Note

Before using this information and the product it supports, read the information in "Notices" on page 107.
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.

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.
Chapter 3. 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.
The IBM TRIRIGA Application Platform Compatibility Matrix lists the servers, components, and operating systems on which the IBM TRIRIGA Application Platform is certified.

Related information:

IBM TRIRIGA Application Platform Compatibility Matrix
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.

Alternatively, each of these logical tiers can be installed on one or more virtual servers. In turn, these virtual servers can be on a physical server, or a cluster of physical servers in a virtual server cluster.

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

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

**Application server**
- Carries out the user business logic with JBoss Application Server, Red Hat JBoss Enterprise Application Platform, WebLogic Server, or WebSphere® Application Server.

**Process server**
- Carries out the background processing and analytics with Red Hat JBoss Enterprise Application Platform, WebLogic Server, or WebSphere Application Server.

**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 Application Platform 3 Single Sign-On Setup User Guide
Chapter 4. Installing the platform

You can select the IBM TRIRIGA Application Platform installation process that applies to your hardware configuration, whether you have a JBoss Application Server (AS), Red Hat JBoss Enterprise Application Platform (EAP), Oracle WebLogic Server, or IBM WebSphere Application 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 IBM TRIRIGA Application Platform Compatibility Matrix 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.

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.

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 Red Hat JBoss Enterprise Application Platform, WebLogic Server, or WebSphere Application Server software must be installed before you run the IBM TRIRIGA Application Platform installer.
Red Hat JBoss Enterprise Application Platform

If you choose to install Red Hat JBoss Enterprise Application Platform, prepare for the following guidelines:

- For JBoss Application Server (AS), you can download the JBoss5.1.0.GA.zip installation file from http://sourceforge.net/projects/jboss/files/JBoss/JBoss-5.1.0.GA/. In Microsoft Windows, extract the .zip file to create a folder with the path of C:\JBoss\jboss-5.1.0.GA. When you are requested by the IBM TRIRIGA Application Platform installer, specify the C:\JBoss\jboss-5.1.0.GA folder as the complete path to your JBoss directory. This path is the typical path. If you choose an alternative path, the name of the JBoss directory must not have a space.

- For Red Hat JBoss Enterprise Application Platform (EAP), you can download the jboss-eap-5.1.0.zip installation file from http://www.redhat.com/products/jbossenterprisemiddleware/application-platform/. In Microsoft Windows, extract the .zip file to create a folder with the path of C:\jboss-eap-5.1\jboss-as\ when you are requested by the IBM TRIRIGA Application Platform installer, specify the C:\jboss-eap-5.1\jboss-as\ folder as the complete path to your JBoss directory. This path is the typical path. If you choose an alternative path, the name of the JBoss directory must not have a space.

- You must not install IBM TRIRIGA Application Platform on a pre-configured Red Hat JBoss Enterprise Application Platform instance. Do not modify any files after unzipping the Red Hat JBoss Enterprise Application Platform .zip file. You can configure Red Hat JBoss Enterprise Application Platform after the IBM TRIRIGA Application Platform installation is complete.

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

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_INDEX table space to support at least this base data. The minimum size for the TRIDATA_DATA table space and TRIDATA_INDEX 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 Java Development Kit (JDK) must be installed before you run the IBM TRIRIGA Application Platform installer. The JDK must be installed before you run the IBM TRIRIGA application. Java must be running during an IBM TRIRIGA installation.

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” on page 18

To configure TRIRIGA with DB2 version 10.5, 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.

Related information:
IBM TRIRIGA Application Platform Compatibility Matrix

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 include full installation and database-only installation. Full installations install and configure all key components for IBM TRIRIGA, including the application server. Database-only installations create the database without installing the application server.

Installation preparation

Whether you choose a full installation or database-only installation, prepare the following access and information before you begin:

- 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:

- Application server
- Database scripts
- Database
Database-only installation process

A database-only installation process creates the database without installing the application server. Do not select the database-only installation or upgrade unless you are directed to do so by the team responsible for planning the IBM TRIRIGA deployment. If you install the database now and you install a newer version of the application server later, an incompatibility can occur between a new feature and the database.
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

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release notes</td>
<td>Read the IBM TRIRIGA Release Notes that apply to your installation version for information and instructions that are specific to that release.</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Data recovery and backups</td>
<td>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.</td>
</tr>
<tr>
<td>Full installation</td>
<td>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.</td>
</tr>
<tr>
<td>Language packs</td>
<td>The installer copies language packs into the [install directory]/userfiles/LanguagePacks folder. Starting with the IBM TRIRIGA Application Platform version 3.3, 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.</td>
</tr>
<tr>
<td>First step in the installation</td>
<td>The first step in the installation is to run the installer:</td>
</tr>
<tr>
<td></td>
<td>• From the Windows environment, double-click the install.exe file. On Windows, C:\tririga is the default installation location.</td>
</tr>
<tr>
<td></td>
<td>• Connect and log in to your application server as the IBM TRIRIGA user through SSH or other remote terminal application.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
</tbody>
</table>
### Java virtual machine (JVM)

During the installation:
- Select the path to the Java virtual machine (JVM) that you want the installer to use. The screen lists the java.exe versions that are available on your target computer. IBM TRIRIGA supports Java 6 only.
- WebSphere Application Server installations support IBM Java versions 6 or 7. JBoss and WebLogic Server installations support Oracle Java.
- If you see the following message, “Unable to install the Java Virtual Machine included with this installer”, then continue with the installation. This message is caused by the version of InstallAnywhere that is used by the installer. It has no effect on the installation.

### 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

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release notes</td>
<td>Read the IBM TRIRIGA Release Notes.</td>
</tr>
<tr>
<td>Multibyte language support</td>
<td>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.</td>
</tr>
</tbody>
</table>
| Multibyte language support            | If you support multibyte languages, take the following steps before you begin the installation:  
  - Set the instance character set to UTF-8 or UTF-16. If you do not select a UTF-8 or UTF-16 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. |
| 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**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release notes</td>
<td>Read the IBM TRIRIGA Release Notes.</td>
</tr>
<tr>
<td>Users</td>
<td>Verify that the database user that is being used for the new installation is uniquely associated to the database.</td>
</tr>
</tbody>
</table>
| Multibyte language support | If you support multibyte languages, take the following steps during the installation:  
  - Select the option to configure your database for multibyte support.  
  - Choose a collation for the database. |
| Multibyte language support and WebLogic Server | If you support multibyte languages, 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 | If you support multibyte languages, verify in the WebSphere Application Server data source that the custom property of `sendStringParametersAsUnicode` is set to true. |
| Multibyte language support and JBoss Enterprise Application Platform | If you support multibyte languages, verify in the JBoss Enterprise Application Platform data source, `tririga-ds.xml`, that the custom property of `sendStringParametersAsUnicode` is set to true. |
| User name requirement | For Microsoft SQL Server, you can use different values for the database name and the database user ID. |

**Checklist for new IBM TRIRIGA Application Platform installations on IBM DB2**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release notes</td>
<td>Read the IBM TRIRIGA Release Notes.</td>
</tr>
<tr>
<td>IBM DB2</td>
<td>Perform DB2 configuration steps.</td>
</tr>
<tr>
<td>Multibyte language support</td>
<td></td>
</tr>
</tbody>
</table>
  - 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`. |
  ```xml`<connection-property name="jdbcCollection">NULLIDR1</connection-property>` | | Data collection performance settings in WebLogic Server. | Data collection performance settings are configured with data source properties using the following parameter values:  
  ```xml`user=TRIRIGA DB User DatabaseName=DB Name jdbcCollection=NULLIDR1` |
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data collection performance settings in WebSphere Application Server.</td>
<td>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.</td>
</tr>
</tbody>
</table>

Related information:
- [IBM TRIRIGA Release Notes](#)
- [IBM TRIRIGA Application Platform 3 Upgrade Installation Guide](#)

Create and configure a DB2 database for TRIRIGA

To configure TRIRIGA with DB2 version 10.5, 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 version 10.5 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 are provided for Windows, Linux, and UNIX.

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 version 10.5 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 version 10 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 `db2cmd` 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
   tririgaUser 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 **tririgaUser** 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 server 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 version 10.5 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 version 10 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/V10.5
> 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 version 10 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/V10.5
> db2fenc1 > 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.

   ```bash
   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.

   ```bash
   ./db2createdb.sh tririga
   triinst US /opt/ibm/db2/V10.5
   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 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 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.

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**Installing TRIRIGA Application Platform on JBoss Application Server**

TRIRIGA Application Platform can be installed on JBoss Application Server (AS) 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. Use of JBoss Application Server (AS) is not supported for production environments.

---

**Installing IBM TRIRIGA Application Platform on JBoss AS and Oracle Database**

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

Verify that the Oracle Database and JBoss AS are running and that you have administrative authority on the servers.

Procedure

1. Run the installer file. Follow the installation instructions.
   a. Accept the licenses for both the application and the application platform.
   b. For the installation set, select **Complete IBM TRIRIGA Application Platform**.
   c. For the installation type, select **New Installation**.
2. For the application server, select **JBoss 5.1.0 (Community - Non Production)**. Specify the JBoss information in the next set of screens.
   a. Specify the complete path to your JBoss directory.
   b. Optional: Define an alternative application context path to access the IBM TRIRIGA application. This path must begin with a slash (/).
   c. Specify the path to the Java Development Kit (JDK) with the JVM that you want the application server to use. IBM TRIRIGA supports Oracle JDK 1.6.
   d. Specify the minimum and maximum Java memory setting values in megabytes.
   e. Specify the server host name.
   f. Optional: Select production mode. This selection sets the value of the **ProductionMode** property in the **TRIRIGAWEB.properties** file. If you must change the setting after the installation is complete, change the value in **TRIRIGAWEB.properties** and restart the application server process.
3. 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. For example, if your database administrator pre-created the table space and schema, 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 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_INDEX 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 minimum and maximum 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.

4. 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 web server.
   c. Review the pre-installation summary and click Install.

5. Click Next. The database configuration process can take a long time because the database must allocate space, create the users, and load the default schema data.
   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.

6. When the installation is complete, click Done.

7. Copy your license files into the tririga_root\config\licenses 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.

8. Start IBM TRIRIGA by locating the \jboss-5.1.0.GA\bin directory that has the appropriate run batch or shell file. On Windows servers, double-click the run.bat file. On UNIX servers, run the run.sh command.
   a. Secure the JBoss Java Management Extensions (JMX) console.

What to do next

Verify that your installation is running properly.

Related information:

Securing the JMX Console

Installing IBM TRIRIGA Application Platform on JBoss AS and Microsoft SQL Server

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

Verify that the Microsoft SQL Server and JBoss AS are running and that you have administrative authority on the servers.

Procedure

1. Run the installer file. Follow the installation instructions.
   a. Accept the licenses for both the application and the application platform.
   b. For the installation set, select **Complete IBM TRIRIGA Application Platform**.
   c. For the installation type, select **New Installation**.

2. For the application server, select **JBoss 5.1.0 (Community - Non Production)**. Specify the JBoss information in the next set of screens.
   a. Specify the complete path to your JBoss directory.
   b. Optional: Define an alternative application context path to access the IBM TRIRIGA application. This path must begin with a slash (/).
   c. Specify the path to the Java Development Kit (JDK) with the JVM that you want the application server to use. IBM TRIRIGA supports Oracle JDK 1.6.
   d. Specify the minimum and maximum Java memory setting values in megabytes.
   e. Specify the server host name.
   f. Optional: Select production mode. This selection sets the value of the `ProductionMode` property in the `TRIRIGAWEB.properties` file. If you must change the setting after the installation is complete, change the value in `TRIRIGAWEB.properties` and restart the application server process.

3. 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. Follow the instructions for downloading the Java Device Test Suite (JDTS) driver. Specify the path to the `jtds-1.2.8.jar` file.
   b. 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. For example, if your database administrator pre-created the table space and schema, clear the first option. When you create the database, you must load data using the installation program.
   c. 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.
   d. 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.
   e. Optional: Select the option to configure your database for multibyte language support. If you do not configure the database for multibyte language support, you can select this option during a future upgrade. However, if you anticipate supporting multibyte languages in the future, you should configure the database for multibyte language support now.
   f. Optional: Choose a collation for the Microsoft SQL Server database. This screen is displayed if you chose to configure your database for multibyte language support.
g. 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.

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

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

j. Specify the minimum and maximum 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.

4. 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 web server.
   c. Review the pre-installation summary and click Install.

5. Click Next. The database configuration process can take a long time because the database must allocate space, create the users, and load the default schema data.
   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.

6. When the installation is complete, click Done.

7. Copy your license files into the `tririga_root\config\licenses` 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.

8. Start IBM TRIRIGA by locating the `\jboss-5.1.0.GA\bin` directory that has the appropriate run batch or shell file. On Windows servers, double-click the `run.bat` file. On UNIX servers, run the `run.sh` command.
   a. Secure the JBoss Java Management Extensions (JMX) console.

What to do next

Verify that your installation is running properly.

Related information:

[Securing the JMX Console](#)

Installing IBM TRIRIGA Application Platform on JBoss AS and IBM DB2

After your application server and database server are prepared, you can begin to install the IBM TRIRIGA Application Platform on JBoss Application Server (AS) and IBM DB2.
Before you begin

Verify that the IBM DB2 and JBoss AS are running and that you have administrative authority on the servers.

