IBM TRIRIGA Application Platform 3.7.0

Installation and Implementation Guide

Note

Before using this information and the product it supports, read the information in “Notices” on page 91.

This edition applies to version 3, release 7, modification 0 of IBM® TRIRIGA® Application Platform and to all subsequent releases and modifications until otherwise indicated in new editions.

Contents

Chapter 1. IBM TRIRIGA Application Platform overview

The IBM TRIRIGA Application Platform solution provides organizations with graphical and configuration tools to rapidly configure applications and extend the use and value of the IBM TRIRIGA applications. The use of standards-based technology and interfaces and a high-performance workflow process engine drive interoperability with critical business systems.

The IBM TRIRIGA Application Platform is a runtime environment for the rapid processing of transactions. The platform provides the underlying technology for the IBM TRIRIGA applications and includes the Administrator Console, Document Manager, IBM TRIRIGA Connector for Business Applications for integration with external systems, and linkage to computer-aided design (CAD) applications. The IBM TRIRIGA Application Platform also provides set of browser-based tools that are used to create and modify the applications that IBM TRIRIGA delivers.

The IBM TRIRIGA Application Platform includes an MVC-based UX framework for building UX applications. The model-view-controller (MVC) approach separates the application into three components or layers: the model, view, and controller. The view layer is built upon the Polymer library of reusable web components. With a modular and flexible architecture, the UX framework enables organizations to more easily meet business requirements with an intuitive user interface, compatibility with touch interfaces, and improved performance.

With the IBM TRIRIGA comprehensive solution, you can:

- Configure IBM TRIRIGA applications without changing source code.
- Create regulatory reports in the same environment as daily work processes.
- Reduce time and costs to implement and maintain IBM TRIRIGA applications.
- Deliver applications through consistent portals.
- Protect unique configurations through application upgrades.
- Modify an existing business object along with relevant data field definitions, lifecycle states, and workflows.

Chapter 2. Installing IBM TRIRIGA Application Platform

You use the IBM TRIRIGA Application Platform to run, build, and manage the IBM TRIRIGA applications. Installing the platform involves preparing the application and database servers, verifying the installation, configuring the platform settings, and inspecting log reports for installation issues. IBM TRIRIGA Application Platform can be installed on a variety of platforms. Use this installation information to plan and install IBM TRIRIGA Application Platform in the configuration that suits your environment and your needs.

Overview of hardware configuration

Before you install the IBM TRIRIGA Application Platform, you must determine the platform architecture, server types, and implementation sizes that apply to your business needs.

Platform architecture

Enterprise software applications are n-tier, where "n" can represent any number of tiers, or layers of processing. The IBM TRIRIGA Application Platform is a logical four-tier system: web, application (and process), tools, and database.

The layering of an application into logical tiers also separates the functions in each tier. In terms of physical tiers, each physical tier describes the actual hardware configuration, the pieces of equipment, and the function of each piece.

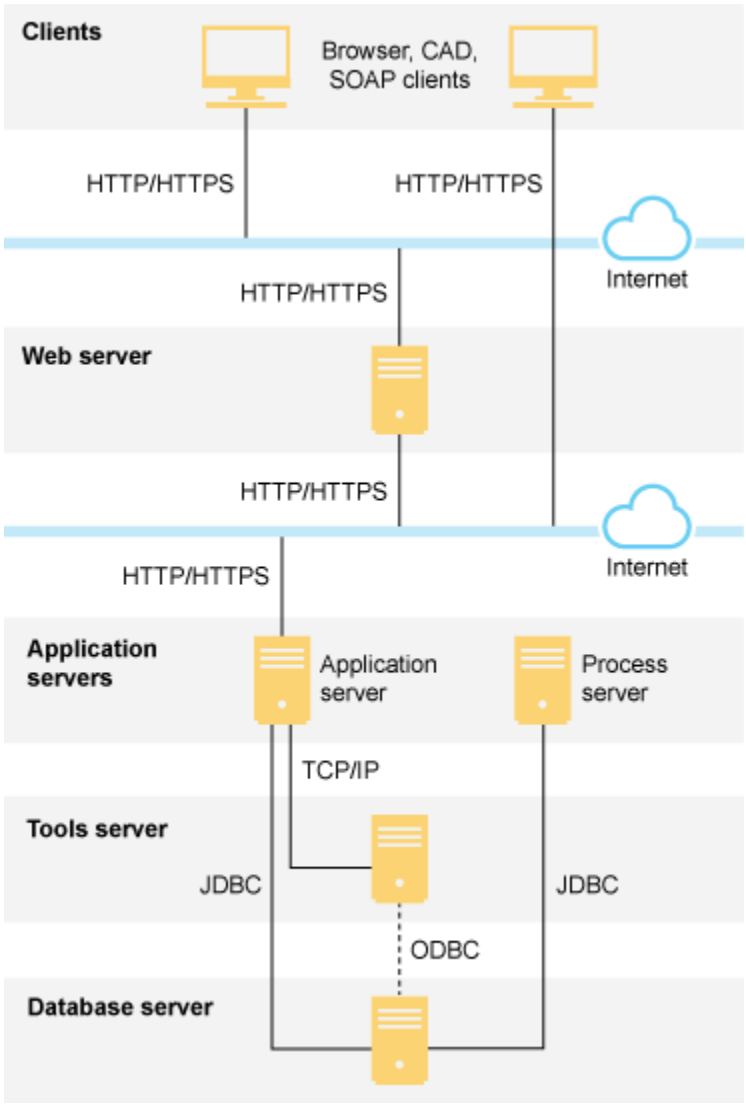

Figure 1. Diagram of the IBM TRIRIGA Application Platform architecture

The *IBM TRIRIGA Application Platform Compatibility Matrix* lists the servers, components, and operating systems on which the IBM TRIRIGA Application Platform is certified.

Servers

The IBM TRIRIGA Application Platform uses many different types of servers. The word "server" is often used to mean a physical piece of equipment, but it can also represent a logical separation that is based on function. Each of these logical servers can be collocated on physical servers, or separated so that each logical tier is installed on their own physical server.

The following logical function-based servers are used in the IBM TRIRIGA Application Platform:

Web server
Receives HTTP/HTTPS requests for web content. Also referred to as a front-end server.

Application server
Carries out the user business logic with WebLogic Server, WebSphere® Application Server, or WebSphere Application Server Liberty.

Process server
Carries out the background processing and analytics with WebLogic Server, WebSphere Application Server, or WebSphere Application Server Liberty.

Tools server
Carries out the reporting.

Database server
Holds the relational database and supported database management system such as Oracle Database, IBM DB2® server, or Microsoft SQL Server.

Web server

The web server is the tier with which each user web browser communicates. Examples of web servers include IBM HTTP Server, Microsoft Internet Information Services (IIS), and Apache HTTP Server. The web server handles HTTP requests only and does not run business logic. The IBM TRIRIGA Application Platform also supports Secure Sockets Layer (SSL) by using HTTPS. Typically, HTTP uses port 80 (non-secure connection) and 443 (secure connection), but it can be configured to use other ports. Each time a user requests a JavaServer Page (JSP), the web server passes the request to the application server for processing. The web server is a physical manifestation of the web tier.

Application server

The application server is a Java virtual machine (JVM) with an instance of the runtime application. This server runs most of the business logic. Application server processes are CPU-intensive and require a great deal of memory. The application tier consists of JavaServer Pages (JSP) and Java classes. The Java™ 2 Platform, Enterprise Edition (J2EE) application server provides a JSP container, a database connection pool, and transaction management services. The application server is a physical manifestation of the application (middleware) tier.

Process server

The process server is a JVM with an instance of the runtime application that is set up as a dedicated processing or analytics engine. This server is configured almost exactly like an application server, but no users sign on to this server. It handles all workflow requests that are queued from users or by the IBM TRIRIGA software. The process server is a physical manifestation of the application (middleware) tier.

Tools server

The tools server houses the third-party extensions from IBM TRIRIGA. You can designate a IBM TRIRIGA application server as a BIRT process server. If you choose to run both BIRT and IBM TRIRIGA on the same server, expect BIRT report handling operations to increase the load on the server. BIRT is run in the same JVM as IBM TRIRIGA in all cases.

Database server

The database server runs the database process. The database is where data is stored. The major database servers use Structured Query Language (SQL) to store and retrieve data. The Oracle Database server, IBM DB2 server, and Microsoft SQL Server use SQL. But each server is a different database engine and each has its own extended SQL for competitive differentiation. The application tier communicates with the database tier by using JDBC connection pools. The database server is a physical manifestation of the database tier.

Implementations

The physical configuration of any system depends greatly on the number of users and amount of data that it supports. For information about IBM TRIRIGA Application Platform system implementations, see the IBM TRIRIGA Best Practices for System Performance.

Before you deploy IBM TRIRIGA in your organization, plan how the user community should access TRIRIGA applications. IBM TRIRIGA requires a user name and password to gain access to applications. Refer to the IBM TRIRIGA Application Platform 3 Single Sign-On Setup User Guide if you want to configure single sign-on (SSO) to manage user access to TRIRIGA applications.

Related information

IBM TRIRIGA Best Practices for System Performance

Installing the platform

You can select the IBM TRIRIGA Application Platform installation process that applies to your hardware configuration, whether you have IBM WebSphere Application Server Liberty, IBM WebSphere Application Server, or Oracle WebLogic Server. For added flexibility, you can also install the platform with Oracle Database export files.

Overview of TRIRIGA Application Platform installation

After you determine the platform architecture, server types, and implementation sizes that apply to your business needs, you are ready to install the TRIRIGA Application Platform.

Before you install IBM TRIRIGA Application Platform

Verify IBM TRIRIGA Application Platform hardware and software requirements before you start the installation process.

The Compatibility Matrix for IBM TRIRIGA Products IBM Support page provides information about the IBM TRIRIGA supported software products. It lists the application servers, database servers, web servers, third-party servers, third-party components, and client options with which the IBM TRIRIGA Application Platform is certified. For more information, refer to the IBM TRIRIGA Best Practices for System Performance.

Furthermore, the following list outlines the hardware requirements and other software considerations:

Memory

The database server must have at least 3 GB of physical dedicated memory.

Ensure that you allocate enough memory to your application servers. Monitor memory usage regularly to avoid out of memory errors. You might also want to consider deploying a second process server to ensure that workflow processing continues if a process server experiences a failure.

Disk space

You must prepare the following disk space requirements:

- If you download all components of an installation, you need at least 1.8 GB of disk space.
- In addition, the installation occupies approximately 300 MB of disk space.
- For the installer to run, you need at least 160 MB in temporary space on the hard disk.
- For a new installation, you need at least 7 GB within the database.
- Each WebSphere Application Server profile requires approximately 1 GB of disk space.

Application server and database server

The application server and database server must be in the same physical location, such as a room or building to avoid issues with network latency. Minimize the number of segments or along the path between the application server and the database server. The minimum network speed that is required is fast Ethernet (100 Mbps), switched.

Application server software

The WebLogic Server or WebSphere Application Server software must be installed before you run the IBM TRIRIGA Application Platform installer. It is not necessary to install WebSphere Application Server Liberty beforehand. The only supported method of configuring WebLogic Server, WebSphere Application Server, or WebSphere Application Server Liberty is to allow the TRIRIGA Application Platform installer to run the setup tasks.

If the value set for the maximum number of parameters allowed in an inbound request is too low, an error can occur when saving a workflow object map. In this case, you can either increase the value, or set the value to unlimited. Refer to your application server documentation for details.

Database server software
Oracle Database, IBM DB2, or Microsoft SQL Server must be installed before you run the IBM TRIRIGA Application Platform installer. During the installation process, you are required to provide the database administrator (DBA) user ID and password.

Oracle Database installations
If necessary, table spaces for new Oracle Database installations must be created before you run the installer. Analyze your base data. This data includes documents, leases, and portfolio data, such as people, organizations, assets, and locations. Set the sizes for the TRIDATA_DATA table space and TRIDATA_INDX table space to support at least this base data. The minimum size for the TRIDATA_DATA table space and TRIDATA_INDX table space is 2.5 GB each. If you use existing IBM TRIRIGA table spaces, verify that the autoextend option is enabled.

IBM DB2 installations
An IBM DB2 instance and database must be created before you run the IBM TRIRIGA Application Platform installer.

Java Development Kit

The specific Java Development Kit (JDK) that is required by your application server must be installed before you run the IBM TRIRIGA Application Platform installer. See information specific to Windows and Linux below.

GNU OpenJDK is not supported and will not work with IBM TRIRIGA and the IBM TRIRIGA Application Platform installation program. The OpenJDK package should be completely uninstalled from the server.

Windows: The IBM TRIRIGA installer for Windows runs on an internally bundled JVM (IBM JDK 8). The IBM TRIRIGA installer for Windows also allows you to install this bundled JVM on your local machine to use with the TRIRIGA runtime.

Linux: The JDK must be installed before you run the IBM TRIRIGA installer. The JDK must be installed before you run the IBM TRIRIGA application. This can be downloaded at https://developer.ibm.com/javasdk/downloads/sdk8/ and is licensed and appropriate for production use on Linux and AIX. Java must be running during an IBM TRIRIGA Application Platform installation. You must set the JAVA_HOME environment variable to the path of the JDK before you start the IBM TRIRIGA Application Platform installation program.

Security privileges and directory access
The administrator or user who runs the IBM TRIRIGA Application Platform installation must have create access and write access to the installation root directory.

IBM TRIRIGA licenses (keys)
Starting with IBM TRIRIGA Application Platform version 3.2, IBM TRIRIGA distributes software licenses in a separate license file for each product. The license file names are in the format `LICENSE_IBM_TRIRIGA_[productname].properties` (for example, `LICENSE_IBM_TRIRIGA_Application_Platform.properties`). You can continue to use an existing `TRIRIGALICENSE.properties` file if you have one until it expires or you use a new product. For more information, see the topic about license files.

Related concepts
Create and configure a DB2 database for TRIRIGA
To configure TRIRIGA with DB2, you must create a database before you start the TRIRIGA Application Platform installation program. You can either create the database manually, or, you can use scripts that are provided with TRIRIGA.

Types of installation

Before you install the IBM TRIRIGA Application Platform, determine the installation path that applies to your particular implementation. Although there are several installation paths, they follow the same general installation process. These installation types refer to full installation. Full installations install and configure all key components for IBM TRIRIGA, including the application server and database.

Installation preparation

Before you begin a full installation, prepare the following access and information:

- For Oracle Database, the system identification (SID) or database instance name
- For Microsoft SQL Server, the database name
- For IBM DB2, the instance port and database name
- For existing databases, the database instance login information
- Server name and IP address of the database server
- Server name of the process server

The process of installing IBM TRIRIGA is the same regardless of the level of security that is applied to your environment. After installation, you can secure your environments according to your business requirements. For instance, security considerations might include securing client communication and restricting access to servers.

Full installation process

A full installation process includes installing the key components and configurations necessary for the IBM TRIRIGA platform and applications to operate:

1. Before running the TRIRIGA installer:
   - Before running the installer, if you choose WebLogic Server or WebSphere Application Server, you must install and configure that application server. If you choose WebSphere Application Server Liberty, this step is not necessary.
   - Before running the installer, you must install the database server, know the database connection details, and possibly the administrator login credentials. Depending on the database type, you might be able to have the TRIRIGA installer configure some of the database instance details during the installation, instead of you having to configure them manually beforehand.
2. Select the TRIRIGA installer for your operating system.
3. Select the installation location.
4. Select a new or upgrade installation.
5. Select, install, and configure the application server, unless the TRIRIGA installer is doing these for you (in the case of Liberty).
6. Select and install the database server, and know the database connection details. Depending on the database type, you might be able to have the TRIRIGA installer configure some of the database instance details during the installation, instead of you having to configure them manually beforehand.
7. Decide whether to configure the database instance, or have the TRIRIGA installer do it for you. Take care to configure anything necessary on the database side that TRIRIGA cannot configure for you, or that you do not want TRIRIGA to configure for you.
8. Installation complete.

Installation checklists

Before you install the IBM TRIRIGA Application Platform, you can follow the application server and database checklists that apply to your implementation.

Checklist for new IBM TRIRIGA Application Platform installations

Item	Description
Release notes	Read the *IBM TRIRIGA Release Notes* that apply to your installation version for information and instructions that are specific to that release.

Item	Description
Data recovery and backups	Before starting the installation process, create a data recovery plan to be used in the event of a IBM TRIRIGA Application Platform system failure. IBM TRIRIGA is a Java enterprise application that runs on a variety of Java application servers and database platforms. Each application server and database platform provides different methods and recommendations for backups and recovery. Consult the product information provided with the application server and database platform you are using with IBM TRIRIGA for backup and recovery operation standards and best practices. After a successful installation, the IBM TRIRIGA installation folder can be backed up regularly to preserve IBM TRIRIGA system settings.
Full installation	Follow the full installation process for a new installation. If you are upgrading an existing IBM TRIRIGA implementation, see the *IBM TRIRIGA Application Platform 3 Upgrade Installation Guide*.
Language packs	To decrease the size of the IBM TRIRIGA Application Platform installer, the installer no longer includes the IBM TRIRIGA language packs `.zip` file. The language packs `.zip` file is on the Application Upgrade image in the IBM TRIRIGA application eAssembly on the IBM Passport Advantage website. Download the image and copy the language packs `.zip` file into the *`[install directory]`*`\userfiles\LanguagePacks` directory on your TRIRIGA server. The directory structure of the language packs separates the label packs from the data packs. You must unpack the main language pack before you select the individual language pack to import. Make sure that you import the correct type of language pack in the specific interface. For example, if you are in the **Label Manager**, you must import a label pack. If you are in the **Language Manager**, you must import a data pack. Importing a data pack is not required if your installation is US English only. For more information, see the *IBM TRIRIGA Application Platform 3 Localization User Guide*.
First steps in the installation	• Install the 64-bit version of Oracle Java 8, minimum update version 171. The Java installation path must not contain spaces. • Run the installer: – From the Windows environment, double-click the `install.exe` file. On Windows, `C:\Tririga` is the default installation location. – Connect and log in to your application server as the IBM TRIRIGA user through SSH or other remote terminal application. – From the UNIX or Linux® command line, log in to a terminal as the IBM TRIRIGA user and type `./install.bin -i console`. To go back, type `back` and press the Enter key. On UNIX servers, `/usr/local/tririga` is the typical installation location. After the root super user pre-creates this directory, run the `chown tririga /usr/local/tririga` command as root, where `tririga` is the name of the installation user.

Item	Description
Java virtual machine (JVM)	During the installation: • Select the path to the JDK that you want the installer to use. The screen lists the `java.exe` versions that are available on your target computer. IBM TRIRIGA supports the 64-bit version of IBM Java 8 SDK and Oracle Java 8 JDK. To obtain the IBM SDK download package for your operating system, see this IBM Support page. – WebSphere Application Server Liberty installations support both the 64-bit version of IBM Java 8 and Oracle Java. – WebSphere Application Server installations support the 64-bit version of IBM Java 8. – WebLogic Server installations support Oracle Java.
Installation directory	During the installation, specify the complete path of the directory to which you want to install the files: • The installation path must not have any spaces. If it has spaces, specify another path. On Windows, `C:\Tririga` is the typical location. On UNIX, `/usr/local/tririga` is the typical location. • The directory must not have an existing installation. If it has an existing installation, rename that directory. For example, rename the directory to add the word "old" and the date.
Application data	During the installation, choose the compressed file where the IBM TRIRIGA application data is stored. This compressed file is named `data.zip` and is selected automatically by the installer. If the file is not selected, then locate and select the correct file.
After the installation	After the installation is complete: • Verify that your installation is running properly. For more information, see the topic about the verification checklist.

Checklist for new IBM TRIRIGA Application Platform installations on Oracle Database

Item	Description
Release notes	Read the *IBM TRIRIGA Release Notes*.
Multibyte language support	If you support multibyte languages, the Oracle Database must originally be installed as a multibyte database. If the database was not originally installed as a multibyte database, it cannot be changed afterwards.
Multibyte language support	If you support multibyte languages, take the following steps before you begin the installation: • Set the instance character set to AL32UTF8 or AL32UTF16. If you do not select a AL32UTF8 or AL32UTF16 character set, a multibyte character is shown as a question mark when saved in the database. • Set the **`NLS_LENGTH_SEMANTICS`** parameter to CHAR (not BYTE). If you use BYTE instead of CHAR, the platform does not run the length operations correctly and data can be lost. • Set a block size of at least 16K.

Item	Description
User name requirement	For Oracle Database, the schema owner must use the same user ID as the database user.

Checklist for new IBM TRIRIGA Application Platform installations on Microsoft SQL Server

Item	Description
Release notes	Read the *IBM TRIRIGA Release Notes*.
Users	Verify that the database user that is being used for the new installation is uniquely associated to the database.
Multibyte language support	New installations of IBM TRIRIGA only support Microsoft SQL Server databases configured for multibyte languages. You must select a collation for the database when you install IBM TRIRIGA.
Multibyte language support and WebLogic Server	Verify on the WebLogic Server that the JDBC URL in your **DataSource-TRIRIGA-data** sets the property of **SendStringParametersAsUnicode** to `true`.
Multibyte language support and WebSphere Application Server	Verify in the WebSphere Application Server data source that the custom property of **sendStringParametersAsUnicode** is set to `true`.
User name requirement	You can use different Microsoft SQL Server values for the database name and the database user ID.
Database authentication	For Microsoft SQL Server, the database login is required to be SQL Server Authentication. Windows authentication is not supported. In addition, this account must be the DBO of the database, and have full permissions to all functions and methods to allow IBM TRIRIGA Application Platform to function.
Database collation and case-sensitivity.	You can install IBM TRIRIGA on a Case Sensitive Microsoft SQL Server, however, the TRIRIGA database must be Case Insensitive.

