DTS: 4.9.0 Installation Guide

APELON

BECAUSE TERMINOLOGY MATTERS

75 Sgt William B Terry Dr, Suite 2005, Hingham, MA 02043

+1 (203) 431-2530

www.APELON.com

www.ApelonDTS.org

TABLE OF CONTENTS

A. Introduction.....5
B. Apelon DTS Installation.....6
B.1 Installation Requirements.....6
B.2 Installing Apelon DTS for Windows.....8
B.2.1 DTS Editor High Resolution Compatibility.....14
B.3 Installing Apelon DTS for Linux.....16
C. Preparing Your Knowledgebase.....17
C.1 Create DTS 4 Database User and DTS 4 Schema.....17
C.1.1 Create DTS 4.9.0 Database.....17
C.1.2 Overview.....19
C.1.3 Create DTS Knowledgebase Schema.....20
D. Populating the DTS 4 Knowledgebase.....22
E. Apelon DTS 4 Server.....23
E.1 Getting Started with Apelon DTS 4 Server.....23
E.2 Java Environment Setup for DTS 4 Server and Client.....24
F. JBoss EAP 7.4 Setup.....29
F.1 JBoss EAP 7.4 Update 23 patch.....31
F.2 Memory Configuration.....32
F.3 JBoss EAP Management User.....33
F.4 JBoss EAP Configuration for Apelon DTS 4 Server.....34
F.4.1 Migrate JBoss EAP DTS users from existing JBoss EAP 7.1 server.....34
F.4.2 JBoss EAP DTS Admin User Configuration.....34
F.4.3 JBoss EAP DTS User Configuration.....36
F.5 Apelon DTS 4.9.0 Server Deployment.....37
F.5.1 Data Source Configuration.....38
F.5.2 Deploy Database Driver.....38
F.5.3 Configure Data Source.....42

© 2026 Apelon, Inc.

F.6 Check JBoss EAP Transaction Timeout Default....47
F.7 Deploy Apelon DTS 4.9.0 Server....49
F.8 Verify DTS Browser & Editor connections to JBoss EAP 7.4 DTS 4.9.0 Server...51
F.8.1 Verify the DTS Browser....51
F.8.2 Verify the DTS Editor connection....52
F.9 Setup JBoss EAP and DTS to start as a Windows Service....54
F.10 Setup JBoss EAP and DTS to start as a Linux Service....57
F.11 Terminating the JBoss EAP Service using taskkill....59
F.12 Upgrade Apelon DTS 4.8.0 JBoss EAP Server & schema to DTS 4.9.0....61
G. WildFly 26 Setup....63
G.1 Memory Configuration....65
G.2 WildFly 26 Management User....66
G.3 WildFly 26 Configuration for Apelon DTS 4 Server....67
G.3.1 Migrate WildFly DTS users from existing WildFly 23 server....67
G.3.2 WildFly 26 DTS Admin User Configuration....68
G.3.3 WildFly 26 DTS User Configuration....69
G.4 Apelon DTS 4.9.0 Server Deployment....71
G.4.1 Data Source Configuration....72
G.4.2 Deploy Database Driver....72
G.4.3 Configure Data Source....77
G.5 Check WildFly Transaction Timeout Default....81
G.6 Deploy Apelon DTS 4.9.0 Server....83
G.7 Verify DTS Browser & Editor connections to WildFly 26 DTS 4.9.0 Server....85
G.7.1 Verify the DTS Browser....85
G.7.2 Verify the DTS Editor connection....85
G.8 Setup WildFly 26 and DTS 4.9.0 to start as a Windows Service....87
G.9 Setup WildFly 26 and DTS 4.9 to start as a Linux Service....89
G.10 Terminating the WildFly 26 Service using taskkill....92
G.11 Upgrade Apelon DTS 4.8.0 WildFly Server & schema to DTS 4.9.0....93
H. WildFly 23 Setup....94
H.1 Memory Configuration....96
H.2 WildFly 23 Management User....97

© 2026 Apelon, Inc.

H.3 WildFly 23 Configuration for Apelon DTS 4 Server....98
H.3.1 Migrate WildFly DTS users from existing WildFly 12 server....98
H.3.2 WildFly 23 DTS Admin User Configuration....99
H.3.3 WildFly 23 DTS User Configuration....100
H.4 Apelon DTS 4.9.0 Server Deployment....102
H.4.1 Data Source Configuration....103
H.4.2 Deploy Database Driver....103
H.4.3 Configure Data Source....108
H.5 Check WildFly Transaction Timeout Default....112
H.6 Deploy Apelon DTS 4.9.0 Server....114
H.7 Verify DTS Browser & Editor connections to WildFly 23 DTS 4.9.0 Server....116
H.7.1 Verify the DTS Browser....116
H.7.2 Verify the DTS Editor connection....116
H.8 Setup WildFly 23 and DTS 4.9.0 to start as a Windows Service....118
H.9 Setup WildFly 23 and DTS 4.9 to start as a Linux Service....120
H.10 Terminating the WildFly 23 Service using taskkill....122
H.11 Upgrade Apelon DTS 4.8.0 WildFly Server & schema to DTS 4.9.0....124

© 2026 Apelon, Inc.

A Note Before We Begin: As of the release of DTS version 4.9.0, Apelon Customer Support will officially support installations of DTS 4.8.0 and DTS 4.9.0. If you are running an older version of DTS 4, consult the latter sections of this guide to upgrade your installation to the current version

A. Introduction

This Installation Guide provides detailed descriptions of the steps required to install the DTS 4.9.0 software and install and configure the associated JBoss and WildFly application servers. The guide was prepared to help new and experienced administrators successfully perform all operations necessary to install the Apelon DTS product.

The Apelon DTS Installation section gives the hardware and software requirements for DTS 4.9.0 and presents the software installation process.
Refer to the section Preparing Your Knowledgebase for procedures and tools which assist in generating the required DTS database tables (DTS 4 schema). For instructions on populating the DTS tables with vocabulary subscription data provided by Apelon, please refer to section Populating the DTS 4 Knowledgebase.
The Apelon DTS Server section gives descriptions of the architecture of the DTS 4.9.0 Server and detailed instructions for downloading, installing, and configuring JBoss and WildFly Application Servers.

© 2026 Apelon, Inc.

B. Apelon DTS Installation

This section details the procedures necessary to install Apelon DTS. These procedures assume that the prerequisite software (listed below) has been installed and is capable of supporting these applications.

B.1 Installation Requirements

The following are recommended/minimum system and software requirements to install and run DTS.

Recommended System Hardware Requirements (DTS Server)

- *CPU*
  - 4 Cores - Minimum
  - 8 or more Cores - Recommended
- *System Memory*
  - 8GB RAM – Minimum
  - 16GB – 32GB RAM – Recommended (minimum if both Server and Database are on same machine and using Classification)
- *Available hard drive space*
  - 100GB Minimum and 200GB+ Recommended
  - This is the recommended available hard drive space, based on a single hard drive being used for both the DTS Server and a DTS knowledgebase configured with SNOMED CT
  - Actual available hard drive space must be sufficient to accommodate the DTS installation (~900M) as well as the space requirements for your specific knowledgebase configuration

DTS 4 Editor & Browser Client Software Requirements

- *Operating Systems:*
  - Windows 11
  - Windows Server 2019 or Windows Server 2022
- *Web Browser (for DTS Browser):*
  - Microsoft Edge
  - Firefox
  - Chrome

© 2026 Apelon, Inc.

DTS Server Software Requirements (only 64-bit supported for DTS Server)

- *Operating Systems:*
  - Windows 11 Professional
  - Windows Server 2019 or Windows Server 2022
  - Red Hat Enterprise Linux 8, Alma Linux 8
- *Database Management System:*
  - MS SQL Server 2019 (Express Edition not supported. Must be hosted on a Windows Server)
  - MS SQL Server 2025 (Express Edition not supported. Must be hosted on a Windows Server)
  - MySQL Community Server 8.4
- *Application Server:*
  - JBoss EAP 7.4 Application Server (Including Update 23)
    - JBoss EAP 7.4 only supported on JDK 1.8
  - WildFly 23.0.2 Final Application Server
    - WildFly 23.0.2 only supported on JDK 1.8
  - WildFly 26.1.3 Final Application Server
    - WildFly 26.1.3 only supported on JDK 1.8
- *Java Runtime Environment:*
  - The DTS 4 Windows installation includes Version 1.8 of the Eclipse Temurin Open Java Runtime Environment (JRE).
    - The JRE 1.8 included with the DTS 4 Windows installation is only used by DTS 4 – it is not for use by the JBoss EAP or WildFly application servers (existing Java installations on the target machine are not affected)

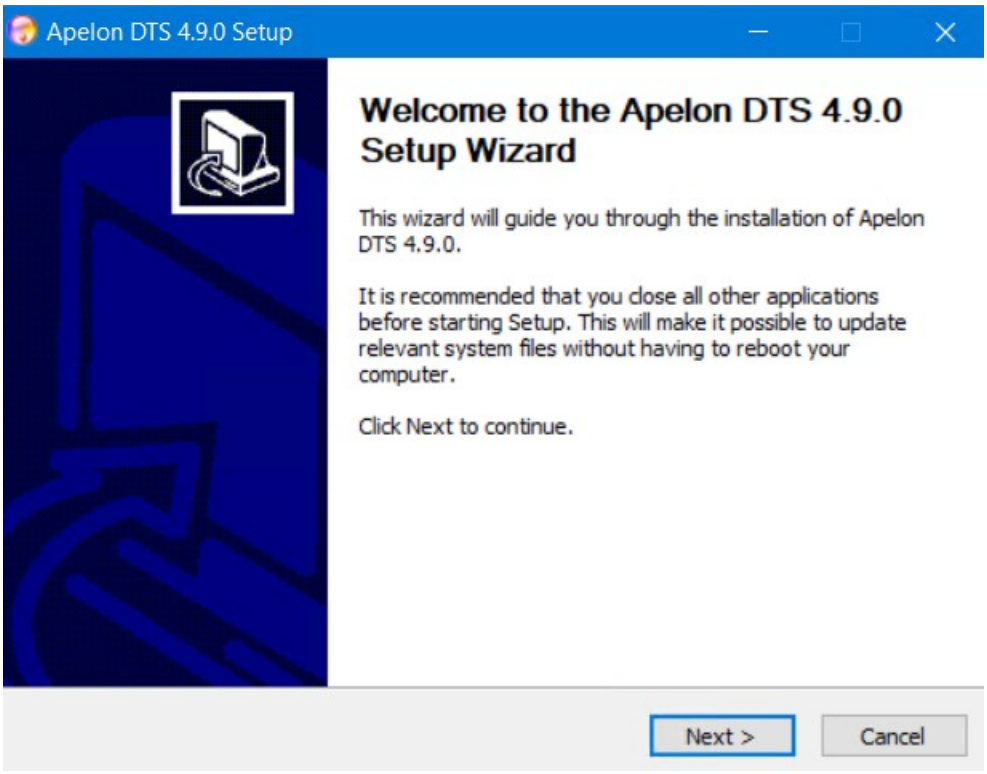
© 2026 Apelon, Inc.

B.2 Installing Apelon DTS for Windows

Follow this procedure to install DTS 4.9.0 on Windows. The installation process creates DTS 4.9.0 directories on your machine and populates them with the files required to run DTS 4.9.0. **Note**: You can retain previous versions of DTS 4 on the same machine (i.e., there is no requirement to uninstall earlier DTS 4 versions).

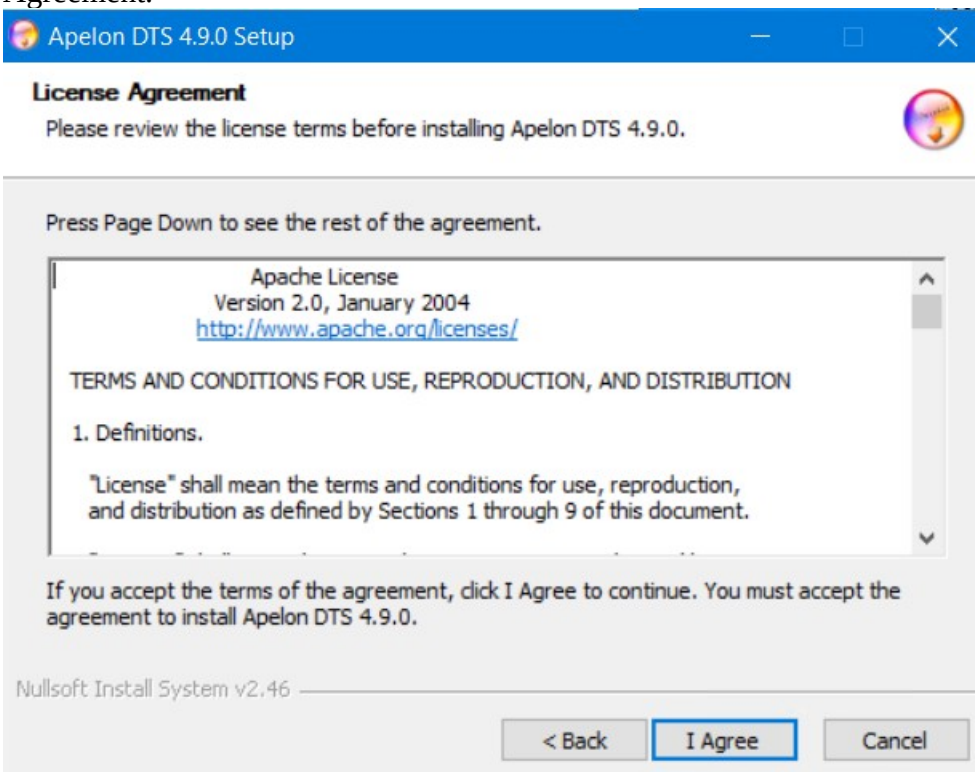
1. Download the `dts_64bit_4.9.0.XXXX.exe` installation file from the Apelon DTS 4.9.0 download page – https://apelon.com/dts-software/. **Note:** The Apelon DTS Server installer includes the installation of Open Java 8 JRE that is isolated within the DTS 4.9.0 Installation location. **Also, the user used to install DTS 4.9.0 must have administrator privileges.**

2. Double click on the installation file to run the installation wizard, which guides you through the installation process.



© 2026 Apelon, Inc.

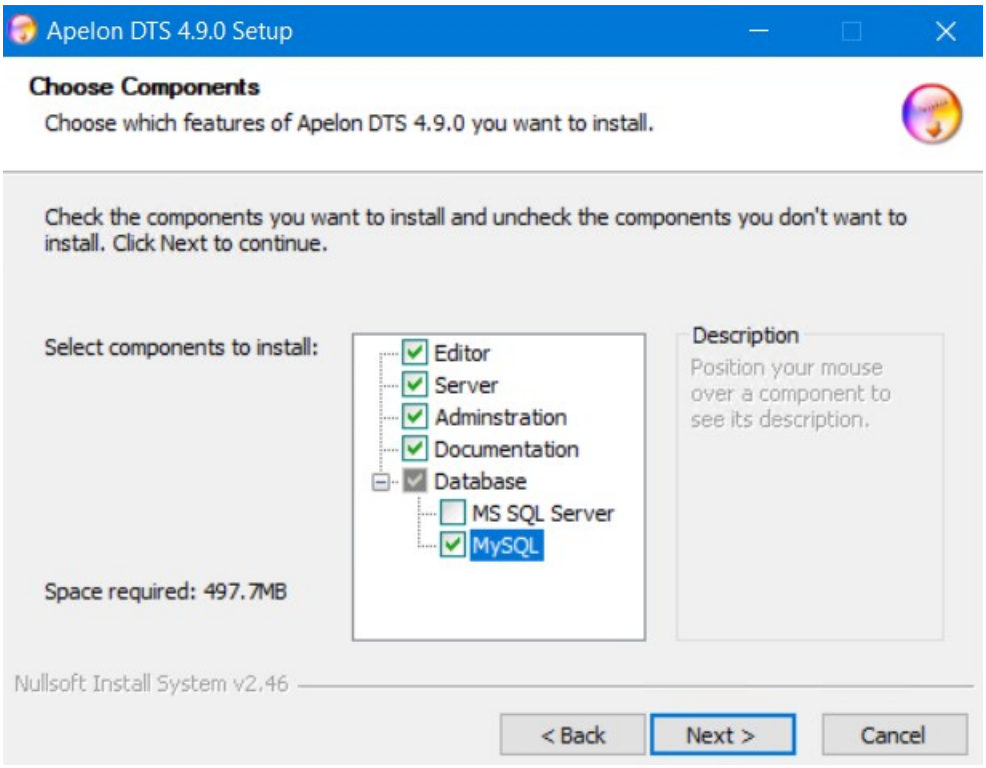
3. Click **Next** in the *Welcome* window. Then choose "I Agree" to the Apache License Agreement.



4. At this point the *Choose Components* window displays. As part of the installation, you are asked to select which of the Apelon DTS 4 components you want installed. The DTS components are listed here:

   - **Editor** (Includes the DTS 4 Editor)
   - **Server** (Includes DTS 4 Browser support)
   - **Administration** (Includes DTS content administration tools)
   - **Documentation** (Includes DTS API Documentation) (NOTE: The latest DTS 4.9.0 documentation can be obtained at https://apelon.com/dts-documentation/)
   - **Database -** Specify the database on which you maintain your DTS 4 Knowledgebase and the driver through which the Application Server will access the data; the appropriate DTS 4 configuration files are updated to reflect this selection.

© 2026 Apelon, Inc.

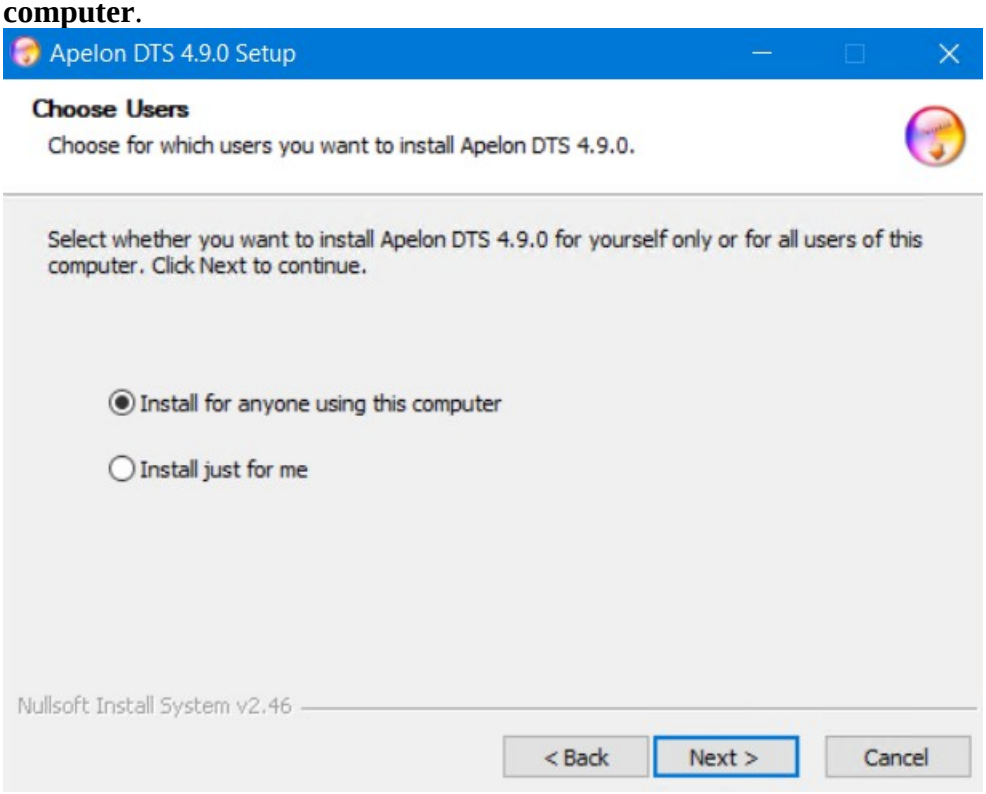


The default is to install all the DTS components. Click the corresponding checkbox to deselect each undesired component.

You can install all the DTS components on the same machine, or install one or more components on separate machines. If you install components on separate machines, these machines must be connected by a network.

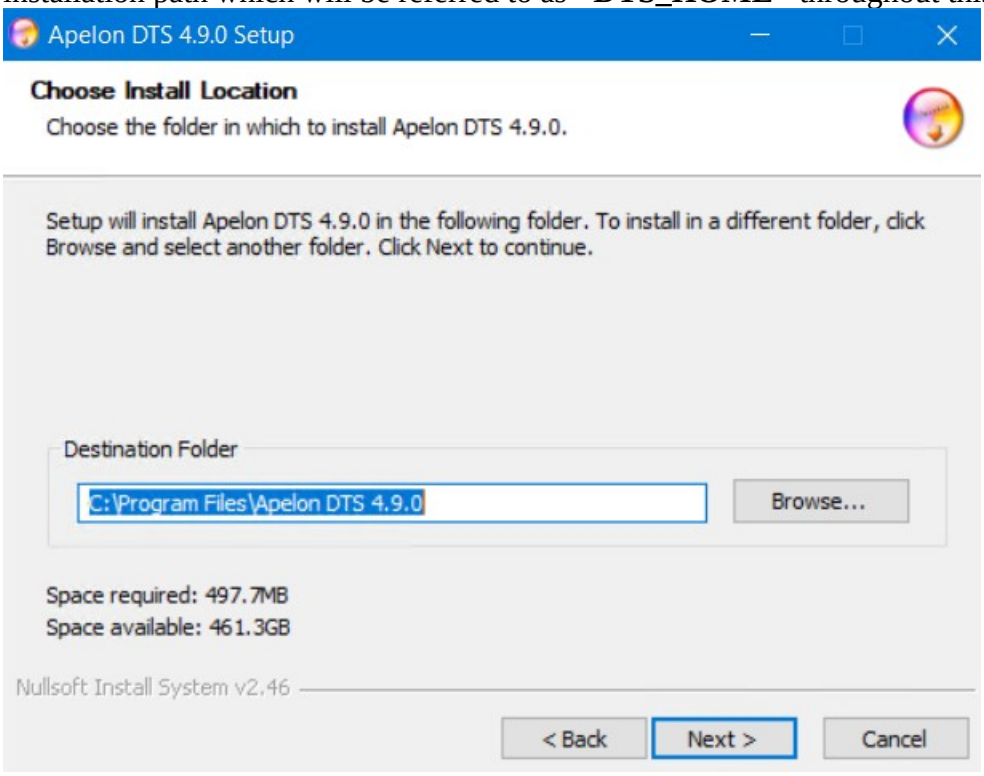
© 2026 Apelon, Inc.

5. On the **Choose Users** window, we recommend choosing to **Install for anyone using this computer**.



© 2026 Apelon, Inc.

6. When the **Choose Install Location** window displays, note that there is a default installation path which will be referred to as **<DTS_HOME>** throughout this document.

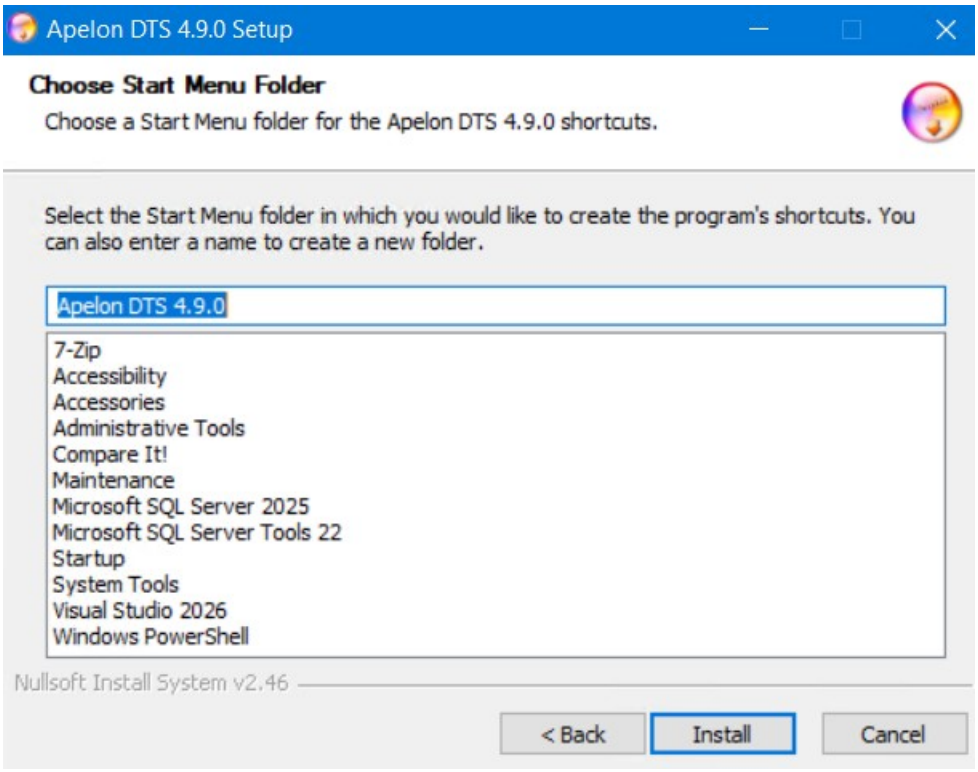


   Earlier DTS 4 versions, installed in other folders, may remain on the same machine.

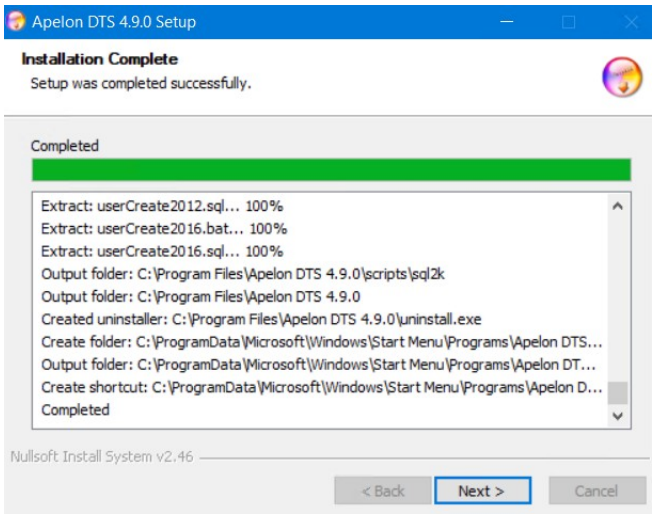
7. Click **Next** to install Apelon DTS in the default destination folder. Otherwise, manually edit the folder destination or click **Browse** to select another folder, then click **Next**.

8. When the *Choose Start Menu Folder* window displays, choose the default Start Menu folder in which to create the program's shortcuts.

© 2026 Apelon, Inc.

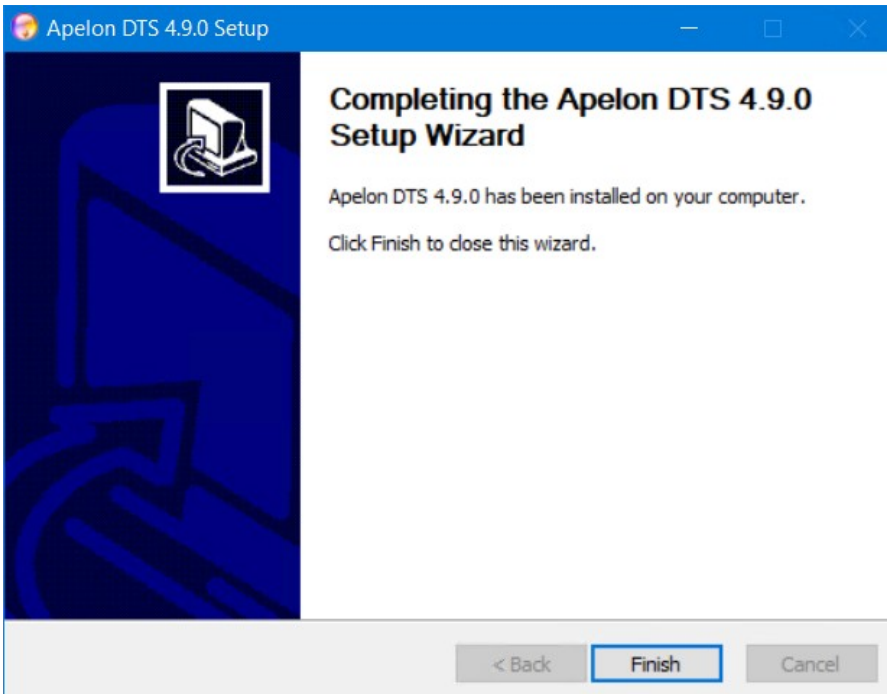


9. Click **Install** to begin installing the selected components in the location you specified. When the **Install Complete** window displays, click **Next**.



10. Click Finish to close the final installation window.

© 2026 Apelon, Inc.

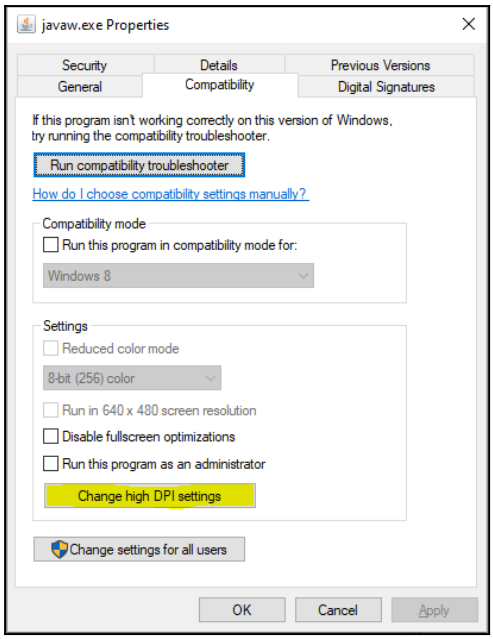


B.2.1 DTS Editor High Resolution Compatibility

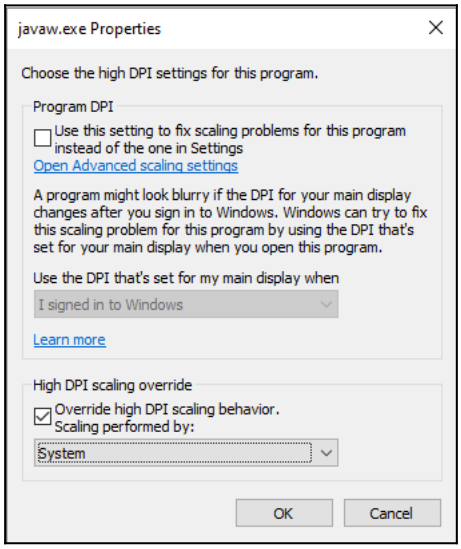
The DTS Editor may experience display issues on high resolution screens. To fix these display issues, follow these steps.