Procedure

1. Run the installer file. Follow the installation instructions.
   a. Accept the licenses for both the application and the application platform.
   b. For the installation set, select Complete IBM TRIRIGA Application Platform.
   c. For the installation type, select New Installation.
2. For the application server, select JBoss 5.1.0 (Community - Non Production). Specify the JBoss information in the next set of screens.
   a. Specify the complete path to your JBoss directory.
   b. Optional: Define an alternative application context path to access the IBM TRIRIGA application. This path must begin with a slash (/).
   c. Specify the path to the Java Development Kit (JDK) with the JVM that you want the application server to use. IBM TRIRIGA supports Oracle JDK 1.6.
   d. Specify the minimum and maximum Java memory setting values in megabytes.
   e. Specify the server host name.
   f. Optional: Select production mode. This selection sets the value of the ProductionMode property in the TRIRIGAWEB.properties file. If you must change the setting after the installation is complete, change the value in TRIRIGAWEB.properties and restart the application server process.
3. 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 and schema, 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. Optional: Specify the database administrator user name and password. If the database is running on Linux or UNIX, specify the instance user. If the database is running on Windows, specify the database administrator user, for example db2admin. This screen is displayed if you chose to create the table spaces. 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 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.

h. Specify the minimum and maximum 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.

4. 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 (or web) server.
   c. Review the pre-installation summary and click Install.

5. Click Next. The database configuration process can take a long time because the database must allocate space, create the tablespaces, and load the default schema data.
   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.

6. When the installation is complete, click Done.

7. Copy your license files into the tririga_root\config\licenses 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.

8. Start IBM TRIRIGA by locating the \jboss-5.1.0.GA\bin directory that has the appropriate run batch or shell file. On Windows servers, double-click the run.bat file. On UNIX servers, run the run.sh command.
   a. Secure the JBoss Java Management Extensions (JMX) console.

What to do next

Verify that your installation is running properly.

Related concepts:

"Create and configure a DB2 database for TRIRIGA" on page 18

To configure TRIRIGA with DB2 version 10.5, 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 on Red Hat JBoss Enterprise Application Platform**

TRIRIGA Application Platform can be installed on Red Hat JBoss Enterprise Application Platform (EAP) 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.

**Installing IBM TRIRIGA Application Platform on JBoss EAP and Oracle Database**

After your application server and database server are prepared, you can begin to install the IBM TRIRIGA Application Platform on Red Hat JBoss Enterprise Application Platform (EAP) and Oracle Database.

**Before you begin**

Verify that the Oracle Database and JBoss EAP are running and that you have administrative authority on the servers.

**Procedure**

1. Run the installer file. Follow the installation instructions.
   a. Accept the licenses for both the application and the application platform.
   b. For the installation set, select **Complete IBM TRIRIGA Application Platform**.
   c. For the installation type, select **New Installation**.

2. For the application server, select **JBoss 5.1 EAP (Enterprise)**. Specify the JBoss information in the next set of screens.
   a. Specify the complete path to your JBoss directory.
   b. Optional: Define an alternative application context path to access the IBM TRIRIGA application. This path must begin with a slash (/).
   c. Specify the path to the Java Development Kit (JDK) with the JVM that you want the application server to use. IBM TRIRIGA supports Oracle JDK 1.6.
   d. Specify the minimum and maximum Java memory setting values in megabytes.
   e. Specify the server host name.
   f. Optional: Select production mode. This selection sets the value of the `ProductionMode` property in the `TRIRIGAWEB.properties` file.

3. 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. For example, if your database administrator pre-created the table space and schema, 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 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_INDEX 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 minimum and maximum 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.

4. 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 web server.


   c. Review the pre-installation summary and click Install.

5. Click Next. The database configuration process can take a long time because the database must allocate space, create the users, and load the default schema data.

   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.

6. When the installation is complete, click Done.

7. Copy your license files into the `tririga_root\config\licenses` 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.

8. Start IBM TRIRIGA by locating the `\jboss-eap-5.1\jboss-eap\bin` directory that has the appropriate run batch or shell file. On Windows servers, double-click the run.bat file. On UNIX servers, run the `run.sh` command.

   a. Secure the JBoss Java Management Extensions (JMX) console.
What to do next

Verify that your installation is running properly.

Related information:
[Securing the JMX Console]

Installing IBM TRIRIGA Application Platform on JBoss EAP and Microsoft SQL Server

After your application server and database server are prepared, you can begin to install the IBM TRIRIGA Application Platform on Red Hat JBoss Enterprise Application Platform (EAP) and Microsoft SQL Server.

Before you begin

Verify that the Microsoft SQL Server and JBoss EAP are running and that you have administrative authority on the servers.

Procedure

1. Run the installer file. Follow the installation instructions.
   a. Accept the licenses for both the application and the application platform.
   b. For the installation set, select Complete IBM TRIRIGA Application Platform.
   c. For the installation type, select New Installation.
2. For the application server, select JBoss 5.1 EAP (Enterprise). Specify the JBoss information in the next set of screens.
   a. Specify the complete path to your JBoss directory.
   b. Optional: Define an alternative application context path to access the IBM TRIRIGA application. This path must begin with a slash (/).
   c. Specify the path to the Java Development Kit (JDK) with the JVM that you want the application server to use. IBM TRIRIGA supports Oracle JDK 1.6.
   d. Specify the minimum and maximum Java memory setting values in megabytes.
   e. Specify the server host name.
   f. Optional: Select production mode. This selection sets the value of the ProductionMode property in the TRIRIGAWEB.properties file.
3. 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. Follow the instructions for downloading the Java Device Test Suite (JDTS) driver. Specify the path to the jtds-1.2.8.jar file.
   b. 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. For example, if your database administrator pre-created the table space and schema, clear the first option. When you create the database, you must load data using the installation program.
   c. 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.
d. 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.

e. Optional: Select the option to configure your database for multibyte language support. If you do not configure the database for multibyte language support, you can select this option during a future upgrade. However, if you anticipate supporting multibyte languages in the future, you should configure the database for multibyte language support now.

f. Optional: Choose a collation for the Microsoft SQL Server database. This screen is displayed if you chose to configure your database for multibyte language support.

g. 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.

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

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

j. Specify the minimum and maximum 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.

4. 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 web server.


   c. Review the pre-installation summary and click Install.

5. Click Next. The database configuration process can take a long time because the database must allocate space, create the users, and load the default schema data.

   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 \texttt{tail -f ant.log} command.

6. When the installation is complete, click Done.

7. Copy your license files into the \texttt{tririga_root/config/licenses} 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.

8. Start IBM TRIRIGA by locating the \texttt{jboss-eap-5.1/jboss-eap/bin} directory that has the appropriate run batch or shell file. On Windows servers, double-click the run.bat file. On UNIX servers, run the \texttt{run.sh} command.

   a. Secure the JBoss Java Management Extensions (JMX) console.

\textbf{What to do next}

Verify that your installation is running properly.

\textbf{Related information:}
Installing IBM TRIRIGA Application Platform on JBoss EAP and IBM DB2

After your application server and database server are prepared, you can begin to install the IBM TRIRIGA Application Platform on Red Hat JBoss Enterprise Application Platform (EAP) and IBM DB2.

Before you begin

Verify that the IBM DB2 and JBoss EAP are running and that you have administrative authority on the servers.

Procedure

1. Run the installer file. Follow the installation instructions.
   a. Accept the licenses for both the application and the application platform.
   b. For the installation set, select Complete IBM TRIRIGA Application Platform.
   c. For the installation type, select New Installation.
2. For the application server, select JBoss 5.1 EAP (Enterprise). Specify the JBoss information in the next set of screens.
   a. Specify the complete path to your JBoss directory.
   b. Optional: Define an alternative application context path to access the IBM TRIRIGA application. This path must begin with a slash (/).
   c. Specify the path to the Java Development Kit (JDK) with the JVM that you want the application server to use. IBM TRIRIGA supports Oracle JDK 1.6.
   d. Specify the minimum and maximum Java memory setting values in megabytes.
   e. Specify the server host name.
   f. Optional: Select production mode. This selection sets the value of the ProductionMode property in the TRIRIGAWEB.properties file.
3. 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 and schema, 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_INDEX is a typical value for indexes.
   e. Optional: Specify the database administrator user name and password. If the database is running on Linux or UNIX, specify the instance user. If the database is running on Windows, specify the database administrator user.
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 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.

h. Specify the minimum and maximum 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.

4. 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 (or web) server.
   c. Review the pre-installation summary and click Install.

5. Click Next. The database configuration process can take a long time because the database must allocate space, create the users, and load the default schema data.

   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.

6. When the installation is complete, click Done.

7. Copy your license files into the tririga_root\config\licenses 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.

8. Start IBM TRIRIGA by locating the \jboss-eap-5.1\jboss-eap\bin directory that has the appropriate run batch or shell file. On Windows servers, double-click the run.bat file. On UNIX servers, run the run.sh command.

   a. Secure the JBoss Java Management Extensions (JMX) console.

What to do next

Verify that your installation is running properly.

Related concepts:

“Create and configure a DB2 database for TRIRIGA” on page 18
TRIRIGA Application Platform can be installed on Oracle WebLogic 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.

Overview of IBM TRIRIGA Application Platform installation on WebLogic

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

Installation phases

Installing the platform on the WebLogic Server involves several phases:
- Preparing the WebLogic Server settings and shutting down the WebLogic Server.
- Starting the IBM TRIRIGA installation.
- Changing the WebLogic Server properties and starting the WebLogic Server.
- Finishing the IBM TRIRIGA installation.

Preparing WebLogic

When the Oracle WebLogic Server is running, you can prepare it for installation by creating a group and user, and assigning the user to the group.

Before you begin

Verify that WebLogic Server is running and that you have administrative authority on the application server.

Procedure

1. Download log4j from the apache.org web site, For example, [http://www.apache.org/dyn/closer.cgi/logging/log4j/1.2.17/log4j-1.2.17.zip](http://www.apache.org/dyn/closer.cgi/logging/log4j/1.2.17/log4j-1.2.17.zip)
2. Unzip the log4j-1.2.17.jar file and copy the log4j JAR file to the WebLogic Server domain lib directory. For example, C:\Weblogic\user_projects\domains\base_domain\lib\log4j-1.2.17.jar
3. Copy the wllog4j.jar file to the WebLogic Server domain lib directory. For example, copy C:\Weblogic\wlserver\server\lib\wllog4j.jar to C:\Weblogic\user_projects\domains\base_domain\lib.
4. Enable log4j logging.
   a. Log in to the WebLogic Server administration console, for example, [http://localhost:7001/console](http://localhost:7001/console).
   b. Click Environment and then Server.
   c. Click the name of the admin server.
   d. Select the Logging tab and then click Advanced.
   e. Change the logging Implementation from the default JDK to log4j logging.
   f. Save changes and restart the server.

The server.log file is now recording information. You can alter the logging settings using the IBM TRIRIGA admin console.
5. Log in to the WebLogic Server administration console, for example, http://localhost:7001/console.
7. In the main panel, click myrealm in the Name column.
8. Create a group named TRIRIGA-AppGroup.
9. Create a user named TRIRIGA-AppUser.
10. Assign the user to the group.
11. Optional: Set up IBM TRIRIGA CAD Integrator/Publisher users.
12. Select Users and Groups from the breadcrumb navigation, select the Roles and Policies tab, select the Realm Roles tab, and select Global Roles > Roles.
13. Add a Global Role named TRIRIGA-Application.
15. Enable tunneling. From Domain Structure, expand the Environments node, and then click Servers. Select the Protocol tab and then select Enable Tunneling.
16. Click Activate Changes.
17. If you are using web service transactions such as IBM TRIRIGA Connector for Business Applications, add another user such as IBM TRIRIGA Connector for Business Applications and OSLC.
   a. Add a WebLogic Server domain user for the web service user.
   b. Assign this user to TRIRIGA-AppGroup.
19. Delete WebLogic Server caches by removing the Admin Server tmp folder and the JSP cache folder if they exist. The file paths to these folders vary as they are specific to your domain and server name. The following are examples of what the paths look like: WL_INSTALL_FOLDER/user_projects/domains/my_domain/servers/AdminServer/tmp and WL_INSTALL_FOLDER/user_projects/domains/my_domain/_tmp_jsp_compile_DefaultWebApp.

What to do next

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

Installing IBM TRIRIGA Application Platform on WebLogic and Oracle Database

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

Before you begin

Verify that the Oracle Database and Oracle WebLogic 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 licenses for both the application and the application platform.
   b. For the installation set, select Complete IBM TRIRIGA Application Platform.
c. For the installation type, select **New Installation**.

2. For the application server, select **WebLogic**. Specify the WebLogic Server information in the next set of screens.
   a. Select **WebLogic Server 12c Release 2 (12.1.2)**.
   b. Specify the path to your WebLogic Server home directory where the `\server\lib` directory is located.
   c. Specify the appropriate information for your WebLogic Server. Enter the server password.
   d. Optional: Define an alternative application context path to access the IBM TRIRIGA application. This path must begin with a slash (/).
   e. Specify the server host name.
   f. Optional: Select production mode. This selection sets the value of the `ProductionMode` property in the `TRIRIGAWEB.properties` file.
   g. Specify the path to the `xercesImpl.jar` file.

3. 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. For example, if your database administrator pre-created the table space and schema, 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 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_INDEX` 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 minimum and maximum 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.

4. 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 web server.
   c. Review the pre-installation summary and click Install.