Checklist for new IBM TRIRIGA Application Platform installations on IBM DB2

Item	Description
Release notes	Read the *IBM TRIRIGA Release Notes*.
IBM DB2	Perform DB2 configuration steps.
Multibyte language support	• If you support multibyte languages, the IBM DB2 database must originally be created as UTF-8. If the database was not originally created as UTF-8, it cannot be changed afterwards. • Set the **string_units** parameter to CODEUNITS32.
Data collection performance settings in WebLogic Server.	Data collection performance settings are configured with data source properties using the following parameter values: `user=TRIRIGA DB User DatabaseName=DB Name jdbcCollection=NULLIDR1`

Item	Description
Data collection performance settings in WebSphere Application Server.	Data collection performance settings are configured by adding a new property to the data source properties: `jdbcCollection=NULLIDR1` The isolation level for WebSphere Application Server is set to `webSphereDefaultIsolationLevel=2` to prevent database locking.

Related information

Release Notes for IBM TRIRIGA Products

IBM TRIRIGA Application Platform 3 Upgrade Installation Guide

Create and configure a DB2 database for TRIRIGA

To configure TRIRIGA with DB2, you must create a database before you start the TRIRIGA Application Platform installation program. You can either create the database manually, or, you can use scripts that are provided with TRIRIGA.

Configuring an existing DB2 server for use with TRIRIGA involves several steps. You must create a TRIRIGA user, create a database, and configure instance and database level settings before you start the IBM TRIRIGA Application Platform installation program. You can create these database objects by using scripts that are provided with TRIRIGA. Scripts for Windows, Linux, and UNIX are provided in the *IBM TRIRIGA Application Upgrade V10.x Multiplatform Multilingual* package. The script files are located in the `Scripts` directory of the `TRI_APPLICATION_UPGRADE_10.x.zip` archive file.

If you create the database objects manually, refer to the scripts for configuration values. You can specify your own values when you create the users, name the database and instance, and define the port that is used by the TRIRIGA database instance. You must accurately provide the DB2 installation directory.

The DB2 database used with TRIRIGA must be configured with the following parameters.

- The DB2 database instance and database must be set to Oracle mode.
- DB2 database parameters must be configured to optimize TRIRIGA performance.
  - STMT_CONC=OFF
  - PAGESIZE=32 K
  - DB2_DEFERRED_PREPARE_SEMANTICS=YES
- The user ID created for TRIRIGA to access the database must have DBADM, SECADM, ACCESSCTRL and DATAACCESS privileges for the database.
- The database must be configured with the UTF-8 code set and CODEUNITS32 string unit if you need to support multibyte characters.

The DB2 port used to communicate with TRIRIGA needs to be available through any firewall software that is active on the system. You can disable firewall software on the DB2 server before you run the TRIRIGA database creation scripts. Firewall software can prevent the TRIRIGA scripts from completing successfully. You can reactivate the firewall after the database is created.

Configuring DB2 for TRIRIGA on Windows by using scripts

Use the **db2createinst** and **db2createdb** commands to create and configure a DB2 database on Windows.

Procedure

1. Log in to the server that is running DB2 as a user that has administrative permissions on the system.
2. Create a system user for TRIRIGA, for example, tridata.

This system user is used by TRIRIGA to access the database. This user is given permission to access the database by the scripts.

3. Log in to the server as the DB2 administrative user.

   The default user ID for the DB2 administrative user is db2admin.

4. Create the DB2 instance and set it to Oracle Compatibility mode.

   a) Copy the `db2createinst.cmd` command file from `\scripts` in the installation media to a temporary directory on the DB2 server.

   b) Open a DB2 command window and run the **db2cmdadmin** command to set up the DB2 environment:

      Alternatively, you can use **Start** > **DB2 Command Window – Administrator**.

   c) Run the **db2createinst** command to create and configure the database instance.

```
db2createinst name port installDir
db2admin password > outputfilename
```

      The **name** parameter specifies the DB2 instance name. The **port** parameter specifies the server port that is used by this instance of DB2. The **installDir** parameter specifies the installation location of DB2. You must use double quotation marks around the value if the path contains spaces. The **db2admin** parameter specifies the DB2 administrator. The **outputfilename** parameter specifies the file that is used to capture output from the command.

      The following example provides sample syntax for the **db2createinst** command.

```
C:\temp>db2createinst triinst 50006
"c:\program files\ibm\sqllib"
db2admin mypassword > db2createinst.log
```

   If the command generates an instance creation return code of 0, the DB2 database instance is created and set to Oracle Compatibility mode, and the message `Instance instance name has been created successfully and started on port port number` is displayed. If the command generated any return codes other than 0, examine the output of the command to determine the cause of the error. You can capture the output of the script to a file to evaluate the command results. Do not attempt to create the database until the **db2createinst** command completes successfully.

5. Create and configure the DB2 database.

   a) Copy the `db2createdb.cmd` command file from `\scripts` in the installation media to a temporary directory on the DB2 server.

   b) Start the **db2createdb** command from the DB2 command window.

```
db2createdb name instance territory installDir
trirgaUser db2admin > outputfilename
```

      The **name** parameter specifies the name of the database. The **instance** parameter specifies the instance that is associated with the database. The **territory** parameter designates the code that is used by the database manager internally to provide region-specific support. The **installDir** parameter specifies the installation location of DB2. You must use double quotation marks around the value if the path contains spaces. The **trirgaUser** parameter specifies the TRIRIGA user ID that is used to access the database. The **db2admin** parameter specifies the DB2 administrator user ID. The **outputfilename** parameter specifies the file that is used to capture output from the command.

      The following example provides sample syntax for the **db2createdb** command.

```
C:\temp>db2createdb tririga triinst
US "c:\Program files\ibm\sqllib"
tridata db2admin > db2createdb.log
```

   If the command generates an exit return code of 0, the DB2 database is created and configured, and the message `Database database name has been created successfully on instance name.` is displayed. If the command generated any exit codes other than 0, examine the output of the command to determine the cause of the error. You can capture the output of the script to a file to

evaluate the command results. Do not continue with the IBM TRIRIGA Application Platform installation process until the **db2createdb** command completes successfully.

What to do next

If you have a firewall, reactivate it and make sure remote connections can be made to the database. Use IBM Data Studio or another SQL tool to verify that a remote connection can be made to the database before you start the IBM TRIRIGA Application Platform installation program. You may need to allow access to the port used by DB2 in the firewall.

Configuring DB2 for TRIRIGA on UNIX and Linux by using scripts

Use the **db2createinst**, **db2configinst**, and **db2createdb** commands to create and configure a DB2 database on UNIX or Linux.

Procedure

1. Log in to the server that is running DB2 as a user that has administrative permissions on the system.
   The user must be able to create system users and DB2 instances.
2. Create system users for TRIRIGA.
   a) Create a system user for TRIRIGA to access the database, for example, tridata.
      This user is given permission to access to the database by the scripts.
   b) Create the DB2 instance owner, for example triinst. The DB2 instance owner creates the DB2 instance for TRIRIGA.
      This user must not have any existing DB2 instances associated with it. The triinst user ID must be assigned to the db2iadm1 group.
   c) Create the fenced user ID for the DB2 instance, for example, db2fenc1.
      This user ID might already exist on the system and can serve as the fenced user ID for other DB2 instances. The db2fenc1 user ID must be assigned to the db2iadm1 group.
3. Create the DB2 database instance.
   a) Copy the `db2createinst.sh` command file from `/Scripts` in the installation media to a temporary directory on the DB2 server.
   b) Ensure the user ID has execute privileges on the file and write privileges to the current directory.
   c) Open a shell window and run the **db2createinst** command to create the database instance.

      ```
      db2createinst.sh name port
      installDir fenceUser
      > outputfilename
      ```

      The **name** parameter specifies the DB2 instance owner. The **port** parameter specifies the server port that is used by this instance of DB2. The **installDir** parameter specifies the installation location of DB2. The **fenceUser** parameter specifies the DB2 fence user. The **outputfilename** parameter specifies the file that is used to capture output from the command.
      The following example provides sample syntax for the **db2createinst** command.

      ```
      ./db2createinst.sh triinst 50006
      /opt/ibm/db2/V11.x
      db2fenc1 > db2createinst.log
      ```

   If the command generates an instance creation return code of 0, the DB2 database instance is created, and the message `Instance instance name has been created successfully on port port number` is displayed. If the command generated any return codes other than 0, examine the output of the command to determine the cause of the error. You can capture the output of the script to a file to evaluate the command results. Do not attempt to configure the database instance until the **db2createinst** command completes successfully.
4. Log in to the server that is running DB2 as the instance user.

5. Configure the DB2 database instance.
   a) Copy the db2configinst.sh command file from /scripts in the installation media to a temporary directory on the DB2 server.
   b) Ensure the user ID has execute privileges on the file and write privileges to the current directory.
   c) From the shell window, run the **db2configinst** command to create the database instance.

      ```
      db2configinst.sh name port installDir > outputfilename
      ```

      The **name** parameter specifies the DB2 instance to configure. The **port** parameter specifies the server port that is used by this instance of DB2. The **installDir** parameter specifies the installation location of DB2. The **outputfilename** parameter specifies the file that is used to capture output from the command.

      The following example provides sample syntax for the **db2configinst** command.

      ```
      ./db2configinst.sh triinst 50006
      /opt/ibm/db2/V11.x
       > db2configinst.log
      ```

   If the command generates a return code for starting instance of 0, the DB2 database instance is created, and the message Instance *instance name* has been configured successfully and started on *server name* is displayed. If the command generated any return codes other than 0, examine the output of the command to determine the cause of the error. You can capture the output of the script to a file to evaluate the command results. Do not attempt to create the database until the **db2configinst** command completes successfully.
6. Create and configure the DB2 database.
   a) Copy the db2createdb.sh command file from /scripts in the installation media to a temporary directory on the DB2 server.
   b) Ensure the user ID has execute privileges on the file and write privileges to the current directory.
   c) From the shell window, run the **db2createdb** command.

      ```
      db2createdb.sh name instance territory
      installDir tririgaUser > outputfilename
      ```

      The **name** parameter specifies the name of the database. The **instance** parameter specifies the instance that is associated with the database. The **territory** parameter designates the code that is used by the database manager internally to provide region-specific support. The **installDir** parameter specifies the installation location of DB2. The **tririgaUser** parameter specifies the TRIRIGA user ID used to access the database. The **outputfilename** parameter specifies the file that is used to capture output from the command.

      The following example provides sample syntax for the **db2createdb** command.

      ```
      ./db2createdb.sh tririga
      triinst US /opt/ibm/db2/V11.x
      tridata > db2createdb.log
      ```

   If the command generates an exit return code of 0, the DB2 database is created and configured, and the message Database *database name* has been created successfully on *instance name* is displayed. If the command generated any return codes other than 0, examine the output of the command to determine the cause of the error. You can capture the output of the script to a file to evaluate the command results. Do not continue with the IBM TRIRIGA Application Platform installation process until the **db2createdb** command completes successfully.

What to do next

If you have a firewall, reactivate it and make sure remote connections can be made to the database. Use IBM Data Studio or another SQL tool to verify that a remote connection can be made to the database before you start the IBM TRIRIGA Application Platform installation program. You may need to allow access to the port used by DB2 in the firewall.

Installing TRIRIGA Application Platform on a WebSphere Application Server Liberty Core profile

TRIRIGA Application Platform can be installed on a Liberty profile and supported by a variety of database software. During the TRIRIGA Application Platform installation process, you can select the type of application server you want to use.

Before you begin

Check the IBM TRIRIGA product wiki for the latest information about deploying IBM TRIRIGA on a Liberty profile.

IBM TRIRIGA application data must be stored on the same filesystem as the filesystem used by the Liberty profile host.

Overview of IBM TRIRIGA Application Platform installation on a Liberty profile

Liberty profiles are dynamic and provision only the features needed by the application, which contributes to faster load speed and a smaller footprint.

The IBM TRIRIGA Application Platform installation program installs the Liberty profile components during the installation process.

Installing TRIRIGA Application Platform on a Liberty profile and Microsoft SQL Server

After your database server is prepared, you can begin to install the TRIRIGA Application Platform on a Liberty profile and Microsoft SQL Server.

Before you begin

Verify that Microsoft SQL Server is running and that you have administrative authority on the server. Ensure the Microsoft SQL Server database has been configured for TRIRIGA.

Procedure

1. Run the installer file. Follow the installation instructions.
   a) Accept the license.
   b) Check for the latest available fix pack and apply it.
   c) Choose the Java Virtual Machine to use with the installation program.
      The 64-bit version of Java 8 is required.
   d) Select the installation folder.
   e) For the installation type, select **New Database (data.zip required)** and then select the data file to install.
2. Select the data file to install and click **Choose**.
3. Optional: If license files for this product are stored on this system, specify the full path to their location.
4. For the application server, select **IBM WebSphere Liberty (Embedded)**. Specify the Liberty profile information in the next set of screens.
   a) Specify the Java memory setting values in megabytes.
   b) Specify HTTP and HTTPS ports and the session timeout value used by the Liberty Profile.
   c) Optional: Configure TRIRIGA to run Liberty as a Windows service. You must run the TRIRIGA installation program as an Administrator to create the Windows service. If you did not run the TRIRIGA installation program as an Administrator, quit the installation program and restart it with

Administrator privileges. This service will replace an existing Liberty Windows service on the system unless you assign it a unique service name.

d) Specify the application context root for accessing the IBM TRIRIGA application.

This path must begin with a slash (/).

5. For the database type, select **Microsoft SQL Server**. Consult with your Microsoft SQL Server administrator and specify the database information in the next set of screens.
   a) Select the database actions to be initiated, such as creating table spaces, creating the schema, and loading the database from a `.zip` file.

   Some of these tasks can be completed by the database administrator beforehand.

   When you create the database, you must load data using the installation program.

   b) Specify the information for the database server connection, such as the port and name.
   For example, `1433` is a typical value for the Microsoft SQL Server port, and `tridata` is a typical value for the Microsoft SQL Server database name.

   c) Specify the database user name and password.
   For example, `tridata` is a typical value for both fields.

   Verify that the database user that is being used for the new installation is uniquely associated to the database.

   d) Choose a collation for the Microsoft SQL Server database.

   e) Specify the database administrator user name and password.

   This information is required to set up the database structures and schema owner.

   You are not prompted to specify the database administrator user if you chose to load the database from a `.zip` file as the only database action to perform.

   f) Review the URL that the installer is using to test the data schema connection.

   g) Review the results of the test. If the test fails, verify that Microsoft SQL Server is running.

   h) Specify the sizes for the database pools.

   These settings determine the number of connections that the application server starts when it initializes and the number that it can grow to under load.

6. Complete and review the installation information in the final set of screens.
   a) Specify the names of the Simple Mail Transfer Protocol (SMTP) mail server and front end server.

   b) Review the pre-installation summary and click **Install**.

7. Click **Next**.
   a) Optional: If you want to monitor the progress in the directory where IBM TRIRIGA is installed, you can open the `ant.log` file in a log monitoring utility.
   In Windows, you can run the WinTail utility. In UNIX, you can run the **`tail -f ant.log`** command.

8. When the installation is complete, click **Done**.
9. Confirm that your license files are in the *`tririga_root`*`\config\licenses` directory. If they are not, you must copy them to this directory.

   All application servers that access a database must have the same set of licenses. The only exception is the license file for the IBM TRIRIGA Connector for Business Applications. This product is licensed for a limited number of servers and the license file must be placed on that number of servers to stay in compliance. For more information, see the topic about license files.

10. Restart IBM TRIRIGA using the appropriate method.

    - On Windows servers, open a command prompt and run the command to start the Liberty profile.
      `tririga_root``\wlp\bin\run.bat`
    - On UNIX servers, open a command prompt and run the command to start the Liberty profile.
      `tririga_root``/wlp/bin/run.sh`

    The command window closes after initial startup. Liberty continues to run as a background process.

What to do next

Verify that your installation is running properly.

Installing TRIRIGA Application Platform on a Liberty profile and Oracle Database

After your database server is prepared, you can begin to install the TRIRIGA Application Platform on a Liberty profile and Oracle Database.

Before you begin

Verify that Oracle Database is running and that you have administrative authority on the server. Ensure the Oracle Database database instance and the database have been configured for TRIRIGA.

Procedure

1. Run the installer file. Follow the installation instructions.
   a) Accept the license.
   b) Check for the latest available fix pack and apply it.
   c) Choose the Java Virtual Machine to use with the installation program.
      The 64-bit version of Java 8 is required.
   d) Select the installation folder.
   e) For the installation type, select **New Database (data.zip required)** and then select the data file to install.
2. Select the data file to install and click **Choose**.
3. Optional: If license files for this product are stored on this system, specify the full path to their location.
4. For the application server, select **IBM WebSphere Liberty (Embedded)**. Specify the Liberty profile information in the next set of screens.
   a) Specify the Java memory setting values in megabytes.
   b) Specify HTTP and HTTPS ports and the session timeout value used by the Liberty Profile.
   c) Optional: Configure TRIRIGA to run Liberty as a Windows service. You must run the TRIRIGA installation program as an Administrator to create the Windows service. If you did not run the TRIRIGA installation program as an Administrator, quit the installation program and restart it with Administrator privileges. This service will replace an existing Liberty Windows service on the system unless you assign it a unique service name.
   d) Specify the application context root for accessing the IBM TRIRIGA application.
      This path must begin with a slash (/).
5. For the database type, select **Oracle**. Consult with your Oracle Database administrator and specify the database information in the next set of screens.
   a) Select the database actions to be initiated, such as creating table spaces, creating the schema, and loading the database from a `.zip` file.
      Some of these tasks can be completed by the database administrator beforehand.
      When you create the database, you must load data using the installation program.
   b) Specify the information for the data schema database server, such as the host name, port, and system identification (SID).
      For example, `1521` is a typical value for the Oracle Database server port, and `orcl` is a typical value for the Oracle Database server system identification.
   c) Specify the data schema user name and password.
      For example, `tridata` is a typical value for both fields.
   d) Specify the names of the data schema table spaces.

Only letters and the underscore can be used in the table space name.

For example, `TRIDATA_DATA` is a typical value for data and `TRIDATA_INDX` is a typical value for indexes.

e) Optional: Specify the data schema table space parameters, such as the file names and file sizes in megabytes.

This screen is displayed if you chose to create the table spaces. The default file size is 2500 MB (or 2.5 GB), which is the minimum that is required. To determine the correct size of these files, conduct a careful analysis. If the autoextend option is enabled for table spaces within the database, the table spaces are automatically extended as needed. However, this extension might severely affect performance.

f) Optional: Specify the database administrator user name and password.

This screen is displayed if you chose to create the table spaces and schema. This information is required to set up the database structures and schema owner.

You are not prompted to specify the database administrator user if you chose to load the database from a `.zip` file as the only database action to perform.

g) Review the URL that the installer is using to test the data schema connection.

h) Review the results of the test. If the test fails, verify that Oracle Database is running. If you see an informative message that your database might not properly support multibyte characters and your implementation must support multibyte characters, then click **Cancel**. Adjust your database and restart the installer.

i) Specify the sizes for the database pools.

These settings determine the number of connections that the application server starts when it initializes and the number that it can grow to under load.

6. Complete and review the installation information in the final set of screens.
   a) Specify the names of the Simple Mail Transfer Protocol (SMTP) mail server and front end server.
   b) Review the pre-installation summary and click **Install**.
7. Click **Next**.
   a) Optional: If you want to monitor the progress in the directory where IBM TRIRIGA is installed, you can open the `ant.log` file in a log monitoring utility.
   In Windows, you can run the WinTail utility. In UNIX, you can run the **`tail -f ant.log`** command.
8. When the installation is complete, click **Done**.
9. Confirm that your license files are in the *`tririga_root`*`\config\licenses` directory. If they are not, you must copy them to this directory.

   All application servers that access a database must have the same set of licenses. The only exception is the license file for the IBM TRIRIGA Connector for Business Applications. This product is licensed for a limited number of servers and the license file must be placed on that number of servers to stay in compliance. For more information, see the topic about license files.
10. Restart IBM TRIRIGA using the appropriate method.
    - On Windows servers, open a command prompt and run the command to start the Liberty profile. *`tririga_root`*`\wlp\bin\run.bat`
    - On UNIX servers, open a command prompt and run the command to start the Liberty profile. *`tririga_root`*`/wlp/bin/run.sh`

    The command window closes after initial startup. Liberty continues to run as a background process.

What to do next

Verify that your installation is running properly.

Installing TRIRIGA Application Platform on a Liberty profile and IBM DB2

After your database server is prepared, you can begin to install the TRIRIGA Application Platform on a Liberty profile and IBM DB2.

Before you begin

Verify that IBM DB2 is running and that you have administrative authority on the server. Ensure the IBM DB2 database instance and the database have been configured for TRIRIGA.

Procedure

1. Run the installer file. Follow the installation instructions.
   a) Accept the license.
   b) Check for the latest available fix pack and apply it.
   c) Choose the Java Virtual Machine to use with the installation program.
      The 64-bit version of Java 8 is required.
   d) Select the installation folder.
   e) For the installation type, select **New Database (data.zip required)** and then select the data file to install.
2. Select the data file to install and click **Choose**.
3. Optional: If license files for this product are stored on this system, specify the full path to their location.
4. For the application server, select **IBM WebSphere Liberty (Embedded)**. Specify the Liberty profile information in the next set of screens.
   a) Specify the Java memory setting values in megabytes.
   b) Specify HTTP and HTTPS ports and the session timeout value used by the Liberty Profile.
   c) Optional: Configure TRIRIGA to run Liberty as a Windows service. You must run the TRIRIGA installation program as an Administrator to create the Windows service. If you did not run the TRIRIGA installation program as an Administrator, quit the installation program and restart it with Administrator privileges. This service will replace an existing Liberty Windows service on the system unless you assign it a unique service name.
   d) Specify the application context root for accessing the IBM TRIRIGA application.
      This path must begin with a slash (/).
5. For the database type, select **IBM DB2**. Consult with your IBM DB2 administrator and specify the database information in the next set of screens.
   a) Select the database actions to be initiated, such as creating table spaces and loading the database from a `.zip` file.
      Some of these tasks can be completed by the database administrator beforehand.
      For example, if your database administrator pre-created the table space, clear the first option.
      When you create the database, you must load data using the installation program.
   b) Specify the information for the data schema database server, such as the host name, port, and database name.
      For example, `50006` is a typical value for the IBM DB2 server port, and `tririga` is a typical value for the IBM DB2 database name.
   c) Specify the IBM TRIRIGA database user name and password.
      For example, `tridata` is a typical value for the database user name.
   d) Specify the names of the data schema table spaces.
      Only letters and the underscore can be used in the table space name.
      For example, `TRIDATA_DATA` is a typical value for data and `TRIDATA_INDX` is a typical value for indexes.

e) Review the URL that the installer is using to test the data schema connection.

f) Review the results of the test. If the test fails, verify that IBM DB2 is running. If you see an informative message that your database might not properly support multibyte characters and your implementation must support multibyte characters, then click **Cancel**. Adjust your database and restart the installer.