1. Go to <DTS Home>\java\jre\bin and find the java.exe and javaw.exe files. For each file, perform the following.
2. Right-click on the file and select Properties
3. Go to Compatibility tab
4. Click Change high DPI settings

© 2026 Apelon, Inc.



5. Check the Override high DPI scaling behavior checkbox
6. In the Scaling performed by dropdown, select System



© 2026 Apelon, Inc.

B.3 Installing Apelon DTS for Linux

Follow this procedure to install DTS 4 on Linux OS. The installation process creates the DTS 4 directories on your machine and populates them with the files required to run DTS.
Note: You can retain previous versions of DTS 4 on the same machine (i.e., there is no requirement to uninstall earlier DTS 4 versions).

Prerequisite: Alma Linux 8 or Red Hat Enterprise Linux 8 (the Linux distributions Apelon currently supports)

As of this writing, the latest stable version of Alma Linux 8 is 8.10. There are three installation ISO images available:

AlmaLinux-8.10-x86_64-boot.iso - a single network installation CD image that downloads packages over the Internet.

AlmaLinux-8.10-x86_64-minimal.iso - a minimal self-containing DVD image that makes possible offline installation.

AlmaLinux-8.10-x86_64-dvd.iso - a full installation DVD image that contains mostly all AlmaLinux packages.

You can select a mirror closest to your geographic area listed on the AlmaLinux ISOs website.

As of this writing, the latest and final minor version of Red Hat Enterprise Linux 8 is RHEL 8.10. You can download it from here if you have a Red Hat account.

1. The DTS 4 Linux installation is contained in a tar file called **dts-linux_v.v.v-xxxx.tar.gz** (where **v.v.v** represents the version number, **xxxx** represents the build number) that you can download from Apelon DTS download page (**dts-linux_4.9.0-8233.tar.gz**) – https://apelon.com/dts-software/. Create the target DTS 4 directory to which you will download and uncompress this tar file. It is recommended that the DTS installation directory name should **not** contain any spaces.
2. Download the current version of Apelon DTS 4 to the target DTS 4 directory you created.
3. Untar (i.e., uncompress) the tar file from Apelon with the following command:
   `tar -zxvf dts-linux_v.v.v-xxxx.tar.gz`
4. After you uncompress the tar file, the DTS installation directory should contain the following directories:
   - bin

© 2026 Apelon, Inc.

- doc
- javadoc
- lib
- scripts
- server

5. Update your RHEL/Alma Linux 8 system by running the following command (sudo privileges required): `sudo dnf update`

6. You must obtain and install Version 1.8 of the **OpenJDK** for Linux that is appropriate for the Application Server being installed as indicated in the **Minimum Software Requirements (Server)** section of this documentation. While you can go online and get the Eclipse Temurin OpenJDK 8 Linux x64 tar.gz file from Adoptium, the easier way for Alma Linux 8 and RHEL 8 users is to download and install the Red Hat build of OpenJDK 8 using the dnf command (sudo privileges required):

```
sudo dnf install java-1.8.0-openjdk -y
```

NOTE: See section Java Environment Setup for DTS 4 Server and Client regarding more information on Java installation.

- Edit the login script **.bash_profile** to export environment variables **JAVA_HOME** and **PATH**

```
JAVA_HOME="/usr/lib/jvm/jre-1.8.0-openjdk"
PATH=$JAVA_HOME/bin:$PATH:$HOME/bin
export JAVA_HOME
export PATH
```

- **JAVA_HOME** is the directory where you installed your JDK

C. Preparing Your Knowledgebase

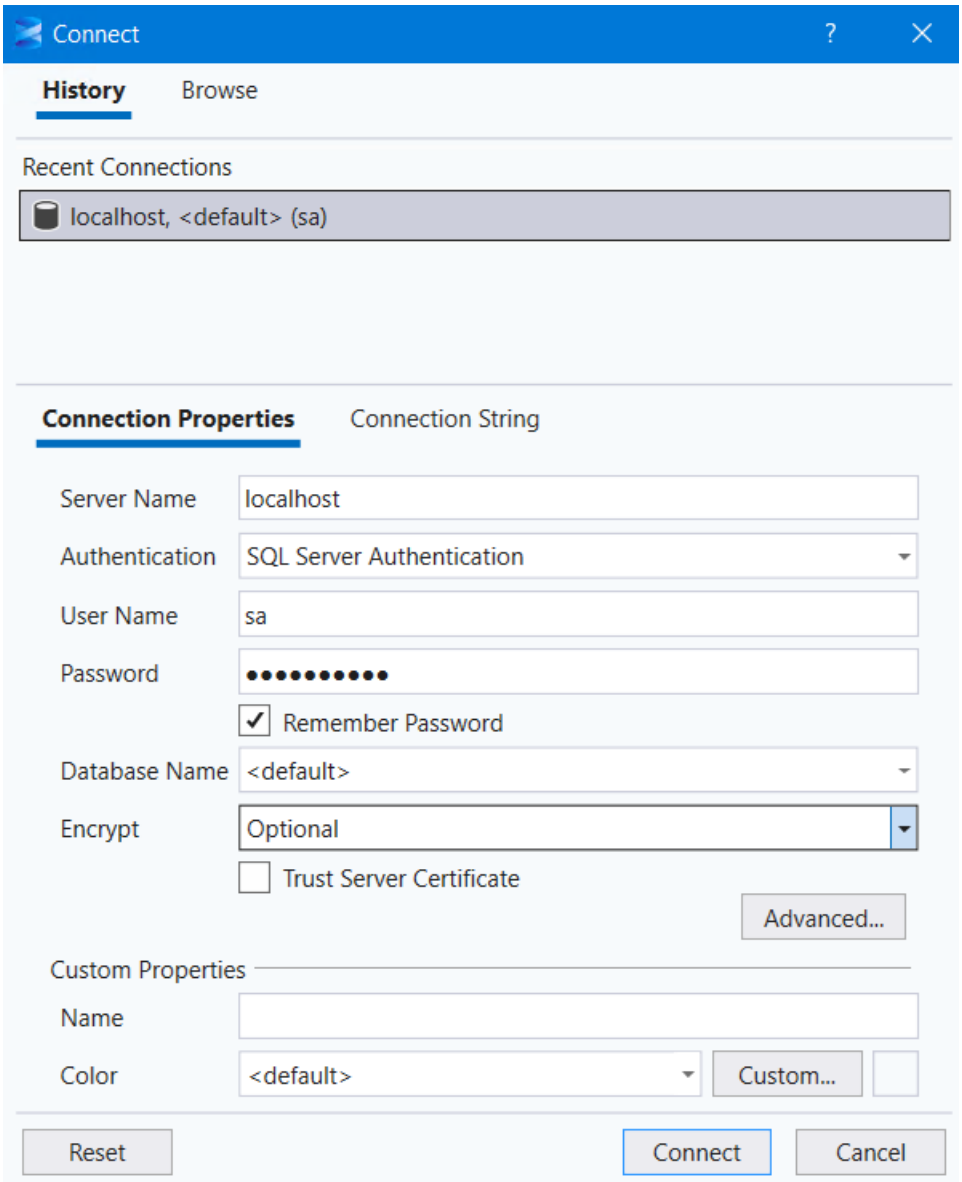
C.1 Create DTS 4 Database User and DTS 4 Schema

The following database setup procedure uses **MS SQL Server** as an example. If you are installing on **MySQL 8.4**, please refer to the **DTS 4.9.0: MySQL 8.4 Installation Guide** at this point. You will return to this document in the Populating the DTS Knowledgebase section below.

C.1.1 Create DTS 4.9.0 Database

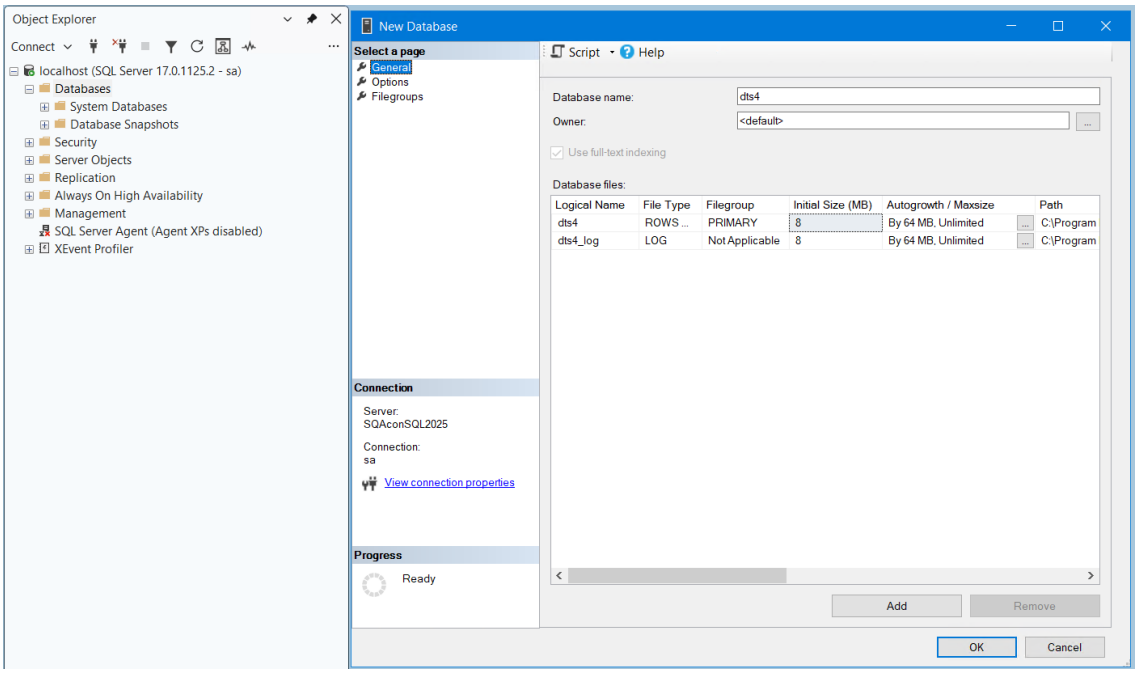
For MS SQL Server (for MySQL 8.4, refer to the **DTS 4.9.0: MySQL 8.4 Installation Guide**) Run the Microsoft SQL Server Management Studio Application. In the Connect to Server Window, connect with a user that has administrator privileges.

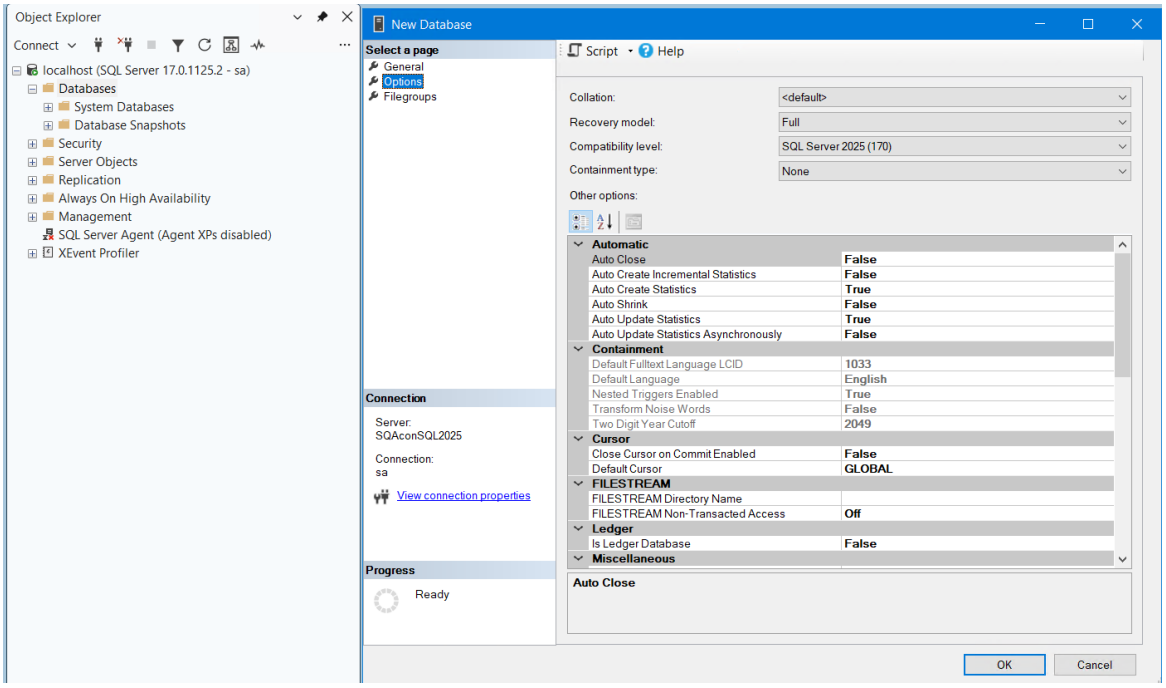
© 2026 Apelon, Inc.



Next, right-click Database and select “New Database”. In the General section, set Database Name to “dts4” and keep all other defaults (the below screen shots are examples from MS SQL Server 2025). Next click OK.

© 2026 Apelon, Inc.





C.1.2 Overview

Regardless of where the data comes from, to populate the DTS 4 knowledgebase (either by migrating data from existing databases or performing a complete import of new subscription data) the database must first be setup with the DTS 4 schema. Also, regardless of which database engine is used (MySQL or MS SQL Server) the DTS 4 schema (tables, indexes, functions, stored procedures, etc.), which includes the DTS-specific database objects that are

© 2026 Apelon, Inc.

required for storing terminology content and proper API function, is setup in a similar process as detailed below.

C.1.3 Create DTS Knowledgebase Schema

After you create the **MySQL** or **MS SQL Server** database, you must create the DTS 4 tables/**schema**. Before you can run the Knowledgebase Create utility to create the schema, you must follow this procedure to configure the parameters by which the schema will be created, and by which a connection will be made to the DTS 4 database.

1. Go to `<DTS_HOME>\bin\kb`. If `'target-connection.xml'` is not present, copy `target-connection-<database>.xml` (where `<database>` is `'sql2k' for MS SQL Server, and 'mysql' for MySQL)` and rename to: `'target-connection.xml'`.

   Open the **target-connection.xml** file (**<*DTS_HOME*>\bin\kb**) where you set the values for the **database** connection. Note in this illustration we are setting up a connection to a MySQL database.

```
<!--
  MySQL connection.
-->
<connection>
  <property name="direction" value="target" />
  <property name="type" value="mysql"/>
  <property name="user" value="dts4user"/>
  <property name="pass" value="dts4password"/>
  <property name="host" value="localhost"/>
  <property name="databaseName" value="dts4"/>
  <property name="databasePort" value="3306"/>
  <property name="jdbcDriver" value="com.mysql.jdbc.Driver"/>
  <property name="url_template" value="jdbc:mysql://[HOST]:[PORT]/[DATABASE]"/>
</connection>
```

2. For the **user** and **pass** property values (highlighted) enter a valid username and password for the database user you created. Also, be sure to update the **host**, **databaseName**, and **databasePort** (highlighted) if different from the default. When you run the Knowledgebase Create utility, a database connection will be established based on the values in this file.

3. Save these updates to the **target-connection.xml** file.

© 2026 Apelon, Inc.

4. Run **kbcreate.bat** (**<*DTS_HOME*>\bin\kb\create**) (or **kbcreate.sh for Linux OS**) to start the Knowledgebase Create utility. If this is the first time **kbcreate.bat** is being run, the utility creates all the tables required to load DTS 4 data into the knowledgebase.

5. If **kbcreate.bat** was run previously, the Knowledgebase Create utility checks for existing tables. **Important Note**: If one or more tables are missing from an existing set, the utility automatically drops all existing tables, then recreates them all (without displaying any user prompts).
   If all the tables exist, the utility prompts you to drop, or not drop, existing tables.

   All the tables exist. Do you want to drop all tables (y/n)?

   If you type **y**, the utility drops all existing tables, then recreates them all. Type **n** to bypass the drop of existing tables and creation of new ones, and to exit the utility.

The results of running the Knowledgebase Create utility are written to the log file (the default log file is **kbcreate.log** in **<*DTS_HOME*>\bin\logs**. If a different log file name and location are specified in the log configuration file **kbcreatelog.xml** (**<*DTS_HOME*>\bin\kb\create**) the results are written to that file.
If an error occurs in the knowledgebase creation process, the utility stops and updates the log file to reflect the error.

If you prefer to start loading subscription content provided by Apelon, please continue on to the *Populating the DTS 4 Knowledgebase* section below and then proceed to setup the Apelon DTS Server.
NOTE: After generation of the DTS 4 tables you can jump to section Apelon DTS 4 Server to install and setup the Apelon DTS 4 Server using the WildFly or JBoss EAP application server.

© 2026 Apelon, Inc.

D. Populating the DTS 4 Knowledgebase

After the DTS 4 database user and DTS 4 schema have been established as described above, the knowledgebase can be loaded with data. Apelon offers a Content Support service which provides subscription-like updates to most standard medical terminologies as soon as they are released.

If you have a Content Support contract with Apelon, all Apelon-provided terminologies are distributed through the Apelon Content Portal and imported into your DTS 4 database through a DTS Distribution Client software interface. As soon as is convenient, contact Apelon Client Services for assistance with the DTS Distribution Client initial installation and Content Portal configuration.

The DTS Distribution Client application works hand-in-hand with our Content Portal server to help make the task of keeping your terminologies current as easy as possible. It lets you choose which standard terminologies (namespaces) you would like to have and then it downloads them for you automatically – including updates as they become available. It also gives you the flexibility of running Change Summary Reports and/or applying the regular updates only when you are ready.

To load your own data into DTS in bulk see the documentation on plugins, in particular the TQL and Import Wizard plugins, that are available in the DTS 4 Editor's Module Manager.

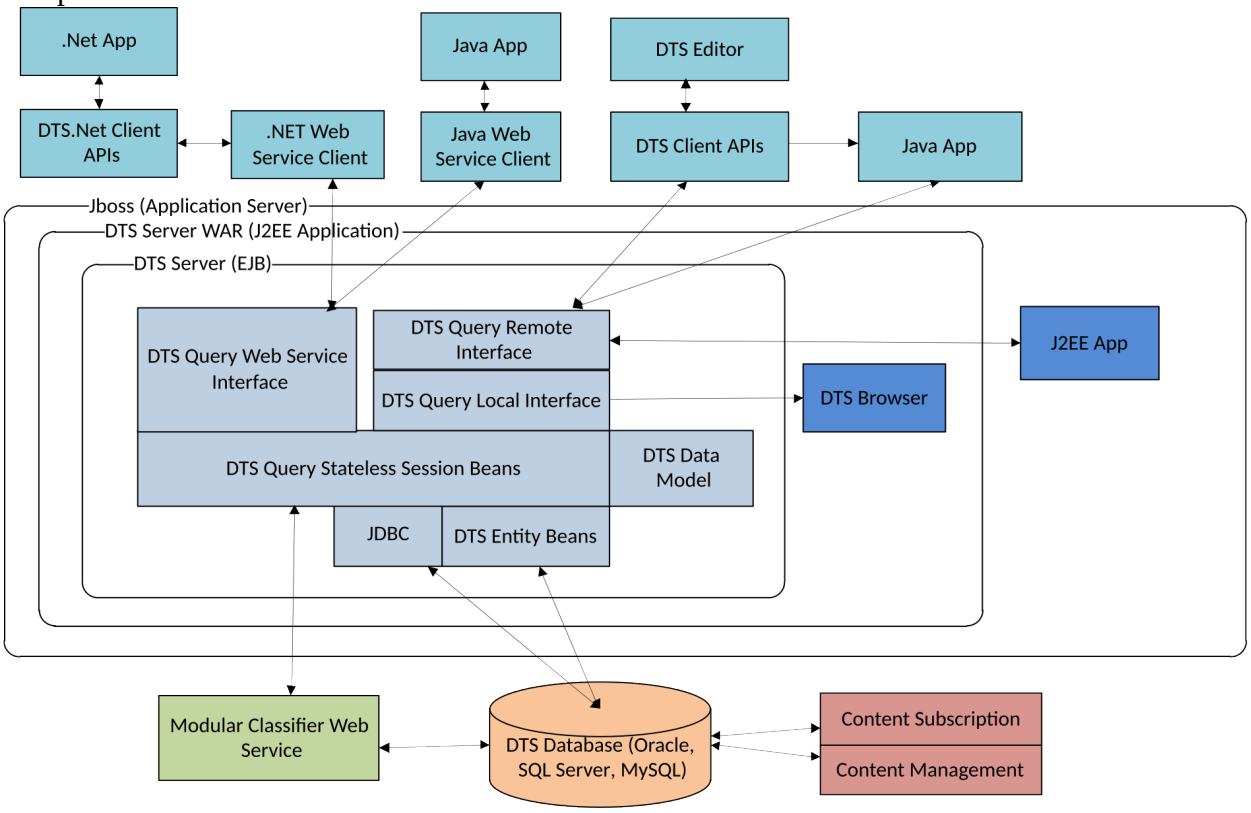
© 2026 Apelon, Inc.

E. Apelon DTS 4 Server

The Apelon DTS 4 Server is a web application that consists of the following components:

- A set of Enterprise JavaBeans (EJB) to provide access to the DTS terminology knowledgebase residing in a database.
- A web browser for viewing terminology content.

The figure below shows the relationship between the DTS 4 Server and other application components.



DTS 4 Architecture

The following sections describe how to install the DTS 4 server and required supporting software.

E.1 Getting Started with Apelon DTS 4 Server

To prepare the Apelon DTS 4 Server, the following steps must be performed:

- Set up Java 8 JDK environment.
- Set up WildFly or JBoss EAP Application Server.
- Configure WildFly or JBoss EAP to run as the Apelon DTS 4 Server.

© 2026 Apelon, Inc.

E.2 Java Environment Setup for DTS 4 Server and Client

Windows – OpenJDK 8 installation

WildFly and JBoss EAP application server installations require Java 8 JDK. We recommend using OpenJDK 8u492 or later from Eclipse Temurin. Must use the 64-bit version of the OpenJDK 8.

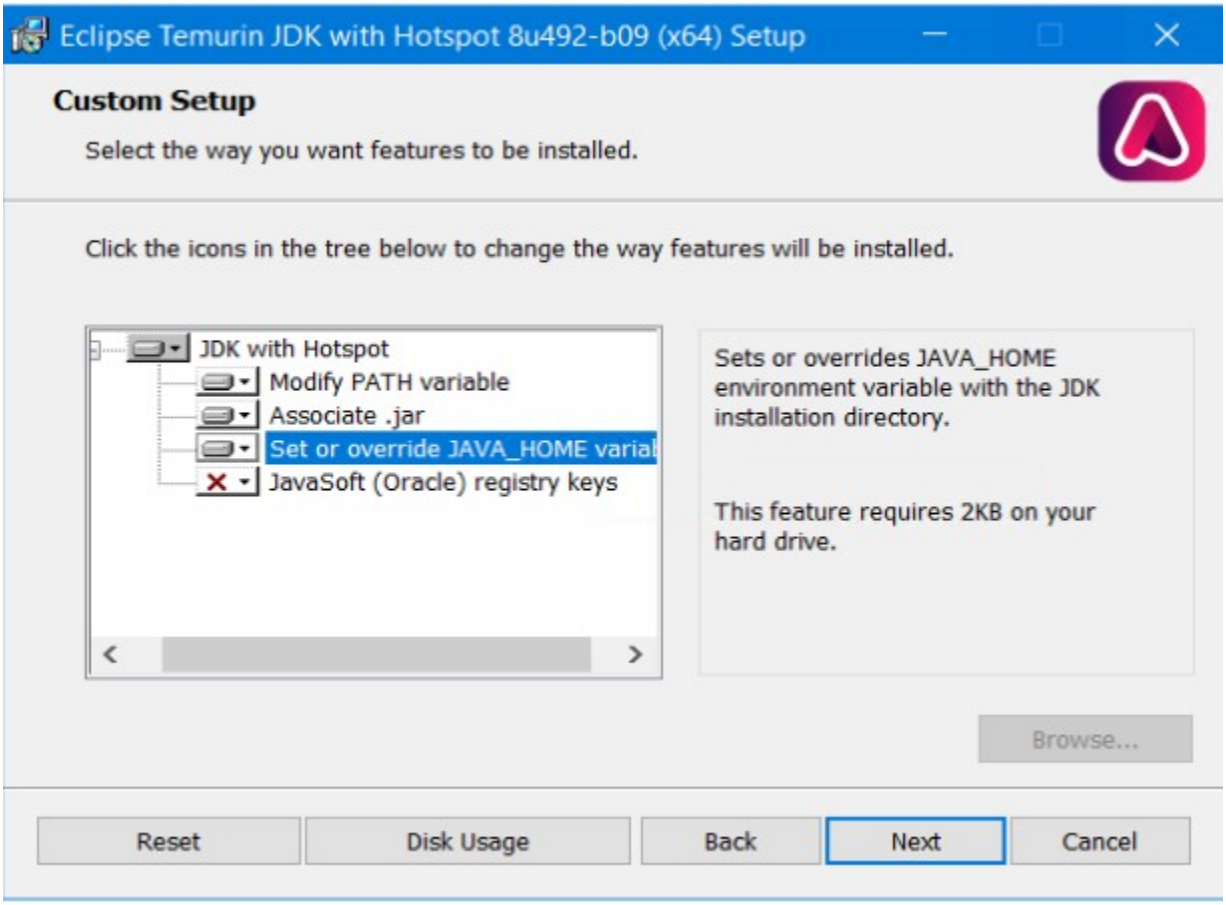
> ***NOTE:*** *DTS 4.9.0 has been verified against the following releases: 8u492b09,* and *8u504b01.*
>
> These steps are only required for server installations. The DTS 4 Editor installation includes Eclipse Temurin OpenJDK 8 JRE isolated in the DTS 4.9.0 installation location on Windows, so if you are not setting up the server you do not need to manually install OpenJDK 8 on Windows.

Download the Eclipse Temurin OpenJDK 8 from the Adoptium download page: https://adoptium.net/temurin/releases/?version=8

Download the Windows x64 JDK MSI installer. In the example below we're using the following installer: OpenJDK8U-jdk_x64_windows_hotspot_8u504b01.msi

© 2026 Apelon, Inc.

When installing the OpenJDK 8 on Windows, install for all users of the machine and include selecting the `Set or override JAVA_HOME variable` option as shown below.

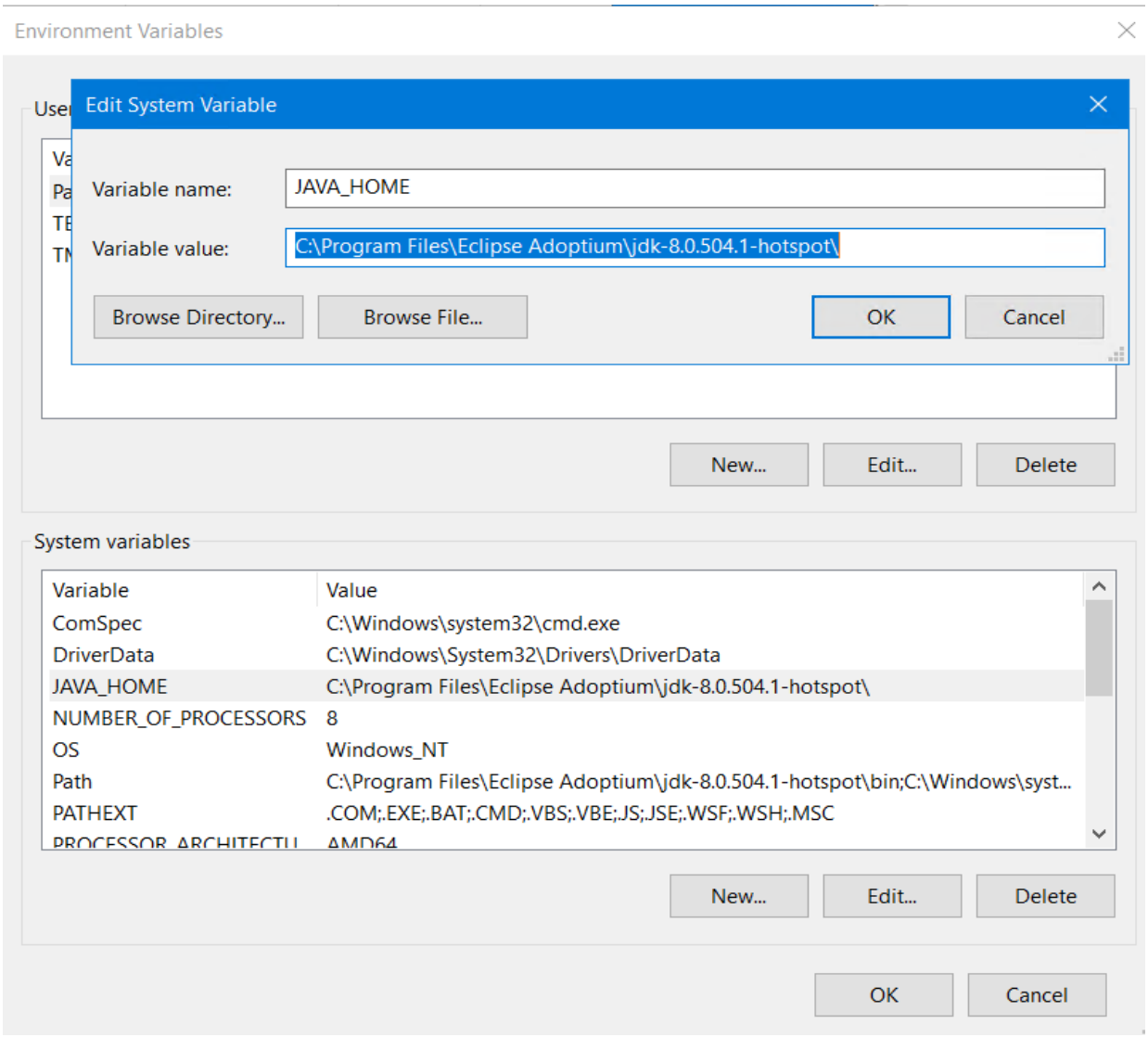


When the installation is complete ensure the environment variable named `JAVA_HOME`, which is directly referenced by JBoss EAP and WildFly startup scripts, was added by the Windows OpenJDK 8 installer. If not, add it as instructed below.
For Windows Server 2022 & 2019 follow these steps:

1. In Windows Search bar search for **Env** and choose the **Edit the system environment variables**.
2. Click on **Environment Variables…** button.
3. Ensure the JAVA_HOME variable is present and set to the path of the installed JDK. If it's not, then In the **System variables** section click on **New…** button.

