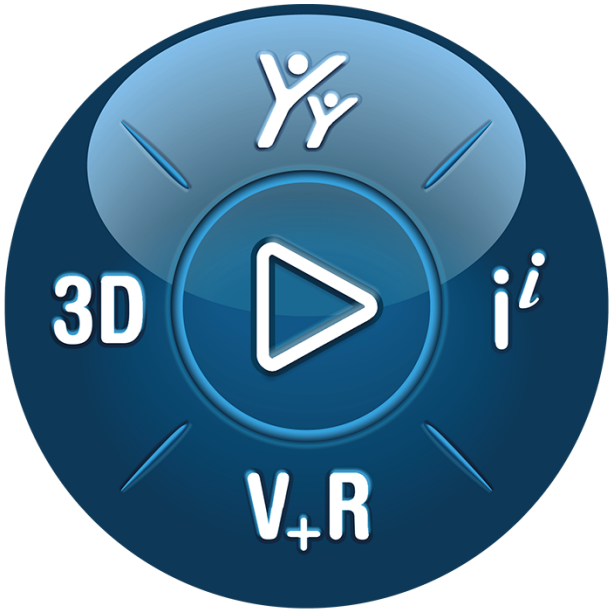
DELMIA Apriso

DELMIA Apriso 2021 Installation Guide

Updated in Service Pack 1



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1 Introduction

1.1 Overview

This document is a guide to getting the DELMIA Apriso solution installed. It describes the software and hardware requirements and the steps for installing DELMIA Apriso.

> It is recommended to refer to the DELMIA Apriso Administration Guide, as it includes additional information about DELMIA Apriso architecture and provides basic troubleshooting.

Installation of the Operating System (Windows) and the database server (SQL Server or Oracle) is outside of the document's scope. This document only contains configuration changes specific to DELMIA Apriso (e.g., creation of a database instance is described in detail).

> It is required that the individual(s) performing the installation have knowledge of databases and a general knowledge of the administration and configuration of servers.

> A key assumption is that Windows and IIS are installed under the "Typical Installation" option and the default security settings have not been modified. Custom actions such as blocking system accounts (e.g., Internet Guest Account), changing the access rights to system folders (especially to Windows), changing Windows service logins, or applying any other custom changes can cause DELMIA Apriso to not function properly. This document does not provide troubleshooting for all possible exceptions to this rule.

The DELMIA Apriso high availability configuration is described in a separate document: High Availability Configuration Installation Guide.

1.2 How to Use This Document

1.2.1 If You Are Installing DELMIA Apriso for the First Time

1. Procure the hardware and install the base operating system, database management system, and third-party software according to the instructions provided by the respective vendor and satisfying the requirements listed in:
   2 Verifying the Prerequisites for the Installation
2. If you are using Oracle database management system, please refer to
   3.5 Installing Oracle Prerequisites on the Application Server
3. When all prerequisites are installed, the next step is to create the DELMIA Apriso application database. Instructions for installing the database are in:
   3 DELMIA Apriso Database Creation and Configuration
   After creating the database, all of the instructions from

3.3.5 Database User Configuration must be followed, regardless of whether an Oracle or SQL DBMS is being used.

4. When the database is ready, the DELMIA Apriso application can be installed. Refer to 4.1 Installing the DELMIA Apriso Application Server
5. When the installation is finished, perform all of the steps from 5 DELMIA Apriso Application Server Post-Install Steps.
6. Should any problems occur during any step of the installation, check if all previous steps described in the documentation were performed correctly, and (if they were) look for a solution in Administration Guide (Miscellaneous/Troubleshooting section). Many known issues as well as instructions for installing third-party software are described there.
7. As the last step, you have to properly configure all client machines to be able to work with the newly installed DELMIA Apriso Server. Refer to 7 DELMIA Apriso Client for instructions on how to do this.

1.2.2 If You Are Upgrading an Existing DELMIA Apriso Instance

Refer to 8 Upgrading an Existing DELMIA Apriso Installation.

1.2.3 General Hints

Most of the scripts provided in the document are also available in the "*.sql" file format as a ZIP package on the DELMIA Apriso Server Configuration page **| Access Tools and File Packs | Installation and Configuration | DELMIA Apriso Server Installation Scripts.** Use this as an alternative to copying the text from the document, which may sometimes be difficult.

2 Verifying the Prerequisites for the Installation

The recommended configuration (for the best performance) is to install the database engine and the application server **on separate machines**. All of the prerequisites are defined separately for the database and the application servers. If the database and DELMIA Apriso are installed on the same machine (possible, but not recommended for production environments):
– prerequisites for both must be met by this machine
– Database Server (plus the required client tools) must be installed before the DELMIA Apriso Application Server.

A complete summary of the licenses that may be required for the DELMIA Apriso implementation is provided in 9.2 Appendix B: Third-Party Licenses for DELMIA Apriso.

When using the Excel Add-in, Cube View Repository screen, Cube Viewer Business Control, Machine Time Analysis screen, or Dashboard Builder screen, please refer to the MPI Installation Guide available on the 6 Enhance the DELMIA Apriso Product for guidance with the prerequisites and installation.

2.1 Hardware Requirements

2.1.1 Database Server/Application (Web) Server

Tests and Other Non-Production Purposes

For training and other non-production uses, it is recommended that the **DELMIA Apriso Server** meet the following minimum requirements to run DELMIA Apriso applications at an adequate speed for 10 users or less:

- **Core i5** (6th generation) CPU (4 cores), or equivalent
- **16 GB** of RAM
- **20 GB** of free hard drive space after meeting the software requirements (**50**+ **GB** if running the database server on the same machine as DELMIA Apriso)
- Network connection

Production Purposes

For production server environments, **work with your implementation partner and/or DELMIA Apriso to determine the adequate hardware configurations**.

One of the first steps is to complete a hardware-sizing questionnaire, which is submitted to Dassault Systèmes and with which recommendations are jointly reached between Dassault Systèmes, the customer, and the implementation partner (if applicable).

If your DELMIA Apriso Server environment requires high-availability or load balancing, consult your implementation partner or Dassault Systèmes contact for specific instructions. Such configurations are complex, and the setup instructions are unique for each instance. You can alternately refer to the High Availability Configuration Installation Guide for configuration instructions.

Dassault Systèmes recommends the following levels when using RAID hard drive configurations for an SQL Server:

- RAID 10 for data files (or RAID 1, if unattainable)
- RAID 1 for log files
- RAID 10 for Temp DB (or RAID 1, if unattainable)

> RAID 5 should **never** be utilized when running SQL DBMS!

> The main goal of the database performance tuning is to maximize the efficiency of input/output operations. The best way to achieve this target is to provide more hard disk drives. While thinking about the hardware configuration for the database server, please keep in mind that the more hard disk drives installed the better its performance will be.

2.1.2 Desktop (PC) Client

The minimum hardware requirements for the DELMIA Apriso Client PC workstation (for all production, test, and training purposes) to perform all DELMIA Apriso functions efficiently are:

- **Core i3** (6th generation) CPU, or equivalent
- **8 GB** of RAM

Parts of DELMIA Apriso functionality using the 3DPlay control for displaying and manipulating 3D models, such as 3D Work Instructions or 3DVQDT, may require more system resources for optimum performance.

For a list of recommended hardware configurations for 3DPlay control, refer to the Certified Workstations 3DS Support Page.

The minimum screen resolution supported for the DELMIA Apriso Portal is dependent on the device type as well as the rendering mechanism and is described in the Portal Implementation Guide.

For desktop DELMIA Apriso Client Apps and Process Builder, the minimum resolution is **1680×1050** pixels.

> Custom DPI settings are not supported and may cause UI elements to be displayed incorrectly.

2.1.3 Mobile Client

Tablets and Smartphones

For handheld devices running the **Android or iOS** operating systems, Dassault Systèmes delivers native mobile apps. The hardware requirements are determined by the operating system version running on the device (for details, see the DELMIA Apriso Mobile Apps Implementation Guide).

2.2 Supported Database Engines

DELMIA Apriso supports the database releases below that run on all operating systems supported by the database provider. For the list of supported operating systems, refer to the manufacturer's website.

If the database and the application server are installed on the same OS, the database must be installed on an OS that is supported for the given database and OS combination as described in the section 2.3 Software Requirements for the Application (Web) Server.

Because demand is not high enough to warrant DELMIA Apriso to validate its solutions on all given operating systems the database providers support, our own internal Quality Assurance/Quality Control is limited to those combinations described in section 2.3 Software Requirements for the Application (Web) Server. If any issues outside these combinations occur, the customer must secure and retain experts within their own IT organization or infrastructure providers for the given database/OS combination. Such expertise must be available to attend support calls, when required. Such experts must also assist throughout the support process including diagnosis, work-around identification, and securing a resolution.

2.2.1 SQL Server Environments

> The latest Service Pack and Cumulative Update are required.

- **Microsoft SQL Server 2017** (only 64-bit)
- **Microsoft SQL Server 2019** (only 64-bit)

2.2.2 Oracle Environments

> The latest DB BUNDLE PATCH is required.

- **Oracle Database 12c R2**. It requires additional steps described in section Granting Access to System Views on Oracle
- **Oracle Database 19c**

2.3 Software Requirements for the Application (Web) Server

The “name” of the server that DELMIA Apriso is to be installed on must be a text string of up to 24 characters using alphabet characters (A-Z), digits (0-9), the minus sign (-), and a period (.). The first character must be an alpha character. The last character must not be a minus sign or period.

It is recommended that the installation be done in the same order as is listed in this document (top-down). **To install all of the prerequisites (as well as the DELMIA Apriso application), login as a user that is a member of an administrators group**.

The DELMIA Apriso Application SERVER is a CLIENT to the database server. The DELMIA Apriso CLIENT (i.e., a PC with a browser) is **not** the same as the DB client!

2.3.1 SQL Server 2017 Environments

Component	Supported Version
Operating System	**Microsoft Windows Server 2016** **Microsoft Windows Server 2019**
Internet Information Services (IIS)[1]	64-bit version of IIS shipped with your OS, with the following server roles installed: ▶ **ASP.NET 3.5** and **4.7** (for Microsoft Windows Server 2019) ▶ **ASP.NET 3.5** and **4.6** (for Microsoft Windows Server 2016) ▶ **Windows Authentication** (only if Windows Integrated Authentication is to be used in DELMIA Apriso)
Microsoft .NET Framework	**4.7.1** and **3.5 SP1**
Database Client	**Microsoft SQL Server 2017** The latest Service Pack and Cumulative Update are required.
Database Client Components	**Client Tools Connectivity** **Client Tools Backwards Compatibility** **Microsoft® Command Line Utilities**[2]

[1]Data Execution Prevention is necessary to be disabled for IIS Worker Process (in IIS configuration) in order for the DELMIA Apriso Report Viewer to work correctly. By default this feature is enabled.

[2]Microsoft® Command Line Utilities include the SQLCMD utility which allows for connecting to SQL server and running script files. It is used in DELMIA Apriso Archiving, DELMIA Apriso Database Upgrader and in DELMIA Apriso Global Process Manager. Note that SQLCMD can be installed as a standalone utiltiy.

Reporting Framework	DELMIA Apriso supports: Crystal Reports[1] (Support Pack 18 for version 13), MS Reporting Services and XtraReports. If you wish to use any of them, refer to Reporting Framework – Crystal Reports Technical Guide, Reporting Services – MS Reporting Services Technical Guide, Reporting Framework – XtraReports Technical Guide accordingly for details.
Microsoft Message Queuing (MSMQ)	Windows Component (version according to the operating system). It is recommended for Global Process Manager to be able to automatically synchronize data between environments in Global Deployment Landscape (see Global Process Manager Help for more information on this feature).
Failover Cluster Command Interface	In High Availability scenarios, **Failover Cluster Command Interface** needs to be installed from **Add Roles and Features Wizard** to be able to use DELMIA Apriso Cluster Configuration Wizard on Windows Server.
Visual C++ Runtime	Visual C++ Redistributable Packages for Visual Studio 2013 [2] Visual C++ Redistributable Packages for Visual Studio 2015-2019 (32bit and 64bit)

2.3.2 SQL Server 2019 Environments

Component	Supported Version
Operating System	**Microsoft Windows Server 2016** **Microsoft Windows Server 2019**
Internet Information Services (IIS)[3]	64-bit version of IIS shipped with your OS, with the following server roles installed: ▶ **ASP.NET 3.5** and **4.7** (for Microsoft Windows Server 2019) ▶ **ASP.NET 3.5** and **4.6** (for Microsoft Windows Server 2016) ▶ **Windows Authentication** (only if Windows Integrated Authentication is to be used in DELMIA Apriso)
Microsoft .NET Framework	**4.7.1** and **3.5 SP1**
Database	**Microsoft SQL Server 2019**

[1]Crystal Reports is no longer installed automatically in the background as DELMIA Apriso default reporting framework provider. Crystal Reports requires a separate license for runtime to be acquired by the customer. Please see Reporting Framework – Crystal Reports Technical Guide for licensing details.

[2]The Visual C++ Redistributable Packages install run-time components that are required to run C++ applications that are built by using Visual Studio 2013. The component is required for Action Scripts functionality in Process Builder.

[3]Data Execution Prevention is necessary to be disabled for IIS Worker Process (in IIS configuration) in order for the DELMIA Apriso Report Viewer to work correctly. By default this feature is enabled.

Client	The latest Service Pack and Cumulative Update are required.
Database Client Components	**Client Tools Connectivity** **Client Tools Backwards Compatibility** **Microsoft® Command Line Utilities**[1]
Reporting Framework	DELMIA Apriso supports: Crystal Reports[2] (Support Pack 18 for version 13), MS Reporting Services and XtraReports. If you wish to use any of them, refer to Reporting Framework – Crystal Reports Technical Guide, Reporting Services – MS Reporting Services Technical Guide, Reporting Framework – XtraReports Technical Guide accordingly for details.
Microsoft Message Queuing (MSMQ)	Windows Component (version according to the operating system). It is recommended for Global Process Manager to be able to automatically synchronize data between environments in Global Deployment Landscape (see Global Process Manager Help for more information on this feature).
Failover Cluster Command Interface	In High Availability scenarios, **Failover Cluster Command Interface** needs to be installed from **Add Roles and Features Wizard** to be able to use DELMIA Apriso Cluster Configuration Wizard on Windows Server.
Visual C++ Runtime	Visual C++ Redistributable Packages for Visual Studio 2013[3] Visual C++ Redistributable Packages for Visual Studio 2015-2019 (32bit and 64bit)

2.3.3 Oracle 12c Environments

Component	Supported Version
Operating System	**Microsoft Windows Server 2016** (only 64-bit)
Internet Information	64-bit version of IIS shipped with your OS, with the following server roles installed:

[1]Microsoft® Command Line Utilities include the SQLCMD utility which allows for connecting to SQL server and running script files. It is used in DELMIA Apriso Archiving, DELMIA Apriso Database Upgrader and in DELMIA Apriso Global Process Manager. Note that SQLCMD can be installed as a standalone utiltiy.

[2]Crystal Reports is no longer installed automatically in the background as DELMIA Apriso default reporting framework provider. Crystal Reports requires a separate license for runtime to be acquired by the customer. Please see Reporting Framework – Crystal Reports Technical Guide for licensing details.

[3]The Visual C++ Redistributable Packages install run-time components that are required to run C++ applications that are built by using Visual Studio 2013. The component is required for Action Scripts functionality in Process Builder.

Services (IIS)[1]	▶ **ASP.NET 3.5** and **4.6** ▶ **Windows Authentication** (only if Windows Integrated Authentication is to be used in DELMIA Apriso)
Microsoft .NET	**4.7.1** and **3.5 SP1**
Database Client	**Oracle Client 12c R2** (**12.2.0.1.0**, only 64-bit) For more information about installing the client, refer to 3.6 Installing the Oracle Client on the Application Server.
Data Provider (installed automatically with client)	**Oracle Data Provider for .NET** (**12.2.0.1.0**) **Oracle Provider for OLE DB** (**12.2.0.1.0**) **Oracle ODBC Driver** (**12.2.0.1.0**)
Reporting Framework	**Crystal Reports**[2] (Support Pack 18 for version 13), MS Reporting Services and XtraReports. If you wish to use any of them, refer to Reporting Framework – Crystal Reports Technical Guide, Reporting Services – MS Reporting Services Technical Guide, Reporting Framework – XtraReports Technical Guide accordingly for details.
Microsoft Message Queuing (MSMQ)	Windows Component (version according to the operating system). It is recommended that Global Process Manager is able to automatically synchronize data between environments in the Global Deployment Landscape (see Global Process Manager Help for more information on this feature).
Visual C++ Runtime	Visual C++ Redistributable Packages for Visual Studio 2013[3] Visual C++ Redistributable Packages for Visual Studio 2015-2019 (32bit and 64bit)

2.3.4 Oracle 19c Environments

Component	Supported Version
Operating System	**Microsoft Windows Server 2019** (only 64-bit)

[1]Data Execution Prevention is necessary to be disabled for IIS Worker Process (in IIS configuration) in order for DELMIA Apriso Report Viewer to work correctly. By default this feature is enabled.

[2]Crystal Reports is no longer installed automatically in the background as DELMIA Apriso default reporting framework provider. Crystal Reports requires a separate license for runtime to be acquired by the customer. Please see Reporting Framework – Crystal Reports Technical Guide for licensing details.

[3]The Visual C++ Redistributable Packages install run-time components that are required to run C++ applications that are built by using Visual Studio 2013. The component is required for Action Scripts functionality in Process Builder.

Internet Information Services (IIS)[1]	64-bit version of IIS shipped with your OS, with the following server roles installed: ▶ **ASP.NET 3.5** and **4.7** ▶ **Windows Authentication** (only if Windows Integrated Authentication is to be used in DELMIA Apriso)
Microsoft .NET	**4.7.1** and **3.5 SP1**
Database Client	**Oracle Client 19c** (**19.0.0.0.0**, only 64-bit) For more information about installing the client, refer to 3.6 Installing the Oracle Client on the Application Server.
Data Provider (installed automatically with client)	**Oracle Data Provider for .NET** (**19.0.0.0.0**) **Oracle Provider for OLE DB** (**19.0.0.0.0**) **Oracle ODBC Driver** (**19.0.0.0.0**)
Reporting Framework	**Crystal Reports**[2] (Support Pack 18 for version 13), MS Reporting Services and XtraReports. If you wish to use any of them, refer to Reporting Framework – Crystal Reports Technical Guide, Reporting Services – MS Reporting Services Technical Guide, Reporting Framework – XtraReports Technical Guide accordingly for details.
Microsoft Message Queuing (MSMQ)	Windows Component (version according to the operating system). It is recommended that Global Process Manager is able to automatically synchronize data between environments in the Global Deployment Landscape (see Global Process Manager Help for more information on this feature).
Visual C++ Runtime	Visual C++ Redistributable Packages for Visual Studio 2013[3] Visual C++ Redistributable Packages for Visual Studio 2015-2019 (32bit and 64bit)

[1]Data Execution Prevention is necessary to be disabled for IIS Worker Process (in IIS configuration) in order for DELMIA Apriso Report Viewer to work correctly. By default this feature is enabled.

[2]Crystal Reports is no longer installed automatically in the background as DELMIA Apriso default reporting framework provider. Crystal Reports requires a separate license for runtime to be acquired by the customer. Please see Reporting Framework – Crystal Reports Technical Guide for licensing details.

[3]The Visual C++ Redistributable Packages install run-time components that are required to run C++ applications that are built by using Visual Studio 2013. The component is required for Action Scripts functionality in Process Builder.

2.4 Software Requirements for the Client Machines

2.4.1 Desktop Client

Component	Supported Version
Operating System (list of supported systems)	**Windows 10 Enterprise** (64-bit) **Windows 10 Enterprise LTSC** (64-bit)
Browser (list of supported systems)	**Microsoft Edge** **Microsoft Edge Legacy** **Google Chrome** (the latest version) **Mozilla Firefox** (the latest version)
Microsoft .NET Framework	**4.7.1** and **3.5 SP1**
Microsoft Office with Excel[1]	**Microsoft Office 2016** **Microsoft Office 2013** **Microsoft Office 2010** **Microsoft Office 2007**
Database Client[2]	Depending on the DBMS used, see section 2.3 Software Requirements for the Application (Web) Server.
Microsoft Access Database Engine 2010 Redistributable	Data Connectivity Component. This is required for importing/updating data from an Excel file. Refer to the Version 2010 page for the installation package.
Transport Layer Security[3]	Version 1.2 For more information, refer to section *Enabling TLS 1.2* in Security Implementation Guide.
Visual C++ Runtime	Visual C++ Redistributable Packages for Visual Studio 2015-2019 (32 bit and 64 bit).

[1]Some DELMIA Apriso modules allow for importing Excel files with data which require Microsoft Office or additional components to be installed on the desktop client machine.

[2]An optional component required by the DELMIA Apriso tools (e.g., Localization Manager) that need to access the DELMIA Apriso database directly.

[3]An optional component, required when SSL is used.

2.4.2 Mobile Client

Tablets and Smartphones

The Android and iOS operating systems are supported by DELMIA Apriso native mobile apps. For details on the operating system versions and the configuration, refer to the DELMIA Apriso Mobile Apps Implementation Guide.

2.5 Additional Software Requirements for External Systems Integration

The software requirements for External Systems integration are outside this document's scope. Refer to the software requirements from the third-party integration broker chosen to integrate DELMIA Apriso with the External Systems. For planning and configuration information specific to Business Integrator, refer to Business Integrator – Integration Planning Technical Guide and 10 References.

Some DELMIA Apriso functionalities – for example, Business Components designed for external systems integration (like SAP) – require some components or sometimes single DLLs to be installed on the machine on which DELMIA Apriso is operating. Such information is available in the documentation for specific BC methods. The components and or DLLs are to be acquired by DELMIA Apriso customers on their own and installed according to the information accompanying these resources.

2.6 Other Prerequisites and Configurations to be done before the Installation

1. DELMIA Apriso requires that the latest **Windows updates** recommended by Microsoft be installed on the system DELMIA Apriso is utilized on. This applies to the Application/Web Server, Database Server, and Client machines.
2. DELMIA Apriso requires that updates related to root certificates are installed prior to installing DELMIA Apriso. This requirement applies to both: the Application/Web Server and Client machines which are part of the DELMIA Apriso infrastructure.

   The root certificate is used to authorize the DELMIA Apriso certificate that is used to sign DELMIA Apriso components. The DELMIA Apriso certificate is supplied by VeriSign and thus the required root certificate is **VeriSign Class 3 Public Primary CA - G5**.

   > On Windows Server, the updates should occur automatically when the machine is connected to the Internet. For detailed information on the effects of missing root certificates on DELMIA Apriso and resolving the issue on disconnected environments, refer to the DELMIA Apriso Administration Guide (ClickOnce Applications Failing to Start when Root Certificates are Missing).

3. It is strongly recommended that you install the databases before the applications, so that you will know what to enter when prompted for database information during the installation process.
4. Make sure that the database server is running and try to connect with the SQL Server/Oracle client tools in order to be sure that you are using the correct connection parameters!
5. Use the Default Web Site in IIS on the system disk (by default `<drive>\Program Files\Dassault Systemes\DELMIA Apriso 2021\WebSite`) as the Home Directory of the DELMIA Apriso Server. If this path is changed, some third-party applications may not be installed correctly during the DELMIA Apriso installation.
6. For Oracle DBMS, the user account that is used by the ASP.NET worker process needs to have **read** privileges to the Oracle client folder on the DELMIA Apriso Application Server. The account is one of the built-in users found in the IIS_IUSRS local user group (i.e., SYSTEM, LOCAL SERVICE, or NETWORK SERVICE). Without these privileges, the ASP.NET worker process may not be able to access the Oracle client DLLs, which will cause DELMIA Apriso to fail.
7. Make sure the properties of the Local Area Connection to be utilized with DELMIA Apriso is using the IPv4 protocol. IPv6 is currently not supported by DELMIA Apriso.
8. All of the required TCP/IP ports between the client, application server, Portal server, and database server must be open. Depending on how DELMIA Apriso is deployed, all of the server components may be located on one physical server, or they may be spread across multiple servers. The various server and client components are defined as follows:
   - **Database server** – the SQL Server or Oracle Server where the DELMIA Apriso databases are installed
   - **Portal server** – the IIS Server where the Portal is installed
   - **Application server** – where the DELMIA Apriso Windows services are running
   - **Client** – the end-user's browser-based PC/device

   Perform the following verification:

   - Ensure that all of the TCP/IP ports used for communication between the **client** and **Portal** servers specified in the table below are opened:

Port Number	Purpose	Can Be Changed?
32500	The default port used by Machine Integrator.	Yes
32501	The remoting port used by Machine Integrator.	Yes
80	HTTP communication.	No
443 (optional)	Secure Sockets Layer (SSL) communication.	No
5672, 15672	RabbitMQ communication.	Yes

   - Ensure that all of the TCP/IP ports used for communication between the **client** and **application** servers specified in the table below are opened:

Port Number	Purpose	Can Be

		Changed?
32500	The default port used by Machine Integrator.	Yes
32501, 32502 and 32503	The remoting port used by Machine Integrator.	Yes
32606 and 32608	The state service used by all of the applications for keeping state.	Yes
32601 and 32600	Framework Services used by all Win UI applets.	Yes
32603	Process Designer Services used for communication with the server.	Yes
32603 and 32610	Process Builder Services used by WinUI applets inside Process Builder.	Yes
32602 and 32604	Maintenance Services used by most of the M&Ms and Cockpit WinUI applets.	Yes
32607 and 32605	Scheduler Services used by Job Scheduler and Job Scheduler WinUI applets.	Yes
32612 and 32611	Job Executor Services used for remote Job execution.	Yes
32809, 32709, 32710, 32810	Global Process Manager Services used for communication with the server.	Yes
5672, 15672	RabbitMQ communication.	Yes

- Ensure that all of the TCP/IP ports used for communication between the **application server** and **database server** specified in the table below are opened:

Port Number	Purpose	Can Be Changed?
1433	SQL.	Yes
1521	Oracle.	Yes

- Ensure that all of the TCP/IP ports used for communication between the **Portal server** and **database server** specified in the table below are opened:

Port Number	Purpose	Can Be Changed?
1433	SQL.	Yes
1521	Oracle.	Yes

- Ensure that all of the TCP/IP ports used for communication between the **Portal server** and **application server** specified in the table below are opened:

Port Number	Purpose	Can Be Changed?
80	HTTP communication between the Web server and other components.	Yes
32500	The default port used by Machine Integrator.	Yes
32501	The remoting port used by Machine Integrator.	Yes
32606	The state service used by all applications for keeping state.	Yes
32601	Framework Services used by all Win UI applets.	Yes
32603	Process Designer Services used for communication with the server.	Yes
32603	Process Builder Services used by WinUI applets inside Process Builder.	Yes
32602	Maintenance Services used by most of the M&Ms and Cockpit WinUI applets.	Yes
32607	Scheduler Services used by Job Scheduler and Job Scheduler WinUI applets.	Yes
32612	Job Executor Services used for remote Job execution.	Yes
32609	Global Process Manager Services used for communication with the server.	Yes
5672, 15672	RabbitMQ communication.	Yes

9. If you are installing DELMIA Apriso from a network share that exists on a UNC path (on the network), then you must ensure that the network share has “everybody read” privileges.

   > If the option above is not valid for your case, please consult your DELMIA Apriso implementation specialist.

10. Configure a sufficient number of **Oracle Processes** for Process Regenerator (Oracle only).

    DELMIA Apriso Process Regenerator executed after the DELMIA Apriso Application Server installation and database upgrade requires more processes for simultaneous data processing than are configured by default in the Oracle Server configuration.

    Make sure to **set the number of Oracle processes to at least 1 000**, but be aware that this depends on the server resources.

11. Configure the client parameters on the application server (Oracle only).

    As Oracle relies on the client to be correctly configured to be able to correctly read and interpret the UTF character sets, it is required to configure the NLS_LANG parameter, which is the method to set the language, territory, and character set used by the client application. The NLS_LANG setting to use is as follows:

NLS_LANG → Language_Territory.Characterset
(e.g., AMERICAN_AMERICA.AL32UTF8)

This parameter must be set in the Windows Registry and can be found in:

HKEY_LOCAL_MACHINE\SOFTWARE\Oracle\<<OracleHome>>

12. Disable 8.3 file name creation on the NTFS partitions for every node (Web and Application). Follow the instructions provided in the ***How to disable 8.3 file name creation on NTFS partitions*** article on the Microsoft Support website.

2.7 Regional Options in Database and Application Servers

If language/national settings other than US-English are applied to the database or application server, some custom actions are necessary (e.g., an index rebuild after the model database is imported, because the indexes are sorted according to the English alphabet). If there are any setting differences between the database and application servers (e.g., the Oracle parameters: NLS_LANG, NLS_SORT, etc.), DELMIA Apriso will not work properly with data containing national characters. Refer to the MsSQL Books Online or Oracle Globalization Support Guide for more info.

When a Microsoft SQL Server is installed, it is necessary to properly configure the collation settings. DELMIA Apriso requires the following collation to be set:

SQL_Latin1_General_CP1_CI_AS

This collation should be set at the server level. This is obligatory, as when a DELMIA Apriso database is running, a temporary database used internally by the SQL Server will use the setting on the server level. The same setting should also be applied on all other levels: database, column, and expression. However, when you import a database delivered by DELMIA Apriso, this setting is already present on the database level. Please do not change it in this case. Setting the proper collation on the database is important, because this is used by default when Database Upgrader creates new columns. A DELMIA Apriso database does not contain specific collation settings for columns, so this is by default taken from the database settings, but it must not be overwritten. The same rule applies to expressions – the settings should not be modified there.

2.8 Recommendations for Client Solutions

The two methods in which DELMIA Apriso allows for the distribution of client components of the DELMIA Apriso application are presented in this chapter.

The table below summarizes the different aspects of each solution that has been presented. A “Yes” in the cell means that the specified inconvenience is observed in that indicated method.

Aspect		1 ClickOnce	2 DELMIA Apriso Client
A	Slow initialization (download)	Yes	

B	After-upgrade download	Yes	
C	First time activity on the client	Yes	Yes
D	After-upgrade manual activity on the client		Yes
E	After-upgrade manual activity on the server	Yes	
F	Solution is restricted only to full client applications	Yes	
G	Risk of conflict with other client or server software		Yes

2.8.1 Download of Only the Client Binaries for Selected Applications Using ClickOnce Technology

ClickOnce technology is applicable only for full client applications. These applications are referred to as client components and are described in 7.3 DELMIA Apriso Client Components.

Advantages of This Approach

- (D) Automatic update when files on the server are changed, and there is no need for any manual activity on the client machine after an upgrade of the server
- (G) The client software is always up to date

Disadvantages of This Approach

- (A) Running a client component for the first time takes a lot of time, as it needs to be downloaded from the server and installed locally
- (B) After a server upgrade (e.g., after a Service Pack is applied), the file need to be re-downloaded to the client
- (C) It may be necessary to install DELMIA Apriso Self-Signed certificate on the client computer to avoid security warnings when installing, or when the local security settings prevent ClickOnce installation. For details, refer to 7.2 DELMIA Apriso Client Configuration.
- (E) After a server upgrade (e.g., after a Service Pack is applied), it is necessary to manually regenerate a manifest of the ClickOnce on the server (this process is described in detail in DELMIA Apriso Upgrade Guide)
- (F) This approach cannot be applied to applications within a browser

2.8.2 Full Client Setup (DELMIA Apriso Client)

This is described in detail in 7 DELMIA Apriso Client. In this scenario, all of the necessary binaries are loaded to GAC (Global Assembly Cache) on a local machine only once.