For the IBM TRIRIGA Application Platform to work correctly, the instance must be configured to use Oracle compatibility mode. To support multibyte characters, the codeset of the IBM DB2 instance must support UTF-8 and **`string_units`** must be set to `CODEUNITS32`.

g) Specify the sizes for the database pools.

These settings determine the number of connections that the application server starts when it initializes and the number that it can grow to under load.

6. Complete and review the installation information in the final set of screens.
   a) Specify the names of the Simple Mail Transfer Protocol (SMTP) mail server and front end server.
   b) Review the pre-installation summary and click **Install**.
7. Click **Next**.
   a) Optional: If you want to monitor the progress in the directory where IBM TRIRIGA is installed, you can open the `ant.log` file in a log monitoring utility.
   In Windows, you can run the WinTail utility. In UNIX, you can run the **`tail -f ant.log`** command.
8. When the installation is complete, click **Done**.
9. Confirm that your license files are in the *`tririga_root`*`\config\licenses` directory. If they are not, you must copy them to this directory.

   All application servers that access a database must have the same set of licenses. The only exception is the license file for the IBM TRIRIGA Connector for Business Applications. This product is licensed for a limited number of servers and the license file must be placed on that number of servers to stay in compliance. For more information, see the topic about license files.
10. Restart IBM TRIRIGA using the appropriate method.
    - On Windows servers, open a command prompt and run the command to start the Liberty profile. *`tririga_root`*`\wlp\bin\run.bat`
    - On UNIX servers, open a command prompt and run the command to start the Liberty profile. *`tririga_root`*`/wlp/bin/run.sh`

    The command window closes after initial startup. Liberty continues to run as a background process.

What to do next

Verify that your installation is running properly.

Installing TRIRIGA Application Platform on IBM WebSphere Application Server

TRIRIGA Application Platform can be installed on IBM WebSphere Application Server and supported by a variety of database software. During the TRIRIGA Application Platform installation process, you can select the type of application server you want to use.

Before you begin

Check the IBM TRIRIGA product wiki for the latest information about deploying IBM TRIRIGA on IBM WebSphere Application Server.

IBM TRIRIGA can be installed on IBM WebSphere Application Server Network Deployment, but it does not support deployment into clustered environments. You must install IBM TRIRIGA on the default application server of a single Cell containing a single Node within IBM WebSphere Application Server Network Deployment. IBM TRIRIGA application data must be stored on the same filesystem as the

filesystem used by the IBM WebSphere Application Server host. IBM TRIRIGA can be configured for high availability through the use of IBM WebSphere Application Server sticky sessions.

Overview of IBM TRIRIGA Application Platform installation on WebSphere

Before you begin the IBM TRIRIGA Application Platform installation, IBM WebSphere Application Server must be installed locally or on a server.

Installation phases

Installing the platform on the WebSphere Application Server involves several phases:

- Create a WebSphere Application Server profile for IBM TRIRIGA. If you do not create a new WebSphere Application Server profile specifically for IBM TRIRIGA, you must be prepared to specify information about an existing profile to use with IBM TRIRIGA during the installation process.
- Using IBM Installation Manager, update WebSphere Application Server to the current required version, which is specified in the "Compatibility Matrix for IBM TRIRIGA Products" IBM Support page. Also using Installation Manager, install IBM Java 8 64 bit. See http://www-01.ibm.com/support/docview.wss?uid=swg24041819 for more information
- Running the IBM TRIRIGA installation.

Preparing WebSphere

A WebSphere Application Server profile is required to install IBM TRIRIGA. You can create a WebSphere Application Server profile specifically for IBM TRIRIGA if you do not want to use the default profile. If you do not create a new WebSphere Application Server profile, you must be prepared to specify information about an existing WebSphere Application Server profile to use with IBM TRIRIGA during the installation process. Refer to WebSphere Application Server product information for details about creating profiles.

Procedure

1. Enable all WebSphere Application Server profiles to use IBM Java 8, where *<SDK_8_64>* is the exact name of the 64-bit IBM Java 8 SDK, such as "1.8_64" or "8.0_64".

   ```
   <WebSphere>/appserver/bin/managesdk
   -enableProfileAll
   -sdkname <SDK_8_64>
   -enableServers
   ```

2. Verify that the specified SDK name now appears for each line of "SDK name".

   ```
   <WebSphere>/appserver/bin/managesdk
   -listEnabledProfileAll
   ```

3. Set the SDK name that script commands are enabled to use when no profile is specified by the command and when no profile is defaulted by the command. Again, for *<SDK_8_64>*, use the exact name of the 64-bit IBM Java 8 SDK, such as "1.8_64" or "8.0_64".

   ```
   <WebSphere>/appserver/bin/managesdk
   -setCommandDefault
   -sdkname <SDK_8_64>
   ```

4. Verify that the specified SDK name now appears as the command default.

   ```
   <WebSphere>/appserver/bin/managesdk
   -getCommandDefault
   ```

5. Update the location of the `/tmp` directory to use, if required. The `/tmp` directory should be at least 2GB in size.
   a) Navigate to **Servers** > **All Servers** > ***<Server_Name>*** > **Java and Process Management** > **Process Definition** > **Java Virtual Machine** > **Custom Properties**.
   b) Click **New**, and enter the following properties.

```
Name: java.io.tmpdir
Value: /path/to/new/tmpdir
Description: Path to desired temp directory
```

c) Click **OK** and then **Save**.

What to do next

Install the platform with the Oracle Database, IBM DB2, or Microsoft SQL Server.

Related information

Installing and configuring your application serving environment
Setting up the application serving environment

Installing IBM TRIRIGA Application Platform on WebSphere and Oracle Database

After your application server and database server are prepared, you can begin to install the IBM TRIRIGA Application Platform on IBM WebSphere Application Server and Oracle Database.

Before you begin

Verify that the Oracle Database and IBM WebSphere Application Server are running and that you have administrative authority on the servers.

Procedure

1. Run the installer file. Follow the installation instructions.
   a) Accept the license.
   b) Check for the latest available fix pack and apply it.
   c) Choose the Java Virtual Machine to use with the installation program.
      The 64-bit version of Java 8 is required.
   d) Select the installation folder.
   e) For the installation type, select **New Database (data.zip required)** and then select the data file to install.
2. Select the data file to install and click **Choose**.
3. Optional: If license files for this product are stored on this system, specify the full path to their location.
4. For the application server, select **IBM WebSphere Application Server (Standalone)**. Specify the WebSphere Application Server information in the next set of screens.
   a) Specify the information for the WebSphere Application Server configuration, such as the cell, node, server, profile, and home.
      Log on to the WebSphere Application Server and run the **`manageprofiles.[bat|sh] -listProfiles`** command to identify the cell, node, server, profile, and home values.
      WebSphere Application Server home is defined as `C:\Program Files\IBM\WebSphere\AppServer`, for example.
      Copy values displayed in the WebSphere Application Server administrative console and paste them to the TRIRIGA installation program fields to avoid typos or other errors. Do not install TRIRIGA into a WebSphere Application Server directory that contains a space. In addition, TRIRIGA cannot be used with cell, node, or server names that include an underscore or dash character.
   b) Specify the WebSphere Application Server administrator user name and password.
      The server must be running after this step to verify that the configuration was specified correctly and needed for the deployment.

c) Optional: Define an alternative application context path that accesses the IBM TRIRIGA application.

   This path must begin with a slash (/).

d) Specify the Java memory setting values in megabytes.

e) Specify the server host name.

5. For the database type, select **Oracle**. Consult with your Oracle Database administrator and specify the database information in the next set of screens.

   a) Select the database actions to be initiated, such as creating table spaces, creating the schema, and loading the database from a `.zip` file.

      Some of these tasks can be completed by the database administrator beforehand.

      When you create the database, you must load data using the installation program.

   b) Specify the information for the data schema database server, such as the host name, port, and system identification (SID).
   For example, `1521` is a typical value for the Oracle Database server port, and `orcl` is a typical value for the Oracle Database server system identification.

   c) Specify the data schema user name and password.
   For example, `tridata` is a typical value for both fields.

   d) Specify the names of the data schema table spaces.

      Only letters and the underscore can be used in the table space name.

      For example, `TRIDATA_DATA` is a typical value for data and `TRIDATA_INDX` is a typical value for indexes.

   e) Optional: Specify the data schema table space parameters, such as the file names and file sizes in megabytes.

      This screen is displayed if you chose to create the table spaces. The default file size is 2500 MB (or 2.5 GB), which is the minimum that is required. To determine the correct size of these files, conduct a careful analysis. If the autoextend option is enabled for table spaces within the database, the table spaces are automatically extended as needed. However, this extension might severely affect performance.

   f) Optional: Specify the database administrator user name and password.

      This screen is displayed if you chose to create the table spaces and schema. This information is required to set up the database structures and schema owner.

      You are not prompted to specify the database administrator user if you chose to load the database from a `.zip` file as the only database action to perform.

   g) Review the URL that the installer is using to test the data schema connection.

   h) Review the results of the test. If the test fails, verify that Oracle Database is running. If you see an informative message that your database might not properly support multibyte characters and your implementation must support multibyte characters, then click **Cancel**. Adjust your database and restart the installer.

   i) Specify the sizes for the database pools.

      These settings determine the number of connections that the application server starts when it initializes and the number that it can grow to under load.

6. Complete and review the installation information in the final set of screens.

   a) Specify the names of the Simple Mail Transfer Protocol (SMTP) mail server and front end server.

   b) Review the pre-installation summary and click **Install**.

7. Click **Next**.

   a) Optional: If you want to monitor the progress in the directory where IBM TRIRIGA is installed, you can open the `ant.log` file in a log monitoring utility.
   In Windows, you can run the WinTail utility. In UNIX, you can run the **`tail -f ant.log`** command.

8. When the installation is complete, click **Done**.

9. Confirm that your license files are in the *tririga_root*\config\licenses directory. If they are not, you must copy them to this directory.

   All application servers that access a database must have the same set of licenses. The only exception is the license file for the IBM TRIRIGA Connector for Business Applications. This product is licensed for a limited number of servers and the license file must be placed on that number of servers to stay in compliance. For more information, see the topic about license files.
10. Restart IBM TRIRIGA by locating the WebSphere Application Server directory with the appropriate method.
    - On Windows servers, start the WebSphere Application Server service `IBM WebSphere Application Server V8.5 - NODENAME` from **Control Panel** > **Administrative Tools** > **Services**.
    - On UNIX servers, run the **stopServer** and **startServer** commands and specify the server name, *WEBSPHERE_HOME*/profiles/AppSrv01/bin/stopServer.sh *SERVER_NAME* and then *WEBSPHERE_HOME*/profiles/AppSrv01/bin/startServer.sh *SERVER_NAME*.
    - Alternatively, you can start the application through the WebSphere Application Server admin console. Log into the WebSphere Application Server admin console, go to **Applications** > **All Applications**, select the IBM TRIRIGA application and click **Stop** and then **Start**.

What to do next

Verify that your installation is running properly.

Installing IBM TRIRIGA Application Platform on WebSphere and Microsoft SQL Server

After your application server and database server are prepared, you can begin to install the IBM TRIRIGA Application Platform on IBM WebSphere Application Server and Microsoft SQL Server.

Before you begin

Verify that the Microsoft SQL Server and IBM WebSphere Application Server are running and that you have administrative authority on the servers.

Procedure

1. Run the installer file. Follow the installation instructions.
   a) Accept the license.
   b) Check for the latest available fix pack and apply it.
   c) Choose the Java Virtual Machine to use with the installation program.

      The 64-bit version of Java 8 is required.
   d) Select the installation folder.
   e) For the installation type, select **New Database (data.zip required)** and then select the data file to install.
2. Select the data file to install and click **Choose**.
3. Optional: If license files for this product are stored on this system, specify the full path to their location.
4. For the application server, select **IBM WebSphere Application Server (Standalone)**. Specify the WebSphere Application Server information in the next set of screens.
   a) Specify the information for the WebSphere Application Server configuration, such as the cell, node, server, profile, and home.

      Log on to the WebSphere Application Server and run the **manageprofiles.[bat|sh] -listProfiles** command to identify the cell, node, server, profile, and home values.

WebSphere Application Server home is defined as `C:\Program Files\IBM\WebSphere \AppServer`, for example.

Copy values displayed in the WebSphere Application Server administrative console and paste them to the TRIRIGA installation program fields to avoid typos or other errors. Do not install TRIRIGA into a WebSphere Application Server directory that contains a space. In addition, TRIRIGA cannot be used with cell, node, or server names that include an underscore or dash character.

b) Specify the WebSphere Application Server administrator user name and password.

The server must be running after this step to verify that the configuration was specified correctly and needed for the deployment.

c) Optional: Define an alternative application context path that accesses the IBM TRIRIGA application.

This path must begin with a slash (/).

d) Specify the Java memory setting values in megabytes.

e) Specify the server host name.

5. For the database type, select **Microsoft SQL Server**. Consult with your Microsoft SQL Server administrator and specify the database information in the next set of screens.

a) Select the database actions to be initiated, such as creating table spaces, creating the schema, and loading the database from a `.zip` file.

Some of these tasks can be completed by the database administrator beforehand.

When you create the database, you must load data using the installation program.

b) Specify the information for the database server connection, such as the port and name.
For example, 1433 is a typical value for the Microsoft SQL Server port, and `tridata` is a typical value for the Microsoft SQL Server database name.

c) Specify the database user name and password.
For example, `tridata` is a typical value for both fields.

Verify that the database user that is being used for the new installation is uniquely associated to the database.

d) Choose a collation for the Microsoft SQL Server database.

e) Specify the database administrator user name and password.

This information is required to set up the database structures and schema owner.

You are not prompted to specify the database administrator user if you chose to load the database from a `.zip` file as the only database action to perform.

f) Review the URL that the installer is using to test the data schema connection.

g) Review the results of the test. If the test fails, verify that Microsoft SQL Server is running.

h) Specify the sizes for the database pools.

These settings determine the number of connections that the application server starts when it initializes and the number that it can grow to under load.

6. Complete and review the installation information in the final set of screens.

a) Specify the names of the Simple Mail Transfer Protocol (SMTP) mail server and front end server.

b) Review the pre-installation summary and click **Install**.

7. Click **Next**.

a) Optional: If you want to monitor the progress in the directory where IBM TRIRIGA is installed, you can open the `ant.log` file in a log monitoring utility.
In Windows, you can run the WinTail utility. In UNIX, you can run the **`tail -f ant.log`** command.

8. When the installation is complete, click **Done**.

9. Confirm that your license files are in the *`tririga_root`*`\config\licenses` directory. If they are not, you must copy them to this directory.

All application servers that access a database must have the same set of licenses. The only exception is the license file for the IBM TRIRIGA Connector for Business Applications. This product is licensed for a limited number of servers and the license file must be placed on that number of servers to stay in compliance. For more information, see the topic about license files.

10. Restart IBM TRIRIGA by locating the WebSphere Application Server directory with the appropriate method.
    - On Windows servers, start the WebSphere Application Server service `IBM WebSphere Application Server V8.5 - NODENAME` from **Control Panel** > **Administrative Tools** > **Services**.
    - On UNIX servers, run the **stopServer** and **startServer** commands and specify the server name, *WEBSPHERE_HOME*`/profiles/AppSrv01/bin/stopServer.sh` *SERVER_NAME* and then *WEBSPHERE_HOME*`/profiles/AppSrv01/bin/startServer.sh` *SERVER_NAME*.
    - Alternatively, you can start the application through the WebSphere Application Server admin console. Log into the WebSphere Application Server admin console, go to **Applications** > **All Applications**, select the IBM TRIRIGA application and click **Stop** and then **Start**.

What to do next

Verify that your installation is running properly.

Installing TRIRIGA Application Platform on WebSphere and IBM DB2

After your application server and database server are prepared, you can begin to install the TRIRIGA Application Platform on IBM WebSphere Application Server and IBM DB2.

Before you begin

Verify that the IBM DB2 and IBM WebSphere Application Server are running and that you have administrative authority on the servers. Ensure the IBM DB2 database instance and the database have been configured for TRIRIGA.

Procedure

1. Run the installer file. Follow the installation instructions.
   a) Accept the license.
   b) Check for the latest available fix pack and apply it.
   c) Choose the Java Virtual Machine to use with the installation program.
      The 64-bit version of Java 8 is required.
   d) Select the installation folder.
   e) For the installation type, select **New Database (data.zip required)** and then select the data file to install.
2. Select the data file to install and click **Choose**.
3. Optional: If license files for this product are stored on this system, specify the full path to their location.
4. For the application server, select **IBM WebSphere Application Server (Standalone)**. Specify the WebSphere Application Server information in the next set of screens.
   a) Specify the information for the WebSphere Application Server configuration, such as the cell, node, server, profile, and home.
      Log on to the WebSphere Application Server and run the **manageprofiles.[bat|sh] -listProfiles** command to identify the cell, node, server, profile, and home values.
      WebSphere Application Server home is defined as `C:\Program Files\IBM\WebSphere\AppServer`, for example.

Copy values displayed in the WebSphere Application Server administrative console and paste them to the TRIRIGA installation program fields to avoid typos or other errors. Do not install TRIRIGA into a WebSphere Application Server directory that contains a space. In addition, TRIRIGA cannot be used with cell, node, or server names that include an underscore or dash character.

b) Specify the WebSphere Application Server administrator user name and password.

The server must be running after this step to verify that the configuration was specified correctly and needed for the deployment.

c) Optional: Define an alternative application context path that accesses the IBM TRIRIGA application.

This path must begin with a slash (/).

d) Specify the Java memory setting values in megabytes.

e) Specify the server host name.

5. For the database type, select **IBM DB2**. Consult with your IBM DB2 administrator and specify the database information in the next set of screens.

a) Select the database actions to be initiated, such as creating table spaces and loading the database from a `.zip` file.

Some of these tasks can be completed by the database administrator beforehand.

For example, if your database administrator pre-created the table space, clear the first option.

When you create the database, you must load data using the installation program.

b) Specify the information for the data schema database server, such as the host name, port, and database name.
For example, `50006` is a typical value for the IBM DB2 server port, and `tririga` is a typical value for the IBM DB2 database name.

c) Specify the IBM TRIRIGA database user name and password.
For example, `tridata` is a typical value for the database user name.

d) Specify the names of the data schema table spaces.

Only letters and the underscore can be used in the table space name.

For example, `TRIDATA_DATA` is a typical value for data and `TRIDATA_INDX` is a typical value for indexes.

e) Review the URL that the installer is using to test the data schema connection.

f) Review the results of the test. If the test fails, verify that IBM DB2 is running. If you see an informative message that your database might not properly support multibyte characters and your implementation must support multibyte characters, then click **Cancel**. Adjust your database and restart the installer.

For the IBM TRIRIGA Application Platform to work correctly, the instance must be configured to use Oracle compatibility mode. To support multibyte characters, the codeset of the IBM DB2 instance must support UTF-8 and **`string_units`** must be set to `CODEUNITS32`.

g) Specify the sizes for the database pools.

These settings determine the number of connections that the application server starts when it initializes and the number that it can grow to under load.

6. Complete and review the installation information in the final set of screens.

a) Specify the names of the Simple Mail Transfer Protocol (SMTP) mail server and front end server.

b) Review the pre-installation summary and click **Install**.

7. Click **Next**.

a) Optional: If you want to monitor the progress in the directory where IBM TRIRIGA is installed, you can open the `ant.log` file in a log monitoring utility.
In Windows, you can run the WinTail utility. In UNIX, you can run the **`tail -f ant.log`** command.

8. When the installation is complete, click **Done**.

9. Confirm that your license files are in the *tririga_root*\config\licenses directory. If they are not, you must copy them to this directory.

   All application servers that access a database must have the same set of licenses. The only exception is the license file for the IBM TRIRIGA Connector for Business Applications. This product is licensed for a limited number of servers and the license file must be placed on that number of servers to stay in compliance. For more information, see the topic about license files.
10. Restart IBM TRIRIGA by locating the WebSphere Application Server directory with the appropriate method.
    - On Windows servers, start the WebSphere Application Server service `IBM WebSphere Application Server V8.5 - NODENAME` from **Control Panel** > **Administrative Tools** > **Services**.
    - On UNIX servers, run the **stopServer** and **startServer** commands and specify the server name, *WEBSPHERE_HOME*/profiles/AppSrv01/bin/stopServer.sh *SERVER_NAME* and then *WEBSPHERE_HOME*/profiles/AppSrv01/bin/startServer.sh *SERVER_NAME*.
    - Alternatively, you can start the application through the WebSphere Application Server admin console. Log into the WebSphere Application Server admin console, go to **Applications** > **All Applications**, select the IBM TRIRIGA application and click **Stop** and then **Start**.

What to do next

Verify that your installation is running properly.

Related concepts

Create and configure a DB2 database for TRIRIGA

To configure TRIRIGA with DB2, you must create a database before you start the TRIRIGA Application Platform installation program. You can either create the database manually, or, you can use scripts that are provided with TRIRIGA.

Installing IBM TRIRIGA Application Platform with Oracle Database export files

If you have an Oracle Database export file to import into the IBM TRIRIGA Application Platform installation, you can run an Oracle Database export installation.

Overview of Oracle Database export installation

If you have an Oracle Database export file to import into the IBM TRIRIGA Application Platform installation, you can run an Oracle Database export installation. You can run this type of installation to move an operational database to a test or staging environment, or restore a database after a failure.

Installation phases

Before you begin the IBM TRIRIGA Application Platform installation, the application server software must be installed locally or on a server. Installing the platform with an Oracle Database export file involves several phases:

- Running the IBM TRIRIGA installation as a new installation to set up the schema (or user) and the table spaces (or database).
- Importing the Oracle Database `.dmp` export file.
- Running the IBM TRIRIGA installation as an upgrade installation to load the database.