5. Select and copy the data that is displayed in the text section.

6. Go to the WebLogic Server directory and find the setDomainEnv file.

7. If you are using Windows, adjust the following properties:
   a. Edit setDomainEnv.cmd.
   b. Find the occurrence of set PATCH_CLASSPATH=. This statement is likely commented out, for example, @REM set PATCH_CLASSPATH=[myPatchClasspath] (windows). Remove the comment prefix, for example, @REM. Also remove the statement value placeholder, for example, [myPatchClasspath] (windows). Immediately after the equal sign (=), insert the IBM TRIRIGA class path that was copied from the Start WebLogic text section earlier.
   c. Find set WLS_MEM_ARGS and adjust the values for -Xms and -Xmx to be appropriate for your implementation.
   d. Find set MEM_MAX_PERM_SIZE and adjust the value for -XX:MaxPermSize to be appropriate for your implementation.
   e. Find set JAVA_DEBUG=. Immediately after both places where %enableHotswapFlag% is displayed, specify the following text:
   -Doracle.jdbc.maxCachedBufferSize=18
   f. To set the logging output to the appropriate location, find the line: if NOT "%LOG4J_CONFIG_FILE%"=="". Directly before that line, set the LOG4J_CONFIG_FILE property to point at the log4j.xml file in the IBM TRIRIGA installation config directory. For example:
   set LOG4J_CONFIG_FILE=C:\Tririga\config\log4j.xml
   if NOT "%LOG4J_CONFIG_FILE%"=="" (set JAVA_PROPERTIES=%JAVA_PROPERTIES% -Dlog4j.configuration=file:%LOG4J_CONFIG_FILE%
   )
   g. Find JAVA_OPTIONS. Add -DUseSunHttpHandler=true to the list of existing options. For example,
   set JAVA_OPTIONS+%JAVA_OPTIONS% -DUseSunHttpHandler=true
   h. Save your changes to setDomainEnv.cmd.

8. If you are using UNIX, adjust the following properties:
   a. Edit setDomainEnv.sh.
   b. Find the occurrence of set PATCH_CLASSPATH=. This statement is likely commented out, for example, # PATCH_CLASSPATH=[myPatchClasspath] (unix). Remove the comment prefix, for example, #. Also remove the statement value placeholder, for example, [myPatchClasspath] (unix). Immediately after the equal sign (=), insert the IBM TRIRIGA class path that was copied from the Start WebLogic text section earlier within double quotes.
c. Find WLS_MEM_ARGS and adjust the values for -Xms and -Xmx to be appropriate for your implementation.
d. Find MEM_MAX_PERM_SIZE and adjust the value for -XX:MaxPermSize to be appropriate for your implementation.
e. Find JAVA_DEBUG= Immediately after both places where enableHotswapFlag is displayed, specify the following text:
   -Doracle.jdbc.maxCachedBufferSize=18
f. To set the logging output to the appropriate location, find the line: if [ "$LOG4J_CONFIG_FILE" != "" ] ; then. Directly before that line, set the LOG4j_CONFIG_FILE property to point at the log4j.xml file in the IBM TRIRIGA installation config directory. For example:
   export LOG4J_CONFIG_FILE="/usr/local/tririga/config/log4j.xml"
   if [ "$LOG4J_CONFIG_FILE" != "" ] ; then
      JAVA_PROPERTIES="$JAVA_PROPERTIES
         -Dlog4j.configuration=file:$LOG4J_CONFIG_FILE"
   export JAVA_PROPERTIES
   fi
g. Find JAVA_OPTIONS. Add -DUseSunHttpHandler=true to the list of existing options. Additionally, if your UNIX environment is running X-Windows, add -Djava.awt.headless=true to the list of existing options. For example,
   JAVA_OPTIONS="$JAVA_OPTIONS
      -DUseSunHttpHandler=true -Djava.awt.headless=true"
h. Save your changes to setDomainEnv.sh.
9. Run the setDomainEnv file.
10. Start the WebLogic Server.
11. Return to the IBM TRIRIGA installer and click Next.
12. Click Next. The database configuration process can take a long time because the database must allocate space, create the users, and load the default schema data.
   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.
13. When the installation is complete, click Done.
14. Copy your license files into the tririga_root\config\licenses 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.
15. Start IBM TRIRIGA by locating the WebLogic Server directory with the appropriate method.
   • On Windows servers, from the Start menu, select Projects > DOMAIN_NAME > Start Admin Server for WebLogic Server Domain.
   • On UNIX servers, run WEBLOGIC_HOME/user_projects/domains/USER_PROJECT_NAME/startWebLogic.sh.

What to do next

If the installation failed, see the topic about validating the deployment on WebLogic Server and Oracle Database.

Verify that your installation is running properly.
Validating the IBM TRIRIGA Application Platform deployment on WebLogic and Oracle Database

If the IBM TRIRIGA Application Platform installation failed, it is still possible to run IBM TRIRIGA on Oracle WebLogic Server and Oracle Database by validating the data sources and deployment.

Procedure

1. Verify the WebLogic Server configuration. Read the ant.log file in the root installation directory. If the last messages in the log discuss the WebLogic Server setup, then the setup must be completed manually.

2. Log in to the WebLogic Server administration console.

3. Verify that the IBM TRIRIGA Java Database Connectivity (JDBC) data sources are created. In the Domain Structure section, select Services > Data Sources.

4. In the main panel, verify that at least one data source with a Java Naming and Directory Interface (JNDI) name of jdbc/local/DataSource-TRIRIGA-data exists.
   a. If the data source exists, continue to verify that the installation is correct.
   b. If the data source does not exist, continue to create the data source.

5. In the main panel, click New and specify the following data source information:
   a. For the name, specify DataSource-TRIRIGA-data.
   b. For the JNDI name, specify jdbc/local/DataSource-TRIRIGA-data.
   c. For the database type, select Oracle, and click Next.
   d. For the database driver, select Oracle's Driver (Thin) for Instance connections; Versions:9.0.1 and later.
   e. Click Next on each screen to move to the next screen.

6. For the database server, specify the database name, host name, database user name, and password.

7. Specify the following database information:
   a. For the URL, specify jdbc:oracle:thin:@DatabaseServer:1521:orcl where DatabaseServer is the host name or IP of your database server, 1521 is the port number of the Oracle Database, and orcl is the system identification (SID) of the Oracle Database instance.
   b. For the driver class name, specify oracle.jdbc.OracleDriver.
   c. For the properties, do not change the default value that contains user=schemaname such as user=tridata.
   d. For the password, specify and confirm the password for your TRIDATA schema.
   e. For the test table name, do not change the default value.
   f. For the database user name, specify the user name of your TRIDATA schema.

8. Click Test Configuration.

9. Select the check box for the server name of the IBM TRIRIGA deployment and click Finish.

10. Validate the IBM TRIRIGA data source. In the Domain Structure section, select Services > JDBC > Data Sources.

11. In the main panel, select DataSource-TRIRIGA-data.

12. Select the Configuration tab, and select the General tab. Verify that the JNDI name is jdbc/local/DataSource-TRIRIGA-data. The JNDI name is case-sensitive.
13. Select the **Connection Pool** tab. Verify that the URL, driver class name, and properties are correct. Change the maximum capacity to 100. You might be required to increase the maximum capacity as you add more users to the implementation. Click **Save**.

14. Select the **Targets** tab. Select the check box for the server that ties the data source to the server.

15. Validate the IBM TRIRIGA deployment. In the Domain Structure section, select **Deployments**. In the main panel, verify that the **tririga-ibs** application is deployed.

16. If the application is deployed, select **tririga-ibs** in the Deployments section.

17. If the application is not deployed:
   a. Select **Install**.
   b. For the path, select the IBM TRIRIGA installation directory, and select the **tririga-ibs.ear** file. Click **Next** on each screen to move to the next screen.
   c. Select **Install this deployment as an application**.
   d. Click **Finish**.

18. Review the settings for the **tririga-ibs** application.
   a. Optional: Restart the WebLogic Server to verify that everything is synchronized and in place for production.

**What to do next**

Verify that your installation is running properly.

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**Installing IBM TRIRIGA Application Platform on WebLogic and Microsoft SQL Server**

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

**Before you begin**

Verify that the Microsoft SQL Server and Oracle WebLogic 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 licenses for both the application and the application platform.
   b. For the installation set, select **Complete IBM TRIRIGA Application Platform**.
   c. For the installation type, select **New Installation**.

2. For the application server, select **WebLogic**. Specify the WebLogic Server information in the next set of screens.
   a. Select **WebLogic Server 12c Release 2 (12.1.2)**.
   b. Specify the path to your WebLogic Server home directory where the `\server\lib` directory is located.
   c. Specify the appropriate information for your WebLogic Server. Enter the server password.
   d. Optional: Define an alternative application context path to access the IBM TRIRIGA application. This path must begin with a slash (/).
e. Specify the server host name.
f. Optional: Select production mode. This selection sets the value of the `ProductionMode` property in the `TRIRIGAWEB.properties` file.
g. Specify the path to the `xercesImpl.jar` file.

3. 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. Follow the instructions for downloading the Java Device Test Suite (JDTS) driver. Specify the path to the `jtds-1.2.8.jar` file.
   b. 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. For example, if your database administrator pre-created the table space and schema, clear the first option. When you create the database, you must load data using the installation program.
   c. 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.
   d. 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.
   e. Optional: Select the option to configure your database for multibyte language support. If you do not configure the database for multibyte language support, you can select this option during a future upgrade. However, if you anticipate supporting multibyte languages in the future, you should configure the database for multibyte language support now.
   f. Optional: Choose a collation for the Microsoft SQL Server database. This screen is displayed if you chose to configure your database for multibyte language support.
   g. 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.
   h. Review the URL that the installer is using to test the data schema connection.
   i. Review the results of the test. If the test fails, verify that Microsoft SQL Server is running.
   j. Specify the minimum and maximum 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.

4. 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 web server.
   c. Review the pre-installation summary and click **Install**.

5. Select and copy the data that is displayed in the text section.

6. Go to the WebLogic Server directory and find the `setDomainEnv` file.

7. If you are using Windows, adjust the following properties:
   a. Edit `setDomainEnv.cmd`.
b. Find the occurrence of `set PATCH_CLASSPATH=`. This statement is likely commented out, for example, `@REM set PATCH_CLASSPATH=[myPatchClasspath]` (windows). Remove the comment prefix, for example, `@REM`. Also remove the statement value placeholder, for example, `[myPatchClasspath]` (windows). Immediately after the equal sign (`=`), insert the IBM TRIRIGA class path that was copied from the **Start WebLogic** text section earlier.

c. To set the logging output to the appropriate location, find the line: `if NOT "%LOG4J_CONFIG_FILE%"==""`. Directly before that line, set the `LOG4j_CONFIG_FILE` property to point at the `log4j.xml` file in the IBM TRIRIGA installation config directory. For example:

```
set LOG4j_CONFIG_FILE=C:\Tririga\config\log4j.xml
if NOT "%LOG4J_CONFIG_FILE%"=="" ( 
    set JAVA_PROPERTIES=%JAVA_PROPERTIES%
    -Dlog4j.configuration=file:%LOG4J_CONFIG_FILE%
  )
```

d. Save your changes to `setDomainEnv.cmd`.

8. If you are using UNIX, adjust the following properties:
   a. Edit `setDomainEnv.sh`.
   
   b. Find the occurrence of `set PATCH_CLASSPATH=`. This statement is likely commented out, for example, `# PATCH_CLASSPATH=[myPatchClasspath]` (unix). Remove the comment prefix, for example, `#`. Also remove the statement value placeholder, for example, `[myPatchClasspath]` (unix). Immediately after the equal sign (`=`), insert the IBM TRIRIGA class path that was copied from the **Start WebLogic** text section earlier within double quotes.

   c. To set the logging output to the appropriate location, find the line: `if [ "${LOG4J_CONFIG_FILE}" != "" ] ; then`. Directly before that line, set the `LOG4j_CONFIG_FILE` property to point at the `log4j.xml` file in the IBM TRIRIGA installation config directory. For example:

   ```
   export LOG4j_CONFIG_FILE="/usr/local/tririga/config/log4j.xml"
   if [ "${LOG4J_CONFIG_FILE}" != "" ] ; then
     JAVA_PROPERTIES="${JAVA_PROPERTIES}
     -Dlog4j.configuration=file:${LOG4J_CONFIG_FILE}"
   export JAVA_PROPERTIES
   fi
   ```

   d. Find `JAVA_OPTIONS`. If your UNIX environment is running X Windows add, `-Djava.awt.headless=true` to the list of existing options. For example:

   ```
   JAVA_OPTIONS="${JAVA_OPTIONS} -Djava.awt.headless=true"
   ```

e. Save your changes to `setDomainEnv.sh`.

9. Run the `setDomainEnv` file.

10. Start the WebLogic Server.

11. Return to the IBM TRIRIGA installer and click **Next**.

12. Click **Next**. The database configuration process can take a long time because the database must allocate space, create the users, and load the default schema data.

   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.

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

14. Copy your license files into the `tririga_root\config\licenses` 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.

15. Start IBM TRIRIGA by locating the WebLogic Server directory with the appropriate method.

- On Windows servers, from the Start menu, select **Projects** > **DOMAIN_NAME** > **Start Admin Server for WebLogic Server Domain**.
- On UNIX servers, run `WEBLOGIC_HOME`/user_projects/domains/<USER_PROJECT_NAME>/startWebLogic.sh.

What to do next

If the installation failed, see the topic about validating the deployment on WebLogic Server and Microsoft SQL Server.

Verify that your installation is running properly.

Validating the IBM TRIRIGA deployment on WebLogic and Microsoft SQL Server

If the IBM TRIRIGA Application Platform installation failed, it is still possible to run IBM TRIRIGA on Oracle WebLogic Server and Microsoft SQL Server by validating the data sources and deployment.

Procedure

1. Verify the WebLogic Server configuration. Read the ant.log file in the root installation directory. If the last messages in the log discuss the WebLogic Server setup, then the setup must be completed manually.

2. Log in to the WebLogic Server administration console.

3. Verify that the IBM TRIRIGA Java Database Connectivity (JDBC) data sources are created. In the Domain Structure section, select **Services** > **Data Sources**.

4. In the main panel, verify that at least one data source with a Java Naming and Directory Interface (JNDI) name of jdbc/local/DataSource-TRIRIGA-data exists.
   a. If the data source exists, continue to verify that the installation is correct.
   b. If the data source does not exist, continue to create the data source.

