -ef | grep kslogin
  ```

For more information on `systemd` and `systemctl`, see your Linux System Administrator documentation. For example, Managing systemd for RHEL 8.

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8.2.9. Troubleshooting

Errors at service startup

If starting the KS Server service results in error messages, this may indicate that the environment is not set properly, or the system is not at sufficient maintenance level, and certain patches need to be installed.

Connectivity issues

- **Connection loss**: If an end user working in client/server mode with server on Linux gets an exception resulting in the loss of connection with the server, in most cases, the problem is resolved on the client side by simply reconnecting to the server using the command **File | Connect** from the application menu. The KS Server service on the Linux server does not need to be restarted.

  If you have to restart KS Service, notify the users that it is about to be shut down. Then shut down and start KS Service using any of the ways described in Sections 8.2.5 and 8.2.6.

- **Authentication issues**: If users get the error message "Authentication failure" or similar errors when trying to connect, the most likely cause is incorrect settings in the configuration file kslogin.conf. Verify that the parameters in kslogin.conf are set properly according to Section 8.2.5, depending on your operating system.

- **Failure to connect**: If a user gets the error, "No connection could be made because the target machine actively refused it", there are two possible causes:

  a) KS service is not running.

  b) The user specified the wrong port number or host name when connecting to KS Server.

  To fix this problem, make sure the kslogin service is running on the server using the command `ps -ef | grep kslogin`. The process "kslogin kslogin.conf" owned by root must be running.

  Make sure the user specifies the correct port number and host name in the connection dialog. The port number must be the one indicated in the kslogin.conf configuration file.

- **Abnormal termination of the client/server connection**: If the network connection between the client machine and the server is lost, the corresponding KS server process on the server (KSWinLogin.exe) is automatically terminated several minutes after the connection loss.

Testing the ODBC Connection

After installing KS Workstation (Section 8.3) and activating the license, test the database connectivity as follows.

1. Run KS Workstation 2025.0 on a Windows client machine and connect to KS Server. If necessary, use the **Connect** command from the **File** menu and specify the KS connection information.

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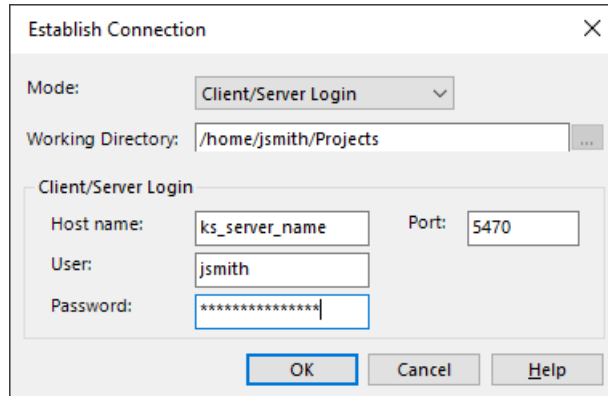
2. When connected, install the license if it is not already installed. See Chapter 14 of this document for the license installation instructions.

3. Create a new project by selecting **Create Project** from the **File** menu.

4. Right-click anywhere on the Workflow Canvas and select **Connect → ODBC Import** from the context menu. The ODBC Import Wizard will open.

5. In the ODBC Connection page (see the screenshot below), select the DSN option, select the DSN you configured, specify the database user ID and password and click **Next >**.

    NOTE: *If you are connecting to DB2, the very first connection must be performed with the user ID that has sufficient privileges to create packages.*

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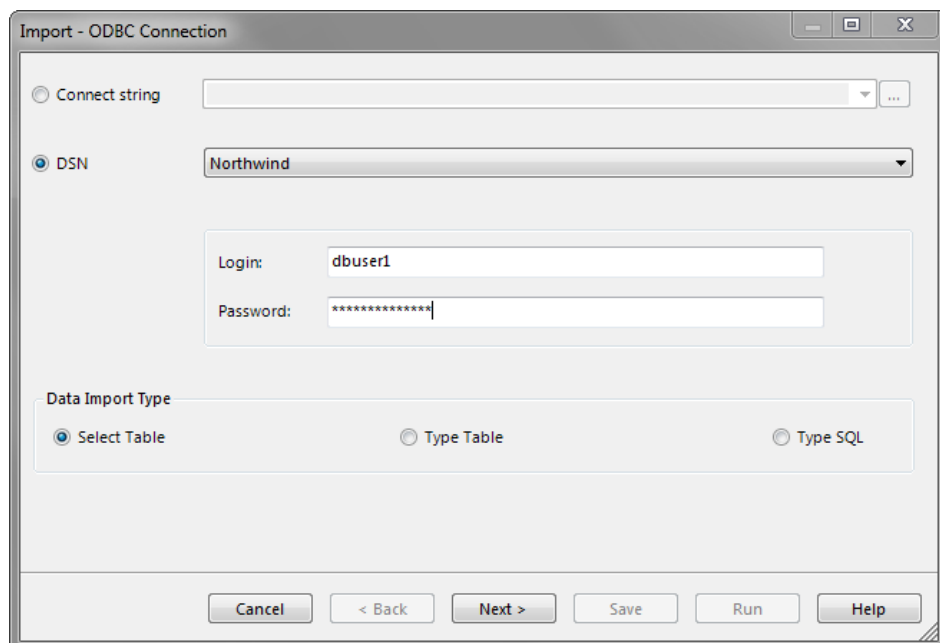
If your DSN is not in the list, this means it is not in the `[ODBC Data Sources]` section of odbc.ini, or the ODBC environment was not configured correctly.

6. Click Next. The list of your database tables will be displayed in the next page of the wizard. Select a table and import data from it.

If you fail to connect to the database or import any table, check your DSN parameters in odbc.ini or consult with your database administrator.

Troubleshooting Database Connectivity Issues:

- o If no tables are displayed after connecting to a database, check the UseCurrentSchema parameter (if available) in the DSN description for your database in odbc.ini. If UseCurrentSchema=1, the database driver looks for tables only in the default schema (the schema with the same name as the database user name specified in the wizard). Change it to UseCurrentSchema=0 so that the driver could look for tables in all accessible schemas and try connecting again.

License Errors

- o For KS Server on Linux, if you get an error message that `textrel_shlib_t` failed to run, this is caused by lack of an *exec* permission on the /tmp partition. Change the location of the temporary files for Altair licensing by defining the TMPDIR variable inside the ks_start script. For example, create a new directory `alm_tmp` under the KS Server home directory and add the following line to ks_start:

```
export TMPDIR=$KSTUDIOHOME/alm_tmp
```

System Configuration for Large File Support

Some operations in KS Server, such as importing a large file, may take a lot of memory. It may be necessary to adjust the resource limits of your operating system.

Edit the file `/etc/security/limits.conf` to view or set the desired ulimit values to increase file size limits and process memory size limit if necessary. See the manual pages for ulimit and your Linux System Administrator documentation for details.

8.3. Deploying Client Components for Client/Server Configuration

This section describes the interactive installation of KS Workstation (desktop client) and dependent components on the client machines as part of the deployment procedure for the client/server configuration. It is assumed that KS Server is already installed on the server. For non-interactive installation modes such as silent install, see Section 9.

8.3.1. Installing KS Workstation

1. Log in to the client machine as a user with sufficient rights to install software.

2. Double-click the downloaded MSI package *KS-Workstation-2025.0-64bit.msi*.

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3. The setup prepares the InstallShield Wizard, and the Welcome window opens. Click **Next >**.
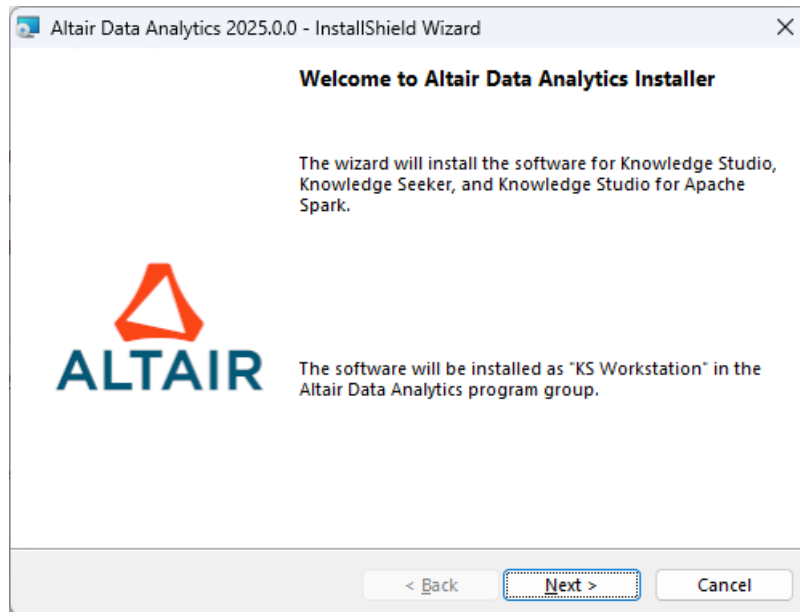
4. The License Agreement window opens. If you accept the terms, select "**I accept**" and click **Next >**
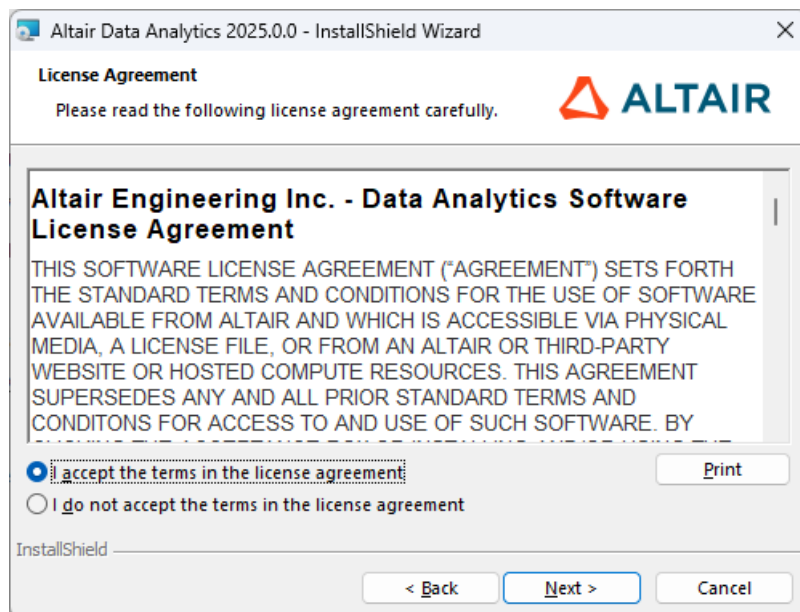
5. The Configuration Type window opens. Select the *Client/Server configuration* option and click **Next >**.
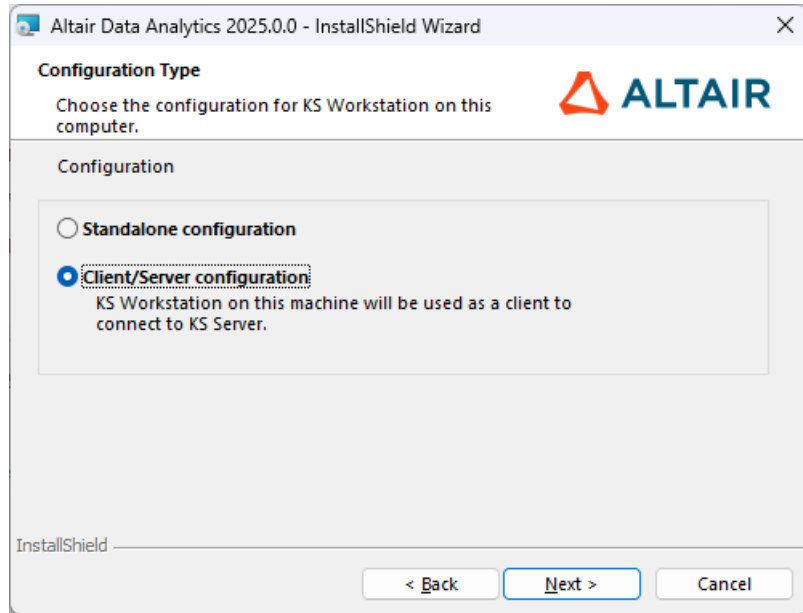
6. If necessary, change the destination folder for the application program files on the client machine by clicking the **Change** button and specifying the desired location. The default is C:\Program Files\Altair Data Analytics. Click **Next >**.
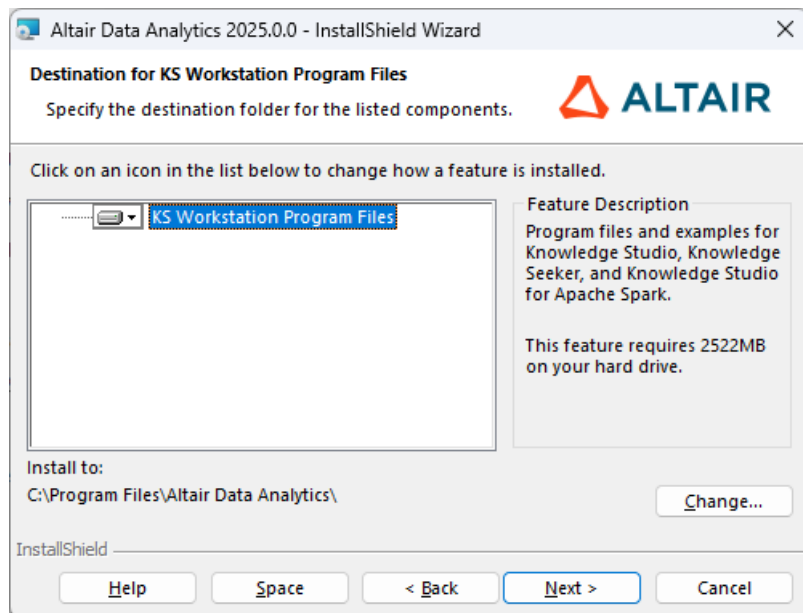
7. The KS Server Connection Properties window opens.

- In the **Host** field, enter the name or the IP address of the server where KS Server is installed.

- In the **Port** field, enter the port number to be used by the client to connect to KS Server. The default port number is **5470**. If you change it, make sure it is the same as the one specified in the KS Server configuration (see Section 8.1.4. "Configuring the KS Service").

- In the **Working Directory** field, enter the working directory for the users' project files.

  Note 1: *This directory path must be a local path with respect to the server (for example,* D:\Altair KS Projects\ *for Windows Server, or* /apps/ks_projects/ *for Linux). You can use a network path such as* \\server1\ks_projects *if the Working directory is on a network drive. The Working Directory must have Read & Write permissions for the intended users.*

  Note 2: *The end users can change their Working Directories at any time after the installation using the* **Set Working Directory** *command in the* **File** *menu. For example, if you created subdirectories user1, user2, … userN under* D:\Altair KSProjects*, instruct the users to set their Working Directories to the respective folders D:\Altair KS Projects\userN.*

Click **Next >.**

8. At the final step, choose whether to install a desktop shortcut for KS Workstation. Click **Install** to start the installation.

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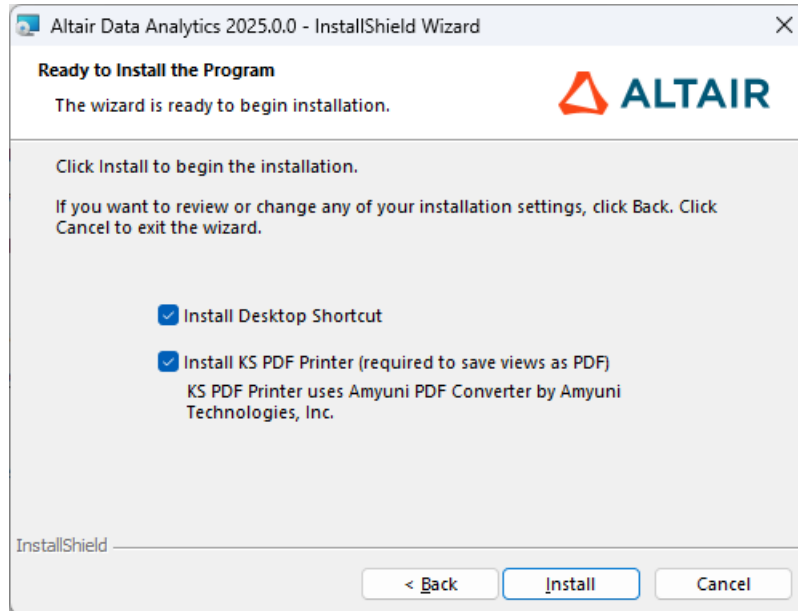
9. The Setup Status window opens. It shows the installation progress. When the installation is complete, click **Finish**.
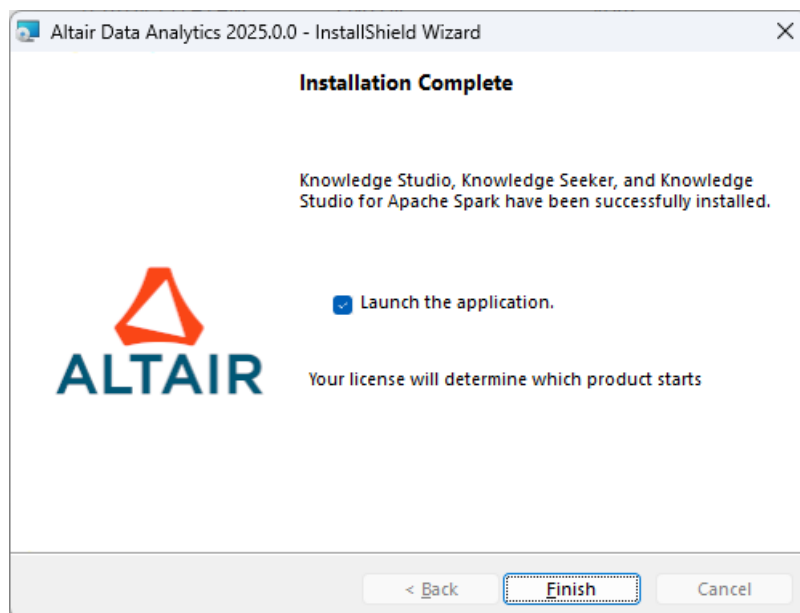
10. The installed software is now available as **KS Workstation** in the program group **Start | Programs | Altair Data Analytics**.

To activate the product, follow the instructions in Chapter 14: "License Administration".

8.3.2. Installing Altair Analytics Workbench

1. On the client side, the graphical user interface for Altair SLC on the server is provided by Altair Analytics Workbench. Run the downloaded Altair Analytics Workbench installation package. Click **Next >** in the Welcome screen.
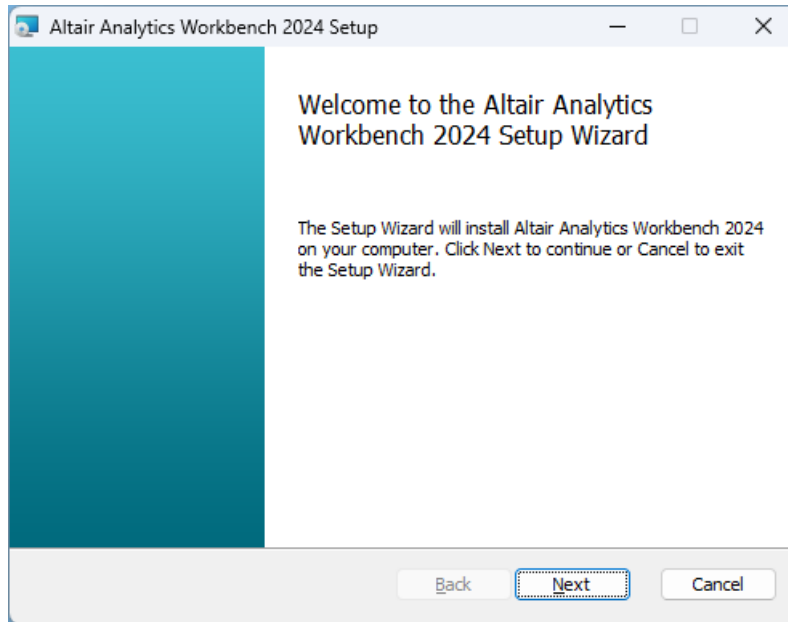
2. In the End-User License Agreement window, select "**I accept the terms in the License Agreement**" if you accept the terms. Click **Next >**.

3. In the Custom Setup page, select all program features, as shown below. To change the destination folder for the application program files, click the **Change** button and specify the desired location. The default is C:\Program Files\Altair\Analytics Workbench\<version>. Click **Next >**.
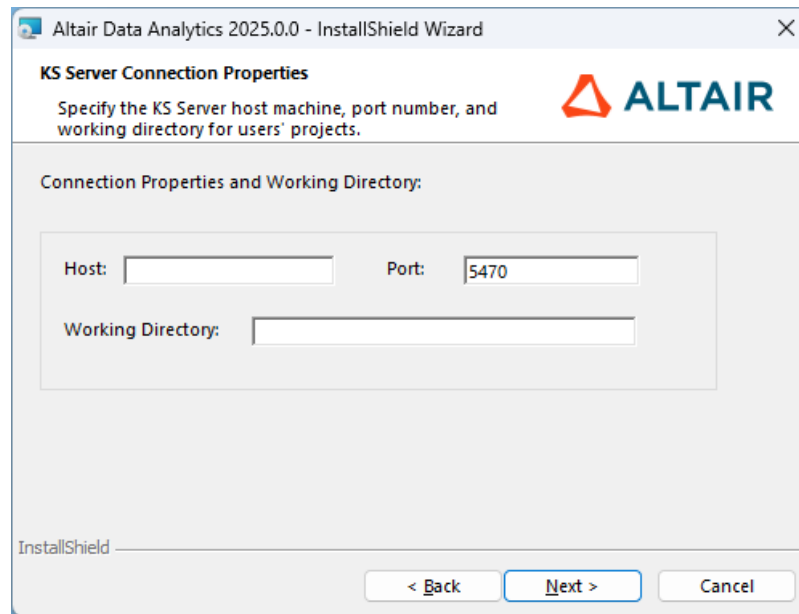

4. Click **Install** to start the installation.

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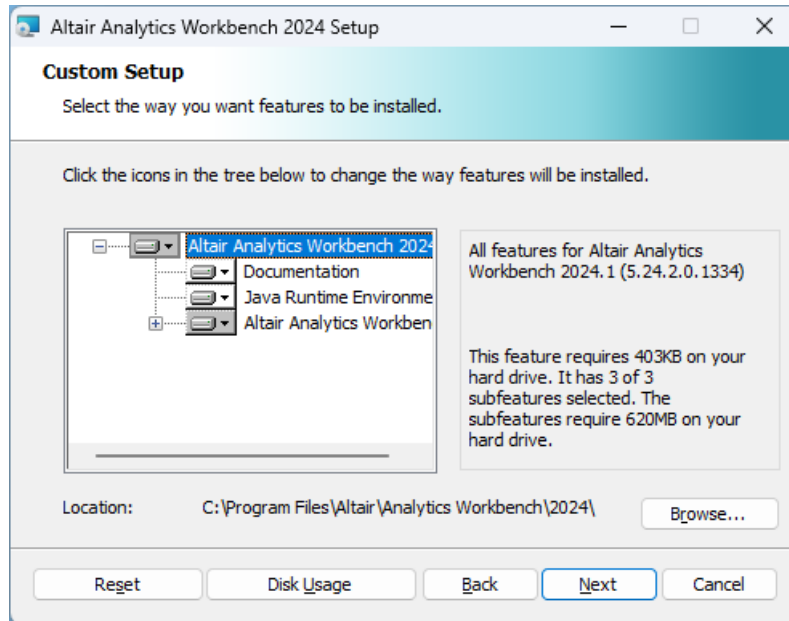
5. The Setup Status window shows the installation progress. When the installation is complete, click **Finish**.
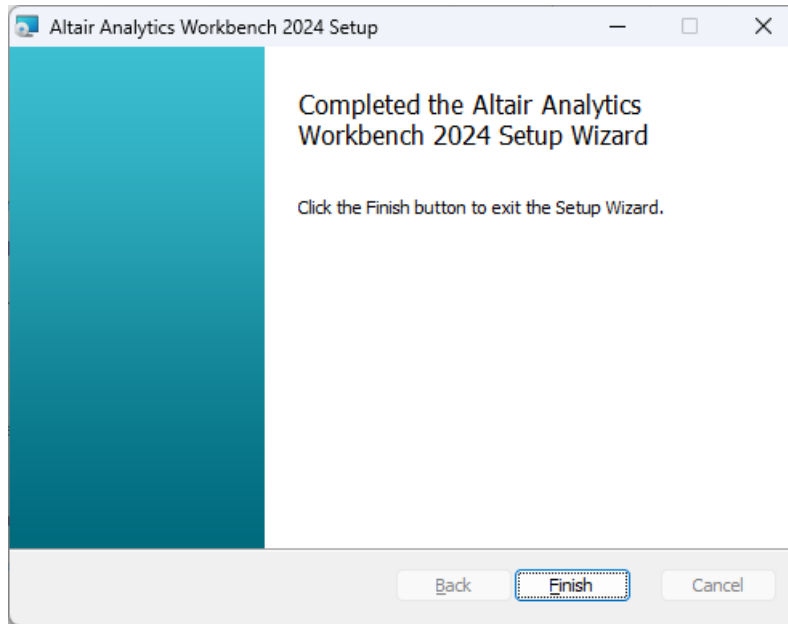
6. Altair Analytics Workbench is now available in the Windows **Start** menu. It can be launched by double-clicking the desktop shortcut "Altair Analytics Workbench" or selecting **Start | Altair | Altair Analytics Workbench**.

9. Alternative Installation Modes on Windows

9.1. Silent Install

To install KS Workstation in the silent mode from the command line without user interaction, follow these steps:

1. Copy the downloaded installation package KS-Workstation-2025.0-64bit.msi to a folder on the intended host machine.

2. Run Command Prompt as administrator. For example, on Windows 10, select Start | Windows System, right-click on **Command Prompt,** and select *More → Run as administrator*.

3. Type **msiexec.exe** in the command prompt and press Enter. The Windows Installer window displays its version and usage options. The syntax of the commands depends on the version of Windows Installer on your system. For more information, see the Windows Installer Portal and the information on the Command Line Options.

4. The following examples show how to install KS Workstation in several typical cases.

   - NEW INSTALLATION: To install KS Workstation 2025.0 with default settings to the default destination folder `C:\Program Files\Altair Data Analytics`

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and save the installation log in the file ks_install.log, execute the following command as a single line:

```
msiexec.exe /package "C:\temp\KS-Workstation-2025.0-
64bit.msi" /quiet /log ks_install.log
```

- UPGRADE: To install KS Workstation 2025.0 and apply the preferences of the previous version, specify the preferences file of the previous version as an argument in the silent install command line. For example:

```
msiexec /i "KS-Workstation-2025.0-64bit.msi" /l*v
"install.log" CWDGROUP="C:\Work\Altair KS Projects"
PREFERENCES="C:\Users\jsmith\AppData\Roaming\Altair\KSMainNe
t64-2022.0.xml" /quiet
```

As a result, all applicable parameters in the specified XML file that correspond to the preference values will be set as the default preference settings in **Tools | Preferences** of the installed application. Note that the Working Directory is specified separately using the options CWDGROUP or SCWD (see the table below).

- UNINSTALL: To uninstall KS Workstation 2025.0, use the following command as a single line:

```
msiexec.exe /uninstall "C:\temp\KS-Workstation-2025.0-
64bit.msi" /quiet /log ks_install.log
```

The options that can be specified to customize the installation are given below. The values must be specified in double quotes, except ALMSERVER. Examples are given below.

ALMSERVER	Self-hosted Altair License Server host name or IP address. Example: `ALMSERVER=6200@server1`
MANAGEDLICENSE	*True* or *False.* Determines whether Managed Altair Licensing is used. The installer creates the system environment variable ALM_HHWU with the specified value. Example: `MANAGEDLICENSE=True`
PREFERENCES	The preferences file that contains the application preferences to be applied. Example syntax: `PREFERENCES="C:\TEMP\KSMainNet64-2024.2.xml"`
CWDGROUP	Working Directory location <u>in the Standalone mode</u>. The default is the "Altair" folder under the current user's *My Documents* folder. Not applicable to the client/server mode. When deploying the client for the client/server configuration (`KSSERVERTYPE=2`) use the SCWD keyword to set the Working Directory on the server.

SCWD	The Working Directory location on the server (in the case of the client/server configuration). This is used in combination with `KSSERVERTYPE=2` (see below).
INSTALLDIR	Installation directory. The default is "`C:\Program Files\Altair Data Analytics`"
DSKTOPSTCUT	Desktop shortcut option ("1" if required to create; "0" otherwise)
PDFPRINTER	Install Amyuni PDF Printer. ("1" if required to install; "0" otherwise). The printer driver is required for users to be able to save trees, tables, charts, and reports as PDF. The default is "1".
KSSERVERTYPE	Determines whether the mode is Standalone or Client/Server. "1" - the standalone mode. This is the default option. "2" - the client/server mode (KS Workstation serves as a client to connect to KS Server)
KSHOSTNAME	The name of the KS Server host to connect to. (Applicable to the client/server configuration, when `KSSERVERTYPE="2"`)
KSPORT	The TCP port number for the KS Workstation (client) to connect to KS Server. The default is "5470". Applicable only to the client/server configuration, when `KSSERVERTYPE="2"` and `KSHOSTNAME` is specified.

Here is an example command (must be specified as a single line in the command prompt or script):

```
msiexec.exe /package "C:\Temp\KS-Workstation-2025.0-64bit.msi"
/quiet /log ks_install.log INSTALLDIR="D:\Program Files\Altair
Data Analytics" ALMSERVER="6200@server1" MANAGEDLICENSE=False
CWDGROUP="C:\Users\jsmith\Documents\Altair" DSKTOPSTCUT="1"
PDFPRINTER="1"
```

If you are performing silent install on multiple PCs at the same time, after the installation you can set the default configuration (client/server or standalone mode, server name to connect, port number, and default Working Directory) on the client side by replacing the INI file in the KS Workstation program folder on every client PC. The configuration file is `C:\Program Files\Altair Data Analytics\KS Workstation 2025.0.0\bin\KDSConnection.ini`

For example, if you want KS Workstation to connect by default to a specific server and set the working directory to D:\KS_Projects, the contents of **KDSConnection.ini** should be:

```
<Config>
<Mode>1</Mode>
```

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```
<Location>D:\KS_Projects</Location>
<Service></Service>
<User></User>
<Host>KS_server_name_or_ip_address</Host>
<Port>5470</Port>
<Secure>True</Secure>
</Config>
```

9.2. Customizations to Assist in Repackaging for Deployment

The KS Workstation installer and software support the capability of deploying on a large number of workstations using automated installation tools. This section provides guidelines on how to prepare the software for this type of deployment.

- Run the installer KS-Workstation-2025.0-64bit.msi.

- The installer prepares the InstallShield Wizard, and the Welcome window opens. Click **Next >**.