Installing IBM TRIRIGA Application Platform on WebLogic or WebSphere

After your application server and database server are prepared, you can begin to install the IBM TRIRIGA Application Platform with your Oracle Database export file.

Before you begin

Verify that the Oracle Database is running and that you have administrative authority on the database server.

Procedure

1. Run the installer file. Follow the installation instructions.
   a) For the installation type, select **New Database (data.zip required)**.
   b) For the database type, select **Oracle**.
2. When you reach the database installation options, select the database action to create the schema. Clear all other options.
   a) Optional: If the table spaces do not exist, select the database action to create the table spaces.
3. When you reach the pre-installation summary, click **Install**.
4. Click **Next**.
   a) Optional: If you want to monitor the progress in the directory where IBM TRIRIGA is installed, you can open the `ant.log` file in a log monitoring utility.
   In Windows, you can run the WinTail utility. In UNIX, you can run the **`tail -f ant.log`** command.
5. When the installation is complete, click **Done**.
6. Import the Oracle Database `.dmp` export file.
   a) Locate the export file and run the import command.
   For example:

   ```
   imp system/manager fromuser=tridata touser=tridata
    file=exp_tridata.dmp log=imp_tridata.log
   ```

   b) When the import is complete, note any warnings or errors that occurred.
7. Review the `ant.log` file for errors.
   a) If an error is found, consult your implementation team on how to proceed.
   b) If no errors are found, delete the `ant.log` file.
8. Run the installer file. Follow the installation instructions.
   a) For the installation type, select **Existing Database**.
   b) For the database type, select **Oracle**.
9. When you reach the pre-installation summary, click **Install**.
10. Click **Next**.
    a) Optional: If you want to monitor the progress in the directory where IBM TRIRIGA is installed, you can open the `ant.log` file in a log monitoring utility.
11. When the installation is complete, click **Done**.
12. Review the `ant.log` file for errors.
    a) If an error is found, consult your implementation team on how to proceed.
13. Verify that your license files are in the *`tririga_root`*`\config\licenses` directory.
14. Optional: If you made customizations that were saved in the `userfiles` directory, copy those files into the upgrade installation.
15. Start IBM TRIRIGA by locating the application server directory with the appropriate method.

What to do next

Verify that your installation is running properly.

Verification checklist

After the IBM TRIRIGA Application Platform installation is complete, verify that your installation is running properly. This verification checklist is not intended to replace your company testing and validation procedures.

Item	Description

Inspecting the installation log	Read the `ant.log` file. This file contains information about that steps that were taken during the installation. The file is written to the IBM TRIRIGA root installation directory. For example, on Windows, `C:\Tririga\ant.log` is the typical location.
	A line toward the end of the file indicates whether the installation succeeded or failed, such as the following examples:
	• The installation succeeded:
	`BUILD SUCCESSFUL`
	`Total time: 25 minutes 51 seconds`
	• The installation failed:
	`BUILD FAILED`
	`C:\Tririga\build.xml:2586: The following error occurred while executing this line:`
	`C:\Tririga\build.xml:2141: Java returned: -1`
	`Total time: 8 minutes 44 seconds`

Starting the application	Start IBM TRIRIGA by locating the application server directory with the appropriate method.
Accessing the application	Verify your access to the IBM TRIRIGA application as the system user as follows: • Specify the URL address in your browser address field. The URL looks something like `http://`*`[hostname:port][/context_path]`*, where *`[hostname:port]`* and *`[/context_path]`* are the specific values for your environment. If you see the error message "Unable to launch the application", then you must set the **FRONT_END_SERVER** property. • Sign in with your user name and password. The default user name is "system" and the default password is "admin".

Item	Description
Accessing the administrator console	Verify your access to the IBM TRIRIGA administrator console as follows. • Specify the URL address in your browser address field. The URL looks something like `http://[hostname:port][/context_path]/html/en/default/admin`, where *[hostname:port]* and *[/context_path]* are the specific values for your environment. • Sign in with your user name and password. The default user name is "system" and the default password is "admin". • In the Agent Manager, start the following agents in the process server: Platform Maintenance Scheduler Agent, Extended Formula Agent, Formula Recalc Agent, Scheduler Agent, Workflow (WF) Agent, and Workflow (WF) Notification Agent. • Sign out of the administrator console.
Creating users and records	As the system user, perform the following: • Verify that you can create and revise records, such as location records. • Verify that the association tree loads in the **Associations** tab of any record that you open. • Verify that you can create and activate an employee record where the **Profile** tab has the following: **Active TRIRIGA User** is selected, one or more user groups are assigned but not the Admin Group, and one or more available licenses are assigned. For example, you can create and activate an employee record where the user belongs to the TRIRIGA Project Manager group with the IBM TRIRIGA Capital Projects Manager license. Log in as the user whose employee record was created and activated above, and perform the following: • Verify that the user can access everything the user is meant to access, according to the assigned groups and licenses. For example, a user who belongs to the TRIRIGA Project Manager group with the IBM TRIRIGA Capital Projects Manager license can see and open capital project records, but cannot see or open real estate lease records. • Verify that the user can create and revise records that the user is meant to create and revise, according to the assigned groups and licenses. For example, a user who belongs to the TRIRIGA Project Manager group with the IBM TRIRIGA Capital Projects Manager license can create and revise capital project records, but cannot create or revise real estate lease records.
Using the builder tools	As the system user, open and verify the builder tools under **Tools** > **Builder Tools** as follows: • In the workflow builder, verify that workflows load completely by opening and revising existing workflows. • In the data modeler, verify that the state transitions load completely. • In the data modeler, verify that the simple mail transfer protocol (SMTP) email notification works by publishing a test business object.

Item	Description
Using the Document Manager	As either the system user or a user with rights, open and verify the Document Manager under **Tools** > **Document Manager** as follows: • Verify that the user can upload new documents, such as `.txt` and `.jpg` files. • Verify that the user can upload new documents with the multifile applet. • Verify that the user can view documents by clicking the icon in the V column. • Verify that the user can check in and check out documents. • If Brava is installed, verify that the user can upload computer-aided design (CAD) documents in `.dxf` format and view the CAD documents by clicking the icon in the V column.
Editing project tasks	As either the system user or a user with rights, verify the functions as follows: • Create or open a new capital project. • In the **Schedule** tab, add or open a task in the Project Tasks section. • In the task, edit the planned start date, planned end date, or planned working hours. • Verify that when one field is edited, the other two fields are adjusted automatically.
Syncing CAD drawings	If IBM TRIRIGA CAD Integrator/Publisher is being used, verify your access to IBM TRIRIGA as follows: • Start TRIRIGA CAD Integrator/Publisher. • Sign in as a user with a TRIRIGA CAD Integrator/Publisher license. • Verify that the user can sync a CAD drawing with TRIRIGA CAD Integrator/Publisher.
Inspecting the server log	Verify that the `server.log` file exists for each application server and process server. This file is written to the `log` directory of the IBM TRIRIGA installation. For example, on Windows, `C:\Tririga\log\server.log` is the typical location. In addition: • Verify that the application server is writing to its `server.log` file. Inspect the file for any major exceptions on first startup. • Verify that the process server is writing to its `server.log` file. One day after the installation and on a regular basis, verify that the process server completed the cleanup process successfully.

Converting `IBS_SPEC_ASSIGNMENTS` to Module Level Assignments

Historically, the IBM TRIRIGA Application Platform stores all associations between records in the `IBS_SPEC_ASSIGNMENTS` table. As an alternative, the 3.7.0 platform has been enhanced to support Module Level Assignment tables. The **Module Level Assignments** (MLA) converter tool takes the `IBS_SPEC_ASSIGNMENTS` table and distributes the IBM TRIRIGA records that are found into smaller tables that are created by module type.

The converter executable is located in the directory where you installed IBM TRIRIGA Application Platform 3.7.0 at `<installation-directory>/tools/MLA-Converter`. Review the prerequisites and conversion instructions below. For more information, see the 3.7.0 Module Level Assignments video.

Contents

I. Prerequisites

To use the Module Level Assignment (MLA) enhancements, you must first install or upgrade to IBM TRIRIGA Application Platform 3.7.0. After installing or upgrading, you must also perform your normal platform-upgrade regression testing. Make sure that your applications behave as expected. Validate the install or upgrade prior to starting the MLA conversion.

Warning: We highly recommend that you perform the MLA conversion in a test environment **before** doing so in a production environment. Validate your business processes **before** you run the MLA converter tool in a production environment. It is **not** possible to reverse this conversion process. The only way to return to the single `IBS_SPEC_ASSIGNMENTS` table is to restore it from your backup.

II. Important Information

- **Supported databases**: Currently, this converter supports Oracle and DB2 databases only. It does **not** support Microsoft SQL Server.
- **Reverse associations**: The **Reverse Association** flag in the IBM TRIRIGA Report Manager is disabled since this functionality is **no longer** supported. After converting your database to use Module Level Assignments, the **Reverse Association** flag in queries and reports is ignored and only forward associations are allowed in reports and queries. Reverse associations as defined in the Association Manager and created through workflow tasks are still supported, and are used to fix any of the reports that are missing data because of the use of the flag.
- **Customized databases**: The converter does **not** support customized databases where partitioning, additional indexing, triggers, or other non-as-delivered database features have been added to the `IBS_SPEC_ASSIGNMENTS` table. The default tablespace will be used as defined in `TRIRIGADB.properties`.

III. Preparing for the Conversion

Procedure

1. Make sure that your IBM TRIRIGA Application Platform build number is the same as the build number of the MLA converter.
   - If your IBM TRIRIGA Application Platform version is earlier than 3.7.0, then upgrade to 3.7.0 or later.
   - Perform your normal platform-upgrade regression testing.
   - Make sure that your applications behave as expected. Validate the upgrade prior to starting the MLA conversion.
2. Create a backup of your current database **before** running the converter in your working environment.
   - It is **not** possible to reverse this conversion process. The only way to return to the single `IBS_SPEC_ASSIGNMENTS` table is to restore it from your backup.

- The database that you use should be comparable in size to the database that you would use in a production environment.
- The length of time that the conversion process takes will be proportional to the capabilities of the database server, the chunk size, and the size of your `IBS_SPEC_ASSIGNMENTS` table.
- In our lab test environments, the conversion took anywhere from four (4) to ten (10) hours on a large `IBS_SPEC_ASSIGNMENTS` table.
- When we used a low-powered database server, the same conversion took days.

3. Make sure that your database server has enough memory and disk space to perform the conversion.
   - Make sure that your database server has enough available space for the conversion. We recommend at least double the size of the `IBS_SPEC_ASSIGNMENTS` table as available space.
   - This conversion is a resource-intensive process.
   - Make sure that your database adheres to the IBM TRIRIGA Best Practices for System Performance.
4. Test your database I/O speed and connection with our Performance Monitor in the IBM TRIRIGA Administrator Console. The database test results should return highlighted in green.
5. To repeat, make sure that you run this converter in a supported database type: Oracle or DB2. Currently, this converter does **not** support Microsoft SQL Server.
6. Make sure that your database does **not** have any customized configurations around `IBS_SPEC_ASSIGNMENTS`. These customized configurations include partitioning, materialized views, triggers, etc.
7. Make sure that your IBM TRIRIGA system **no longer** processes reverse association filters.
   - The **Reverse Association** flag is **no longer** supported or allowed with queries and reports in the IBM TRIRIGA Report Manager.
   - To determine if your IBM TRIRIGA system still has reverse associations:
     a. Go to the **Administrator Console** > **Database Query Tool**.
     b. Run the following SQL query: `Q13a Find ALL queries using reverse associations (PLATFORM_AUDIT - No Hops)`
     c. If you do not have this query, go to the **Administrator Console** > **Must Gather Tool**.
     d. Clear the **Send Report to IBM TRIRIGA Support** option.
     e. Clear any other fields that have testing or irrelevant data.
     f. Make sure to select the **Perform Audit** option.
     g. Select **Submit Must Gather** and wait a few minutes.
     h. When the process is completed, the query starting with `Q13a` can be found in the **Database Query Tool**.
     i. If any reverse association queries are found, then determine if they are still used, and fix or remove them before the conversion. If an IBM TRIRIGA query with a **Reverse Association** flag is encountered in an MLA-converted database, the query is run, a message is logged, and the reverse association is ignored.
     j. For guidance, see the Best Practices, Chapter 7 IBM TRIRIGA Tuning, Section 7.3.4 Reverse Association Queries.
8. If you are using Linux, you must use the **`export`** command to set the **`MLA_CONV_DIR`** environment property to equal the directory in which the converter file resides.
   - Run this command in the same terminal session from which the converter will be launched.
   - For example: `export MLA_CONV_DIR="/home/user/IBM/Tririga/tools/MLA-Converter"`
9. Determine the chunk size for the conversion. By default, the chunk size is set to 100 million records.
   - To change the default value, run the following SQL statement. For example, this statement sets the chunk size to 50 million records:
   - `insert into ENVIRONMENT_PROPERTIES (PROPERTY, ENVIRONMENT, VALUE) values ('isa.chunk.size', 'platform', '50000000')`

- A zero (0) chunk size means **no** chunking. In this case, the converter will attempt to copy all of the data for a particular module into its assignment table.
- A zero (0) chunk size is **not** recommended unless you have a high-end database server.

10. Make sure that there are **no** other active connections to the database that you are converting.
    - Turn off any application servers, and any Oracle SQL Developer or IBM Data Studio sessions, that are running against the database server.
    - If you do **not** turn them off, the conversion may fail because of a deadlock or transaction timeout.

IV. Running the Conversion

Procedure

1. When you are ready, run the converter executable file in your working environment.
    - Do **not** move the converter executable from the *<installation-directory>*/tools/MLA-Converter directory. The converter must be left in place and executed from there.
    - Do **not** start any application servers or establish any other connections to the database during the conversion process.
2. Open the mla-conversion.log file to track the conversion progress. This log file is actively updated.
    - We recommend that you open the log file with **BareTail** or any other software that lets you automatically reload the file when it is updated, to avoid closing and opening the log file again to see the progress being logged.
    - In our lab test environments, the conversion took anywhere from four (4) to ten (10) hours on a large IBS_SPEC_ASSIGNMENTS table.
    - In general, the larger the IBS_SPEC_ASSIGNMENTS table is, the longer the conversion takes.
3. If there are any issues during the conversion process, review the mla-conversion.log file.
    - Fix any errors as suggested. Restart the converter.
    - If your database is in an unstable state and you cannot fix it, you will need to restore the database from your backup.
    - Until your database is converted successfully, you will not be able to start or run an application server against the database.

V. After the Conversion Finishes

Procedure

1. To make sure that your database is converted successfully, review the mla-conversion.log file.
2. Start each of your application servers one by one.
3. Perform your normal platform regression testing. Make sure that your applications behave as expected.
4. Validate the conversion.
5. After you are satisfied with the conversion, you can delete or drop the IBS_SPEC_ASSIGNMENTS_OLD table.
    - It is **not** possible to reverse this conversion process.
    - The only way to return to the single IBS_SPEC_ASSIGNMENTS table is to restore it from your backup.
6. If your database is converted successfully, do **not** run the converter again.

Configuring the platform

Although the IBM TRIRIGA Application Platform installation process applies most of the required configurations, further configuration might be necessary for your particular implementation. You can avoid issues by determining what the key configurations are and where changes can be made to optimize your environment.

Properties files

Certain IBM TRIRIGA properties must be set when they apply to your particular implementation. The properties files are in the `config` directory of the IBM TRIRIGA Application Platform installation. For example, on Windows, `C:\Tririga\config` is the typical location.

The properties files follow the concept of "name-value pairs" where a variable name is followed by an equal sign (=) and the defined value. Lines in the properties files that begin with a number sign (#) are comments and not read by the implementation. Name-value pairs are case-sensitive.

The variables and settings in the properties files might change from one version of IBM TRIRIGA to the next. Before you upgrade from a prior version of the IBM TRIRIGA software, save your old properties files. After you complete your upgrade installation, carefully review each newly installed properties file and adjust any values that apply to your implementation.

For information about the `TRIRIGACRYSTAL.properties` file, see the *IBM TRIRIGA Application Platform 3 Connector for SAP BusinessObjects User Guide*.

TRIRIGAWEB.properties

To adjust the IBM TRIRIGA web application properties, open the `TRIRIGAWEB.properties` file. The application server must be restarted for changes in the `TRIRIGAWEB.properties` file to take effect.

1: File system settings

Property	Values	Description
FileSystemRoot	[Valid path]	The path to the `userfiles` directory. For example, `C:/Tririga/userfiles`.
FileSystemBrowseRoot	[Valid path]	The path to the `userfiles` directory. For example, `C:/Tririga/userfiles`.
BatchInputLoc	[Valid path]	The path to the directory where the batch upload data files are stored. For example, `C:/Tririga/userfiles/input`.
BatchProcessLoc	[Valid path]	The path to the directory where the batch upload data files are processed. For example, `C:/Tririga/userfiles/processing`.
BatchOutputLoc	[Valid path]	The path to the directory where the batch upload data process writes to the output log. For example, `C:/Tririga/userfiles/output`.
BatchErrorLoc	[Valid path]	The path to the directory where the batch upload data process writes to the error log. For example, `C:/Tririga/userfiles/error`.

Property	Values	Description
BatchLogLoc	[Valid path]	The path to the directory where the batch upload data process writes to the running log. For example, `C:/Tririga/userfiles/log`.
ServerRoot	[Valid path]	The path to the parent directory of the `userfiles` directory. For example, `C:/Tririga`.

2: External server settings

Property	Values	Description
mail.smtp.host	[Host name or IP address]	The simple mail transfer protocol (SMTP) mail server for delivering outgoing notifications and messages to external mail systems. This property is set to a host name or IP address. In most cases, the mail server must be listening on port 25. The SMTP server must be configured to accept outgoing emails from the IP address of the IBM TRIRIGA server without authentication. For example, LAPTOP234 and 10.11.12.13.
mail.smtp.email.domain	[String]	The SMTP mail server domain name for delivering outgoing notifications and messages. In most cases, the mail server must be listening on port 25. The platform tries to use this property value first, and if this property value is not set, the platform uses the value in `mail.smtp.host`. For example, `mail.company.com`.
mail.imaps.ssl.key	[String]	For the Incoming Mail Agent to connect to and process IMAPS requests where the SSL certificate is self signed, use this property to point to a keystore file on the local server that has been configured to accept and trust the IMAPS Server's SSL Key. This is the path on the server's file system to where the Secure Sockets Layer (SSL) keystore is loaded for the SSL connection. If no value is specified, but the Internet Message Access Protocol - Secure (IMAPS) is used for the Incoming Mail Agent, then the application server must set the keystore.
mail.imaps.ssl.port	[Number]	The default port setting for IMAPS. For example, 993.

You can add JavaMail API properties (mail.smtp.*) to the `TRIRIGAWEB.properties` file that customize the behavior of the IBM TRIRIGA Application Platform mail framework. If you do not add these properties, default values and specifications are used.

Brava server settings

Property	Values	Description
BRAVA_SERVER_URL	[URL]	The Brava Server URL. For example, `http\://9.72.78.55\:8080`
BRAVA_EXCLUDE_LIST	[Valid file extensions]	A list of file extensions to identify the files to be ignored by Brava. If no value is specified, then all file extensions are passed to Brava. Separate the file extensions in the list with commas. Do not include the dot (".") when you specify an extension. For example, html,htm,svg,rpt,zip,exe,doc,xls,ppt,pdf,txt,xml,docx,xlsx,pptx,jar

CMIS settings

Property	Values	Description
ENABLE_CMIS	Y, N	Set to Y if the installation uses a CMIS-supported ECM to manage documents within TRIRIGA. Set to N if the installation uses TRIRIGA Document Manager to manage documents. The default value is N.
CMIS_URL	[URL]	The URL of the CMIS server for the AtomPub protocol. Leave this property blank if CMIS is not enabled.
CMIS_USER	[String]	The user name of the CMIS server. Leave this property blank if CMIS is not enabled.
CMIS_PW	[String]	The password for the CMIS server. The password must be encrypted. Leave this property blank if CMIS is not enabled.
CMIS_STORE	[Store_name]	The name of the ECM document store that holds the TRIRIGA documents. Leave this property blank if CMIS is not enabled.
CMIS_ROOT	[Folder name]	The ECM folder that is the root for all TRIRIGA documents. Leave this property blank if CMIS is not enabled.

3: Agent settings

Property	Values	Description
AGENTS_NOT_ALLOWED	[String]	A comma-delimited list of agents that are not allowed to run on this server. Manage agent settings for this server and all other IBM TRIRIGA servers on the **Agent Manager** page of the administrator console. For more information, see the *IBM TRIRIGA Application Platform 3 Administrator Console User Guide*. A blank value allows any agent to be started on this server but does not start any agent automatically.
INSTANCE_ID	[Number]	Overrides the default computer ID. The INSTANCE properties override the default system ID and system name. If you leave these optional properties blank, a hostname lookup action is used to name the instance and calculate the ID. **Note:** The **INSTANCE_ID** property must be set to an integer value. When two or more IBM TRIRIGA servers are running on the same physical computer, the **INSTANCE_ID** property must be unique for independent agent management. The **INSTANCE_ID** property must be set to an integer value less than 10000. Leave this value blank if you are running a single instance per physical computer.
INSTANCE_NAME	[String]	Overrides the default computer name. The INSTANCE properties override the default system ID and system name. If you leave these optional properties blank, a hostname lookup action is used to name the instance and calculate the ID. When two or more IBM TRIRIGA servers are running on the same physical computer, the **INSTANCE_NAME** property must be unique for independent agent management. When a value is present, the value of the **INSTANCE_NAME** property can be any alphanumeric value. Leave this value blank if you are running a single instance per physical computer.
CadIntegratorLoad	[Number]	The maximum load. For example, 100.0.
CadIntegratorMaxThreads	[Number]	The maximum number of threads. The default value is 5.