5. In the main panel, click **New** and specify the following data source information:
   a. For the name, specify DataSource-TRIRIGA-data.
   b. For the JNDI name, specify jdbc/local/DataSource-TRIRIGA-data.
   c. For the database type, select **MS SQL Server**, and click **Next**.
   d. For the database driver, select **Other**.
   e. Click **Next** on each screen to move to the next screen.

6. For the database server, specify the database name, host name, database user name, and password.

7. Specify the following database information:
   a. For the URL, specify `jdbc:jtds:sqlserver://hostname:db.port/db.name;tds=8.0;SendStringParametersAsUnicode=mwcs;prepareSQL=2`
      where *hostname* is the host name or IP of your database server, *db.port* is the port number of the Microsoft SQL Server database (such as 1433),
      *db.name* is the database name, and *mwcs* is either true for multibyte support or false for no multibyte support.
b. For the driver class name, specify net.sourceforge.jtds.jdbc.Driver.
c. For the properties, specify user=USERNAME such as user=tridata.
d. For the password, specify and confirm the password for your TRIDATA schema.
e. For the test table name, specify SQL SELECT 1.
f. For the database user name, specify the user name of your TRIDATA schema.

8. Click Test Configuration.
9. Select the check box for the server name of the IBM TRIRIGA deployment and click Finish.
10. Validate the IBM TRIRIGA data source. In the Domain Structure section, select Services > JDBC > Data Sources.
11. In the main panel, select DataSource-TRIRIGA-data.
12. Select the Configuration tab, and select the General tab. Verify that the JNDI name is jdbc/local/DataSource-TRIRIGA-data. The JNDI name is case-sensitive.
13. Select the Connection Pool tab. Verify that the URL, driver class name, and properties are correct. Change the maximum capacity to 100. You might be required to increase the maximum capacity as you add more users to the implementation. Click Save.
14. Select the Targets tab. Select the check box for the server that ties the data source to the server.
15. Validate the IBM TRIRIGA deployment. In the Domain Structure section, select Deployments. In the main panel, verify that the tririga-ibs application is deployed.
16. If the application is deployed, select tririga-ibs in the Deployments section.
17. If the application is not deployed:
   a. Select Install.
   b. For the path, select the IBM TRIRIGA installation directory, and select the tririga-ibs.ear file. Click Next on each screen to move to the next screen.
   c. Select Install this deployment as an application.
   d. Click Finish.
18. Review the settings for the tririga-ibs application.
   a. Optional: Restart the WebLogic Server to verify that everything is synchronized and in place for production.

What to do next

Verify that your installation is running properly.

Installing IBM TRIRIGA Application Platform on WebLogic and IBM DB2

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

Before you begin

Verify that the IBM DB2 and Oracle WebLogic 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 licenses for both the application and the application platform.
   b. For the installation set, select **Complete IBM TRIRIGA Application Platform**.
   c. For the installation type, select **New Installation**.

2. For the application server, select **WebLogic**. Specify the WebLogic Server information in the next set of screens.
   a. Select **WebLogic Server 12c Release 2 (12.1.2)**.
   b. Specify the path to your WebLogic Server home directory where the \server\lib directory is located.
   c. Specify the appropriate information for your WebLogic Server. Enter the server password.
   d. Optional: Define an alternative application context path to access the IBM TRIRIGA application. This path must begin with a slash (/).
   e. Specify the server host name.
   f. Optional: Select production mode. This selection sets the value of the ProductionMode property in the TRIRIGAWEB.properties file.
   g. Specify the path to the xercesImpl.jar file.

3. 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 and schema, 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. Optional: Specify the database administrator user name and password. If the database is running on Linux or UNIX, specify the instance user. If the database is running on Windows, specify the database administrator user, for example db2admin. This screen is displayed if you chose to create the table spaces. 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 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.

h. Specify the minimum and maximum 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.

4. 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 (or web) server.
   c. Review the pre-installation summary and click **Install**.

5. Select and copy the data that is displayed in the text section.

6. Go to the WebLogic Server directory and find the `setDomainEnv` file.

7. If you are using Windows, adjust the following properties:
   a. Edit `setDomainEnv.cmd`.
   b. Find the occurrence of `set PATCH_CLASSPATH=`. This statement is likely commented out, for example, `@REM set PATCH_CLASSPATH=[myPatchClasspath] (windows)`. Remove the comment prefix, for example, `@REM`. Also remove the statement value placeholder, for example, `[myPatchClasspath]` (windows). Immediately after the equal sign (`=`), insert the IBM TRIRIGA class path that was copied from the **Start WebLogic** text section earlier.
   c. Find `set WLS_MEM_ARGS` and adjust the values for `-Xms` and `-Xmx` to be appropriate for your implementation.
   d. Find `set MEM_MAX_PERM_SIZE` and adjust the value for `-XX:MaxPermSize to be appropriate for your implementation.
   e. Find `set JAVA_DEBUG=`. Immediately after both places where `%enableHotswapFlag%` is displayed, specify the following text:
   
   ```
   -Doracle.jdbc.maxCachedBufferSize=18
   ```
   
   f. To set the logging output to the appropriate location, find the line: if NOT "%LOG4J_CONFIG_FILE%=="". Directly before that line, set the `LOG4j_CONFIG_FILE` property to point at the `log4j.xml` file in the IBM TRIRIGA installation config directory. For example:
   
   ```
   set LOG4J_CONFIG_FILE=C:\Tririga\config\log4j.xml
   if NOT "%LOG4J_CONFIG_FILE%==""
   set JAVA_PROPERTIES=%JAVA_PROPERTIES%
   -Dlog4j.configuration=file:%LOG4J_CONFIG_FILE%
   ```
   
   g. Find `JAVA_OPTIONS`. Add `-DUseSunHttpHandler=true` to the list of existing options. For example,
   
   ```
   set JAVA_OPTIONS=%JAVA_OPTIONS%
   -DUseSunHttpHandler=true
   ```
   
   h. Save your changes to `setDomainEnv.cmd`.

8. If you are using UNIX, adjust the following properties:
   a. Edit `setDomainEnv.sh`.
   b. Find the occurrence of `set PATCH_CLASSPATH=`. This statement is likely commented out, for example, `# PATCH_CLASSPATH=[myPatchClasspath] (unix)`. Remove the comment prefix, for example, `#`. Also remove the statement value placeholder, for example, `[myPatchClasspath]` (unix).
Immediately after the equal sign (=), insert the IBM TRIRIGA class path that was copied from the **Start WebLogic** text section earlier within double quotes.

c. Find **WLS_MEM_ARGS** and adjust the values for -Xms and -Xmx to be appropriate for your implementation.

d. Find **MEM_MAX_PERM_SIZE** and adjust the value for -XX:MaxPermSize to be appropriate for your implementation.

e. Find **JAVA_DEBUG**. Immediately after both places where enableHotswapFlag is displayed, specify the following text:

```
-Doracle.jdbc.maxCachedBufferSize=18
```

f. To set the logging output to the appropriate location, find the line: if [ "${LOG4J_CONFIG_FILE}" != "" ]; then. Directly before that line, set the **LOG4J_CONFIG_FILE** property to point at the log4j.xml file in the IBM TRIRIGA installation config directory. For example:

```
export LOG4J_CONFIG_FILE="/usr/local/tririga/config/log4j.xml"
if [ "${LOG4J_CONFIG_FILE}" != "" ]; then
  JAVA_PROPERTIES="${JAVA_PROPERTIES}
  -Dlog4j.configuration=file:${LOG4J_CONFIG_FILE}"
export JAVA_PROPERTIES
```

g. Find **JAVA_OPTIONS**. Add -DUseSunHttpHandler=true to the list of existing options. Additionally, if your UNIX environment is running X-Windows, add -Djava.awt.headless=true to the list of existing options. For example,

```
JAVA_OPTIONS="${JAVA_OPTIONS}
-DUseSunHttpHandler=true -Djava.awt.headless=true"
```

h. Save your changes to setDomainEnv.sh.

9. Run the setDomainEnv file.

10. Start the WebLogic Server.

11. Return to the IBM TRIRIGA installer and click **Next**.

12. Click **Next**. The database configuration process can take a long time because the database must allocate space, create the users, and load the default schema data.

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.

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

14. Copy your license files into the `tririga_root\config\licenses` 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.

15. Start IBM TRIRIGA by locating the WebLogic Server directory with the appropriate method:

   - On Windows servers, from the Start menu, select **Projects > DOMAIN_NAME > Start Admin Server for WebLogic Server Domain**.
   - On UNIX servers, run `WEBLOGIC_HOME/user_projects/domains/USER_PROJECT_NAME/startWebLogic.sh`. 
What to do next

If the installation failed, see the topic about validating the deployment on WebLogic Server and IBM DB2.

Verify that your installation is running properly.

Related concepts:
“Create and configure a DB2 database for TRIRIGA” on page 18

To configure TRIRIGA with DB2 version 10.5, 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.

Validating the IBM TRIRIGA Application Platform deployment on WebLogic and IBM DB2

If the IBM TRIRIGA Application Platform installation failed, it is still possible to run IBM TRIRIGA on Oracle WebLogic Server and IBM DB2 by validating the data sources and deployment.

Procedure

1. Verify the WebLogic Server configuration. Read the ant.log file in the root installation directory. If the last messages in the log discuss the WebLogic Server setup, then the setup must be completed manually.
2. Log in to the WebLogic Server administration console.
3. Verify that the IBM TRIRIGA Java Database Connectivity (JDBC) data sources are created. In the Domain Structure section, select Services > Data Sources.
4. In the main panel, verify that at least one data source with a Java Naming and Directory Interface (JNDI) name of jdbc/local/DataSource-TRIRIGA-data exists.
   a. If the data source exists, continue to verify that the installation is correct.
   b. If the data source does not exist, continue to create the data source.
5. In the main panel, click New and specify the following data source information:
   a. For the name, specify DataSource-TRIRIGA-data.
   b. For the JNDI name, specify jdbc/local/DataSource-TRIRIGA-data.
   c. For the database type, select DB2, and click Next.
   d. For the database driver, select IBM’s DB2 Driver (Type 4) for JDBC and SQLJ; Versions:8.X and later.
   e. Click Next on each screen to move to the next screen.
6. For the database server, specify the database name, host name, database user name, and password.
7. Specify the following database information:
   a. For the URL, specify jdbc:db2:DatabaseServer:50000/DatabaseName where DatabaseServer is the host name or IP of your database server, 50000 is the port number of the IBM DB2, and DatabaseName is the name of the database.
   b. For the driver class name, specify com.ibm.db2.jcc.DB2Driver.
   c. For the properties, do not change the default value that contains user=schemaname such as user=tridata.
   d. For the password, specify and confirm the password for your TRIDATA schema.
e. For the test table name, do not change the default value.

f. For the database user name, specify the user name of your TRIDATA schema.

8. Click **Test Configuration**.

9. Select the check box for the server name of the IBM TRIRIGA deployment and click **Finish**.

10. Validate the IBM TRIRIGA data source. In the Domain Structure section, select **Services > JDBC > Data Sources**.

11. In the main panel, select **DataSource-TRIRIGA-data**.

12. Select the **Configuration** tab, and select the **General** tab. Verify that the JNDI name is `jdbc/local/DataSource-TRIRIGA-data`. The JNDI name is case-sensitive.

13. Select the **Connection Pool** tab. Verify that the URL, driver class name, and properties are correct. Change the maximum capacity to 100. You might be required to increase the maximum capacity as you add more users to the implementation. Click **Save**.

14. Select the **Targets** tab. Select the check box for the server that ties the data source to the server.

15. Validate the IBM TRIRIGA deployment. In the Domain Structure section, select **Deployments**. In the main panel, verify that the `tririga-ibs` application is deployed.

16. If the application is deployed, select `tririga-ibs` in the Deployments section.

17. If the application is not deployed:

   a. Select **Install**.

   b. For the path, select the IBM TRIRIGA installation directory, and select the `tririga-ibs.ear` file. Click **Next** on each screen to move to the next screen.

   c. Select **Install this deployment as an application**.

   d. Click **Finish**.

18. Review the settings for the `tririga-ibs` application.

   a. Optional: Restart the WebLogic Server to verify that everything is synchronized and in place for production.

**What to do next**

Verify that your installation is running properly.

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**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](https://tririga.english.Title) for the latest information about deploying IBM TRIRIGA on IBM WebSphere Application Server.
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:

• Optionally 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.
• Running the IBM TRIRIGA installation.
• Manually configuring WebSphere Application Server properties if the installer process fails to deploy the IBM TRIRIGA application.

Timeout property in WebSphere

The IBM TRIRIGA installation with the WebSphere Application Server might fail if the `com.ibm.SOAP.requestTimeout` property value is not increased. The property can be found in the `soap.client.props` file of the WebSphere Application Server properties directory. For example, in UNIX, the location might look like:

```
/usr/IBM/WebSphere/AppServer/profiles/AppSrv01/properties/soap.client.props
```

Setting the property value to 0 sets the timeout to unlimited.

```plaintext
com.ibm.SOAP.requestTimeout=0
```

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.

What to do next

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

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 licenses for both the application and the application platform.
   b. For the installation set, select **Complete IBM TRIRIGA Application Platform**.
   c. For the installation type, select **New Installation**.

2. Select the data file to install and click **Choose**.

3. For the application server, select **WebSphere**. 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.
   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 minimum and maximum Java memory setting values in megabytes.
   e. Specify the server host name.
   f. Optional: Select production mode. This selection sets the value of the `ProductionMode` property in the `TRIRIGAWEB.properties` file.

4. 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. For example, if your database administrator pre-created the table space and schema, 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 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_INDEX` 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 minimum and maximum 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.

5. 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 web server.
   c. Review the pre-installation summary and click Install.