Advantages of This Approach

- (A) There is no wait time during the first-time download, as the client software is installed locally by the Client Setup (obviously the client setup can itself be downloaded from a remote server, but this is done before the installation process)

- (B) After a server upgrade, the user does not suffer from a slow first-time download of the binaries, as this upgrade is done on the client during the client upgrade process
- (F) The solution can be used by applications within a browser

Disadvantages of This Approach

- (C) It is necessary to manually install the full DELMIA Apriso Client (all of the necessary components) on each client machine
- (D) When applying a Service Pack, it is necessary to manually install a new version of the DELMIA Apriso Client on each client computer
- (E) Manual maintenance of the server machine other than the application of Service Packs is not necessary
- (G) There is a risk of conflict with the software already installed on the client computer and the need to access (from a local or network drive) the client version fully compatible with the current one on the server

3 DELMIA Apriso Database Creation and Configuration

This chapter is divided into four sections. If MS-SQL is being used, disregard the entire section regarding Oracle (3.3 Creating DELMIA Apriso Database on Oracle), and vice-versa for (3.2 Creating DELMIA Apriso Database on Microsoft SQL Server). Sections 3.1 DELMIA Apriso Data Categories and 3.4 Post-Install Data Configuration contain important information for both database providers.

The recommended database installation sequence is to import model data from a backup/dump file and run Database Upgrader during the installation of the DELMIA Apriso binaries (select the “Upgrade database” check box in the DELMIA Apriso install wizard). If there are any differences in the database and binaries versions, the proper scripts will be executed to upgrade the database to the correct version.

3.1 DELMIA Apriso Data Categories

Data in the DELMIA Apriso tables is divided into the following categories (ordered by importance, and the first two are the most important):

- **INIT** – data loaded during the installation (e.g., menu items, ADMIN account, sequence providers, etc.)
  - Once customized, they are never modified during DB upgrades
  - They are necessary for DELMIA Apriso to work properly
- **PRIME** – data loaded during the installation (all of the Dictionary such as DELMIA Apriso function types, job types, etc.)
  - Can be customized, but can be overwritten during DB upgrades
  - They are necessary for DELMIA Apriso to work properly
- **DEMO** – optional data, but very useful: sample Processes, Operations, Functions, and Reason Codes
  - Reusing DEMO data during the implementation saves a lot of time
  - During the upgrade, DEMO data can be overwritten
- **DLL** – data created from standard and/or custom DLL binary files during the last phase of the DELMIA Apriso Application Server installation
- **BPF** – optional Business Process Flows data containing Operations, Processes, and related data serving the purpose of examples

MODEL data = INIT + PRIME + DEMO + DLL + BPF

- Custom data – data created by the implementing team and local administrators, which is never upgraded
- Runtime data – data generated by the DELMIA Apriso background processes which cannot be edited
  - Usually it exists in the DB in the status: CreatedBy user SYSTEM

The data category is determined by the “CreatedBy” column (in each DELMIA Apriso table). The “CreatedBy” column contains the data category name (e.g., “INIT”) followed by the DB version number when the data were added to DELMIA Apriso (e.g. “9.1.11552”).

The person installing the database must know what data should be installed! This depends on the customer’s solution. The possibility of future upgrades must also be considered.

3.2 Creating DELMIA Apriso Database on Microsoft SQL Server

> The following scenario is valid for supported versions: SQL Server 2019 and SQL Server 2017. Any differences between the installations of these environments are outlined in the text. The screenshots present SQL Server 2017.

3.2.1 Database Server Roles

The user installing DELMIA Apriso must have the **dbcreator** and **securityadmin** privileges to restore the database and create these logins: FlxAdmin, FlxReader, FlxWriter. After that, the server administrator has to add the user to the **db_owner** role on the restored database in order to allow mapping the server users with the database users.

3.2.2 SQL Server Configuration

The creator must have the ADMIN rights on the server. Use a “sa” account or another account that has the “System Administrators” server role assigned.

The SQL instance must be set up to use a mixture of NT Authentication and SQL security login. This can be maintained and changed by using SQL Server Management Studio. See Figure 1 SQL Server Properties window, which shows the **SQL Server and Windows Authentication mode** authentication selected.

To get to this configuration screen, run **SQL Server Management Studio**, connect to the server, and right-click the server node and choose **Properties**.

For DELMIA Apriso high availability configuration on SQL Server, refer to the High Availability Configuration Installation Guide.

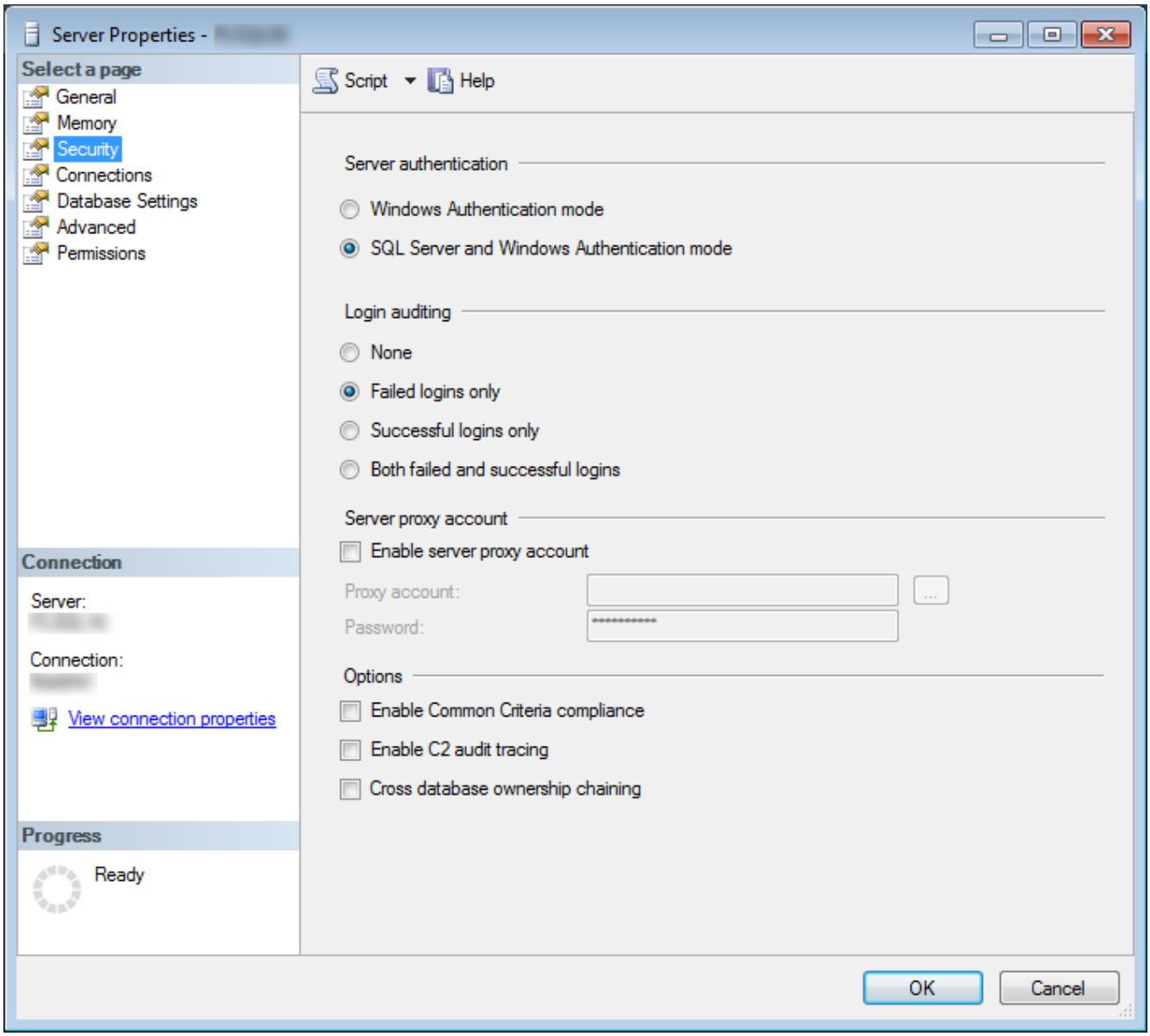

Figure 1 SQL Server Properties window

3.2.3 Restoring the Database(s)

In the `Databases\` folder (in the DELMIA Apriso 2021 installation folder), there are the following database backup files:

- `Apriso\MSSQL\FLX21M.bak` (DELMIA Apriso database)
- `Localization Repository\MSSQL\LR21M.bak` (Localization Repository[1] database)

The sections below describe the purpose of each database and the procedure to have them restored.

[1]The Localization Repository database was formerly called Framework Database. Currently the database only contains localization data and is no longer required.

DELMIA Apriso Database (Required)

This is the primary database containing all of the operational data required to run DELMIA Apriso.

To restore the database, start **Microsoft SQL Server Management Studio**, connect to the proper database server, and perform the following steps:

1. Browse the database server.
2. Right-click **Database**.
3. Select **Restore Database**.
4. The Restore Database window will open.
5. In the **To Database** field, type the target name of the database (recommended: “Apriso”).

> The database name **must be** a text string using alphabet characters (A-Z), digits (0-9), and/or an underscore (_). The first character cannot be an underscore.

6. From the Source for restore section, select the **From Device** button and click “…” (Browse) on the right side, and the new window will open.
7. Click **Add** to choose the backup file.

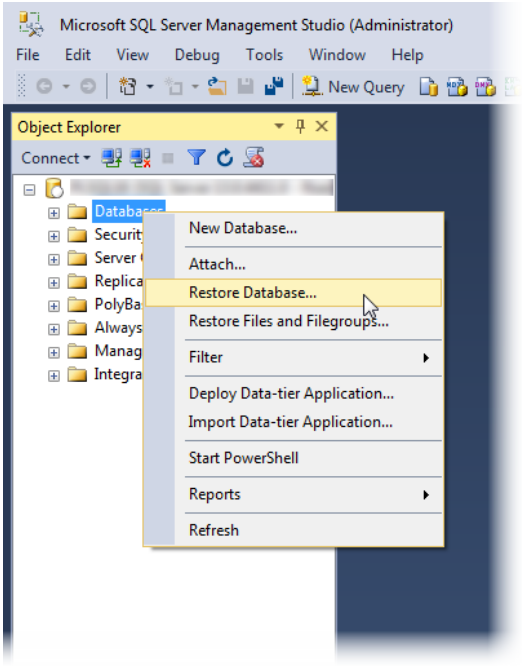

Figure 2 Restore Database browsing

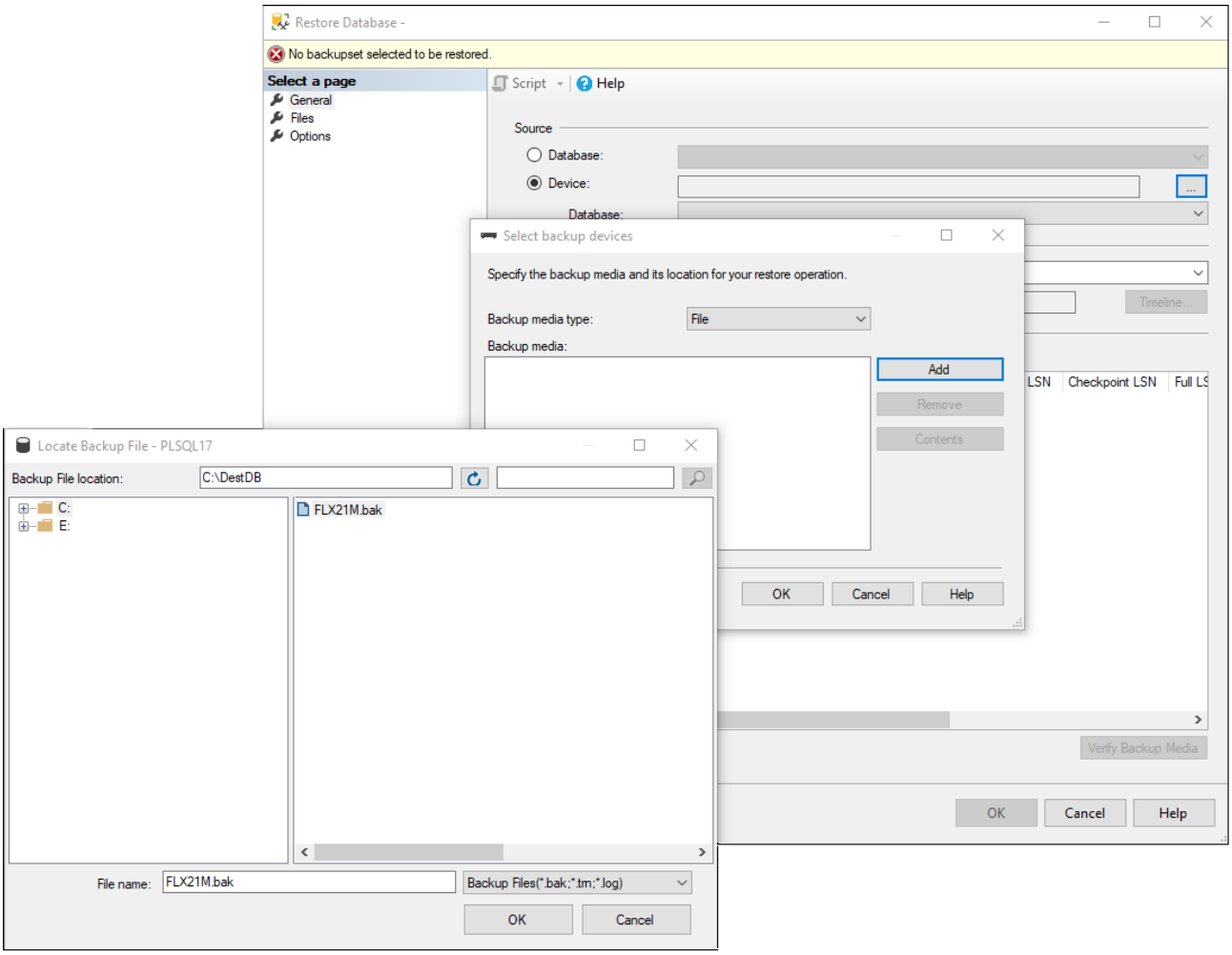

Figure 3 Restore Database procedure

8. Select the backup file name from the DELMIA Apriso 2021 installation folder.
9. Press **OK** to confirm the selections on the **Locate Backup File** window and on the **Specify Backup** window. Do NOT close the **Restore Database** window.
10. In the **Select the backup sets to restore** list, check the added database backup.
11. Navigate to the **Files** page.
12. Check the **Relocate all files to folder** box and specify the folders.
13. Verify if the **Restore As** values are correct.
14. The SQL Server proposes paths from the server where the export was created. Usually the path does not exist on the server where the application is installed. Manually type the correct physical path and the file name as shown in the picture above. Any file name can be used, but the folder MUST exist, as it will **not** be created!
15. Press the **OK** button to start the data import.

    When the import is finished, a message is displayed in a separate window. The DELMIA Apriso database creation is completed.

16. Create three new logins:

- FlxAdmin
- FlxReader
- FlxWriter

To do this, use the `INSTALL_Create_FlexnetLogins` script[1] and replace the text in red with your password:

```
CREATE LOGIN [FlxAdmin] WITH PASSWORD=N'YourPassword', CHECK_EXPIRATION=OFF,
CHECK_POLICY=OFF
GO
ALTER LOGIN [FlxAdmin] ENABLE
GO
CREATE LOGIN [FlxReader] WITH PASSWORD=N'YourPassword', CHECK_EXPIRATION=OFF,
CHECK_POLICY=OFF
GO
ALTER LOGIN [FlxReader] ENABLE
GO
CREATE LOGIN [FlxWriter] WITH PASSWORD=N'YourPassword', CHECK_EXPIRATION=OFF,
CHECK_POLICY=OFF
GO
ALTER LOGIN [FlxWriter] ENABLE
GO
```

17. Give the proper rights to FlxAdmin using the `INSTALL_AlterOnLogins` script (used for the Database Upgrader session browser):

```
USE master;
GRANT VIEW SERVER STATE TO [FlxAdmin];
GRANT ALTER ON LOGIN::FlxReader TO FlxAdmin;
GRANT ALTER ON LOGIN::FlxWriter TO FlxAdmin;
GO
```

18. Map the server logins to the proper database users. To do this, use the `INSTALL_MapLoginsToUsers` script:

```
USE [FlexNet]
GO
ALTER USER [FlxAdmin] With LOGIN=FlxAdmin
GO
ALTER USER [FlxReader] With LOGIN=FlxReader
GO
ALTER USER [FlxWriter] With LOGIN=FlxWriter
GO
```

19. Set the maximum allowed **Compatibility level** (Database Properties > Options) that is available on the SQL server.

[1]Most of the scripts provided in the document are also available in the "*.sql" file format as a ZIP package on the **DELMIA Apriso Server Configuration page | Access Tools and File Packs | Installation and Configuration | DELMIA Apriso Server Installation Scripts**. Use this as an alternative to copying the text from the document, which may sometimes be difficult.

Localization Repository Database (Optional)

The Localization Repository database needs to be created **if you want to be able to manage the localization process** (refer to the Process of Translation Implementation Guide). You can use the DELMIA Apriso database as a literal provider if you decide not to create a Localization Repository database (to be configured in the Configuration Manager after the installation) for the DELMIA Apriso runtime to function.

To create the **Localization Repository** database (containing literals) repeat the same steps, using the following names:

- Database name = “LR”
- SQL Server filenames = “LR.mdf” and “LR.ldf”, respectively

The logical file names – “LR” and “LR_log” respectively – are to be left unchanged!

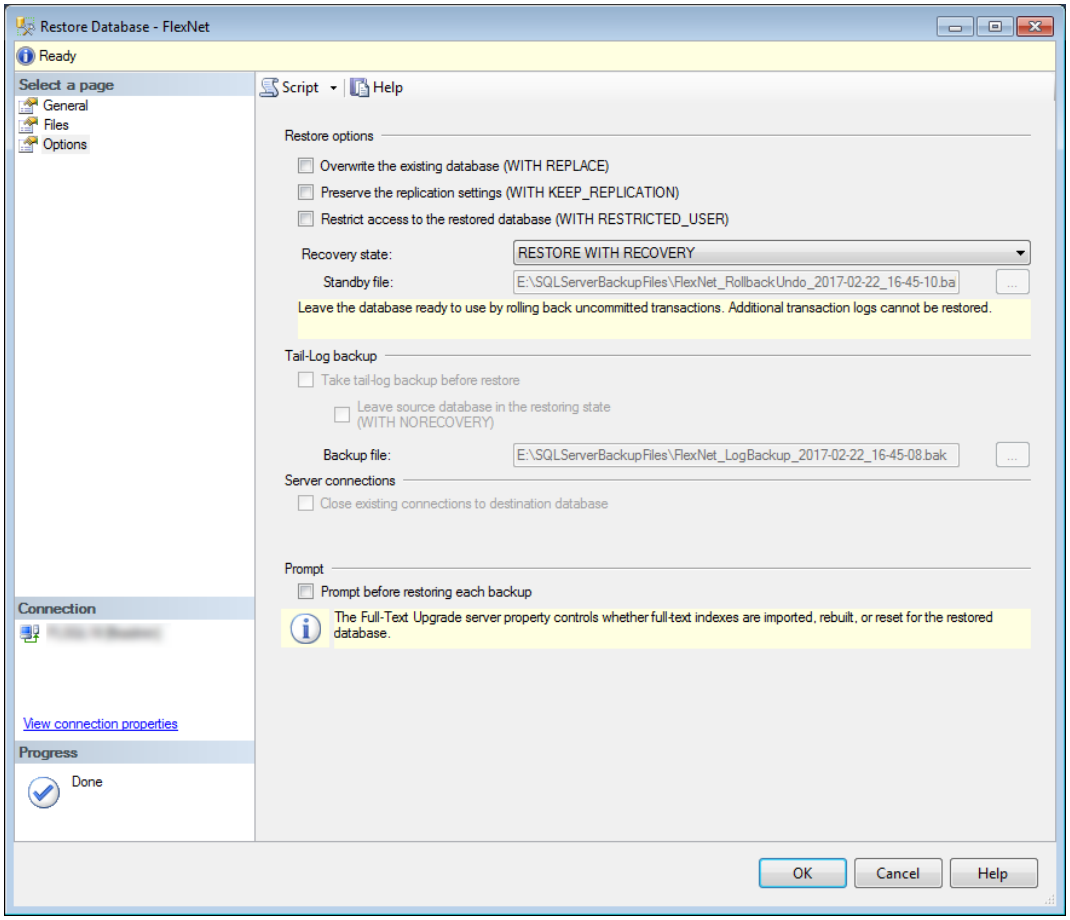

Figure 4 Restore Database options

It is also necessary to create the **FlxAdmin** login for the Localization Repository by using the `INSTALL_LR_CreateLogin.sql` scripts:

```
CREATE LOGIN [FlxAdmin] WITH PASSWORD=N'YourPassword', CHECK_EXPIRATION=OFF, CHECK_
POLICY=OFF
GO
ALTER LOGIN [FlxAdmin] ENABLE
GO
```

Then map the newly created user with the database user by using the `INSTALL_LR_MapLogin.sql` script:

```
USE [LR]
GO
ALTER USER [FlxAdmin] With LOGIN=FlxAdmin
GO
```

3.3 Creating DELMIA Apriso Database on Oracle

The procedure of setting up the DELMIA Apriso Database in the Oracle environment consists of the following tasks:

1. Installation of the Oracle server and creation of an instance. Refer to 3.3.1 Installing the Oracle Server and Creating a Database Instance .
2. Creation of a tablespace for DELMIA Apriso data. Refer to 3.3.2 Configuring the Storage Parameters for DELMIA Apriso DB.
3. Creation of a schema owner. Refer to 3.3.3 Creating a Schema Owner.
4. Import of the DELMIA Apriso and Localization Repository databases. Refer to 3.3.4 Import of DELMIA Apriso Data.
5. Test if the machine where the Oracle server is installed can communicate with the machine where the DELMIA Apriso Server will be installed (not needed if both servers are installed on the same machine).
6. Installation of the Oracle Client on the Application Server (not needed if the Oracle server and the DELMIA Apriso Server are installed on the same machine). Refer to 3.6 Installing the Oracle Client on the Application Server.

> The instructions below are just an example of a system configuration and may be valid for test server installations, but this is not recommended for production server installations, which should be done by an experienced database administrator.

3.3.1 Installing the Oracle Server and Creating a Database Instance

The instructions in this chapter do not contain all the screens that appear during the installation but only the most important ones in order to provide a clear view of the Oracle configuration recommended for DELMIA Apriso.

While creating a database instance, take note of the exact name you are assigning to it, as this name will need to be provided during the DELMIA Apriso database installation.

The required server settings are:

- Character Set “AL32UTF8”
- National Character Set “AL16UTF16”
- A general recommendation is to let the Oracle installer detect the database server configuration and use its own rules to determine optimal settings
- Oracle XML DB component
- Oracle Application Express DB component

It is also recommended to **not** install these Oracle facilities:

- OLAP
- Oracle Text
- JVM

> The following scenario is valid for supported versions: Oracle Database 12c R2 and Oracle Database 19c. The screenshots present Oracle 19c.

To install the Oracle server and create a database instance, follow the steps below:

1. Run the installer.
2. Select **Create and configure a single instance database** option and click **Next**.
3. Select the **Server Class** option and click **Next**.
4. Select the installation type and click **Next**.

   > The subsequent steps describe the advanced installation.

6. Select a database edition to install (Standard or Enterprise Edition).

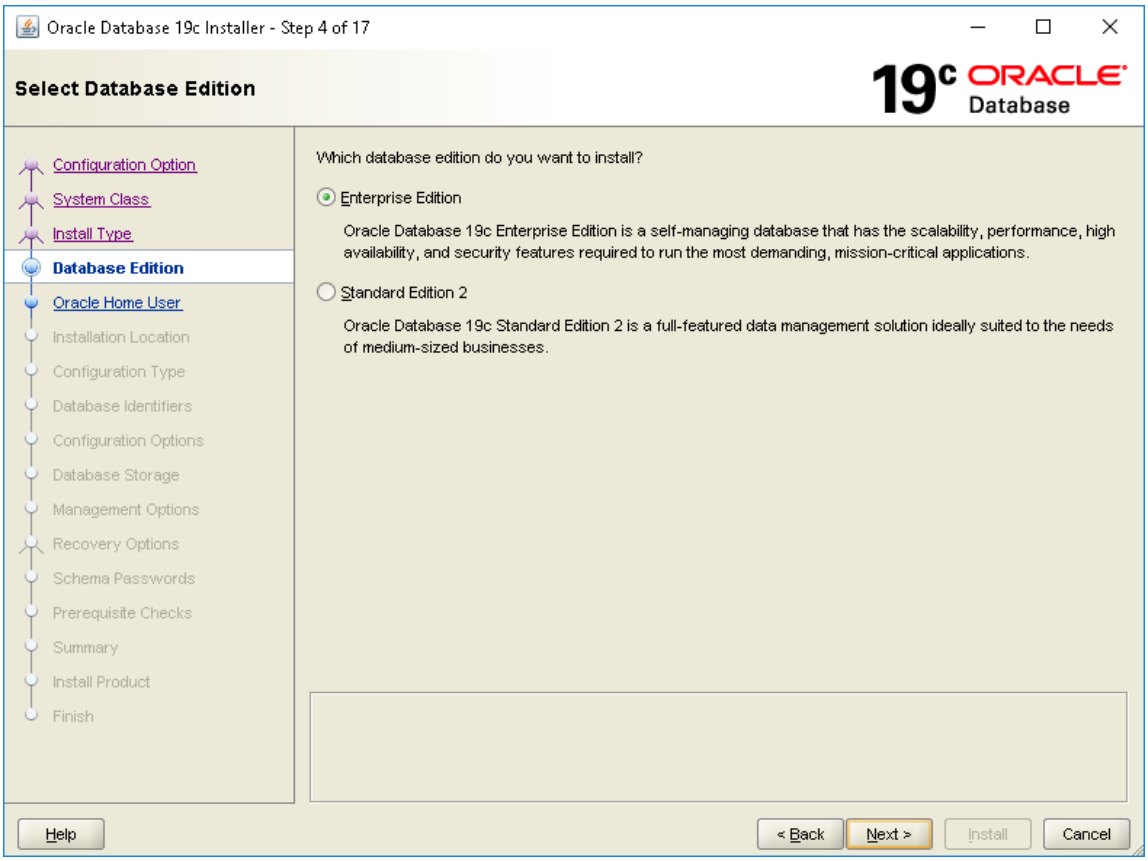

Figure 5 Selecting a type for the database installation

> The subsequent steps describe the installation of the Enterprise Edition.

7. Select the Oracle Home User and click **Next**.
8. Provide the locations for the Oracle Base Directory and for the Oracle Home Directory. Click **Next**.
9. Select the **GeneralPurpose / Transaction Processing** database type and click **Next**.

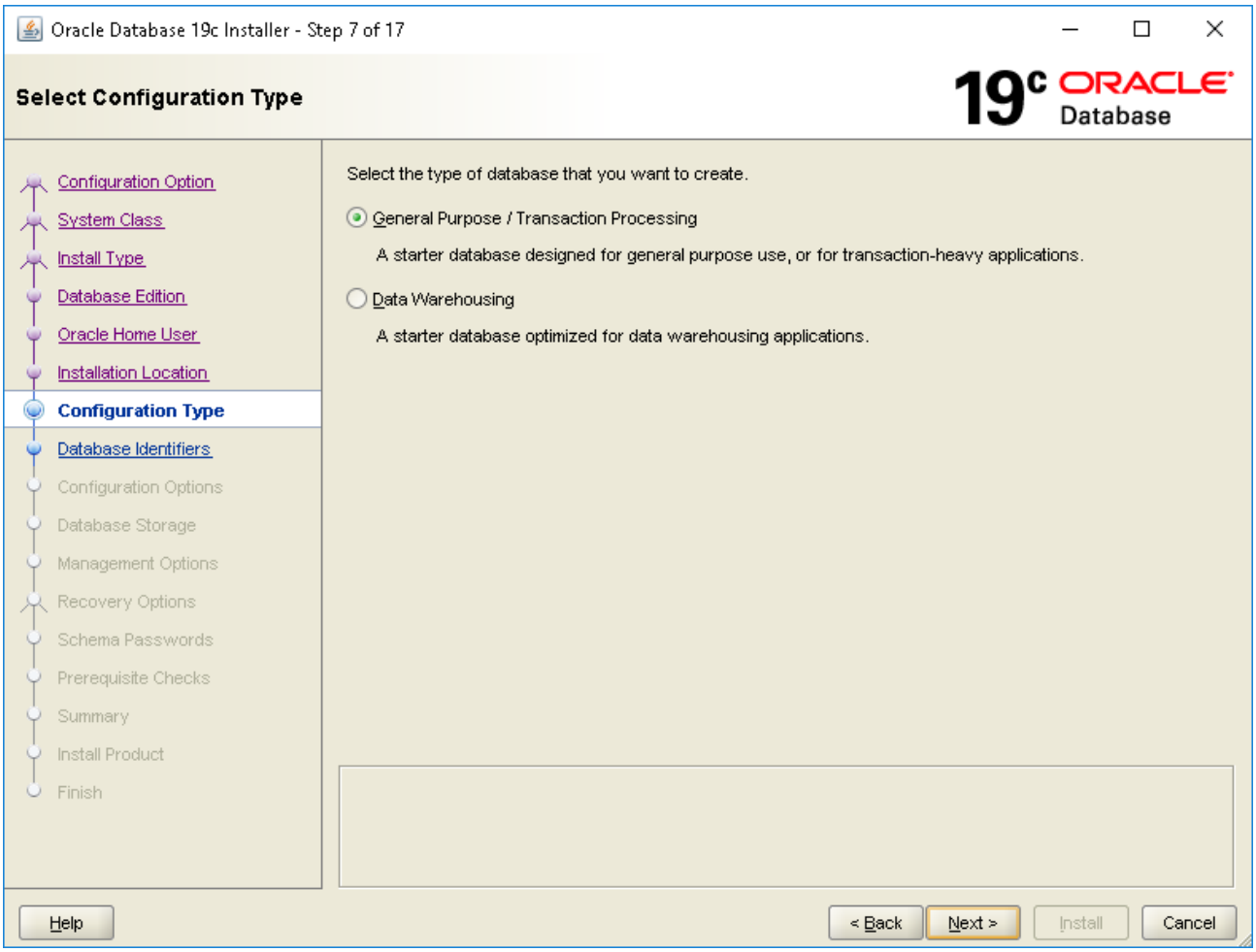

Figure 6 Selecting the configuration type

10. Provide the **Global Database Name** and **Oracle Service Identifier**. Consider creating database in the CDB (multitenant container database) architecture. Click **Next**.