- The License Agreement window opens. If you accept the terms, select "**I accept"** and click **Next >**.

- The Configuration Type window opens.

- For the **Standalone** configuration, select the "*Standalone configuration*" option, click **Next >**, and proceed as follows:

  - Select the option "*I am an administrator installing the software for someone else*". Click **Next >.**

  - If necessary, change the destination folder for the application program files by clicking the **Change** button and specifying the desired location. The default is C:\Program Files\Altair Data Analytics. Click **Next >.**

  - The Working Directory window opens. Specify the path for the Working Directory.

    The Working Directory can be parameterized to point to each end user's folder `My Documents\Altair` or another user-specific folder. For example, you can specify the following path in the Working Directory field:

    `%USERPROFILE%\Documents\Altair`

    Note 1: *Each user will be able to change the Working Directory at any time using the **Set Working Directory** command in the **File** menu of the installed application*.

    Make sure the folder has Read & Write permissions for the intended user(s).

    *Note 2: If you prefer to use cloud storage, such as OneDrive or Google Drive, select a folder with offline access enabled. For example, if you choose a folder on OneDrive, right-click the folder in Windows Explorer and select option "**Always keep on this device**".*

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The License Configuration window opens. Follow the instructions of **Step 9** in Section 7.1. Deploying KS Workstation (Standalone) to configure the licensing method.

Click **Next >** and then click **Install** in the next page to start the installation.

- For the **Client/Server** configuration, select the *Client/Server configuration* option and proceed as follows.

  - If necessary, change the destination folder for the application program files by clicking the **Change** button and specifying the desired location. The default is `C:\Program Files\Altair Data Analytics`. Click **Next >.**

  - The **KS Server Connection Properties** window opens.

    o In the **Host** field, enter the name or the IP address of the server where KS Server is installed.

    o In the **Port** field, enter the port number to be used by the client to connect to KS Server. The default port number is **5470**. If you change it, make sure the port number entered here is the same as the one specified in the KS Server configuration.

    o In the **Working Directory** field, enter the directory for users' projects.

      Note 1: *This directory path must be a **local path with respect to the server machine** (for example,* `C:\UserProjects\` *for Windows Server or* `/home/userprojects/` *for Linux). You can use a network path such as* `\\server1\projects` *if the Working directory will be on a server different from the one that hosts KS Server. The Working Directory should have Write permissions for the intended user(s);*

      Note 2: *The end users can change their Working Directories at any time after the installation by using the **Set Working Directory** command in the **File** menu.*

      If each user is supposed to have a separate working directory on the server, the Working Directory entry can be parameterized to point to end users' individual folders (e.g., `C:\UserProjects\<user_name>`). For example, specify the following path ensuring to maintain the spaces and the case of the letters:

      `C:\UserProjects\%USERNAME%`

    o If necessary, specify a location for the license files in the **License Location** field. This must be a local path with respect to the server. The default is C:\Program Files\Altair Data Analytics\License.

    Click **Next >** and then click **Install** to start the installation.

- The Setup Status window opens. It shows the installation progress. When the installation is complete, click **Finish**.

If the custom settings you programmed during the installation don't take effect, the workaround is to set the custom configuration after deploying the product with default

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settings. You can set the mode (client/server or standalone), server name to connect, port number, and the Working Directory by replacing an INI file in the KS Workstation program folder on every client PC. The configuration file is `C:\Program Files\Altair Data Analytics\KS Workstation 2025.0.0\bin\KDSConnection.ini`

For example, if you want KS Workstation to connect by default to a specific server and set the working directory to `D:\KS_Projects`, the contents of `KDSConnection.ini` should be as follows:

```
<Config>
<Mode>1</Mode>
<Location>D:\KS_Projects</Location>
<Service></Service>
<User></User>
<Host>KS_server_name_or_ip_address</Host>
<Port>5470</Port>
<Secure>True</Secure>
</Config>
```

In this case, however, the Working Directory will be the same for all users, and they will need to change it using the File | Set Working Directory command if they need separate working directories.

10. Citrix and Remote Desktop Services Environments

10.1. Citrix

In a Citrix environment, you will need to deploy the Client/Server configuration of the product. KS Workstation can be replicated across as many computers of the Citrix farm as desired, while KS Server must be installed on a **single server**, which may be outside of the farm.

Here are the steps required to deploy the product in a Citrix environment:

- Make sure all the installation prerequisites listed in Section 5 are met. Allocate the necessary disk space on the server and create Working Directories for the users following the guidelines in Section 5.

- Follow the instructions in Section 8: Deploying Client/Server Configuration. See also Section 9 if you plan to package the Workstation for mass deployment on your Citrix farm computers.

  Note: The installation wizard for KS Workstation lets you specify a location for the Working Directory. The users will still be able to change their Working Directories at any time using the **File | Set Working Directory** menu command (or the **File | Connect** command). If you want the users to use separate working directories (recommended) rather than a shared one, you will need to either parameterize the Working Directory in the installation wizard as described at the end of Section 9.2, or notify the users after you finish the installation that they should set Working Directory to the appropriate locations.

- For configuring the licensing method, see Chapter 14, "License Administration".

10.2. Remote Desktop Services

If you intend to use the product in a multi-user environment where users access the software via Windows Remote Desktop Services, you will need to deploy the **standalone** configuration of the product.

The installation procedures are the same as those described in Section 7, "Deploying Standalone Configuration". Follow these steps:

- Make sure all the installation prerequisites listed in Section 5 are met.

- Determine whether a separate Working Directory is required for each user or one shared Working Directory is required for all users.

  If the users require separate Working Directories, create one for each user and assign appropriate read/write permissions for the created directories. After you finish the installation, notify the users that they should set Working Directory to the appropriate locations. Any user can change his/her working directory at any time after the installation by selecting menu commands **File | Connect** or **File | Set Working Directory…** in the client application.

- Proceed to Section 7, "Deploying Standalone Configuration". Follow the instructions therein, taking into account the following details:

  - o If each user requires a separate Working Directory for their projects (recommended in most cases), then

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- If necessary, create a new folder for each user of the application. For example, create a folder called Altair under the My Documents folder of each user profile. Make sure it has read and write permissions for the respective users. *The Working Directory does not have to be on the server that hosts KS Server. It can be a network folder, and users can refer to it using a UNC path. Note that KS Server cannot access mapped drives in the client/server mode on Windows.*

- When specifying the Working Directory in the installation wizard, specify any folder that has at least *Read* permissions for all users.

- After the installation and license activation is done, instruct the users to run KS Workstation and set their Working Directories to their respective working folders for projects using the **File | Set Working Directory** menu command (or **File | Connect** command)

  o If all users require a single shared Working Directory for their projects, then

    - Create a folder with Read and Write permissions for all users. The Working Directory does not have to be on the server that hosts KS Server. It can be a network folder, and users can refer to it using a UNC path. Note that KS Server cannot access mapped drives in the client/server mode on Windows.

    - Specify this folder as the Working Directory in the installation wizard (see the Custom setup option in Step 7 of Section 7).

    - To configure the licensing method, see Chapter 14, "License Administration".

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12. Advanced Configuration: Optional Runtime Parameters

Optional runtime parameters for the application can be specified in a special configuration file. To set any of the parameters described below, use any text editor to create a new file called **KDSProvider.conf** in the directory that contains the application binaries. The default location for the configuration file is:

- For the standalone configuration of KS Workstation on Windows:

`C:\Program Files\Altair Data Analytics\KS Workstation 2025.0.0\bin`

- For the client/server configuration on Windows Server:

`C:\Program Files\Altair Data Analytics\KS Server 2025.0.0\bin`

- For KS Server on Linux:

`/opt/Altair-Data-Analytics/KS-Server-2025.0/lib`

Since file names on Linux are case-sensitive, make sure that you name the file exactly as specified: `KDSProvider.conf`.

In the client/server configuration, after modifying KDSProvider.conf, KS Server must be restarted for the changes to take effect.

The following runtime parameters can be specified in KDSProvider.conf:

- `jupyter_path` – full path to the jupyter executable (enclosed in double quotes).

- `http.logfile` - set to 1 to generate an http log for Knowledge Studio for Apache Spark. The log file is created in the `%TEMP%` directory (the default temporary files folder under the current user profile). The default is 0 (the log is not generated).

- `proc` – maximum number of threads created by the engine processes (the default is "unlimited").

- `cores` – maximum number of CPU cores used (the default is "unlimited")

- `index_max` – maximum size of the temporary index file during data import. Determined dynamically by the engine unless the value is set. **0** means "unlimited".

- `pivot_max` – maximum size of the temporary pivot file during data import. **0** means "unlimited".

- `window_max` – maximum size of memory window during data import. If the value is not set, this does not exceed 3 GB. **0** means "unlimited".

- `y2k_future` – together with y2k_window, defines the default century for Date variables. This is ignored if y2k_window has been assigned a value.

- `y2k_window` – together with y2k_future, defines the default century for Date variables. If no value is assigned, then it is computed from y2k_future as follows: `y2k_window = current_year + y2k_future - 100`

- `wamp.enabled` – enables the WAMP service (required for Knowledge Studio for Apache Spark). The default value is 1 (enabled).

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Example configuration in KDSProvider.conf:

```
jupyter_path "C:\ProgramData\miniforge3\Scripts\jupyter.exe"
http.logfile 1
proc 4
cores 2
index_max 0
pivot_max 0
window_max 0
y2k_future 10
```

In this example, since `index_max`, `pivot_max`, and `window_max` are set to 0, data import operations will use as much memory as available on the host system. Be careful with these settings if you must limit the resource usage in multi-user environments.

After setting or changing any parameters in KDSProvider.conf, restart KS Server in the case of the client/server configuration or KS Workstation in the standalone configuration.

13. Uninstalling Altair Data Analytics Products

This section describes the procedure of uninstalling, modifying, or repairing the products featured in this guide.

13.1. Modifying, Repairing, and Removing KS Workstation

To uninstall KS Workstation, repair the installation, or to add or remove components of the software, follow the steps below.

Note: *Uninstalling, modifying, or repairing the software will not delete the users' projects or license files.*

In the Programs and Features list in the Windows Control Panel, select **KS Workstation 2025.0.0**.

- To uninstall the software, click Remove or Uninstall.

- To change or modify the installation, click the **Change** button.

1. The Welcome window opens. Click **Next >**.

2. The Program Maintenance window opens. The description beside each explains in detail what it does. Select the appropriate radio button and click **Next >** to continue.

    o If you select **Modify**, the Custom Setup window opens. A list shows you the components that are available, and the components that are already installed. See the appropriate installation instructions above for the description of the options in this window. Select or deselect the components to install or uninstall. Click **Next >**.