6. Click Next. The database configuration process can take a long time because the database must allocate space, create the users, and load the default schema data.
   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.

7. When the installation is complete, click Done.

8. Copy your license files into the `tririga_root\config\licenses` 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.

9. 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 licenses for both the application and the application platform.
   b. For the installation set, select Complete IBM TRIRIGA Application Platform.
   c. For the installation type, select New Installation.
2. Select the data file to install and click Choose.
3. For the application server, select WebSphere. 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.
   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 minimum and maximum Java memory setting values in megabytes.
   e. Specify the server host name.
   f. Optional: Select production mode. This selection sets the value of the ProductionMode property in the TRIRIGAWEB.properties file.
4. 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. Follow the instructions for downloading the Java Device Test Suite (JDTS) driver. Specify the path to the jtds-1.2.8.jar file.
   b. 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. For example, if your database administrator pre-created the table space and schema, clear the first option. When you create the database, you must load data using the installation program.
   c. 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.
d. 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.

e. Optional: Select the option to configure your database for multibyte language support. If you do not configure the database for multibyte language support, you can select this option during a future upgrade. However, if you anticipate supporting multibyte languages in the future, you should configure the database for multibyte language support now.

f. Optional: Choose a collation for the Microsoft SQL Server database. This screen is displayed if you chose to configure your database for multibyte language support.

g. 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.

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

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

j. Specify the minimum and maximum 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.

5. 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 web server.


c. Review the pre-installation summary and click **Install**.

6. Click **Next**. The database configuration process can take a long time because the database must allocate space, create the users, and load the default schema data.

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.

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

8. Copy your license files into the `tririga_root\config\licenses` 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.

9. 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`. 

Chapter 4. Installing the platform
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 licenses for both the application and the application platform.
   b. For the installation set, select Complete IBM TRIRIGA Application Platform.
   c. For the installation type, select New Installation.
2. Select the data file to install and click Choose.
3. For the application server, select WebSphere. 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.
   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 minimum and maximum Java memory setting values in megabytes.
   e. Specify the server host name.
   f. Optional: Select production mode. This selection sets the value of the ProductionMode property in the TRIRIGAWEB.properties file.
4. 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 and schema, 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. Optional: Specify the database administrator user name and password. If the database is running on Linux or UNIX, specify the instance user. If the database is running on Windows, specify the database administrator user, for example db2admin. This screen is displayed if you chose to create the table spaces. 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 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.

h. Specify the minimum and maximum 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.

5. 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 (or web) server.
   c. Review the pre-installation summary and click Install.

6. Click Next. The database configuration process can take a long time because the database must allocate space, create the users, and load the default schema data.
   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.

7. When the installation is complete, click Done.

8. Copy your license files into the tririga_root\config\licenses 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.
9. 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” on page 18

To configure TRIRIGA with DB2 version 10.5, 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 JBoss, 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 set, select IBM TRIRIGA Application Platform.
   b. For the installation type, select New Installation.
   c. 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. The database configuration process can take a long time because the database must allocate space, create the users, and load the default schema data.
   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
      The database import process can take a long time.
   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 set, select Database Only.
   b. For the installation type, select Platform Upgrade.
   c. 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.

---

**Configuring IBM TRIRIGA Application Platform with Brava**

Although the IBM TRIRIGA Application Platform installation does not provide the Brava! Enterprise Viewer for IBM TRIRIGA, the platform can integrate with Brava for multi-format document viewing and markup within the IBM TRIRIGA Document Manager. This integration involves the application server where the Brava client is installed, and the tools server where the Brava server is installed.

**Overview of Brava installation**

Before you begin the installation of the Brava! Enterprise Viewer for IBM TRIRIGA, you can avoid issues by becoming familiar with its administration guide. The most relevant sections of the administration guide contain information about setting up the queue server and publishing Microsoft Office documents.

**Administration guide**

The *Brava Enterprise 5.5j Administration Guide* contains several sections that are relevant to an IBM TRIRIGA installation that integrates with Brava!:

- Section 1.3.3 describes how to configure the Brava queue server.
- Section 3.3.5 describes how to publish files in other applications such as IBM TRIRIGA, including the steps to publish Microsoft Word documents.
- Section 4.2.2 describes how to troubleshoot the known issues of using Brava when you view or publish Microsoft Word documents.
- Brava can be installed correctly with direct console or virtual network computing (VNC) access only. It cannot be installed correctly with Microsoft Windows terminal services. Follow the installation instructions in the *Brava Enterprise 5.5j Administration Guide*.

**Java job processor**

You might decide to install Brava to view documents that are created in Microsoft Office or Adobe Acrobat. However, if your users do not have the corresponding software products on their local computers, they cannot view the documents. In this case, you can install Brava Java Job Processor (formerly Brava Net-It Enterprise) with the corresponding software products on the Brava server.

**Resource directory**

The Brava resource folder is the IGC folder that contains the SupportFiles directory and brava.css file. On Windows, a typical location is C:\IGC.
### 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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
</table>
| 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". |
| 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]/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. |
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
</table>
| Creating users and records  | As the system user, create and verify an IBM TRIRIGA employee who is not an administrator as follows:  
  - Assign the user to several user groups, but not all of them.  
  - Assign the user with several user licenses, but not all of them.  
  - Sign in as the user that you created.  
  - Verify that the user can access everything that the employee is meant to access, according to the assigned groups and licenses.  
  - Verify that the user can create and revise records, such as people records and location records.  
  - Verify that the association tree loads in the Associations tab of an opened record. |
| 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. |
| 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, .html, 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. |
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
</table>
| 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. |
| Inspecting the properties file | If you installed the IBM TRIRIGA Application Platform in a performance or production environment, open the TRIRIGAWEB.properties file to verify that the **ProductionMode** property is set to the value of Y (yes) instead of the default value of N (no). This file is in the config directory of the IBM TRIRIGA installation. For example, on Windows, C:\Tririga\config is the typical location. |
Chapter 5. 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.

TRIRIGACONVERSION.properties

To adjust the IBM TRIRIGA conversion and validator properties, open the TRIRIGACONVERSION.properties file.

Conversion properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MoveTableThrdCount</td>
<td>[Number]</td>
<td>The number of threads to move data.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, 15.</td>
</tr>
<tr>
<td>PopulateAllDataThrdCount</td>
<td>[Number]</td>
<td>The number of threads to populate all data.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, 20.</td>
</tr>
<tr>
<td>PopulateContainerDataThrdCount</td>
<td>[Number]</td>
<td>The number of threads to populate container data.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, 10.</td>
</tr>
<tr>
<td>PopulateSmartSectionsThrdCount</td>
<td>[Number]</td>
<td>The number of threads to populate smart sections.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, 10.</td>
</tr>
</tbody>
</table>
### CreateUnlinkedObjects

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThrdCount</td>
<td>[Number]</td>
<td>The number of threads to create unlinked objects. For example, 10.</td>
</tr>
</tbody>
</table>

### Validator properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VALIDATOR_DATA_PERCENTAGE</td>
<td>[Number]</td>
<td>The validator data comparison percentage. For example, 10.</td>
</tr>
</tbody>
</table>

**TRIRIGAMIDDLEWARE.properties**

To adjust the IBM TRIRIGA middleware properties, open the TRIRIGAMIDDLEWARE.properties file.

### Middleware properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATABASE_TYPE</td>
<td>oracle, mssql</td>
<td>The type of database, either Oracle Database or Microsoft SQL Server.</td>
</tr>
<tr>
<td>DATA_DATA_TABLESPACE</td>
<td>[String]</td>
<td>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.</td>
</tr>
<tr>
<td>DATA_INDEX_TABLESPACE</td>
<td>[String]</td>
<td>The name of the index table space that is used to create tables in the data schema. For example, a typical value is TRIDATA_INDEX.</td>
</tr>
<tr>
<td>J2EE_SERVER</td>
<td>JBOSS, WEBLOGIC, WEBSPHERE</td>
<td>The Java 2 Platform, Enterprise Edition (J2EE) environment that is being used.</td>
</tr>
<tr>
<td>ORACLE_FETCH_SIZE</td>
<td>[Number]</td>
<td>The Oracle Database Java Database Connectivity (JDBC) fetch size (for JBoss Application Server and WebSphere Application Server). This value is the number of rows that the JDBC driver pre-fetches from the database before the IBM TRIRIGA application requests a row. The Oracle Database driver default is to fetch 10 rows at a time. To prevent the application server from explicitly setting the fetch size on every connection, set the value to 10.</td>
</tr>
<tr>
<td>Property</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| TraceLevelData  | 0, 1, 2, 4, 8, 12 | The Oracle Database trace level for each data connection pool. The following values and their trace levels are available:  
  • 0: No statistics.  
  • 1: Basic statistics CURSOR, PARSE, EXEC, FETCH ERROR, SORT UMAP, ERROR, UMAP, STATS, and XCTEND. This value is the same as setting sql_trace=true.  
  • 2: Same as level 1.  
  • 4: Same as level 1 plus BIND section.  
  • 8: Same as level 1 plus WAIT events.  
  • 12: Same as level 1 plus BINDs and WAITs. |

**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.

**File system settings**

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FileSystemRoot</td>
<td>[Valid path]</td>
<td>The path to the userfiles directory.</td>
</tr>
<tr>
<td>FilesystemBrowseRoot</td>
<td>[Valid path]</td>
<td>The path to the userfiles directory.</td>
</tr>
<tr>
<td>BatchInputLoc</td>
<td>[Valid path]</td>
<td>The path to the directory where the batch upload data files are stored.</td>
</tr>
<tr>
<td>BatchProcessLoc</td>
<td>[Valid path]</td>
<td>The path to the directory where the batch upload data files are processed.</td>
</tr>
<tr>
<td>BatchOutputLoc</td>
<td>[Valid path]</td>
<td>The path to the directory where the batch upload data process writes to the output log.</td>
</tr>
<tr>
<td>BatchErrorLoc</td>
<td>[Valid path]</td>
<td>The path to the directory where the batch upload data process writes to the error log.</td>
</tr>
<tr>
<td>BatchLogLoc</td>
<td>[Valid path]</td>
<td>The path to the directory where the batch upload data process writes to the running log.</td>
</tr>
<tr>
<td>ServerRoot</td>
<td>[Valid path]</td>
<td>The path to the parent directory of the userfiles directory.</td>
</tr>
</tbody>
</table>
### External server settings

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
</table>
| **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] | The path on the network 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. |

### Brava server settings

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
</table>
| **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,rvg,rpt,zip,exe,doc,xls,ppt,pdf,txt,xml |
| **FRONT_END_SERVER** | [Host name] | Front end Web server. |
### Agent settings

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGENTS_NOT_ALLOWED</td>
<td>[String]</td>
<td>A comma-delimited list of agents that are not allowed to run on this server.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A blank value allows any agent to be started on this server but does not start any agent automatically.</td>
</tr>
<tr>
<td>INSTANCE_ID</td>
<td>[Number]</td>
<td>Overrides the default computer ID.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leave this value blank if you are running a single instance per physical computer.</td>
</tr>
<tr>
<td>INSTANCE_NAME</td>
<td>[String]</td>
<td>Overrides the default computer name.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leave this value blank if you are running a single instance per physical computer.</td>
</tr>
<tr>
<td>ReportQueueAgentLoad</td>
<td>[Number]</td>
<td>The number of threads in proportion to the number of connections.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, 100.0.</td>
</tr>
<tr>
<td>ReportQueueAgentMax</td>
<td>[Number]</td>
<td>The maximum number of threads.</td>
</tr>
<tr>
<td>Threads</td>
<td></td>
<td>If there is no upper limit, set to 0.</td>
</tr>
<tr>
<td>DataImportAgentLoad</td>
<td>[Number]</td>
<td>The number of threads in proportion to the number of connections.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, 100.0.</td>
</tr>
<tr>
<td>DataImportAgentMax</td>
<td>[Number]</td>
<td>The maximum number of threads.</td>
</tr>
<tr>
<td>Threads</td>
<td></td>
<td>If there is no upper limit, set to 0.</td>
</tr>
<tr>
<td>SchedulerAgentLoad</td>
<td>[Number]</td>
<td>The number of threads in proportion to the number of connections.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, 100.0.</td>
</tr>
<tr>
<td>SchedulerAgentMax</td>
<td>[Number]</td>
<td>The maximum number of threads.</td>
</tr>
<tr>
<td>Threads</td>
<td></td>
<td>If there is no upper limit, set to 0.</td>
</tr>
<tr>
<td>Property</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>WFAgentLoad</td>
<td>[Number]</td>
<td>The number of threads in proportion to the number of connections. For example, 100.0.</td>
</tr>
<tr>
<td>WFAgentMaxThreads</td>
<td>[Number]</td>
<td>The maximum number of threads. If there is no upper limit, set to 0.</td>
</tr>
<tr>
<td>WF_AGENT_MAX_ACTIVE_PER_USER</td>
<td>[Number]</td>
<td>The thread limit per user on active workflows. Set this property to a low number to prevent one user from reaching the environment maximum.</td>
</tr>
<tr>
<td>WF_NOTIFICATION_EMAIL_ID</td>
<td>[Valid email address]</td>
<td>The sent-from email address on outgoing workflow notifications. For example, <a href="mailto:wf.notifications@us.ibm.com">wf.notifications@us.ibm.com</a></td>
</tr>
</tbody>
</table>
## WF_INSTANCE_SAVE

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
</table>
| WF_INSTANCE_SAVE | PER_WORKFLOW_PRODUCTION, PER_WORKFLOW_ALWAYS, ALWAYS, ERRORS_ONLY | Configures when workflow instances are saved. The property includes the following values:  
  - **PER_WORKFLOW_PRODUCTION**: If the environment is in production mode, save the instance if the workflow is configured to save. In non-production mode, always save instances.  
  - **PER_WORKFLOW_ALWAYS**: Save the instance if the workflow is configured to save, regardless of production or non-production mode.  
  - **ALWAYS**: Always save instances.  
  - **ERRORS_ONLY**: Save instances only when an error occurs (default). Select this value for the normal operation of production environments. |

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:

- **Never**. Corresponds to the NEVER value.
- **As configured in the workflow**. Corresponds to the PER_WORKFLOW_ALWAYS value.
- **As configured in the workflow (in production mode)**. Corresponds to the PER_WORKFLOW_PRODUCTION value.
- **Always**. Corresponds to the ALWAYS value.