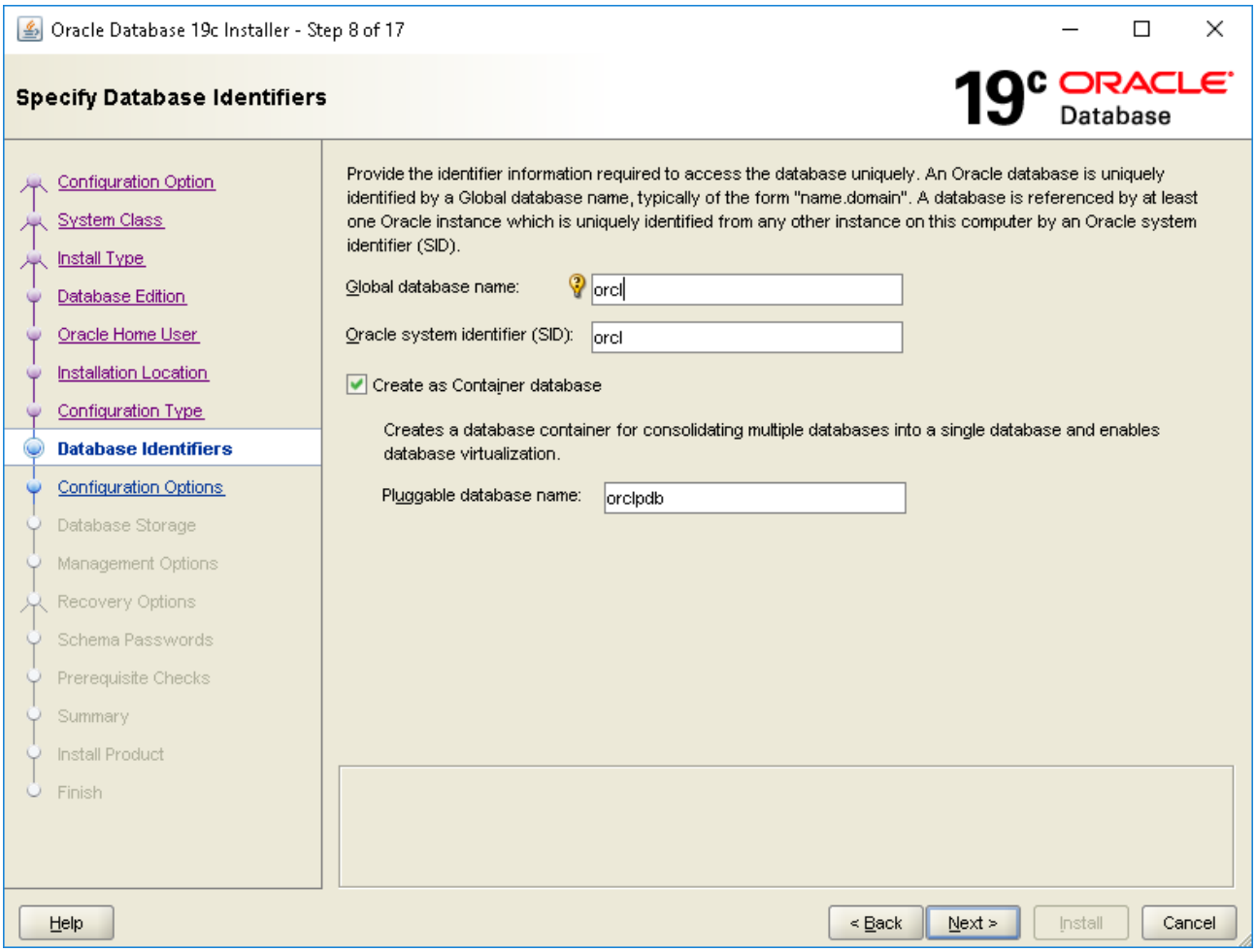

Figure 7 Providing database identifiers

11. Set the Percentage to the proper value depending on the database server configuration. Follow these simple rules to determine the optimal percentage:
    a. If the database is running on a dedicated server that is different than the application server (as recommended), leave at least 1 GB for Windows OS and allocate all the remaining memory for the Oracle DBMS. The more memory allocated for the DB cache and sort areas, the better the DB performance, providing that other processes on the server do not start swapping. See an example in the figure below.
    b. If the database and the DELMIA Apriso application are running on the same server (which is **not** recommended), leave at least 1 GB for the OS, at least 2 GB for the DELMIA Apriso Application Services and IIS and allocate all the remaining memory for the Oracle DBMS.

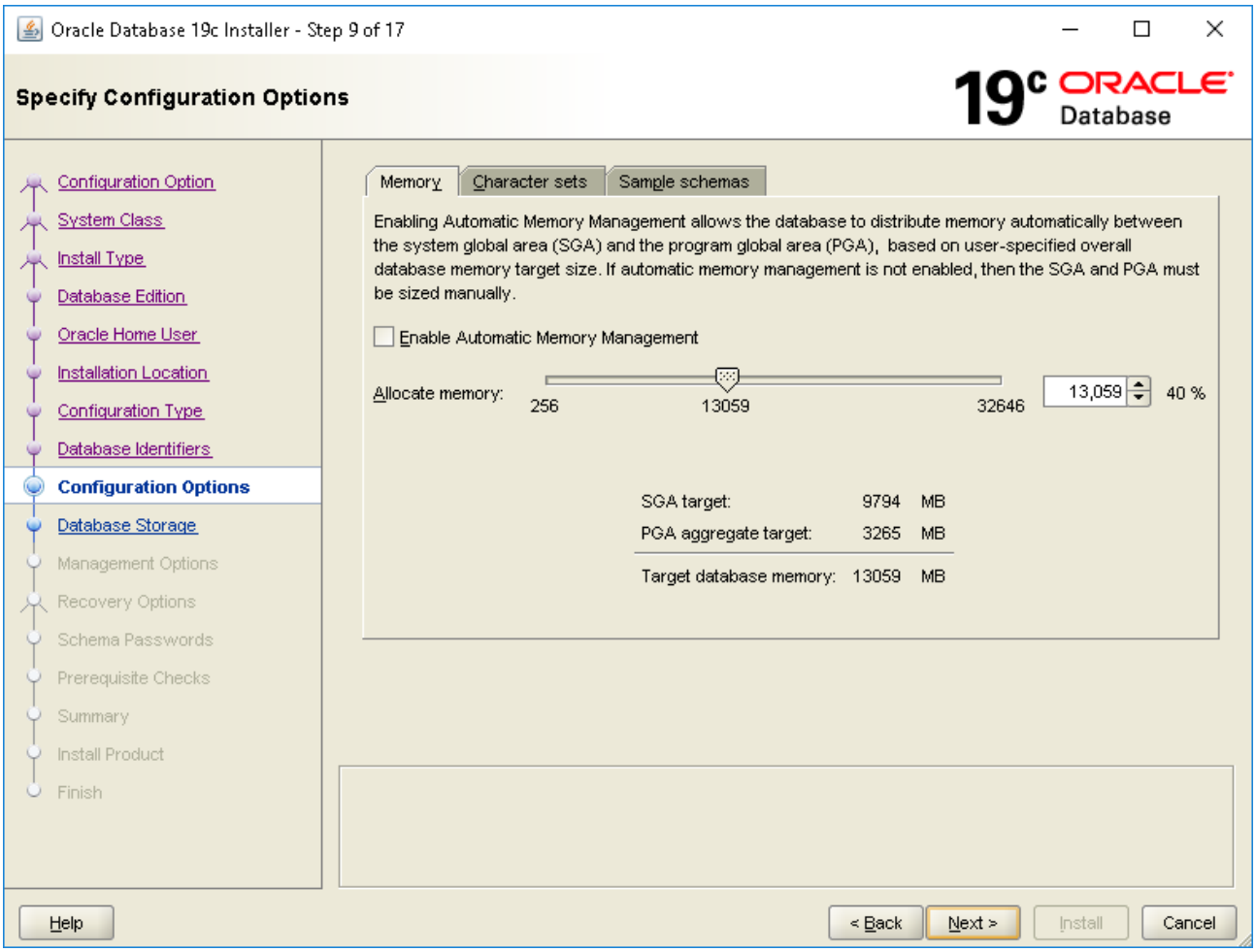

Figure 8 Configuring memory options

12. Switch to the **Character sets** tab and set the values as presented in the figure below. DELMIA Apriso uses the AL32UTF8 character set to store its data, as this character set supports all of the DELMIA Apriso-supported language sets.

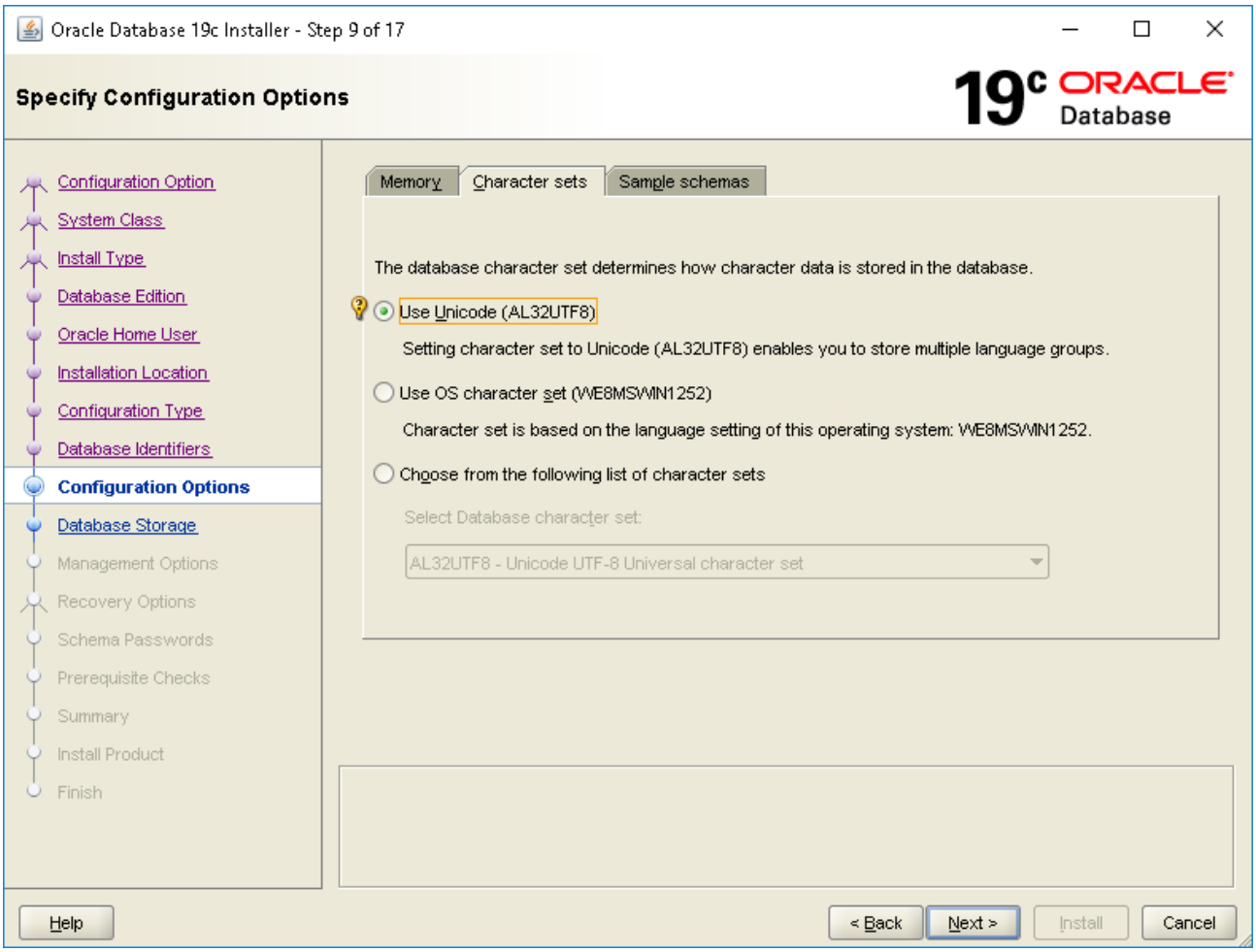

Figure 9 Configuring character sets

13. Provide the location for the Oracle files and click **Next** (use a large and fast disk). Oracle redo logs, control files, undo, and temp tablespaces will be created there. It is possible to move some files to different locations later.
    Automatic Storage Management (ASM) is recommended by the Oracle Corporation for the best performance. It has internal Oracle settings, and DELMIA Apriso works properly in any configuration.

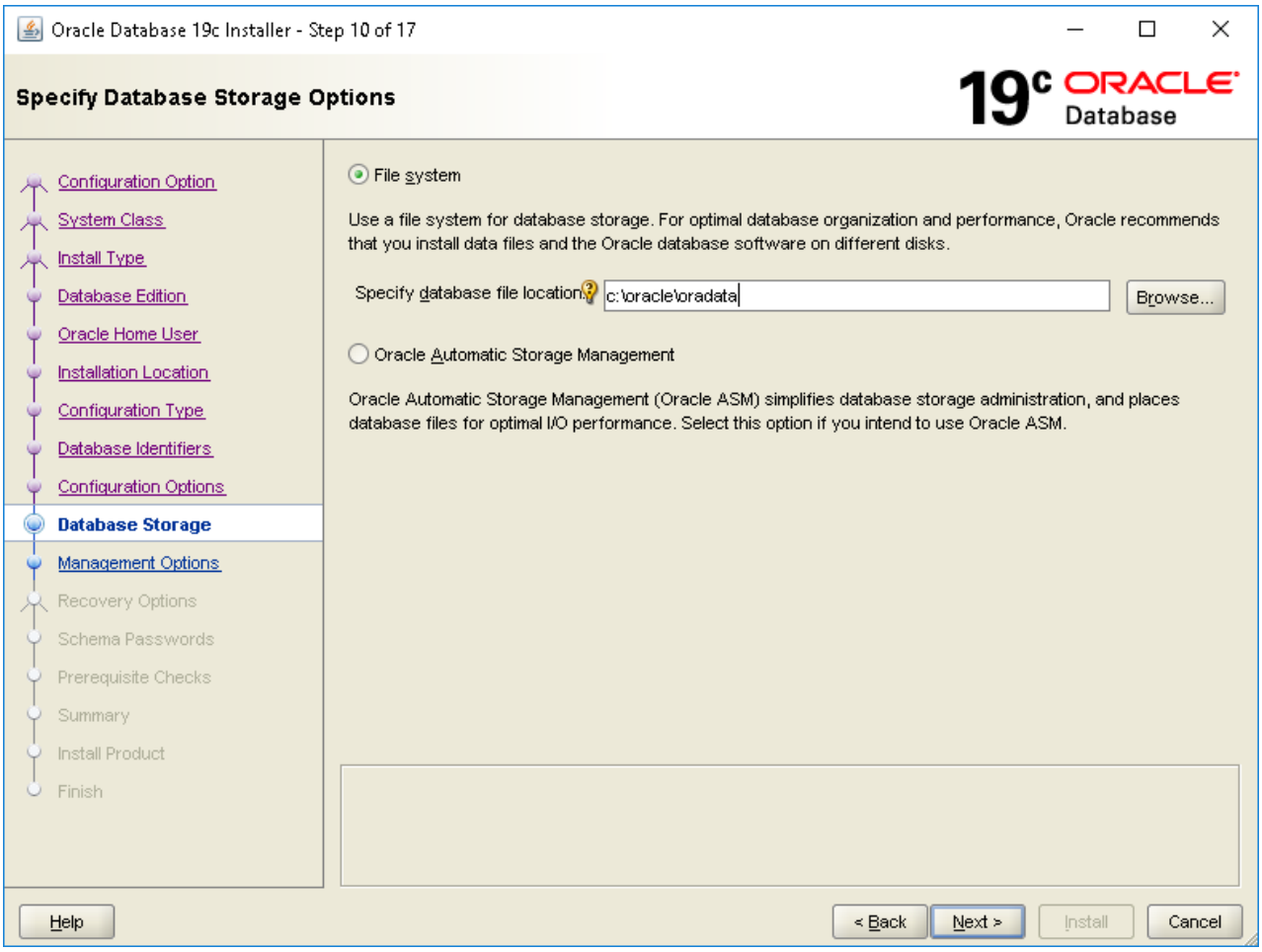

Figure 10 Selecting storage

> The subsequent steps describe installation using the file system storage. If another storage mechanism is selected (“ASM” or “Raw Devices”), several installation steps will look slightly different, but this has no impact on the DELMIA Apriso application. All the settings that are important for DELMIA Apriso are the same.

14. Decide if you want to enable automated backups and click **Next**. The Recovery Area is the folder where Oracle 12 c keeps its backups, logs etc. The Oracle wizard is not aware of the future DELMIA Apriso DB size. Use a large disk to be able to extend this folder to at least 25GB (the more space, the better). There is no need to create a Recovery Area on the fastest disk. Keep this disk for DELMIA Apriso data and index tablespaces.
15. Provide passwords for the system accounts and click **Next**.
    For security reasons, it is strongly recommended to not use well-known passwords, such as “oracle,” “manager,” or “change_on_install.”

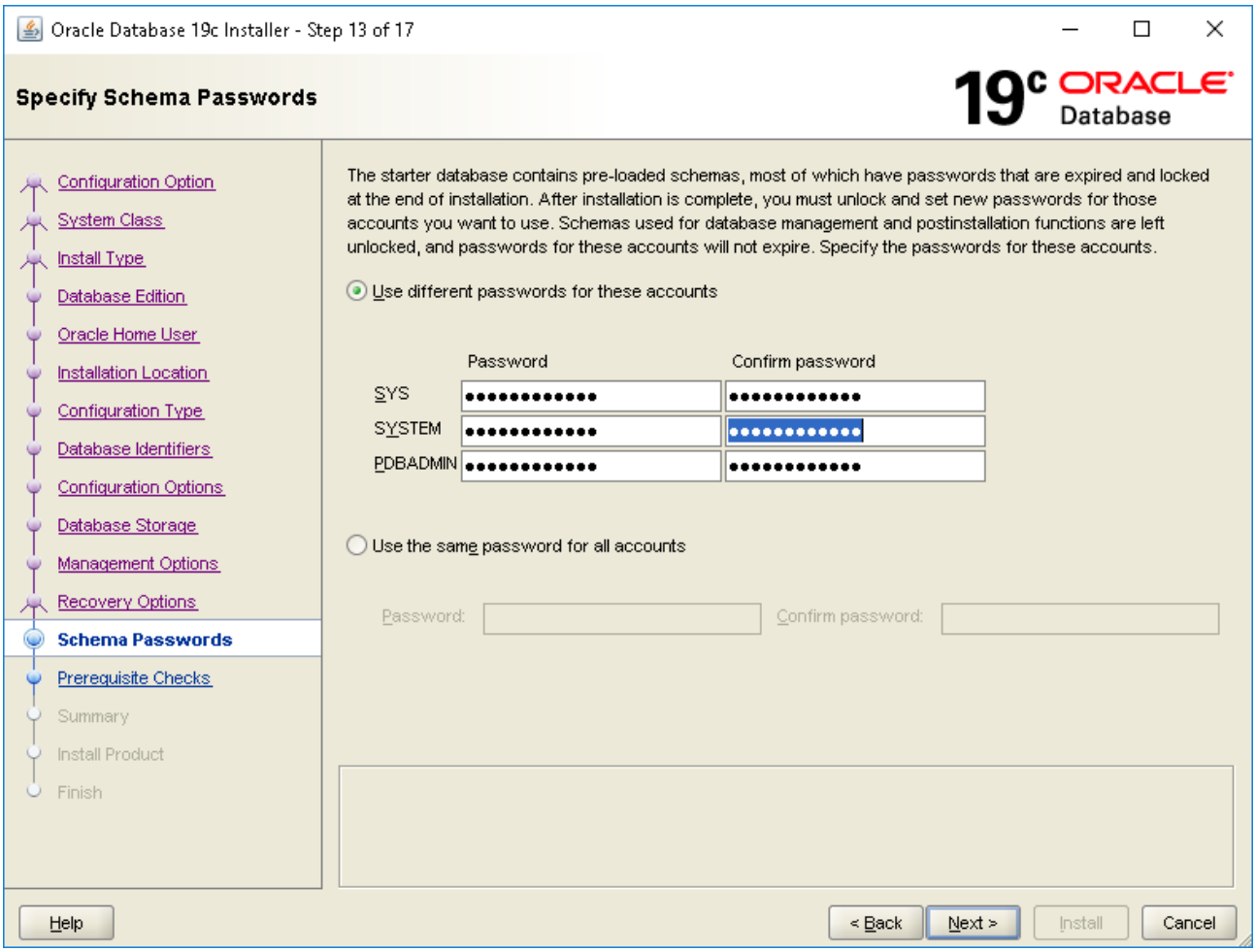

Figure 11 Specifying schema passwords

16. The installer will perform prerequisite checks. After that, a window that summarizes the choices that have been made will appear. Review the displayed settings. Check if the parameters were set correctly. If necessary, go back and fix any parameter that was not set according to the instructions. Review the location of the database files. For example, if all the copies of the control files are in the same folder, move each file to a separate location. If the Oracle disks are not mirrored, create a redundant redo log file in each group on a separate disk. The file locations can be edited directly in this window. For more guidelines, see Oracle Database Administrator's Guide and Oracle Database Concepts manual. When ready, click **Install**. The database creation process will start. This will take several minutes and, when the process is completed successfully, a confirmation screen will be displayed.

3.3.2 Configuring the Storage Parameters for DELMIA Apriso DB

Create a new tablespace for the DELMIA Apriso data in a new datafile. The Localization Repository (if applicable) database can be put in the same tablespace because it is small and relatively rarely used.

If the storage mechanism is a file system, the tablespace can be created with an SQL command such as the one below:

```
CREATE TABLESPACE flexnet
DATAFILE 'e.g. D:\OraData\flexnet.dbf' SIZE 2048M AUTOEXTEND ON
EXTENT MANAGEMENT LOCAL AUTOALLOCATE
SEGMENT SPACE MANAGEMENT AUTO;
```

If the storage mechanism is ASM or Raw Device, the second line (DATAFILE…) must be skipped.

This command creates a new tablespace in a specified path. Dassault Systèmes recommends using the AUTOALLOCATE and SEG. MANAGEMENT AUTO options, as shown in the example above. SIZE and AUTOEXTEND ON/OFF depends on the local installation.

The parameters are explained in detail below:

TABLESPACE NAME – the name of the storage location where the actual data underlying the database objects can be kept. The recommended name is “flexnet”, but any name can be used provided that the command used to import the DELMIA Apriso data (see 3.3.4 Import of DELMIA Apriso Data) contains the REMAP_TABLESPACE parameter as in the example below:

```
impdp SYSTEM/[password] SCHEMAS=FLX21M REMAP_SCHEMA=FLX21M:FLXUSER REMAP_TABLESPACE
FLEXNET:<<new tablespace name>> DUMPFILE=FLX21M.dmp
```

DATAFILE with PATH – use a disk capable of storing a DELMIA Apriso datafile. Remember that the file can increase significantly. Remember also that the Apriso logs (default: `C:\TEMP\AprisoLogs`) can allocate disk space very quickly.

SIZE – to be able to import at least 512MB is necessary, but a reasonable value for the production database is at least 2GB (or even more, depending on the implementation).

AUTOEXTEND – if the option is set to ON, the DB requires less attention, but free disk space can still be a limitation.

EXTENT MANAGEMENT LOCAL AUTOALLOCATE – this option lets Oracle manage space more efficiently. The first extent for each table will be 64KB and, for most DELMIA Apriso tables, this is enough. If some tables grow, the next extents will be increased to prevent DB fragmentation. The UNIFORM option would allow easy de-allocation and efficient reuse of released segments, but the constant extent size of 1MB would cause the allocation of more than 1GB to start, even if there is no data in most of the tables. That is why Dassault Systèmes’ suggestion is AUTOALLOCATE, but if there is enough space, DELMIA Apriso will also work properly with UNIFORM EXTENT MANAGEMENT.

SEGMENT SPACE MANAGEMENT AUTO – strongly recommended by Oracle because of its good performance and easy administration (although the default option in 9i is still MANUAL).

If the SYSTEM tablespace is DICTIONARY MANAGED, it is possible to create a tablespace for DELMIA Apriso data with the following parameters:

```
CREATE TABLESPACE flexnet DATAFILE 'e.g. D:\OraData\flexnet.dbf'
SIZE 2048M AUTOEXTEND ON
DEFAULT STORAGE (INITIAL 50K NEXT 512KREMAP_SCHEMA=FLX21M
```

```
ALTER DATABASE DATAFILE 'D:\OraData\flexnet.dbf' RESIZE 4096M;
```

The best DBA practice is to create a separate tablespace for all of the indexes and to put it on a separate disk. Use the same storage options as for the data tablespace, but the size can be 30-60% of that of the data tablespace. The index can be moved to another tablespace with the following command:

```
ALTER INDEX idx_name REBUILD TABLESPACE idx_tablespace_name;
```

For the best storage management, create three different tablespaces with the option EXTENT MANAGEMENT LOCAL UNIFORM SIZE …M. The best SIZE for the smallest tables is 64K, for medium/large tables 1M, and for the largest tables 8M. Estimate the tables' sizes (this always depends on the customer's configuration), and put the tables into the proper tablespaces. It is possible to move the tables between the tablespaces later, in production (i.e., stop DELMIA Apriso, export the table data, drop the table and create it in another tablespace, then import the data). A table can be moved with all of its data to another tablespace with the following command:

```
ALTER TABLE table_name MOVE TABLESPACE target_tablespace_name
```

3.3.3 Creating a Schema Owner

The following Oracle user for the DELMIA Apriso database needs to be created:

- *flxuser*[1] (cannot exceed 19 characters)

The DELMIA Apriso user must have the following Oracle privileges granted:

- CONNECT
- RESOURCE
- CREATE TABLE
- CREATE LIBRARY
- CREATE VIEW
- CREATE TYPE
- CREATE ANY CONTEXT
- SELECT ANY DICTIONARY

[1]The default names "flxuser" and "lruser" (for the optional Localization Repository database) will be used as an example throughout this document. You can pick any name provided that its length does not exceed 19 characters.

The CREATE TABLE and CREATE LIBRARY system privileges must be granted directly to the user, even if the user has the roles granted that contain these privileges!

The Localization Repository database user needs only CONNECT and RESOURCE. The Database Upgrader does not connect to the framework database, so neither CREATE TABLE nor CREATE LIBRARY nor CREATE VIEW are necessary.

The `INSTALL_Create_FLXUSER.sql` and `INSTALL_Create_LRUSER.sql` scripts are example SQL commands that create users and grant the appropriate privileges:

```
CREATE USER flxuser IDENTIFIED BY YourPassword
DEFAULT TABLESPACE flexnet
TEMPORARY TABLESPACE temp;
GRANT CONNECT, RESOURCE TO flxuser;
GRANT CREATE TABLE, CREATE LIBRARY, CREATE VIEW, CREATE ANY CONTEXT, CREATE TYPE, SELECT
ANY DICTIONARY TO flxuser;
```

```
CREATE USER lruser IDENTIFIED BY YourPassword
DEFAULT TABLESPACE flexnet
TEMPORARY TABLESPACE temp;
GRANT CONNECT, RESOURCE TO lruser;
GRANT SELECT ANY DICTIONARY TO lruser;
```

Replace the text in red with your password.

Set the users' passwords according to your company policy! Do not leave the default password.

3.3.4 Import of DELMIA Apriso Data

The following database backup files are in the `Databases\` folder (of the DELMIA Apriso 2021 installation folder):

- `Apriso\Oracle\FLX21M.dmp` (DELMIA Apriso database)
- `Localization Repository\Oracle\LR21M.dmp` (Localization Repository[1] database)

The DELMIA Apriso database needs to be imported as a DELMIA Apriso user (default: "flxuser") and the Localization Repository database (optional) as a Localization Repository database user (default: "lruser").

It is recommended to start the file import on the database server, in order to avoid potential problems with the Oracle client configuration (e.g., the most frequent problem is the character set or the Oracle client version). If one ORACLE_HOME exists on the server, the easiest way to import is to:

[1]The Localization Repository database was formerly called the Framework database. Currently the database only contains localization data and it is no longer required.

1. Copy the database dump files to a temporary folder on the database server.
2. Start the Windows command line.
3. Copy the dump file to the data pump directory. You can get the directory by executing the following query (on sys account):

```
SELECT DIRECTORY_PATH FROM ALL_DIRECTORIES WHERE DIRECTORY_NAME ='DATA_PUMP_DIR';
```

4. Run `IMPDP.exe` with the appropriate parameters.

The sections below describe example procedures for having the databases imported.

DELMIA Apriso Database (required)

This is the primary database containing all of the operational data required to run DELMIA Apriso.

To import the database, use the following command:

```
impdp SYSTEM/[password] SCHEMAS=FLX21M REMAP_SCHEMA=FLX21M:FLXUSER DUMPFILE=FLX21M.dmp
transform=OID:n:type exclude=statistics
```

In the example, the **IMPDP** utility connects as a **system** user to the Oracle database, but the tables are created in the *flxuser* schema (the target schema is determined by the **REMAP_SCHEMA** parameter).

The `SCHEMAS=FLX21M`, `REMAP_SCHEMA=FLX21M:FLXUSER` parameters are obligatory, because the **FLX21M** user name is hardcoded in the export file.

`<DBconn>` must be a valid a connection string (the service name must be defined in the `tnsnames.ora` file on the DELMIA Apriso Application Server).

Because the statistics were excluded from the DELMIA Apriso database import, you need to generate them using the following query (make sure you are using a sys account):

```
SET SERVEROUTPUT ON SIZE unlimited
WHENEVER SQLERROR EXIT FAILURE
DECLARE I_SCHEMANAME VARCHAR2(19):= '&1';
BEGIN
                dbms_output.put_line('dbms_stats.gather_schema_stats(' || I_SCHEMANAME ||
')');
                dbms_stats.gather_schema_stats(I_SCHEMANAME);
END;
/
EXIT
```

When asked to provide a value for **I_SCHEMANAME**, give the same value you provided as your **FLXUSER** in the **REMAP_SCHEMA** parameter above.

Be aware that generating statistics can take a long time (in some cases, upwards of 30 minutes).

Localization Repository Database (Optional)

The Localization Repository database needs to be created **if you want to be able to manage the localization process** (refer to the Process of Translation Implementation Guide). You can use the DELMIA Apriso database as a literal provider if you decide not to create a Localization Repository database (to be configured in the Configuration Manager after the installation) for the DELMIA Apriso runtime to function.

To import the database, use the following command:

```
impdp SYSTEM/[password] SCHEMAS=LR21M REMAP_SCHEMA=LR21M:LRUSER DUMPFILE=LR21M.dmp
```

The parameter explanations are the same as for the DELMIA Apriso database above.

If there are more ORACLE_HOMEs, be sure that the proper IMPDP.EXE is started (use the full path).

After importing the DELMIA Apriso database, check if all of the procedures, functions, packages, triggers, and views are compiled. Use **Toad** or any other Oracle client tools, or use this query (run as the DELMIA Apriso schema owner):

```
SELECT * FROM user_objects WHERE status <> 'VALID';
```

If there are any decompiled objects, compile them and check the object status again. Repeat the compiling until all of the objects are in the VALID status.