- The Data Mining Engine Setup Window opens. Change the entries as required. See the appropriate installation instructions above for the description of the options in this window. Click **Next >** to continue, then click **Install**.

- The Setup Status window opens. It shows the installation progress. When the maintenance is complete, click **Finish**.

OR

- If you selected **Repair**, the *Ready To Repair the Program* window opens. Click **Install**.

- The Setup Status window opens. The Repair option automatically fixes any damaged files or replaces lost files. It begins installing the software to the same specifications you selected last time you installed. When this process is complete, click **Finish**.

OR

- If you selected **Remove**, the Remove the Program window opens. Clicking the Remove button will uninstall the program. When this process is complete, click **Finish**.

13.2. Modifying, Repairing, or Removing KS Server for Windows

To uninstall KS Server, repair or change the installation, follow the steps below.

Note: *Uninstalling, modifying, or repairing the software will not delete the users' projects or license files.*

Open the list of Programs and Features on Windows Server and select **KS Server 2025.0.0**.

- To uninstall the software, click **Remove** or **Uninstall**.

- If you want to change or modify the software, click the **Change** button.

  1. The Welcome window opens. Click **Next>**.

  2. The Program Maintenance window opens. The description beside each explains in detail what it does. Select the appropriate radio button and click **Next>**.

     - If you selected **Modify**, the Custom Setup window opens. A list shows you the components that are available, and the components that are already installed. See the appropriate installation instructions above for the description of the options in this window. Select or deselect the components to install or uninstall. Click **Next>**.

     - The Windows Service Setup Window opens. Choose the desired options. See the appropriate installation instructions above for the description of the options in this window. Click **Next>** to continue, then click **Install**.

     - The Setup Status window opens. It shows the installation progress. When the maintenance is complete, click **Finish**.

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OR

- o If you selected **Repair**, the Ready To Repair the Program window opens. Click **Install**.

- o The Setup Status window opens. The Repair option automatically fixes any damaged files or replaces lost files. It begins installing the software to the same specifications you selected last time you installed. When this process is complete, click **Finish**.

OR

- o If you selected **Remove**, the Remove the Program window opens. Clicking the Remove button will uninstall the program. When this process is complete, click **Finish**.

13.3. Uninstalling KS Server on Linux

To uninstall KS Server on Linux, follow these steps:

1. To prevent the interruption of any user's work by shutting down the service, identify the user processes using the command `ps -ef | grep kslogin` and make sure there are no active client sessions.

2. Shut down the kslogin service and terminate all users' kslogin processes on the server by running the script **ks_shutdown** from the Altair Data Analytics home directory.

3. If you used R language integration features on Linux and would like to uninstall the KS Library for R and Survival Analysis package, use the commands:

   ```
   R CMD REMOVE angoss

   R CMD REMOVE KnowledgeSurvival
   ```

4. If you are planning to reinstall the product or upgrade to a new version, make a backup copy of the KS Server licenses. For example, if the product is installed under /opt/Altair-Data-Analytics, copy the directory /opt/Altair-Data-Analytics/license/ to a backup location. Also, back up the environment and startup scripts and odbc.ini in /opt/Altair-Data-Analytics/KS-Server-NN.N, where NN.N is your current version.

5. Check the KS Server 2025.0 package name using any of the commands

   ```
   rpm -qa KS-Server

   rpm -qaiv KS-Server
   ```

The latter provides a detailed description of the package.

To uninstall KS Server 2025.0, use the command

   ```
    rpm -e <package_name>
   ```

where *<package_name>* is the exact name reported by the command `rpm -qa KS-Server,` for example, *KS-Server-2025.0-18151_centos8.x86_64*.

If there are any errors during the uninstall, you may use the command

   ```
   rpm -e package_name --noscripts
   ```

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After that you can delete the KS Server home directory. For example,

```
rm –rf /opt/Altair-Data-Analytics/KS-Server-2025.0.0
```

where X.X is the KS-Server version. You can also delete the parent directory `/opt/Altair-Data-Analytics` after backing up the license folder and any configuration files, if necessary.

6. If you enabled the automatic startup of KS Server as described in Section 8.2.9, "Enabling automatic startup", delete the startup script and the related link (if any) from the corresponding system directories. The location of the startup scripts depends on your operating system (refer to Section 8.2.9 for details).

14. Licensing Methods and Configuration

14.1. Licensing Methods

Altair Units is a value-based license management system enabling metered usage of an entire suite of products. All Altair Data Analytics products have the capability to use a single pool of recyclable Altair Units.

- Managed Altair Licensing

  If your organization is using *Managed Altair Licensing*, the License Server is hosted by Altair, and the application checks out the required license units by contacting the license servers in the Altair One cloud via HTTPS.

  See https://help.altair.com/altairone/index.htm for more information on Altair One™.

- On-premises Altair License Server

  If your organization is using a self-hosted Altair License Server, the application checks out the required license units by connecting via TCP to a license server in your corporate network or in a cloud managed by your organization. The license server is managed by your IT team.

  The Altair License Manager software installation and administration guide is available on the Altair Documentation Portal.

14.2. License Configuration

This section describes the process of configuring the application host for the licensing method you are using.

If you are using a self-hosted Altair License Server, the instructions below assume that it is already installed on a server in your network, and that you have the name or IP address of the license server at hand.

There are three configurations of Knowledge Studio and Knowledge Seeker:

1. Standalone
2. Client/Server for Windows Server
3. Client/Server for Linux

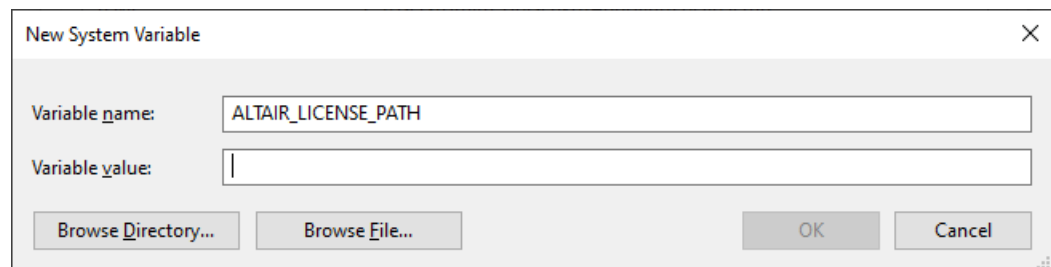### 14.2.1. Environment Variables in the Standalone Configuration

From the Windows Control Panel, select **System** and click **Advanced System Properties**. If you have no access to Advanced System Properties, click on the Windows Start button and start typing "environment", then select "*Edit environment variables for your account*".
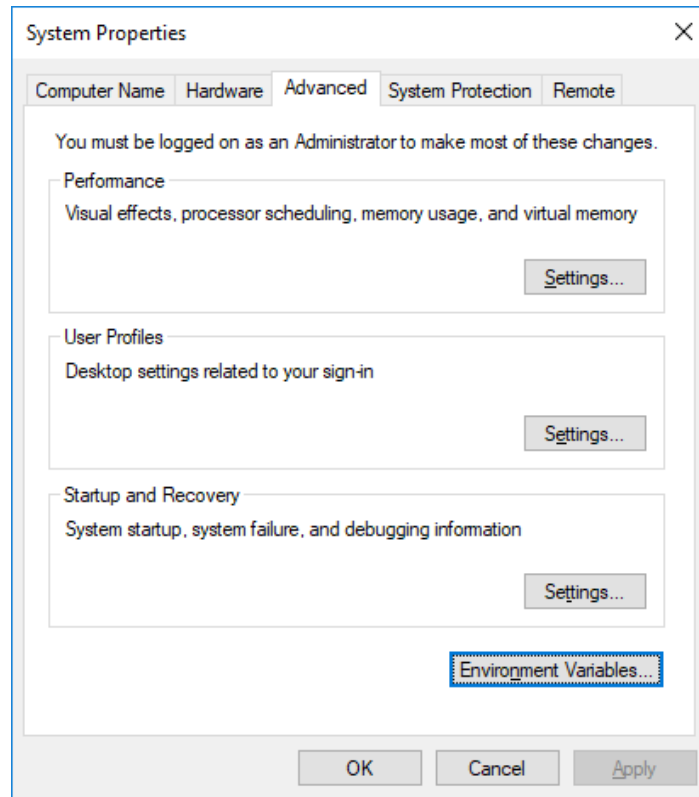
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In the Advanced tab of the System Properties dialog, click the **Environment Variables** button.
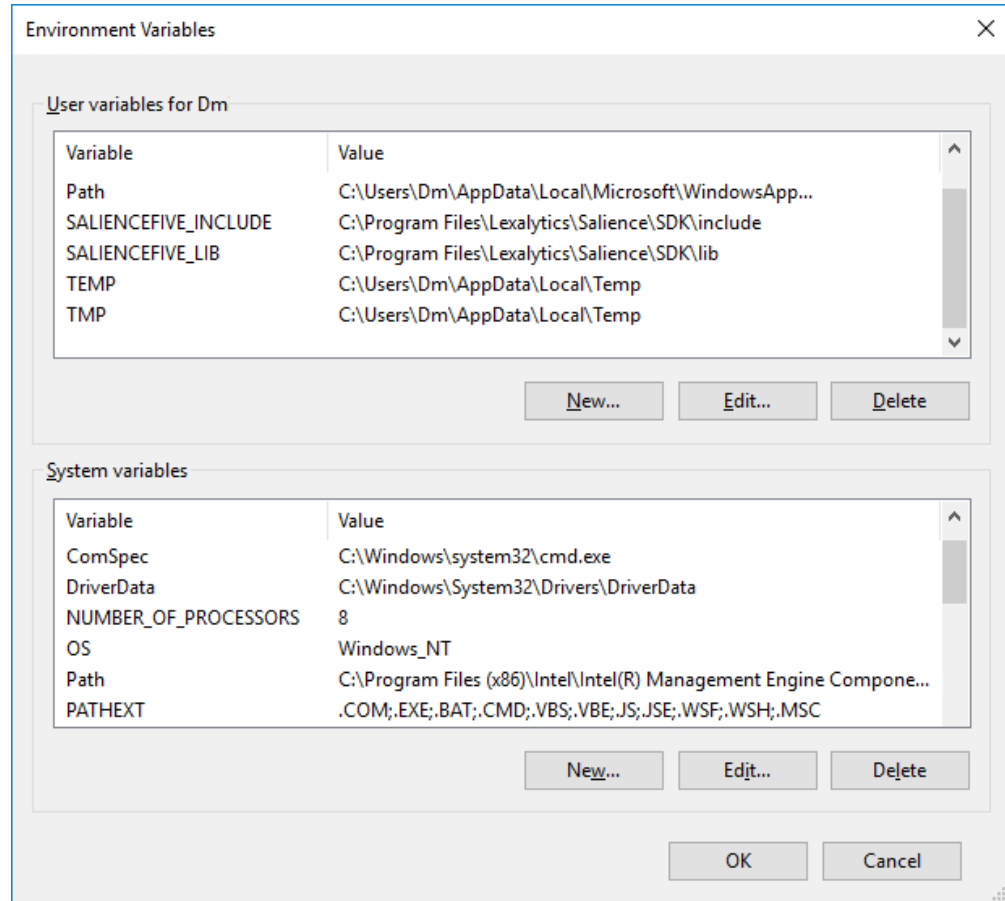
Click the **New** button in the *System variables* section or in the *User variables* section, depending on whether you are activating the product for all users on this machine or only the user ID currently logged in.
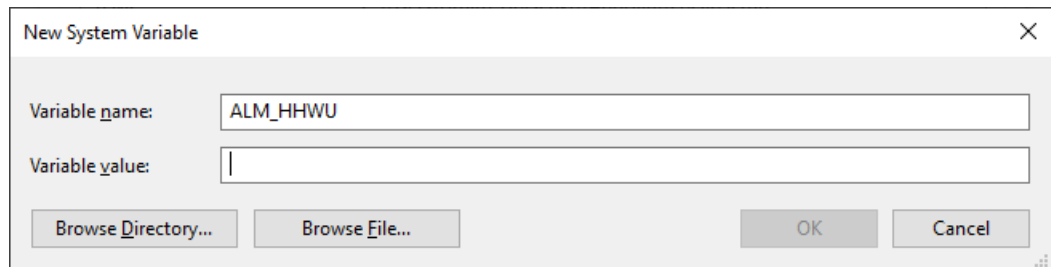