There is also an option to restore 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.
<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>USE_WF_BINARY_LOAD</td>
<td>N, Y</td>
<td>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.</td>
</tr>
</tbody>
</table>
| 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 JBoss Application Server on SERVER123, this property must be set to SERVER123:8001. |
<p>| CLEAN_HOUR                           | [Whole number from 0 to 23] | The hour at which the Cleanup Agent starts, in 24-hour time. The default value is 2.                                                                                                                          |
| 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 10.                                                        |
| 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).                                                                          |</p>
<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WF_AGENT_WAITTIME</td>
<td>[Number]</td>
<td>The number of milliseconds that the Workflow Agent waits before it checks for more free threads. This property is not the same as workflow sleep time. The minimum value is 100.</td>
</tr>
<tr>
<td>WF_FUTURE_AGENT_SLEEPTIME</td>
<td>[Number]</td>
<td>The number of seconds that the Workflow Future Agent waits before it checks whether more items must be processed. The default value is 5.</td>
</tr>
<tr>
<td>REPORTDATA_AGENT_SLEEPTIME</td>
<td>[Number]</td>
<td>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.</td>
</tr>
<tr>
<td>REPORTDATA_AGENT_RECORD_COUNT</td>
<td>[Number]</td>
<td>The number of records in a report before the Report Data Index Agent reindexes the report. The default value is 500.</td>
</tr>
<tr>
<td>DATACONNECT_SLEEP_TIME</td>
<td>[Number]</td>
<td>The number of minutes that the DataConnect Agent waits before it checks whether more items must be processed. The default value is 10.</td>
</tr>
<tr>
<td>SHOW_ZEROS_IN_NUMBER_FIELDS</td>
<td>N, Y</td>
<td>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. When set to Y, the fields are filled with 0 or .00.</td>
</tr>
</tbody>
</table>

### System settings

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProductionMode</td>
<td>N, Y</td>
<td>If set to Y, the application servers and process servers cache data from the database into memory. The property can be set during the installation when the installer prompts you for a series of application server settings. The default value is N.</td>
</tr>
<tr>
<td>ServerEnvironment</td>
<td>[Host name]</td>
<td>The server environment that is used for integration with computer-aided design (CAD) software products.</td>
</tr>
<tr>
<td>Property</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>BaseCurrency</td>
<td>[Valid currency]</td>
<td>The base currency for currency conversions. 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. 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.</td>
</tr>
<tr>
<td>CancelLabel</td>
<td>[String]</td>
<td>The label that replaces the Cancel action on all form wizards. A blank value hides the Cancel action. The default value is x.</td>
</tr>
<tr>
<td>CONTEXT_PATH</td>
<td>[Path]</td>
<td>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 /.</td>
</tr>
<tr>
<td>SecurityScopeCacheTime</td>
<td>[Number]</td>
<td>The frequency at which the Security Scope Cache is refreshed in minutes. The default value is 20.</td>
</tr>
<tr>
<td>DataRefreshTime</td>
<td>[Number]</td>
<td>The frequency at which the portal data is refreshed in minutes. The default value is 5.</td>
</tr>
<tr>
<td>SSO</td>
<td>N, Y</td>
<td>If set to Y, the environment runs in Single Sign-On (SSO) mode. The default value is N.</td>
</tr>
<tr>
<td>SSO_BACKING_SERVER_PORT</td>
<td>[Number]</td>
<td>The port number used by the backend server. This property must be set when SSO is enabled if the SSO server port does not match the backend server port. The default value is -1. If -1 or any other negative value is set for this property, then the port number set for the front end server is also set as the backend server port.</td>
</tr>
<tr>
<td>SSO REMOTE_USER</td>
<td>N, Y</td>
<td>If set to Y, the environment trusts that a directory service through a web server has authenticated the user. The method request.getRemoteUser() is used to sign in. The user name must exactly match the user name that is created in IBM TRIRIGA. Set the value to N when the value of the SSO_USER_PRINCIPAL property is Y. The default value is Y.</td>
</tr>
<tr>
<td>Property</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>SSO_USER_PRINCIPAL</td>
<td>N, Y</td>
<td>If set to Y, the environment uses the HTTP header parameter <code>UserPrincipal</code>.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When the value is Y, set the value of the SSOREMOTE_USER property to N.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default value is N.</td>
</tr>
<tr>
<td>SSO_REMOVE_DOMAIN_NAME</td>
<td>N, Y</td>
<td>If set to Y, the environment removes the domain name from the active directory user name that is passed through the SSO_REMOTE_USER property.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default value is Y.</td>
</tr>
<tr>
<td>SSO_REQUEST_ATTRIBUTE_NAME</td>
<td>sm_user, [user name]</td>
<td>The name of the property that the SSO environment inserts into the HTTP header whose value is the IBM TRIRIGA user name.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default value is sm_user, indicating use with CA SiteMinder.</td>
</tr>
<tr>
<td>USERNAME_CASE_SENSITIVE</td>
<td>N, Y</td>
<td>If set to Y, the environment treats sign-in user names as case sensitive.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If you want to authenticate without case sensitivity, set this property to N.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default value is Y.</td>
</tr>
<tr>
<td>ALTERNATE_RESOURCE_DIRECTORY</td>
<td>[Path]</td>
<td>The path to the alternative sign-in page resource directory.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, <code>C:\Tririga\userfiles\alt</code>.</td>
</tr>
<tr>
<td>ALTERNATE_INDEX_HTML</td>
<td>[File name]</td>
<td>The file name of the alternative sign-in page.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, <code>index.html</code></td>
</tr>
<tr>
<td>DocMgmtApplet</td>
<td>N, Y</td>
<td>If set to Y, the Document Management MultiFile applet is on.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default value is Y.</td>
</tr>
<tr>
<td>DocumentWorkflowTraversal</td>
<td>N, Y</td>
<td>If set to Y, document permissions are handled with a custom workflow.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default value is N.</td>
</tr>
<tr>
<td>3ptMajor</td>
<td>[Number]</td>
<td>Sets the minimum requirement for the JRE for applications that are JRE-dependent, such as Brava and the Document Management MultiFile Applet.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This value represents the major version of Java. For example, the '1' in 1.6.0.</td>
</tr>
<tr>
<td>3ptMinor</td>
<td>[Number]</td>
<td>Sets the minimum requirement for the JRE for applications that are JRE-dependent, such as Brava and the Document Management MultiFile Applet.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This value represents the minor version of Java. For example, the '6' in 1.6.0.</td>
</tr>
<tr>
<td>Property</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 3ptVersion          | [Number]   | Sets the minimum requirement for the JRE for applications that are JRE-dependent, such as Brava and the Document Management MultiFile Applet.  
                      |            | This value represents the subminor version of Java. For example, the "0" in 1.6.0.                                                        |
| classId             | [String]   | Sets the minimum requirement for the JRE for applications that are JRE-dependent, such as Brava and the Document Management MultiFile Applet.  
                      |            | Set up the Java plug-in to use the appropriate class ID, which determines how to handle a client if the plug-in is not found.             
                      |            | Security for Java applets no longer allows specifying a specific version. Doing so results in an error. Use the following class ID for any JRE in the 1.6 family:  
                      |            | CAFEEDAC-0016-0000-FFFF-ABCDEFFEDCBA  
<pre><code>                  |            | If clients are not using the 1.6 family, this value can be changed to specify a 1.5 or 1.4 family.                                     |
</code></pre>
<p>| 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.                                                                                                                      |
| PORTAL_CLOSE_LOGOUT | N, Y       | If set to Y, the user is logged out when the portal window closes.                                                                               |
|                     |            | 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_HEADER_COLUMN| Name, Title| Set this property to show the name or title of the report.                                                                                     |
|                     |            | The default value is Title.                                                                                                                  |</p>
<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>REPORT_MEMORY_USAGE_LIMIT</td>
<td>[Whole number from 0 to 100], [Blank]</td>
<td>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 &quot;There are not enough resources available to run the report&quot;, 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 35.</td>
</tr>
<tr>
<td>MOD_NAME_ON_WIZARD</td>
<td>N, Y</td>
<td>If set to Y, the module name shows in the title bar of a record wizard. The default value is N.</td>
</tr>
<tr>
<td>PORTAL_MY_TIMESHEET</td>
<td>N, Y</td>
<td>If set to Y, the My Timesheet link displays wherever the My Timesheet link can be displayed. The default value is N.</td>
</tr>
<tr>
<td>ANALYZE_META_DATA_TABLES</td>
<td>N, Y</td>
<td>If set to Y, metadata tables are analyzed during the flat data conversion process. The default value is Y.</td>
</tr>
<tr>
<td>RUNVALIDATOR</td>
<td>no, yes</td>
<td>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.</td>
</tr>
<tr>
<td>Reserve</td>
<td>N, Y</td>
<td>If set to Y, the IBM TRIRIGA Workplace Reservation Manager application is enabled. The default value is N.</td>
</tr>
<tr>
<td>EXCHANGE_ROOT_PATH</td>
<td>[String]</td>
<td>Sets the Microsoft Exchange server path for IBM TRIRIGA Workplace Reservation Manager appointments. The default value is exchange.</td>
</tr>
<tr>
<td>EXTERNAL_MAIL_SERVER_USERNAME</td>
<td>[String]</td>
<td>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.</td>
</tr>
<tr>
<td>Property</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>EXTERNAL_MAIL_SERVER_PASSWORD</strong></td>
<td>[String]</td>
<td>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.</td>
</tr>
<tr>
<td><strong>TRIRIGA_RESERVE_SUB_DOMAIN</strong></td>
<td>[String]</td>
<td>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</td>
</tr>
<tr>
<td><strong>EXCHANGE_DOMAIN</strong></td>
<td>[String]</td>
<td>The IBM TRIRIGA domain for the Microsoft Exchange server. For example, tririga.com</td>
</tr>
</tbody>
</table>
| **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/` |
<p>| <strong>TRIRIGA_RESERVE_OUTLOOK_TAB_LABEL</strong>     | [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 |
| <strong>SMTP_CLIENT_TIMEOUT</strong>                   | [Number]   | The timeout of the SMTP endpoint in minutes. For example, 10. |
| <strong>SMTP_KEEP_EMAIL</strong>                       | 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. In a production environment, the value must be N. |</p>
<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMTP_PORT</td>
<td>[Number]</td>
<td>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.</td>
</tr>
<tr>
<td>FLASH_TIMEOUT_TIME</td>
<td>[Number]</td>
<td>Sets the timeout time in seconds for flash graphs. If flash graphs display the message “Error: Data could not be loaded” for slow running queries, increase this value. The higher value configures the platform to wait longer to load the graphs. The default value is 300.</td>
</tr>
<tr>
<td>CUSTOM_ERROR_PAGE</td>
<td>N, Y</td>
<td>If set to Y, enables your custom error page. If set to N, a default error page is used. The default value is N.</td>
</tr>
<tr>
<td>CUSTOM_ERROR_PAGE_PATH</td>
<td>[Path]</td>
<td>The path of the custom error page.</td>
</tr>
<tr>
<td>EXCLUDE_CHARACTERS</td>
<td>[String]</td>
<td>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, &lt; &gt; &amp;</td>
</tr>
<tr>
<td>ALLOWED_CHARACTERS</td>
<td>[String]</td>
<td>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 <code>\?</code>. For example, <code>\? &amp; </code>```</td>
</tr>
<tr>
<td>ENFORCE_CHARACTER_RESTRICTIONS_FOR_RECORDS</td>
<td>N, Y</td>
<td>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.</td>
</tr>
<tr>
<td>TABLE_SIZE_CHECK_FOR_ORACLE</td>
<td>N, Y</td>
<td>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.</td>
</tr>
<tr>
<td>ErrorHandlerStrategy.MessageResetMinutes</td>
<td>[Number]</td>
<td>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.</td>
</tr>
<tr>
<td>Property</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>SYSTEM_DEFAULT_TIMEZONE</td>
<td>[String]</td>
<td>Time zone that is used if the <strong>Time Zone</strong> field in the record is blank and the user ID is not available, such as application notifications. The default value is America/Los_Angeles.</td>
</tr>
<tr>
<td>SHOW_MY_PROFILE_LINK</td>
<td>N, Y</td>
<td>If set to Y, the <strong>My Profile</strong> link is displayed. The default value is Y.</td>
</tr>
<tr>
<td>SHOW_PREFERENCES_LINK</td>
<td>N, Y</td>
<td>If set to Y, the &quot;Welcome, [name]&quot; 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.</td>
</tr>
<tr>
<td>USE_PROJECT_SECURITY</td>
<td>N, Y</td>
<td>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.</td>
</tr>
<tr>
<td>ENFORCE_GUI_LEVEL_QUERY_SECURITY</td>
<td>N, Y</td>
<td>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.</td>
</tr>
<tr>
<td>ENFORCE_REPORT_ACCESS_SECURITY</td>
<td>N, Y</td>
<td>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.</td>
</tr>
<tr>
<td>USE_AUTO_COMPLETE_IN_LOCATOR_FIELD</td>
<td>N, Y</td>
<td>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.</td>
</tr>
<tr>
<td>Property</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>--------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>USE_AUTO_COMPLETE_IN_SMART_SECTION</td>
<td>N, Y</td>
<td>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.</td>
</tr>
<tr>
<td>AUTO_COMPLETE_MIN_CHAR</td>
<td>[Number]</td>
<td>The minimum number of characters a user must type to trigger autocomplete. The default value is 3.</td>
</tr>
<tr>
<td>DRAWING_REPROCESSING_AS_NEEDED</td>
<td>N, Y</td>
<td>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.</td>
</tr>
<tr>
<td>GRAPHICS_SECTION_LOGGING_LEVEL</td>
<td>ERROR, INFO, WARN</td>
<td>Sets the client-side logging level for graphics sections. The default value is ERROR.</td>
</tr>
<tr>
<td>PDF_EXPORT_GRAPHIC_STROKE_WIDTH_OVERRIDE</td>
<td>[Blank]</td>
<td>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.</td>
</tr>
<tr>
<td>ALLOW_PASSWORD_AUTO_COMPLETE</td>
<td>N, Y</td>
<td>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.</td>
</tr>
<tr>
<td>OSLC_MYPROFILE_Resource</td>
<td>[Profile Name]</td>
<td>The ID of the OSLC resource that represents the My Profile business object. The default value is triMyProfileRS.</td>
</tr>
<tr>
<td>OSLC_BASE_URI</td>
<td><a href="http://hostname:port/oslc">http://hostname:port/oslc</a></td>
<td>Use this property to define the base URI for OSLC.</td>
</tr>
</tbody>
</table>
### Properties for SVG rendering