Give the **Variable name** a value of 'JAVA_HOME' and give the **Variable value** a value of the path to your OpenJDK 8 installation. An example is shown below:

© 2026 Apelon, Inc.

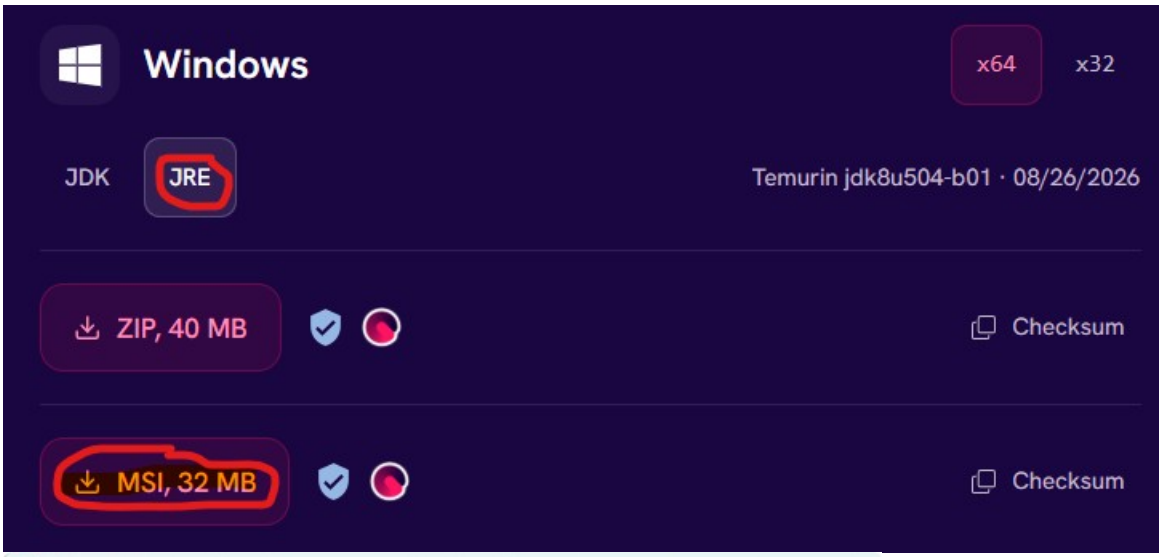


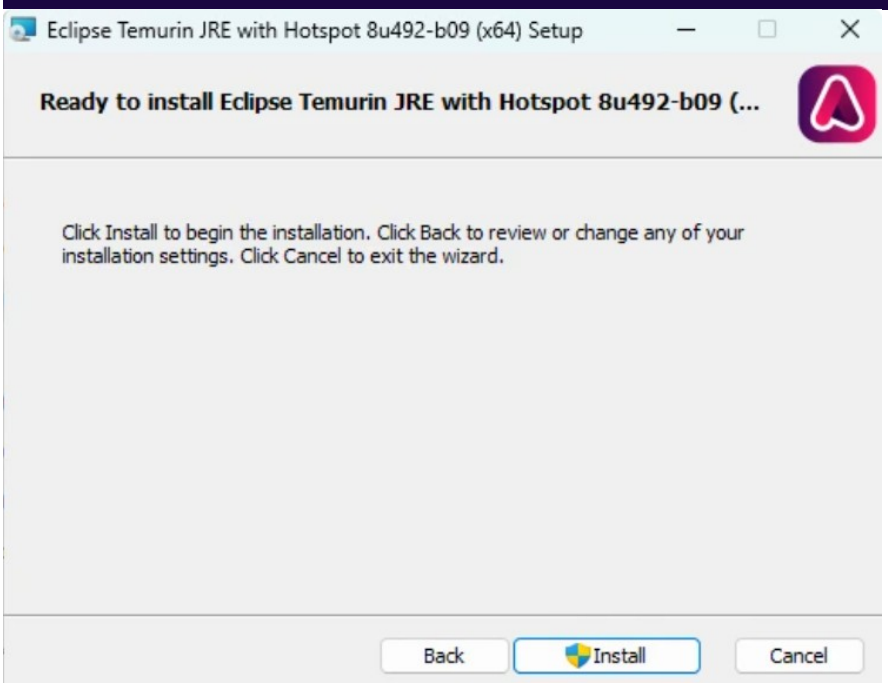
Windows – How to update the default OpenJDK 8 JRE installed with DTS 4.9.0 Editor

The DTS Editor Version 4.9.0 now comes bundled with the OpenJDK 8 JRE (Eclipse Temurin) Version 1.8.0_482. Since OpenJDK 8 JRE updates can occur quarterly, customers may want to download and install a newer OpenJDK 8 JRE version in order to get the latest security updates from Adoptium: https://adoptium.net/temurin/releases/?version=8&os=any&arch=any

Be sure to download the OpenJDK 8 JRE x64 MSI instller and not the JDK. Then install the JRE following all the default values in the wizard. When you reach the last page of the installation wizard, click the Install button.

© 2026 Apelon, Inc.

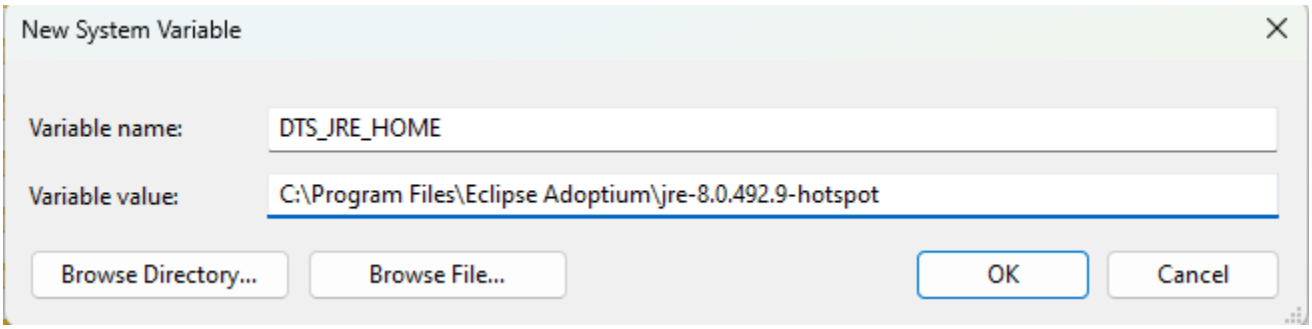




Follow these steps to override the default JRE version that comes with the DTS 4.9.0 Editor with a newer version of Eclipse Temurin OpenJDK 8 JRE on Windows OS:

1. Click on Windows Start icon in taskbar, type “env” into the search bar
2. When you see “Edit the system environment variables”, click “Open”
3. In the System Properties panel, click the button labeled “Environment Variables …”
4. In the System Variables subpanel (bottom half), click the button labeled “New…”
5. For “Variable name” enter: DTS_JRE_HOME
6. For “Variable value” enter the file path to your Java 8 JRE that you installed. Click “Browse Directory…” button if you do not know the file path.
7. Click OK button on the New System Variable panel

© 2026 Apelon, Inc.



Example using installed file path for Eclipse Temurin JRE version 8u492-b09

8. Click OK button on the Environment Variables panel
9. Click OK button on the System Properties panel
10. Start the DTS Editor and verify new OpenJDK 8 JRE version in the "About Apelon DTSEditor" Panel by navigating from top menubar "Help" to "About Apelon DTSEditor …"

Optional: If security scans still flag the old JRE version that was bundled with DTS as a vulnerability, delete the Apelon installed JRE folder and its contents from where it was originally installed (i.e. C:\Program Files\Apelon DTS 4.9.0\java\jre).

Linux – OpenJDK 8 installation

You must obtain and install Version 1.8 of the **OpenJDK** for Linux that is appropriate for the Application Server being installed as indicated in the **Minimum Software Requirements (Server)** section of this documentation. While you can go online and get the Eclipse Temurin OpenJDK 8 Linux x64 tar.gz file from Adoptium, the easier way for Alma Linux 8 and RHEL 8 users is to download and install the Red Hat build of OpenJDK 8 using the dnf command (sudo privileges required):

```
sudo dnf install java-1.8.0-openjdk -y
```

When installing on Linux and you have not yet set up Java as part of DTS 4 installation, export environment variable JAVA_HOME in login script **.bash_profile** as follows:

- Edit the login script **.bash_profile** to export environment variables **JAVA_HOME** and **PATH**

```
JAVA_HOME="/usr/lib/jvm/jre-1.8.0-openjdk"
PATH=$JAVA_HOME/bin:$PATH:$HOME/bin
export JAVA_HOME
export PATH
```

- **JAVA_HOME** is the directory where you installed your JDK

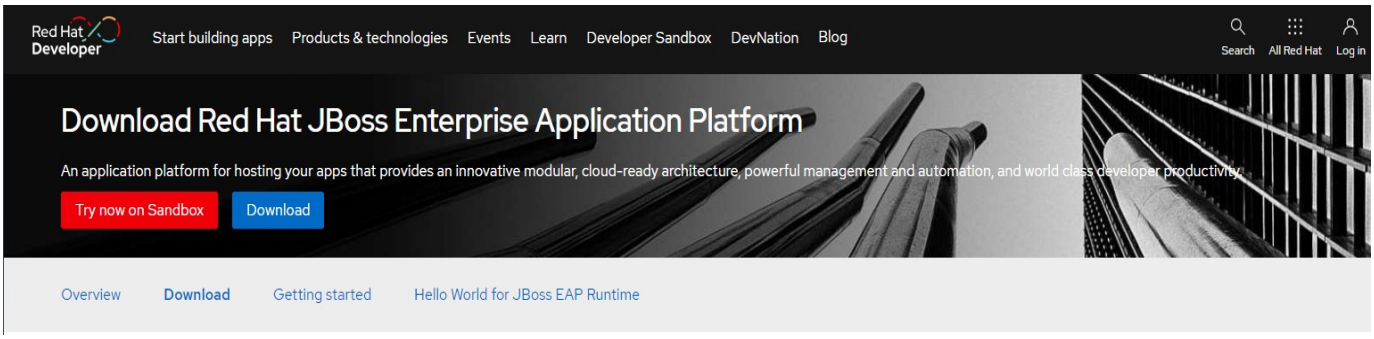
© 2026 Apelon, Inc.

F. JBoss EAP 7.4 Setup

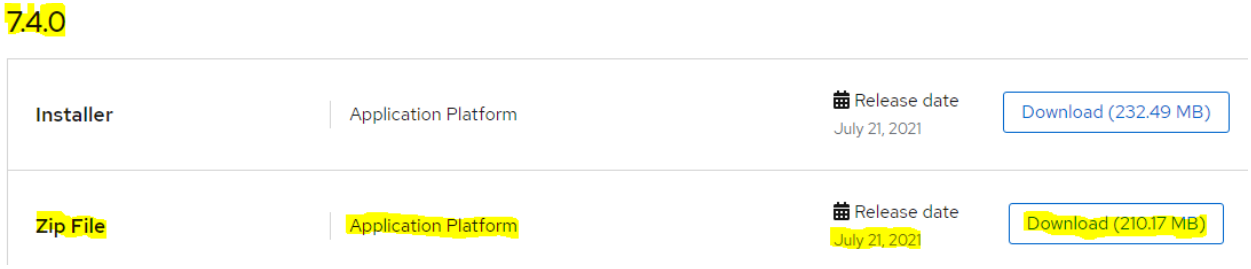
Note: JBoss EAP 7.4 requires the use of Java 8 JDK. See Java Environment Setup for a Server section above for additional details.

The JBoss EAP 7.4 Application Server can be downloaded from the Red Hat Developer download site: https://developers.redhat.com/products/eap/download/

If deploying JBoss EAP into a production environment, you can obtain a Red Hat subscription which will give you access to customer support from Red Hat for your JBoss EAP production environment.



For Windows and Linux, select the **`7.4.0` July 21, 2021 Application Platform ZIP file** to download.

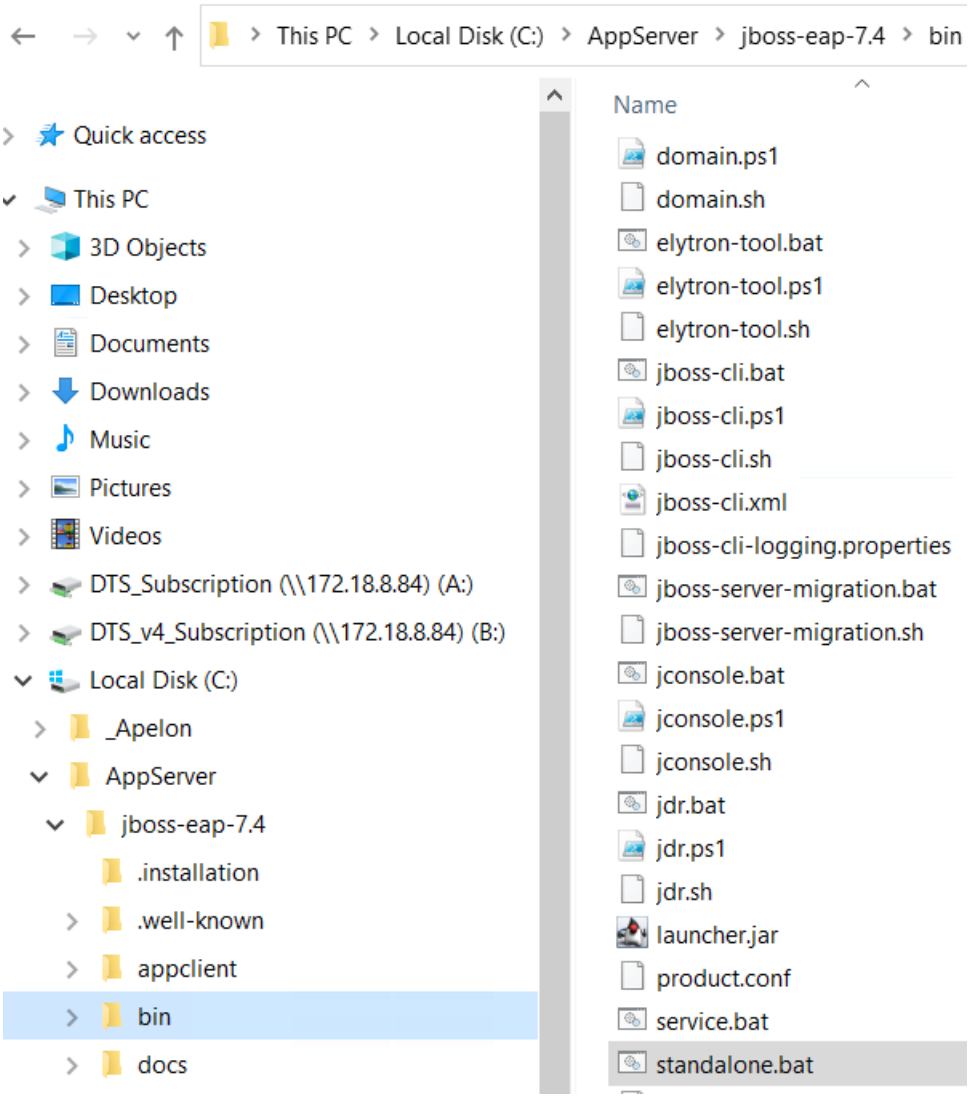


NOTE: If you will also be installing the **Update 23 patch**, obtain the Update 23 patch file "jboss-eap-7.4.23-patch.zip" from your Red Hat subscription.

To install JBoss EAP 7.4.0 just extract the compressed archive. **Unzip the JBoss EAP 7.4.0 archive into a folder with a pathname that does NOT contain any spaces.** For example in Windows OS, extracting to the `C:\AppServer` folder will place the JBoss EAP 7.4.0 files in the `C:\AppServer\jboss-eap-7.4` folder. We will identify this folder in the rest of the document as <JBossEAP74_HOME>. It is not necessary to create <JBossEAP74_HOME> as an environment variable (for Linux OS it will be installed in the `../AppServer/jboss-eap-7.4` folder).

To verify the JBoss EAP 7.4 install, go to the `<JBossEAP74_HOME>\bin` folder and run `standalone.bat` (or `<JBossEAP74_HOME>/bin/standalone.sh` for Linux OS).

© 2026 Apelon, Inc.

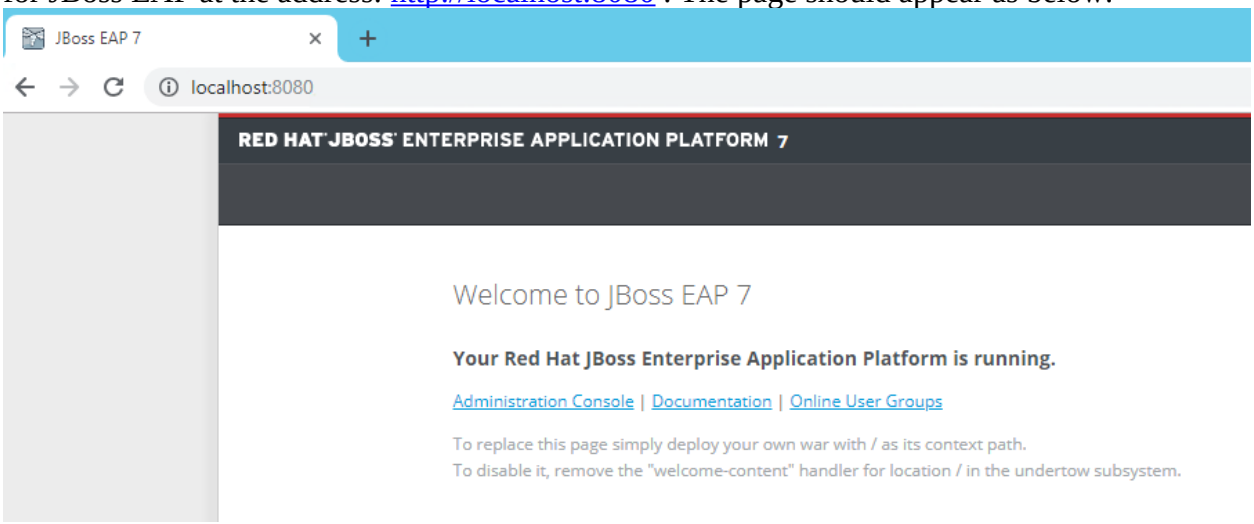


Upon successful start, the message in the last lines will indicate success. Here is a sample startup screen:

```
14:24:57,249 INFO  [org.wildfly.extension.undertow] (MSC service thread 1-1) Queuing requests.
14:24:57,265 INFO  [org.wildfly.extension.undertow] (MSC service thread 1-1) WFLYUT0018: Host default-host starting
14:24:57,359 INFO  [org.wildfly.extension.undertow] (MSC service thread 1-6) WFLYUT0006: Undertow HTTP listener default listening on 127.0.0.1:8080
14:24:57,437 INFO  [org.jboss.as.jaxrs] (ServerService Thread Pool -- 52) WFLYRS0016: RESTEasy version 3.15.1.Final-redhat-00001
14:24:57,468 INFO  [org.jboss.as.ejb3] (MSC service thread 1-3) WFLYEJB0493: Jakarta Enterprise Beans subsystem suspension complete
14:24:57,578 INFO  [org.jboss.as.connector.subsystems.datasources] (MSC service thread 1-5) WFLYJCA0001: Bound data source [java:jboss/datasources/ExampleDS]
14:25:03,968 INFO  [org.jboss.as.patching] (MSC service thread 1-5) WFLYPAT0050: JBoss EAP cumulative patch ID is: base, one-off patches include: none
14:25:03,984 WARN  [org.jboss.as.domain.management.security] (MSC service thread 1-1) WFLYDM0111: Keystore C:\AppServer\jboss-eap-7.4\standalone\configuration\appli
cation.keystore not found, it will be auto generated on first use with a self signed certificate for host localhost
14:25:04,000 INFO  [org.jboss.as.server.deployment.scanner] (MSC service thread 1-6) WFLYDS0013: Started FileSystemDeploymentService for directory C:\AppServer\jbos
s-eap-7.4\standalone\deployments
14:25:04,031 INFO  [org.wildfly.extension.undertow] (MSC service thread 1-4) WFLYUT0006: Undertow HTTPS listener https listening on 127.0.0.1:8443
14:25:05,656 INFO  [org.jboss.ws.common.management] (MSC service thread 1-1) JBWS022052: Starting JBossWS 5.4.2.Final-redhat-00001 (Apache CXF 3.3.9.redhat-00001)
14:25:05,797 INFO  [org.jboss.as.server] (Controller Boot Thread) WFLYSRV0212: Resuming server
14:25:05,812 INFO  [org.jboss.as] (Controller Boot Thread) WFLYSRV0025: JBoss EAP 7.4.0.GA (WildFly Core 15.0.2.Final-redhat-00001) started in 34251ms - Started 317
 of 556 services (343 services are lazy, passive or on-demand)
14:25:05,812 INFO  [org.jboss.as] (Controller Boot Thread) WFLYSRV0060: Http management interface listening on http://127.0.0.1:9990/management
14:25:05,812 INFO  [org.jboss.as] (Controller Boot Thread) WFLYSRV0051: Admin console listening on http://127.0.0.1:9990
```

© 2026 Apelon, Inc.

To verify that the server is reachable, you can point your browser to the default welcome page for JBoss EAP at the address: http://localhost:8080 . The page should appear as below:



After you have verified the server is reachable select the JBoss EAP command window and then press `Ctrl+C`. You will be prompted to terminate the batch job, type **y** and hit **enter** to stop JBoss EAP.

F.1 JBoss EAP 7.4 Update 23 patch

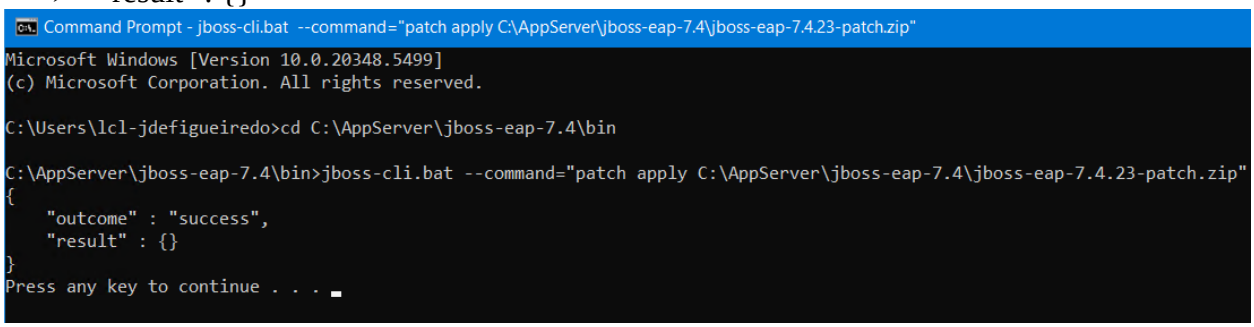
Windows OS: To install the JBoss EAP 7.4 Update 23 patch, copy the "jboss-eap-7.4.23-patch.zip" file to the `<JBossEAP74_HOME>\ folder.`

`In a Windows Command Prompt window perform the following:`

- C:\Windows\system32>cd C:\AppServer\jboss-eap-7.4\bin
- C:\AppServer\jboss-eap-7.4\bin>jboss-cli.bat --command="patch apply C:\AppServer\jboss-eap-7.4\jboss-eap-7.4.23-patch.zip"

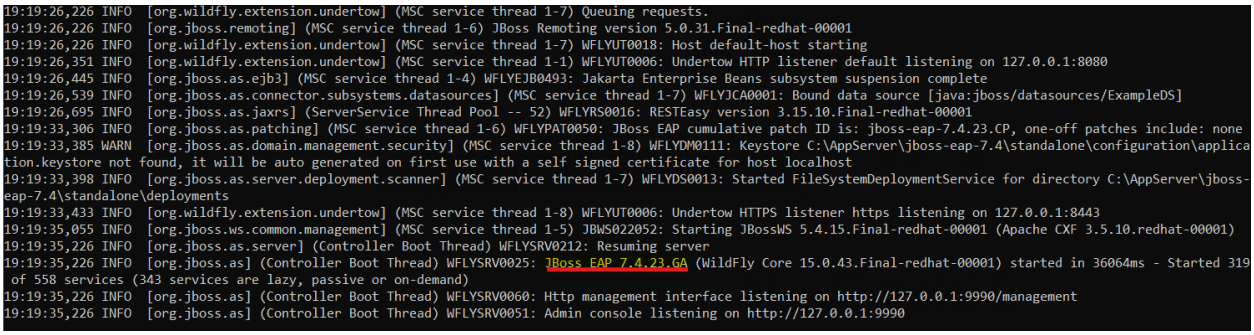
If the patch application is successful, you will receive the messages shown here:

- "outcome" : "success",
- "result" : {}



Run `<JBossEAP74_HOME>\bin\standalone.bat` again, as described above, to ensure the server is still running successfully. The server log should now report version "JBoss EAP 7.4.23 GA".

© 2026 Apelon, Inc.



Linux OS: To install the JBoss EAP 7.4 Update 23 patch, copy the "jboss-eap-7.4.23-patch.zip" file to the `<JBossEAP74_HOME>/ folder.`
`In the <JBossEAP74_HOME>/bin folder run the following:`

- ./jboss-cli.sh --command="patch apply [path to <JBossEAP74_HOME>]/jboss-eap-7.4.23-patch.zip"

If the patch application is successful, you will receive the messages shown here:

- "outcome" : "success",
- "result" : {}

Run `<JBossEAP74_HOME>/bin/standalone.sh` again, as described above, to ensure the server is still running successfully. The server log should now report version "JBoss EAP 7.4.23 GA".

F.2 Memory Configuration

The Apelon DTS Server performs better when additional memory is assigned to JBoss EAP. To increase the memory utilized, open `<JBossEAP74_HOME>\bin\standalone.conf.bat` (or `<JBossEAP74_HOME>/bin/standalone.conf` for Linux OS) and modify the JVM memory allocation pool parameters as shown below:

NOTE: *We recommend a memory limit of at least 4GB. If your DTS environment will be running Modular Classification, you will require a larger allocation to your JVM. On systems utilizing Modular Classification with 16 GB of RAM or more, a setting of at least 8GB (4 GB min) is recommended.*

For Windows OS:

```
rem # JVM memory allocation pool parameters - modify as appropriate.
set "JAVA_OPTS=-Xms1G -Xmx4G -XX:MetaspaceSize=512M
-XX:MaxMetaspaceSize=4G"
```

For Linux OS:

```
# Specify options to pass to the Java VM.
#
if [ "x$JAVA_OPTS" = "x" ]; then
   JAVA_OPTS="-Xms1303m -Xmx4G -XX:MetaspaceSize=512M
-XX:MaxMetaspaceSize=4G
```

© 2026 Apelon, Inc.

F.3 JBoss EAP Management User

You must create a JBoss EAP Management user (e.g., **apelonadmin/apelon**) – This user administers the JBoss EAP server. Go `to` **`<JBossEAP74_HOME>\bin`** and run **`add-user.bat`** (or **`<JBossEAP74_HOME>/bin/add-user.sh`** for Linux OS). Follow the steps below.