- Set *Variable name* to **ALTAIR_LICENSE_PATH**

- For the *Variable value* field:

  o If you are using Altair License Server, enter its address and port number. The format is: **NNNN@<server_name_or_IP_address>**,

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where *NNNN* is the port number (**6200** by default), and the second part is the Altair License Server host name or IP address. For example: 6200@server1

  o   If you are using Managed Altair Licensing, set the value to **false**

Click **OK** to create the variable.

Click the **New** button in the same section as ALTAIR_LICENSE_PATH.

- Set *Variable name* to **ALM_HHWU**

- To use Managed Altair Licensing, set the value of ALM_HHWU to **True.** Otherwise, set it to **False**.

Click **OK** in all dialogs to save the changes and exit the Advanced System Properties dialog.

Start the KS Workstation application.

The Select Product window will prompt you to select the desired product (feature set to be enabled).
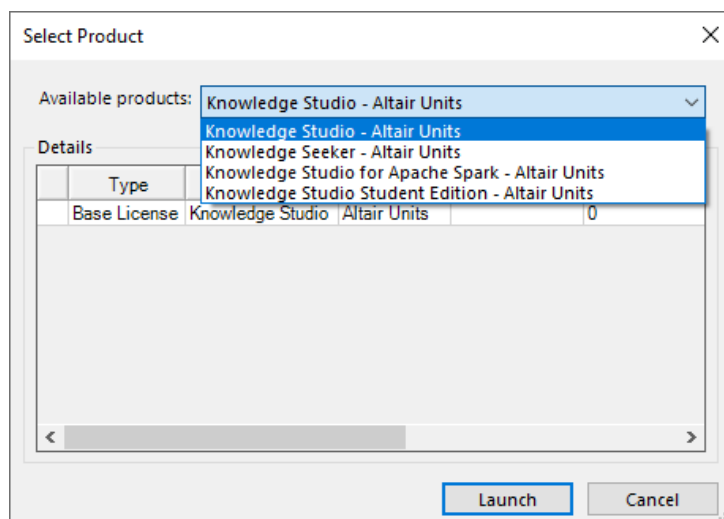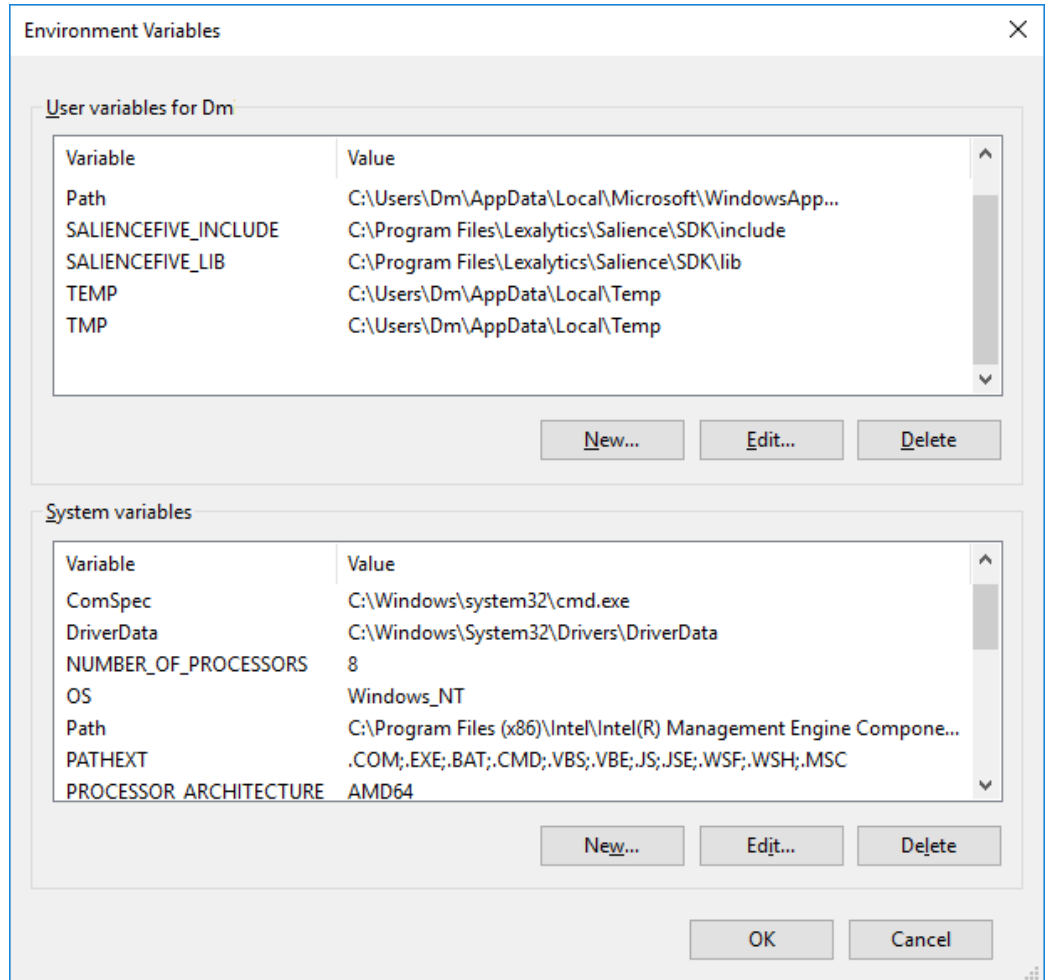

Select the desired product and click **Launch**.

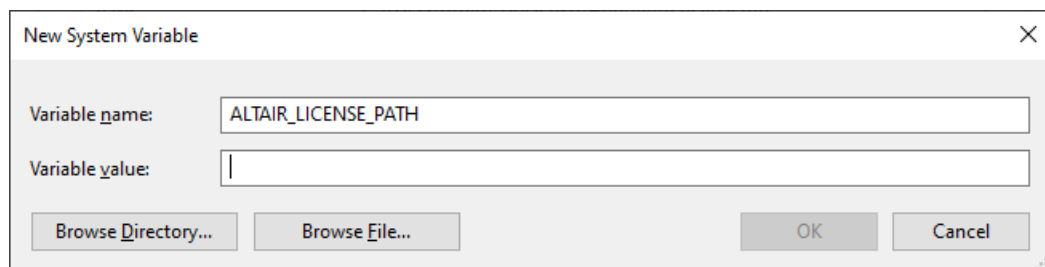### 14.2.2. Environment Variables for KS Server on Windows

From the Windows Server Control Panel, select **System** and click **Advanced System Properties**.
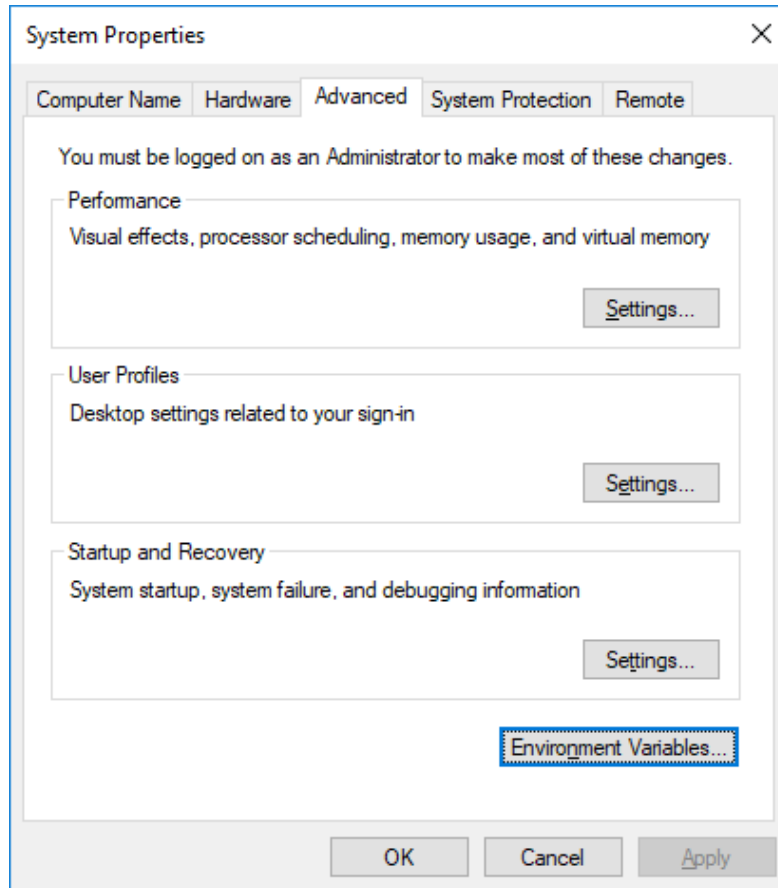
In the Advanced tab of the System Properties dialog, click the **Environment Variables** button.