A Scalable Vector Graphics (SVG) viewer is required to view SVG content in IBM TRIRIGA. Adobe support for its SVG Viewer plug-in ended January 1, 2009. IBM TRIRIGA provides and supports the IBM TRIRIGA SVG Viewer Applet. No installation is required to use the IBM TRIRIGA SVG Viewer Applet. To change to the IBM TRIRIGA SVG Viewer Applet, follow these steps:

- Set the `SVG_VIEW_TYPE` property to `APPLET`.
- Clear the server browser cache and close all browser windows.
- Clear the browser cache and close all browser windows on all client computers.
- Use a new browser instance for the first time that all client computers sign in to IBM TRIRIGA.

When you change from the Adobe viewer to the IBM TRIRIGA SVG Viewer Applet:

- Republish existing drawings that are published from IBM TRIRIGA CAD Integrator/Publisher. Republished drawings are compatible with the Adobe SVG Viewer plug-in.
- Ensure that all client computers have the Java Runtime Environment (JRE) that is specified in the *IBM TRIRIGA Application Platform Compatibility Matrix*. According to the Microsoft web page *Information for Developers about Internet Explorer* (at http://msdn.microsoft.com/en-us/ie/bb969055.aspx): As of April 2008, the activation behavior is permanently removed for all customers as part of the April 2008 Internet Explorer Cumulative Update (947864). This Internet Explorer (IE) cumulative update replaces the IE ACA previews released in December 2007 and February 2008.
- Configure client computers to use the ‘Next-generation Java plug-in’.

Use the `SVG_VIEW_TYPE` property (that is defined in the following table) to specify your company SVG viewer preference. The default is to use the Adobe SVG Viewer plug-in.

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>OSLC_TRANSACTION_RETENTION_DAYS</code></td>
<td>[Days]</td>
<td>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.</td>
</tr>
<tr>
<td><code>MASTER_DETAIL_RECORD_VIEW_TYPE</code></td>
<td>POPUP, INLINE</td>
<td>Use this property to control how records are displayed in Master Detail navigation targets when clicked.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
</table>
| `SVG_VIEW_TYPE` | ADOBE, APPLET | Controls which application is used to view SVG content on pages. The property includes the following values:  
  • ADOBE: Use the Adobe SVG Viewer plug-in.  
  • APPLET: Use the IBM TRIRIGA SVG Viewer Applet.  
  The default value is ADOBE. |
### Property Values Description

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TREE_PAGING_SIZE</td>
<td>[Number]</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Projects**

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
</table>
| 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 TRIRIGA 9 applications.
- "Associated To" for TRIRIGA 8i applications.

The default value is Contains.
<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RECORD_PROJECT_CONTAINMENT</td>
<td>N, Y, [Blank]</td>
<td>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.</td>
</tr>
<tr>
<td>SMARTQUERY_RESULT_SIZE_LIMIT</td>
<td>[Number]</td>
<td>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.</td>
</tr>
<tr>
<td>ENFORCE_REQUIRED_VALIDATION</td>
<td>N, Y</td>
<td>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.</td>
</tr>
<tr>
<td>QUERY_ChART_IMAGE_URL</td>
<td>[Valid path], [Blank]</td>
<td>The location of the server that converts a chart from .xml to a .png image when the user selects <strong>Save as image.</strong> The default value is <a href="http://localhost:port/AnyChartPNGSaver/PNGSaver">http://localhost:port/AnyChartPNGSaver/PNGSaver</a>.</td>
</tr>
<tr>
<td>Property</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>MAX_FORM_ACTION_NUMBER</strong></td>
<td>[Number]</td>
<td>Sets the maximum number of actions that are displayed on a form before the platform puts the excess actions into the overflow button.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The platform does not count the <strong>Cancel</strong> 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default value is 4.</td>
</tr>
<tr>
<td><strong>BYPASS_PORTAL_MENU_UPGRADE</strong></td>
<td>N, Y</td>
<td>Controls whether the IBM TRIRIGA Application Platform 3.0 installer upgrades portals and menus.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If set to Y or blank, an upgrade to 3.0 bypasses the portal and menu upgrades that typically occur. One scenario where a portal and menu upgrade is not desirable is when portals and menus are reimplemented after the upgrade to 3.0.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If set to N, an upgrade to 3.0 runs the portal and menu upgrade, converting all pre-3.0 portals and menus to 3.0-equivalent constructs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the implementation includes IBM TRIRIGA 10.0, this property has no affect. The upgrade does not run since IBM TRIRIGA 10.0 brings a new set of portals and menus.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default value is N.</td>
</tr>
<tr>
<td><strong>SESSION_HISTORY_TRACKING</strong></td>
<td>ALL, NONE, WEB_USER</td>
<td>Indicates which user sessions are logged to the <strong>SESSION_HISTORY</strong> table.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If set to WEB_USER, user sessions from IBM TRIRIGA Connector for Business Applications are not logged to the <strong>SESSION_HISTORY</strong> table.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default value is ALL.</td>
</tr>
<tr>
<td><strong>ENABLE_CHART_ANIMATION</strong></td>
<td>N, Y</td>
<td>If set to Y, charts display animation when they load.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default value is N.</td>
</tr>
<tr>
<td><strong>CHART_RENDERING_TYPE</strong></td>
<td>FLASH_PREFERRED, SVG_PREFERRED, FLASH_ONLY, SVG_ONLY</td>
<td>Determines how charts are rendered in the web browser.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The SVG_PREFERRED and SVG_ONLY options use the native HTML5 support of the browser to render the chart. The FLASH_PREFERRED and FLASH_ONLY options require the Adobe Flash Player browser plug-in to render the chart. For Microsoft Internet Explorer, charts are always rendered with the Adobe Flash Player browser plug-in regardless of the selected option.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default value is FLASH_PREFERRED.</td>
</tr>
<tr>
<td>Property</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>ENABLE_PROFILE_ROW _LEVEL_SECURITY</strong></td>
<td>N, Y</td>
<td>Controls user security access to My Profile records.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default value is Y.</td>
</tr>
<tr>
<td><strong>BIRT_MEMORY_USAGE_LIMIT</strong></td>
<td>[Whole number from 0 to 100], [Blank]</td>
<td>The maximum percentage of available server memory that can be used while the query results of a BIRT report are assembled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default value is 35.</td>
</tr>
<tr>
<td><strong>MEMORY_MANAGED_PROCESS _POLLING_FREQUENCY</strong></td>
<td>[Number]</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default value is 1000, which equals 1 second.</td>
</tr>
<tr>
<td><strong>BIRT_PROCESS_SERVER _HOST_NAME</strong></td>
<td>[Host name or IP address]</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ProcessServer ☐</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• processserver.domain.com</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 10.1.1.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If this value is blank, all BIRT processing is done on the application server.</td>
</tr>
<tr>
<td>Property</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>BIRT_PROCESS_SERVER_PORT</strong></td>
<td>[Number]</td>
<td>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 <strong>BIRT_PROCESS_SERVER_LISTENING_PORT</strong> property on the BIRT process server. Leave this value blank to process BIRT reports on the application server.</td>
</tr>
<tr>
<td><strong>BIRT_PROCESS_SERVER_LISTENING_PORT</strong></td>
<td>[Number]</td>
<td>Configuring this port enables this server as a BIRT process server. The server listens for BIRT requests on this port. For example, 47074.</td>
</tr>
<tr>
<td><strong>AVAILABILITY_CACHE_LOAD_FACTOR</strong></td>
<td>[Number]</td>
<td>The decimal value that is used by the availability section applet to determine how much data to cache. This value is multiplied by the visible time range unit and indicates how much time in the past and future is cached. For example, with a value of 1.5, if the visible time range is 1 week, then the applet loads one and a half weeks in the past and in the future, and caches the data.</td>
</tr>
<tr>
<td><strong>AVAILABILITY_CACHE_LOAD_THRESHOLD</strong></td>
<td>[Number]</td>
<td>The decimal value that is used by the availability section applet to determine how much data is left in the cache before more data is loaded to the cache. This value is multiplied by the visible time range unit. For example, with a value of 0.25, if the visible time range is 1 week and the user is scrolling the applet in the future, then when user has a quarter of a week left in the cache, the applet loads more data and caches the data.</td>
</tr>
<tr>
<td><strong>ALLOWED_URL_FOR_REDIRECT</strong></td>
<td>[List of URLs]</td>
<td>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, <a href="http://ibm.com">http://ibm.com</a></td>
</tr>
</tbody>
</table>
### Property Values Description

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
</table>
| 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.

<table>
<thead>
<tr>
<th>SESSION_WARNING_ENABLED</th>
<th>N, Y</th>
<th>Allows an alert message to be displayed to a user whose session is about to expire.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>If set to Y, then the session expiration redirects the browser to a session expiration page.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If set to N, then the session expiration redirection is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default value is N.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SESSION_WARNING_THRESHOLD</th>
<th>[Number]</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default value is 2.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OOTB_G11N_EXPORT_APP_VERSION</th>
<th>[String]</th>
<th>Inserts a value or description of the IBM TRIRIGA application version in the file header of the instance data export.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>For example, 10.3.1.</td>
</tr>
<tr>
<td>Property</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>COMPANY_FILE_UPLOAD_EXCLUDE_EXTENSIONS</td>
<td>[Valid file extensions]</td>
<td>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. This property does not cover Document Manager file uploads. For example, .exe, .js, .sh The default value is .exe</td>
</tr>
<tr>
<td>COMPANY_FILE_UPLOAD_INCLUDE_EXTENSIONS</td>
<td>[Valid file extensions]</td>
<td>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</td>
</tr>
<tr>
<td>IMPORT_CONTENT_EXCLUDE_EXTENSIONS</td>
<td>[Valid file extensions]</td>
<td>Restricts file uploads of binary 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 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. This property does not cover Document Manager file uploads. For example, .exe, .js, .sh The default value is .exe</td>
</tr>
<tr>
<td>Property</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>---------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>IMPORT_CONTENT_INCLUDE_EXTENSIONS</strong></td>
<td>[Valid file extensions]</td>
<td>Restricts file uploads of binary files according to their file extensions. Separate the file extensions in the list with commas.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For a looser restriction, use the <strong>IMPORT_CONTENT_EXCLUDE_EXTENSIONS</strong> 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, .doc, .docx, .pdf</td>
</tr>
<tr>
<td><strong>WS_RELIABLE_MESSAGING</strong></td>
<td>N, Y</td>
<td>Enables (Y) or disables (N) the Web Services Reliable Messaging Protocol (<a href="http://schemas.xmlsoap.org/ws/2005/02/rm/">http://schemas.xmlsoap.org/ws/2005/02/rm/</a>). Set the value to Y to enable.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default is N.</td>
</tr>
<tr>
<td><strong>WS_RM_INACTIVITY_TIMEOUT</strong></td>
<td>[Number]</td>
<td>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 <strong>WS_RELIABLE_MESSAGING</strong> property is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Specify a value in milliseconds.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default is 600000, which equals 10 minutes.</td>
</tr>
<tr>
<td><strong>WS_RM_BASE_RETRANSMISSION_INTERVAL</strong></td>
<td>[Number]</td>
<td>The interval at which an acknowledgement is received by the Reliable Message source for a given message. This property applies only when the <strong>WS_RELIABLE_MESSAGING</strong> property is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Specify a value in milliseconds.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default is 4000, which equals 4 seconds.</td>
</tr>
<tr>
<td><strong>WS_RM_ACKNOWLEDGMENT_INTERVAL</strong></td>
<td>[Number]</td>
<td>The interval at which the Reliable Message destination sends asynchronous acknowledgements. This property applies only when the <strong>WS_RELIABLE_MESSAGING</strong> property is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Specify a value in milliseconds.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default is 2000, which equals 2 seconds.</td>
</tr>
<tr>
<td><strong>WS_RM_DELIVERY_ASSURANCE_TYPE</strong></td>
<td>AtMostOnce, AtLeastOnce, ExactlyOnce</td>
<td>The delivery assurance type of the Reliable Message. This property applies only when the <strong>WS_RELIABLE_MESSAGING</strong> property is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default is AtMostOnce.</td>
</tr>
</tbody>
</table>
Property Values Description

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WS_RM_DELIVERY_ASSURANCE_IN_ORDER</td>
<td>N, Y</td>
<td>Enables (Y) or disables (N) the delivery assurance &quot;in order&quot; type of the Reliable Message. This &quot;in order&quot; 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.</td>
</tr>
</tbody>
</table>

Related information:

[IBM TRIRIGA Application Platform Compatibility Matrix](#)

**TRIRIGAWEBDYNAMIC.properties**

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

**Web dynamic properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TririgaApplication Version</td>
<td>[Number]</td>
<td>The version of the IBM TRIRIGA software that is installed. This required value is displayed by the Help subsystem. For example, 3.0.</td>
</tr>
</tbody>
</table>

**TRIRIGAWEBLOGICPOOL.properties**

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

**Connection pool properties**

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

**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.

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.