Property	Values	Description
DataImportAgentLoad	[Number]	The number of threads in proportion to the number of connections. For example, 100.0.
DataImportAgentMax Threads	[Number]	The maximum number of threads. If there is no upper limit, set to 0. The default value is 6.
SchedulerAgentLoad	[Number]	The number of threads in proportion to the number of connections. For example, 100.0.
SchedulerAgentMax Threads	[Number]	The maximum number of threads. If there is no upper limit, set to 0. The default value is 3.
WFAgentLoad	[Number]	The number of threads in proportion to the number of connections. For example, 100.0.
WFAgentMaxThreads	[Number]	The maximum number of threads. If there is no upper limit, set to 0. The default value is 80.
ReportQueueAgentLoad	[Number]	The number of threads in proportion to the number of connections. For example, 100.0.
ReportQueueAgentMax Threads	[Number]	The maximum number of threads. If there is no upper limit, set to 0. The default value is 2.
AGENT_STALE_TIME_IN _SECONDS	[Number]	The agent idle time in seconds before it might be considered down and other servers might initiate cleanup action on the agent and its server. The default value is 60. The lowest acceptable value is 60.
WF_AGENT_MAX_ACTIVE_PE R _USER	[Number]	The thread limit per user on active workflows. Set this property to a low number to prevent one user from reaching the environment maximum. The default value is 70.
WF_NOTIFICATION_EMAIL _ID	[Valid email address]	The sent-from email address on outgoing workflow notifications. For example, wf.notifications@us.ibm.com

Property	Values	Description
WF_NOTIFICATION_EMAIL_ID_FROM_DISPLAY_LABEL	[String]	Assign a title to outgoing emails sent from the address defined for **WF_NOTIFICATION_EMAIL_ID**. For example, Workflow Notifications<wf.notifications@us.ibm.com>
NOTIFICATION_HTML_TAG_WHITELIST	[String]	Specifies the HTML tags that are allowed in outgoing email and can be used to allow images to be placed in outgoing mail. To add to the comma-delimited list, add the new HTML tag without spaces. When left blank, the default list will be used. The default list contains: html,head,title,body, h1,h2,h3,h4,h5,h6,p,br,hr,pre,em,strong,code, b,i,a,ul,li,ol,dl,dd,dt,table,tr,td,thead, tbody,th,input,form,select,option,textarea, blockquote,div,span,label,style
NOTIFICATION_HTML_ATTRIBUTE_WHITELIST	[String]	Specifies the HTML attributes that are allowed in outgoing email and can be used to allow images to be placed in outgoing mail. To add to the comma-delimited list, add the new HTML attribute without spaces. When left blank, the default list will be used. The default list contains: id,class,src,value,href, alt,width,colspan,rowspan,readonly,style,type, align,nowrap,height,valign,cellspacing, cellpadding,checked,selected

Property	Values	Description
WF_INSTANCE_SAVE	ERRORS _ONLY, DATA _LOAD, PER _WORK FLOW _ALWAYS, ALWAYS	Configures when workflow instances are saved. The property includes the following values: • ERRORS_ONLY: Save instances only when an error occurs. This is the default value. • DATA_LOAD: Use this value for the mass or batch loading of many records. This value bypasses and never saves any instances, which increases performance and decreases database size. This can be used in production environments as well, especially if the production environment has many workflows that error out or have Stop tasks, but there are no application developers available to correct the problems in the workflows. • PER_WORKFLOW_ALWAYS: Save the instance if the workflow is configured to save. • ALWAYS: Always save instances. Never use this value in a production environment, and never for more than a few hours. Instances that are required by the platform are saved as necessary regardless of this setting. Suspended workflows and workflows with errors are always saved. Changing this property within the `TRIRIGAWEB.properties` file requires restarting the server for the change to take effect. **Workflow Agent Manager.** You can change the setting from the administrator console without restarting the server. The Workflow Agent Manager contains a **Workflow Instance Recording** field and a **Save** action. The field contains the following options: • **Errors Only**: Corresponds to the ERRORS_ONLY value. • **Data Loading**: Corresponds to the DATA_LOAD value. • **As configured in the workflow**: Corresponds to the PER_WORKFLOW_ALWAYS value. • **Always**: Corresponds to the ALWAYS value. Never use this value in a production environment, and never for more than a few hours. Never use the ALWAYS value in production environments. Never use the ALWAYS value for an extended period of time. It will cause performance issues and excessive space consumption. It is better to use PER_WORKFLOW_ALWAYS in a development environment to isolate issues without saving instances of other unrelated application processes. Do not leave WF Instance set to ALWAYS for more than a few hours as you troubleshoot an issue Serious performance, memory, and database space problems will happen if you keep this setting.

Property	Values	Description
WF_INSTANCE_SAVE (continued)		There is also an option to restore this setting from the `TRIRIGAWEB.properties` file. The setting takes effect as soon as you click **Save**. This setting affects the specific server on which the administrator console is being accessed; it does not apply across servers. This setting stays in effect until it is changed or until the server is restarted. Restarting the server reverts the setting to the value in the `TRIRIGAWEB.properties` file.
WF_INSTANCE_SAVE _24HR_THRESHOLD	[Number]	Configures when workflow instances should stop being saved. When excessive workflow instances are saved, the platform will stop saving if the number of saved instances exceeds a certain threshold. This feature allows administrators to set an upper bound for how many workflow instances will be saved in a 24-hour period. This setting will prevent the Platform Maintenance Scheduler (Cleanup Agent) from being impacted by excessive workflow instance data. The default value is 1000. To override the default value, set WF_INSTANCE_SAVE_24HR_THRESHOLD=#### where #### is a positive integer, and restart the server. This must be set on each server in the environment. Do not set this value to a number larger than 10000 or the Platform Maintenance Scheduler (Cleanup Agent) will take a long time to remove the debugging records. The default value is 1000. The maximum value is 10000.
USE_WF_BINARY_LOAD	N, Y	If set to Y, the platform uses the binary load process. The Workflow Templates are loaded with their stored binary version, if they cannot be found in the Workflow Template cache. If set to N or no value, the platform skips the binary load process. The default value is Y.

Property	Values	Description
FRONT_END_SERVER	[Host name or IP address]	The main URL that the user enters to access the IBM TRIRIGA application. It consists of a protocol (optional), host (required), and port (optional). If no protocol is specified, then "`http://`" is used by default. For example: • `tririga.company.com` • `tri-dev.company.com:8001` • `https://tri-secure.company.com` This property must be configured properly for Business Intelligence and Reporting Tools (BIRT) reports in IBM TRIRIGA to work correctly. If your users are seeing an application error "Unable to launch the application", you must set this property. If you are not using Apache HTTP Server, enter the application server IP with the port number. For example, if your application server is running Oracle WebLogic Server on SERVER123, this property must be set to `SERVER123:8001`.
EXTERNAL_FRONT_END_SERVER=	[Host name or IP address]	The main URL an external user would click in an e-mail notification to access the IBM TRIRIGA system. It consists of a protocol, host, and, optionally, a port value. Do not add the context-path. IBM TRIRIGA supports split horizon DNS, so internal and external users can access IBM TRIRIGA using the same URL. The DNS server delivers an internal IP address for internal personnel, and an external IP address for external personnel.
CLEAN_HOUR	[Whole number from 0 to 23]	The hour at which the Cleanup Agent starts, in 24-hour time. The default value is 0.
CLEAN_TIMEOUT	[Whole number]	The number of minutes the Platform Maintenance Agent is allowed to run. The default value is 240.
DC_HISTORY_RETENTION_DAYS	[Number]	The DataConnect Agent deletes completed or obsolete DataConnect Jobs that are older than this number of days. The default value is 5.
WF_HISTORY_RETENTION_DAYS	[Number]	The Cleanup Agent deletes workflows that are not waiting on a user or on approval tasks that are older than this number of days. The default value is 5.

Property	Values	Description
CLEANUP_AGENT_SCHEDULER_TASKS	N, Y	If set to Y, the platform runs the Scheduler Cleanup tasks. The default value is Y.
CLEANUP_AGENT_SCHEDULED_EVENT_COMPLETE_DAYS	[Number]	The platform moves scheduled events that were not completed in this many days to a completed state. The default value is 7 (1 week).
CLEANUP_AGENT_RECORD_BATCH_SIZE	[Number]	The maximum number of records in a batch of records that is marked for deletion, to remove from the tables at one time. The Modulus function will be used on the **SPEC_ID** to place records in a batch. So if there are 35000 records to clean up, and this value is set at a batch size of 10000, then there will be 4 batches of around 10000 each. If there are 1000 records to clean up, set at a batch size of 10000, there will be 1 batch. The default value is 50000.
CLEANUP_AGENT_ADD_MISSING_ASSOCIATIONS_FOR_SMART_SECTIONS	TRUE,FALSE	This will perform a very expensive statement to add back the removed associations for smart sections. This is typically caused by a workflow which removes an association that is used in a smart section without clearing or de-linking the record that is used in the smart section. The legacy behavior is to set this to TRUE. However, this can be set to FALSE, if you are sure that there are no de-association tasks that would remove a smart section's associations. The default value is TRUE.
WF_MAX_BATCH_ENTRIES	[Number]	The maximum size of the batch when cleaning up workflow instances. The default value is 200000.
WF_AGENT_WAITTIME	[Number]	The number of milliseconds that the Workflow Agent waits before it checks for more free threads. This property is not the same as Workflow Agent sleep time. The minimum value is 100. The default value is 100.
WF_AGENT_SLEEPTIME	[Number]	The frequency with which to check the **WF_EVENT** table for new events, during the rest period when there are no events to process. If you are running multiple Workflow Agent servers, set this value to a unique value between 4500 and 5500, so that the different agents do not get into lock step with each other. By default, TRIRIGA will generate a random value between 4500 and 5500, so you should not need to set this value. If set, the default value is 4999.

Property	Values	Description
WF_FUTURE_AGENT _SLEEPTIME	[Number]	The number of seconds that the Workflow Future Agent waits before it checks whether more items must be processed. The default value is 5.
REPORTDATA_AGENT _SLEEPTIME	[Number]	The number of minutes that the Report Data Index Agent waits before it checks whether more items must be processed. The default value is 5.
REPORTDATA_AGENT _RECORD_COUNT	[Number]	The number of records in a report before the Report Data Index Agent reindexes the report. The default value is 500.
DATACONNECT_SLEEP_TIME	[Number]	The number of minutes that the DataConnect Agent waits before it checks whether more items must be processed. Use a negative integer to indicate a value measured in seconds. For example, to check every ten seconds, use the value -10. Ten seconds is the shortest interval supported. The default value is 10.
INCOMING_MAIL _AGENT_SLEEP_TIME	[Number]	Incoming Mail Agent sleep time, measured in seconds. For example, 5. The default value is 5. This parameter must be set to a minimum value of 1.
TDI_AGENT_SLEEPTIME	[Number]	The number of minutes that the agent waits before it checks to ensure the Tivoli Directory Integrator server is running. If the server is not running, the agent restarts it. The default value is 2.

4: System settings

Property	Values	Description
BaseCurrency	[Valid currency]	The base currency for currency conversions. An administrator must set this value at the time of installation. Evaluate your use of currencies during implementation and add or remove currencies that are necessary to your business before you add records. Failure to do so before you create records can cause conversion issues or data loss on those records. Changing the currency after the transaction records have been created is not recommended as previously created records will not be updated. Consult your implementation team before you attempt to remove or change a currency unit of measure (UOM) after implementation. The default value is US Dollars.
CancelLabel	[String]	The label that replaces the **Cancel** action on all form wizards. A blank value hides the **Cancel** action. If the value is set to `Cancel`, the word is translated for non-US English users on the record form and report manager pages. If set to `x`, the value is shown regardless of the language settings for the end user. If the value of this property is empty or the property is not in the file, the **Cancel** button is not displayed. The default value is x.
CONTEXT_PATH	[Path]	The application context path that accesses the IBM TRIRIGA application. The first character must be /. If you revise this property, you must also revise the enterprise archive (EAR) `application.xml` file. The default value is /.
SecurityScopeCacheTimeGap	[Number]	The frequency at which the Security Scope Cache is refreshed in minutes. The default value is 20.
DataRefreshTime	[Number]	The frequency at which the portal data is refreshed in minutes. The default value is 5.
SSO	N, Y	If set to Y, the environment runs in single sign-on (SSO) mode. If set to Y, when you log out of IBM TRIRIGA, the session is ended by closing the browser or browser tab used to access IBM TRIRIGA. The default value is N.

Property	Values	Description
SSO_BACKING_SERVER_PORT	[Number]	The port number that is used by the back-end server. If the SSO server port does not match the back-end server port, this property must be set. The default value is -1. If -1 or any other negative value is set for this property, then the port number that is set for the front-end server is also set for the back-end server port.
SSO_REMOTE_USER	N, Y	If set to Y, the `request.getRemoteUser()` method is used to sign in. The user name must exactly match the user name that is created in IBM TRIRIGA. When the value of **SSO_USER_PRINCIPAL** is Y, set **SSO_REMOTE_USER** to N. The default value is Y.
SSO_USER_PRINCIPAL	N, Y	If the system is configured to append the User Principal Name (UPN) to the HTTP header, set this property to Y. If set to Y, the HTTP header parameter **UserPrincipal** is used, and the user name is retrieved by calling the `request.getUserPrincipal().getName()` method. When the value is Y, set the value of the **SSO_REMOTE_USER** property to N. The default value is N.
SSO_REMOVE_DOMAIN_NAME	N, Y	If set to Y, the prefixed or appended domain name is removed from the directory server user name that is passed by using the **SSO_REMOTE_USER** property. The default value is Y. • If user names contain a domain name when passed from the directory server and user names in IBM TRIRIGA contain only the user name, set this property to Y. • If user names contain a domain name when passed from the directory server and user names in IBM TRIRIGA include the domain name, set this property to N.

Property	Values	Description
SSO_REQUEST_ATTRIBUTE_NAME	[headername], sm_user, [username], [$WSRU]	The name of the property that is inserted into the HTTP header whose value is the IBM TRIRIGA user name. **Example 1:** For use with SiteMinder, set **SSO_REQUEST_ATTRIBUTE_NAME**=sm_user **Example 2:** For use with SAML SSO and WebSphere Application Server standalone or WebSphere Application Server Liberty, set **SSO_REQUEST_ATTRIBUTE_NAME**=$WSRU This property is case sensitive. Use the requestTest.jsp page to check the correct parameter name. If the user name is stored in a distinct HTTP attribute variable, set **SSO_REMOTE_USER** to N, and set this property to the HTTP attribute name. In some systems, you can define the variable name in which the user name is located. In this case, set this property to the variable name in your system. The default value is headername.
SSO_DISABLE_UNAUTHORIZED_STATUS	N, Y	The `unauthorized.jsp` page sends an `HTTP Error 401` response in the HTTP Header. If set to Y, the header response is disabled. If you want the `HTTP Error 401` response sent, set this property to N. The default value is N.
USERNAME_CASE_SENSITIVE	N, Y	If set to Y, sign-in user names are case-sensitive. If you want to authenticate without case sensitivity, set this property to N. The default value is Y.
SSO_SINGLE_SIGN_OUT_REDIRECT_URL	[URL]	Define to redirect users to a single sign out URL. If the SSO parameter is set to Y and this parameter is left blank, the window will close on exit. If the SSO parameter is set to N and this parameter is left blank, the user will be directed to the default login page.
ALTERNATE_RESOURCE_DIRECTORY	[Path]	The path to the alternative sign-in page resource directory, for example, `C:\`*`pathToTRIRIGA`*`\userfiles\alt`.
ALTERNATE_INDEX_HTML	[File name]	The file name of the alternative sign-in page, for example, `index.html`

Property	Values	Description
LOGIN_PAGE_RESOURCE_LIST	[Path]	Specifies which images in the USERFILES table can be accessed without a user session. To make images available to users before they have authenticated with the system, add the images to this property as a list of comma-separated values. Each value must be the name of the image as it is found in the FILELOC column of the USERFILES table. For example, `/images/ExampleImage1.png`, `/images/ExampleImage2.png`
ALTERNATE_UX_LOGIN_VIEW	[Name]	The name of an alternate login view for UX applications.
DocumentWorkflowTraversal	N, Y	If set to Y, document permissions are handled with a custom workflow. The default value is N.
DEFAULT_TITLE	[String]	Sets the default title for the IBM TRIRIGA application.
SHOW_URL_ON_PORTAL_QUERY	N, Y	If set to Y, portal queries display URL text. The default value is Y.
FULL_HELP_OBJECT	N, Y	If set to Y, the full Help business object is shown when you click the **Help** link. If set to N, the Notes section of the Help business object is shown. The default value is Y.
REPORT_MEMORY_USAGE_LIMIT	[Whole number from 0 to 100], [Blank]	The maximum percentage of available server memory that can be used while a user report is running. This limit does not apply to System Reports or Community Reports; it applies to My Reports only. If a user sees a query error "There are not enough resources available to run the report", then the query is the likely cause. However, it is also possible that other concurrent processes used memory while the query was assembling its results. Valid values are 0 to 100. The specific values of 0 and 100 disable any enforced limit and allow a single query by one user to run the server out of memory. An empty value or an invalid value is treated as a default value. The default value is 50.

Property	Values	Description
EXPORT_EXCEL_BATCH _PROCESS_SIZE	[Number]	The number of records at a time that will be processed to export a report to Microsoft Excel. This is not a maximum, but a batch process size. Care should be taken because an export can consume a lot of memory on the application server. This should be tuned to balance the number of batches to run versus the memory heap available on this application server. The default value is 75000.
MOD_NAME_ON_WIZARD	N, Y	If set to Y, the module name shows in the title bar of a record wizard. The default value is N.
PORTAL_MY_TIMESHEET	N, Y	If set to Y, the **My Timesheet** link displays wherever the **My Timesheet** link can be displayed. The default value is N.
ANALYZE_META_DATA _TABLES	N, Y	If set to Y, metadata tables are analyzed during the flat data conversion process. The default value is Y.
RUNVALIDATOR	no, yes	If set to yes, the validator runs when you upgrade from TRIRIGA 8i to the TRIRIGA Application Platform 2.x. The default value is yes.
Reserve	N, Y	If set to Y, the IBM TRIRIGA Workplace Reservation Manager application is enabled. The default value is N.
EXCHANGE_ROOT_PATH	[String]	Sets the Microsoft Exchange server path for IBM TRIRIGA Workplace Reservation Manager appointments. The default value is exchange.
EXTERNAL_MAIL_SERVER _USERNAME	[String]	The user name for integrating with Microsoft Exchange and IBM TRIRIGA Workplace Reservation Manager. This value can be plain text or encrypted. For information about the encryption tool, see the *IBM TRIRIGA Application Platform 3 Administrator Console User Guide*.
EXTERNAL_MAIL_SERVER _PASSWORD	[String]	The password for integrating with Microsoft Exchange and IBM TRIRIGA Workplace Reservation Manager. This value can be plain text or encrypted. For information about the encryption tool, see the *IBM TRIRIGA Application Platform 3 Administrator Console User Guide*.

Property	Values	Description
TRIRIGA_RESERVE_SUB_DOMAIN	[String]	The IBM TRIRIGA subdomain for the Microsoft Exchange server. This value determines which emails are forwarded to IBM TRIRIGA. The resources that are managed in IBM TRIRIGA must have a contact to forward to in this subdomain. For example, `reserve.tririga`
EXCHANGE_DOMAIN	[String]	The IBM TRIRIGA domain for the Microsoft Exchange server. For example, `tririga.com`
TRIRIGA_RESERVE_SMTP_ROOT	[Path]	The simple mail transfer protocol (SMTP) root directory that is created when the Reserve SMTP Agent is started. If the directory exists, the IBM TRIRIGA process must have write access to the directory. For example: • On Microsoft Windows: `c:\tririga\install\userfiles\smtp\in\` • On UNIX: `/tririga/install/userfiles/smtp/in/`
TRIRIGA_RESERVE_OUTLOOK_TAB_LABEL	[String]	The label that is displayed when a user connects the Microsoft Outlook client to the IBM TRIRIGA application server. For multi-byte support, you must Unicode-escape your values according to the Java specification. For example, TRIRIGA Reserve
SMTP_CLIENT_TIMEOUT	[Number]	The timeout of the SMTP endpoint in minutes. For example, 10.
SMTP_KEEP_EMAIL	N, Y	Determines whether to keep the email after SMTP processing by iCalendar. If set to Y, then the environment keeps the email after processing. Use Y only when SMTP processing is being debugged. If set to N, then the environment deletes the email after processing.
SMTP_PORT	[Number]	The port that is used by the Reserve SMTP Agent for incoming SMTP traffic. If the value is anything other than 25, then the administrator must route the SMTP traffic to that port value. This value is the port on which IBM TRIRIGA listens for SMTP traffic. For example, 25.

Property	Values	Description
SMTP_SUBJECT_PREFIX	[String]	When an outgoing email from IBM TRIRIGA is sent, this string will be prefixed to the Subject of the message. This is so you can tell the difference between Development, Test, and Production environments. For example, [Dev]. The default value is blank.
CUSTOM_ERROR_PAGE	N, Y	If set to Y, enables your custom error page. If set to N, a default error page is used. The default value is N.
CUSTOM_ERROR_PAGE_PATH	[Path]	The path of the custom error page.
EXCLUDE_CHARACTERS	[String]	List of characters or strings to exclude from fields, which are separated by spaces. Used to avoid characters that can be treated as a script for cross-site scripting (XSS). For example, < > & {
ALLOWED_CHARACTERS	[String]	List characters or strings that are allowed in fields, which are separated by spaces. Regular expression characters must be escaped. For example, to allow the character ?, enter \\? For example, \\? & \\(\\)
ENFORCE_CHARACTER_RESTRICTIONS_FOR_RECORDS	N, Y	If set to Y, the special character restrictions that are defined in the **EXCLUDE_CHARACTERS** and **ALLOWED_CHARACTERS** properties are enforced for record publish names. An error occurs if the user tries to save a record with a publish name that includes a character in the **EXCLUDE_CHARACTERS** property. The default value is N.
TABLE_SIZE_CHECK_FOR_ORACLE	N, Y	If set to Y, the platform checks the Oracle Database to see whether the table space block size exceeds 8K bytes. The default value is N.
ErrorHandlerStrategy.MessageResetMinutes	[Number]	The number of minutes the platform waits before it clears duplicate attention messages. When cleared, duplicate attention messages with counts greater than 1 show in a log entry. The default value is 60.
SYSTEM_DEFAULT_TIMEZONE	[String]	This sets the default time zone. This is used when the user has not set their time zone in their My Profile and/or Employee record. Make sure this value matches the database and local application server OS. For example, America/Los_Angeles.