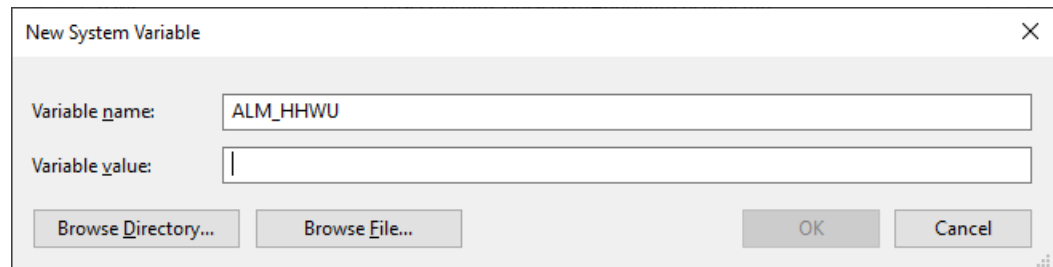Click the **New** button in the *System variables* section.

- Set *Variable name* to **ALTAIR_LICENSE_PATH**
- For the *Variable value* field:
  - If you are using Altair License Server, enter its address and port number. The format is **NNNN@<server_name_or_IP_address>**,

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where **NNNN** is the port number (**6200** by default), and the second part is the Altair License Server host name or IP address. For example, 6200@server1.

o   If you are using Managed Altair Licensing, set the value to **False**

Click **OK** to create the variable.

Click the **New** button in the *System variables* section.

- Set *Variable name* to **ALM_HHWU**

- To use Managed Altair Licensing, set the value of ALM_HHWU to **True.** Otherwise, set it to **False**.

Click **OK** in all dialogs to save the changes and exit the Advanced System Properties dialog.

Start the KS Workstation application on any client machine.

Connect to KS Server. The Product Selection window will prompt you to select the desired product.
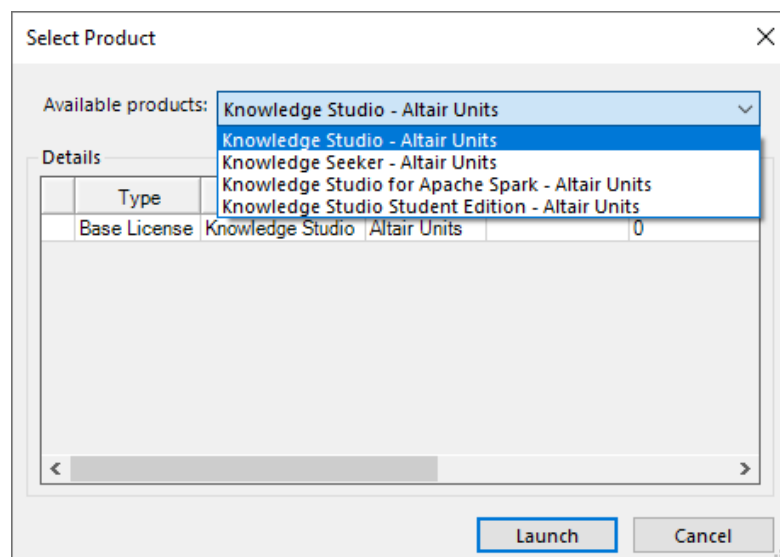
Select the desired product and click **Launch**.

14.2.3. Environment Variables for KS Server on Linux

Define the environment variables ALTAIR_LICENSE_PATH and ALM_HHWU in the KS Server startup script **ks_start** as described below. For information about ks_start, see Section 8.2.5, "Configuring KS Server on Linux".

1. If you are using self-hosted Altair License Server:

   - Set the value of ALTAIR_LICENSE_PATH to the address of the Altair License Server. The format is: **NNNN@<server_name_or_IP_address>**, where NNNN is the port number (**6200** by default), and the second part is the Altair License Server host name of IP address. For example:

     ```
     export ALTAIR_LICENSE_PATH=6200@server1
     ```

   - Set the value of ALM_HHWU to **false**:

     ```
     export ALM_HHWU=false
     ```

2. To use Managed Altair Licensing:

   - Set the value of ALM_HHWU to **true**

     ```
     export ALM_HHWU=true
     ```

Save the changes in ks_start and restart KS Server using any of the methods described in Sections 8.2.5 and 8.2.6.

Start KS Workstation on any client machine and connect to KS Server. The Product Selection window will prompt you to select the desired product (feature set).
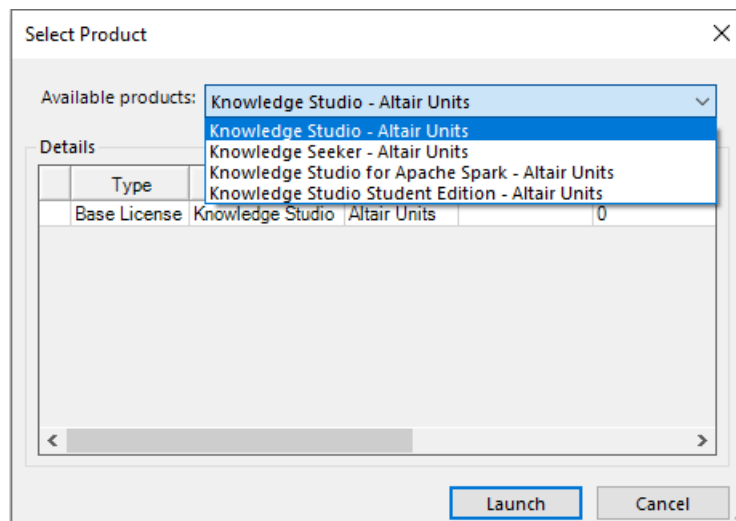
Select the desired product and click **Launch**.

14.2.4. Machine Authorization for Managed Altair Licensing

This section describes how to authorize the application host machine(s) for **Managed Altair Licensing**, where the license server is hosted in the Altair cloud. This step is not required if you are using a self-hosted Altair License Server.
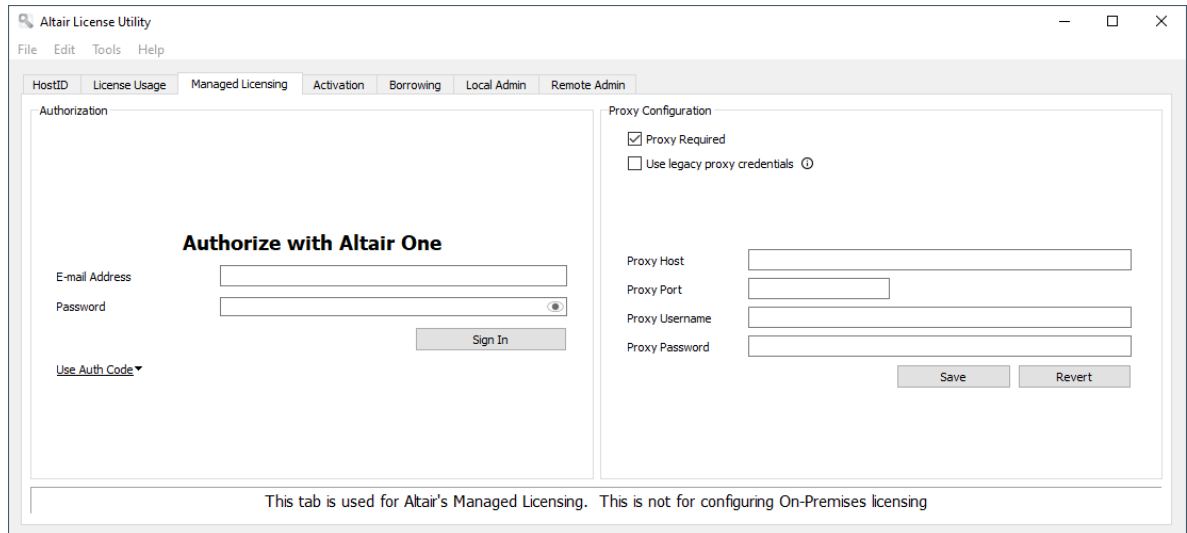
Standalone configuration for a single user:

1. If you have not registered on the AltairOne portal yet, ask a user with Altair license admin role at your company to add you as a user at https://AltairOne.com. You will receive an email from Altair with a link to activate your AltairOne account. Click the activation link in your email and register on the AltairOne portal.