<table>
<thead>
<tr>
<th>License type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concurrent User</td>
<td>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.</td>
</tr>
<tr>
<td>Named User</td>
<td>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.</td>
</tr>
<tr>
<td>Enterprise</td>
<td>The Enterprise license did not restrict the number of users in a company by allowing an unlimited number of users.</td>
</tr>
</tbody>
</table>

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 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.

**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.

<table>
<thead>
<tr>
<th>Former Enterprise license</th>
<th>Equivalent IBM TRIRIGA licenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility Management Enterprise</td>
<td>(1) Real Estate Manager, (2) Facilities Manager, and (3) Workplace Operations Manager</td>
</tr>
</tbody>
</table>

**Available licenses**

IBM TRIRIGA distributes the following LICENSE.ibm_tririga files for individual products.

<table>
<thead>
<tr>
<th>License files</th>
</tr>
</thead>
<tbody>
<tr>
<td>LICENSE.ibm_tririga.Anywhere_Workplace_Operations.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Application.Builder.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Application_Platform.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.CAD.Integrator.Publisher.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Capital.Projects_Manager.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Connector_for_Business_Applications.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Connector_for_Offline_Forms.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Facilities_Manager.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Facility_Assessment.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Integrated_Workplace_Manager.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Mobile.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Portfolio_Data_Manager.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Real.Estate.Environmental.Sustainability_Impact_Manager.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Real.Estate.Environmental.Sustainability_Manager.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Real.Estate.Manage.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Request_Central.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Strategic_Facility_Planning.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Workplace_Operations_Manager.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Workplace_Performance_Management_Enterprise.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Workplace_Performance_Management_Facilities.properties</td>
</tr>
<tr>
<td>LICENSE.ibm_tririga.Workplace_Performance_Management_Operations.properties</td>
</tr>
</tbody>
</table>
License files

<table>
<thead>
<tr>
<th>License file</th>
</tr>
</thead>
<tbody>
<tr>
<td>LICENSE_IBM_TRIRIGA_Workplace_Performance_Management_Projects.properties</td>
</tr>
<tr>
<td>LICENSE_IBM_TRIRIGA_Workplace_Performance_Management_Real_Estate.properties</td>
</tr>
<tr>
<td>LICENSE_IBM_TRIRIGA_Workplace_Reservation_Coordinator.properties</td>
</tr>
<tr>
<td>LICENSE_IBM_TRIRIGA_Workplace_Reservation_Manager.properties</td>
</tr>
<tr>
<td>LICENSE_IBM_TRIRIGA_Workplace_Reservation_Manager_for_Small_Installations.properties</td>
</tr>
</tbody>
</table>

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

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.

<table>
<thead>
<tr>
<th>Connection pool settings</th>
<th>File location</th>
</tr>
</thead>
<tbody>
<tr>
<td>JBoss Application Server data source</td>
<td>[jboss_root]\jboss-5.1.0.GA\server\all\deploy\tririga-ds.xml</td>
</tr>
<tr>
<td></td>
<td>For example, C:\jboss-5.1.0.GA\server\all\deploy\tririga-ds.xml</td>
</tr>
<tr>
<td></td>
<td>If your JBoss settings are encrypted in the tririga-ds.xml file, you must</td>
</tr>
<tr>
<td></td>
<td>redo the encryption after you upgrade.</td>
</tr>
<tr>
<td>Oracle WebLogic Server pools</td>
<td>[tririga_root]\config\TRIRIAGEBLOGICPOOL.properties</td>
</tr>
<tr>
<td></td>
<td>For example, C:\Tririga\config\TRIRIAGEBLOGICPOOL.properties</td>
</tr>
<tr>
<td>Oracle Database trace levels</td>
<td>[tririga_root]\config\TRIRIGAMIDDLEWARE.properties</td>
</tr>
<tr>
<td></td>
<td>For example, C:\Tririga\config\TRIRIGAMIDDLEWARE.properties</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>XSS filter properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EXCLUDE_CHARACTERS</strong></td>
<td>This property contains a list of characters or strings to exclude from fields, which are separated by spaces. For example: `&lt; &gt; &amp; {</td>
</tr>
</tbody>
</table>
| **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.

<table>
<thead>
<tr>
<th>Business process agent</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platform Maintenance Scheduler</td>
<td>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.</td>
</tr>
<tr>
<td>Data Import Agent</td>
<td>This agent looks for all tab-delimited files that are uploaded and imports the data into the platform.</td>
</tr>
<tr>
<td>DataConnect (DC) Agent</td>
<td>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.</td>
</tr>
<tr>
<td>Extended Formula Agent</td>
<td>This agent looks for and processes extended formulas.</td>
</tr>
<tr>
<td>Formula Recalc Agent</td>
<td>This agent recalculates formulas as needed in the platform.</td>
</tr>
</tbody>
</table>
### Business process agent Description

<table>
<thead>
<tr>
<th>Business process agent</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incoming Mail Agent</td>
<td>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.</td>
</tr>
<tr>
<td>Object Migration Agent</td>
<td>This agent migrates business objects from one environment to another environment.</td>
</tr>
<tr>
<td>Object Publish Agent</td>
<td>This agent publishes business objects in the platform.</td>
</tr>
<tr>
<td>Report Queue Agent</td>
<td>This agent retrieves queued report requests, processes the report, and notifies the user.</td>
</tr>
<tr>
<td>Reserve SMTP Agent</td>
<td>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.</td>
</tr>
<tr>
<td>Scheduler Agent</td>
<td>This agent looks for and processes all scheduled and recurring events in the platform.</td>
</tr>
<tr>
<td>Workflow (WF) Agent</td>
<td>This agent processes queued workflow events and the asynchronous workflows that are registered for those events.</td>
</tr>
<tr>
<td>Workflow (WF) Notification Agent</td>
<td>This agent looks for and processes notifications in the platform, including those notifications to be sent at a scheduled time.</td>
</tr>
</tbody>
</table>

### 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](https://www.ibm.com).

### 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.

<table>
<thead>
<tr>
<th>Method</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Outlook</td>
<td>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.</td>
</tr>
<tr>
<td>Microsoft Outlook Web App</td>
<td>Attach the .msg file to the main email that you are delivering in the Microsoft Outlook Web App (OWA).</td>
</tr>
</tbody>
</table>

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 /etc/sysconfig/iptables file:

   ```bash
   -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:

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

3. Open port 25 for forwarding:

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

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

   ```bash
   /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:

   ```bash
   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 JBoss settings

Certain Red Hat JBoss Enterprise Application Platform (EAP) settings must be configured when they apply to your particular implementation. These settings include disabling file compression in JBoss, running JBoss as a service, and editing the display of JBoss environment data.

Disabling file compression in JBoss

You can use file compression in JBoss to conserve transactional bandwidth in your network. However, if you discover that your IBM TRIRIGA Application Platform implementation experiences problems with file compression, you can disable compression. The default Red Hat JBoss Enterprise Application Platform (EAP) configuration enables compression, except for connections through Apache JServ Protocol (AJP) for Apache.

Before you begin

You must be a IBM TRIRIGA or JBoss administrator.

Procedure

1. Remove gzip from the Accept-Encoding header of the HTTP request. If there are issues with removing gzip, continue to the next step.
2. Edit the server.xml file in the \[jboss_path]\server\all\deploy\jbossweb.sar directory.
3. Remove the code that begins with compression="on", as highlighted in the following example:

   <!-- A HTTP/1.1 Connector on port changed from Jboss default 8080 to 8001 -->
   <Connector protocol="HTTP/1.1" port="8001" address="${jboss.bind.address}"
   compression="on" compressableMimeType="text/html,text/xml,text/css,
text/javascript,application/x-javascript,application/javascript"
   connectionTimeout="20000" redirectPort="8443" maxPostSize="10485760"
   disableUploadTimeout="true"/>

4. Save the server.xml file.

Running JBoss as a service on Windows servers

The IBM TRIRIGA Application Platform installation does not automatically configure Red Hat JBoss Enterprise Application Platform (EAP) as a service on Microsoft Windows servers. However, you can manually configure this service. When this service is configured, starting the application server and process server also starts JBoss.

Before you begin

You must be a IBM TRIRIGA or JBoss administrator.

Procedure

1. Edit the service.bat file in the \[jboss_path]\bin directory.
2. Modify the service name and parameters in the following configuration lines. Red Hat JBoss Enterprise Application Platform is shown as an example:

   set SVCCNAME=TRIRIGA_8001
   set SVCDISP=TRIRIGA (8001) - JBoss EAP 5.1
   set SVCDESC=TRIRIGA 8001/JBoss EAP 5.1.0 GA

3. Save the service.bat file.
4. Install the service as follows:
a. Open the Windows command prompt.
b. Change the directory to the \[jboss_path]\bin directory.
c. Run the service.bat install command.

5. Optional: When the service is installed, it is set to start manually. You can set the service to start automatically as follows:
   a. Open the Windows Control Panel > Administrative Tools > Services console.
   b. Double-click the TRIRIGA (8001) service to open its properties.
   c. For the startup type, select Automatic.
   5. Click Apply and OK.

Related information:
- Securing the JMX Console

Editing the display of JBoss environment data
When IBM TRIRIGA is running, certain Red Hat JBoss Enterprise Application Platform (EAP) environment data is displayed in the HTTP response headers. For example, X-Powered-By: Servlet 2.4; JBoss-5.1.0 GA (build: SVNTag=JBoss_5_1_0_GA date=201303131313)/Tomcat-5.5. However, if this data must be hidden for security or other reasons, you can edit the display of information.

Before you begin
You must be an IBM TRIRIGA or JBoss administrator.

Procedure
1. Edit the web.xml file in the \[jboss_path]\server\all\deployers\jbossweb.deployer directory.
2. In the Common Filter Configuration section, remove the <init-param> tag and tag elements, as highlighted in the following lines. Red Hat JBoss Enterprise Application Platform is shown as an example:
   <filter>
     <filter-name>CommonHeadersFilter</filter-name>
     <filter-class>
       org.jboss.web.tomcat.filters.ReplyHeaderFilter</filter-class>
     <init-param>
       <param-name>X-Powered-By</param-name>
       <param-value>Servlet 2.4; JBoss-5.1.0.GA (build: SVNTag=JBoss_5_1_0_GA date=201303131313)/Tomcat-5.5</param-value>
     </init-param>
   </filter>

The edited <filter> tag and tag elements look like the following example:

   <filter>
     <filter-name>CommonHeadersFilter</filter-name>
     <filter-class>
       org.jboss.web.tomcat.filters.ReplyHeaderFilter</filter-class>
   </filter>

Chapter 6. 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 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.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition expression is invalid. Review and correct the expression.</td>
<td>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.</td>
</tr>
<tr>
<td>Retired the workflow because of a block structure error that cannot be repaired.</td>
<td>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.</td>
</tr>
<tr>
<td>Issue Description</td>
<td>Description</td>
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<tr>
<td>----------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Retired the workflow because of a missing Start step that cannot be repaired.</td>
<td>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.</td>
</tr>
<tr>
<td>Retired the workflow because of missing Start and End steps that cannot be repaired.</td>
<td>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.</td>
</tr>
<tr>
<td>Retired the workflow because of a structure error that cannot be repaired.</td>
<td>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.</td>
</tr>
<tr>
<td>Retired the workflow because of an unknown task type &lt;type-number&gt;.</td>
<td>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.</td>
</tr>
<tr>
<td>Retired the workflow because of missing step definitions that cannot be repaired.</td>
<td>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.</td>
</tr>
<tr>
<td>Unexpected problem in trying to load the workflow.</td>
<td>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.</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Issue Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Added the required End step structure and definition information.</td>
<td>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.</td>
</tr>
<tr>
<td>Issue</td>
<td>Description</td>
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</tr>
<tr>
<td>Changed step with missing definition to a No-Op.</td>
<td>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.)</td>
</tr>
<tr>
<td>Converted obsolete task type step to a No-Op.</td>
<td>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.</td>
</tr>
<tr>
<td>Flow control value was invalid. Set step to normal flow (non-swapped).</td>
<td>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.</td>
</tr>
<tr>
<td>Removed the entry from WF_LOOKUP because the workflow is not in a published state.</td>
<td>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.</td>
</tr>
<tr>
<td>Retired the workflow because its Business Object could not be found.</td>
<td>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.</td>
</tr>
<tr>
<td>Retired the workflow because its Module could not be found.</td>
<td>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.</td>
</tr>
<tr>
<td>Retired the workflow because there isn’t a corresponding entry in WF_LOOKUP.</td>
<td>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.</td>
</tr>
<tr>
<td>Step definition added for Block-End step.</td>
<td>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.</td>
</tr>
<tr>
<td>Issue</td>
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</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>Step definition added for End step.</td>
<td>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.</td>
</tr>
<tr>
<td>Step definition added for No-Op step.</td>
<td>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.</td>
</tr>
<tr>
<td>Step definition added for Stop step.</td>
<td>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.</td>
</tr>
<tr>
<td>Updated the workflow name in WF_LOOKUP.</td>
<td>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.</td>
</tr>
</tbody>
</table>
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