- Select Management User. **(a):** hit **enter** to accept default

```
What type of user do you wish to add?
 a) Management User (mgmt-users.properties)
 b) Application User (application-users.properties)
(a): a
```

- Realm (**ManagementRealm)** will be used by default.
- Enter the desired Username. i.e., **apelonadmin**

```
Username : apelonadmin
```

- Enter the desired Password. The password cannot be same as the username. i.e., **apelon**
- *Note: JBoss EAP will prompt you if your password doesn't meet the recommended criteria. You may type "**yes**" and press "**enter**" to accept the password, despite this.*

```
WFLYDM0099: Password should have at least 8 characters!
Are you sure you want to use the password entered yes/no?
```

- Re-enter Password. i.e., **apelon**

```
Password :
Re-enter Password :
```

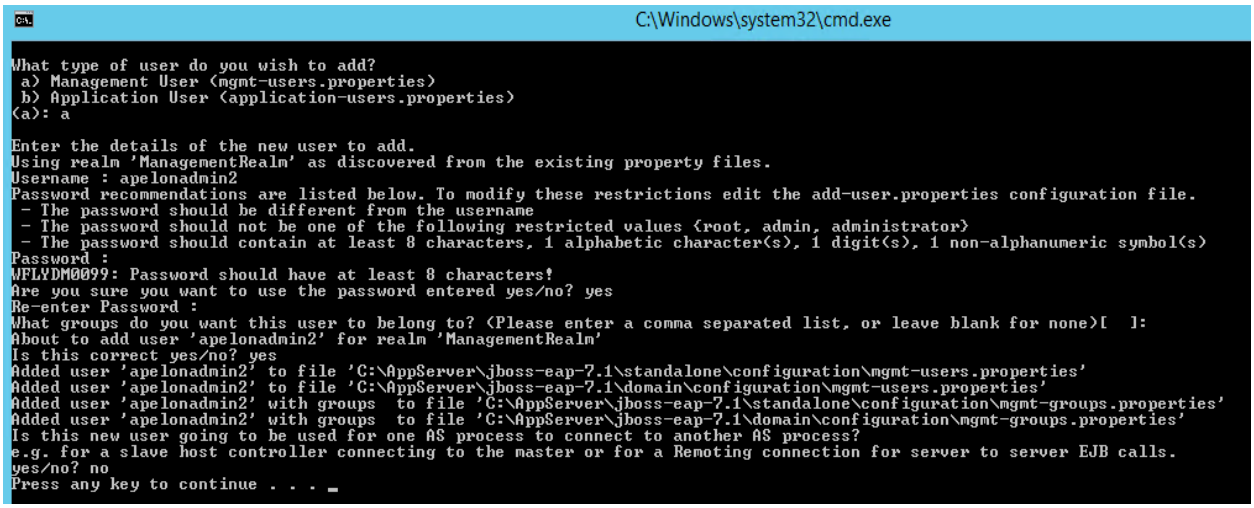
- JBoss EAP will prompt you to add the user to any groups. For the Application Server administrator user, no groups are necessary, you may hit "**enter**" to proceed.
- Type "**yes**" to add the user and hit **enter**.

```
About to add user 'apelonadmin' for realm 'ManagementRealm'
Is this correct yes/no? yes
```

- JBoss EAP supports an AS to AS configuration between multiple instances of the application server. When prompted if the user will be used to connect another AS process, for DTS purposes, you may type "**no**" and press "**enter**".

© 2026 Apelon, Inc.

See the screen shot below to confirm:



F.4 JBoss EAP Configuration for Apelon DTS 4 Server

F.4.1 Migrate JBoss EAP DTS users from existing JBoss EAP 7.1 server

If you are currently Running DTS and are setting up JBoss EAP 7.4 to replace your existing JBoss EAP 7.1 server environment, you can migrate your existing DTS users by performing the following steps:

1. Ensure the new JBoss EAP Application Server is stopped.
2. Locate the **application-roles.properties** and **application-users.properties** files in your existing Application Server installation directory. There are 2 instances of each of these files, one in **<AppServer Home>\domain\configuration** and the other in **<AppServer Home>\standalone\configuration**.
3. Copy these files and place them (overwriting if prompted) in **<JBossEAP74_HOME>\domain\configuration** and **<JBossEAP74_HOME>\standalone\configuration** respectively.
4. Skip to section Apelon DTS Server Deployment

Note: Since the DTS User Manager users are contained within the DTS Database, no modifications will be necessary for the DTS User Manager users, provided the Application Server users migrate successfully

F.4.2 JBoss EAP DTS Admin User Configuration

JBoss EAP Application Users must be created for every individual who will connect to *the **Apelon DTS Server via the DTS Browser or DTS Editor*** and will require access to the ***DTS Editor User Manager*** to setup ***DTS User Roles and Permissions***. These JBoss EAP users must have the group "**apelondtsadmin**".

Go to `<JBossEAP74_HOME>\bin` and run `add-user.bat` (or `<JBossEAP74_HOME>/bin/add-user.sh` for Linux OS). Follow the steps below.

© 2026 Apelon, Inc.

- Select Application User. Type **b** and hit **enter**

```
What type of user do you wish to add?
 a) Management User (mgmt-users.properties)
 b) Application User (application-users.properties)
(a): b
```

- Realm (**ApplicationRealm)** is used by default.
- Enter the desired Username. e.g., **dtsadminuser**

```
Username : dtsadminuser
```

- Enter the desired Password. The password cannot be same as the username. e.g., **dtsadmin**
- *Note: JBoss EAP will prompt you if your password doesn't meet the recommended criteria. You may type "yes" and press "enter" to accept the password, despite this.*

```
WFLYDM0099: Password should have at least 8 characters!
Are you sure you want to use the password entered yes/no? _
```

- Re-enter Password. e.g, **dtsadmin**

```
Are you sure you want to use the password entered yes/no? yes
Re-enter Password :
```

- JBoss EAP will prompt you to add the user to any groups. For the DTS administrator user, you will need to add to the "apelondtsadmin" and optionally "apelondts" groups, separated by a comma.

```
What groups do you want this user to belong to? (Please enter a comma separated list, or leave blank
 for none)[  ]: apelondtsadmin,apelondts
```

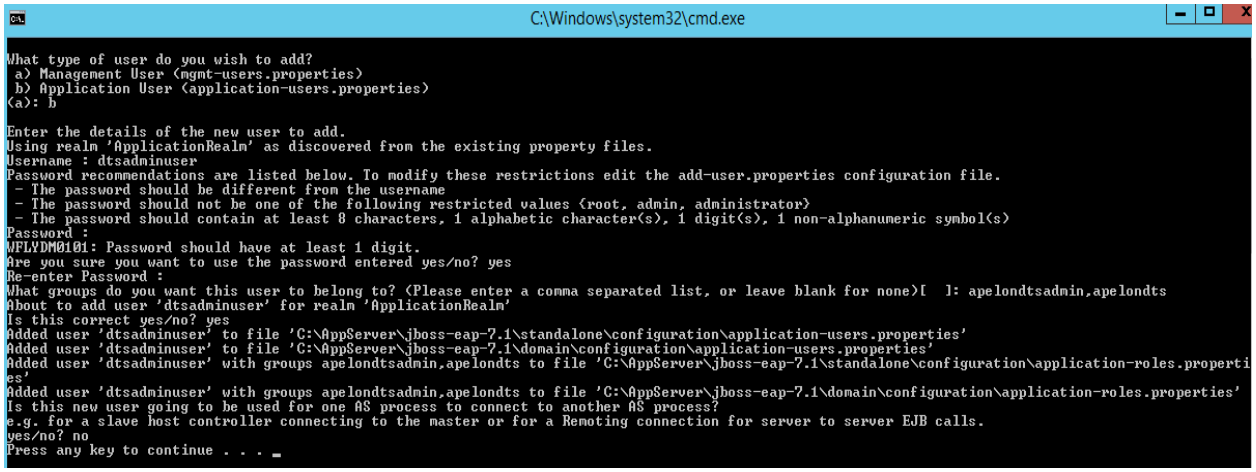
- Type "**yes**" to add the user and hit **enter**.

```
About to add user 'dtsadminuser' for realm 'ApplicationRealm'
Is this correct yes/no? yes
```

- JBoss EAP supports an AS to AS configuration between multiple instances of the application server. When prompted if the user will be used to connect another AS process, for DTS purposes, you may type "no" and press enter.

```
Is this new user going to be used for one AS process to connect to another AS process?
e.g. for a slave host controller connecting to the master or for a Remoting connection for server to
 server EJB calls.
yes/no? no
```

See the screen shot below to confirm:



© 2026 Apelon, Inc.

F.4.3 JBoss EAP DTS User Configuration

JBoss EAP Application Users must be created for every individual who will connect to the ***Apelon DTS Server via either the DTS Browser or DTS Editor*** and ***will not require access to the DTS Editor User Manager***. These JBoss EAP users must have the group **"apelondts".**
Go to `<JBossEAP74_HOME>\bin` and run `add-user.bat` (or `<JBossEAP74_HOME>/bin/add-user.sh` for Linux OS). Follow the steps below.

- Select Application User. Type **b** and hit **enter**

```
What type of user do you wish to add?
 a) Management User (mgmt-users.properties)
 b) Application User (application-users.properties)
(a): b
```

- Realm (**ApplicationRealm)** is used by default.
- Enter the desired Username. e.g, **dtsuser**

```
Username : dtsuser
```

- Enter the desired Password. The password cannot be same as the username. e.g., **dts**
- *Note: JBoss EAP will prompt you if your password doesn't meet the recommended criteria. You may type "yes" and press "enter" to accept the password, despite this.*

```
WFLYDM0099: Password should have at least 8 characters!
Are you sure you want to use the password entered yes/no? _
```

- Re-enter Password. e.g., **dts**

```
Are you sure you want to use the password entered yes/no? yes
Re-enter Password :
```

- JBoss EAP will prompt you to add the user to any groups. For the standard DTS users, you will need to add to the "apelondts" group.

```
What groups do you want this user to belong to? (Please enter a comma separated list, or leave blank
 for none)[  ]: apelondts
```

- Type "**yes**" to add the user and hit **enter**.

```
About to add user 'dtsadminuser' for realm 'ApplicationRealm'
Is this correct yes/no? yes
```

- JBoss EAP supports an AS to AS configuration between multiple instances of the application server. When prompted if the user will be used to connect another AS process, for DTS purposes, you may type "no" and press enter.

© 2026 Apelon, Inc.

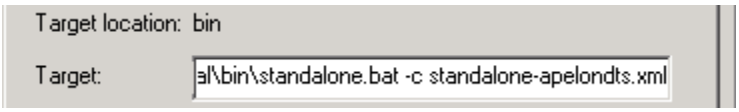
F.5 Apelon DTS 4.9.0 Server Deployment

1. Copy the **standalone-apelondts.xml** file from
   `<DTS_HOME>\server\jboss-eap\standalone\configuration`
   to the `<JBossEAP74_HOME>\standalone\configuration` folder.

2. Create a shortcut for `<JBossEAP74_HOME>\bin\standalone.bat`. Rename this to something like "Apelon DTS JBoss EAP".

3. Right-click on the shortcut and go to Properties. Modify target as follows:

```
<JBossEAP74_HOME>\bin\standalone.bat -c standalone-apelondts.xml
```



4. Use this "Apelon DTS JBoss EAP" shortcut for running JBoss EAP configured for Apelon DTS.

5. For launching on Linux OS use the following terminal command from `<JBossEAP74_HOME>/bin/`:

   ```
   standalone.sh -c standalone-apelondts.xml
   ```

© 2026 Apelon, Inc.

F.5.1 Data Source Configuration

Apelon DTS Server requires a data source configured with JBoss EAP to connect to the database. The necessary steps are:

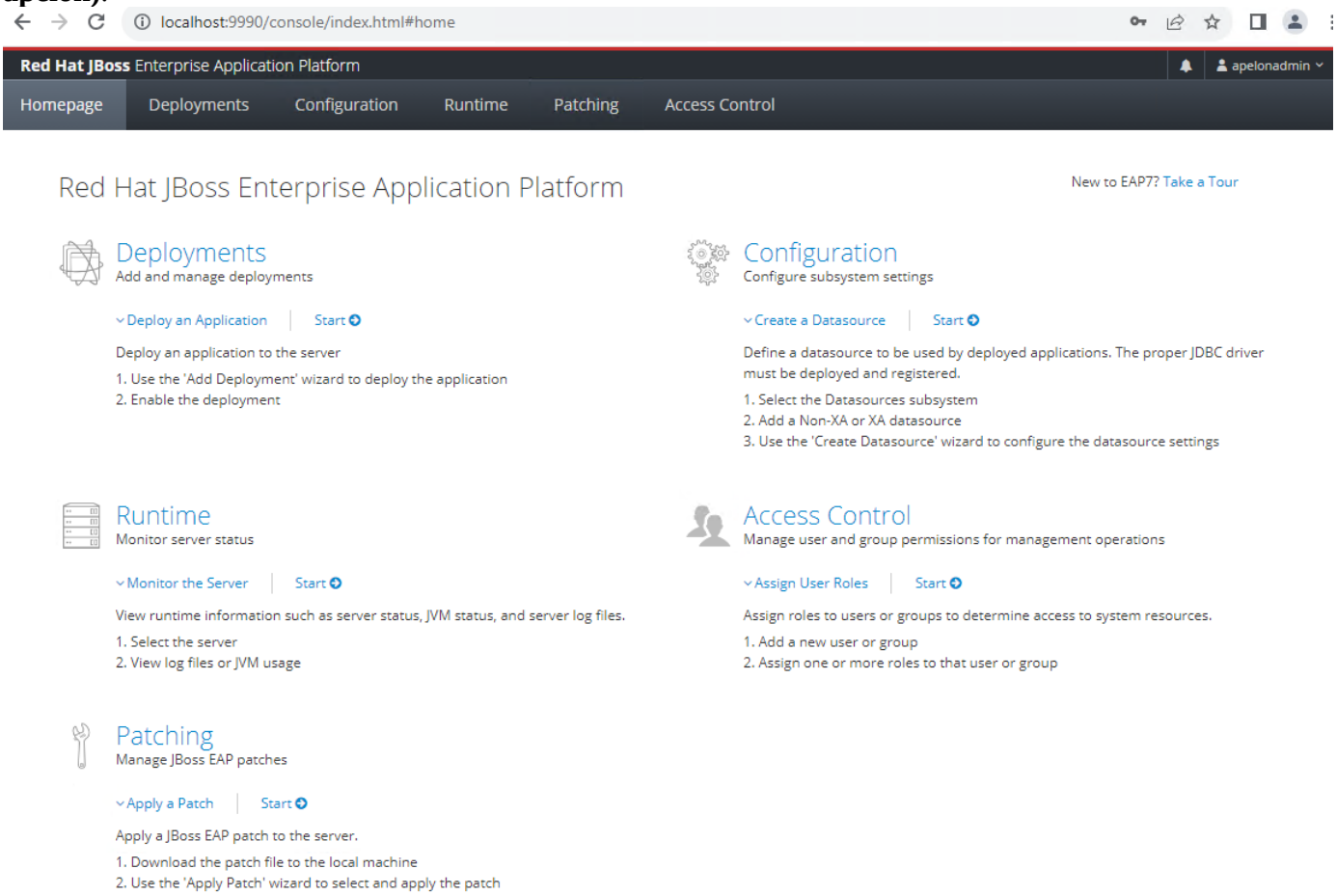
- Deploy database driver.
- Configure data source.

F.5.2 Deploy Database Driver

Start JBoss EAP using the "Apelon DTS JBoss EAP" shortcut for Windows OS (or from terminal window for Linux OS) created in the previous step. Open a browser and go to the default JBoss EAP Management URL:

```
http://localhost:9990/console/index.html
```

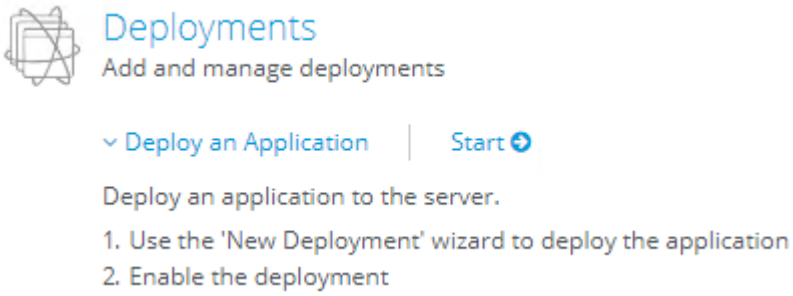
Login using the JBoss EAP Management User we created in an earlier step (i.e., **apelonadmin / apelon)**.



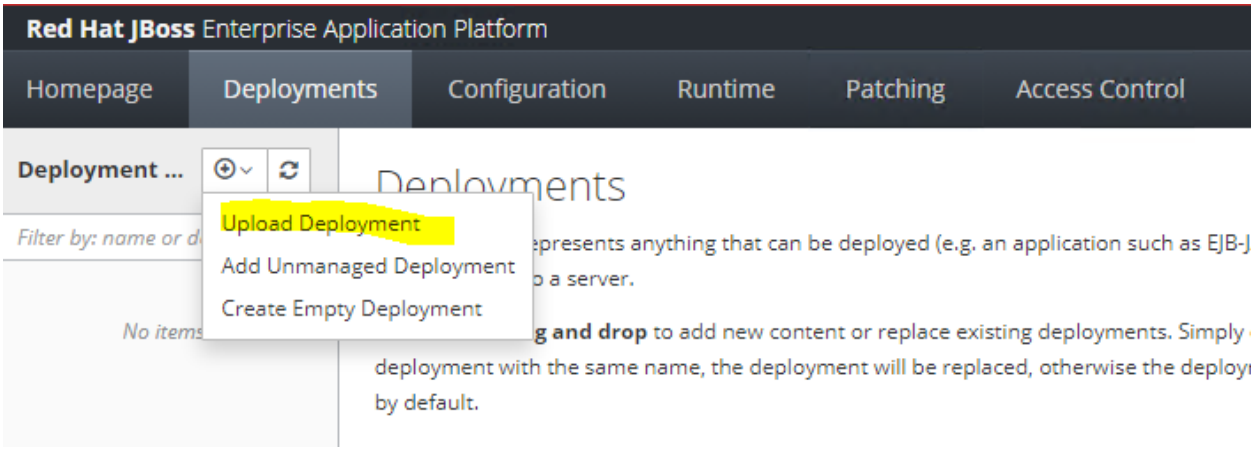
If your view does not display as shown above, refresh your browser or clear your browser cache.

© 2026 Apelon, Inc.

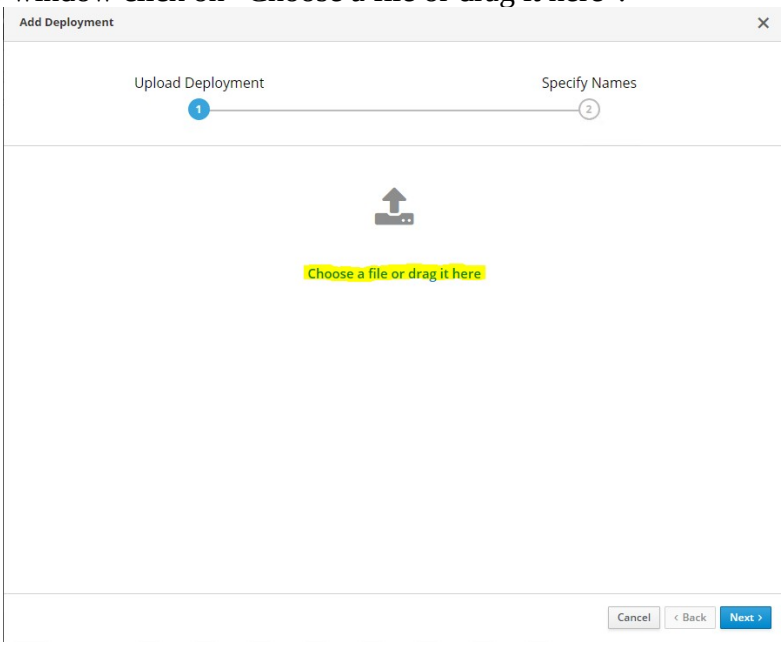
Then Under the “Deployments” header, next to “Deploy an Application” click on the Start arrow.



Then click on the dropdown button to the right of **Deployment…** in the upper left. In the pop-up window click on “Upload deployment” as shown below.



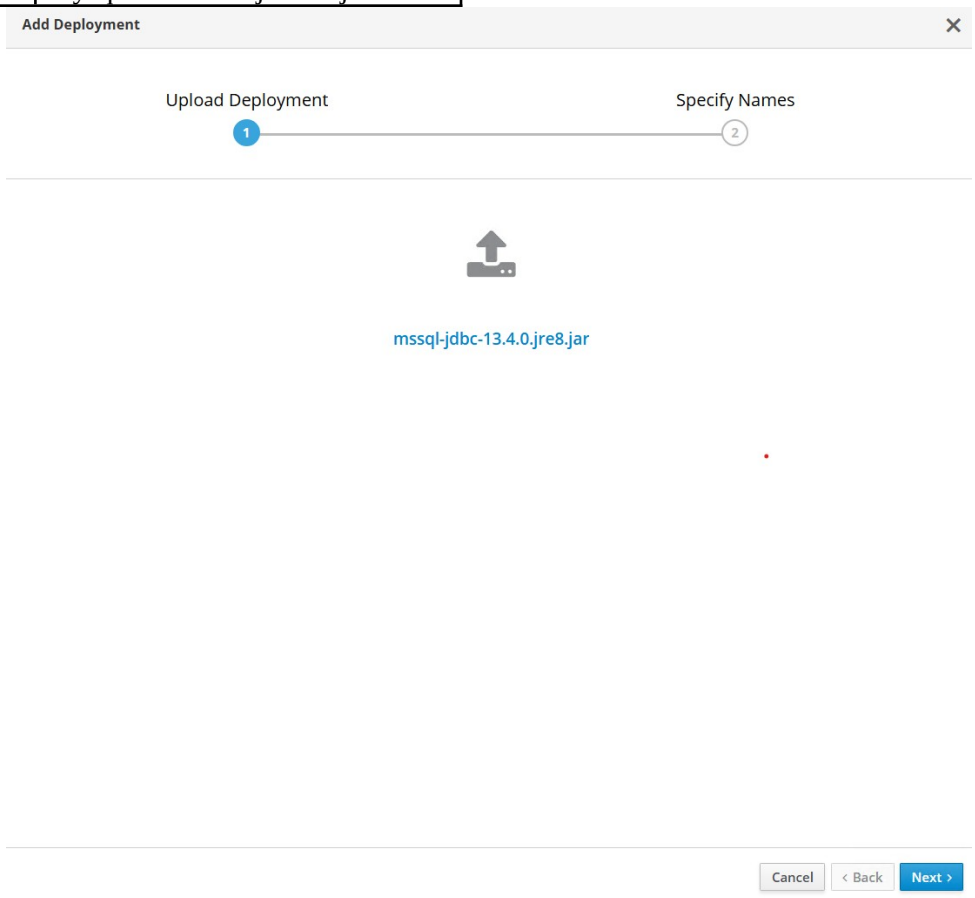
In the next pop-up window click on “Choose a file or drag it here”.



© 2026 Apelon, Inc.

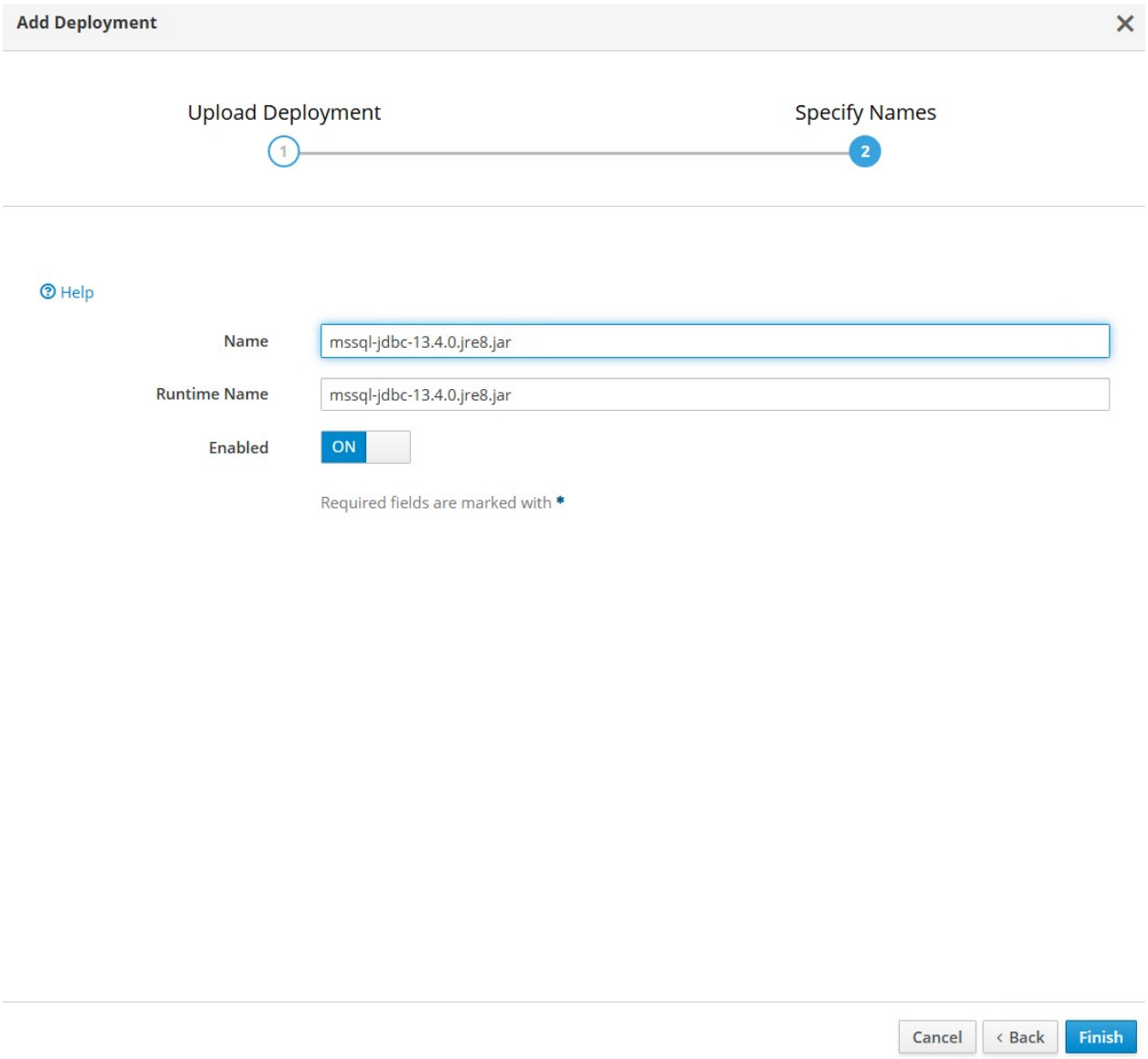
Navigate to the **<DTS_HOME>\lib** folder.
Select a Driver .jar file for the database as shown below and click **Next**.

Database	Driver
MS SQL Server 2019	mssql-jdbc-13.4.0.jre8.jar
MS SQL Server 2025	mssql-jdbc-13.4.0.jre8.jar
MySQL 8.4	mysql-connector-j-9.6.0.jar

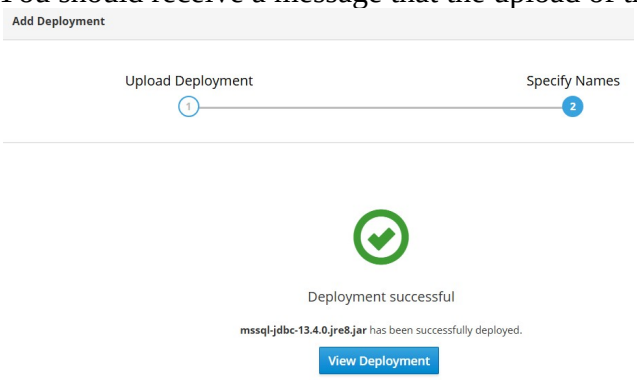


© 2026 Apelon, Inc.

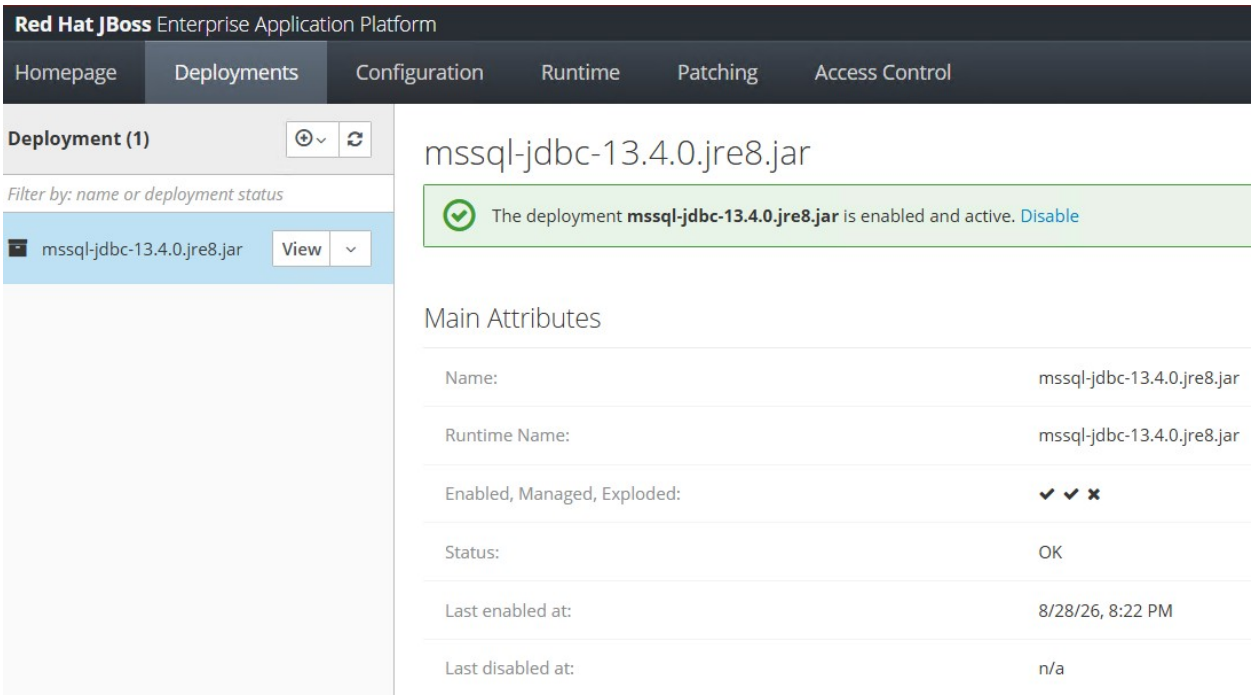
Ensure the **`Enable`** is **ON** and click “Finish”.