2. Open the file browser and navigate to the folder `C:\Program Files\Altair Data Analytics\KS Workstation 2025.0.0\security`
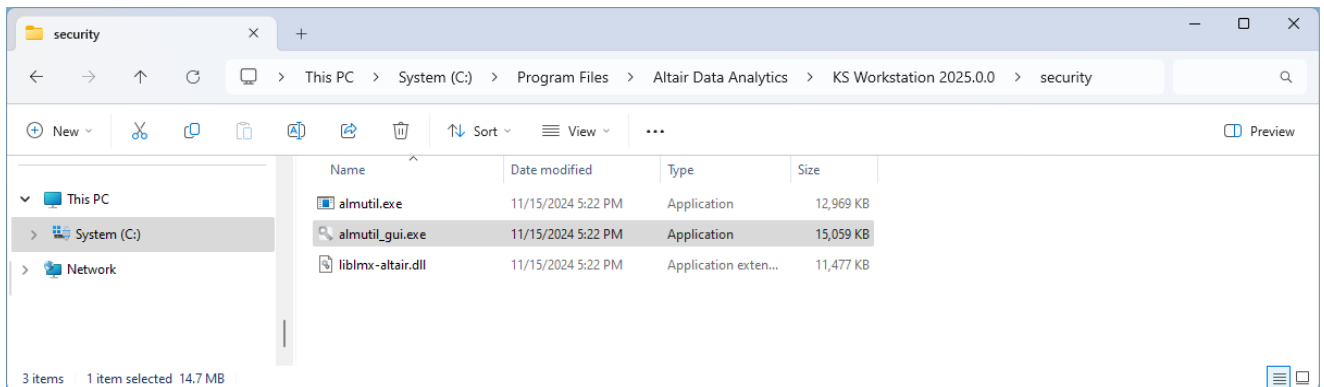
3. Double-click on the **almutil_gui**. The Altair License Utility window opens:
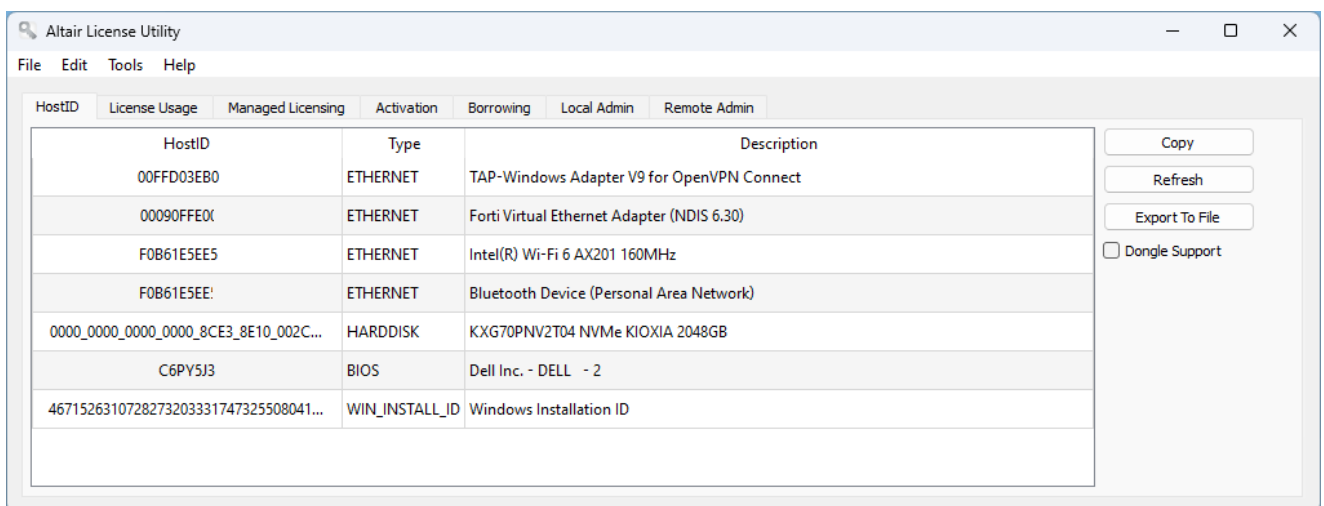
4. Go to the **Managed Licensing** tab of Altair License Utility window:

5. Specify your AltairOne credentials: your email address and password that you used to register at the AltairOne portal. Click **Sign In**.

Alternatively, if you are not registered at the AltairOne portal and received an authorization code an Altair license admin user at your company, click Use Auth Code, specify the authorization code received from this user and click **Authorize**.

You will get the message: "Successfully authorized this machine". Click **OK**.

Client/Server configuration or Standalone configuration for multiuser access:

1. If you have not registered yet on the AltairOne portal, ask a user with Altair license admin role at your company to add you as a user at https://AltairOne.com. You will receive an email from Altair with a link to activate your Altair One account. Click the activation link in your email and register on the Altair One portal.

2. Log on to https://altairone.com/Dashboard. In the Manage Account section of the Altair One Dashboard page, click **Managed Licenses**, as shown below.

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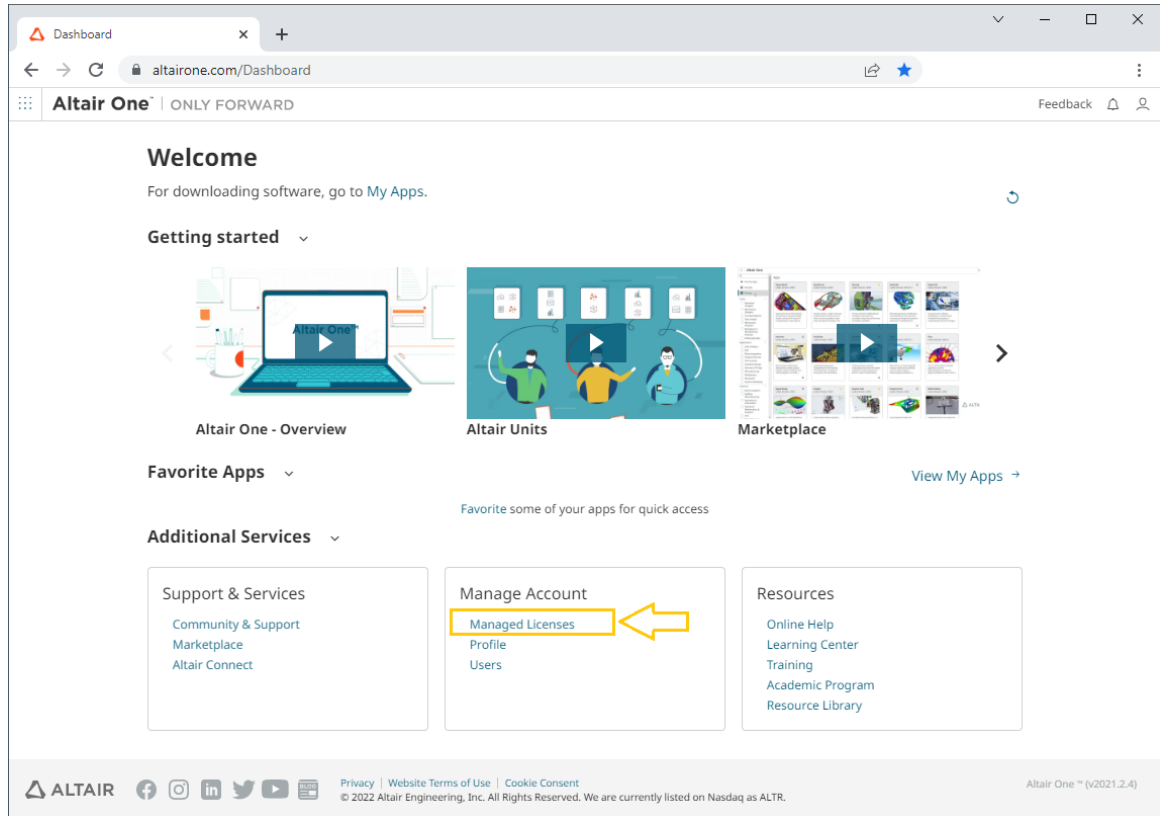
3. In the left pane, click **User Profile**:
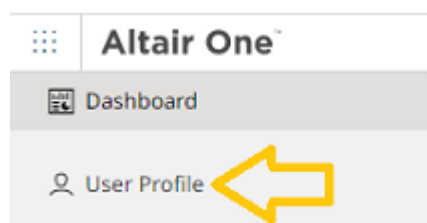
4. Click **Authorized Machines** in the User Profile page:
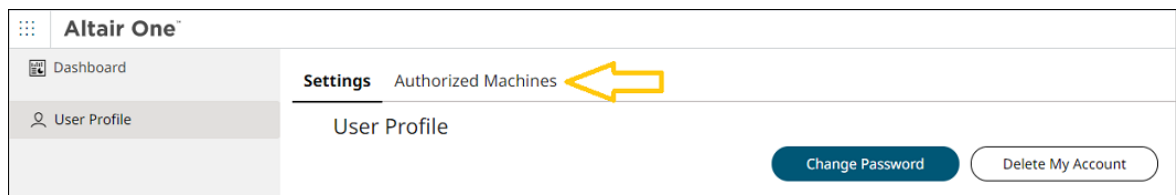
5. In the Authorized Machines page, click **Generate Auth Code** at the top right corner:

6. This will generate an authorization code to authorize a machine for the Altair license. Copy the code to the clipboard. Note: The code is valid for 15 minutes, so you must perform the next 7 steps within 15 minutes of generating the code.
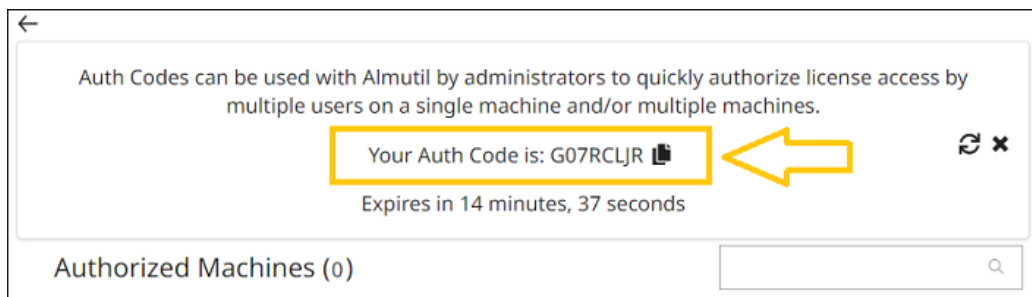
7. After copying the code:

- For the Standalone configuration on Windows: run Command Prompt as administrator and change to the folder `C:\Program Files\Altair Data Analytics\KS Workstation 2025.0.0\security`

- For the Client/Server configuration on Windows: run Command Prompt as administrator and change to the folder `C:\Program Files\Altair Data Analytics\KS Server 2025.0.0\security`

- For the client/server configuration on Linux: Change to the directory `/usr/local/altair/licensing15.5/bin/`, which contains **almutil**. If you cannot find almutil on your Linux system, please contact Altair Customer Support.

8. Run the following command as administrator, where *NNNN* is the authorization code generated at the previous step:

```
almutil -alauth -system -code NNNNN
```

The almutil tool can also be used to test the connectivity with the license servers in the Altair One cloud and configure proxy settings. Run `almutil` to view the detailed information on the usage and all available options.

9. Once you get the message that the machine was successfully authorized, restart the application (KS Server service for the client/server configuration; KS Workstation for the Standalone configuration).

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15. Contacting Customer Support

Altair Customer Support website: https://community.altair.com/community

To report issues with the software or ask questions regarding the product features, please contact Customer Support via email or telephone:

- Telephone: 1-888-715-7391 (toll-free within North America) or 1-416-593-2417
- Data Analytics Customer Support e-mail: dasupport@altair.com

We welcome your suggestions on how to make our application easier to use and understand. Please send your comments and suggestions to dasupport@altair.com.

Join our online community of experts and users to share insights, collaborate with colleagues and find more ways to take full advantage of your product: https://altair.com/knowledge-studio-user-group

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Altair is a global leader in delivering advanced analytics to businesses looking to improve performance across risk, marketing and sales.

Altair removes the complexity inherent with predictive analytics and machine learning with a platform that is intuitive to use and rich in features. It is designed so that Data Scientists and Data Citizens alike can build models used to help solve business problems.

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