Property	Values	Description
SHOW_MY_PROFILE_LINK	N, Y	This controls whether the My Profile Link is shown in the My Links portal section. The default value is Y.
SHOW_PREFERENCES_LINK	N, Y	This controls whether the Preferences Link is shown in the top navigation. If set to Y, the "Welcome, *[name]*" text in the welcome bar becomes a link that the user can click to open the My Profile record of that user. The default value is N.
USE_PROJECT_SECURITY	N, Y	Use this property to add project security with the application security that governs records that are returned in queries and accessed through forms. If set to Y, the user access to a record is controlled by the project security. This security is applied along with the other layers of security that control record access. The default value is N.
ENFORCE_GUI_LEVEL_QUERY _SECURITY	N, Y	Use this property to control form-level security in reports and queries. If set to Y, the platform enforces the Security Group settings for the logged in user while a query is running. If the user does not have access to the records that are queried, no results are returned. The default value is N.
ENFORCE_REPORT_ACCESS _SECURITY	N, Y	Use this property to have security control whether report or query links are visible to the user. IBM TRIRIGA 10 implementations must set this value to Y and implementations of older versions must set this value to N. If set to Y, license security and security group security control whether a user sees a report link. If set to N, security does not control whether a user sees a report link. The default value is Y.
USE_AUTO_COMPLETE_IN _LOCATOR_FIELD	N, Y	If set to Y, autocomplete is available to users in every locator field for which it is configured. For more information about autocomplete for a locator field, see *Application Building for the IBM TRIRIGA Application Platform 3*. The default value is Y.

Property	Values	Description
USE_AUTO_COMPLETE_IN _SMART_SECTION	N, Y	If set to Y, autocomplete is available to users in every single-record smart section for which it is configured. For more information about autocomplete for a single-record smart section, see *Application Building for the IBM TRIRIGA Application Platform 3*. The default value is Y.
AUTO_COMPLETE_MIN_CHAR	[Number]	The minimum number of characters a user must type to trigger autocomplete. The default value is 3.
DRAWING_REPROCESSING _AS_NEEDED	N, Y	If set to Y, at server startup, the platform checks drawings to see whether any require reprocessing and reprocesses the drawings that need it. If set to N, at server startup, the platform does not check drawings to see whether any require reprocessing. The default value is Y.
GRAPHICS_SECTION _LOGGING_LEVEL	ERROR, INFO, WARN	Sets the client-side logging level for graphics sections. The default value is ERROR.
PDF_EXPORT_GRAPHIC _STROKE_WIDTH_OVERRIDE	[Blank]	Overrides all stroke (line) widths when a graphics section is exported to a `.pdf` file. On some larger-scale drawings, the width of lines can look thick when zoomed into the `.pdf` file at a high magnification. This property can be used to resolve that issue by setting the stroke width to a small constant value such as 0.0000001. When the value is left blank, the exported `.pdf` file uses the stroke width that is defined per line in the graphic, which is derived from the line widths as published from the CAD drawing. The default value is blank with no value specified.
TREE_PAGING_SIZE	[Number]	The maximum number of child records that are shown in the hierarchy tree for Location, Organization, Geography, Classification, Cost Code, and newly created hierarchical trees. The application includes the child records of the root node in the count. The default value is 1000.
EXCLUDED_TREE _HIERARCHY_CACHE_TYPES	[Valid tree types]	Controls which tree hierarchy types to exclude from hierarchy cache events. This prevents hierarchy types from being synchronized across servers. The value of this property is a comma-delimited list of tree types. For example, triCostCode.

Property	Values	Description
REBUILD_HIERARCHIES_ON_CACHE_REFRESH	[Valid module names]	Controls which additional hierarchy modules are rebuilt automatically when the hierarchy tree cache is cleared in either the admin console or when the Platform Maintenance Scheduler runs. The following modules will always be rebuilt automatically: • Geography • Organization • Location The value of this property is a comma-separated list of module names. For example, Document,Classification.
AUTO_PROJECT_ASSOCIATION_RESTRICTION	[String], [Blank]	Controls the automatic creation of record-level associations between new records and the current Capital Project. If set to an association name, such as "Contains", the platform creates that specific record-level association automatically. This association definition must be defined from the Capital Project to the business object of the records that are being created in that project. If set to blank (with no value specified), when records are created in a non-default project (or company level), the platform creates all record-level associations automatically. These associations correspond to the association definitions that are defined between the Capital Project business object and the business object of the newly created record. If the association definition does not exist from the Capital Project to the business object of the created record, no record-level association is created automatically. The value is case-sensitive and must be identical to the value defined in the Data Modeler. The property includes the following typical values: • "Contains" for IBM TRIRIGA 10 and IBM TRIRIGA 9 applications. • "Associated To" for IBM TRIRIGA 8i applications. The default value is Contains.

Property	Values	Description
RECORD_PROJECT_CONTAINMENT	N, Y, [Blank]	Controls how the platform decides the project context of a record. If set to Y or blank, the platform drives project behavior that is based on the project context of the current record. This context helps provide consistent record interactions, especially when a record in one project is opened within the portal context of a different project. If set to N, the platform drives project behavior that is based on the portal project context. The default value is Y.
SMARTQUERY_RESULT_SIZE_LIMIT	N, Y	Enables the Run Dynamic Query feature in Business Connect. The default value is Y.
ENFORCE_REQUIRED_VALIDATION	N, Y	Establishes when the platform conducts the required field validations. If set to Y, when a user moves from tab to tab, the platform does not check whether all required fields on the tab are specified. However, the platform still conducts field validations (for example, `isNumeric`). On state transitions, the platform checks required fields. In addition, if set to Y, this property ensures that a record cannot be created unless all required fields are populated, regardless of the tab. This behavior also occurs in IBM TRIRIGA Connector for Business Applications where in previous releases only the required fields on the first tab were validated. This change has the potential to cause previously working integrations to fail. To resume the previous behavior, set this property to N. If set to N, when a user moves from tab to tab, the platform checks that all required fields on the tab are specified. The platform also conducts field validations. The default value is Y.
MAX_FORM_ACTION_NUMBER	[Number]	Sets the maximum number of actions that are displayed on a form before the platform puts the excess actions into the overflow button. The platform does not count the **Cancel** action and the overflow button when it determines how many actions to display. The platform puts all secondary actions and normal actions that exceed this number into the overflow button. The default value is 4.

Property	Values	Description
SESSION_HISTORY _TRACKING	ALL, NONE, WEB_USER	Indicates which user sessions are logged to the SESSION_HISTORY table. If set to WEB_USER, user sessions from IBM TRIRIGA Connector for Business Applications are not logged to the SESSION_HISTORY table. The default value is WEB_USER.
ENABLE_PROFILE_ROW _LEVEL_SECURITY	N, Y	Controls user security access to My Profile records. If set to Y, the platform uses the **Access All Profiles** field in the group of the user to determine whether the user can access the My Profile record from another user. Additionally, the user's group controls the user access to the My Profile form and access to tabs, sections, actions, and other form elements. If set to N, the user has administrator access to the user's own My Profile record. If a user tries to access the My Profile record from another user, the platform applies standard group access controls. The default value is Y.
BIRT_NESTED_TABLE_IN _FOOTER_CLEANUP	FIX, ERROR, DISABLED	The BIRT framework has changed how it handles parameter bindings for nested tables inside a parents footer row. If the table binds to the row of the parent, the value is no longer accessible. Reports can be preprocessed at report runtime to handle this framework update in one of three ways. • FIX: The report design is updated automatically to use a workaround to run the report normally. • ERROR: The report fails and generates a detailed error message. Use this value to identify reports that need to be refactored. • DISABLED: The report is not modified. Use this value if report processing causes errors with other reports. All reports run as normal, but affected reports can return incorrect results.

Property	Values	Description
BIRT_MEMORY_USAGE_LIMIT	[Whole number from 0 to 100], [Blank]	The maximum percentage of available server memory that can be used while the query results of a BIRT report are assembled. If the memory requirement for such a task exceeds the limit, the query yields an error because of insufficient resources. The query is the likely cause of the error. However, it is also possible that other concurrent processes used memory while the query was assembling its results. Valid values are 0 to 100. The specific values of 0 and 100 disable any enforced limit and allow a single query by one user to run the server out of memory. An empty value or an invalid value is treated as a default value. The default value is 35, which indicates that no set of query results can consume more than 35% of available memory. If this is a dedicated BIRT-only server, the default value can be increased to 70.
MEMORY_MANAGED_PROCESS_POLLING_FREQUENCY	[Number]	The number of milliseconds that the platform waits between polls of memory managed processes. An example of a memory managed process is running BIRT reports. The default value is 1000, which equals 1 second.
BIRT_PROCESS_SERVER_HOST_NAME	[Host name or IP address]	The host name or IP address of the BIRT process server. Configure this value to offload the processing of BIRT reports to a separate process server. For example: • `ProcessServer` • `processserver.domain.com` • `10.1.1.1` If this value is blank, all BIRT processing is done on the application server.
BIRT_PROCESS_SERVER_PORT	[Number]	The port to send BIRT requests for processing. This value must be configured to offload the processing of BIRT reports. This port corresponds to the value of the **BIRT_PROCESS_SERVER_LISTENING_PORT** property on the BIRT process server. Leave this value blank to process BIRT reports on the application server.
BIRT_PROCESS_SERVER_LISTENING_PORT	[Number]	Configuring this port enables this server as a BIRT process server. The server listens for BIRT requests on this port. For example, 47074.

Property	Values	Description
BIRT_ALLOW_XLSX	TRUE,FALSE	This is an option to allow BIRT reports to be exported with the `.xlsx` file extension. Set the property to TRUE when the BIRT reports to be exported have a direct connection and pull data directly from the database. If there are any issues with exporting when using the `.xlsx` extension, it is recommended to change this property to FALSE. The default value is FALSE.
ALLOWED_URL_FOR _REDIRECT	[Valid URLs]	The list of URLs or external sites to allow for redirect. The URLs are separated by spaces. IBM TRIRIGA blocks redirections to URLs that are not internal to IBM TRIRIGA. To allow a redirection to an external URL, enter that URL in the list. For example, http://ibm.com
ALLOW_ETL_DETERMINE_DB _CONNECTIONS	N, Y	Allows the "Extract, Transform, and Load" (ETL) processes to determine whether or not to use multiple database connections. If set to Y, then the value of "Use Unique Connections" on the ETL determines whether to use one connection (On) or multiple connections (Off). Setting "Use Unique Connections" to Off in the ETL can improve performance for long-running ETLs, but can cause the application server to run out of database connections for large ETLs with lots of steps that access the database. In this case, it might be necessary to increase the maximum database connections for the application server. If set to N, then the platform automatically sets "Use Unique Connections" to On when the ETL is running. Therefore only one database connection is used by the ETL. The default value is N.
SESSION_WARNING_ENABLE D	N, Y	Allows an alert message to be displayed to a user whose session is about to expire. If set to Y, then the session expiration redirects the browser to a session expiration page. If set to N, then the session expiration redirection is disabled. This property enables or disables the alert message only; it does not configure the session expiration. The session expiration timeout is configured in your application server software. For example, for Liberty profiles, you can edit the `server.xml` file located in the `tririga/wlp/usr/server/tririgaServer` directory. Update the **`httpSession invalidationTimeout`** value, measured in seconds. The default value is N.

Property	Values	Description
SESSION_WARNING _THRESHOLD	[Number]	If the value of the **SESSION_WARNING_ENABLED** property is set to Y, then this threshold property allows the alert message to be displayed at a specific number of minutes before the session is set to expire. This property configures the threshold time for the alert message only; it does not configure the session expiration. The session expiration timeout is configured in your application server software. The default value is 2.
OOTB_G11N_EXPORT_APP _VERSION	[String]	Inserts a value or description of the IBM TRIRIGA application version in the file header of the instance data export. For example, 10.3.1.
COMPANY_FILE_UPLOAD _EXCLUDE_EXTENSIONS	[Valid file extensions]	Used for image uploads. Restricts file uploads of image files according to their file extensions. Separate the file extensions in the list with commas. For a looser restriction, use this property. For a tighter restriction, use the **COMPANY_FILE_UPLOAD_INCLUDE_EXTENSIONS** property. If both properties are used, then the **COMPANY_FILE_UPLOAD_INCLUDE_EXTENSIONS** property takes precedence. If neither property is used, then file uploads are not restricted. For example, `.exe`, `.js`, `.sh` The default value is `.exe`
COMPANY_FILE_UPLOAD _INCLUDE_EXTENSIONS	[Valid file extensions]	Used for image uploads. Restricts file uploads of image files according to their file extensions. Separate the file extensions in the list with commas. For a looser restriction, use the **COMPANY_FILE_UPLOAD_EXCLUDE_EXTENSIONS** property. For a tighter restriction, use this property. If both properties are used, then this property takes precedence. If neither property is used, then file uploads are not restricted. This property does not cover Document Manager file uploads. For example, `.png`, `.bmp`, `.jpeg`

Property	Values	Description
IMPORT_CONTENT_EXCLUDE_EXTENSIONS	[Valid file extensions]	Used for document uploads. Restricts file uploads according to their file extensions. Separate the file extensions in the list with commas. For a looser restriction, use this property. For a tighter restriction, use the **IMPORT_CONTENT_INCLUDE_EXTENSIONS** property. If both properties are used, then the **IMPORT_CONTENT_INCLUDE_EXTENSIONS** property takes precedence. If neither property is used, then file uploads are not restricted. For example, `.exe`, `.js`, `.sh` The default value is `.exe`
IMPORT_CONTENT_INCLUDE_EXTENSIONS	[Valid file extensions]	Used for document uploads. Restricts file uploads according to their file extensions. Separate the file extensions in the list with commas. For a looser restriction, use the **IMPORT_CONTENT_EXCLUDE_EXTENSIONS** property. For a tighter restriction, use this property. If both properties are used, then this property takes precedence. If neither property is used, then file uploads are not restricted. This property does not cover Document Manager file uploads. For example, `.doc`, `.docx`, `.pdf`
MAXIMUM_UPLOAD_FILE_SIZE_MEGABYTES	[Number]	Restricts the size of a file that a user can upload to IBM TRIRIGA. This property should be set to an integer value that represents the maximum upload file size in megabytes. Valid values must be whole integers greater than 0. The default is 20. If no value is set the system will automatically restrict the maximum upload to the default value of 20 megabytes.
WS_RELIABLE_MESSAGING	N, Y	Enables (Y) or disables (N) the Web Services Reliable Messaging Protocol (http://schemas.xmlsoap.org/ws/2005/02/rm/). Set the value to Y to enable. The default is N.
WS_RM_INACTIVITY_TIMEOUT	[Number]	The amount of time that must pass without receiving a message for the Reliable Message sequence to be considered terminated due to inactivity. This property applies only when the **WS_RELIABLE_MESSAGING** property is enabled. Specify a value in milliseconds. The default is 600000, which equals 10 minutes.

Property	Values	Description
WS_RM_BASE _RETRANSMISSION _INTERVAL	[Number]	The interval at which an acknowledgment is received by the Reliable Message source for a given message. This property applies only when the **WS_RELIABLE_MESSAGING** property is enabled. Specify a value in milliseconds. The default is 4000, which equals 4 seconds.
WS_RM_ACKNOWLEDGMENT _INTERVAL	[Number]	The interval at which the Reliable Message destination sends asynchronous acknowledgments. This property applies only when the **WS_RELIABLE_MESSAGING** property is enabled. Specify a value in milliseconds. The default is 2000, which equals 2 seconds.
WS_RM_DELIVERY _ASSURANCE_TYPE	AtMostOnce, AtLeastOnce, ExactlyOnce	The delivery assurance type of the Reliable Message. This property applies only when the **WS_RELIABLE_MESSAGING** property is enabled. The default is AtMostOnce.
WS_RM_DELIVERY _ASSURANCE_IN_ORDER	N, Y	Enables (Y) or disables (N) the delivery assurance "in order" type of the Reliable Message. This "in order" assurance type can be combined with the delivery assurance type that is specified by the **WS_RM_DELIVERY_ASSURANCE_TYPE** property. Set the value to Y to enable. The default is N.
RUN_DYNAMIC_QUERY _ENABLED	[Number]	The maximum number of query results that can be used in a smart query section. This maximum sets a threshold so that the results of a query do not get so large that the query section is unable to render. The default value is 500.
ALLOW_PASSWORD_AUTO_ COMPLETE	N, Y	If set to Y, auto completion of login password is available. The default value is Y. If no value is specified, this property defaults to Y.
TDI_INSTALL_DIR	[Number]	The directory where you installed Tivoli Directory Integrator. For example, `TDI_INSTALL_DIR=C:/Program Files/IBM/TDI/V7.1.1`
TDI_HTTP_SERVER_PORT	[Number]	The port used to send requests to the Tivoli Directory Integrator server. IBM TRIRIGA uses this port to send ETL transforms to the Tivoli Directory Integrator server to process. The default value is 8088.

Property	Values	Description
TDI_SERVER_TIMEOUT	[Number]	The number of seconds to wait for a successful start or stop command of the Tivoli Directory Integrator server before a failure is reported. The default value is 60.
TDI_SERVER_PORT	[Number]	Port used by the Tivoli Directory Integrator server.
OSLC_BASE_ URI	http:// *hostname*: *port*/oslc.	Use this property to define the base URI for OSLC.
OSLC_MYPROFILE_ RESOURCE	[Profile Name]	The ID of the OSLC resource that represents the My Profile business object. The default value is triMyProfileRS.
OSLC_TRANSACTION_ RETENTION_DAYS	[Days]	The number of days the transaction records are kept. Transaction records are then truncated using smart object delete. Transaction records are physically removed from the database by the object cleanup process.
OSLC_DEFAULT _NAMESPACE	http:// *hostname* /ns/ism/ smarter_ physical_ infra structure#	Default OSLC namespace.
SNMP_AGENT_PORT	[Number]	The port used in the SNMP Agent for incoming SNMP traps. The default value is 161.
SNMP_COMMUNICATION _PROTOCOL	[UDP,TCP]	The IP protocol to use in the SNMP Agent for incoming SNMP traps. The default value is UDP.
UNSUCCESSFUL_LOGIN _ATTEMPT	[Number]	How many unsuccessful login attempts are allowed before the account is locked out. The default value is -1, which disables this feature.
DOUBLE_GROUPING _FORMAT_PATTERNS	[Character]	The list of decimal format patterns that require double grouping formatting. Characters are separated using semicolons. For example, ##,##,###.00;##,##,###.##;#,##,###.00;#,##,### .##
MASTER_DETAIL_ RECORD_VIEW _TYPE	POPUP, INLINE	Use this property to control how records are displayed in Master Detail navigation targets when clicked.

Property	Values	Description
SHOW_TOTAL _CURRENCY_INDICATOR	N,Y	Enable the currency indicator in the total row of queries. When set to N, the total row of a query does not display the current indicator. The default value is N.
SHOW_ZEROS_IN_NUMBER _FIELDS	N, Y	Numeric fields can be configurable to display zero or empty when it is null When set to N, all null currency and field numbers are displayed empty. A number field renders empty in a form and in a query with no editable fields when the value in the database is null. When set to Y the fields are filled with 0 or .00. A number field renders zero in a form and in a query with no editable fields when the value in the database is null. The default value is Y.
VIRUS_SCAN _ENABLED	TRUE,FALSE	Scan for viruses when a file is uploaded to the system. The default value is FALSE.
VIRUS_SCANNER _IP_ADDRESS	[IP Address]	IP address of the virus scanner server. This property requires a value if the **VIRUS_SCAN_ENABLED** enabled property is set to TRUE.
VIRUS_SCANNER _PORT	[IP Address]	Port used by the virus scanner server. This property requires a value if the **VIRUS_SCAN_ENABLED** enabled property is set to TRUE.
SYSTEM_SECTION_ADD _ACTION_STYLE	[LINK LIGHT_ BUTTON DARK_ BUTTON]	Determines the style of the form section action "Show Add". The default value is LIGHT_BUTTON.
SYSTEM_ACTION_STYLE	[LINK, LIGHT_BUTT ON, DARK_BUTTO N]	Determines the style of links within an application, which includes the Refresh action in places such as the Project Tasks section on the Schedule tab of projects. The default value is LIGHT_BUTTON.
DEFAULT_CHART _COLORS	[RRGGBB hexadecimal values]	Chart colors can be configured by using both the color preferences specified in your profile section, and values defined for the **DEFAULT_CHART_COLORS** property. The value of this property is a comma-delimited list of hexadecimal color values in RRGGBB format. For example, 326496, bac95a, 8c2c0e, e8c473.

Property	Values	Description
CHART_EXPORT_SERVER	[Host name or IP address]	Specifies the AnyChart Export Server to use for handling the conversion of a chart to a JPG, PDF, or PNG when "Save as JPG", "Save as PDF", or "Save as PNG" is selected from the chart. If this property is not set, export.anychart.com will be used. See the following documentation for details on setting up an AnyChart Export Server: http://docs.anychart.com/7.12.0/Common_Settings/Server-side_Rendering. **Note:** In the referenced documentation, the step detailed in the "How to Set the Path to Export Server" section is completed by setting the **CHART_EXPORT_SERVER** property. For example: `http://localhost:2000`
REP_HISTORY_AGE_CLEANUP	[Number of days]	Specifies how many days to wait before deleting report history. The default value is 365.
OM_AUDIT_TRAIL_ENABLED	TRUE,FALSE	Determines if the OM_PKG_HEADER record header for an object migration package should be kept in the database for audit purposes, or deleted from the database. The default value is FALSE.
OM_AUDIT_TRAIL_RETENTION_DAYS	[Number of days]	Specifies how many days to wait before removing metadata of deleted objects from the database. This value must be set to a whole number greater than 0. The default value is 365.
PRESERVE_IMAGE_HEIGHT_WIDTH_QUERY_SECTION	N,Y	Determines how an image smaller than 50 pixels in height and width is displayed inside a query section when it is attached to a TRIRIGA record image field. When set to 'Y', the original height and width of the image is used when it is displayed in a query. This property does not affect the display of an image in other areas of the application.
CALENDAR_EVENT_MAX_OCCURRENCES	[Number of occurrences]	Set the maximum number of occurrences when creating a recurring booking. The greater the number of occurrences set for this variable, the less performance you get on this process.
TINYMCE_HTML_EDITOR_ENABLED	TRUE,FALSE	Show or hide the HTML button in Notes fields. When enabled, clicking the HTML button opens the TinyMCE HTML Source Editor. The default is TRUE.