You should receive a message that the upload of the .jar deployment was successful.



© 2026 Apelon, Inc.

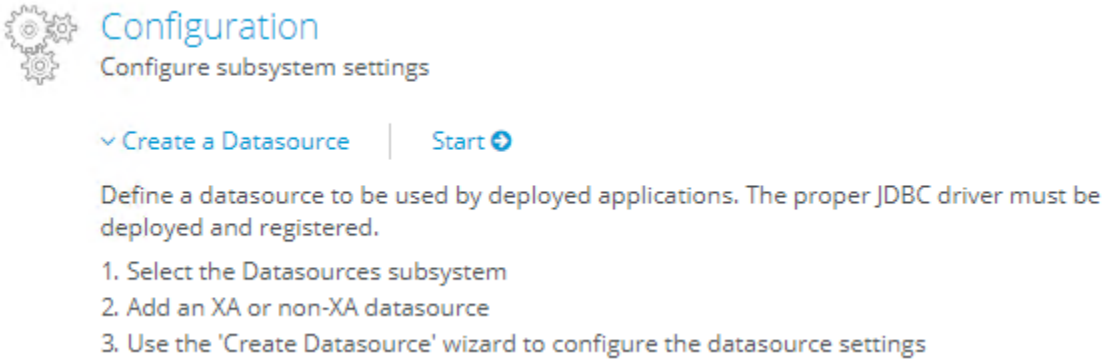


F.5.3 Configure Data Source

The Apelon DTS Server requires a data source named "**ApelonDtsDS**". This data source must be set up similar to the examples given below (*ensure the appropriate User, Password, and database name are used if they are not the values used as an example here. Also "localhost" can be replaced with the database server IP address or server name*).

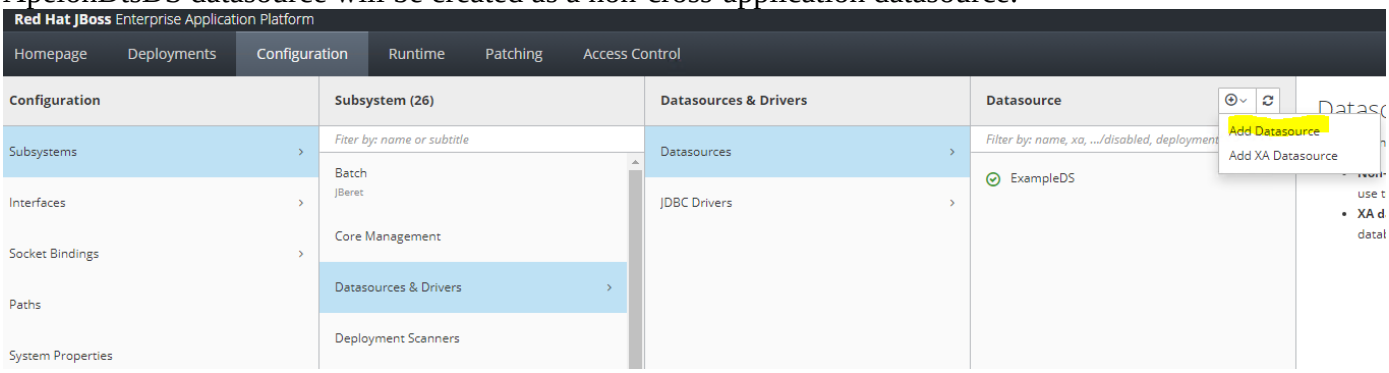
Database	User	Password	Connection URL
MS SQL Server	dts4user	dts4pass	jdbc:sqlserver://localhost:1433;trustServerCertificate=true;databasename=dts4
MySQL	dts4user	dts4pass	jdbc:mysql://localhost:3306/dts4

To create the **`ApelonDtsDS`** data source, navigate back to "Homepage" in the JBoss EAP administration console, and under the "Configuration" header, select the Start arrow next to "Create a Datasource":

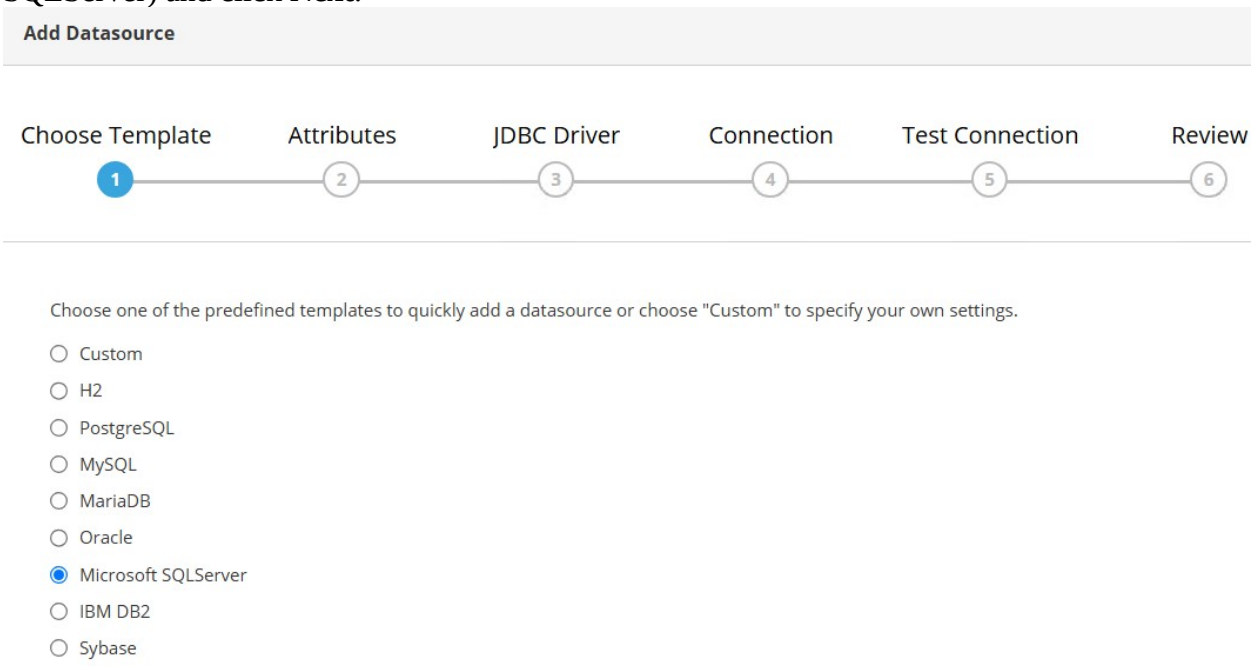


© 2026 Apelon, Inc.

In the “Configuration” column, select the “Subsystems” tab. Under the “Subsystem” column, select the “Datasources & Drivers” tab. Under the “Datasources & Drivers" column, select the “Datasources” tab.
In the “Datasource” column click on the dropdown and choose “Add Datasource”, where the ApelonDtsDS datasource will be created as a non-cross-application datasource.

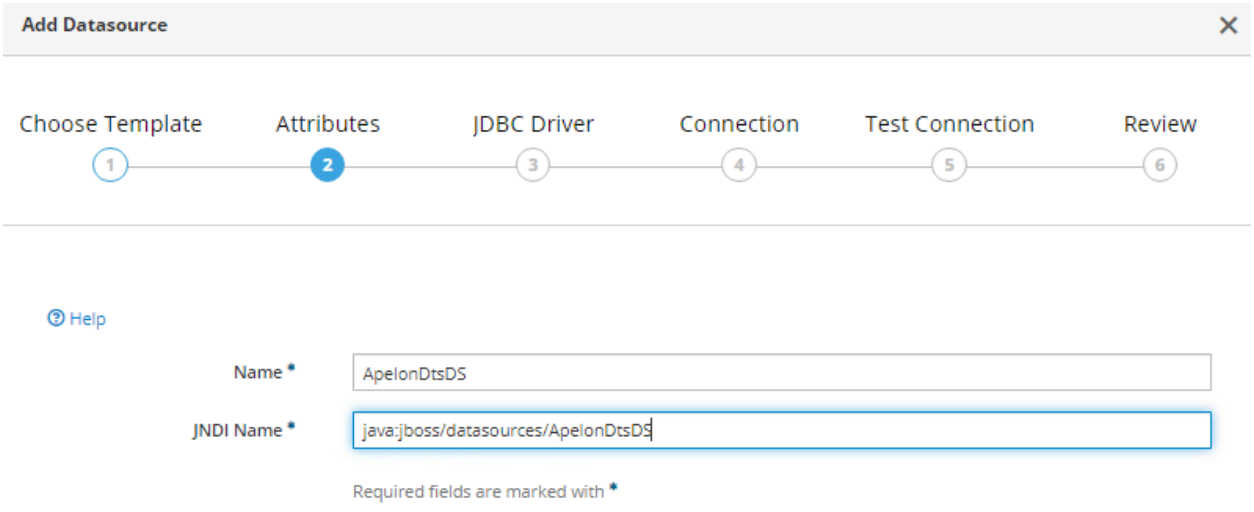


In the next popup, select the database type for your Datasource (MySQL or Microsoft SQLServer) and click **Next**.

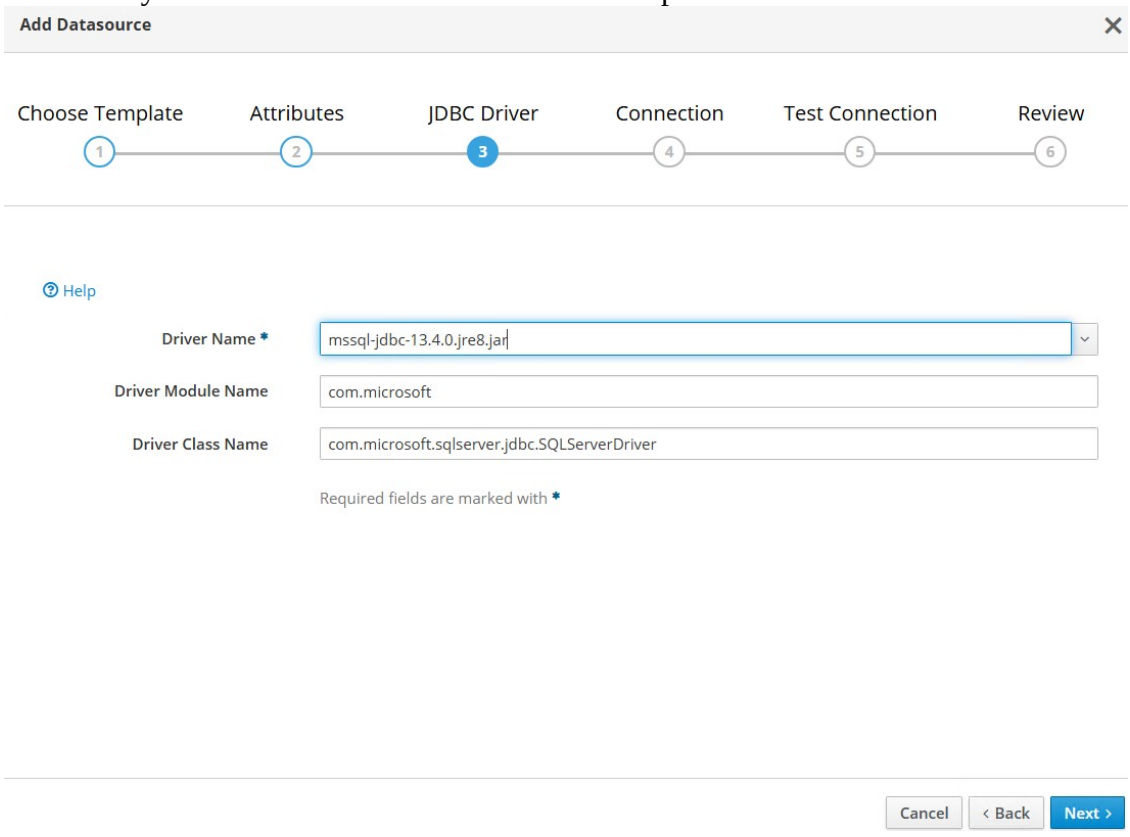


Edit the Datasource Attributes **Name** and **JNDI Name**, then **Next** (*Note: these values are Case-Sensitive*).
The **Name** should be: “ApelonDtsDS”
The **JNDI Name** should be: “java:jboss/datasources/ApelonDtsDS”

© 2026 Apelon, Inc.



In the next window, select the database driver from the **Driver Name** dropdown. Choose the database driver you added to JBoss EAP in an earlier step and hit “Next”.

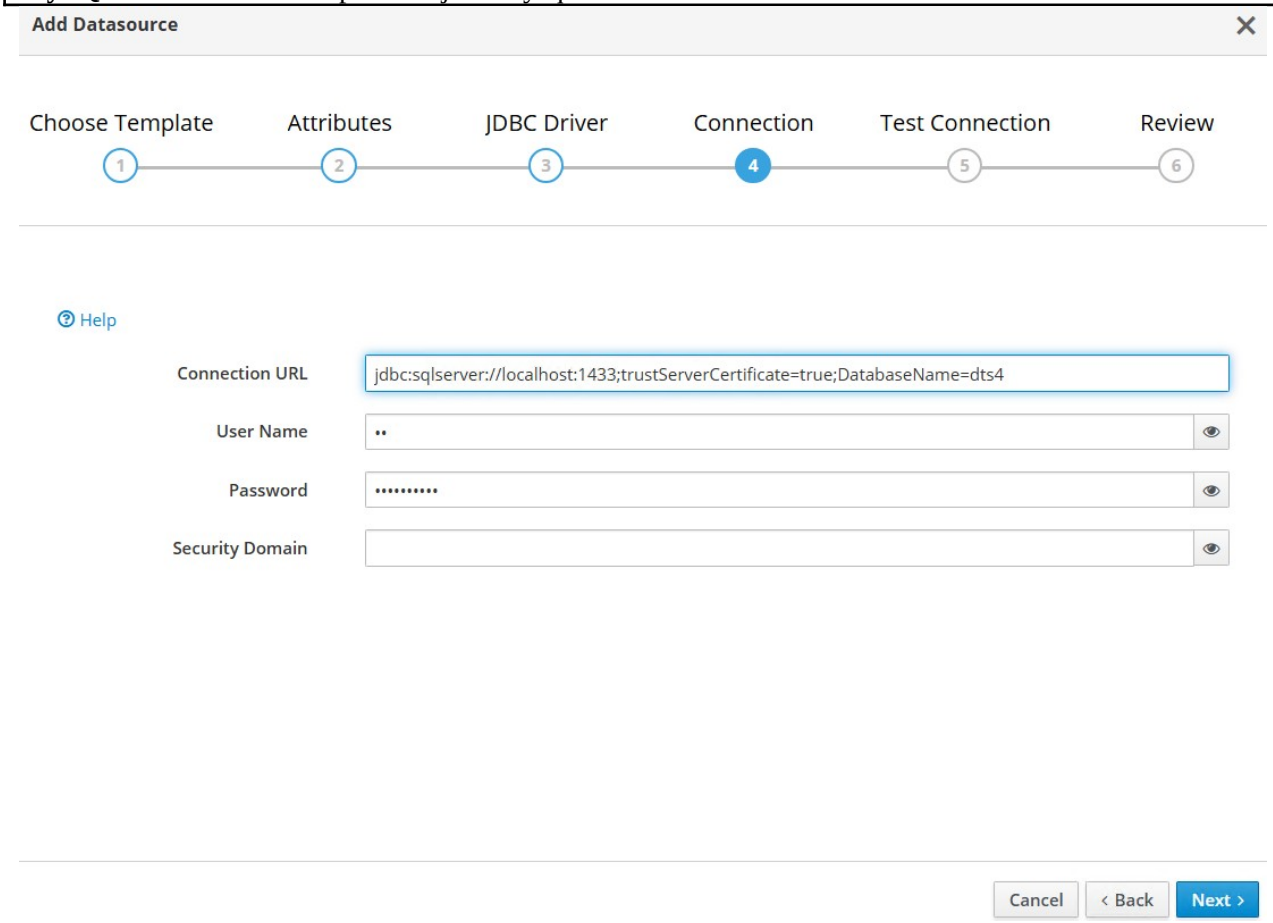


On the next window, enter the appropriate Connection URL, Username, and Password for your database environment. Examples are again presented below, but you should enter the parameters which are correct for your database (*ensure the appropriate User, Password, and database name*

© 2026 Apelon, Inc.

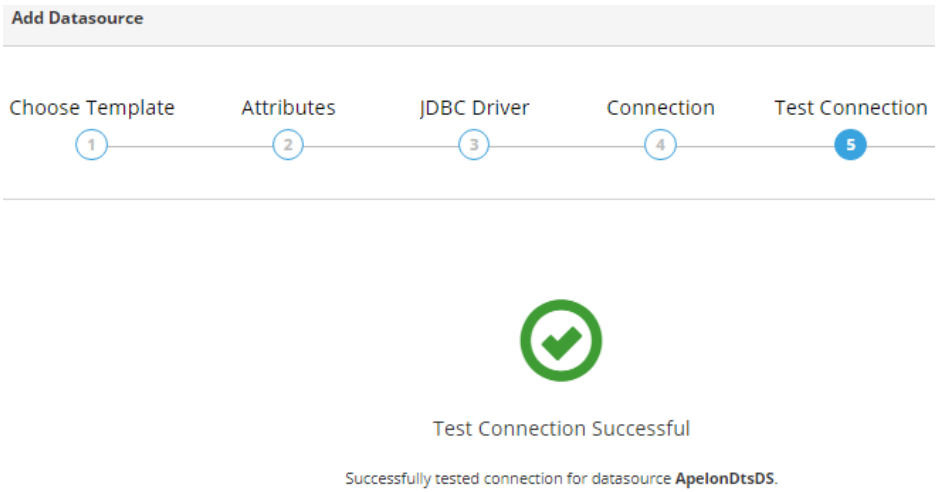
are used if they are not the values used as an example here. Also "localhost" can be replaced with the database server IP address or server name).

Database	User	Password	Connection URL
MS SQL Server	dts4user	dts4pass	jdbc:sqlserver://localhost:1433;trustServerCertificate=true;databasename=dts4
MySQL	dts4user	dts4pass	jdbc:mysql://localhost:3306/dts4

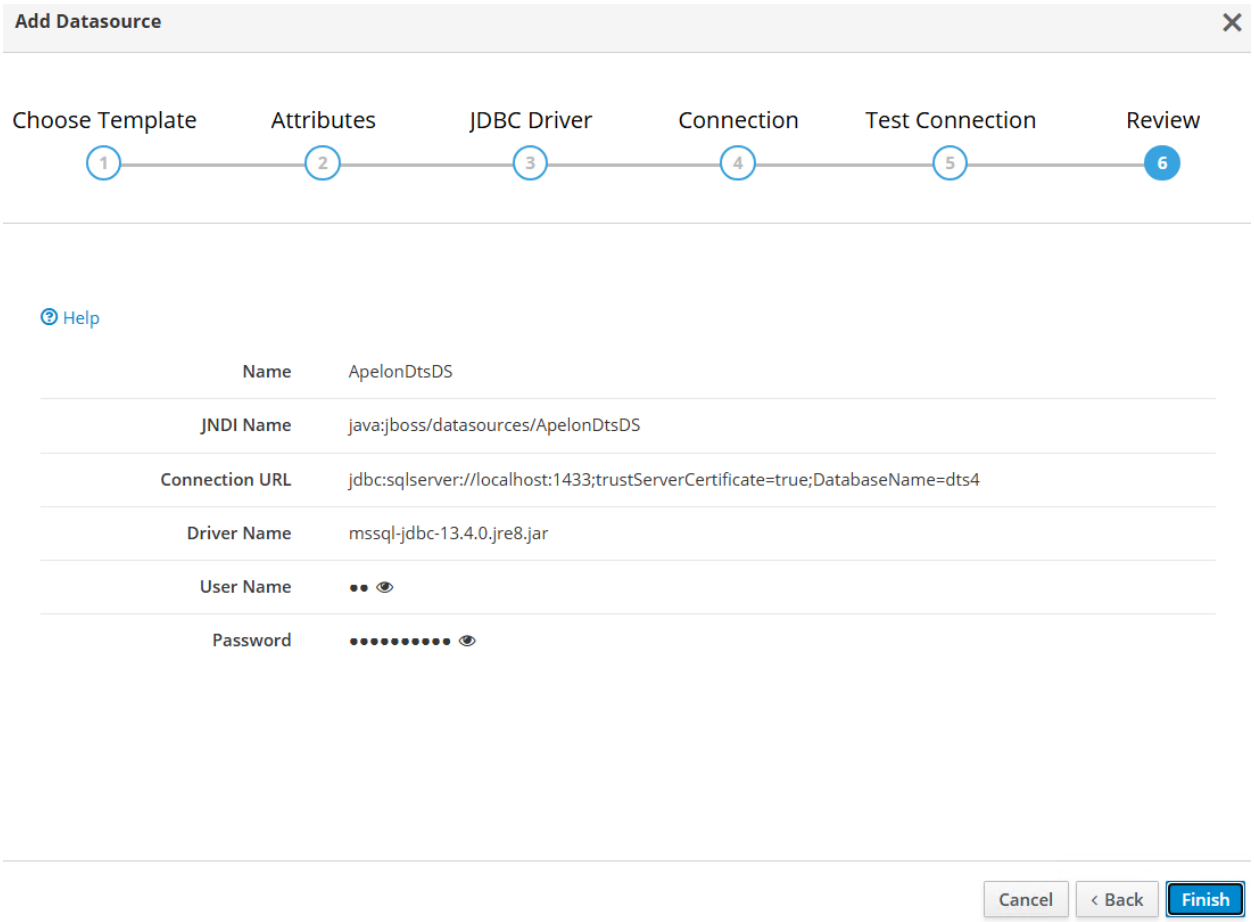


The next window will provide a Test Connection option. Click on the "Test Connection" button to ensure the above entered connection settings are valid. If the connection test is successful click "Next". If the connection test fails, click "Back" and correct the connection settings (NOTE: the connection settings may get cached by the browser so you may need to restart the Add Datasource process to enter the valid connection settings).

© 2026 Apelon, Inc.

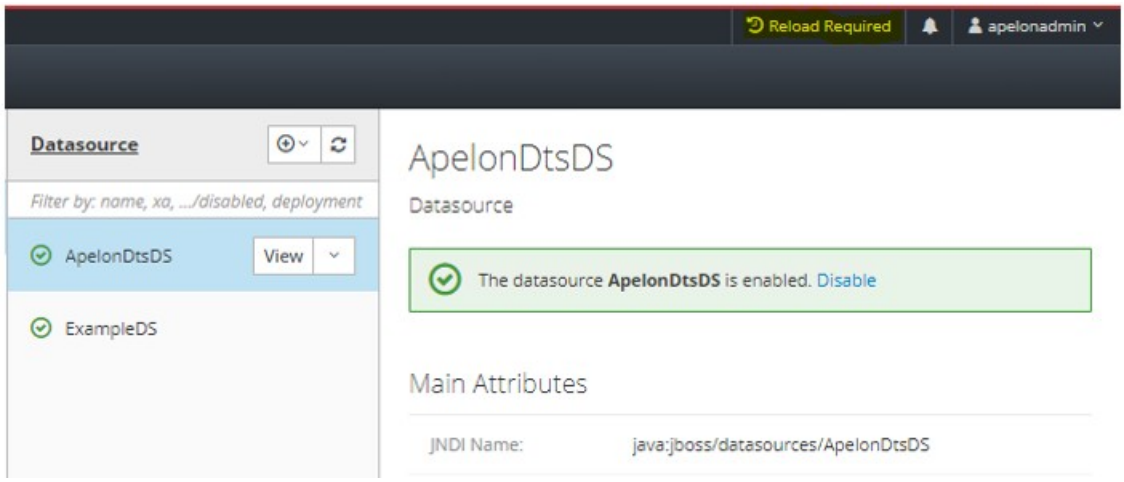


On the next window, JBoss EAP will provide you a summary of the Datasource settings. Click "Finish" to accept, or "back" to make any revisions.

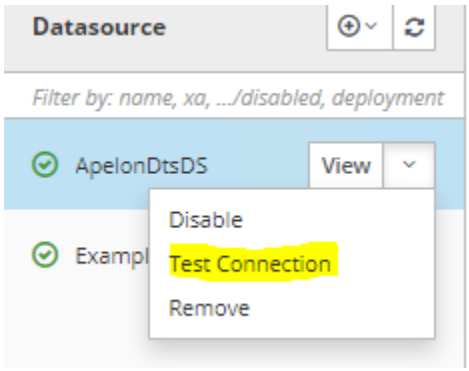


After clicking "Finish" a pop-up message will be displayed indicating the server configuration changed and to reload the server. Click "Reload". If you miss the Reload pop-up, click on the Reload Required link in the upper right of the Management Console.

© 2026 Apelon, Inc.



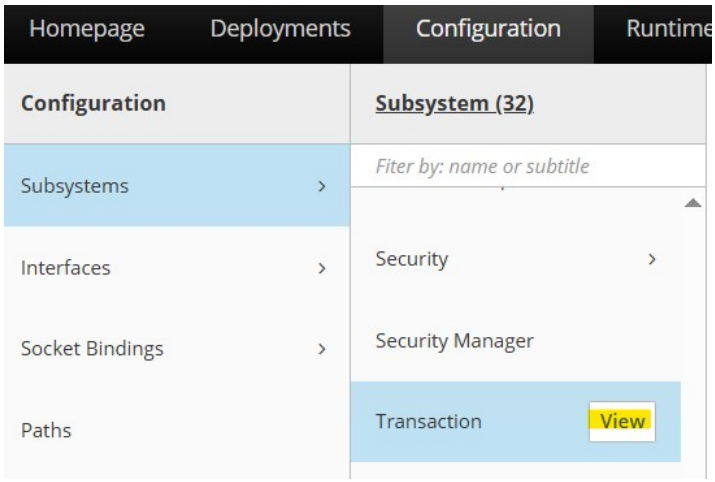
You should receive a message that the Server was successfully loaded.
Now that the Datasource has been created, you may test the connection once again, from the dropdown next to it from the “Datasource” column.



Ensure the connection test is successful before continuing.

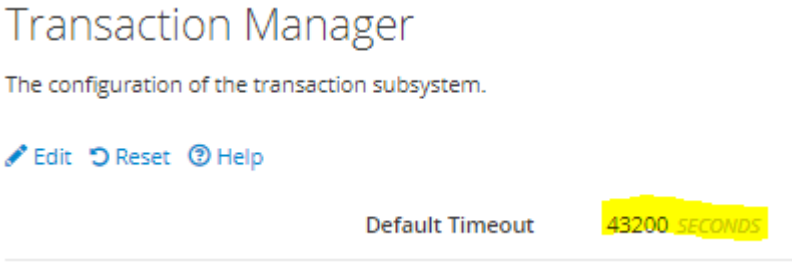
F.6 Check JBoss EAP Transaction Timeout Default

The JBoss EAP Transaction Timeout Default is **set to 43200 seconds** to accommodate long running DTS transactions.
To edit or view the JBoss EAP Transaction Timeout Default, from the “Configuration” column select “Subsystems”>”Transactions” and click “View”.



© 2026 Apelon, Inc.

Then click “Edit” and enter the new timeout value.

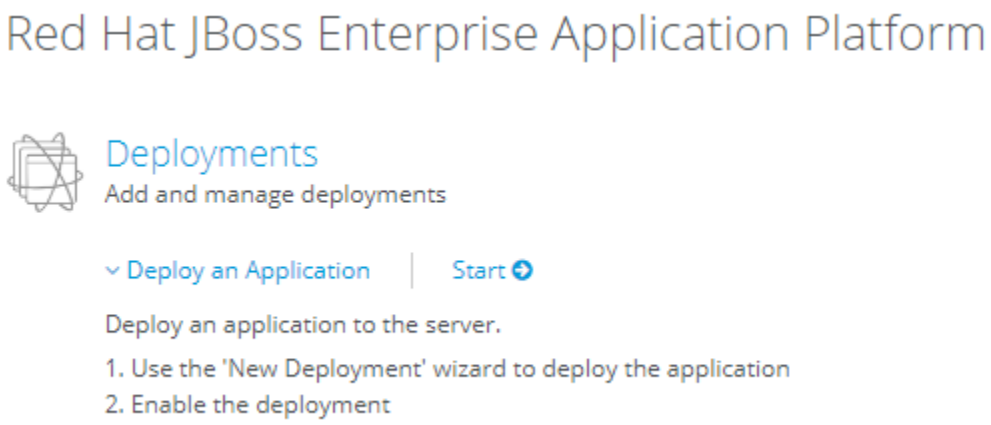


Then click “Save”. The JBoss EAP server must be restarted for the change to take effect.

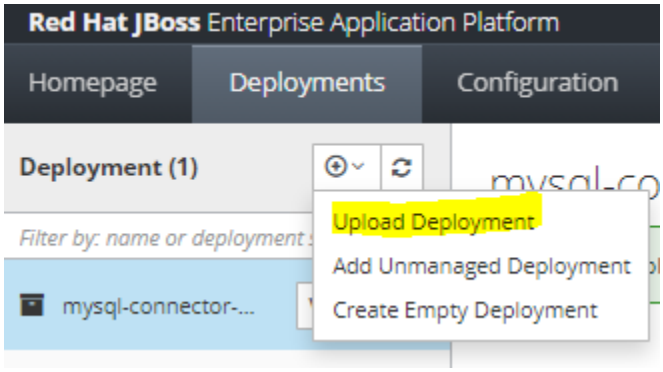
© 2026 Apelon, Inc.