3.3.5 Database User Configuration

Granting Access to System Views on Oracle

On Oracle 12c R2 and higher, access to system views has to be granted manually.

In version 12.2, the user is only granted the READ privilege. The SYS user grants the SELECT privilege on system views to the current user with a GRANT. This can be done using the following script:

```
grant select on SYS.USER_CONS_COLUMNS to DATABASE_USER with grant option;
grant select on SYS.ALL_CONSTRAINTS to DATABASE_USER with grant option;
grant select on SYS.ALL_CONS_COLUMNS to DATABASE_USER with grant option;
grant select on SYS.ALL_COL_COMMENTS to DATABASE_USER with grant option;
grant select on SYS.ALL_TAB_COLUMNS TO DATABASE_USER with grant option;
grant select on SYS.ALL_ARGUMENTS to DATABASE_USER with grant option;
grant select on SYS.ALL_OBJECTS to DATABASE_USER with grant option;
grant select on SYS.ALL_PROCEDURES to DATABASE_USER with grant option;
grant select on SYS.ALL_TABLES to DATABASE_USER with grant option;
```

```
grant select on SYS.ALL_TAB_COLS to DATABASE_USER with grant option;
grant select on SYS.ALL_TAB_COMMENTS to DATABASE_USER with grant option;
grant select on SYS.ALL_INDEXES to DATABASE_USER with grant option;
grant select on SYS.ALL_VIEWS to DATABASE_USER with grant option;
grant select on SYS.PUBLIC_DEPENDENCY to DATABASE_USER with grant option;
grant select on SYS.ALL_SEQUENCES to DATABASE_USER with grant option;
```

Creating Database Users

> The database Schema Name is needed to create database users. The Schema name is equal to Admin database user name.

The following users can be distinguished in DELMIA Apriso for Oracle with regard to their rights:

- APP_READER_*flxuser* – a user with read-only rights
- APP_WRITER_*flxuser* – a user with read and write rights

> Please note that neither APP_READER_*flxuser* nor APP_WRITER_*flxuser* are able to interfere in the database structure.

To create the required users, please use the `INSTALL_Create_APP_READER_AND_APP_WRITER.sql` script and replace the text in red with your password:

```
DECLARE V_USERNAME VARCHAR2(30);
        I_SCHEMANAME VARCHAR2(19):= 'flxuser';
        V_ROWCOUNT number;
        v_statement VARCHAR2(2000);
  BEGIN

    DBMS_OUTPUT.PUT_LINE('Start Creating Application users.');
    -- Aplication Reader
    DBMS_OUTPUT.PUT_LINE('Start Creating App_reader');
    V_USERNAME := 'APP_READER_' || I_SCHEMANAME;

    v_rowcount := 0;
    SELECT COUNT(*) INTO v_rowcount FROM ALL_USERS WHERE USERNAME = V_USERNAME;
    IF v_rowcount = 0 THEN
        v_statement :='CREATE USER ' || V_USERNAME
                        || ' IDENTIFIED BY YourPassword '
                        || 'DEFAULT TABLESPACE FLEXNET '
                        || ' TEMPORARY TABLESPACE TEMP '
                        || 'PROFILE DEFAULT '
                        || 'ACCOUNT UNLOCK ';
        EXECUTE IMMEDIATE V_STATEMENT;
    ELSE
        DBMS_OUTPUT.PUT_LINE('User already exists: '||V_USERNAME||'...');
    END IF;
        v_statement :='GRANT CONNECT TO ' || V_USERNAME;
        EXECUTE IMMEDIATE v_statement;
        v_statement :='ALTER USER ' || V_USERNAME  ||' DEFAULT ROLE ALL';
        EXECUTE IMMEDIATE V_STATEMENT;

      v_statement:='CREATE OR REPLACE TRIGGER ' || v_UserName ||'.after_logon_trg
                    AFTER LOGON ON ' || v_UserName ||'.SCHEMA
                    BEGIN
                    DBMS_APPLICATION_INFO.set_module(USER, ''Initialized'');
                    EXECUTE IMMEDIATE ''ALTER SESSION SET current_schema=' || i_SchemaName
|| ''';
                    END;';
          EXECUTE IMMEDIATE V_STATEMENT;

    DBMS_OUTPUT.PUT_LINE('Finished Creating App_reader');

    -- Aplication Writer
    DBMS_OUTPUT.PUT_LINE('Start Creating App_writer');
    V_USERNAME := 'APP_WRITER_' || I_SCHEMANAME;

    v_rowcount := 0;
    SELECT COUNT(*) INTO v_rowcount FROM ALL_USERS WHERE USERNAME = V_USERNAME;

    IF v_rowcount = 0 THEN
        v_statement :='CREATE USER ' || V_USERNAME
                        || ' IDENTIFIED BY YourPassword '
                        || 'DEFAULT TABLESPACE FLEXNET '
                        || ' TEMPORARY TABLESPACE TEMP '
```

```
                        || 'PROFILE DEFAULT '
                        || 'ACCOUNT UNLOCK ';
        EXECUTE IMMEDIATE V_STATEMENT;
    ELSE
        DBMS_OUTPUT.PUT_LINE('User already exists: '||V_USERNAME||'...');
    END IF;
        v_statement :='GRANT CONNECT TO ' || V_USERNAME;
        EXECUTE IMMEDIATE v_statement;
        v_statement :='ALTER USER ' || V_USERNAME  ||' DEFAULT ROLE ALL';
        EXECUTE IMMEDIATE V_STATEMENT;

      v_statement:='CREATE OR REPLACE TRIGGER ' || v_UserName ||'.after_logon_trg
                    AFTER LOGON ON ' || v_UserName ||'.SCHEMA
                    BEGIN
                    DBMS_APPLICATION_INFO.set_module(USER, ''Initialized'');
                    EXECUTE IMMEDIATE ''ALTER SESSION SET current_schema=' || i_SchemaName
|| ''';
                    END;';
           EXECUTE IMMEDIATE V_STATEMENT;
    COMMIT;
    DBMS_OUTPUT.PUT_LINE('Finished Creating App_writer');

    DBMS_OUTPUT.PUT_LINE('Finished Creating Application users.');

  END;
/
```

Configuring Database Users

In order to grant the rights for APP_READER, please log in as *flxuser*, and use the `INSTALL_Grant_APP_READER_PRIVILEGES.sql` script:

```
----- GRANT EXECUTE PACKAGES ----
DECLARE
   v_procedure VARCHAR2(1000);
BEGIN
   FOR i IN (Select DISTINCT OBJECT_NAME from USER_Procedures where OBJECT_TYPE =
'PACKAGE')
   LOOP
       v_procedure := 'GRANT EXECUTE ON ' || i.OBJECT_NAME || ' TO APP_READER_' || USER;
       EXECUTE IMMEDIATE v_procedure;
   END LOOP;

   v_procedure:= 'REVOKE EXECUTE ON '|| USER ||'.FLEXNET_ARCHIVE FROM APP_READER_' ||
USER;
   EXECUTE IMMEDIATE v_procedure;
   v_procedure:= 'REVOKE EXECUTE ON '|| USER ||'.FLEXNET_ARCHIVEENGINE FROM APP_READER_'
|| USER;
   EXECUTE IMMEDIATE v_procedure;
v_procedure:= 'GRANT EXECUTE ON CIM_P_CHANGE_FACILITY TO APP_READER_' || USER ;
EXECUTE IMMEDIATE V_PROCEDURE;
v_procedure:= 'GRANT EXECUTE ON CIM_P_CHANGE_PLANT TO APP_READER_' || USER ;
EXECUTE IMMEDIATE V_PROCEDURE;
v_procedure:= 'GRANT EXECUTE ON CIM_P_CHANGE_PLANTANDFACILITY TO APP_READER_' || USER ;
EXECUTE IMMEDIATE V_PROCEDURE;
v_procedure:= 'GRANT EXECUTE ON FLX_SPCOPYLITERALS TO APP_READER_' || USER ;
EXECUTE IMMEDIATE V_PROCEDURE;
v_procedure:= 'GRANT EXECUTE ON FLX_SPRETURNCURRENTUTCTIME TO APP_READER_' || USER ;
EXECUTE IMMEDIATE v_procedure;
   FOR i IN (SELECT OBJECT_NAME FROM USER_PROCEDURES WHERE OBJECT_NAME LIKE 'MPI_%')
   LOOP
       v_procedure := 'GRANT EXECUTE ON ' || i.OBJECT_NAME || ' TO APP_READER_' || USER;
       EXECUTE IMMEDIATE v_procedure;
   END LOOP;
END;
/

----- GRANT SELECT ON TABLES-------
DECLARE
   v_procedure VARCHAR2(1000);
BEGIN
   FOR i IN (Select TABLE_NAME from USER_TABLES)
   LOOP
       v_procedure := 'GRANT SELECT ON "' || i.TABLE_NAME || '" TO APP_READER_' || USER;
       EXECUTE IMMEDIATE v_procedure;
   END LOOP;
END;
/

----- GRANT SELECT ON VIEWS-------
DECLARE
   v_procedure VARCHAR2(1000);
BEGIN
   FOR i IN (Select VIEW_NAME from USER_VIEWS WHERE VIEW_NAME NOT IN ('FLX_USER_ARGUMENTS',
```

```
                                                                'FLX_USER_COL_COMMENTS',
                                                                'FLX_USER_CONSTRAINTS',
                                                                'FLX_USER_OBJECTS',
                                                                'FLX_USER_PROCEDURES',
                                                                'FLX_USER_TABLES',
                                                                'FLX_USER_TAB_COLS',
                                                                'FLX_USER_TAB_COLUMNS',
                                                                'FLX_USER_TAB_COMMENTS',
                                                                'FLX_USER_CONS_COLUMNS',
                                                                'FLX_ALL_OBJECTS',
                                                                'FLX_USER_INDEXES',
                                                                'FLX_USER_VIEWS',
                                                                'FLX_PUBLIC_DEPENDENCY',
                                                                'FLX_USER_SEQUENCES',
                                                                'CIMCOLS',
                                                                'VERD_TABLE_TABLE'
                                                               ))
   LOOP
       v_procedure := 'GRANT SELECT ON ' || i.VIEW_NAME || ' TO APP_READER_' || USER;
       EXECUTE IMMEDIATE v_procedure;
   END LOOP;
END;
/
----- GRANT READ ON VIEWS-------
DECLARE
   v_procedure VARCHAR2(1000);
BEGIN
   FOR i IN (Select VIEW_NAME from USER_VIEWS WHERE VIEW_NAME IN ('FLX_USER_ARGUMENTS',
                                                                'FLX_USER_COL_COMMENTS',
                                                                'FLX_USER_CONSTRAINTS',
                                                                'FLX_USER_OBJECTS',
                                                                'FLX_USER_PROCEDURES',
                                                                'FLX_USER_TABLES',
                                                                'FLX_USER_TAB_COLS',
                                                                'FLX_USER_TAB_COLUMNS',
                                                                'FLX_USER_TAB_COMMENTS',
                                                                'FLX_USER_CONS_COLUMNS',
                                                                'FLX_ALL_OBJECTS',
                                                                'FLX_USER_INDEXES',
                                                                'FLX_USER_VIEWS',
                                                                'FLX_PUBLIC_DEPENDENCY',
                                                                'FLX_USER_SEQUENCES',
                                                                'CIMCOLS',
                                                                'VERD_TABLE_TABLE'
                                                               ))
   LOOP
       v_procedure := 'GRANT READ ON ' || i.VIEW_NAME || ' TO APP_READER_' || USER;
       EXECUTE IMMEDIATE v_procedure;
   END LOOP;
END;
/
----- GRANT EXECUTE ON FUNCTIONS -------
```

```
DECLARE
   v_procedure VARCHAR2(1000);
BEGIN
   FOR i IN (Select OBJECT_NAME from USER_PROCEDURES WHERE OBJECT_TYPE = 'FUNCTION')
   LOOP
       v_procedure := 'GRANT EXECUTE ON ' || i.OBJECT_NAME || ' TO APP_READER_' || USER;
       EXECUTE IMMEDIATE v_procedure;
   END LOOP;
END;
/
----- GRANT EXECUTE ON TYPE -------
DECLARE
   v_procedure VARCHAR2(1000);
BEGIN
   v_procedure := 'GRANT EXECUTE ON TSTRINGTABLE TO APP_READER_' || USER;
   EXECUTE IMMEDIATE v_procedure;

   v_procedure := 'GRANT EXECUTE ON TNUMBERSTABLE TO APP_READER_' || USER;
   EXECUTE IMMEDIATE v_procedure;
END;
/
```

In order to grant the rights for APP_WRITER, please log in as *flxuser*, and use the `INSTALL_Grant_APP_WRITER_PRIVILEGES.sql` script:

```
----- GRANT EXECUTE PACKAGES ----
DECLARE
   v_procedure VARCHAR2(1000);
BEGIN
   FOR i IN (Select DISTINCT OBJECT_NAME from USER_Procedures where OBJECT_TYPE =
'PACKAGE')
   LOOP
       v_procedure := 'GRANT EXECUTE ON ' || i.OBJECT_NAME || ' TO APP_READER_' || USER;
       EXECUTE IMMEDIATE v_procedure;
   END LOOP;

   v_procedure:= 'REVOKE EXECUTE ON '|| USER ||'.FLEXNET_ARCHIVE FROM APP_READER_' ||
USER;
   EXECUTE IMMEDIATE v_procedure;
   v_procedure:= 'REVOKE EXECUTE ON '|| USER ||'.FLEXNET_ARCHIVEENGINE FROM APP_READER_'
|| USER;
EXECUTE IMMEDIATE v_procedure;
v_procedure:= 'GRANT EXECUTE ON CIM_P_CHANGE_FACILITY TO APP_READER_' || USER ;
EXECUTE IMMEDIATE V_PROCEDURE;
v_procedure:= 'GRANT EXECUTE ON CIM_P_CHANGE_PLANT TO APP_READER_' || USER ;
EXECUTE IMMEDIATE V_PROCEDURE;
v_procedure:= 'GRANT EXECUTE ON CIM_P_CHANGE_PLANTANDFACILITY TO APP_READER_' || USER ;
EXECUTE IMMEDIATE V_PROCEDURE;
v_procedure:= 'GRANT EXECUTE ON FLX_SPCOPYLITERALS TO APP_READER_' || USER ;
EXECUTE IMMEDIATE V_PROCEDURE;
v_procedure:= 'GRANT EXECUTE ON FLX_SPRETURNCURRENTUTCTIME TO APP_READER_' || USER ;
EXECUTE IMMEDIATE v_procedure;
   FOR i IN (SELECT OBJECT_NAME FROM USER_PROCEDURES WHERE OBJECT_NAME LIKE 'MPI_%')
   LOOP
       v_procedure := 'GRANT EXECUTE ON ' || i.OBJECT_NAME || ' TO APP_READER_' || USER;
       EXECUTE IMMEDIATE v_procedure;
   END LOOP;
END;
/
----- GRANT SELECT ON TABLES-------
DECLARE
v_procedure VARCHAR2(1000);
BEGIN
FOR i IN (Select TABLE_NAME from USER_TABLES)
LOOP
v_procedure := 'GRANT SELECT ON "' || i.TABLE_NAME || '" TO APP_READER_' || USER;
EXECUTE IMMEDIATE v_procedure;
END LOOP;
END;
/
----- GRANT SELECT ON VIEWS-------
DECLARE
   v_procedure VARCHAR2(1000);
BEGIN
   FOR i IN (Select VIEW_NAME from USER_VIEWS WHERE VIEW_NAME NOT IN ('FLX_USER_ARGUMENTS',
                                                                      'FLX_USER_COL_COMMENTS',
                                                                      'FLX_USER_CONSTRAINTS',
```

```
                                                                'FLX_USER_OBJECTS',
                                                                'FLX_USER_PROCEDURES',
                                                                'FLX_USER_TABLES',
                                                                'FLX_USER_TAB_COLS',
                                                                'FLX_USER_TAB_COLUMNS',
                                                                'FLX_USER_TAB_COMMENTS',
                                                                'FLX_USER_CONS_COLUMNS',
                                                                'FLX_ALL_OBJECTS',
                                                                'FLX_USER_INDEXES',
                                                                'FLX_USER_VIEWS',
                                                                'FLX_PUBLIC_DEPENDENCY',
                                                                'FLX_USER_SEQUENCES',
                                                                'CIMCOLS',
                                                                'VERD_TABLE_TABLE'
                                                               ))
   LOOP
       v_procedure := 'GRANT SELECT ON ' || i.VIEW_NAME || ' TO APP_READER_' || USER;
       EXECUTE IMMEDIATE v_procedure;
   END LOOP;
END;
/

----- GRANT READ ON VIEWS-------
DECLARE
   v_procedure VARCHAR2(1000);
BEGIN
   FOR i IN (Select VIEW_NAME from USER_VIEWS WHERE VIEW_NAME IN ('FLX_USER_ARGUMENTS',
                                                                  'FLX_USER_COL_COMMENTS',
                                                                  'FLX_USER_CONSTRAINTS',
                                                                  'FLX_USER_OBJECTS',
                                                                  'FLX_USER_PROCEDURES',
                                                                  'FLX_USER_TABLES',
                                                                  'FLX_USER_TAB_COLS',
                                                                  'FLX_USER_TAB_COLUMNS',
                                                                  'FLX_USER_TAB_COMMENTS',
                                                                  'FLX_USER_CONS_COLUMNS',
                                                                  'FLX_ALL_OBJECTS',
                                                                  'FLX_USER_INDEXES',
                                                                  'FLX_USER_VIEWS',
                                                                  'FLX_PUBLIC_DEPENDENCY',
                                                                  'FLX_USER_SEQUENCES',
                                                                  'CIMCOLS',
                                                                  'VERD_TABLE_TABLE'
                                                                 ))
   LOOP
       v_procedure := 'GRANT READ ON ' || i.VIEW_NAME || ' TO APP_READER_' || USER;
       EXECUTE IMMEDIATE v_procedure;
   END LOOP;
END;
/

----- GRANT EXECUTE ON FUNCTIONS -------
```

```
DECLARE
   v_procedure VARCHAR2(1000);
BEGIN
   FOR i IN (Select OBJECT_NAME from USER_PROCEDURES WHERE OBJECT_TYPE = 'FUNCTION')
   LOOP
       v_procedure := 'GRANT EXECUTE ON ' || i.OBJECT_NAME || ' TO APP_READER_' || USER;
       EXECUTE IMMEDIATE v_procedure;
   END LOOP;
END;
/

----- GRANT EXECUTE ON TYPE -------
DECLARE
   v_procedure VARCHAR2(1000);
BEGIN
   v_procedure := 'GRANT EXECUTE ON TSTRINGTABLE TO APP_READER_' || USER;
   EXECUTE IMMEDIATE v_procedure;

   v_procedure := 'GRANT EXECUTE ON TNUMBERSTABLE TO APP_READER_' || USER;
   EXECUTE IMMEDIATE v_procedure;
END;
/
```

3.3.6 Setting the Number of Simultaneous Processes

In order to make sure that the database supports scenarios with large number of processes (like the DELMIA Apriso upgrade), using SQLPLUS is recommended for setting the processes parameter value to 1000.

To check how many processes are currently set, please enter the following command:

```
show parameter processes
```

To modify the value of the parameter:

```
alter system set processes=1000 scope=spfile;
```

To restart the instance:

```
Startup Force;
```

3.4 Post-Install Data Configuration

3.4.1 Changing the Facility Number after the Installation

This step is optional and depends on the implementation strategy (the basic guidelines are described in 3.1 DELMIA Apriso Data Categories).

One of the possible strategies (recommended only for Dassault Systèmes staff) is to install a fresh DB with the DEMO data and replace the name of the sample Facility “C1P1” with the customer’s plant name. The DELMIA Apriso database contains this Stored Procedure:

```
FlexnetPending_ChangePlantAndFacility
```

This takes two parameters – the “from” and the “to” plant numbers – and performs all that is necessary to modify the plant numbers in the database. The default Facility name in the DEMO data is “C1P1.” The new name can consist of a maximum of four characters.

On an SQL Server database run in Query analyzer:

```
exec FlexnetPending_ChangePlantAndFacility ‘C1P1’, ‘<newName>’
```

On an Oracle database execute as a script:

```
exec FLEXNET_PENDING. ChangePlantAndFacility( N‘C1P1’, N‘<newName>’ )
```

3.4.2 Setting Sequences

In DELMIA Apriso, all of the database sequences should generate IDs starting from 100000000, because the 1–100000000 range is dedicated only for:

- Model data (demos, test data, etc.) delivered by Dassault Systèmes with a fresh database
- Processes/operations defined in a Center of Operational Excellence

In most DELMIA Apriso implementations, the sequences are set to 100 000 000. To achieve this, run a Stored Procedure:

- For an SQL Server: **FlexNetAdmin_ReseedIdentities** with the parameter “1”
- For Oracle: **FlexNet_Admin.ReseedIdentities** with the parameter “TRUE”

Please note that the **ReseedIdentities** Stored Procedure sets only technical IDs (set by the database sequences and triggers). User visible IDs from a SEQUENCE_table (e.g., SerialNo, LotNo, OrderNo) are not set. They should always start from “1”, because all of the tables that use the DELMIA Apriso SEQUENCE_ table are not a part of the model data.

3.4.3 Creating an Audit Context for the 21 CFR Part 11 Functionality (Oracle database only)

After the database schema import, an audit context has to be created by issuing the following script while logged in as the DELMIA Apriso user (default: “flxuser”):

```
BEGIN
    EXECUTE IMMEDIATE 'CREATE OR REPLACE CONTEXT '||USER||'_AUDIT using FLEXNET_AUDIT
ACCESSED GLOBALLY';
END;
```

3.5 Installing Oracle Prerequisites on the Application Server

> The DELMIA Apriso Application SERVER is a CLIENT to the database server. The DELMIA Apriso CLIENT (i.e., a work station with a browser) **never** connects to the database, so the DELMIA Apriso Client is **not** the same as the DB client!

Below are the components that must be installed on every computer connecting to a database as the DELMIA Apriso server The installation instructions provided in this chapter will result in the versions of the components (in parentheses).

Oracle Database Client 19c with:

- ODBC Driver (19.0.0.0.0)
- Oracle Data Provider for .NET (19.0.0.0.0)
- Oracle Provider for OLE DB (19.0.0.0.0)

All of the previous versions of the Oracle Database Client and Oracle Data Access Components should be uninstalled. After the installation has finished, all of the assemblies listed below have to be manually removed from GAC when their version number is lower than 4.122:

- `Oracle.DataAccess.dll`
- `Policy.9.2.Oracle.DataAccess.dll`
- `Policy.10.1.Oracle.DataAccess.dll`
- `Policy.10.2.Oracle.DataAccess.dll`
- `Policy.1.102.Oracle.DataAccess.dll`
- `Policy.2.102.Oracle.DataAccess.dll`

If for some reason multiple versions of the Oracle Data Provider are needed on the DELMIA Apriso Server, the following section should be added to all of the DELMIA Apriso `.config` files for DELMIA Apriso to run on an environment with multiple Oracle Client versions:

```
<runtime>
   <assemblyBinding xmlns="urn:schemas-microsoft-com:asm.v1">
      <qualifyAssembly partialName="Oracle.ManagedDataAccess"
fullName="Oracle.ManagedDataAccess, Version=4.122.19.1, Culture=neutral,
PublicKeyToken=89b483f429c47342" />
   </assemblyBinding>
</runtime>
```

3.6 Installing the Oracle Client on the Application Server

> Patch that is required to be installed on the server is required to be installed on the Oracle Client.

To install the Oracle Client:

1. Start the **Oracle Database Client 19c Installer**.
2. On the **Select Installation Type** screen, select **Runtime** and click **Next**.

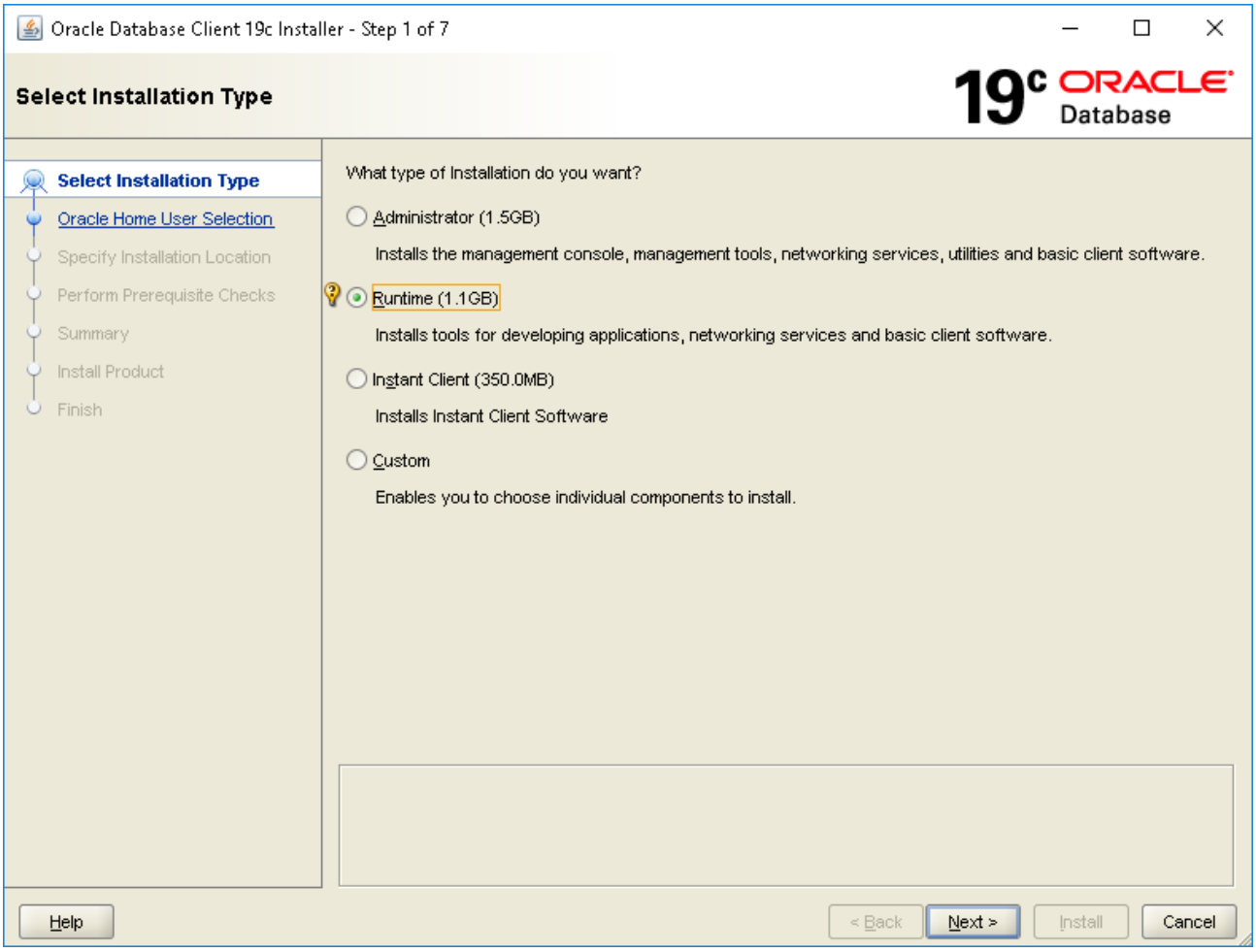

Figure 12 Oracle Client installer – selecting the Installation type

3. If **Select Product Languages** step is available, select a language and click **Next**.
4. Select a user for running the Windows Services for the Oracle Home (it is recommended) and click **Next**.
5. Provide the locations for the Oracle Base Directory and for the Oracle Home Directory. Click **Next**.