Property	Values	Description
GANTT_STRICT _MODE	TRUE,FALSE, MINIMAL	If set to TRUE, strict enforcement of the As Soon As Possible constraint is enabled. Project behavior is the same as with the deprecated Gantt Java-based applet in previous releases. Setting to TRUE forces all first tasks (tasks without incoming dependencies) to start directly on either the Planned Project Start Date or Planned Project End Date depending on the value that is specified for Calculate Project From. All next tasks are moved left or right to be as close as possible to their ancestors and to not violate any dependencies or constraints. If set to FALSE, all first tasks (tasks without incoming dependencies) are moved left as little as possible. Planned Task Start Date and End Date are honored and determine where the task is instead of the As Soon as Possible constraint. The next tasks are moved left only to correct dependencies. The next tasks need do not need to be close to their ancestors. If set to MINIMAL, all first tasks (tasks without incoming dependencies) are moved left as little as possible. Planned Task Start Date and End Date are honored and determine where the task is instead of the As Soon as Possible constraint. All next tasks are moved left or right to be as close as possible to their ancestors and to not violate any dependency or constraints. The default is FALSE.
GANTT_LOCK _STARTED_TASKS	TRUE,FALSE	If set to TRUE, the Gantt scheduler refrains (or is "locked") from changing the Planned Start and Planned End for a task that has already started when correcting dependencies and constraints. Only tasks that have not yet started will be corrected when fixing dependencies and constraints. If set to FALSE, all tasks will be corrected when fixing dependencies and constraints. The default is FALSE.

Property	Values	Description
ALLOW_GANTT _SCHEDULER_UPDATE _ACTUALS	TRUE,FALSE	If set to TRUE, the Gantt scheduler updates Actual Start, End, Working Hours, and Duration values based on the Planned Start date and Actual Percent Complete fields. This business logic is similar to the Task Forms. The default is TRUE, which reflects the legacy behavior. Algorithm: • If Actual Percent Complete = 100%, set Actual Start, End, Duration, Working Hours to Planned Start, End, Duration, Working Hours. • If Actual Percent Complete > 0, set Actual Start, End, Duration, Working Hours to Planned Start, 0, 0, 0. • If Actual Percent Complete = 0, set Actual Start to Planned Start if Actual Start > 0, else set to 0 and set Actual End, Duration, Working Hours to 0, 0, 0. If set to FALSE, the Gantt scheduler does not update Actual values if the Actual Start Date is > 0. If Actual Start date is not set, the default behavior is followed.
ALLOW_REVERSE _ASSOCIATION	TRUE,FALSE	Enables or disables the use of reverse associations during queries. The default is FALSE. **Note:** If your database is converted to enable Module Level Assignments (MLA), the **ALLOW_REVERSE_ASSOCIATION** property will no longer be honored. The **Reverse Association** flag in queries and reports will be ignored, and only forward associations will be allowed in reports and queries.
WEATHER_API_KEY	[String]	Holds the license key for The Weather Channel API. The property is used by the triplat-weather UX components.
SHOW_HELP_AND _SUPPORT_LINKS	TRUE,FALSE	Enables or disables the Help and Support links on the IBM TRIRIGA main page. To enable these links, set the value to TRUE. The default is FALSE.
SHOW_ABOUT_LINK	TRUE,FALSE	Enables or disable the About link on the IBM TRIRIGA main page. To disable this link, set the value to FALSE. The default is TRUE.

Property	Values	Description
HONOR_DOCUMENT _PERMISSIONS_MODEL _FOR_DOWNLOAD	TRUE,FALSE	Checks the document permissions model when a user clicks a document record download link. When set to TRUE, a user or groups ability to download a document must be set explicitly on the permissions tab of each document record that is created. When set to FALSE, a user or group can download a record regardless of the group or user permissions set on the permissions tab. The default is FALSE.
AVAILABILITY _SECTION_ROW _LIMIT	[Number]	Limits the maximum number of results or rows when rendering the availability section. If there are more rows to be displayed, the availability section will alert the user of the limit. This limit ensures reasonable performance and memory usage when using the availability section. If you set this value too high, performance will be impacted when rendering. Very large values will cause memory issues. Update the backing reserve queries to reduce results or design filters that keep the number of record results limited. The default is 50. If the value is set to 0, -1, or any other invalid value, the default of 50 will be used. The maximum value accepted is 500. Any value above the maximum value of 500 will be set to 500 instead.
ENABLE_CONCURRENT _AVAILABILITY	TRUE,FALSE	Enables or disables the ability to process reserve queries concurrently. The default is TRUE.
CONCURRENT _AVAILABILITY _POOL_SIZE	[Number]	If **ENABLE_CONCURRENT_AVAILABILITY** is set to TRUE, this property determines the maximum number of system wide threads that will be used in processing availability. The default is 200.
CONCURRENT _AVAILABILITY _REQUEST_BATCH_SIZE	[Number]	If **ENABLE_CONCURRENT_AVAILABILITY** is set to TRUE, this property determines the maximum number of system wide threads that each availability request can use to process availability. The default is 10.
WA_UPLOAD_POLL _INTERVAL	[Number]	The amount of time, in minutes, to wait between polling Watson Analytics to check on the status of a dataset upload job. The default is 1.

Property	Values	Description
WA_UPLOAD_POLL _TIMEOUT	[Number]	The amount of total time, in minutes, to poll Watson Analytics to check on the status of a dataset upload. When this time is exceeded, IBM TRIRIGA will stop polling. The default is 30.
WA_MULTI_SEGMENT _UPLOAD_ENABLED	TRUE,FALSE	If set to TRUE, this property will enable the multiple-segment upload of a dataset to Watson Analytics. If set to FALSE, this property will disable the multiple-segment upload of a dataset to Watson Analytics. Instead, the entire dataset will be uploaded in a single segment to Watson Analytics. The default is TRUE.
WA_UPLOAD_SEGMENT _SIZE_MB	[Number]	The size of the dataset segments, in megabytes, to upload to Watson Analytics. This property is used only when **WA_MULTI_SEGMENT_UPLOAD_ENABLED** is set to TRUE. The default is 10.
REPORT_CASE _SENSITIVE	FORCE_CASE _INSENSITIV E, NATIVE_DB _CASE_SORT	If set to FORCE_CASE_INSENSITIVE, queries with Text values in the Where clause sort in case insensitive order. This setting is the legacy behavior. If set to NATIVE_DB_CASE_SORT, queries with Text values in the Where clause sort according to the native database settings. The default is NATIVE_DB_CASE_SORT.
PERFORMANCE_ANALYZER _MAX_FILE_SIZE _IN_MB	[Number]	Limits the maximum file size, in megabytes, that the Performance Analyzer allows when processing or uploading log files. The property is used to prevent large files from being processed. The larger the file size, the slower the loading of the logs and rendering of the Performance Analyzer form. To minimize the file size, process only specific user scenarios with the Performance Analyzer, particularly when using the SQL and Extended Formula logging, which generate more data than other categories. The default is 50.
PERFORMANCE_LOGGING _THRESHOLD	[Number]	Defines the performance logging threshold, in milliseconds, where the operation must take longer than the threshold for the operation to be logged. This property is only supported for Extended Formula, SQL, Report, and State Transition performance log settings. If the value is invalid or not set, then no threshold is defined and everything is logged. The default is 100.

Property	Values	Description
TIME_FIELD_STANDARD _DISPLAY	TRUE,FALSE	Changes the display format of time fields. There are two different time formats. The "standard" time format displays the time field in a 12-hour format with an AM/PM period value. The "military" time format displays the time field in a 24-hour format. If set to TRUE, the time will be displayed in "standard" time format as 12:00:00 AM. If set to FALSE, the time will be displayed in "military" time format as 00:00:00. The default is TRUE.
WEB_DEV_CONFIG _ENABLED	TRUE,FALSE	Enables or disables the UX Framework developer configuration console for UX applications. This console can be used to clear cached application and translation files. The default is FALSE.
GEO_ORG_SECURITY _CONTRIBUTE_BEHAVIOR	OR,PATH, COALESCE	Gives the customer the ability to decide how to contribute geography and organization security to queries and reports. OR and COALESCE are similar in that they use the IBS_SPEC_STRUCTURE table to determine to which organizations and geographies the user has access. OR is the original legacy implementation. COALESCE is an improvement on OR and is the recommended option unless you notice performance issues when running queries and reports as non-admin users. Analysis must be done before moving to the new PATH option since it has limitations. PATH has the following limitations. The triPathSY must be in sync with the IBS_SPEC_STRUCTURE. User and group geography and organization values must be less (length wise) than the length of triPathSY on the geography and organization objects. See the *IBM TRIRIGA Performance Best Practices* for information on how to check triPathSY consistency and more information on the PATH option. The default is COALESCE.

Property	Values	Description
NOTIFICATIONS _RECOVERY_FROM_DATE	[Date]	Used by the MissingNotificationsRecoveryTool upgrade class to restore notifications starting from a certain point in time until the present. By default, this tool will recover all missing notifications found in the system for all users. This process is run only once with the upgrade class. To recover missing notifications based on the notification date or age, update only one of these parameters and enter a valid value. The first parameter **NOTIFICATIONS_RECOVERY_FROM_DATE** accepts a date format value. The valid format is MM/dd/yyyy (month/day/year). For example, to recover notifications from January 15, 2018 until today, enter the value of 01/15/2018. The second parameter **NOTIFICATIONS_RECOVERY_AGE_DAYS** accepts a number value. This value represents the number of days from which the recovery will start. For example, to recover notifications from 12 days ago until today, enter the value of 12. Remove the <BLANK> parameter and update only one these parameters. If both parameters have valid values, then the platform will choose the first parameter **NOTIFICATIONS_RECOVERY_FROM_DATE**. For example, **NOTIFICATIONS_RECOVERY_FROM_DATE** = 01/15/2018. If both parameters have blank values, or if an invalid or unexpected value is entered for either parameter, then the platform will treat them as blank values (default) and will recover all missing notifications found in the system for all users. The default value is <BLANK>.

Property	Values	Description
NOTIFICATIONS _RECOVERY_AGE_DAYS	[Number of days]	Used by the MissingNotificationsRecoveryTool upgrade class to restore notifications starting from a certain point in time until the present. By default, this tool will recover all missing notifications found in the system for all users. This process is run only once with the upgrade class. To recover missing notifications based on the notification date or age, update only one of these parameters and enter a valid value. The first parameter **NOTIFICATIONS_RECOVERY_FROM_DATE** accepts a date format value. The valid format is MM/dd/yyyy (month/day/year). For example, to recover notifications from January 15, 2018 until today, enter the value of 01/15/2018. The second parameter **NOTIFICATIONS_RECOVERY_AGE_DAYS** accepts a number value. This value represents the number of days from which the recovery will start. For example, to recover notifications from 12 days ago until today, enter the value of 12. Remove the <BLANK> parameter and update only one these parameters. If both parameters have valid values, then the platform will choose the first parameter **NOTIFICATIONS_RECOVERY_FROM_DATE**. For example, **NOTIFICATIONS_RECOVERY_FROM_DATE** = 01/15/2018. If both parameters have blank values, or if an invalid or unexpected value is entered for either parameter, then the platform will treat them as blank values (default) and will recover all missing notifications found in the system for all users. The default value is <BLANK>.

TRIRIGAWEBDYNAMIC.properties

To adjust the IBM TRIRIGA web application version, open the `TRIRIGAWEBDYNAMIC.properties` file.

Web dynamic properties

Property	Values	Description
TririgaApplication Version	[Number]	The version of the IBM TRIRIGA software that is installed. This required value is displayed by the Help subsystem. For example, 3.0.

TRIRIGAWEBLOGICPOOL.properties

To adjust the Oracle WebLogic Server connection pool properties, open the `TRIRIGAWEBLOGICPOOL.properties` file.

Connection pool properties

Property	Values	Description
/jdbc/local/DataSource-TRIRIGA-default	[Valid WebLogic Server pool]	This value must match a connection pool that is configured on the WebLogic Server. For example, `jdbc:weblogic:jts:DefaultPool`
/jdbc/local/DataSource-TRIRIGA-content	[Valid WebLogic Server pool]	This value must match a connection pool that is configured on the WebLogic Server. For example, `jdbc:weblogic:jts:ContentPool`

TRIRIGADB.properties

To adjust the IBM TRIRIGA database connection properties, open the `TRIRIGADB.properties` file.

Property	Values	Description
data_dbuser	[String]	User used to connect to the database. This value can be set to either an encrypted or unencrypted value.
data_dbpassword	[String]	Password for the user used to connect to the database. This value can be set to either an encrypted or unencrypted value.
data_dbname	[String]	Name of the database.
data_data_tblspace	[String]	The name of the data table space that is used to create tables in the data schema. For example, a typical value is TRIDATA_DATA.
data_datafile	[String]	Database file name for the data table space. For example, a typical value is tridata_data01.dbf.
data_datasize	[Number]	Size of the data table space database, measured in MB. For example, a typical value is 2500.
data_index_tblspace	[String]	The name of the index table space that is used to create tables in the data schema. For example, a typical value is TRIDATA_INDX.
data_indxfile	[String]	Database file name for the index table space. For example, a typical value is tridata_indx01.dbf.
data_indxsize	[Number]	Size of the index table space database, measured in MB. For example, a typical value is 2500.

Property	Values	Description
data_bufferpool_name	[String]	The name of the buffer pool used by the TRIRIGA database. For example, a typical value is TRIRIGABUFFERPOOL.
mbcs_support	TRUE,FALSE	Support multibyte character sets in Microsoft SQL Server. This value is set by the TRIRIGA Application Platform installation program. Do not change the value of this property directly in the file.
mbcs_collation	[String]	Collation setting for the Microsoft SQL Server database. The collation setting must include support for case and accent sensitivity. For example, a typical value is Latin1_General_CS_AS. This value is set by the TRIRIGA Application Platform installation program. Do not change the value of this property directly in the file.
upgrade_sort_area_size	[Number]	Specifies in bytes the maximum amount of memory that Oracle uses for hash joins. This setting is used during upgrade only.
upgrade_hash_area_size	[Number]	Specifies in bytes the maximum amount of memory that Oracle uses to sort. This setting is used during upgrade only.
upgrade_enable_parallel_dml	TRUE,FALSE	Enable parallel DML handling for Oracle. This setting is used during upgrade only.
upgrade_trace_level	0,1,2,4,8,12	Set Oracle trace levels for upgrade scripts. 0 - no statistics 1 - basic statistics CURSOR, PARSE, EXEC, FETCH ERROR, SORT UMAP, ERROR, UMAP, STATS and XCTEND. This is the same as setting sql_trace=true. 2 - same as level 1 4 - same as level 1 except adds BIND section. 8 - same as level 1 except with wait events. 12 - same as level 1 but includes binds and waits events. Trace file name will look like: orcl10_ora_nnnn_upgrade_level12.trc if the upgrade_trace_level = 12 This setting is used during upgrade only.

Property	Values	Description
DB2_TABLES_OUTSIDE_TABLESPACE	[String]	Use this setting to resolve an issue in TRIRIGA Application Platform 3.5.0 and 3.5.1 where IBM DB2 tables are created in a default table space and not the TRIRIGA table space. Set to SKIP_UPGRADE to prevent the upgrade script from running. Set to a comma separated list of table to be skipped. For example, if you purposely have a table, like DM_CONTENT in a different table space, you would set DB2_TABLES_OUTSIDE_TABLESPACE=DM_CONTENT. This setting is used during upgrade only.

License files

IBM TRIRIGA controls the usage of its various products with license files. Starting with IBM TRIRIGA Application Platform 3.2, IBM TRIRIGA distributes a separate license for each product.

Each license file grants access to its respective functions when it is assigned to a user. The license files by themselves do not enforce license count restrictions. Each license is governed by its respective software license agreement. The license file names are in the format `LICENSE_IBM_TRIRIGA_[productname].properties`; for example, `LICENSE_IBM_TRIRIGA_Application_Platform.properties`.

The license matrix is delivered in the software. It is available at **Tools** > **Administration** > **License Manager**. The License Manager includes a List View and a Matrix View.

The license matrix is IBM PROPRIETARY and CONFIDENTIAL and its disclosure to you shall be governed by the terms of the IBM Agreement for the Exchange of Confidential Information found at http://www-05.ibm.com/support/operations/files/pdf/aeci_ca_en.pdf, or the applicable confidentiality agreement signed between IBM and your company. IBM TRIRIGA is providing the license matrix as a courtesy to you under the condition that you treat the information with the utmost confidence. Under no circumstances may you distribute or allow use of the license matrix outside of your organization without first obtaining IBM's express written consent. The license matrix should not be construed as a definitive list of functionality licensed by the you; it is simply a proxy for the limited functionality that you have actually licensed, but your actual licenses are set forth in separate agreements between IBM and your company. The license matrix is provided for informational purposes only without warranty of any kind, does not contain contractual obligations, does not constitute a software, product or services warranty, and is subject to change without notice.

Before IBM TRIRIGA Application Platform 3.2

Before IBM TRIRIGA Application Platform 3.2, IBM TRIRIGA distributed one license file named `TRIRIGALICENSE.properties`. If you have an existing `TRIRIGALICENSE.properties` file, you can continue to use it until it expires or until you use a new product.

License types

This single-file method managed three distinct types of licenses: (1) Concurrent User, (2) Named User, and (3) Enterprise.

License type	Description
Concurrent User	The Concurrent User license offered a pool of licenses to limit the number of users who signed into the application at any one time. Although there might be hundreds of unique user accounts in the application, the number of concurrent users was restricted by the Concurrent User license.
Named User	The Named User license assigned each seat in the license to a uniquely named user. Users did not share licenses. If a customer needed extra user accounts, the customer was required to upgrade the license.
Enterprise	The Enterprise license did not restrict the number of users in a company by allowing an unlimited number of users.

IBM TRIRIGA Application Platform 3.2 and later

After the IBM TRIRIGA Application Platform installation, your *[tririga_root]*\config\licenses directory must contain either your LICENSE_IBM_TRIRIGA_*[productname]*.properties files or your TRIRIGALICENSE.properties file, but not both.

After a new installation, copy your license files into the *[tririga_root]*\config\licenses directory. After an upgrade installation, verify that your license files were automatically copied into the *[tririga_root]*\config\licenses directory.

If you use the LICENSE_IBM_TRIRIGA files, do not use the TRIRIGALICENSE file. If you use the TRIRIGALICENSE file, do not use the LICENSE_IBM_TRIRIGA files. If you are using WebSphere Application Server and LICENSE_IBM_TRIRIGA files, set up valid resource URLs for all of your licenses. If you are using WebSphere Application Server and the TRIRIGALICENSE file, verify that the resource URL points to the correct location.

After you upgrade to the LICENSE_IBM_TRIRIGA files, you cannot return to the previous TRIRIGALICENSE file. When you start the application server for the first time after you upgrade to the LICENSE_IBM_TRIRIGA files, the application attempts to swap user licenses to the LICENSE_IBM_TRIRIGA license set. For this process to be successful, it is important that all of your LICENSE_IBM_TRIRIGA files exist in the *[tririga_root]*\config\licenses directory and that all user changes are complete. Verify that all asynchronous workflows are completed before you restart the application server with the LICENSE_IBM_TRIRIGA files.

All application servers, that is IBM TRIRIGA installs, that access a database must have the same license set. In other words, all licenses that a customer is entitled to that they want to deploy, including Install license types, must be installed on all IBM TRIRIGA installs that access a IBM TRIRIGA database.

Deprecated licenses

Several licenses that were contained in the TRIRIGALICENSE file were deprecated with the LICENSE_IBM_TRIRIGA files. The Enterprise licenses are no longer bundled, but IBM TRIRIGA distributes their equivalent licenses for individual products.

Former Enterprise license	Equivalent IBM TRIRIGA licenses
Facility Management Enterprise	(1) Real Estate Manager, (2) Facilities Manager, and (3) Workplace Operations Manager

Available licenses

IBM TRIRIGA distributes the following LICENSE_IBM_TRIRIGA files for individual products.

License files
LICENSE_IBM_TRIRIGA_Anywhere_Workplace_Operations.properties

License files
LICENSE_IBM_TRIRIGA_Application_Builder.properties
LICENSE_IBM_TRIRIGA_Application_Platform.properties
LICENSE_IBM_TRIRIGA_CAD_Integrator_Publisher.properties
LICENSE_IBM_TRIRIGA_Capital_Projects_Manager.properties
LICENSE_IBM_TRIRIGA_Connector_for_Business_Applications.properties
LICENSE_IBM_TRIRIGA_Connector_for_Offline_Forms.properties
LICENSE_IBM_TRIRIGA_Facilities_and_Real_Estate_Management_on_Cloud_Approvals_ and _Reporting.properties
LICENSE_IBM_TRIRIGA_Facilities_and_Real_Estate_Management_on_Cloud_Enterprise .properties
LICENSE_IBM_TRIRIGA_Facilities_and_Real_Estate_Management_on_Cloud_Occasional .properties
LICENSE_IBM_TRIRIGA_Facilities_and_Real_Estate_Management_on_Cloud_Self_Servi ce .properties
LICENSE_IBM_TRIRIGA_Facilities_Manager.properties
LICENSE_IBM_TRIRIGA_Facility_Assessment.properties
LICENSE_IBM_TRIRIGA_Integrated_Workplace_Manager.properties
LICENSE_IBM_TRIRIGA_Mobile.properties
LICENSE_IBM_TRIRIGA_Portfolio_Data_Manager.properties
LICENSE_IBM_TRIRIGA_Real_Estate_Environmental_Sustainability_Impact_Manager .properties
LICENSE_IBM_TRIRIGA_Real_Estate_Environmental_Sustainability_Manager .properties
LICENSE_IBM_TRIRIGA_Real_Estate_Manager.properties
LICENSE_IBM_TRIRIGA_Request_Central.properties
LICENSE_IBM_TRIRIGA_Strategic_Facility_Planning.properties
LICENSE_IBM_TRIRIGA_Workplace_Operations_Manager.properties
LICENSE_IBM_TRIRIGA_Workplace_Performance_Management_Enterprise .properties
LICENSE_IBM_TRIRIGA_Workplace_Performance_Management_Facilities .properties
LICENSE_IBM_TRIRIGA_Workplace_Performance_Management_Operations .properties
LICENSE_IBM_TRIRIGA_Workplace_Performance_Management_Projects .properties
LICENSE_IBM_TRIRIGA_Workplace_Performance_Management_Real_Estate.properties
LICENSE_IBM_TRIRIGA_Workplace_Reservation_Coordinator.properties
LICENSE_IBM_TRIRIGA_Workplace_Reservation_Manager.properties

License files
LICENSE_IBM_TRIRIGA_Workplace_Reservation_Manager_for_Small_Installations.properties

Context path

During the IBM TRIRIGA Application Platform installation, you can define an alternative application context path that accesses the IBM TRIRIGA application. The default value is a slash (/). By defining an alternative context path, you can deploy IBM TRIRIGA as a non-root application.