F.7 Deploy Apelon DTS 4.9.0 Server

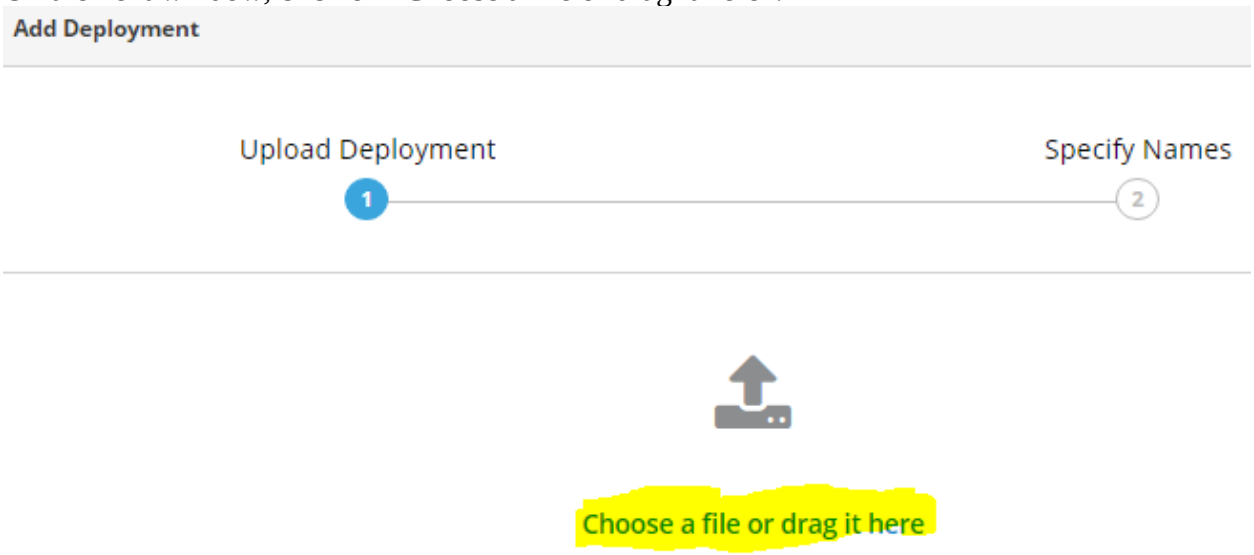
To deploy the Apelon DTS Server EAR file, click the Start arrow next to “Deploy an application” under the Deployments header from the Homepage tab.



Click the dropdown button in the upper left and choose “Upload Deployment” to begin the deployment process.



On the next window, click on “Choose a file or drag it here”.

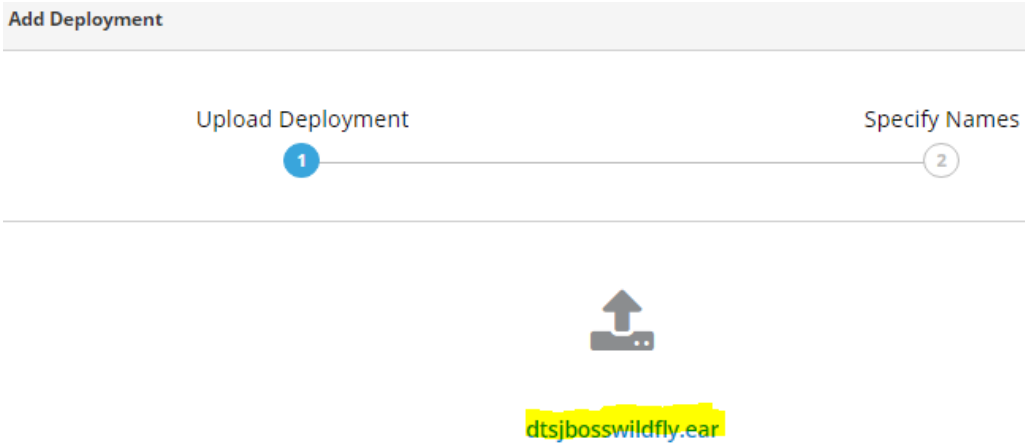


© 2026 Apelon, Inc.

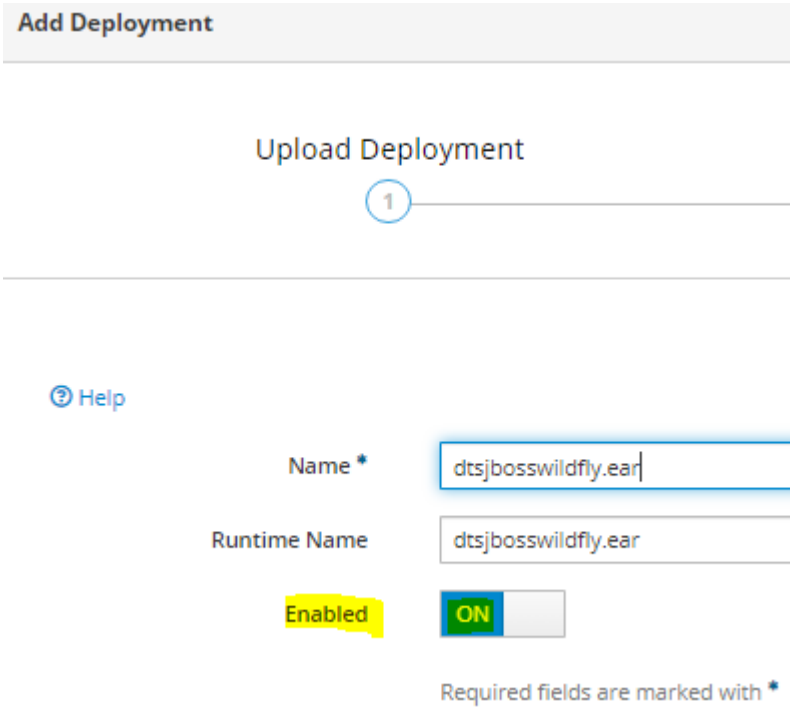
Navigate to the `<DTS_HOME>\server\jboss-eap\standalone\deployments` directory and select **`dtsjbosswildfly.ear, then click Next`** (This is not a typo, WildFly is the next open source iteration of JBoss EAP and as such the .ear file contains "wildfly" in the name).

NOTE: For **Microsoft SQL Server** the `dtsjbosswildflyforsqlserver.ear` file that is specific to Microsoft SQL Server must be used.

- The MS SQL Server specific `"dtsjbosswildflyforsqlserver.ear"` file is in the following location:
  `<DTS_HOME>\server\jboss-eap\standalone\deployments\sqlserver\`



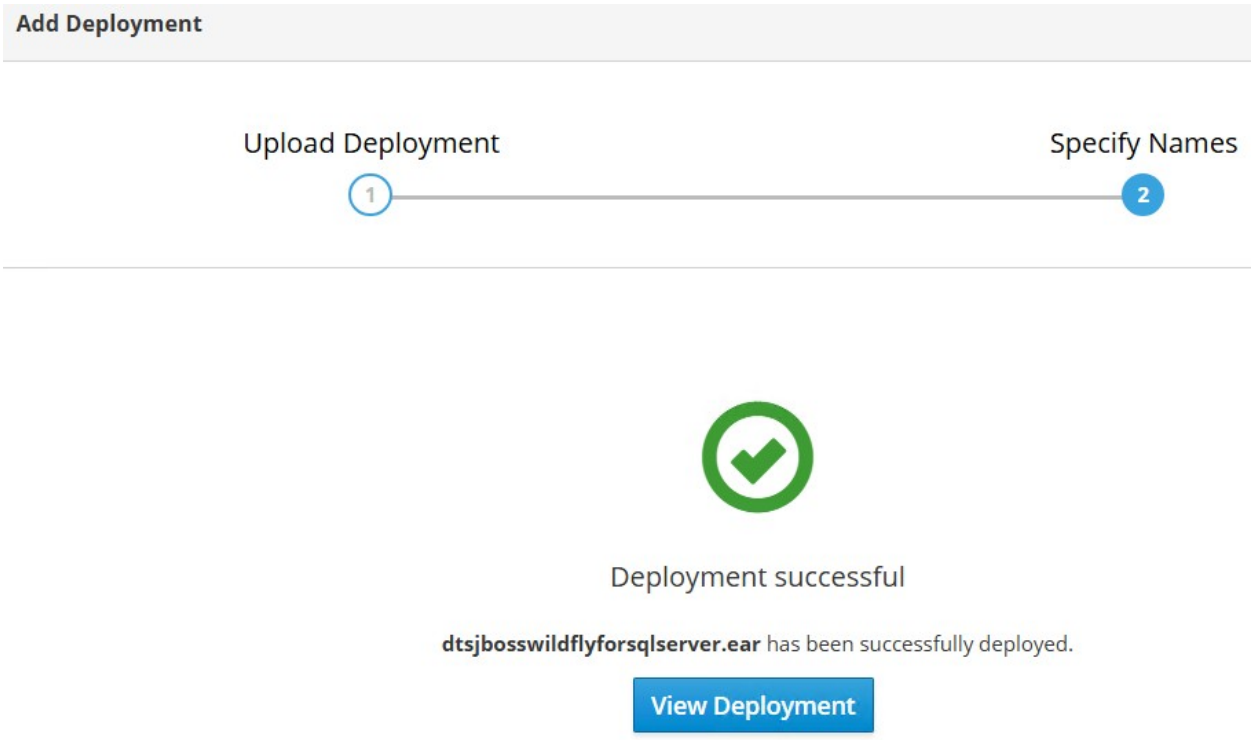
In the next window ensure "Enable" is set to **ON** and then click "Finish".



JBoss EAP will report that the deployment is in process. NOTE: you may see a message that "… management operations are running longer than expected…" but you can ignore this message.

© 2026 Apelon, Inc.

When the deployment is finished you will receive a “Deployment successful” message as shown below:



****IMPORTANT****
In the case of upgrading from an earlier DTS 4 schema version, Do Not Restart JBoss EAP 7.4 until the Deployment has completely finished and you have verified that the Database Schema is fully deployed to the correct version (See section: Upgrade Apelon DTS 4.8.0 JBoss EAP Server & schema to DTS 4.9.0). Once the correct schema version is verified, SHUT DOWN and RESTART the JBoss EAP 7.4 server to ensure the changes are integrated.

F.8 Verify DTS Browser & Editor connections to JBoss EAP 7.4 DTS 4.9.0 Server

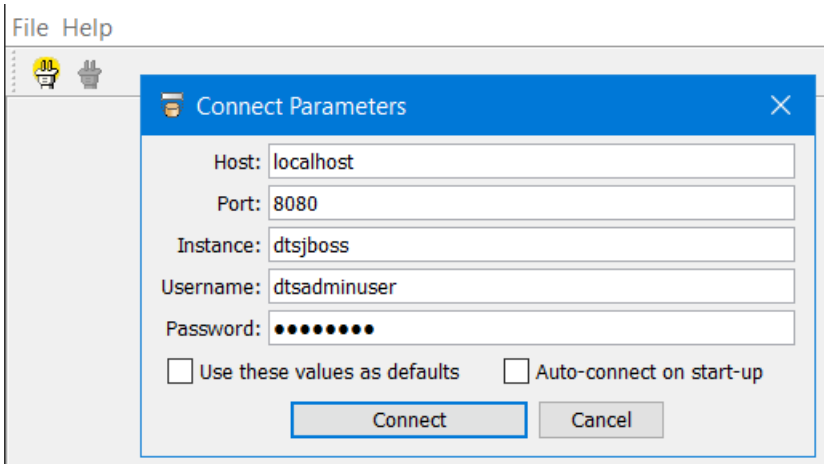
F.8.1 Verify the DTS Browser

You can access the DTS Browser from: http://localhost:8080/dtsserverws.
To login to the DTS Browser, you will need to enter user credentials created in the JBoss EAP Configuration for Apelon DTS 4 Server section.
Note: If you used the example users defined in the guide, the credentials would be either **dtsadminuser/dtsadmin** or **dtsuser/dts**.

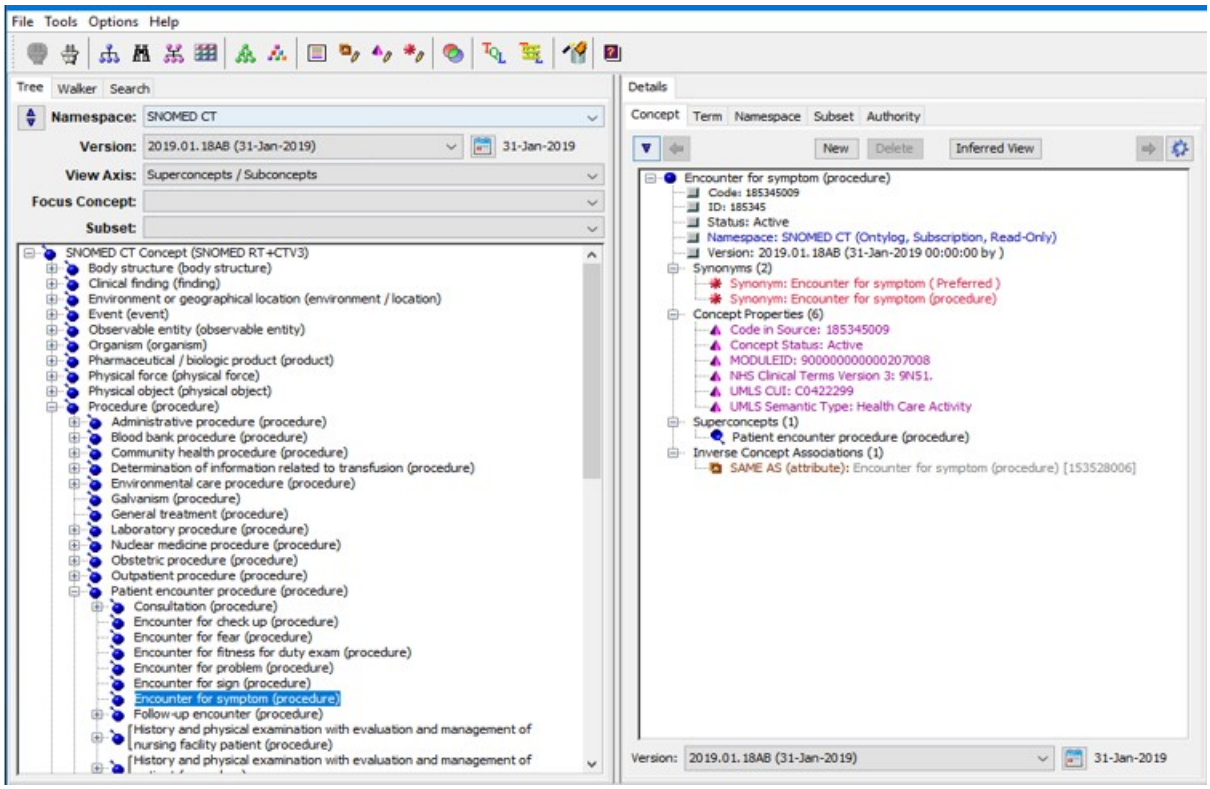
© 2026 Apelon, Inc.

F.8.2 Verify the DTS Editor connection

Run the DTS Editor shortcut (DTS Editor) provided by the DTS 4 installation.
Connect to the JBoss EAP server by using the **Host** value of the JBoss EAP Server (localhost, server IP address, or server name) an **Instance** of '**dtsjboss**' and default **Port** number '**8080'** along with the user credentials created in the JBoss EAP Configuration for Apelon DTS Server section.
Note: If you used the example users defined in this guide the credentials would be either **dtsadminuser/dtsadmin** or **dtsuser/dts**.
Click "Connect".



© 2026 Apelon, Inc.



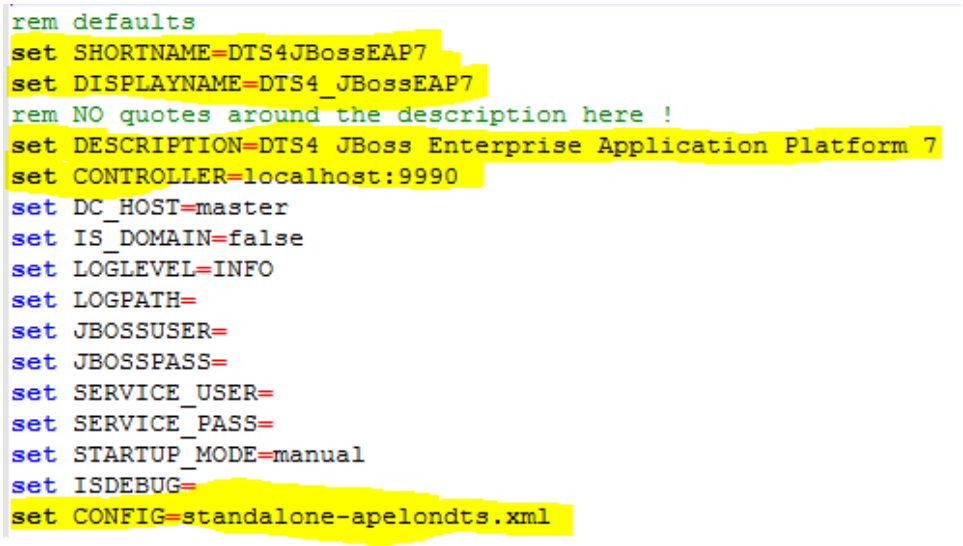
© 2026 Apelon, Inc.

F.9 Setup JBoss EAP and DTS to start as a Windows Service

To have JBoss EAP DTS Server start as a service you will need to download the **"commons-daemon-1.1.0-bin-windows.zip"** file from the Apelon DTS Software Downloads page – https://apelon.com/dts-software/.

Follow these steps to get your JBoss EAP server running as a windows service:

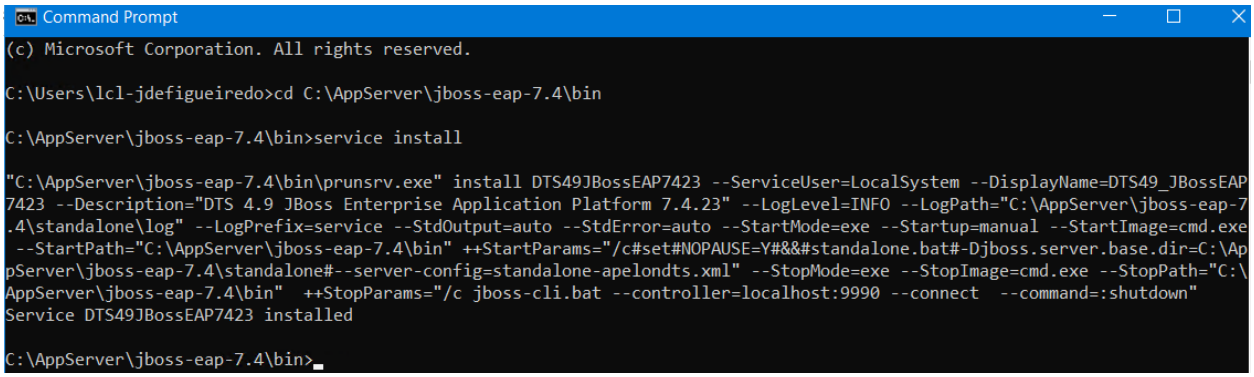
1. Unzip **`commons-daemon-1.1.0-bin-windows.zip`** into your **`<JBossEAP74_HOME>\bin`** folder, where **`<JBossEAP74_HOME>`** represents the base JBoss EAP 7.4 folder specified in the JBoss EAP 7.4 Setup i.e., **`C:\AppServer\jboss-eap-7.4`** folder.
2. Open the **service.bat** file located in the **`<JBossEAP74_HOME>\bin`** folder.
3. In the `service.bat` file, locate the "**CONFIG**" variable and set its value equal to the DTS server configuration file name "**`standalone-apelondts.xml`**":
   set `CONFIG= standalone-apelondts.xml`
4. Also, update the windows service variable values.
   e.g.:
   `set SHORTNAME= DTS49JBossEAP7423`
   `set DISPLAYNAME= DTS49_JBossEAP7423`
   `set DESCRIPTION= DTS 4.9 JBoss Enterprise Application Platform 7.4.23`
   Note1: If present, please be sure to remove the quotations surrounding the Description value.
   Note2: If the JBoss Management Port Number specified in the **`standalone-apelondts.xml`** provided by DTS4 is changed (i.e. from `jboss.management.http.port:9990` to `jboss.management.http.port:XXXX`), then the Controller Port Number specified in the **`services.bat`** found in the following line must be changed to match the JBoss Management Port Number:
   `CONTROLLER=localhost:9990`



```
rem defaults
set SHORTNAME=DTS4JBossEAP7
set DISPLAYNAME=DTS4_JBossEAP7
rem NO quotes around the description here !
set DESCRIPTION=DTS4 JBoss Enterprise Application Platform 7
set CONTROLLER=localhost:9990
set DC_HOST=master
set IS_DOMAIN=false
set LOGLEVEL=INFO
set LOGPATH=
set JBOSSUSER=
set JBOSSPASS=
set SERVICE_USER=
set SERVICE_PASS=
set STARTUP_MODE=manual
set ISDEBUG=
set CONFIG=standalone-apelondts.xml
```

© 2026 Apelon, Inc.

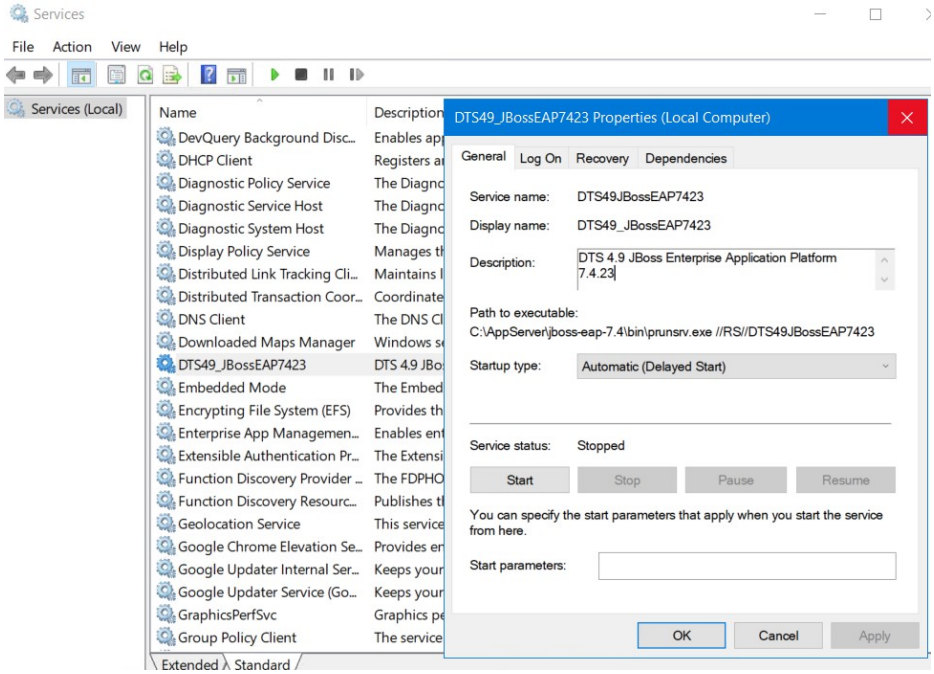
5. Open a command prompt (as administrator) and change directory to the **<JBossEAP74_HOME>\bin** directory
6. To install the JBoss Service enter and execute the following command:
   >**service install**



7. After the JBoss EAP service is installed, close the *Command Prompt* window**.**
8. Search for **Services** and select the Services app. Find the **“DTS49_JBossEAP7423”** service. Right click and select **Properties**.

© 2026 Apelon, Inc.

9. Perform the following:
    a. Set the *Startup type* to **Automatic (Delayed Start)**
    b. Click **Apply**
    c. **Start** the Service.
    d. Click **OK**



10. The **“DTS49_JBossEAP7423”** service is now **Running** and set to **Automatic (Delayed Start)**.

© 2026 Apelon, Inc.

F.10 Setup JBoss EAP and DTS to start as a Linux Service

To install DTS as a daemon service on Linux, you will need to copy and configure the service launching scripts that are included with JBoss EAP.

Follow this procedure to configure the service.

1. Create a new user which will be used to launch the service. For example:
   ```
   => useradd -r -d /tmp/ jbossas
   ```

2. The `jbossas` user needs to have permission to read, write and execute to the path where JBoss EAP was installed. One option to grant this permission is to change the ownership of the JBoss EAP installation folder to the new user that was created. For example:
   ```
   => chown -R jbossas /opt/jboss-eap-7.4/
   ```

3. Optionally change the group membership of the JBoss EAP installation folder to the newly created user. For example:
   ```
   => chgrp -R jbossas /opt/jboss-eap-7.4/
   ```

   Alternatively, add the jbossas user to a shared users group, and change the group of the JBoss EAP installation folder to this shared group.

4. Copy the "**<JBossEAP74_HOME>/bin/init.d/jboss-eap.conf**" file to the folder "**/etc/default**". For example:
   ```
   => cp /opt/jboss-eap-7.4/bin/init.d/jboss-eap.conf
   /etc/default/
   ```

5. Add or update the following lines in the newly created "**/etc/default/jboss-eap.conf**" file, customizing as necessary for your installation.

```
# The username that should own the process
JBOSS_USER=jbossas

## The amount of time to wait for startup
STARTUP_WAIT=90

# The installation path of JBoss
JBOSS_HOME=/opt/jboss-eap-7.4

# The name of the server config file to use for your Database.
JBOSS_CONFIG=standalone-apelondts.xml
```

6. Copy the "**<JBossEAP74_HOME>/bin/init.d/jboss-eap-rhel.sh**" file to the folder "**/etc/init.d**" and rename it to "**jbossas**"
   ```
   => cp /opt/jboss-eap-7.4/bin/init.d/jboss-eap-rhel.sh
   ```

© 2026 Apelon, Inc.

```
/etc/init.d/jbossas
```

7. Modify the file "**<JBossEAP74_HOME>/bin/standalone.conf**" to specify the Java JVM to use when the service starts. Add a `JAVA_HOME` parameter to your file, customizing as necessary for your installation. Note – this parameter may already exist in the file – if it does – you can either modify the existing one, or comment it out. For example:

```
# Specify the location of the Java home directory.
#If set then $JAVA will be defined to $JAVA_HOME/bin/java, else
#$JAVA will be "java".
#
#JAVA_HOME="/opt/java/jdk"
JAVA_HOME=/opt/java/jdk1.8.0_351
```

8. Create the necessary links to the **/etc/init.d/jbossas** script so it starts and stops at the appropriate runlevels.

```
=> chkconfig jbossas on
```

9. The server is now configured to automatically start and stop with the system. To manually start the server, execute:

```
=> /etc/init.d/jbossas start
```

To manually stop the server, execute:

```
=> /etc/init.d/jbossas stop
```

To check the status of the server, execute:

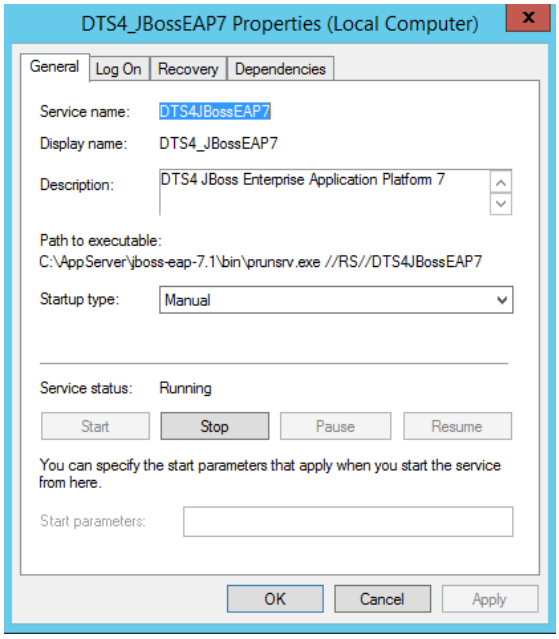
```
=> /etc/init.d/jbossas status
```

© 2026 Apelon, Inc.

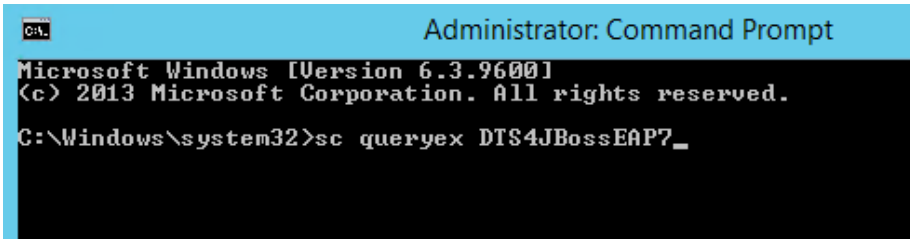
F.11 Terminating the JBoss EAP Service using taskkill

Stopping the Jboss EAP Service in the Services Window sometimes does not shut down in a timely manner, sometimes returning an error that the service is not responding. In this case, using a taskkill command to terminate the service is an effective way of circumventing this Services issue. Here are the instructions for doing so:

1. In the Services Window, right-click on the JBoss EAP Service and choose Properties.
2. In the Properties Window, identify the Service Name and copy it.