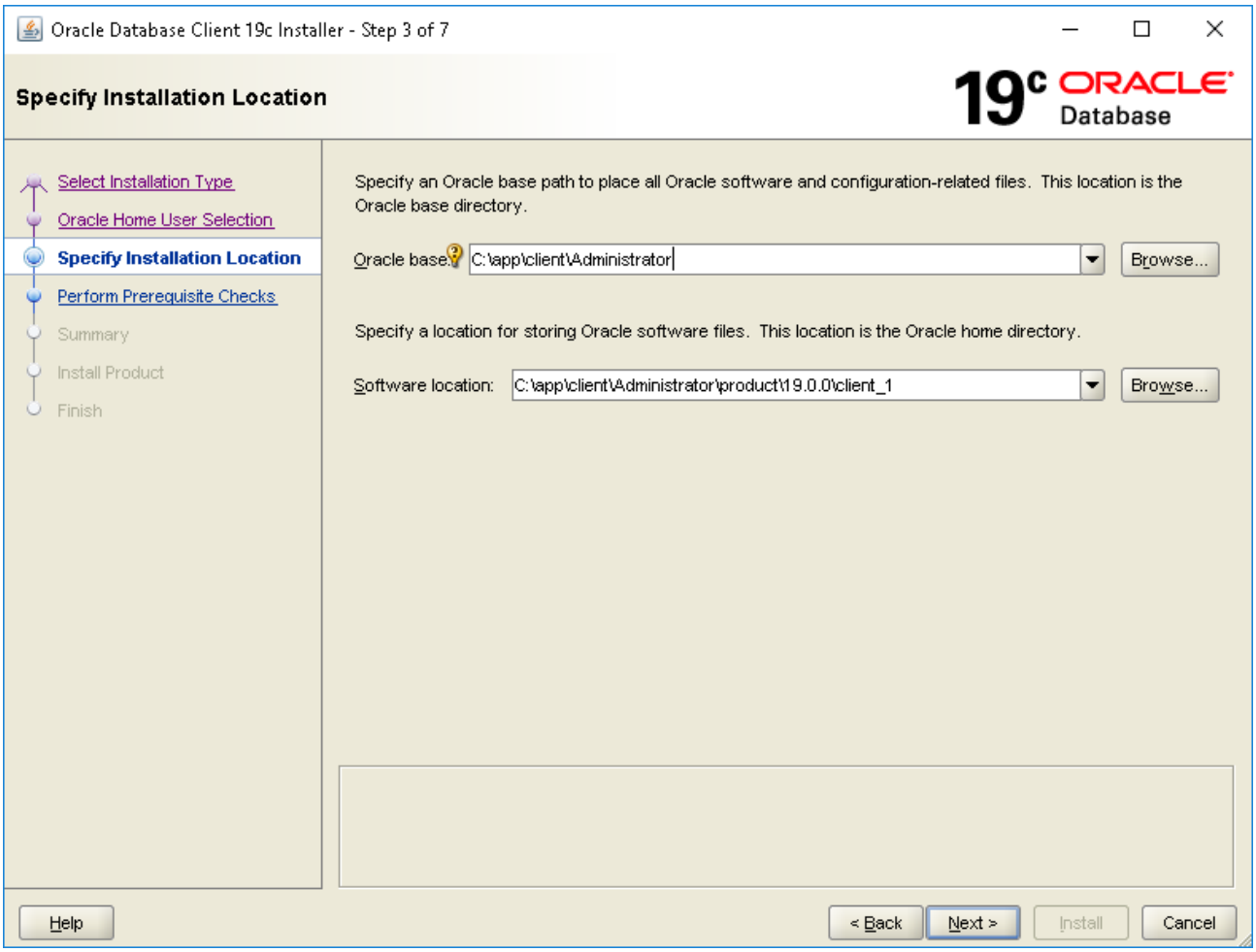

Figure 13 Oracle Client installer – Specify Installation Location screen

6. After your environment is successfully verified, click **Next**.

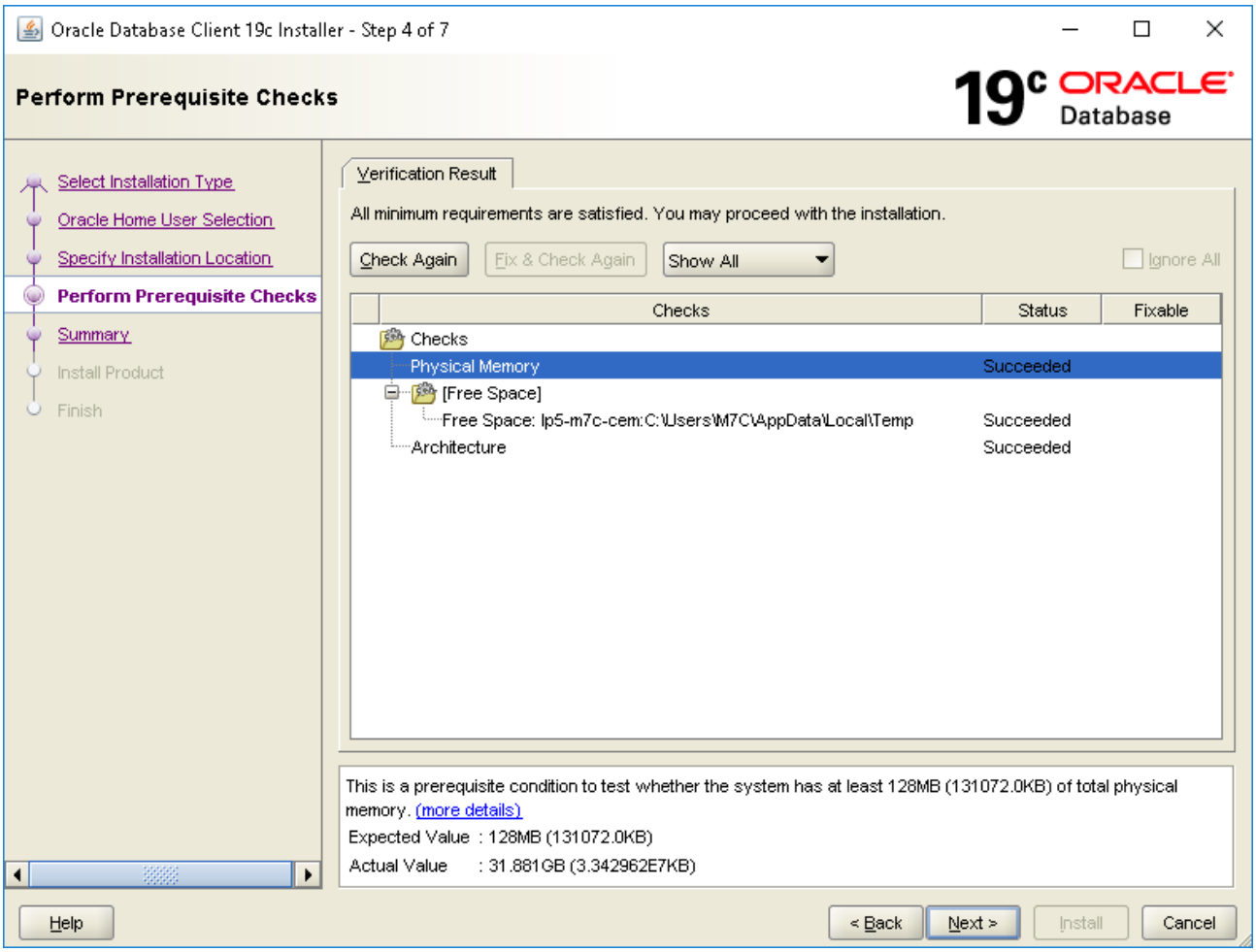

Figure 14 Oracle Client installer – Perform Prerequisite Checks screen

7. When the Summary screen is displayed, click **Install**. The Oracle Client will be installed.

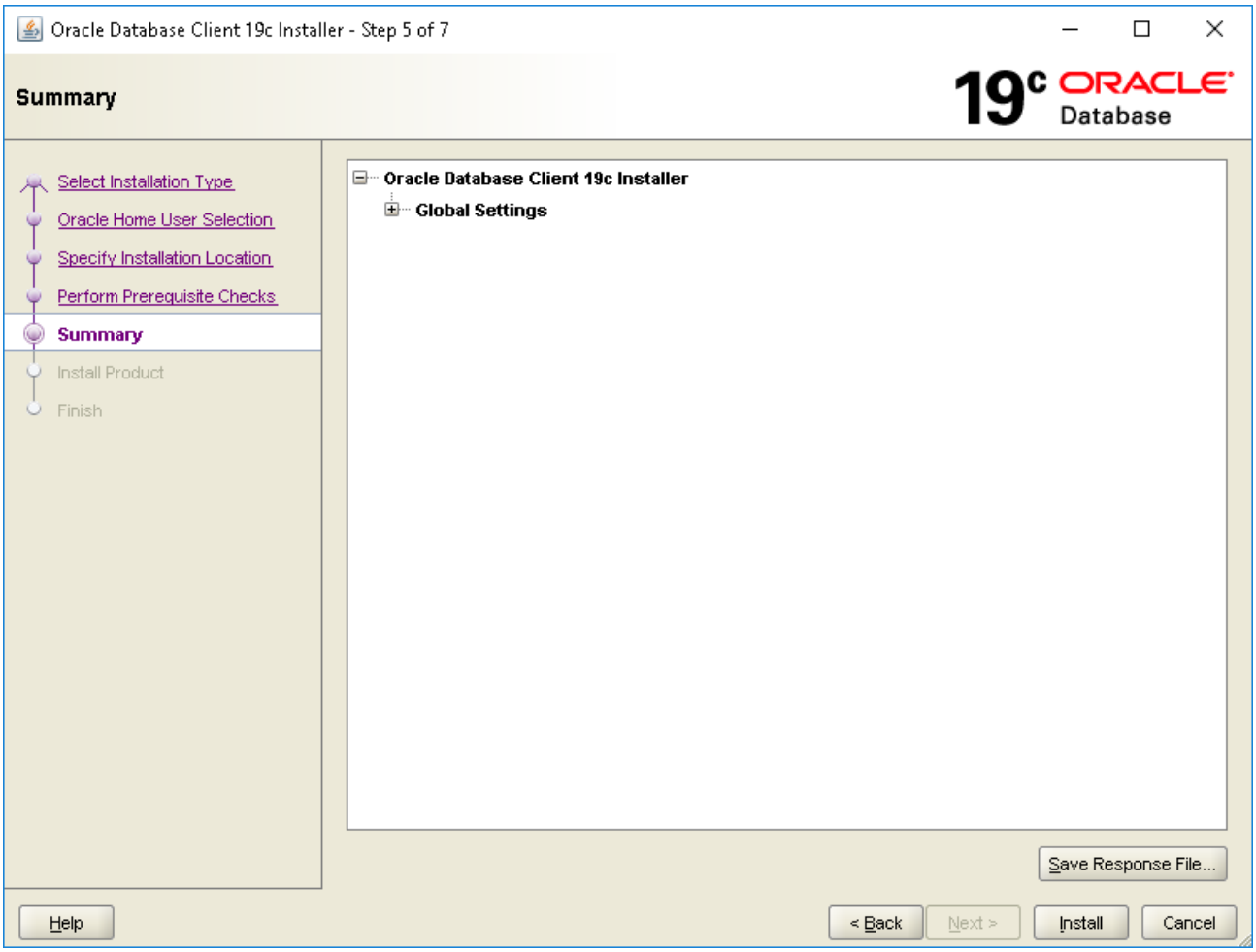

Figure 15 Oracle Client installer – Summary screen

> In case of upgrade from previous DELMIA Apriso version you need to launch Configuration Manager and save the configuration to apply the correct connection string.

8. Once the Oracle Client installation is complete, add the `Oracle.ManagedDataAccess.dll`, `Oracle.DataAccess.dll` and `Policy.x.xxx.Oracle.ManagedDataAccess.dll` to the Global Assembly Cache folder using Global Assembly Cache Tool (Gacutil.exe).

   The `Oracle.ManagedDataAccess.dll` is installed by default into the following directory: `ORACLE_BASE\ORACLE_HOME\odp.net\managed\common`

   The `Policy.x.xxx.Oracle.ManagedDataAccess.dll` is installed by default into the following directory: `ORACLE_BASE\ORACLE_HOME\odp.net\managed\PublisherPolicy\4`.

   > For information on using the Global Assembly Cache Tool, refer to the Microsoft Docs.

9. Finally, there should be the Oracle.ManagedDataAccess folder and related policies Policy.x.xxx.Oracle.DataAccess folder both in version 4.122.19.1 in the Global Assembly Cache folder.

3.7 Oracle Client Parameters Configuration on App Server

Oracle relies on the client for the correct configuration to be able to read and interpret the UTF character sets properly. Therefore, the NLS_LANG parameter needs to be configured. It is the method to set the language, territory and character set, used by the client application.

To configure the parameter:

1. Open the Windows Registry and go to the following key:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Oracle\<Oracle home>
```

2. Open the NLS_LANG value and change it to the proper character set used in your territory, for example AMERICAN_AMERICA.AL32UTF8.

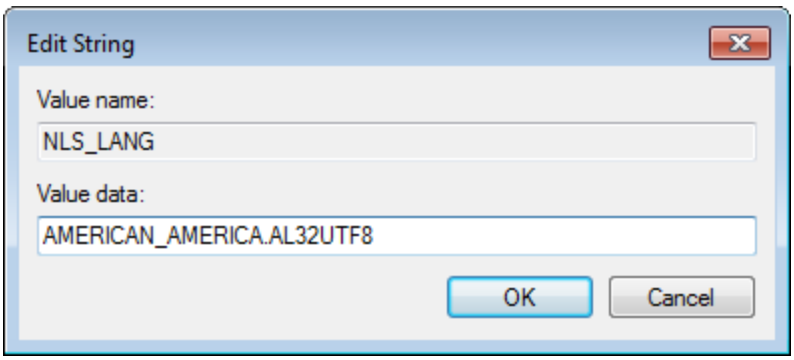

Figure 16 Changing the NLS_LANG value

Be aware that regional settings are controlled by "NLS_Language" and "NLS_Territory" keys of the Central Configuration file (for details, see Central Configuration Documentation).

4 DELMIA Apriso Application Server Installation

This chapter covers the fresh installation of the DELMIA Apriso Application Server (with no other DELMIA Apriso version present on the machine) and other scenarios related to the current version of the DELMIA Apriso Application Server.

If you wish to upgrade your DELMIA Apriso Application Server from the existing version, refer to the DELMIA Apriso Upgrade Guide.

Before starting the installation make sure all prerequisites listed in 2.2.2 Oracle Environments are met.

> Be aware that the DELMIA Apriso installation includes **RabbitMQ**. If RabbitMQ is already installed on the server, its installation might be **overwritten** and any existing configuration lost. Furthermore, RabbitMQ should be properly configured after DELMIA Apriso is installed on the server to make it secure (see 5.5 RabbitMQ Security Configuration).

> RabbitMQ must be reinstalled in case of any environment changes, including a new server name.

4.1 Installing the DELMIA Apriso Application Server

To install DELMIA Apriso for the first time, **log in as a user that is in the administrators group and do the following**:

1. Make sure that the prerequisites described in 2 Verifying the Prerequisites for the Installation of this document are met.
2. In the `Setup\` folder (in the DELMIA Apriso 2021 installation folder), there is the `setup.exe` installer file.
3. Double-click the `setup.exe` file. The welcome screen will be displayed (Figure 17 DELMIA Apriso 2021 – Welcome screen).

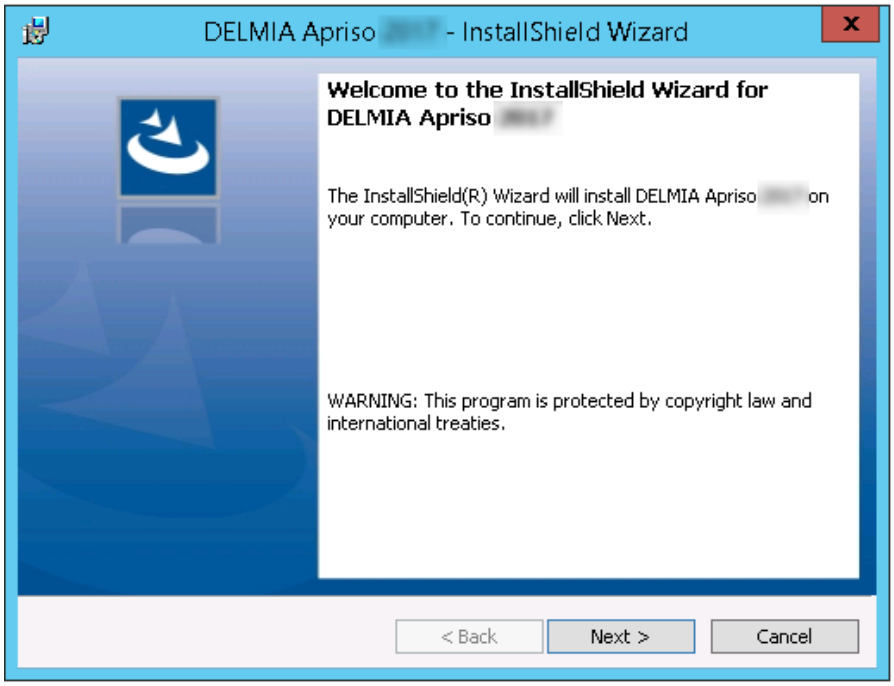

Figure 17 DELMIA Apriso 2021 – Welcome screen

4. Click **Next**.
5. Accept the End User Acknowledgement and click **Next**.
6. In the **Setup Type** screen, choose either a **Complete** or **Custom** installation (Figure 18 Setup Type selection screen):
   - **Complete** installation will automatically install every single part of the DELMIA Apriso install.
   - **Custom** installation allows for certain parts of the install to not be installed if they are not required. Custom installation is recommended only for experienced DELMIA Apriso administrators.

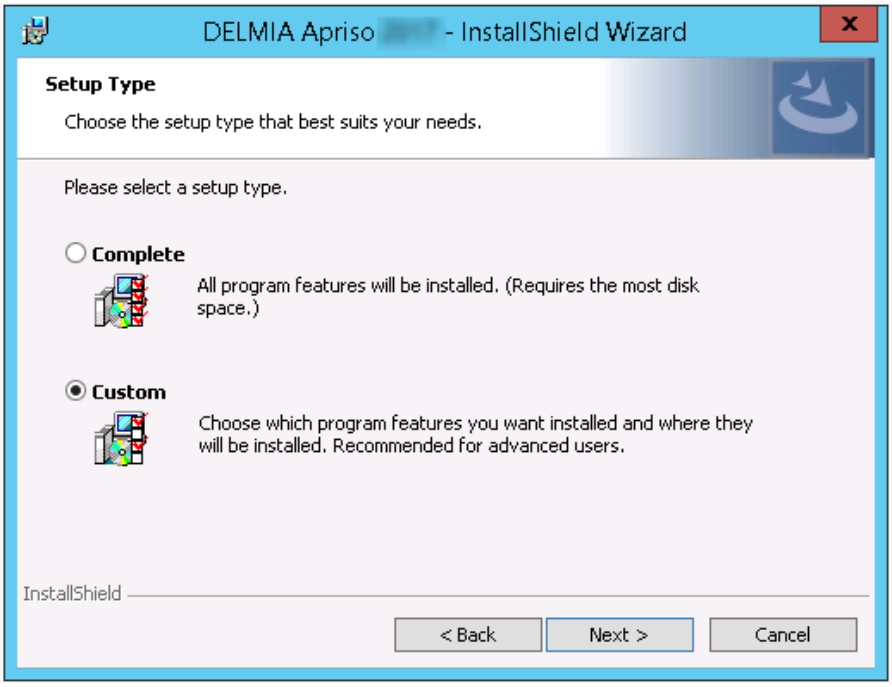

Figure 18 Setup Type selection screen

a. If you select **Custom setup**, an additional screen will appear with a list of all of the programs. You can select the features you want installed as well as their location on the computer using **Browse**.
b. If any module/feature is not required, select **This feature will not be available** (Figure 19 Custom Setup component selection window). When done, click **Next**.

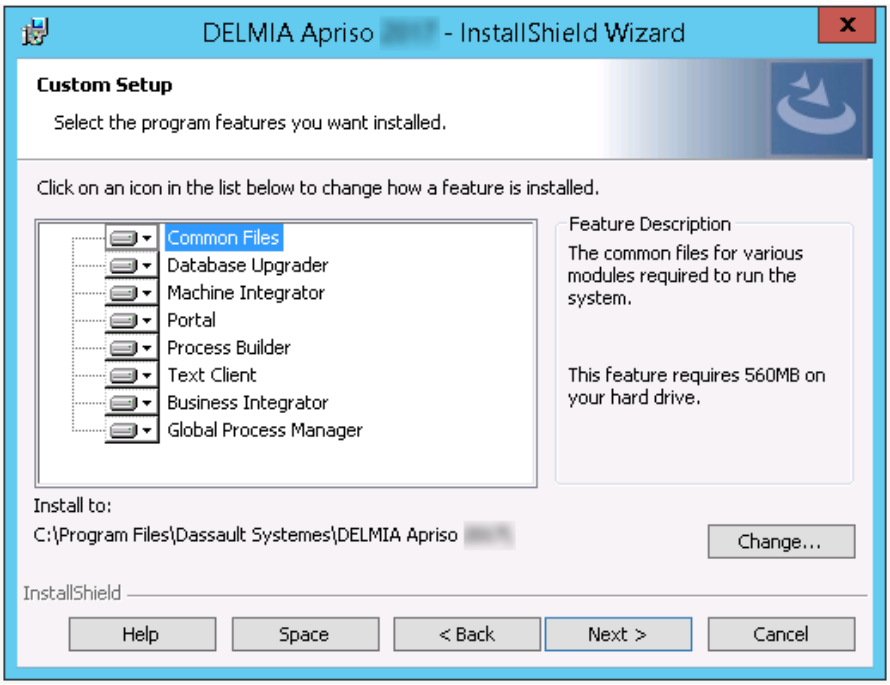

Figure 19 Custom Setup component selection window

7. Select the DELMIA Apriso destination location (or leave at the default) and click **OK**.

- The default installation location is the following:
  - **DELMIA Apriso**: `<drive>\Program Files\Dassault Systemes\DELMIA Apriso 2021`
  - **web applications files**: `<drive>\Program Files\Dassault Systemes\DELMIA Apriso 2021\WebSite`
- If you want to change the location, click **Change**. The screen to select the new location appears.

8. In the **Database Configuration Options** screen (Figure 20 SQL database configuration information/Figure 21 Oracle database configuration information), select the database type: **SQL** or **Oracle**.

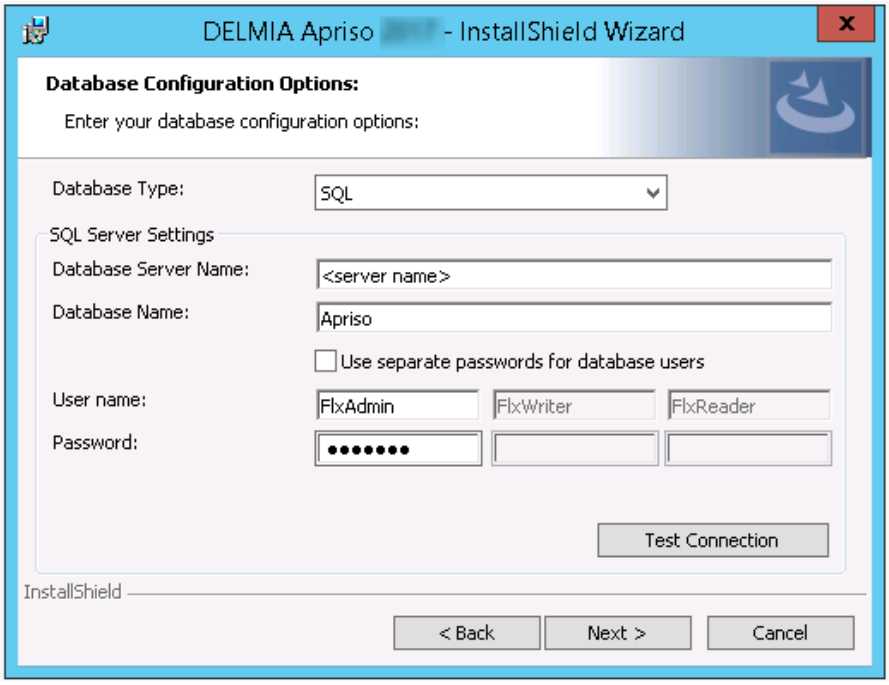

Figure 20 SQL database configuration information

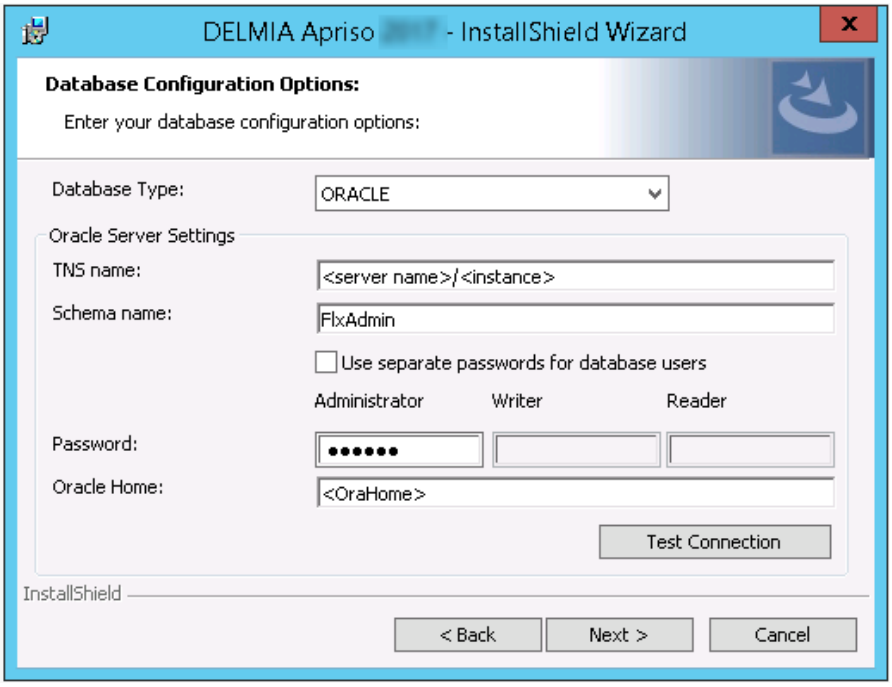

Figure 21 Oracle database configuration information

Depending on the selection, you are prompted to enter different configuration information:

- **SQL**
  - Enter the logon parameters for the Apriso database. Any values for the **Database Server Name** and **Database Name** can be used, but they must refer to the existing databases created as described in 3.2 Creating DELMIA Apriso Database on Microsoft SQL Server .
  - Also, any **DELMIA Apriso user** (“Logon ID”) can be used, but the user must have the rights configured. You can also set different passwords for every type of a user (select the **Use separate passwords for database users** check box). If the check box is not selected, the password will be the same for all database users.
- **Oracle**
  - Enter the logon parameters for the Apriso database. Any values for **TNS Name** can be used, but they must refer to the existing Oracle Server (type the exact name, as in `%ORACLE_HOME%\network\admin\tnsnames.ora`, and it is recommended to put the domain name in the `tnsnames.ora` file).
  - The Oracle instance must be configured as described in 3.3 Creating DELMIA Apriso Database on Oracle.
  - Also, database configuration must be configured exactly as described in 3.3.5 Database User Configuration. You can set different passwords for every type of a user (select the **Use separate passwords for database users** check box).
  - The **Oracle Home** name (local client OracleHome name) field at the bottom of the screen is used by the setup to create the correct ODBC DSN for reports.
  - It is required to specify the TNS_ADMIN environment variable for TNS connections. For this purpose, create a TNS_ADMIN environment variable via Control Panel > System > Advanced > Environment Variables, specifying the points to the directory

where the SQL*Net configuration files (e.g., `sqlnet.ora` and `tnsnames.ora`) are located.

```
%ORACLE_HOME%\network\admin
```

Do not insert the "hash" sign before the database password (e.g. #bc123).

There is a limitation in the DELMIA Apriso installer that the connection to the Localization Repository (optional) database is always set to the same SQL Server/Oracle Server instance as DELMIA Apriso Database connection can be changed later using the DELMIA Apriso Configuration Manager.

10. Click the **Test Connection** button to check if the connection to a database is correct.
11. If the data in all of the fields is correct, click **Next**.
12. If the Database Upgrader was selected to be installed (Figure 19 Custom Setup component selection window), the **Apriso Database Upgrade** screen appears.
    - Select the check box (as presented in Figure 22 Automatic database upgrade window) if you want the database upgrade to be automatically launched after the installation (the database upgrade will be the last step), and click **Next**.

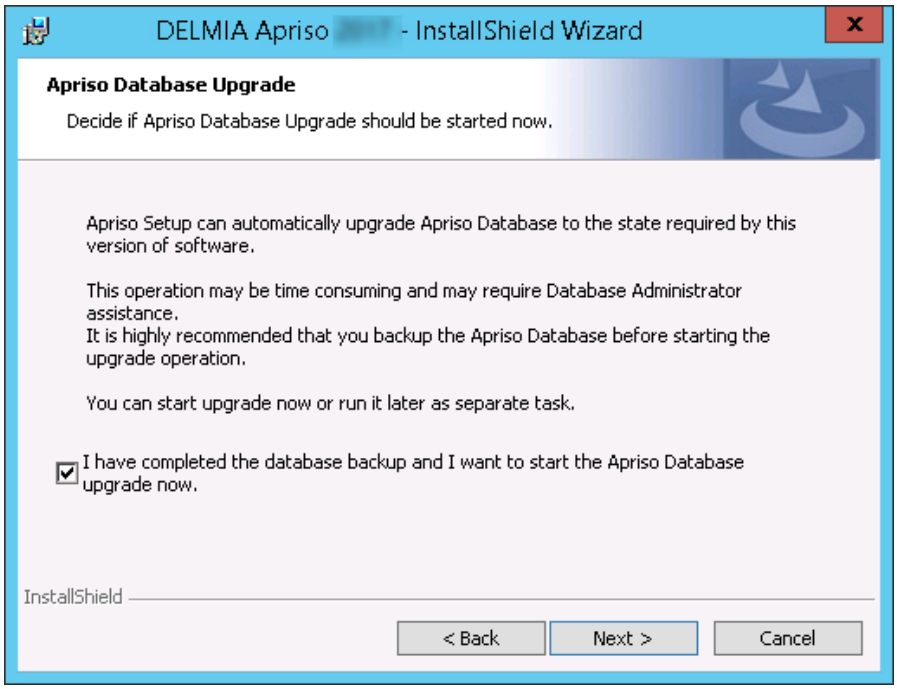

Figure 22 Automatic database upgrade window

To ensure that the database and binaries versions are exactly the same, it is strongly recommended to run the Database Upgrader after the installation. Since DELMIA Apriso is under a continuous enhancement process, it is possible that some enhancement in the binaries can require upgrades in the database. Scripts started by Database Upgrader perform all of the necessary database updates.

After the database upgrade process is completed, the Database Upgrader will automatically launch the Post-Upgrade Utility to synchronize the newly installed application server with the upgraded database.

> If for any reason the DELMIA Apriso Database Upgrader or Post-Upgrade Utility fails (or returns warnings), refer to the Database Upgrader Help or Post-Upgrade Utility Help accordingly for troubleshooting.

> Make sure all database connections are closed before you start installation.

13. Click **Install**. The installer will now start copying files. This may take approximately **15-20** minutes.
14. When the install is completed (Figure 23 DELMIA Apriso installation finish window), click **Finish**.

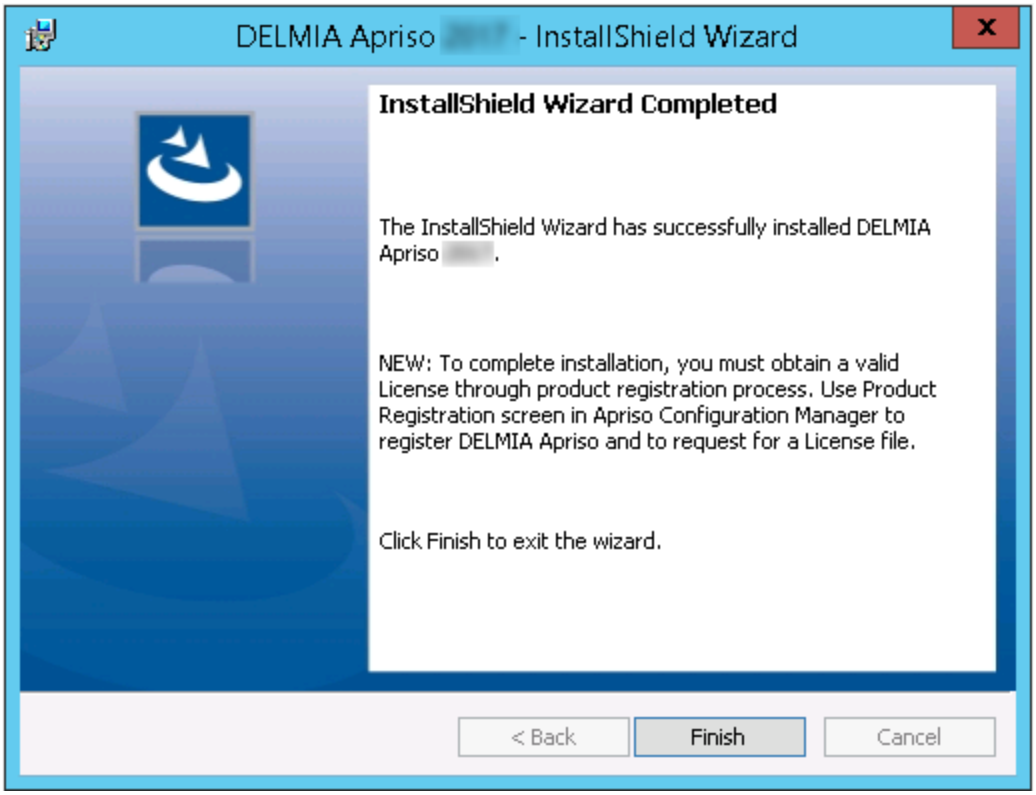

Figure 23 DELMIA Apriso installation finish window

Note that you need to register your DELMIA Apriso instance in order to make it fully functional. Detailed information on the limitations and registration process is available in 5.1 Registration.

15. Click **Yes** (when prompted) to restart the server.

> It is possible that at the end of the installation process, a final screen with this information will be displayed: “The wizard was interrupted before DELMIA Apriso 2021 could be completely installed (…)”. This may occur when the setup has failed to access third-party software (IIS). However, in most cases the setup will complete successfully, despite the fact that the wizard will state otherwise.

If all of the steps are performed successfully, after the server restarts (following the DELMIA Apriso installation), proceed to 5 DELMIA Apriso Application Server Post-Install Steps for instructions on how to validate your installation.

To configure the DELMIA Apriso interface to External Systems, use the **DELMIA Apriso Configuration Manager** when the installation is finished. For details about DELMIA Apriso integration with External Systems, refer to the following documents available on the DELMIA Apriso Start page:

- Business Integrator – Integration Planning Technical Guide
- Business Integrator – External System Integration Analysis Technical Guide
- Business Integrator – SAP Business Connector Configuration Guidelines Technical Guide
- XML Schema Builder Help

4.1.1 Installing the DELMIA Apriso Application Server in Silent Mode

Alternatively, DELMIA Apriso Setup can be invoked in “Silent Mode” without any user interaction as the DELMIA Apriso setup accepts values from the command line parameters. Administrators can take advantage of this installation method and prepare batch files automating the installation process.

To run a DELMIA Apriso setup silently, type the following in the command line:

```
setup.exe /s /v"[PARAMETERS] /qb"
```

The DELMIA Apriso-specific setup parameters are:

- DEFAULTINSTALLCBX1 (SQL/ORACLE) – the database type
- DATABASEUPGRADER (0/1) – specifies if the Database Upgrader should be run at the end of the installation/upgrade
- DIFFDBPASS (1) – enables using different passwords for DB users
  - READERDBPASS=<readerPassword> WRITERDBPASS=<writerPassword>

SQL:

- DBSERVER – the computer name (SQL Server)
- DBNAME – the name of a DELMIA Apriso database that exists on DBSERVER
- DBUSER – the username of a user that has access to the specified database
- DBPASS – the DELMIA Apriso and framework database user password

ORACLE:

- ORACLETNS – Oracle TNS
- ORACLEDBUSER – the DELMIA Apriso database name that exists on ORACLETNS
- ORACLEDBPASS – the DELMIA Apriso database user password
- ORAHOME – the Oracle Home name

General setup parameters useful for DELMIA Apriso:

- INSTALLDIR – overrides the default installation path (`<drive>\Program Files\Dassault Systemes\DELMIA Apriso 2021`) with a custom one
- REBOOT (**R**eallySuppress;**S**uppress;**F**orce) – specifies how the system should behave after the installation process is completed (handling the request for rebooting the system), and only the first letter of the value is evaluated

> For a full list of the parameters available for Windows installer, refer to Microsoft Docs.

Usage examples:

1. Installation
   a. SQL database:

```
Setup.exe /s /v"DEFAULTINSTALLCBX1=SQL DATABASEUPGRADER=1
DBSERVER=<dbservername> DBNAME=FLXD DBUSER=user DBPASS=password
DBFWNAME=FRMD REBOOT=R /qb
```

   b. Oracle database:

```
Setup.exe /s /v "DEFAULTINSTALLCBX1=ORACLE DATABASEUPGRADER=1
ORACLETNS=EXAMPLE.DOMAIN.COM ORACLEDBUSER=user ORACLEDBPASS=password
ORACLEFWDBNAME=FlexNetFW ORACLEFWDBPASS=password REBOOT=R /qb"
```

2. Uninstallation

```
Setup.exe /s /x /v"REBOOT=R /qb"
```

3. Upgrade

```
Setup.exe /s /v"DATABASEUPGRADER=1 REBOOT=R /qb"
```

> If one of your parameters contains a space character(s), be sure to enclose it in quotation marks preceded by a backslash character, for example:
> `(…)/v"TEST=\"c:\temp location\foo.bar\""`

Two additional parameters are added by default to the Oracle connection string during the installation:

- Validate Connection = true – causes validation of the existing connection while getting it from the connection pool (true/false)
- Promotable Transaction = local – forces the local transaction scope to be used

Central Configuration contains an additional key – EnableOracleTAF (set to “true” by default) – that enables the Transparent Application Failover feature on .NET connections for DELMIA Apriso. For more information, refer to the “DataServices” section of the Central Configuration Documentation.

All of the additional parameters can be modified any time after the installation via the DELMIA Apriso Configuration Manager.

4.2 Removing DELMIA Apriso Application

Follow the procedure below to uninstall a DELMIA Apriso application:

1. Navigate to: **Start | Control Panel | Programs and Features**.
   The **Programs and Features** screen will be displayed.
2. Select the DELMIA Apriso application and click **Uninstall**.
3. When the uninstall process is completed (Figure 23 DELMIA Apriso installation finish window), click **Finish**.

When the restart information appears, it is recommended to select **No** and check if all of the DELMIA Apriso folders were removed. All of the log files will remain in their folders. Archive the logs for future analysis:

```
<drive>\Program Files\Dassault Systemes\DELMIA Apriso 2021\
<drive>\Program Files\Dassault Systemes\DELMIA Apriso 2021\WebSite\FIInvocation\
<drive>\Temp\AprisoLogs
```

Or use another logging directory specified in:

`LoggingConfiguration.xml`

If any of the binaries (DLL, EXE) remain in those folders, they need to be removed manually.

Check if any DLLs with names starting with “FlexNet” exist in GAC (`Windows\assembly` and `Windows\Microsoft.NET\assembly`). If yes, delete them manually.

> The DELMIA Apriso setup will not automatically remove Crystal Reports upon uninstallation. You need to remove it manually by uninstalling it from Add/Remove Programs.

After restarting, the server is ready for the new DELMIA Apriso installation.

> When the DELMIA Apriso setup is uninstalled, all the Service Packs installed for the version are uninstalled automatically. However, uninstalling the Service Packs manually is recommended for the proper removal of the files changed by these Service Packs.

5 DELMIA Apriso Application Server Post-Install Steps

5.1 Registration

Once DELMIA Apriso is installed, it is not fully functional until it is registered. An unregistered version (some functional modules) has several limitations, which are presented in the table below. Because the availability of DELMIA Apriso modules is dependent on your contract agreement, some limitations may remain in force even after the registration.

Limitation	Not Registered	Registered
"Not registered" information displayed in the DELMIA Apriso Portal, DELMIA Apriso Desktop Client, Apriso Classic Portal, and Process Builder	Yes	No
The number of allowed concurrent user sessions[1] (DELMIA Apriso Portal, DELMIA Apriso Desktop Client, Apriso Classic Portal, and Process Builder)	Up to 10	Unlimited
Global Process Manager – ability to add/connect to destination servers (**Global Process Manager** module must be licensed)	Disabled	Any
Process Manager – ability to add/connect to destination servers (**Process Manager** module must be licensed)	Disabled	From same site

Apriso Classic Portal has been deprecated.

5.1.1 Licensing Assumptions

In order to register a DELMIA Apriso instance, it is necessary to deploy a valid license in the form of an XML file (the license file).

A license is issued by DELMIA Apriso after having received the Product Registration information (also an XML file, the registration file).

The registration file is generated via a form available from the DELMIA Apriso Configuration Manager (accessible from the Start menu on a machine where DELMIA Apriso was installed). The form contains basic information on the system that the DELMIA Apriso instance is running on and on DELMIA Apriso itself. This information will be used by DELMIA Apriso for licensing purposes and for DELMIA Apriso Support in case problems are reported.

The license file can be used to register:

[1]Current user sessions can be viewed via the Session View Maintenance and Monitoring screen.

- **Multiple DELMIA Apriso instances** – the license is issued for the entire site with the restriction that all of the machines are operating on a single subnet within the same domain. The domain and subnet information is automatically retrieved during generation of the registration file.

  > All of the DELMIA Apriso Servers on a site which have the same domain will be sharing the same DELMIA Apriso license file. In a cluster environment or in the case of servers with multiple Network Adapters (also referred to as Network Interface Controllers [NIC]), make sure to configure the Network Adapter connected to the domain that you register the server for as the first (primary) on each of the machines. The Network Adapter should appear as the first one in the Connections area of the Adapters and Bindings tab of the Advanced Network Connections Settings.

- **A single DELMIA Apriso instance** – the license is issued for a single computer. The computer details are automatically retrieved during generation of the registration file.

A new license file needs to be deployed upon each DELMIA Apriso upgrade other than the deployment of a Service Pack (for details, see the DELMIA Apriso Administration Guide).

5.1.2 Registration Procedure

The following steps need to be performed in order to register DELMIA Apriso:

1. Launch the **DELMIA Apriso Configuration Manager** and click **About** (Figure 24 Accessing the Product Registration form).
   A Product Registration window (Figure 25 Product Registration window) will appear with your system information on the System Information tab.

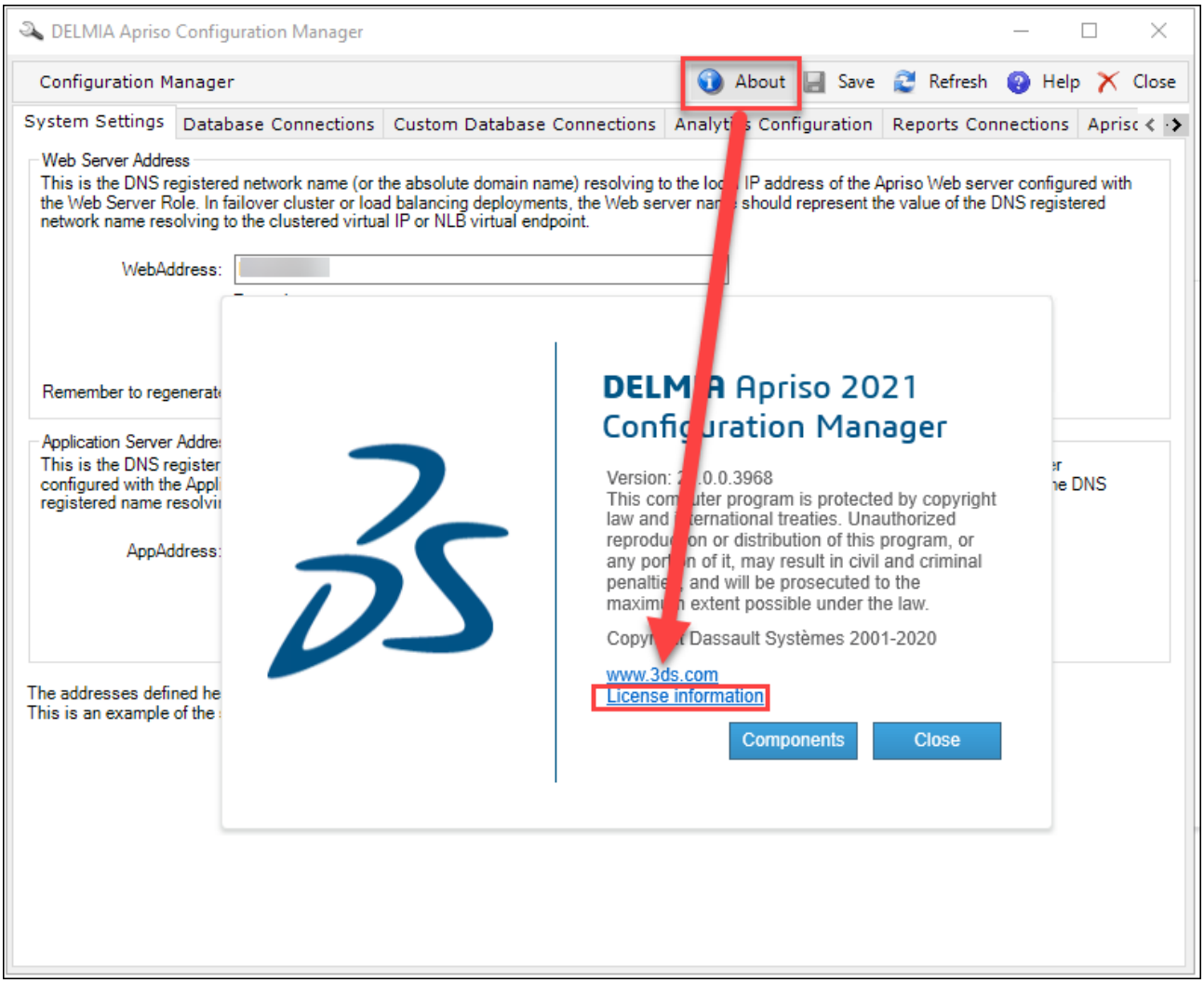

Figure 24 Accessing the Product Registration form

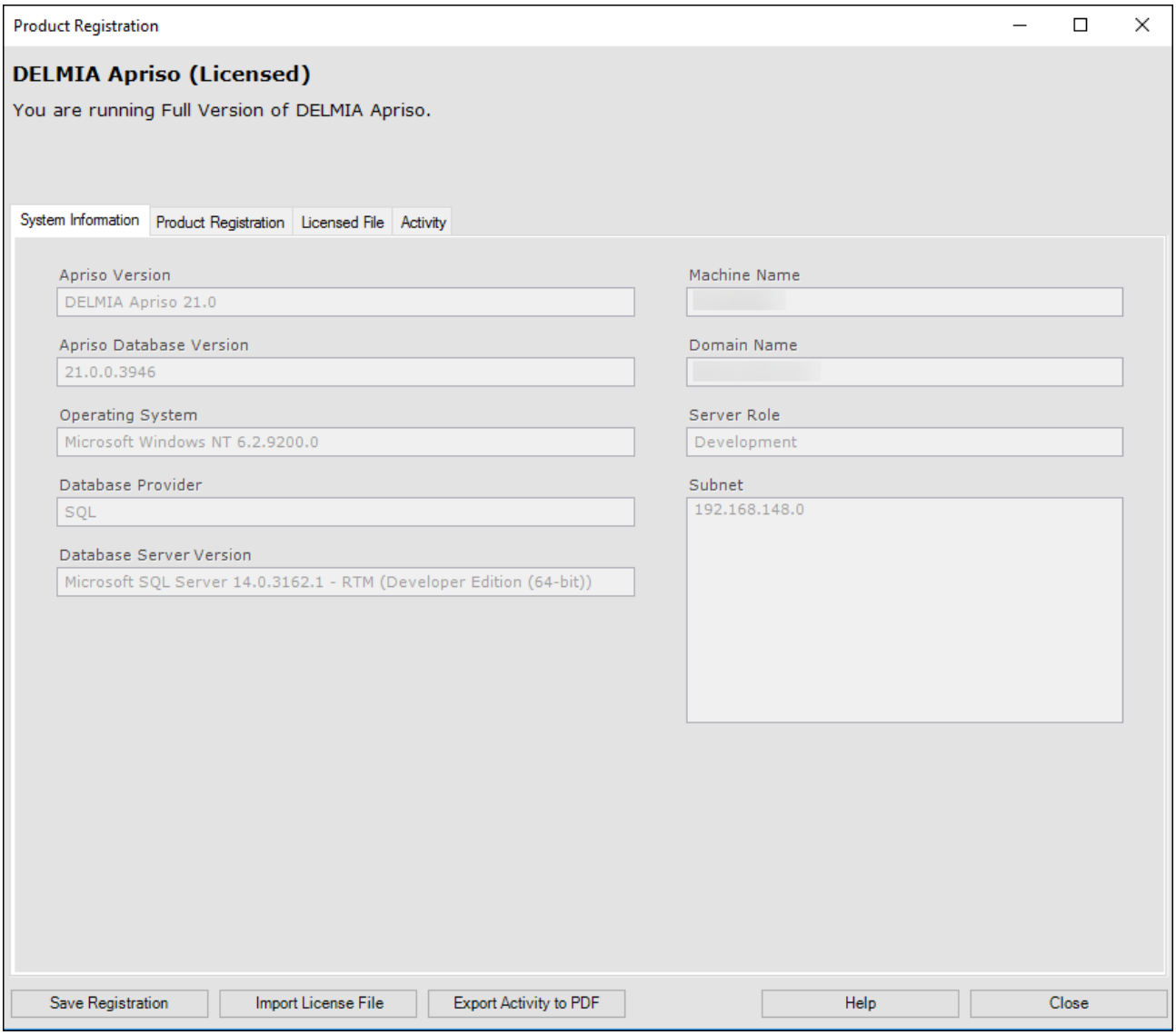

Figure 25 Product Registration window

2. Switch to the **Product Registration** tab and fill out the remaining information necessary for the registration process. The required fields are emphasized with a bold font face. The licensing information you should provide is:
3. Click **Save Registration** and select the name and location for the XML file to be created containing the information DELMIA Apriso needs to successfully process your registration request.
   - **Site Name** – as the license is issued for a single site, type the unique name that identifies the site in this field
   - **License Type**
     - Select COE (Center of Excellence) if you are going to use the server as a distribution point for Processes/Operations via Global Process Manager and this server is capable of distributing packages to all other servers on all of the connected sites
     - Select Site for any other site server capable of receiving packages from a COE server

- **Server Role** – defines the role of this particular DELMIA Apriso instance in your site hierarchy
- **Subnet** – choose a subnet that is in the same domain as the server that you are registering

4. Fill in the License Key Request form available on the https://www.3ds.com/terms/software-keys/ (Obtaining Software License Keys section). Select and mark the Reason for License Key Request and do not fill the VAR name and VAR ID columns.
5. Submit the form and XML file generated in the step 3 to the Dassault Systèmes Key Management Center (KMC) in your geography. The email addresses are listed in the License Key Request form.

   Usually the registration process does not take longer than one business day given that the sales contract is in place. If the information you provide is correct and compliant with your contract, you should receive your license file for the site within this time. You will be informed of the registration status once your request is received and if any problems with your request should occur.

   For more information on the License Key Request Procedure refer to Dassault Systèmes Customer License Key Reference – Excludes V6 and **3D**Experience Guide available from the https://www.3ds.com/terms/software-keys/ (see Customer License Key Reference Documents section).

   After you have received the license file:

6. Access the **Product Registration** window by repeating the instructions from step 1.
7. Click **Import License File** in the bottom-left corner of the window, locate the license file that you received, and click **Open** (Figure 26 Importing the license file).

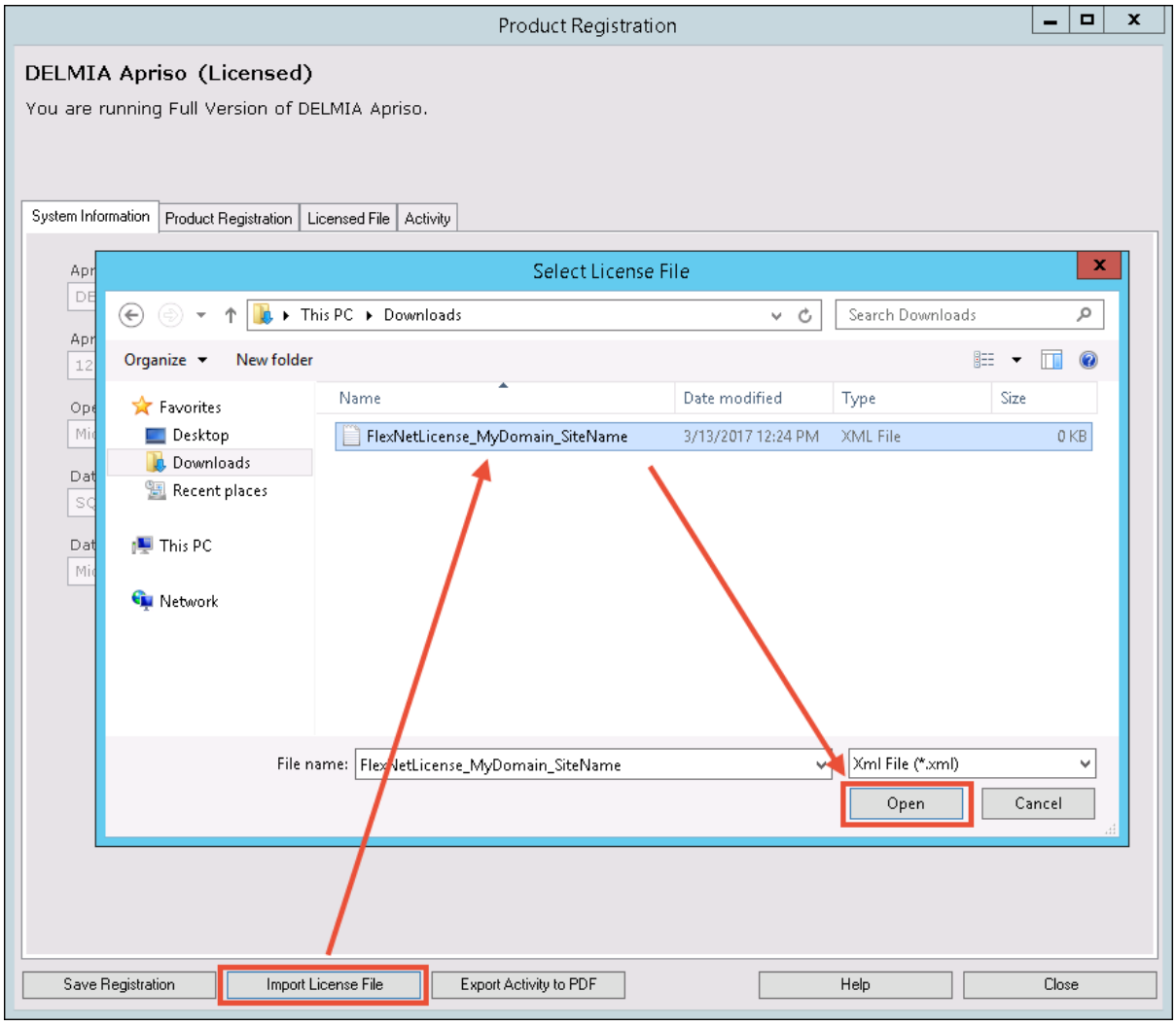

Figure 26 Importing the license file

The system will validate the license file and display the result information immediately. The registration of your DELMIA Apriso copy will not require any additional steps.

> If the license file gets damaged or contains invalid data, please report this fact to DELMIA Apriso Support.

> If the license file becomes corrupted as a result of manual interference with its content after it was used to successfully register the DELMIA Apriso instance, the signature will become invalid. DELMIA Apriso will keep notifying you of this fact, and you will need to request a new license file to resolve this issue.

8. Restart your machine (or at least the IIS service). Navigate to the **License File** tab on the **Product Registration** window (Figure 25 Product Registration window) to verify the license data.
9. If your license file was issued for multiple DELMIA Apriso instances, repeat steps 5–7 on all of the DELMIA Apriso Servers that you want to register.

5.2 Display Literals Configuration

The DELMIA Apriso Central Configuration file

```
<drive>\Program Files\Dassault Systemes\DELMIA Apriso
2021\Website\CentralConfiguration\CentralConfiguration.xml
```

contains the "DisplayEmptyTranslation" key (for details, see Central Configuration Documentation).

If any literals (e.g., control names in screens, messages) are missing in the framework database, an empty window will be displayed. An empty screen should never appear after implementation (when the development and translation process is finished), so “DisplayEmptyTranslation” key should remain “TRUE.”

During implementation and testing, it is better to set this key to “FALSE.” This causes the display of the literal’s ID (i.e., on screens, in message windows) where a translation is missing. Remember to restore this value to “TRUE” before leaving DELMIA Apriso instance to be used in production.

5.3 Debugging on the Production Server Configuration

During the development and testing phases, it is common to configure specific server settings to facilitate easier debugging and problem diagnosis. However, such settings are often undesirable in a production server environment because they can negatively impact performance.

The following is one such setting. Ensure that it is set to “false” on all production servers:

File:

```
<drive>\Program Files\Dassault Systemes\DELMIA Apriso 2021\WebSite\Portal\Web.config
```

Setting:

```
<compilation defaultLanguage="c#" debug="false">
```

5.4 TransactionTimeout Configuration

TransactionTimeout defines the time after which transactions will be terminated. It applies to every .NET transaction (every DELMIA Apriso transaction in particular).

> This timeout is not the same as CommandTimeout from the `CentralConfiguration.xml` file.

This setting is important when some jobs in Job Scheduler take more time. Setting the proper TransactionTimeout can prevent Job Scheduler from going on an infinite loop and therefore blocking other scheduled jobs.

To change the TransactionTimeout setting from default, you have to modify the `machine.config` files located in the following directories:

- `<drive>\Windows\Microsoft.NET\Framework\<latest .net version>\Config\`
- `<drive>\Windows\Microsoft.NET\Framework64\<latest .net version>\Config\`

In both `machine.config` files add the `<system.transactions>` section with `<machineSettings>` section containing the `maxTimeout` value, as shown in the example below:

```
<configuration>
<system.transactions>
    <machineSettings maxTimeout="24:00:00" />
</system.transactions>
</configuration>
```

In the example above, the timeout is set to 24 hours, but you can start from 1 hour at first.

> The `<system.transactions>` section may be already present in the `machine.config` file.

More information on this subject can be found in Microsoft Docs.

5.5 RabbitMQ Security Configuration

The DELMIA Apriso installation includes RabbitMQ, which enables efficient communication between different components of the product. For security reasons, the RabbitMQ configuration on the server should be changed immediately after installation as explained below:

> Before configuring, refer to RabbitMQ documentation.

> For detailed information about RabbitMQ commands referred to below, see rabbitmqctl manual page.

1. Add a new user in RabbitMQ using the add_user command.

   ```
   rabbitmqctl add_user username password
   ```

2. Set appropriate read and write permissions for the new user to access the virtual host using the set_permissions command.

   ```
   rabbitmqctl set_permissions -p / username ".*" ".*" ".*"
   ```

3. Revoke access for the default "guest" account using the clear_permissions command.