If you defined a non-root context path, then after installation is complete, you must use the corresponding URL address to access the IBM TRIRIGA application. For example, if you specified that the context path was `/tri`, then you must access the IBM TRIRIGA application with the URL address of `http://[hostname:port]/tri`, where `[hostname:port]` is the specific value for your application server environment.

If you have multiple installations, it might be valuable to define a different context path for each installation. For example, `/tridev`, `/tritest`, and `/triprod`.

Connection pools

Connection pools contain a cached set of database connections that can be used for incoming database connection requests. You configure a connection pool to accommodate the number of concurrent users and transaction load expected, Depending on your environment, the connection pool settings in one or more files must be configured for correct connectivity to the database. Connection pool names are case-sensitive.

The recommended setting for minimum connections is 10. The recommended setting for maximum connections is 100. A setting of 100 maximum connections is common for a JVM that is not expected to exceed 500 concurrent users. You can modify the connection pool setting on the data source defined for IBM TRIRIGA.

Connection pool settings	File location
Oracle WebLogic Server pools	*[tririga_root]*\config\TRIRIGAWEBLOGICPOOL.properties For example, C:\Tririga\config\TRIRIGAWEBLOGICPOOL.properties
Oracle Database trace levels	*[tririga_root]*\config\TRIRIGAMIDDLEWARE.properties For example, C:\Tririga\config\TRIRIGAMIDDLEWARE.properties

Cross-site scripting filters

Cross-site scripting (XSS) filters are defined in the `TRIRIGAWEB.properties` file with the **EXCLUDE_CHARACTERS** and **ALLOWED_CHARACTERS** properties. By default, typical XSS characters are filtered.

XSS filters are applied in the following cases: (1) the user name and password input fields in the sign-in page, (2) the input fields in the IBM TRIRIGA Application Platform builder tools, and (3) the published name input fields in forms.

XSS filter properties	Description
EXCLUDE_CHARACTERS	This property contains a list of characters or strings to exclude from fields, which are separated by spaces. For example: < > & {

XSS filter properties	Description
ALLOWED_CHARACTERS	This property contains a list of characters or strings to allow in fields, which are separated by spaces. Regular expression characters must be escaped with a double backslash (\\). For example, ? must be specified as \\?. To allow the following four characters ? & ( ), specify \\? & \\(\\)

Configuring agent processes

Certain IBM TRIRIGA agents or agent processes must be configured when they apply to your particular implementation. Before you configure the process server to run agents, first complete the IBM TRIRIGA Application Platform installation on the process server.

Business process agents

The IBM TRIRIGA Application Platform agents are business process agents that conduct the automated work for the IBM TRIRIGA applications. When the platform identifies an event that requires an agent, the platform places the event into a queue where the agent can retrieve and process it.

Business process agent	Description
Platform Maintenance Scheduler	This agent conducts data cleanup and runs an analysis on the database. This agent removes all data in the state of null, and removes DataConnect (DC) jobs and staging table entries that are obsolete or completed. This agent also cleans up the completed workflow instances that do not have any user-operable tasks (such as user tasks and approval tasks) within the workflow.
Data Import Agent	This agent looks for all tab-delimited files that are uploaded and imports the data into the platform.
DataConnect (DC) Agent	This agent looks for DataConnect (DC) jobs in the Job Control table that are ready to run. When the agent finds a job, it creates an appropriate smart object for the job. Then the agent posts an asynchronous workflow event to initiate the workflow that pulls the external data into the IBM TRIRIGA database tables.
Extended Formula Agent	This agent looks for and processes extended formulas.
Formula Recalc Agent	This agent recalculates paths as needed in the platform.
Incoming Mail Agent	This agent downloads mail from a Post Office Protocol 3 (POP3) server or Internet Message Access Protocol (IMAP) server and translates them into email message records.
Object Migration Agent	This agent migrates business objects from one environment to another environment.
Object Publish Agent	This agent publishes business objects in the platform.
Report Queue Agent	This agent retrieves queued report requests, processes the report, and notifies the user.
Reserve SMTP Agent	This agent receives and processes reservation e-mails sent by Microsoft Exchange. This Simple Mail Transfer Protocol (SMTP) receiver service allows Microsoft Exchange to communicate with IBM TRIRIGA and allow it to manage resources in Reserve. A Microsoft Exchange send connector is configured to forward any email address with the reservation-specific subdomain to the IBM TRIRIGA application server that runs this SMTP agent.

Business process agent	Description
Scheduler Agent	This agent looks for and processes all scheduled and recurring events in the platform.
SNMP Agent	This agent receives and processes Simple Network Management Protocol (SNMP) traps (notifications). SNMP traps include those used for the IBM TRIRIGA Real Estate Environmental Sustainability Impact Manager.
Tivoli Directory Integrator Agent	This agent starts and stops the Tivoli Directory Integrator (TDI) runtime server from within TRIRIGA. The TDI server must be running for TDI-based ETL job items to run properly. TDI-based ETL job items include those used to import data for the IBM TRIRIGA Real Estate Environmental Sustainability Impact Manager.
Workflow (WF) Agent	This agent processes queued workflow events and the asynchronous workflows that are registered for those events.
Workflow (WF) Future Agent	This agent processes actions from a workflow that are set up to trigger at a future date, and is used by many applications including, but not limited to BIM, Job Scheduling, Reserve, and Lease.
Workflow (WF) Notification Agent	This agent looks for and processes notifications in the platform, including those notifications to be sent at a scheduled time.

Administrator console

Before you configure the process server to run agents, first complete the IBM TRIRIGA Application Platform installation process on the process server. Then, open the Agent Manager in the IBM TRIRIGA administrator console to configure and manage agents.

You can independently stop and start each agent from the Agent Manager in the IBM TRIRIGA administrator console. If you want to prevent an agent from starting on the process server, you can configure that agent in the **AGENTS_NOT_ALLOWED** property of the `TRIRIGAWEB.properties` file. Then, restart the process server for changes in the `TRIRIGAWEB.properties` file to take effect.

However, if an agent is stopped, parts of the IBM TRIRIGA application might not function with the same behavior. For example, if the Workflow (WF) Agent is stopped, the platform does not run any logic that is defined by an asynchronous workflow. Instead, the platform holds each event in a queue that the WF Agent picks up when it is restarted.

For more information, see the *IBM TRIRIGA Application Platform 3 Administrator Console User Guide*.

Attaching Microsoft Outlook messages

Microsoft Exchange converts a sent Microsoft Outlook message (`.msg` file) and any attached messages (`.msg` files) into Multipurpose Internet Mail Extensions (MIME) format. However, the IBM TRIRIGA Incoming Mail Agent is not designed to recognize attachments in MIME format. Instead of attaching Microsoft Outlook `.msg` messages to another `.msg` message, you have two alternative options.

Procedure

1. Attach the file.

Method	Action
Microsoft Outlook	Save the `.msg` attachment as a Microsoft Outlook file template (`.oft` file). Then, attach the `.oft` file to the main `.msg` message that you are delivering in Microsoft Outlook.

Method	Action
Microsoft Outlook Web App	Attach the `.msg` file to the main email that you are delivering in the Microsoft Outlook Web App (OWA).

2. Send the message or email.

Configuring the SMTP port in Linux

Linux does not allow root users to bind port traffic to ports 1024 and below. However, the simple mail transfer protocol (SMTP) port property of the TRIRIGAWEB.properties file has a default value of port 25. If you are running Linux, you must configure the reserve SMTP agent to listen to a custom port instead of the default port 25.

Before you begin

You must be an IBM TRIRIGA administrator. Run the commands in the following procedure as a root user.

Procedure

1. Update your firewall to open the port above port 1024 by adding the following lines to your `/.../sysconfig/iptables` file:

```
-A OUTPUT -p tcp -s serverIP -d 0/0 --dport Port_Above_1024
   -m state --state ESTABLISHED -j ACCEPT
-A INPUT -s 0/0 -d serverIP -m state --state NEW,ESTABLISHED
   -p tcp --dport Port_Above_1024 -i eth0 -j ACCEPT
```

2. Restart your firewall:

```
/.../init.d/iptables restart
```

3. Open port 25 for forwarding:

```
/sbin/iptables -A FORWARD -p tcp --destination-port 25 -j ACCEPT;
```

4. Forward port 25 to your custom port above 1024:

```
/sbin/iptables -t nat -A PREROUTING -j REDIRECT
   -p tcp --destination-port 25 --to-port Port_Above_1024
```

5. To verify that port 25 is forwarding, start the IBM TRIRIGA application server so that it binds to your custom port, and run a telnet command:

```
telnet yourServer 25
```

6. If you do not receive a successful response, forward port 25 to a different custom port (step 4).

What to do next

This task does not permanently configure the port. If the Linux server is restarted or the IP tables service is reset from a firewall modification, then the configuration is dropped. To reconfigure the port, you must forward port 25 to your custom port (step 4) again.

Configuring Pentaho Data Integration for IBM TRIRIGA

If you plan to use IBM TRIRIGA Real Estate Environmental Sustainability, you must configure IBM TRIRIGA to use the Pentaho Data Integration tool (or other compatible tool) to run the needed ETL job items. IBM Tivoli® Directory Integrator is no longer supported, so any TDI-based ETLs must be rewritten for the replacement tool. For more information, see ETL Integration.

Configuring globalized applications and SSO authentication

After a successful installation, you can configure IBM TRIRIGA applications for globalization and single sign-on (SSO) authentication.

Globalized applications

Globalization, also known as multicultural or multilingual support, is the process of organizing an application so that it can be configured to work in different countries and in different languages. You can use the IBM TRIRIGA Application Platform to provide translated messages and any other text content that appears to the end-user in the language that you want.

For more information, see Globalizing applications.

SSO authentication

The IBM TRIRIGA Application Platform can be configured to use single sign-on (SSO) technology if SSO is also configured in your environment. After the appropriate properties are configured, IBM TRIRIGA can accept tokens issued by application servers for SSO. IBM Support can assist with configuring IBM TRIRIGA properties for SSO. However, due to the number of supported products, technologies, and configurations supported by IBM TRIRIGA, IBM Support cannot assist in the configuration of SSO within your environment.

For more information, see Authenticating users by using SSO.

Chapter 3. Workflow cleanup log

When you start the application server or process server for the first time after you install IBM TRIRIGA Application Platform, a workflow validation process is initiated. This process identifies and reports any issues that might keep the workflows from running as expected. The log report is named `WorkflowCleanup.log`.

The workflow validation process runs for only one time, when you start the server for the first time after installation. The process reports any issues with published workflows that require a user action to resolve, and any issues that are repaired automatically. After the process is completed, you can review the log report to understand which workflows were updated and which workflows might need your attention.

The log report is written to the `log` directory of the IBM TRIRIGA installation. For example, on Windows, `C:\Tririga\log\WorkflowCleanup.log` is the typical location.

Log format

The format of the log report can contain as many as three main sections. The first section indicates that the process ran and completed. The second section lists any issues and related workflows that cannot be repaired automatically. The third section lists any issues and related workflows that were repaired automatically.

Similar issues are listed together. Within an issue, the workflows are ordered by module, business object, and workflow name. Many of the issues provide more information to help you locate the specific step that needs review or repair. A workflow might be listed more than one time, depending on what issues were found and what repairs were made. It is also possible for a workflow that was retired by the process (because of an irreparable issue) to contain more issues than what was reported.

Log example

The following sample comes from a `WorkflowCleanup.log` report, and highlights the three main sections:

```
Workflow cleanup and repair processing pass 1.
Workflow cleanup and repair processing pass 2.
Workflow cleanup and repair completed in 2 passes.

The following problems could not be completely repaired.
Review the identified workflow(s) and the action taken (if any) and resolve any
remaining problems to assure correct workflow execution.
 Condition expression is invalid. Review and correct the expression.
 Workflow:19124805.14 Module=exModule1 BO=-Any- Name='exModule1 - condition'
 Invalid Expression[p0 == == 1] Step:0 Start(1) 'Start'
 Retired the workflow because of missing step definitions that could not be
  repaired.
 Workflow:10485177.0 Module=exModule1 BO=exBO
 Name='exModule1 - PRE-CREATE - initialize'
 Information about missing definition: Step:100033 Switch(14)
 Parent Step:100030 Modify Records(28) 'Update Examples'

The following problems were repaired.
Review the identified workflow(s) and the resolution to assure correct workflow
execution.
 Removed the entry from WF_LOOKUP because the workflow is not in a published
  state.
 Workflow:19122518.0 Module=exModule1 BO=-Any- Name='A New Workflow'
 Retired the workflow because there isn't a corresponding entry in WF_LOOKUP.
 Workflow:19122236.2 Module=exModule1 BO=-Any- Name='Copy of A New Workflow'
 Flow control value was invalid. Set step to normal flow (non-swapped).
 Review flow and verify this is correct.
 Workflow:19139030.0 Module=exModule1 BO=-Any- Name='exModule1 - Workflow 2'
 Invalid flow value was 'REPORT' Step:206635 Break(21)
 Retired the workflow because its Module could not be found.
 Workflow:19122928.1 Module=<23549> BO=-Any- Name='Example Map Source to Section'
 Step definition added for End step.
 Workflow:10179388.0 Module=exModule1 BO=exBO2
 Name='Delete associated BO Values'
```

```
Added the required End step structure and definition information.
Workflow:18412.1 Module=exModule2 BO=exBO3
Name='exBO3 - Add Values'
Changed step with missing definition to a No-Op.
Workflow:12034842.1 Module=exModule1 BO=-Any-
Name='exModule1 - exUpdate - Record Update'
Information about missing definition: Step:1000112 Call Workflow(38)
Parent Step:1000100 Fork(13)
Workflow:19111379.6 Module=exModule2 BO=exBO3
Name='exModule2 – exBO3 - Populate File'
Information about missing definition: Step:205341 Populate File(36)
Parent Step:0 Start(1) 'Start'
```

Reported issues

The log report might identify issues that the process cannot repair automatically. When the process cannot repair a workflow automatically, it typically retires the workflow. You can review this log report to repair any issues in the workflows that your business processes require, and publish the revised workflows.

Suggested actions

The following issues cannot be repaired automatically. The table shows the issue that is written to the `WorkflowCleanup.log` file and the corresponding description and suggested actions.

Issue	Description
Condition expression is invalid. Review and correct the expression.	A workflow condition expression is invalid and the expression cannot be processed. At run time, these conditions are treated as though they are blank. For Start conditions, the workflow is started. For Switch conditions, the expression is always true. For Break conditions, the Loop or Iteration is stopped. The information for the workflow lists the expression and the task step in which it is contained. The process leaves the workflow in the published state. The workflow must be revised, the expression must be corrected, and the workflow must be republished.
Retired the workflow because of a block structure error that cannot be repaired.	A block structure within the workflow has a problem that makes it invalid and cannot be repaired by the process. The following task types define block structures: Switch, Loop, Iterator, Fork, and DataConnect. The process retires the workflow. Review the retired workflow and correct any problems. It is possible that a workflow that is listed might not open in the Workflow Builder. If the listed workflow version cannot be opened, then open older versions for review.
Retired the workflow because of a missing Start step that cannot be repaired.	The workflow is missing the Start task step and cannot be repaired by the process. The process retires the workflow. Review the retired workflow and correct any problems. It is possible that a workflow that is listed might not open in the Workflow Builder. If the listed workflow version cannot be opened, then open older versions for review.
Retired the workflow because of missing Start and End steps that cannot be repaired.	The workflow is missing the Start and End task steps and cannot be repaired by the process. The process retires the workflow. Review the retired workflow and correct any problems. It is possible that a workflow that is listed might not open in the Workflow Builder. If the listed workflow version cannot be opened, then open older versions for review.

Issue	Description
Retired the workflow because of a structure error that cannot be repaired.	The step-to-step structure of the workflow has a problem that makes it invalid and the structure cannot be repaired by the process. The process retires the workflow. Review the retired workflow and correct any problems. It is possible that a workflow that is listed might not open in the Workflow Builder. If the listed workflow version cannot be opened, then open older versions for review.
Retired the workflow because of an unknown task type <type-number>.	The workflow contains a step with a task type that cannot be understood by the workflow processor. Since the step uses an unknown task type, this condition cannot be repaired by the process. The process retires the workflow. Review the retired workflow and correct any problems. It is possible that a workflow that is listed might not open in the Workflow Builder. If the listed workflow version cannot be opened, then open older versions for review.
Retired the workflow because of missing step definitions that cannot be repaired.	The properties for one or more steps within the workflow cannot be loaded. Since the properties for the step are specific to the logic of the workflow, this condition cannot be repaired by the process. The process retires the workflow. Review the retired workflow and correct any problems. It is possible that a workflow that is listed might not open in the Workflow Builder. If the listed workflow version cannot be opened, then open older versions for review.
Unexpected problem in trying to load the workflow.	This issue covers any problems that do not fit into any of the other categories. The process retires the workflow. Review the retired workflow and correct any problems. It is possible that a workflow that is listed might not open in the Workflow Builder. If the listed workflow version cannot be opened, then open older versions for review.

Automatic repairs

The following issues can be repaired automatically. The table shows the issue that is written to the `WorkflowCleanup.log` file and the corresponding description and automatic repairs.

Issue	Description
Added the required End step structure and definition information.	Valid workflows require an End task step and one cannot be found. The process adds an End task step to the workflow. Review the workflow to verify that the step was added correctly.
Changed step with missing definition to a No-Op.	The properties for a task step cannot be loaded. According to past behavior, when the properties for a step cannot be loaded, the step was skipped and processing was continued with the next step. Because the properties for steps other than an End or Stop task are specific to the workflow, the process cannot create them. However, because the step was skipped in the past, the process replaces the task step with a No-Op task step. A No-Op (or No Operation) task step is a task step that does nothing. The log entry provides information about what was replaced so the workflow can be reviewed. Review previous versions of the workflow to determine the purpose of the step and replace the step if necessary. The task types Switch, Fork, Loop, Iterator, and DataConnect cannot be converted to a No-Op step. Missing properties for these task types results in retiring the workflow. (This condition is covered by the table of issues that cannot be automatically repaired by the process.)

Issue	Description
Converted obsolete task type step to a No-Op.	Older workflows might contain task steps that were not supported since the Workflow Builder was released in 2005. These obsolete types are most likely to exist in workflows that were originally created with the older non-graphical workflow editor. According to past behavior, the process skipped these task steps and continued to the next step. The process converts these task steps to No-Op steps.
Flow control value was invalid. Set step to normal flow (non-swapped).	Switch and Break task steps contain an internal value that indicates whether the condition must be used as-is or swapped. If the internal value is not valid for either a normal or swapped step, the process replaces it with the value for a normal step. This value is an internally used value and not the condition expression for the step. Review the listed Switch or Break and verify that the step is correct. Swap the step if necessary.
Removed the entry from WF_LOOKUP because the workflow is not in a published state.	An entry for the workflow existed in the WF_LOOKUP table, but the workflow is not currently published. Only published workflows must have an entry in the WF_LOOKUP table, so the entry was removed. The workflow can be published if it is necessary for current business processes.
Retired the workflow because its Business Object could not be found.	The business object for which the workflow is defined does not exist. If the business object does not exist, then this workflow cannot run. The process retires the workflow.
Retired the workflow because its Module could not be found.	The module for which the workflow is defined does not exist. If the module does not exist, then this workflow cannot run. The process retires the workflow.
Retired the workflow because there isn't a corresponding entry in WF_LOOKUP.	The workflow entry in the WF_TEMPLATE table has a status of Published, but there is no entry in the WF_LOOKUP table. Since the WF_LOOKUP table locates workflows at run time, this workflow cannot run. The process changes the status from Published to Retired. The workflow can be published if it is necessary for current business processes.
Step definition added for Block-End step.	The properties for a Block-End task step cannot be loaded. A Block-End task step is the bottom of a Switch or Loop task step. All task steps require valid properties to be run. However, the properties for this task type do not contain any values that are specific to the workflow. The process creates valid properties for them.
Step definition added for End step.	The properties for an End task step cannot be loaded. All task steps require valid properties to be run. However, the properties for this task type do not contain any values that are specific to the workflow. The process creates valid properties for them.
Step definition added for No-Op step.	The properties for a No-Op task step cannot be loaded. A No-Op task step is a task step that does nothing, but sometimes it is added to a workflow by the Workflow Builder. All task steps require valid properties to be run. However, the properties for this task type do not contain any values that are specific to the workflow. The process creates valid properties for them.
Step definition added for Stop step.	The properties for a Stop task step cannot be loaded. All task steps require valid properties to be run. However, the properties for this task type do not contain any values that are specific to the workflow. The process creates valid properties for them.

Issue	Description
Updated the workflow name in WF_LOOKUP.	The name of the workflow in the WF_LOOKUP table does not match the name in the WF_TEMPLATE table. The process repaired this condition by updating the name in the WF_LOOKUP table. Review the name and verify that this name is expected.

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