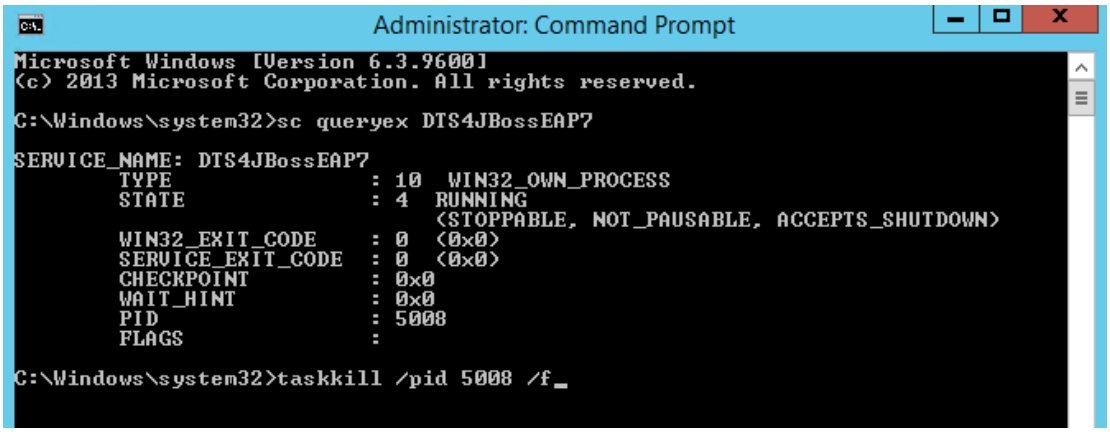


3. Open a Command Window and type the following: `sc queryex [Service Name]`

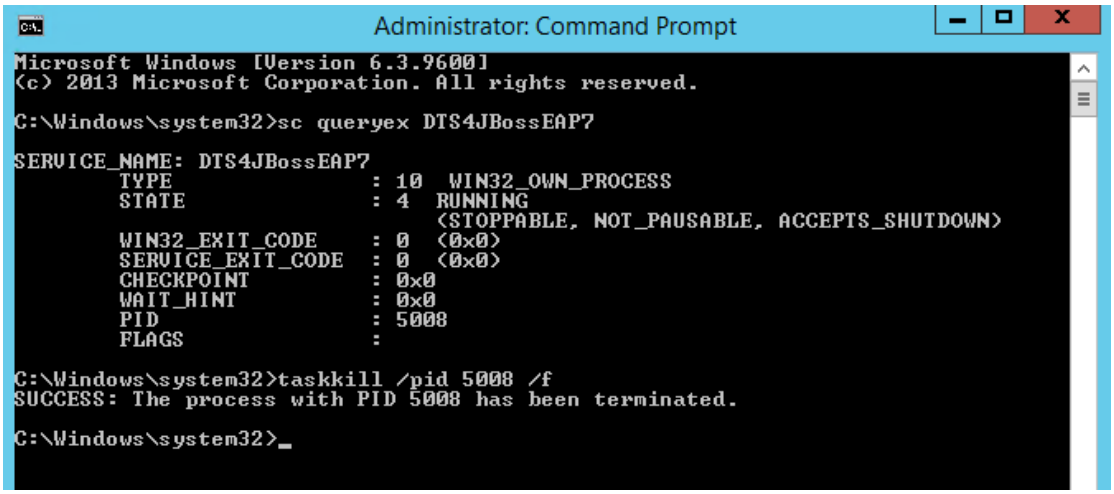


4. This should produce information about the JBoss EAP Service, including the PID.
5. Type the following in the Command Window: `taskkill /pid [PID] /f`

© 2026 Apelon, Inc.



6. The Service should be terminated, as confirmed by the following message:



© 2026 Apelon, Inc.

F.12 Upgrade Apelon DTS 4.8.0 JBoss EAP Server & schema to DTS 4.9.0

Perform the following steps to upgrade your Apelon DTS 4.8.0 JBoss EAP Server to Apelon DTS 4.9.0 JBoss EAP Server **(Note: DTS 4.7.1 – 4.8.0 have the same schema version as DTS 4.9.0)**:

- Follow instructions in Section B for installing DTS 4.9.0 on the server to be upgraded.
- Stop the Apelon DTS JBoss EAP service.
- Copy the Apelon DTS JBoss EAP configuration file "standalone-apelondts.xml" from the DTS 4.9.0 home directory <`DTS_HOME>\server\jboss-eap\standalone\configuration` to the `<JBossEAP74_HOME>\standalone\configuration` folder. Replace the existing file with this new Apelon DTS JBoss EAP configuration file.
- Restart the Apelon DTS JBoss EAP service.
- Review the Notes below before continuing to the next steps.
- Follow steps **F.5.2**(Deploy Database Driver) through **F.8**(Verify DTS Browser & Editor connections to JBoss EAP DTS Server) to finish configuring the Apelon DTS 4.9.0 JBoss EAP server.
- **NOTE1:** If upgrading from a DTS 4.7.0 schema to DTS 4.9.0, as instructed in section **F.7**(Deploy Apelon DTS Server), when deploying the "`dtsjbosswildfly.ear`" **Do NOT shut down or restart the JBoss EAP service while the schema is being upgraded**. This step could take some time, especially when upgrading DTS schemas in MySQL and SQL Server.
- **To verify the correct DTS 4.9.0 schema version, perform the following steps:**
    1. View the "server.log" file located in the <JBossEAP74_HOME>`\standalone\log` directory. Search the JBoss EAP "server.log" file for the statement:
        - "Schema Upgrade to 4.0.29 complete" – for SQL Server 2025 or SQL Server 2019.
        - "Schema Upgrade to 4.0.30 complete" – for MySQL 8.4.
    2. A second way to determine the schema upgrade was successful is via the DTS 4.9.0 DTS Editor.
        - Connect to the Apelon DTS JBoss EAP server.
        - Once the connection is established choose: **Help>About Apelon DTSEditor…**
        - In the help window that is launched click on the "*Details>>*" label. In the "Server Configuration:" section is displayed a "schema.version" value. The schema version should read:
            - "4.0.29" – for SQL Server 2025 or SQL Server 2019.
            - "4.0.30" – for MySQL 8.4.
- **NOTE2 - SQL Server Schema Upgrade:** If upgrading from a version older than DTS 4.4, not only may the SQL Server schema upgrade to version 4.0.29 take up to or longer than an hour, it may also require about as much available drive space for its database log file as is being used by the database prior to the schema upgrade. Consult with your SQL Server Database Administrator regarding the available drive space and the possibility of shrinking the database log after the schema is successfully upgraded to version 4.0.29.

© 2026 Apelon, Inc.

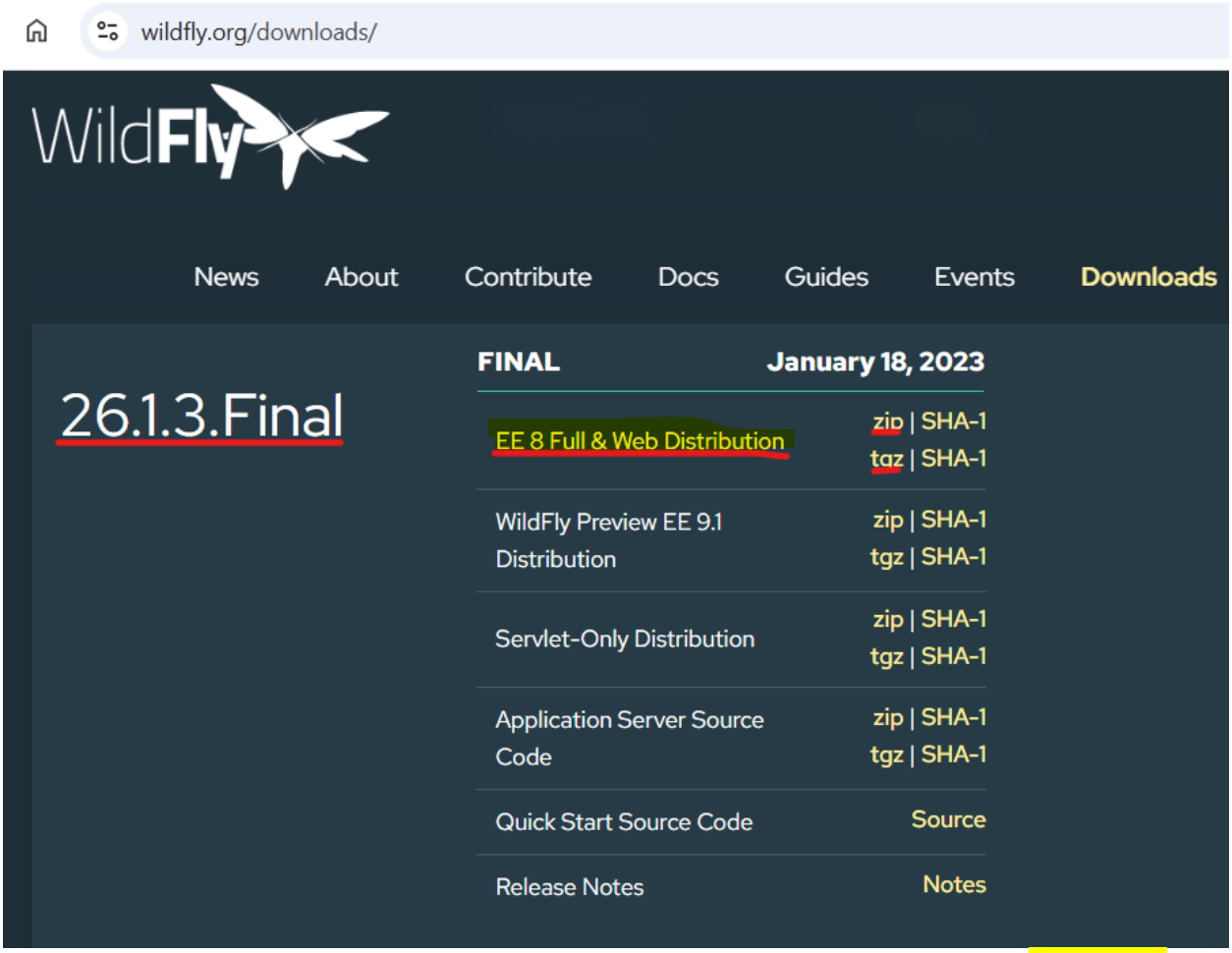
© 2026 Apelon, Inc.

G. WildFly 26 Setup

Note: WildFly 26 requires the use of Java 8 JDK. See Java Environment Setup for DTS 4 Server and Client section above for additional details.

The WildFly Application Server can be downloaded from the WildFly community download site: http://wildfly.org/downloads/

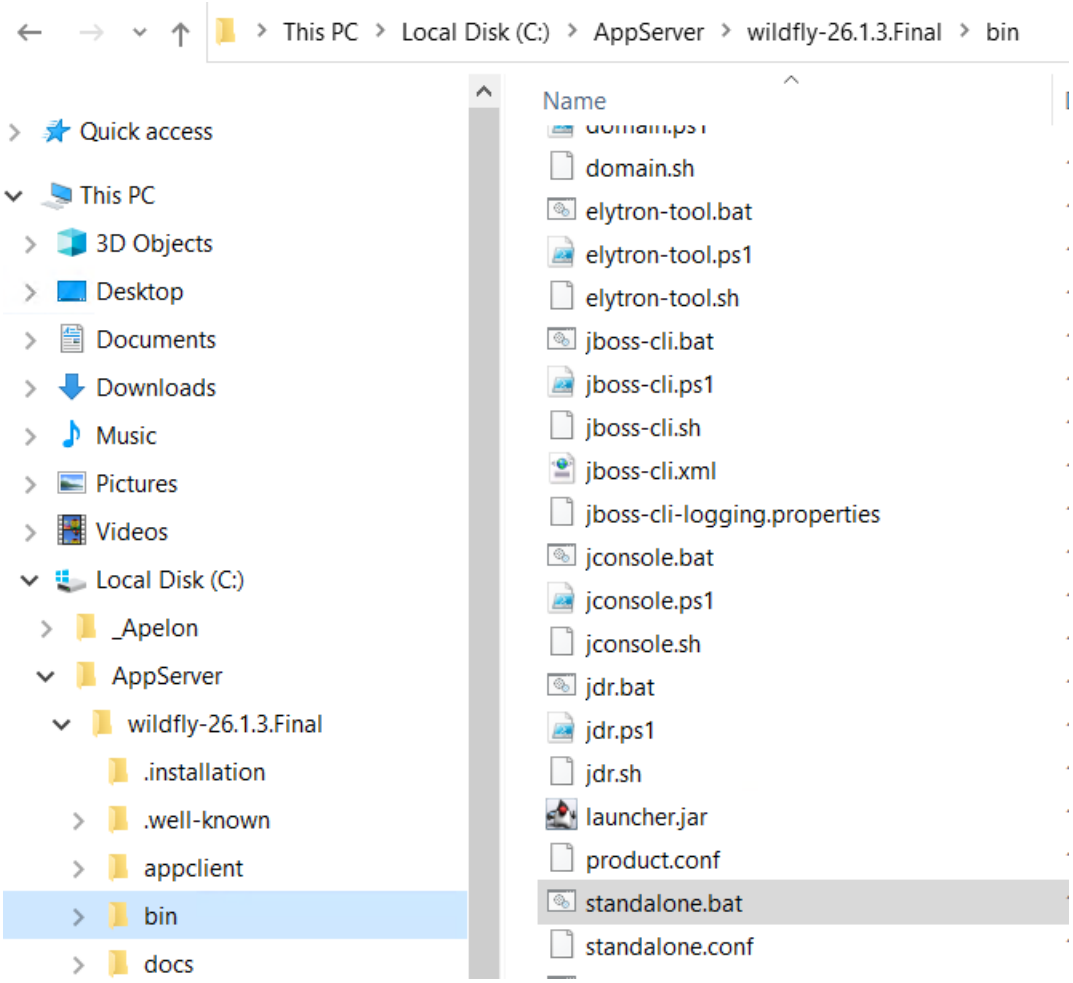
For **Windows OS**, select the **`26.1.3.Final January 18, 2023 EE 8 Full & Web Distribution ZIP`** file to download.
For **Linux OS** select the **`26.1.3.Final January 18, 2023 EE 8 Full & Web Distribution TGZ`** file.



WildFly 26 does not come with an installer; just extract the compressed archive. **Unzip the WildFly 26 archive into a folder with a pathname that does NOT contain any spaces.** For example, extracting to the `C:\AppServer` folder will place the WildFly 26.1.3 Final files in the `C:\AppServer\wildfly-26.1.3.Final` folder. We will identify this folder in the rest of the document as <WILDFLY26_HOME>. It is not necessary to create <WILDFLY26_HOME> as an environment variable.

© 2026 Apelon, Inc.

To verify the WildFly 26 install, go to the `<WILDFLY26_HOME>\bin` folder and run `standalone.bat` (or `<WILDFLY26_HOME>/bin/standalone.sh` for Linux OS).

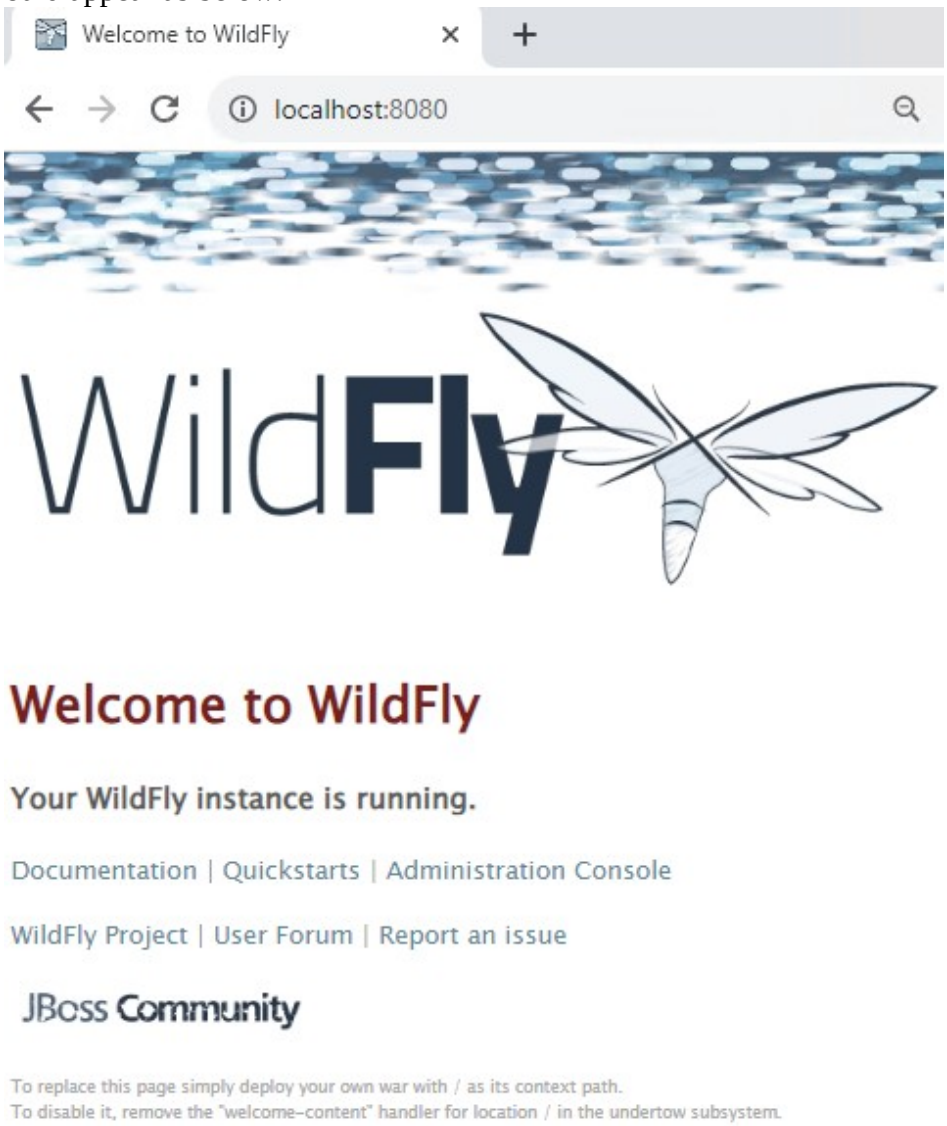


Upon successful start, the message in the last line will indicate success.
Here is a sample startup screen:

```
19:20:30,587 INFO  [org.wildfly.extension.undertow] (MSC service thread 1-1) WFLYUT0012: Started server default-server.
19:20:30,618 INFO  [org.wildfly.extension.undertow] (MSC service thread 1-3) Queuing requests.
19:20:30,665 INFO  [org.wildfly.extension.undertow] (MSC service thread 1-8) WFLYUT0006: Undertow HTTP listener default listening on 127.0.0.1:8080
19:20:30,665 INFO  [org.wildfly.extension.undertow] (MSC service thread 1-3) WFLYUT0018: Host default-host starting
19:20:31,043 INFO  [org.wildfly.extension.undertow] (MSC service thread 1-5) WFLYUT0006: Undertow HTTPS listener https listening on 127.0.0.1:8443
19:20:31,086 INFO  [org.jboss.as.ejb3] (MSC service thread 1-1) WFLYEJB0493: Jakarta Enterprise Beans subsystem suspension complete
19:20:31,210 INFO  [org.jboss.as.connector.subsystems.datasources] (MSC service thread 1-1) WFLYJCA0001: Bound data source [java:jboss/datasources/ExampleDS]
19:20:37,742 INFO  [org.jboss.as.patching] (MSC service thread 1-7) WFLYPAT0050: WildFly Full cumulative patch ID is: base, one-off patches include: none
19:20:37,749 INFO  [org.jboss.as.server.deployment.scanner] (MSC service thread 1-7) WFLYDS0013: Started FileSystemDeploymentService for directory C:\AppServer
\wildfly-26.1.3.Final\standalone\deployments
19:20:39,338 INFO  [org.jboss.ws.common.management] (MSC service thread 1-2) JBWS022052: Starting JBossWS 5.5.0.Final (Apache CXF 3.4.10)
19:20:39,505 INFO  [org.jboss.as.server] (Controller Boot Thread) WFLYSRV0212: Resuming server
19:20:39,509 INFO  [org.jboss.as] (Controller Boot Thread) WFLYSRV0025: WildFly Full 26.1.3.Final (WildFly Core 18.1.2.Final) started in 35939ms - Started 298
of 538 services (337 services are lazy, passive or on-demand) - Server configuration file in use: standalone.xml
19:20:39,514 INFO  [org.jboss.as] (Controller Boot Thread) WFLYSRV0060: Http management interface listening on http://127.0.0.1:9990/management
19:20:39,515 INFO  [org.jboss.as] (Controller Boot Thread) WFLYSRV0051: Admin console listening on http://127.0.0.1:9990
```

© 2026 Apelon, Inc.

To verify that the server is reachable, you can point your browser to the default welcome page for WildFly at the address: http://localhost:8080.
The page should appear as below:



After you have verified the server is reachable, select the WildFly command window and then press `Ctrl+C`. You will be prompted to terminate the batch job, type **y** and hit **enter** to stop WildFly.

```
Terminate batch job (Y/N)? y
```

G.1 Memory Configuration

The Apelon DTS Server performs better when additional memory is assigned to WildFly. To increase the memory utilized, open `<WILDFLY26_HOME>\bin\standalone.conf.bat` (or `<WILDFLY26_HOME>/bin/standalone.conf` for Linux OS) and modify the JVM memory allocation pool parameters as shown below:

© 2026 Apelon, Inc.

NOTE: *We recommend a memory limit of at least 4GB. If your DTS environment will be running Modular Classification, you will require a larger allocation to your JVM. On systems utilizing Modular Classification with 16 GB of RAM or more a setting of at least 8GB (4 GB min) is recommended.*

For Windows OS:

```
    rem # JVM memory allocation pool parameters - modify as
appropriate.
    set "JBOSS_JAVA_SIZING=-Xms1G -Xmx4G -XX:MetaspaceSize=512M
-XX:MaxMetaspaceSize=4G"
```

For Linux OS:

```
# Specify options to pass to the Java VM.
#
if [ "x$JBOSS_JAVA_SIZING" = "x" ]; then
   JBOSS_JAVA_SIZING="-Xms1G -Xmx4G -XX:MetaspaceSize=512M
-XX:MaxMetaspaceSize=4G"
```

G.2 WildFly 26 Management User

You must create a WildFly Management user (e.g., **apelonadmin/apelon**) – This user administers the WildFly server. Go to **<WILDFLY26_HOME>\bin** and run **add-user.bat** (or **<WILDFLY26_HOME>/bin/add-user.sh** for Linux OS). Follow the steps below.

- Select Management User. **(a):** hit **enter** to accept default

```
What type of user do you wish to add?
 a) Management User (mgmt-users.properties)
 b) Application User (application-users.properties)
(a): a
```

- Realm (**ManagementRealm)** will be used by default.
- Enter the desired Username. i.e., **apelonadmin**

```
Username : apelonadmin
```

- Enter the desired Password. The password cannot be same as the username. i.e., **apelon**
- *Note: WildFly will prompt you if your password doesn't meet the recommended criteria. You may type "**yes**" and press "**enter**" to accept the password, despite this.*

```
WFLYDM0099: Password should have at least 8 characters!
Are you sure you want to use the password entered yes/no?
```

© 2026 Apelon, Inc.

- Re-enter Password. i.e., **apelon**

```
Password :
Re-enter Password :
```

- WildFly will prompt you to add the user to any groups. For the Application Server administrator user, no groups are necessary, you may hit "**enter**" to proceed.
- Type "**yes**" to add the user and hit **enter**.

```
About to add user 'apelonadmin' for realm 'ManagementRealm'
Is this correct yes/no? yes
```

- WildFly supports an AS to AS configuration between multiple instances of the application server. When prompted if the user will be used to connect another AS process, for DTS purposes, you may type "**no**" and press "**enter**".

See the screen shot below to confirm:

```
What type of user do you wish to add?
 a) Management User (mgmt-users.properties)
 b) Application User (application-users.properties)
(a): a

Enter the details of the new user to add.
Using realm 'ManagementRealm' as discovered from the existing property files.
Username : apelonadmin2
Password recommendations are listed below. To modify these restrictions edit the add-user.properties
 configuration file.
 - The password should be different from the username
 - The password should not be one of the following restricted values (root, admin, administrator)
 - The password should contain at least 8 characters, 1 alphabetic character(s), 1 digit(s), 1 non-a
lphanumeric symbol(s)
Password :
WFLYDM0099: Password should have at least 8 characters!
Are you sure you want to use the password entered yes/no? yes
Re-enter Password :
What groups do you want this user to belong to? (Please enter a comma separated list, or leave blank
 for none)[  ]:
About to add user 'apelonadmin2' for realm 'ManagementRealm'
Is this correct yes/no? yes
Added user 'apelonadmin2' to file 'C:\AppServer\wildfly-12.0.0.Final\standalone\configuration\mgmt-u
sers.properties'
Added user 'apelonadmin2' to file 'C:\AppServer\wildfly-12.0.0.Final\domain\configuration\mgmt-users
.properties'
Added user 'apelonadmin2' with groups  to file 'C:\AppServer\wildfly-12.0.0.Final\standalone\configu
ration\mgmt-groups.properties'
Added user 'apelonadmin2' with groups  to file 'C:\AppServer\wildfly-12.0.0.Final\domain\configurati
on\mgmt-groups.properties'
Is this new user going to be used for one AS process to connect to another AS process?
e.g. for a slave host controller connecting to the master or for a Remoting connection for server to
 server EJB calls.
yes/no? no
Press any key to continue . . .
```

G.3 WildFly 26 Configuration for Apelon DTS 4 Server

G.3.1 Migrate WildFly DTS users from existing WildFly 23 server

If you are currently Running DTS and are setting up WILDFLY26 to replace your existing WildFly 23 environment, you can migrate your existing DTS users by performing the following steps:

1. Ensure the new WILDFLY 26 Application Server is stopped.
2. Locate the **application-roles.properties** and **application-users.properties** files in your existing Application Server installation directory. There are 2 instances of each of these files, one in **<AppServer Home>\domain\configuration** and the other in **<AppServer Home>\standalone\configuration**.

© 2026 Apelon, Inc.

3. Copy these files and place them (overwriting if prompted) in **<WILDFLY26_Home>\domain\configuration** and **<WILDFLY26_Home>\standalone\configuration** respectively.
4. Start the WILDFLY 26 Application Server

Note: : Since the DTS User Manager users are contained within the DTS Database, no modifications will be necessary for the DTS User Manager users, provided the Application Server users migrate successfully

G.3.2 WildFly 26 DTS Admin User Configuration

WildFly Application Users must be created for every individual who will connect to *the **Apelon DTS Server via the DTS Browser or DTS Editor*** and will require access to the ***DTS Editor User Manager*** to setup ***DTS User Roles and Permissions***. These WildFly users must have the group "**apelondtsadmin**".

Go to `<WILDFLY26_HOME>\bin` and run `add-user.bat` (or `<WILDFLY26_HOME>/bin/add-user.sh` for Linux OS). Follow the steps below.

- Select Application User. Type **b** and hit **enter**

```
What type of user do you wish to add?
 a) Management User (mgmt-users.properties)
 b) Application User (application-users.properties)
(a): b
```

- Realm (**ApplicationRealm)** is used by default.
- Enter the desired Username. e.g., **dtsadminuser**

```
Username : dtsadminuser
```

- Enter the desired Password. The password cannot be same as the username. e.g., **dtsadmin**
- *Note: WildFly will prompt you if your password doesn't meet the recommended criteria. You may type "yes" and press "enter" to accept the password, despite this.*

```
WFLYDM0099: Password should have at least 8 characters!
Are you sure you want to use the password entered yes/no? _
```

- Re-enter Password. e.g, **dtsadmin**

```
Are you sure you want to use the password entered yes/no? yes
Re-enter Password :
```

- WildFly will prompt you to add the user to any groups. For the DTS administrator user, you will need to add to the "apelondtsadmin" and optionally "apelondts" groups, separated by a comma.

```
What groups do you want this user to belong to? (Please enter a comma separated list, or leave blank
 for none)[  ]: apelondtsadmin,apelondts
```

- Type "**yes**" to add the user and hit **enter**.

```
About to add user 'dtsadminuser' for realm 'ApplicationRealm'
Is this correct yes/no? yes
```

- WildFly supports an AS to AS configuration between multiple instances of the application server. When prompted if the user will be used to connect another AS

© 2026 Apelon, Inc.

process, for DTS purposes, you may type “no” and press enter.

```
Is this new user going to be used for one AS process to connect to another AS process?
e.g. for a slave host controller connecting to the master or for a Remoting connection for server to
 server EJB calls.
yes/no? no
```

See the screen shot below to confirm:

```
What type of user do you wish to add?
 a) Management User (mgmt-users.properties)
 b) Application User (application-users.properties)
(a): b

Enter the details of the new user to add.
Using realm 'ApplicationRealm' as discovered from the existing property files.
Username : dtsadmin
Password recommendations are listed below. To modify these restrictions edit the add-user.properties configuration file.
 - The password should be different from the username
 - The password should not be one of the following restricted values (root, admin, administrator)
 - The password should contain at least 8 characters, 1 alphabetic character(s), 1 digit(s), 1 non-alphanumeric symbol(s)
Password :
WFLYDM0102: Password should have at least 1 non-alphanumeric symbol.
Are you sure you want to use the password entered yes/no? yes
Re-enter Password :
What groups do you want this user to belong to? (Please enter a comma separated list, or leave blank for none)[  ]: apelondtsadmin,apelondts
About to add user 'dtsadmin' for realm 'ApplicationRealm'
Is this correct yes/no? yes
Added user 'dtsadmin' to file 'C:\AppServer\wildfly-12.0.0.Final\standalone\configuration\application-users.properties'
Added user 'dtsadmin' to file 'C:\AppServer\wildfly-12.0.0.Final\domain\configuration\application-users.properties'
Added user 'dtsadmin' with groups apelondtsadmin,apelondts to file 'C:\AppServer\wildfly-12.0.0.Final\standalone\configuration\application-roles.prope
rties'
Added user 'dtsadmin' with groups apelondtsadmin,apelondts to file 'C:\AppServer\wildfly-12.0.0.Final\domain\configuration\application-roles.propertie
s'
Is this new user going to be used for one AS process to connect to another AS process?
e.g. for a slave host controller connecting to the master or for a Remoting connection for server to server EJB calls.
yes/no? no
Press any key to continue . . .
```

G.3.3 WildFly 26 DTS User Configuration

WildFly Application Users must be created for every individual who will connect to the ***Apelon DTS Server via either the DTS Browser or DTS Editor*** and ***will not require access to the DTS Editor User Manager***. These WildFly users must have the group **“apelondts”.**
Go to `<WILDFLY26_HOME>\bin` and run `add-user.bat` (or `<WILDFLY26_HOME>/bin/add-user.sh` for Linux OS). Follow the steps below.