```
rabbitmqctl clear_permissions -p / guest
```

4. Go the **DELMIA Apriso Configuration Manager | Message Bus** tab (for more information, see Configuration Manager Help).
5. Enter the RabbitMQ username and password created in the steps above.

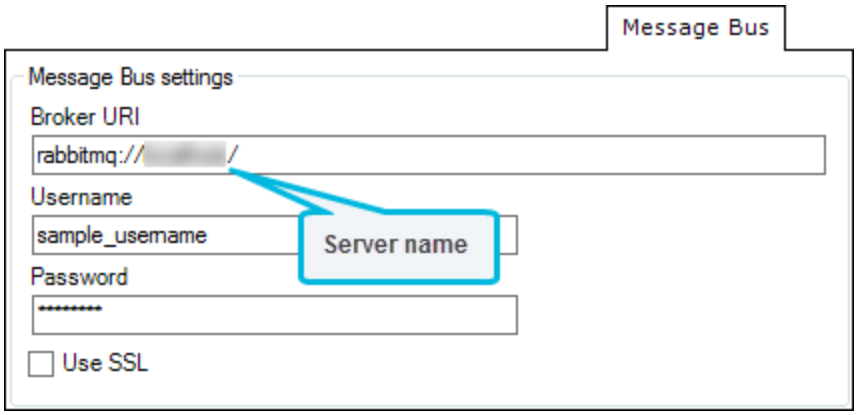

Figure 27 Configuration Manager – Message Bus tab

5.6 PI System

DELMIA Apriso Machine Integrator is designed to operate with several Data Sources, including OSIsoft's **PI System** (for more information, see OSIsoft documentation).

However, before Machine Integrator can communicate with the PI System, certain additional utilities need to be installed and configured. This includes the **PI AF Client**, which should be installed on the DELMIA Apriso Application Server and on each machine running Machine Integrator. Currently, Machine Integrator supports the 2018 version of the PI AF Client.

5.6.1 Security

The PI System has been built to support Windows Integrated Security and strongly leverages Active Directory (AD) for central administration of users' credentials. This means that the connection from DELMIA Apriso to the PI System will be performed with the current Windows user only. In other words, the PI System does not support authentication types other than Windows Integrated Authentication. The user must belong to the same, trusted domain (Active Directory).

> The users running Machine Integrator and the PI System should be **in the same domain and have administrative privileges**. Moreover, the user running Machine Integrator must be added to the PI System's trusted users. For information on adding trusted users in the PI System, see the OSIsoft documentation.

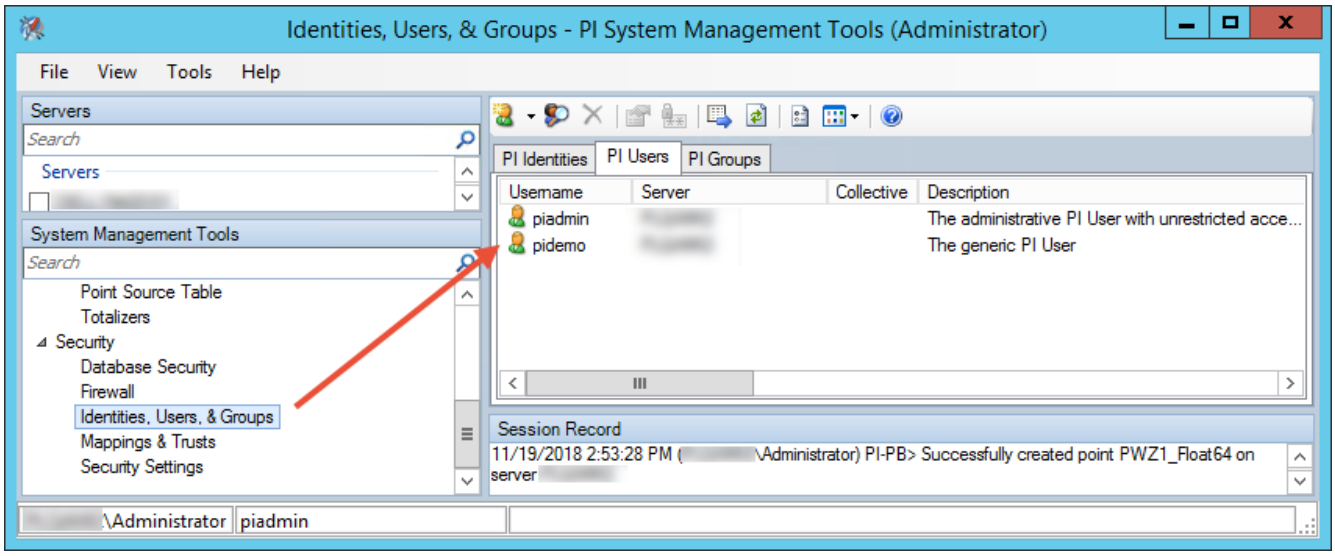

Figure 28 PI System security configuration

6 Enhance the DELMIA Apriso Product

Resources to enhance the DELMIA Apriso product are available from the **DELMIA Apriso Server Configuration page**. It is possible to set up:

- Preconfigured Solutions
  - **Complex Assembly**

    Solution designed for roles: Complex Assembly Production Supervisor, Complex Assembly Production Operator. It consists of the following applications: Order Cockpit, Production Monitoring Cockpit, Dispatching Board, and Execution Cockpit.
  - **3DPlay Experience for Work Instructions**

    Solutionsupports the display of 3D data with work instructions on the manufacturing shop floor. It includes the Work Instructions 3D Business Control and the Work Instructions 3D FlexPart.
  - **Distributed Numerical Control (DNC)**

    Solution provides data management, cataloging, and transfer of Numerical Control (NC) programs and their related documents to and from machine tools.
  - **Warehouse Management System**

    Solution designed for the following roles: Warehouse Supervisor and Warehouse Operator. It consists of three applications: Inventory Operations, Receiving, and Receiving Cockpit.
- Manufacturing Analytics
  - **MPI Lite** (for details, see MPI Lite Installation Guide)
  - **MPI** (for details, see MPI Installation Guide)
- Global Traceability (for details, see Global Traceability Installation Guide)
- Access Tools and Files Packs (for details, click the link and follow the descriptions)
- View Product Documentation

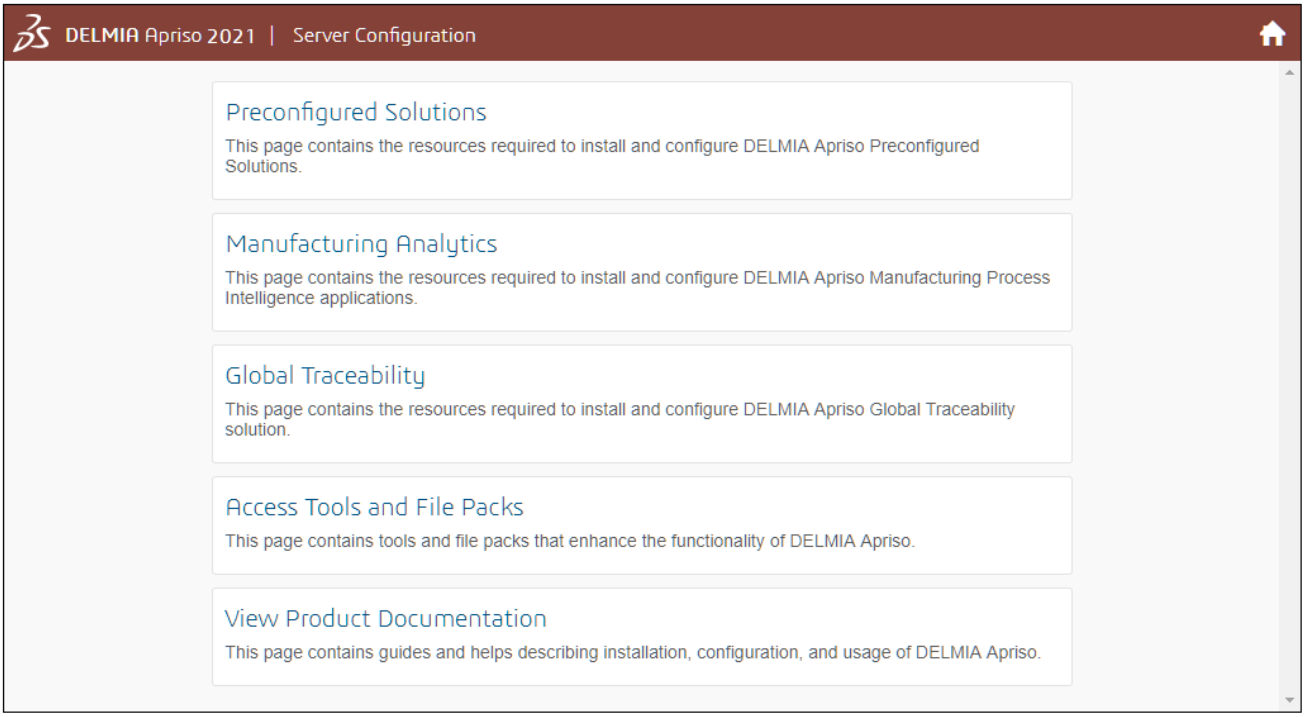

Figure 29 DELMIA Apriso Server Configuration page

The DELMIA Apriso Server Configuration page can be launched from the DELMIA Apriso Server after it is installed.

To access the page:

1. Locate the DELMIA Apriso Start shortcut on the desktop of the application server and launch it (Figure 30 DELMIA Apriso shortcut on the Application Server Desktop).
2. Make sure an Internet browser that is currently supported is being used (see 2.4.1 Desktop Client).

Figure 30 DELMIA Apriso shortcut on the Application Server Desktop

7 DELMIA Apriso Client

Installation and Configuration

7.1 DELMIA Apriso Client Overview

In most configurations, no local DELMIA Apriso deployments are required, as all DELMIA Apriso components run on the DELMIA Apriso Server. However, there are cases when selected components can be installed on the client machine for the utilization of local resources or for other special tasks. Installation of such components is possible through the **DELMIA Apriso Start page**.

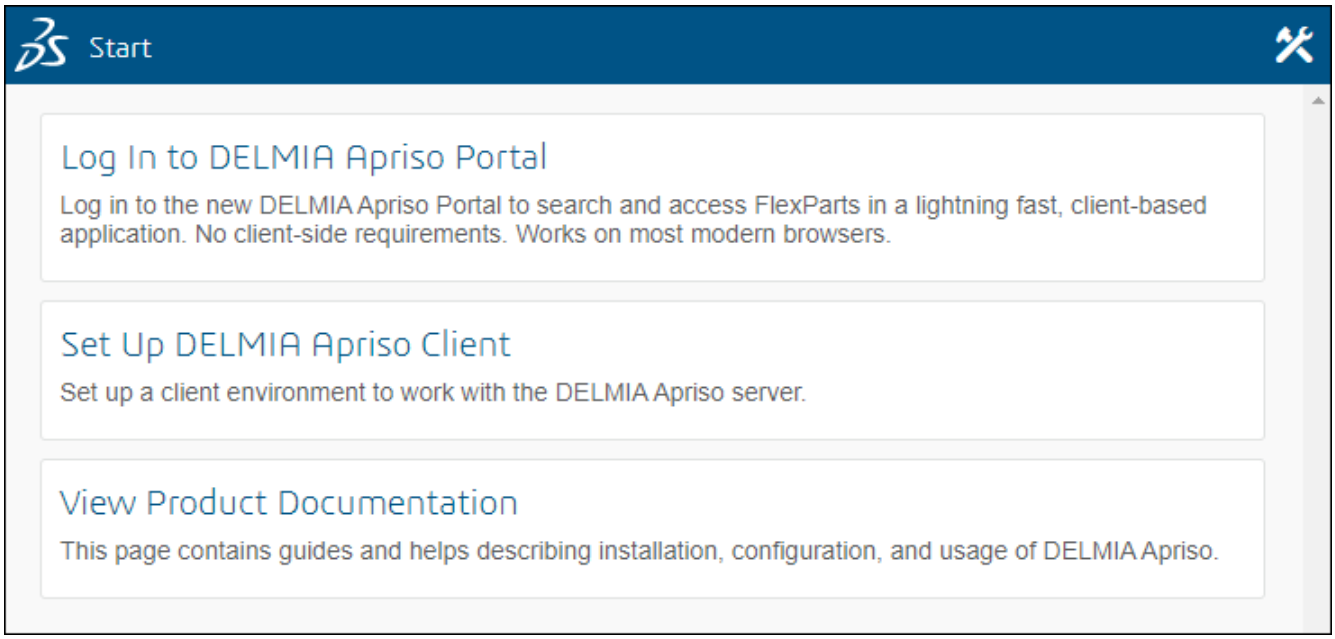

Figure 31 DELMIA Apriso Start page

To access the page:

1. Load the `http://<server name>/Apriso/Start`. The DELMIA Apriso Start page is displayed.
2. Go to the **Set up DELMIA Apriso Client**.

> Microsoft Edge is currently the only browser officially supporting the ClickOnce technology.

Components using the ClickOnce technology can be installed only from a DELMIA Apriso Server. Once installed, they will be automatically synchronized with their server versions and updated accordingly upon each launch (an update of the ClickOnce client components is performed based on the server XML manifest file). The procedure is described in detail in the DELMIA Apriso Upgrade Guide. Each Start menu name of the application instance will contain the server name to inform about the server version with which the application is synchronized.

A Version Compatibility Check feature implemented in some client modules (e.g., Process Builder) may cause conflicts when the version of the module components installed on the client machine differs from that of the corresponding components on the server. Upon detection of any incompatibilities, the user will be informed of each connection attempt. The version information for particular module components can be compared in the Component dialog box accessible through **Help | About | Components** (button) when running the module.

To properly configure the client machine to work with DELMIA Apriso, refer to 7.2 DELMIA Apriso Client Configuration.

To optionally install any of the available DELMIA Apriso components, refer to the descriptions and installation instructions in 7.3 DELMIA Apriso Client Components.

7.2 DELMIA Apriso Client Configuration

Before starting to use DELMIA Apriso:

1. Make sure the prerequisites described in 2.4 Software Requirements for the Client Machines of this document are met.
2. Make sure you are logged in as the system administrator (i.e., you have administrator rights).
3. Make sure your Internet browser is configured in the following way:
   - The default browser settings are used (i.e., the initial settings after Windows or another browser is installed) – this is important especially for the cookies and JavaScript settings
   - The security settings for the **Local intranet** are set to **Medium-Low (Tools | Internet Options | Security tab)**, otherwise installations using ClickOnce technology will be blocked by Windows security

     To facilitate installations using ClickOnce technology, you can install the DELMIA Apriso Self-Signed certificate (Available for download from **DELMIA Apriso Start | Set up DELMIA Apriso Client**) in both of the following locations:

     - **Trusted Publishers** local machine store catalog – to prevent the “Unknown Publisher” warning during installation.
     - **Trusted Root Certification Authorities** local machine store catalog – to remove any security warnings during installation.

     For more information, refer to the Microsoft Docs.

   - The "Protected Mode" for **Local intranet** is not used (set in the **Tools | Internet Options | Security** tab), as the “Protected Mode” causes Maintenance and Monitoring screens not to load
4. If you want to be able to access DELMIA Apriso using multiple browser instances, make sure the session is not shared. For more information, refer to the specific browser documentation.
5. If you are using a proxy configuration, make sure the DELMIA Apriso Server you are connecting to, is added to the exceptions list (details are described in the DELMIA Apriso

Administration Guide, *Connectivity Problems due to Proxy Configuration* section), otherwise installations using ClickOnce technology will fail.

6. Make sure the **time** translation (represented in UTC) between your client machine and the DELMIA Apriso Application Server is less than **10 minutes**, otherwise DELMIA Apriso Maintenance and Monitoring screens will fail to load. This is due to a WCF security mechanism which does not allow information signed by a security certificate to be older than the specified time span. This configuration may be changed, but both DELMIA Apriso and Microsoft advise against doing so.

7.3 DELMIA Apriso Client Components

The components available to be installed on the DELMIA Apriso Client machine are described below.

The components differ in terms of the rights required to install them on a local machine, as well as their availability to other users once installed:

Component	Are admin rights required?	Will it be available to other users?
DELMIA Apriso Client	Yes	Yes
DELMIA Apriso Desktop Client (ClickOnce)	No	No
DELMIA Apriso Desktop Client Launcher	Yes	Yes
DELMIA Apriso Process Builder (ClickOnce)	No	No
DELMIA Apriso Global Process Manager (ClickOnce)	No	No
DELMIA Apriso Archiving (ClickOnce)	No	No
DELMIA Apriso MPI Excel Add-In (ClickOnce)	No	No
DELMIA Apriso MPI RAP Data Integrator (ClickOnce)	No	No

7.3.1 DELMIA Apriso Client

Components

The DELMIA Apriso Client (an MSI package) consists of the following sub-components:

- **Report Development Files** – enable special features offered by DELMIA Apriso Reporting Framework that can be used in reports (like custom functions for localization or UTC conversions). Installing the files is recommended on a machine where reports are to be designed. For detailed information on DELMIA Apriso Reporting Framework, refer to the

Reporting Framework – Crystal Reports Technical Guide or Reporting Services – MS Reporting Services Technical Guide.

- **Client Machine Integrator** – the Machine Integrator service that runs on the client machine and can connect and interface with machines connected directly to the local client machine. This is required for RS devices connected to the client machine for processes that directly communicate with a machine while interacting with the end-user. Please refer to the Machine Integrator Implementation Guide for details relating to this configuration.
- **DELMIA Apriso Global Process Manager** – this application, described in 7.3.4 DELMIA Apriso Global Process Manager (ClickOnce), additionally enables command line mode operation from the location in which it is installed. Installation of this version of Global Process Manager is recommended for administrators who manage bulk deployments.

General Installation Information

> The DELMIA Apriso Client is intended to be used with the specific version of DELMIA Apriso for which it was designed. All of the previous versions of the DELMIA Apriso Client must be uninstalled before installing any new version. Exceptions will be stated in the Release Notes document accompanying the Service Packs with which the new DELMIA Apriso Client is available. When a Service Pack is delivered that impacts client components, new files must be deployed on each client machine! Detailed instructions will be delivered with Service Packs.

> The DELMIA Apriso Client cannot be installed on a machine where the DELMIA Apriso Server is already present!

The Machine Integrator service (DELMIA Apriso Machine Connector) should be found running under the Windows services (**Computer Management | Services and Applications | Services**).

After a successful installation, the DELMIA Apriso Client will be visible under the Windows' Add/Remove Programs. Removal of the installation can be performed there.

Standard Installation

Perform the following steps to install the DELMIA Apriso Client files:

1. Go to the DELMIA Apriso Start page | **Set Up DELMIA Apriso Client**.
2. In the **Desktop Client Components** section, click the **DELMIA Apriso Client** link to install DELMIA Apriso Client 2021 on your computer. The DELMIA Apriso 2021 Client installation wizard will open.

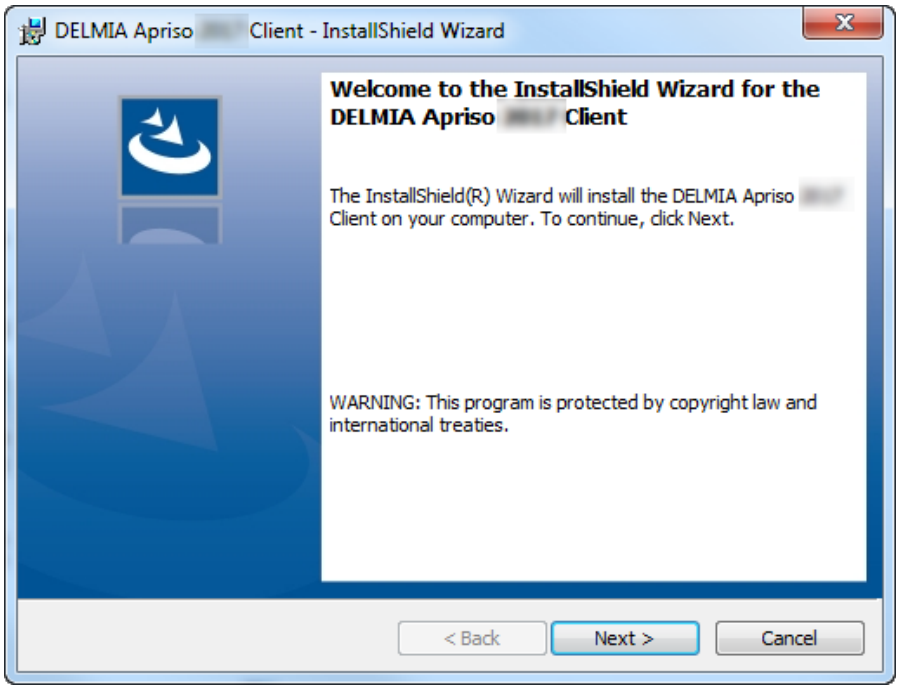

Figure 32 DELMIA Apriso Client – Welcome screen

3. Click **Next**.
4. On the **Setup Type** screen, choose either a **Complete** or **Custom** installation:
   - **Complete** installation will automatically install all of the components to the default location (`<drive>\Program Files\Dassault Systemes\DELMIA Apriso 2021`)
   - **Custom** installation allows for the modification of the components to be installed and their installation directory

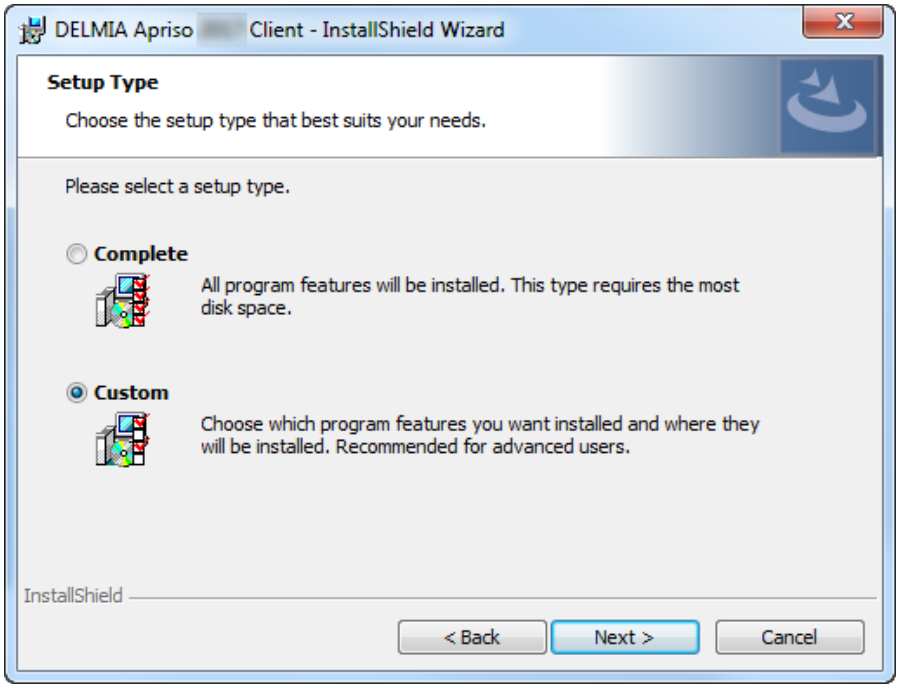

Figure 33 DELMIA Apriso Client – Setup Type screen

5. Click **Next**. When the Custom setup type was selected the Custom Setup screen appears.

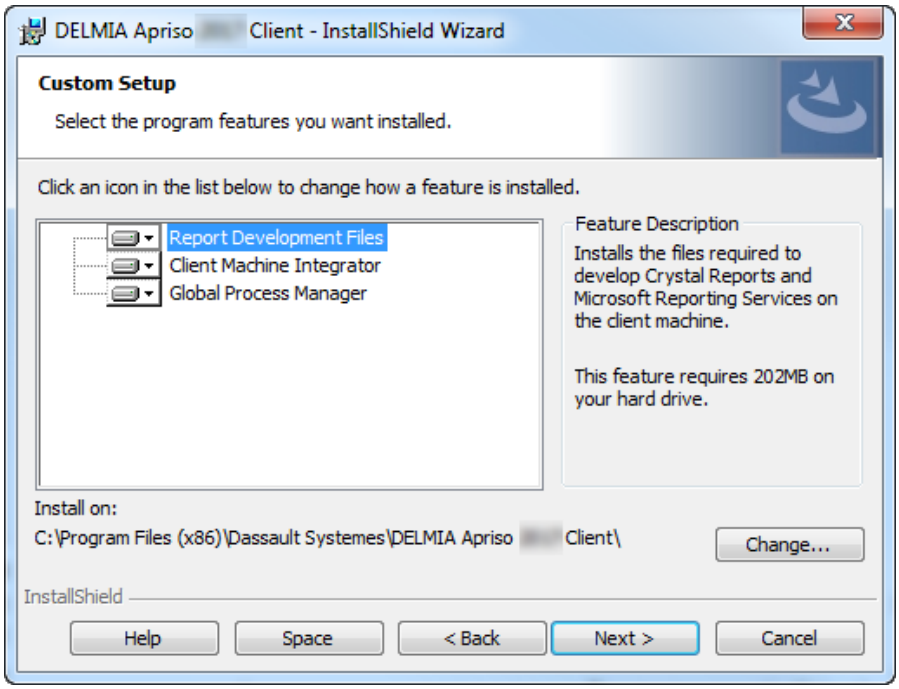

Figure 34 DELMIA Apriso Client – Custom Setup screen

When the **Client Machine Integrator** feature is selected, an additional screen is presented that allows for providing the additional configuration settings required by Machine Integrator.

6. Click **Next**.
7. Enter the server name that publishes the **Central Configuration** files (e.g., myserver01), as each client machine must be connected to the operating DELMIA Apriso instance.

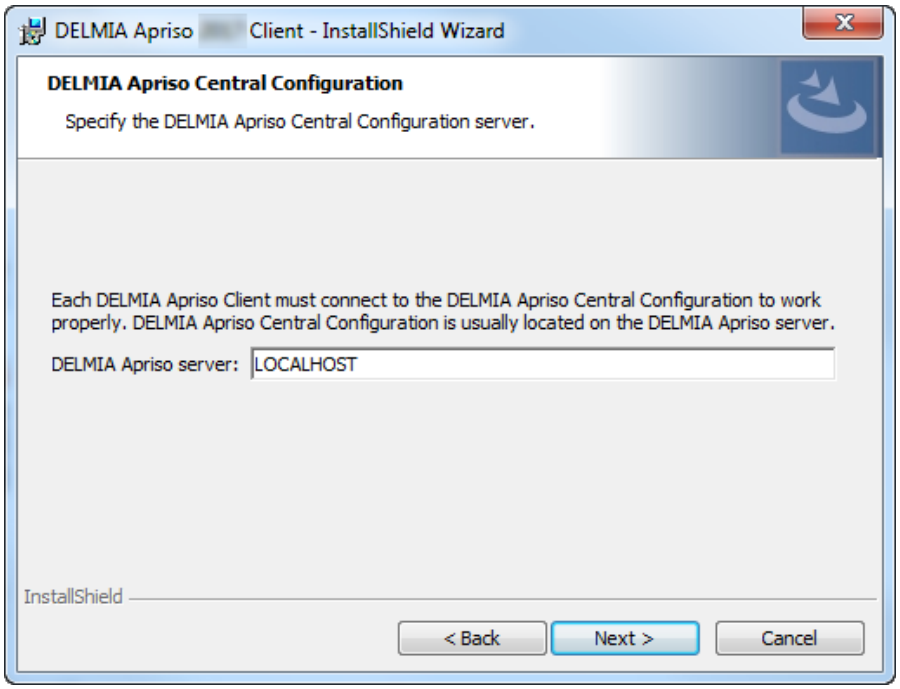

Figure 35 DELMIA Apriso Client – DELMIA Apriso Central Configuration screen

8. Enter the Machine Integrator **Instance name** (e.g., Production\connector1) as every Machine Integrator instance must by uniquely identified in the data acquisition hierarchy.

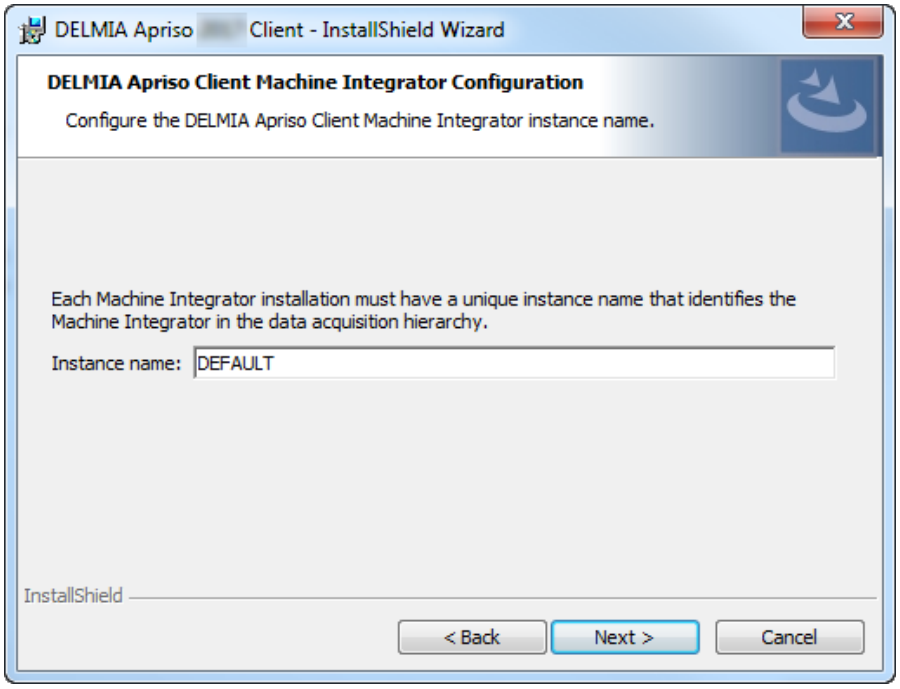

Figure 36 DELMIA Apriso Client MI Configuration screen – Instance name

> You can modify the above settings later in the configuration files. For details refer to Machine Integrator Implementation Guide.

9. Click **Next**.

10. Select the Machine Integrator storage type.

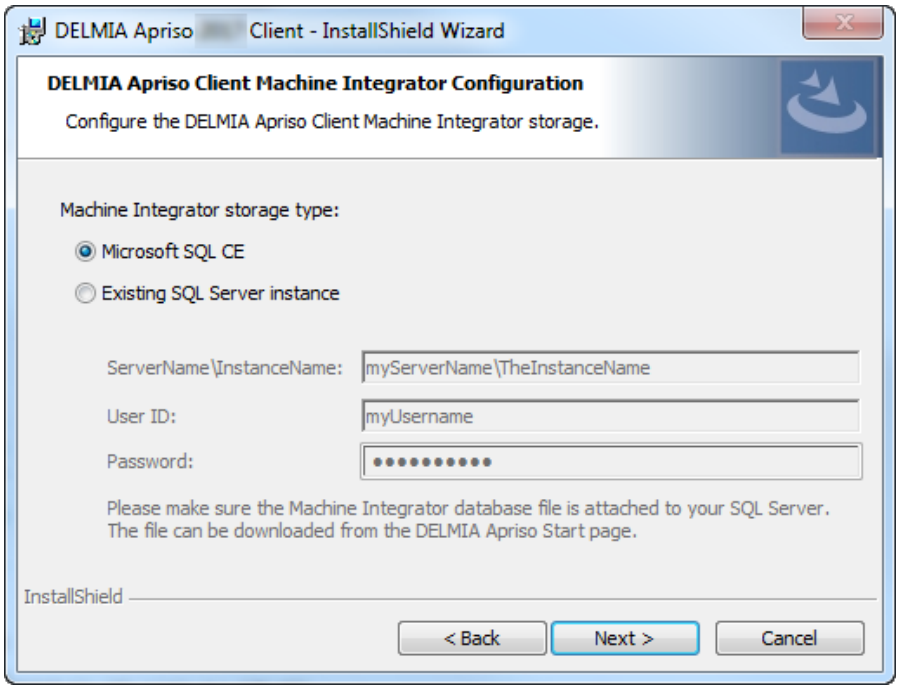

Figure 37 DELMIA Apriso Client MI Configuration screen – MI storage type

There are two possible options:

- **Microsoft SQL CE** – a local database will be created in `<drive>\Program Files\Dassault Systemes\DELMIA Apriso 2021\Services\Machine Integrator Service\` after the first run of Client Machine Integrator
- **Existing SQL Server instance** – to use this option:
  - Attach the `MachineIntegrator.mdf` file to the existing SQL Server (in order to download the file go to the **Desktop Client Components** section in the DELMIA Apriso Start page **| Set Up DELMIA Apriso Client** and click the **Tools and File Packs** link. The Machine Integrator Database link is available in the Installation and Configuration section).
  - Manually specify the InstanceName, UserID, and Password for the MI configuration

> When using an existing SQL Server Instance, the following database server versions are supported:
> **Microsoft SQL Server 2019** (only 64-bit) (minimum SQL Express Edition)
> **Microsoft SQL Server 2017** (only 64-bit) (minimum SQL Express Edition)
> The latest Service Pack and Cumulative Update are required.

> Make sure that the user that starts SQL Service has write access to the `<drive>\Program Files\Dassault Systemes\DELMIA Apriso 2021\Services\Machine Integrator Service` folder.

11. Click **Next**.

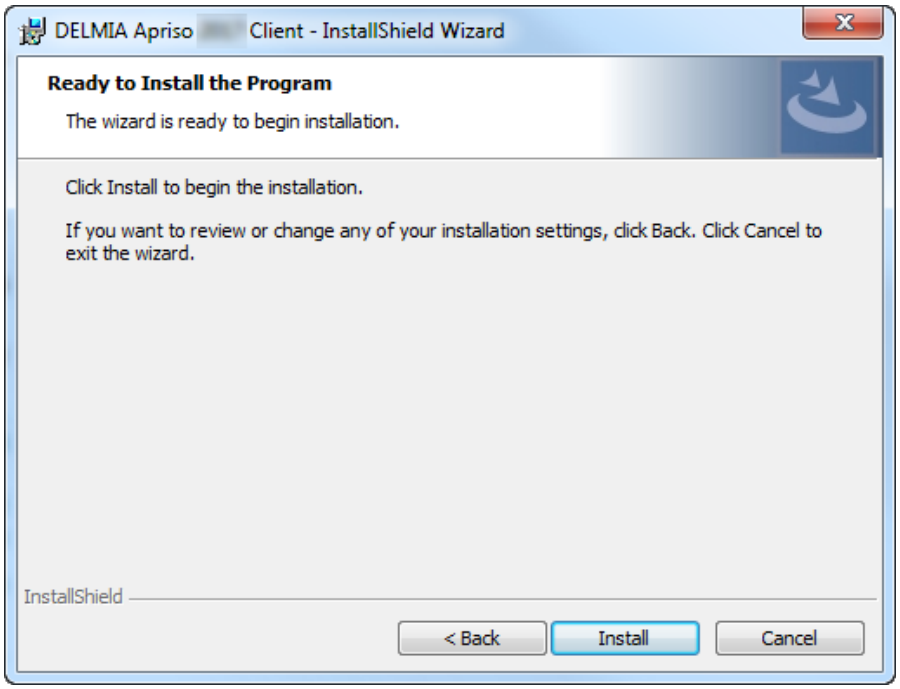

Figure 38 DELMIA Apriso Client – Ready to Install the Program screen

12. Click **Install** on the **Ready to Install the Program** screen. Wait until the process of installation ends and the **Install Wizard Completed** screen appears.
13. Click **Finish**.
14. Choose **Yes** when prompted to restart the machine or **No** if you either plan to restart it later or want to run the Machine Integrator service manually.

Silent Mode Installation

It is possible to install the DELMIA Apriso Client using the command line (silent/quiet) mode. The syntax is the following:

```
setup.exe /s /v"[PARAMETERS] /qb"
```

The DELMIA Apriso Client-specific setup parameters are:

- APRISOSERVER – required for all features
- INSTANCENAME – required when LocalMachineIntegrator was selected
- STORAGETYPE={SQLSERVER|SQLCE} – required when LocalMachineIntegrator was selected
- SQLINSTANCENAME – required when LocalMachineIntegrator was selected with STORAGETYPE set to SQLSERVER
- SQLUSERID – required when LocalMachineIntegrator was selected with STORAGETYPE set to SQLSERVER
- SQLPASSWORD – required when LocalMachineIntegrator was selected with STORAGETYPE set to SQLSERVER
- REPLACE – allows reinstalling currently installed DELMIA Apriso Client. If set to 1, the DELMIA Apriso Client is reinstalled, if set to 0, the reinstallation will not be started.

Some general setup parameters useful for DELMIA Apriso Client are:

- INSTALLDIR – overrides the default installation path (`<drive>\Program Files\Dassault Systemes\DELMIA Apriso 2021`) with a custom one
- ADDLOCAL=...
  - CommonFiles (required element for all options)
  - CrystalReportsDevelopmentFiles
  - LocalMachineIntegrator + {LocalMachineIntegrator32 or LocalMachineIntegrator64}
  - GlobalProcessManager

> For a full list of the parameters available for the Windows installer, refer to Microsoft Docs.

Installing the DELMIA Apriso Client with MI (SqlCE as a storage)

ADDLOCAL=CommonFiles,LocalMachineIntegrator,
{LocalMachineIntegrator32/LocalMachineIntegrator64}

APRISOSERVER={DELMIA Apriso Server HostName}

INSTANCENAME={Machine Integrator unique instance name}

STORAGETYPE=SQLCE

Installing the DELMIA Apriso Client with MI (existing Sql Server Instance as a storage)

ADDLOCAL=CommonFiles,LocalMachineIntegrator,
{LocalMachineIntegrator32/LocalMachineIntegrator64}

APRISOSERVER={DELMIA Apriso Server HostName}

INSTANCENAME={Machine Integrator unique instance name}

STORAGETYPE=SQLSERVER

SQLINSTANCENAME={instanceName}

SQLUSERID={userId}

SQLPASSWORD={userPassword}

Installing the DELMIA Apriso Client with CrystalReports

ADDLOCAL=CommonFiles,CrystalReportsDevelopmentFiles

APRISOSERVER={DELMIA Apriso Server HostName}

Installing the DELMIA Apriso Client with GPM

ADDLOCAL=CommonFiles,GlobalProcessManager

APRISOSERVER={DELMIA Apriso Server HostName}

An Example

Installing the client Machine Integrator (attaching to existing SqlServer) on a 64-bit machine:

```
setup.exe /s /v"ADDLOCAL=CommonFiles,LocalMachineIntegrator,LocalMachineIntegrator64
APRISOSERVER=AprisoServer INSTANCENAME=AprisoInstanceName STORAGETYPE=SQLSERVER
SQLINSTANCENAME=myServerName\myInstanceName SQLUSERID=myUsername SQLPASSWORD=myPassword
/qb"
```

Remote Installation on Multiple Machines

It is possible to install/uninstall or update the DELMIA Apriso Client remotely on multiple machines by configuring and executing the script available on the **DELMIA Apriso Server Configuration page | Access Tools and File Packs | Installation and Configuration | DELMIA Apriso Client Batch Deployment Script**.

You will find the prerequisites and detailed usage information in the `ReadMe.txt` file within the script package.

7.3.2 DELMIA Apriso Desktop Client (ClickOnce)/Launcher

Overview

The **DELMIA Apriso Desktop Client** is a standalone application used for launching M&M screens and other DELMIA Apriso screens such as Standard Operations. This application is an alternative to the DELMIA Apriso Portal for supervisors, back-office users, and engineers who use Windows desktop computers.

The application allows the user to easily find screens and define a list of favorite screens, and it incorporates other useful features to speed up and simplify the use of M&M screens and other FlexParts. For more information on the application, please refer to its Help.

The **DELMIA Apriso Desktop Client Launcher** is a supplement for the application that registers the DELMIA Apriso protocol (`apriso://`) allowing to launch FlexPart links with the use of the main application linked to the designated server. Both applications are required to fully integrate with DELMIA Apriso infrastructure.

Launcher Installation

The **DELMIA Apriso Desktop Client Launcher** is installed on a per machine basis and will be available to all users who log in to the given computer.

Perform the following steps to install the **DELMIA Apriso Desktop Client Launcher:**

1. Go to the DELMIA Apriso Start page **| Set Up DELMIA Apriso Client**.
2. In the **Prerequisites** section, click the **DELMIA Apriso Desktop Client Launcher** link to initiate the setup wizard that will guide you through the rest of the installation.

After the installation is successful, launching any Maintenance and Monitoring screen from DELMIA Apriso Portal or using any FlexPart link will result in triggering the **DELMIA Apriso Desktop Client installation** (if not already installed).

Launcher Batch Deployment/Installation

Batch Installation of the **DELMIA Apriso Desktop Client Launcher** is performed via the Group Policy Management console (Administrative Tools) in Windows.

Make sure client machines have the required .NET Framework installed prior to the installation (see 2.4 Software Requirements for the Client Machines). Then download the `AprisoDesktopClientLauncher.exe` from the DELMIA Apriso Start page.

To have **DELMIA Apriso Desktop Client** automatically installed (via ClickOnce) pass the URL parameter with ClickOnce application URL, e.g:

```
AprisoDesktopClientLauncher.exe /s /v"URL=http://<server
name>/apriso/Downloads/MMClient/AprisoDesktopClient.application /qb"
```

Also, please consider adding DELMIA Apriso certificate to trusted publishers to simplify the ClickOnce installation (and prevent displaying any dialog windows during the process).

Application Installation

Perform the following steps to install the DELMIA Apriso Desktop Client (ClickOnce):

1. Go to the DELMIA Apriso Start page **| Set Up DELMIA Apriso Client**.
2. In the **Desktop Client Components** section, click the **DELMIA Apriso Desktop Client (ClickOnce)** link to initiate the installation (Figure 39 Running the application installation (ClickOnce)).
3. Alternatively the application installation can also be triggered from the DELMIA Apriso Portal using any Menu Item linked to a FlexPart (e.g. M&M screen).

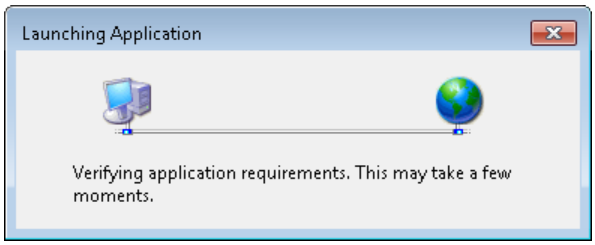

Figure 39 Running the application installation (ClickOnce)

4. Click **Install** on the Security Warning screen (Figure 40 Application installation – Security Warning (ClickOnce)).

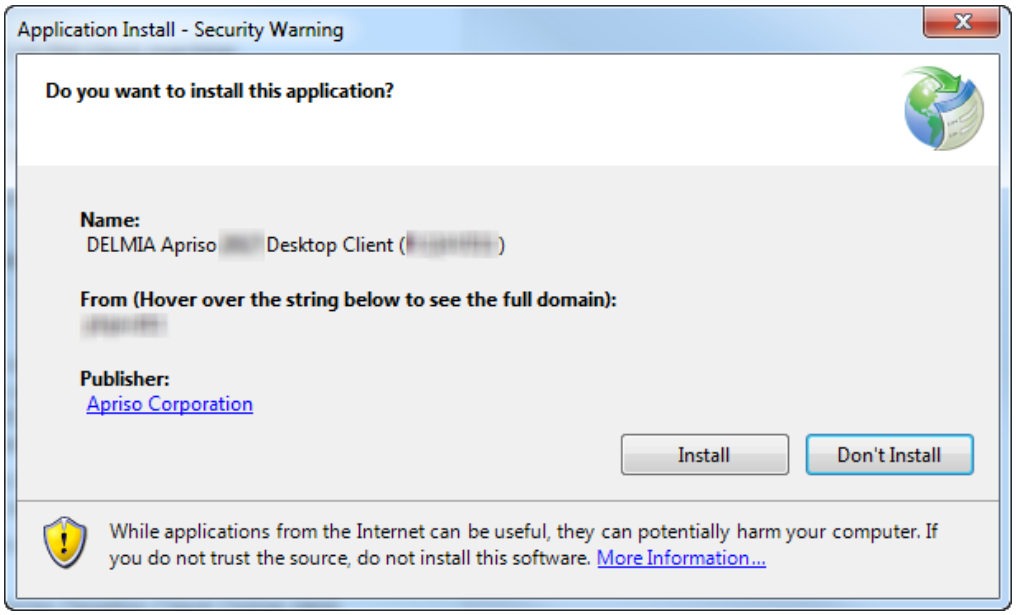

Figure 40 Application installation – Security Warning (ClickOnce)

When the installation completes the application will be opened and you will be asked to logon.

Once installed, DELMIA Apriso Desktop Client can be accessed from the Windows Start menu.

7.3.3 DELMIA Apriso Process Builder (ClickOnce)

DELMIA Apriso Process Builder delivers an improved Process modeling, maintenance, and testing experience for Process Engineers. It offers a global view of and easy access to all the levels of a Process for visualization and modification. The three perspectives available are: "Flow" for Functional Engineers, "Screen Flows Designer" for Technical Engineers, and "Test Run" for the testing needs of both user types. Thanks to enhanced support for reusability, logic that was previously developed in the form of Steps and Operations can now be quickly reused in new Processes. In addition, Processes can now be easily parameterized through the unified linking of business entities (e.g., documents, components, characteristics, specifications, and resources) to their various levels. For more information on the application, refer to the Process Builder Help.

The Process Builder installation procedure is similar to the one described for the 7.3.2 DELMIA Apriso Desktop Client (ClickOnce)/Launcher (Application Installation). Before installing, make sure the software requirements are met (see 2.4 Software Requirements for the Client Machines).

Once installed, the Start menu item name will contain the origin server name in order to inform the user of the server version with which the application is synchronized.

7.3.4 DELMIA Apriso Global Process Manager (ClickOnce)

DELMIA Apriso Global Process Manager is an application developed to allow for the full deployment of DELMIA Apriso solutions, regardless of their customization level. With use of this application deploying is fast, manageable, and reliable, with support for single- and multi-production server environments. For more information on the application, refer to the Global Process Manager Help available at the application level.

> The SQL Server Client and/or Oracle Database Client (in the versions described in 2.3.3 Oracle 12c Environments) installed on a machine where the Global Process Manager service is running (application server) are required as a prerequisite (it uses these components to deploy SQL scripts and Stored Procedures).

The Global Process Manager installation procedure is similar to the one described for the 7.3.2 DELMIA Apriso Desktop Client (ClickOnce)/Launcher (Application Installation). Before installing, make sure the software requirements are met (see 2.4 Software Requirements for the Client Machines).

Once installed, Global Process Manager is accessed from both the Windows Start menu and Apriso Classic Portal menu item.

> Apriso Classic Portal has been deprecated.

7.3.5 DELMIA Apriso Archiving (ClickOnce)

Databases can grow in size as new information is added and older, unused data is not removed. Database growth leads to serious maintenance and performance problems. DELMIA Apriso Archiving helps to eliminate these problems by maintaining a database at a constant size and, at the same time, a constant, high level of functionality. For more information on the application, refer to the Archiving Help available at the application level.

The DELMIA Apriso Archiving installation procedure is similar to the one described for the 7.3.2 DELMIA Apriso Desktop Client (ClickOnce)/Launcher (Application Installation). Before installing, make sure the software requirements are met (see 2.4 Software Requirements for the Client Machines).

Once installed, DELMIA Apriso Archiving is accessed from the Windows Start menu.

7.3.6 DELMIA Apriso MPI Excel Add-in (ClickOnce)

The DELMIA Apriso MPI Excel Add-in is used to display Cube information on a pivot grid or chart. The add-in makes it possible to share report documents with use of Cube View Repository and to open them in Microsoft Excel or inside the browser's window.

The prerequisites for installing the DELMIA Apriso MPI Excel Add-in can be found in the MPI Installation Guide. For further details, refer to the MPI Excel Add-in Help.

7.3.7 DELMIA Apriso MPI RAP Data Integrator (ClickOnce)

The DELMIA Apriso MPI Reporting Analytics Platform Data Integrator is a part of Manufacturing Process Intelligence (MPI), used to author ETL packages, configure and deploy data integration between Source and Destination Databases. ETL packages created by RAP DI are compliant with Microsoft SQL Server Integration Services and can be deployed and executed on this platform.

For full functionality, including generation and deployment of ETL packages, RAP DI requires installation of prerequisites and additional third party components. The user will be prompted to download them when needed. For more information on the application, refer to the RAP Data Integrator Help.

Before installing, make sure the software requirements are met (see MPI Installation Guide).

8 Upgrading an Existing DELMIA Apriso Installation

Upgrading DELMIA Apriso means:

- Upgrading the DELMIA Apriso Application Server
- Upgrading the DELMIA Apriso Database Server
- Synchronizing the above two
- Upgrading the DELMIA Apriso Client

Additionally, there are multiple questions that need to be answered when planning an upgrade, such as:

- From which DELMIA Apriso version are you upgrading?
- Do you need/want to upgrade your OS/DBMS system?
- Do you have any custom or Solution Engineering solution present in your system?

All the above, plus the possible mix of scenarios, makes the upgrade process extremely complex. Due to this fact, Dassault Systèmes does not deliver any upgrade documentation with the product, but advises you to use the DELMIA Apriso Upgrade Guide available **only** on 3DS Support page.

Dassault Systèmes also recommends contacting Support whenever your scenario is not covered in the Upgrade Guide or if you have doubts regarding any information contained there.

9 Appendices

9.1 Appendix A: Specification of Windows Services Created by the DELMIA Apriso Setup

The description of Services created by the DELMIA Apriso Setup is available in the Configuration Manager Help (Services tab).

9.1.1 Security of DELMIA Apriso Services

DELMIA Apriso uses Windows Communication Foundation (WCF), which allows for communication between DELMIA Apriso components. One of the possibilities offered by WCF is secure data transmission.

For details on configuring and securing DELMIA Apriso Services, please refer to Security Implementation Guide.

9.2 Appendix B: Third-Party Licenses for DELMIA Apriso

This appendix lists the third-party licenses that may be required for DELMIA Apriso, summarizing and extending the list of critical ones from 2 Verifying the Prerequisites for the Installation. Please use this as a reference when estimating the full cost of the DELMIA Apriso solution implementation. Work with your implementation partner and/or Dassault Systèmes Services to determine the licenses required.

Hardware:

- DELMIA Apriso Database Server and Application Server
- OPC Server (for Machine Integrator)
- PI System server (for Machine Integrator)
- Label printing server hardware
- Interface broker server
- RFID Server
- Archiving server
- COE Server

Supplementary software licenses for optional modules:

- Database licenses
- OPC Server licenses
- PI System licenses
- Label designer licenses (label spooling software licenses)
- Interface broker licenses
- RFID software licenses
- Crystal Reports license (if needed, for customizing and building new reports only)
  - See Reporting Framework – Crystal Reports Technical Guide for details

- DevExpress XtraReports Suite (if needed, for customizing and building new reports only)

9.3 Appendix C: DELMIA Apriso in the Cloud

This appendix contains general information and recommendations for deploying DELMIA Apriso in the Cloud.
DELMIA Apriso can work in the Cloud model under the following assumptions:

- The 9.3.5 Infrastructure as a Service (IaaS) model is used
- The connection between the plant and the Cloud is secured properly
- Virtualization solutions are used

9.3.1 Available Cloud Service Models

This chapter contains information about Cloud service models that are available on the market and a short description of the model supported by DELMIA Apriso.

9.3.2 Comparison of Service Models

There are different service models for Cloud computing. The table below contains simple comparison of available options.

Name	Consumer	Provided Cloud Service	Service Provider Responsibilities
Software as a Service (SaaS)	End user	▶ Ready-to-use application	▶ Application availability and performance
Platform as a Service (PaaS)	Application owner	▶ Environment to run the application code ▶ Storage ▶ Other Cloud services	▶ Environment availability and performance
Infrastructure as a Service (IaaS)	Application owner or IT	▶ Virtual server ▶ Storage	▶ Virtual server availability ▶ Provisioning time

The subsequent sections provide more information on the presented models.

9.3.3 Software as a Service (SaaS)

In this model, the consumer uses the service provider's applications that are running on a Cloud infrastructure. The access to the applications is possible through a thin client interface (for example a web browser) from client devices.

The infrastructure and IT operational functions are controlled and managed by the service provider. It includes elements such as network, servers, operating systems, and application capabilities.

This model offers minimal customization possibilities in exchange for shifting the operational risks to the service provider.

9.3.4 Platform as a Service (PaaS)

In this model, the consumer deploys their applications in the Cloud infrastructure maintained by the service provider. The deployed applications must be created using tools and languages supported by the service provider.

The service provider manages and controls elements such as network, servers, operating systems, and storage. The consumer controls only the deployed applications and the configuration of their hosting environment.

This model offers a high level of application customization, but within the limitations of the provided service. Because of those constraints, some applications may need to be rewritten.

9.3.5 Infrastructure as a Service (IaaS)

In this model, the consumer deploys and runs software, such as operating systems and applications, on the computing resources maintained by the service provider.

The service provider manages and controls the physical infrastructure. The consumer controls operating systems, storage, deployed applications, and, to some extent, networking components.

This model offers maximal customization possibilities in exchange for shifting to the consumer the operational risk that exists above the infrastructure.

> For detailed information about the Cloud service and deployment models, refer to the article titled available at *What is Infrastructure as a Service?* at Microsoft Docs.

9.3.6 Cloud Service Model Supported by DELMIA Apriso

From all of the service models described above, DELMIA Apriso 2021 supports the 9.3.5 Infrastructure as a Service (IaaS) model. The IaaS infrastructure can be provided by any 3rd party vendor that supports VMWare or Hyper-V virtualization, for example Microsoft Azure or Amazon EC2. More information about DELMIA Apriso support for Virtualization can be found in 9.4 Appendix D: DELMIA Apriso Virtualization Support Statement.

9.3.7 Proposed Architecture

The proposed architecture for DELMIA Apriso deployed in the Cloud is presented in the diagram below.

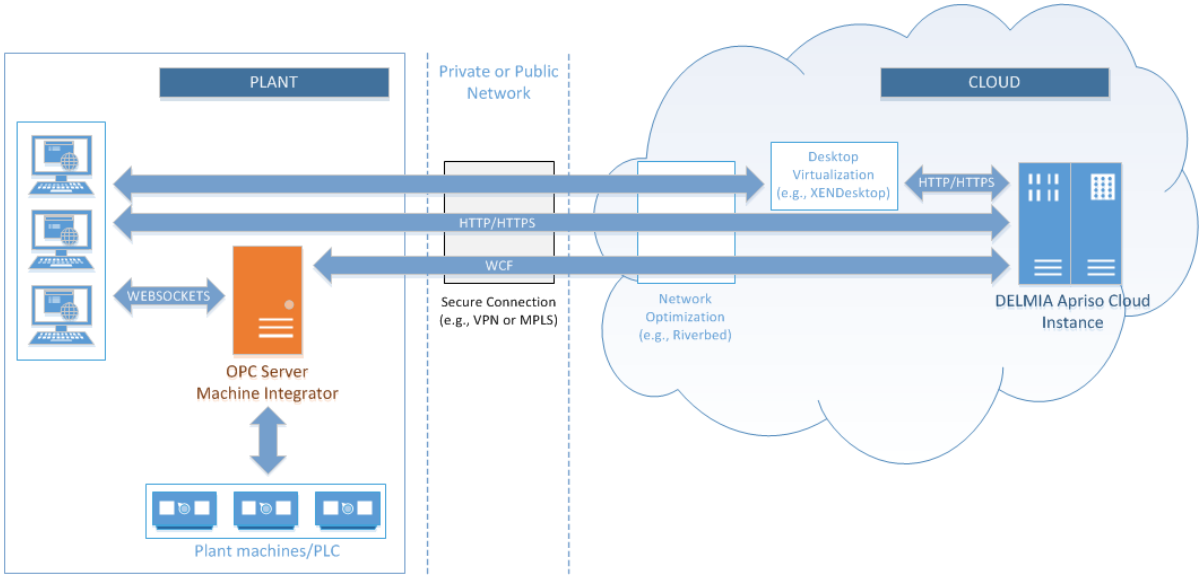

Figure 41 DELMIA Apriso installed in the IaaS Cloud

Although, it is possible to use one DELMIA Apriso Cloud instance for multiple plants (this model is supported, but with limitations), usually one DELMIA Apriso instance is used for only one plant.

Client machines and the OPC Server with Machine Integrator (MI) are located in the plant. The majority of DELMIA Apriso implementations require the MI layer to be deployed locally in the plant.

In the architecture presented above, the Application Server, Web Server, and Database Server are located in a private Cloud. Additionally, the entire communication is performed over a secured channel.

Depending on network capabilities, additional solutions, such as Desktop Virtualization and Network Optimization, can be used in order to improve service efficiency and user experience.

9.3.8 Recommendations

The Cloud architecture is dependent on the technical capabilities of the Cloud service provider and the consumer. Therefore, every deployment is a different scenario that should be handled by the customer. Dassault Systèmes does not provide detailed recommendations or prerequisites in this area.

> If in your deployment Machine Integrator is going to process a lot of data, you must ensure efficient connection bandwidth and latency for the data processing.

9.3.9 DELMIA Apriso Requirements

To ensure proper communication between the plant and the Cloud, the TCP/IP ports described in 2.6 Other Prerequisites and Configurations to be done before the Installation (step 8) must be open.

9.4 Appendix D: DELMIA Apriso Virtualization Support Statement

Dassault Systèmes continuously investigates and evaluates industry and technology trends to ensure appropriate technical support for our customers. Many Dassault Systèmes customers have implemented, or are considering implementing virtual environments as a way to reduce costs and provide greater flexibility for their DELMIA Apriso implementations. Thus far, Dassault Systèmes has had no issues resulting from customers running DELMIA Apriso software in a virtual environment utilizing VMware or MS Hyper-V. However, there are guidelines and best practices Dassault Systèmes is now observing and recommends in order to maximize performance while minimizing potential performance issues of your DELMIA Apriso deployments. These points are summarized in this statement of technical support.

This appendix covers the following topic:

VMware ESX/ESXi Server and MS Hyper-V Server support for DELMIA Apriso in production

9.4.1 Details

Dassault Systèmes continually strives to meet our client's diverse and ever-changing needs. The suite of DELMIA Apriso software products provides support and integrates with many of today's leading IT platforms, operating systems and applications deployed across our client's manufacturing IT enterprises.

Many of our clients are running applications and operating systems under VMware or MS Hyper-V. Those clients that elect to pursue this deployment strategy are expected to follow the guidelines outlined in this Statement of Technical Support in order to reap the full potential of their VMware or MS Hyper-V deployment.

Dassault Systèmes makes extensive use of VMware and MS Hyper-V during the development process of DELMIA Apriso updates, as well as within internal IT and support organizations to create and test various Windows environments for compatibility and other purposes. Dassault Systèmes is not aware of any specific issues with DELMIA Apriso Software Products and VMware or MS Hyper-V.

In the context of this statement, DELMIA Apriso Software Products include:

Product	Running on
FlexNet 9.4.2	VMware ESX 3.0
FlexNet 9.5/MPI 2.1	VMware ESX 4.0
FlexNet 9.6/MPI 2.1 or 3.0	VMware ESXi 5.1+ MS Hyper-V version that comes with the supported Windows Server version
Apriso 9.7/MPI 4.0	VMware ESXi 5.1+

	MS Hyper-V version that comes with the supported Windows Server version
DELMIA Apriso 2016	VMware ESXi 5.1+ MS Hyper-V version that comes with the supported Windows Server version
DELMIA Apriso 2017	VMware ESXi 5.1+ MS Hyper-V version that comes with the supported Windows Server version
DELMIA Apriso 2018	VMware ESXi 5.5+ MS Hyper-V version that comes with the supported Windows Server version
DELMIA Apriso 2019	VMware ESXi 5.5+ MS Hyper-V version that comes with the supported Windows Server version
DELMIA Apriso 2020	VMware ESXi 6.5+ MS Hyper-V version that comes with the supported Windows Server version
DELMIA Apriso 2021	VMware ESXi 6.5+ MS Hyper-V version that comes with the supported Windows Server version

While we expect Dassault Systèmes products to function properly in virtual environments, there may be performance ramifications, which could invalidate Dassault Systèmes' typical sizing and recommended setting guidelines. Analysis must be performed in the context of the specific application to be hosted in a virtual environment in order to minimize potential resource contention, which can have significant impact on performance and scalability, particularly under peak loads. Dassault Systèmes offers Performance Tuning services to help with this analysis, and highly recommends the implementation of these services prior to undertaking any potential VMware or MS Hyper-V virtualization deployment.

In order to facilitate a quick resolution and root cause to any potential Dassault Systèmes product issue encountered under VMware or MS Hyper-V, Dassault Systèmes has established some basic guidelines for supporting DELMIA Apriso software in a VMware or MS Hyper-V environment:

- All versions and configurations of applications and operating systems running under VMware or MS Hyper-V must comply with the versions specified by DELMIA Apriso support.
- The client is responsible for properly configuring their virtual machine and applications for VMware or MS Hyper-V.

- While Dassault Systèmes does not insist that clients recreate each issue without VMware or MS Hyper-V before contacting support, we reserve the right to request the client diagnose and troubleshoot specific issues without the VMware or MS Hyper-V "variable." This will only be done where we have reason to believe the issue is directly related to VMware or MS Hyper-V.
- In the event that DELMIA Apriso support cannot directly identify the root cause as an DELMIA Apriso, VMware or MS Hyper-V issue, support will ask the client to open a support issue with VMware or Microsoft, as well as any other necessary 3rd party vendors, to expedite the timely and accurate resolution of the issue. At that point, we would expect Dassault Systèmes, VMware or Microsoft, and the client can work together toward a quick and mutually acceptable resolution.

As stated above, there are no known issues running DELMIA Apriso software with VMware or MS Hyper-V. However, these guidelines and best practices are now being observed and are recommended in order to maximize performance while minimizing potential performance issues of your DELMIA Apriso deployments.

10 References

Internal Documentation

1. ***DELMIA Apriso Upgrade Guide***

   A guide to the upgrade process of the DELMIA Apriso solution. It covers the most common scenarios and discusses known issues and configurations in detail. **Please note that this document is only available from the 3DS Support.**

2. ***High Availability Configuration Installation Guide***

   Provides detailed instructions on configuring DELMIA Apriso for high availability environments.

3. ***Database Upgrader Help***

   Provides the background information necessary to use the DELMIA Apriso Database Upgrader (DBU) tool and describes how to carry out common tasks.

4. ***Post-Upgrade Utility Help***

   Provides an overview of DELMIA Apriso Post-Upgrade Utility (PUU), presents the background information on using it, and describes how to carry out common tasks. This Help is intended for users who administer and train on performing basic everyday procedures with the use of Post-Upgrade Utility.

5. ***Business Integrator – Integration Planning Technical Guide***

   Provides the basic guidelines for a System Analyst to determine how to integrate DELMIA Apriso Business Integrator (BI) with an external system using an Integration Broker.

6. ***Business Integrator – External System Integration Analysis Technical Guide***

   Identifies the XML schemas necessary for DELMIA Apriso to integrate with external systems (SAP) using DELMIA Apriso Business Integrator (BI).

7. ***Business Integrator – SAP Business Connector Configuration Guidelines Technical Guide***

   Covers the creation of SAP IDOC XML schemas, modification of DELMIA Apriso Business Integrator (BI) Integration settings, and configuration of the SAP Business Connector.

8. ***Business Integrator – Configuration Guidelines Technical Guide***

   Provides the information required to configure DELMIA Apriso Business Integrator (BI), which enables adjusting the standard DELMIA Apriso configuration (installed) to custom configuration requirements.

All the internal documents referenced in this section are available from the DELMIA Apriso Start page, which can be accessed on your DELMIA Apriso server (<server name>/apriso/start). The newest versions of all documents are available from 3DS Support at: https://www.3ds.com/support/documentation/

9. ***XML Schema Builder Help***

   Provides the information required by a Schema Designer to use DELMIA Apriso XML Schema Builder in order to design and construct the DELMIA Apriso XML Schemas necessary for interfacing with external systems and to populate the transaction history for reporting purposes.

10. ***Portal Implementation Guide***

    Provides an overview of the DELMIA Apriso Portal and the Apriso Classic Portal along with the background information on understanding their roles, capabilities, and customization.

11. ***Machine Integrator Implementation Guide***

    Provides an overview of DELMIA Apriso Machine Integrator (MI), which is used for monitoring machinery on the production floor and, in some cases, steering these machines.

12. ***Reporting Framework – Crystal Reports Technical Guide***

    Provides all the information required by a Programmer using the Reporting Framework with Crystal Reports.

13. ***Reporting Services – MS Reporting Services Technical Guide***

    Provides all the information required by a Programmer using the Reporting Framework with MS SQL Reporting Services.

14. ***Reporting Framework – XtraReports Technical Guide***

    Provides all the information required by a Report Designer using the XtraReports Reporting Framework.

15. ***DELMIA Apriso Administration Guide***

    Describes the administration of the DELMIA Apriso server. Several DELMIA Apriso tools are covered to provide a general overview of their scope.

16. ***Process of Translation Implementation Guide***

    Provides an overview of the translation process as well as background information on translating DELMIA Apriso content and Cube literals. The guide focuses on the localization of operational data in DELMIA Apriso (through use of the DELMIA Apriso Localization Manager and DELMIA Apriso Translation Tool) as well as on translating the user interface data and MODEL data.

17. ***Global Process Manager Help***

    Describes the installation, configuration, and usage of DELMIA Apriso Global Process Manager (GPM). This application enables the full deployment of DELMIA Apriso solutions, regardless of their customization level, with support for both single- and multi-production server environments.

18. ***MPI Installation Guide***

    Provides information on installation of the Manufacturing Process Intelligence (MPI) module. It also specifies prerequisites and describes the basic configuration.

19. ***Process Builder Help***

    Provides an overview of DELMIA Apriso Process Builder (PB) and information on installing and using the application. This Help describes the user interface elements, entity maintenance, available Business Controls, and management of Processes, Operations, and Screen Flows.

20. ***Archiving Help***

    Provides information on using DELMIA Apriso Archiving, which allows users responsible for archiving custom databases to create their own Archiving procedures on the basis of the described tools and examples.

21. ***DELMIA Apriso Mobile Apps Implementation Guide***

    Provides an overview of the DELMIA Apriso mobile apps for Google® Android™ and Apple® iOS. The guide also provides information on where the DELMIA Apriso mobile apps can be installed from, how to configure DELMIA Apriso to work with the apps, and how to use the apps on mobile devices.

22. ***Configuration Manager Help***

    Provides the background information necessary to use the DELMIA Apriso Configuration Manager tool and describes how to carry out common tasks.

23. ***Security Implementation Guide***

    Provides an overview of DELMIA Apriso security and information on effectively securing all instances of DELMIA Apriso.

24. ***RAP Data Integrator Help***

    Describes the features of the Reporting Analytics Platform Data Integrator (RAP DI), explains basic ETL concepts, and guides the user through all the Reporting Analytics Platform Wizard steps.

25. ***MPI Lite Installation Guide***

    Provides information on the installation of the Manufacturing Process Intelligence Lite (MPI Lite) module, which is designed to fulfil manufacturing analytical reporting needs at the plant level.

26. ***Global Traceability Installation Guide***

    Provides information on installation of the Global Traceability (GT) module. It also specifies prerequisites and describes the basic configuration.

27. ***Central Configuration Documentation***

    Describes in detail all the keys of the Central Configuration (CC) file for DELMIA Apriso. Various sections group the keys for individual modules or distinct functional areas.

3DS Support Knowledge Base

If you have any additional questions or doubts not addressed in our documentation, feel free to visit the **3DS Support Knowledge Base** at https://support.3ds.com/knowledge-base/.