- Select Application User. Type **b** and hit **enter**

```
What type of user do you wish to add?
 a) Management User (mgmt-users.properties)
 b) Application User (application-users.properties)
(a): b
```

- Realm (**ApplicationRealm)** is used by default.
- Enter the desired Username. e.g, **dtsuser**

```
Username : dtsuser
```

- Enter the desired Password. The password cannot be same as the username. e.g., **dts**
- *Note: WildFly will prompt you if your password doesn’t meet the recommended criteria. You may type “yes” and press “enter” to accept the password, despite this.*

```
WFLYDM0099: Password should have at least 8 characters!
Are you sure you want to use the password entered yes/no?
```

© 2026 Apelon, Inc.

- Re-enter Password. e.g., **dts**

```
Are you sure you want to use the password entered yes/no? yes
Re-enter Password :
```

- WildFly will prompt you to add the user to any groups. For the standard DTS users, you will need to add to the “apelondts” group.

```
What groups do you want this user to belong to? (Please enter a comma separated list, or leave blank
 for none)[  ]: apelondts
```

- Type “**yes**” to add the user and hit **enter**.

```
About to add user 'dtsadminuser' for realm 'ApplicationRealm'
Is this correct yes/no? yes
```

- WildFly supports an AS to AS configuration between multiple instances of the application server. When prompted if the user will be used to connect another AS process, for DTS purposes, you may type “no” and press enter.

© 2026 Apelon, Inc.

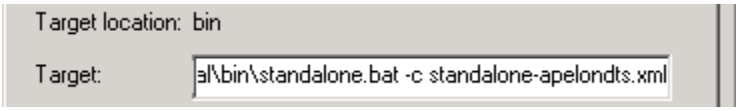
G.4 Apelon DTS 4.9.0 Server Deployment

1. Copy the **standalone-apelondts.xml** file from
   `<DTS_HOME>\server\wildfly\standalone\configuration\WF26`
   to the `<WILDFLY26_HOME>\standalone\configuration` folder.

2. Create a shortcut for `<WILDFLY26_HOME>\bin\standalone.bat`. Rename this to something like "Apelon DTS WildFly".

3. Right-click on the shortcut and go to Properties. Modify target as follows:

```
<WILDFLY26_HOME>\bin\standalone.bat -c standalone-apelondts.xml
```



4. Use this "Apelon DTS WildFly" shortcut for running WildFly configured for Apelon DTS.

5. For launching on Linux OS use the following terminal command from `<WILDFLY26_HOME>/bin/`:

```
standalone.sh -c standalone-apelondts.xml
```

© 2026 Apelon, Inc.

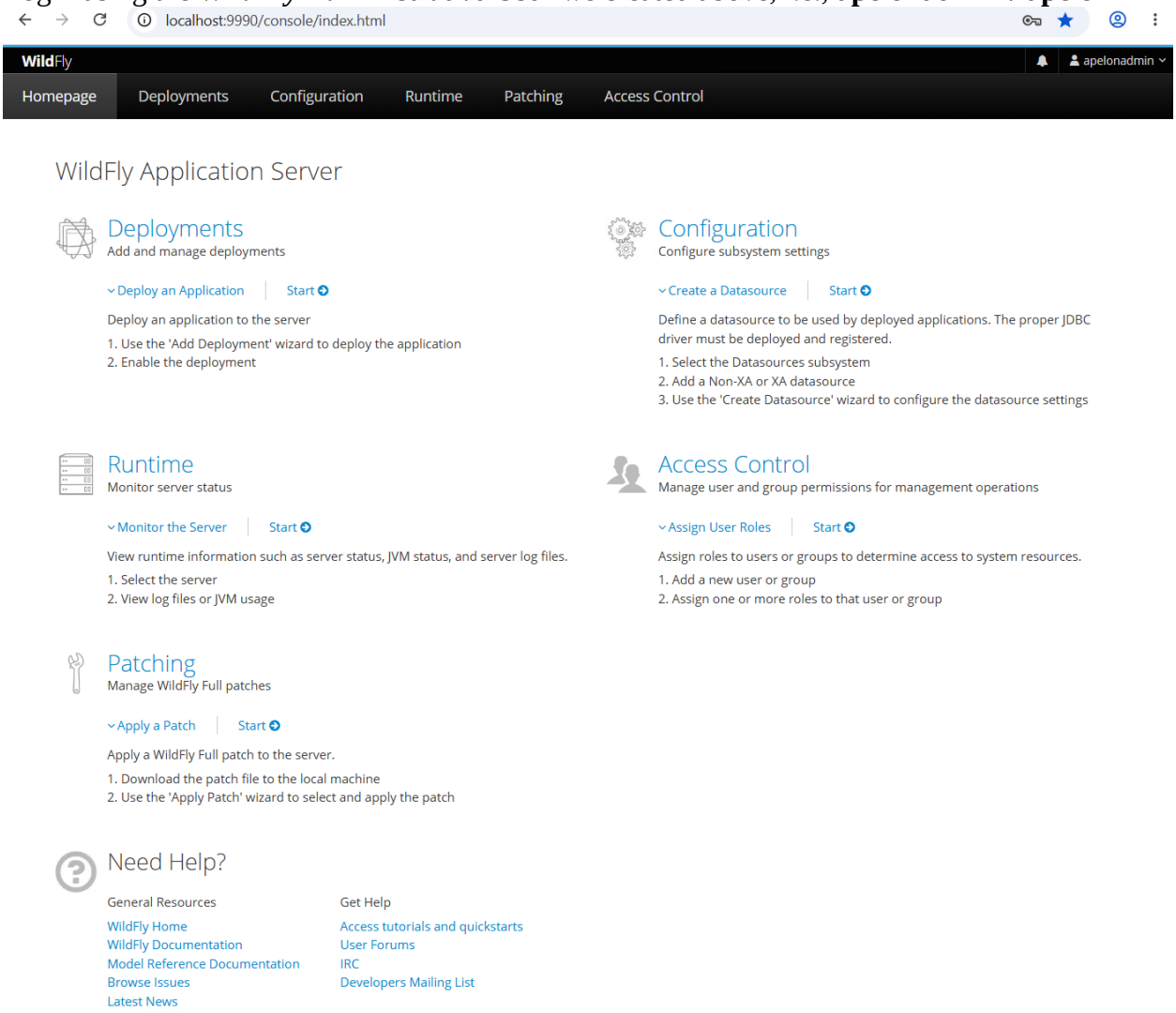
G.4.1 Data Source Configuration

Apelon DTS Server requires a data source configured with WildFly to connect to the database. The necessary steps are:

- Deploy database driver.
- Configure data source.

G.4.2 Deploy Database Driver

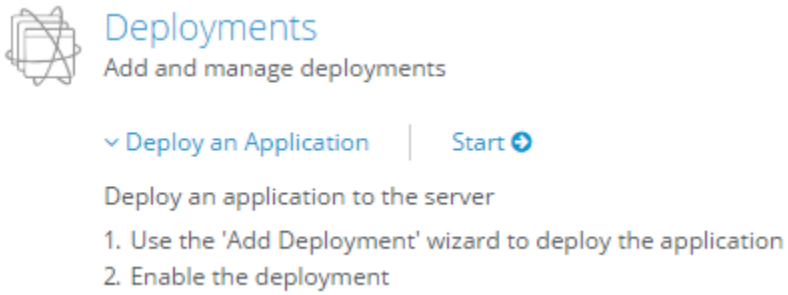
Start WildFly 26 using the "Apelon DTS WildFly" shortcut for Windows OS (or from terminal window for Linux OS) created in the previous step. Open a browser and go to the default WildFly Management URL: `http://localhost:9990/console/index.html`
Login using the ***WildFly Administrative User*** we created above, i.e., **apelonadmin / apelon**



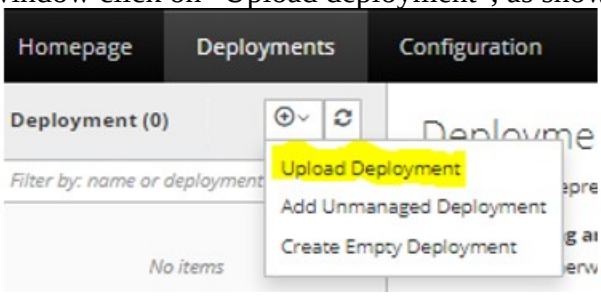
If your view does not display as shown above, refresh your browser or clear your browser cache.

© 2026 Apelon, Inc.

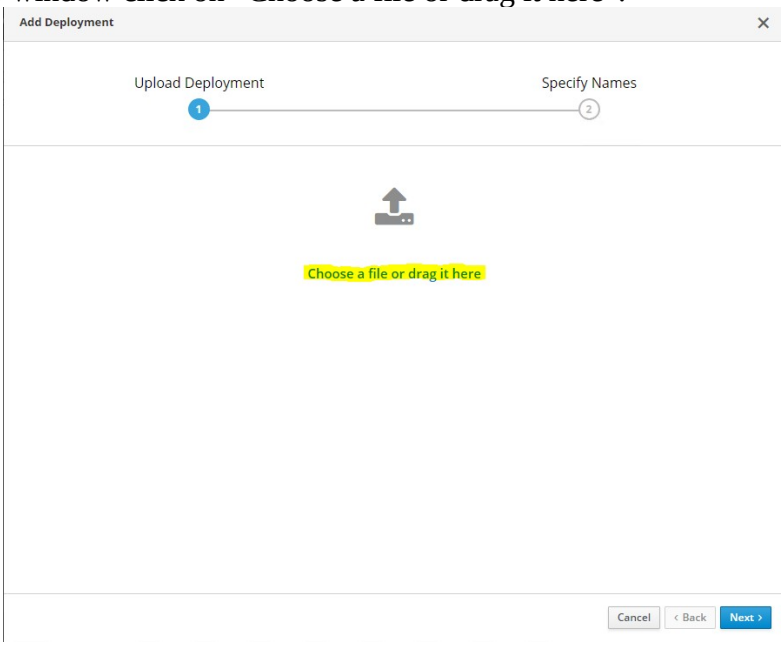
Then Under the “Deployments” header, next to “Deploy an Application” click on the Start arrow.



Then click on the dropdown button to the right of **Deployment…** in the upper left. In the pop-up window click on “Upload deployment”, as shown below.



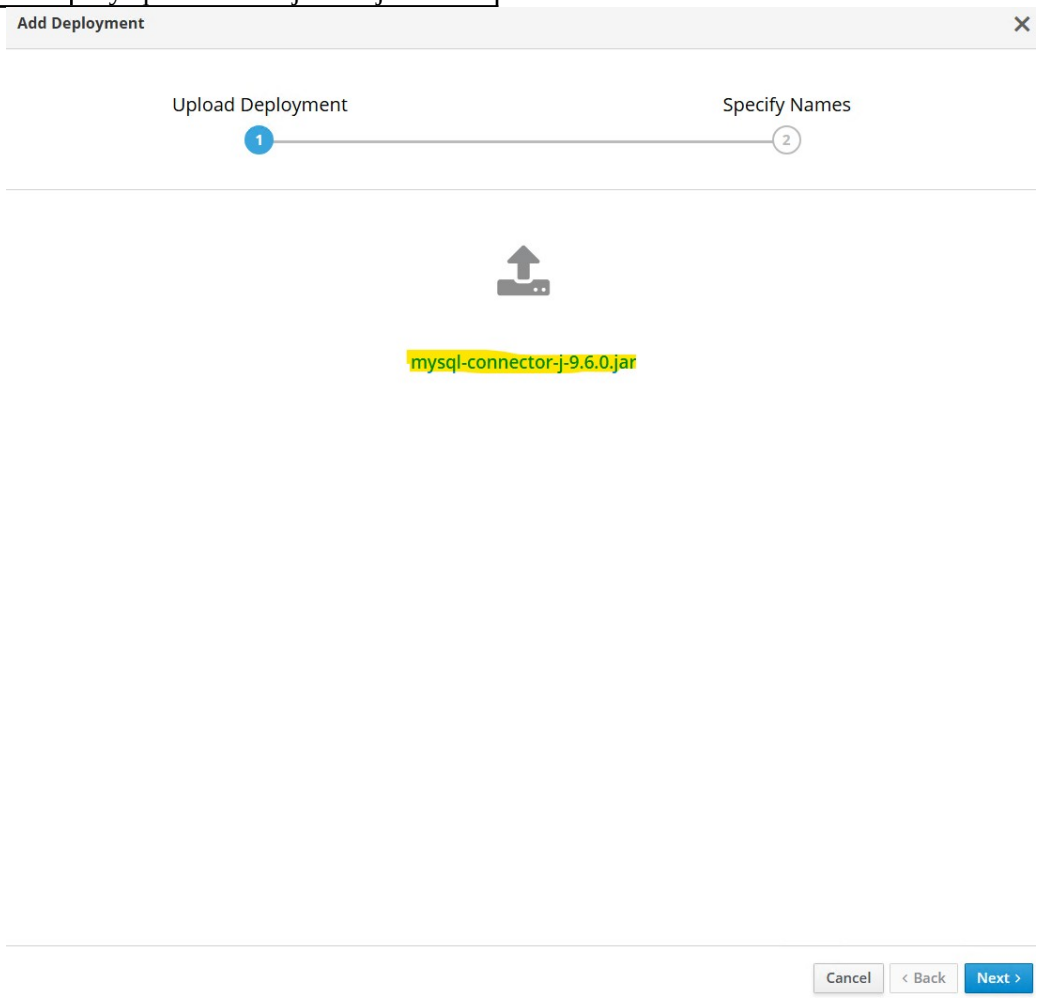
In the next pop-up window click on “Choose a file or drag it here”.



© 2026 Apelon, Inc.

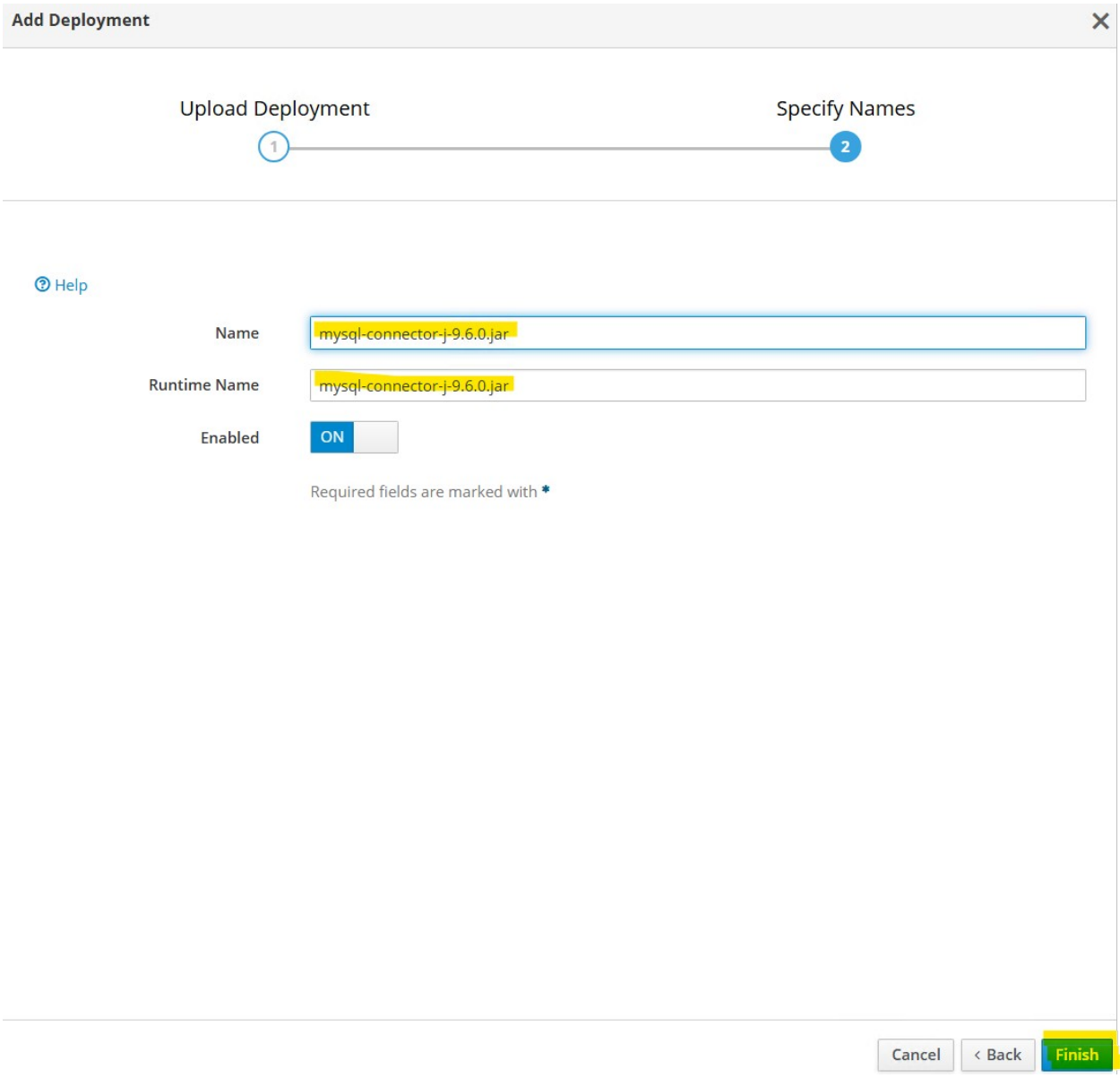
Navigate to the **<DTS_HOME>\lib** folder.
Select a Driver .jar file for the database as given below and click **Next**.

Database	Driver
MS SQL Server 2019	mssql-jdbc-13.4.0.jre8.jar
MS SQL Server 2025	mssql-jdbc-13.4.0.jre8.jar
MySQL 8.4	mysql-connector-j-9.6.0.jar



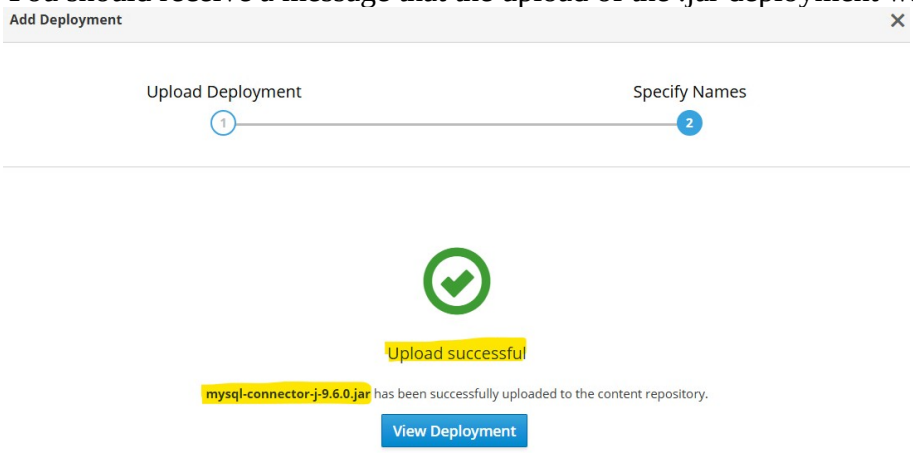
© 2026 Apelon, Inc.

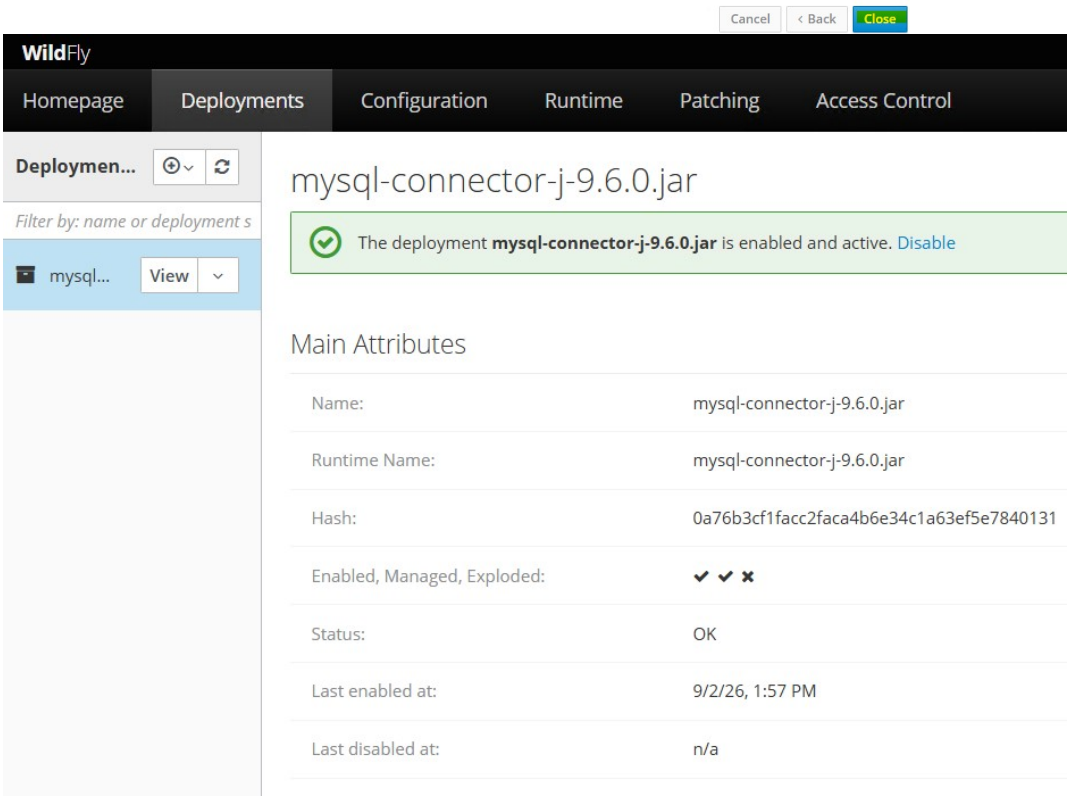
Ensure the **`Enable`** is **ON** and click “Finish”.



© 2026 Apelon, Inc.

You should receive a message that the upload of the .jar deployment was successful.





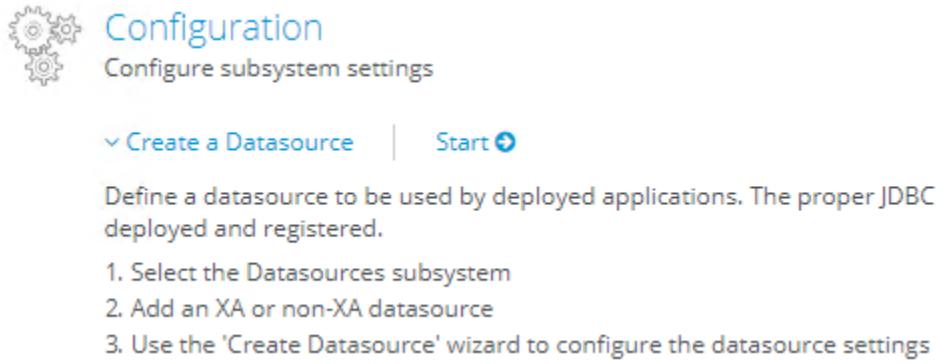
© 2026 Apelon, Inc.

G.4.3 Configure Data Source

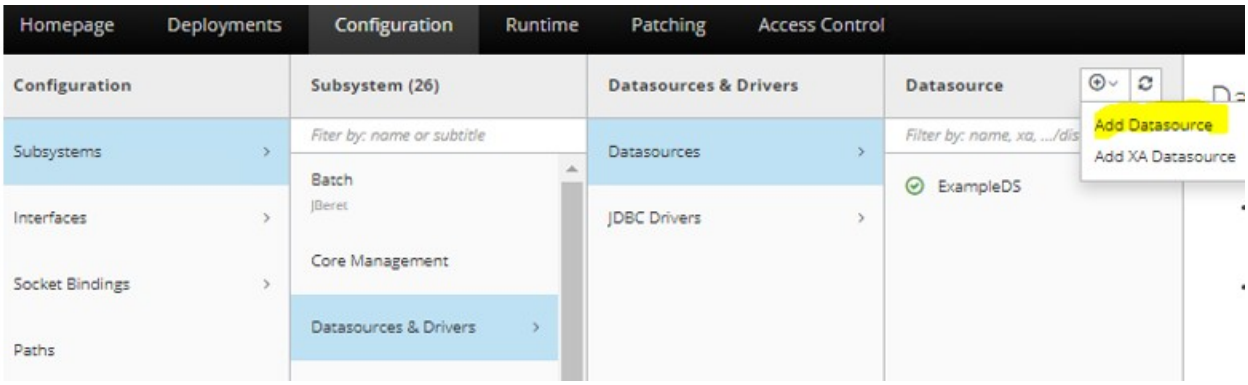
The Apelon DTS Server requires a data source named "**ApelonDtsDS**". This data source must be set up similar to the examples given below (*ensure the appropriate User, Password, and database name are used if they are not the values used as an example here. Also "localhost" can be replaced with the database server IP address or server name*).

Database	User	Password	Connection URL
MS SQL Server	dts4user	dts4pass	jdbc:sqlserver://localhost:1433;trustServerCertificate=true;databasename=dts4
MySQL	dts4user	dts4pass	jdbc:mysql://localhost:3306/dts4

To create the **`ApelonDtsDS`** data source, navigate back to "Homepage" in the WildFly 26 administration console, and under the "Configuration" header, select the Start arrow next to "Create a Datasource":

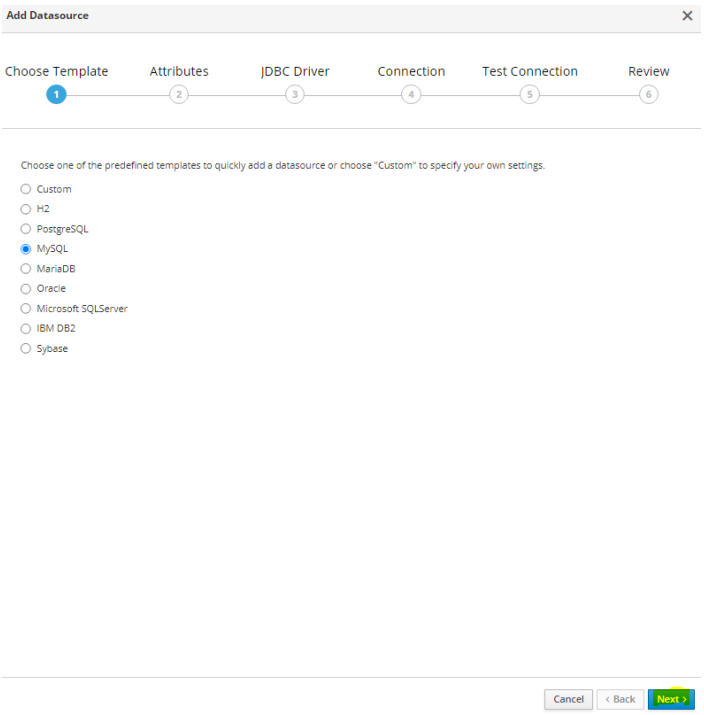


In the "Configuration" column, select the "Subsystems" tab. Under the "Subsystem" column, select the "Datasources & Drivers" tab. Under the "Datasources & Drivers" column, select the "Datasources" tab.
In the "Datasource" column click on the dropdown and choose "Add Datasource", where the ApelonDtsDS datasource will be created as a non-cross-application datasource.

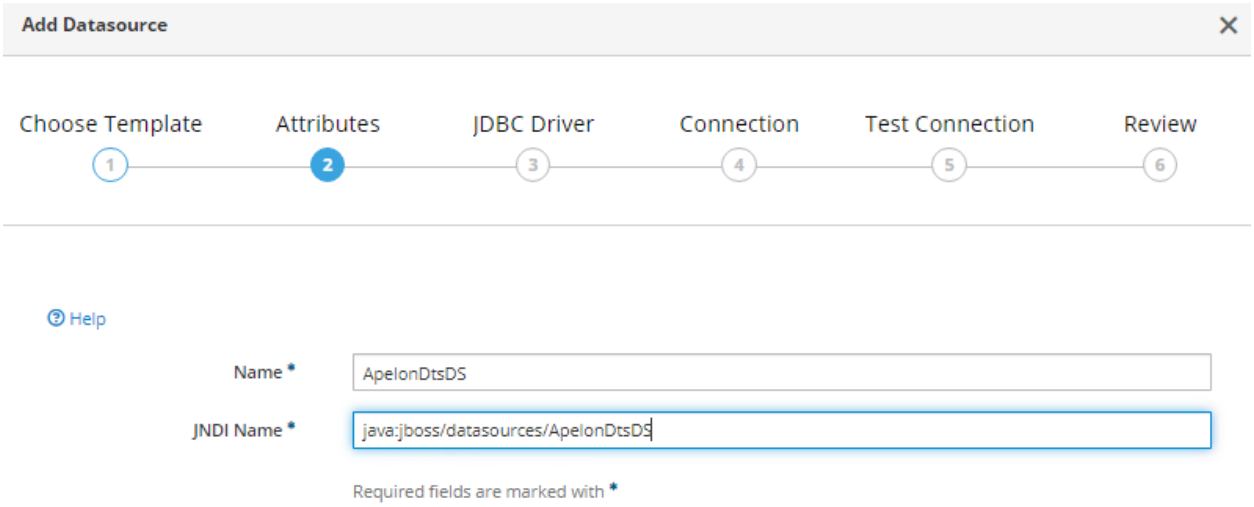


In the next popup, select the database type for your Datasource (MySQL or Microsoft SQLServer) and click **Next**.

© 2026 Apelon, Inc.

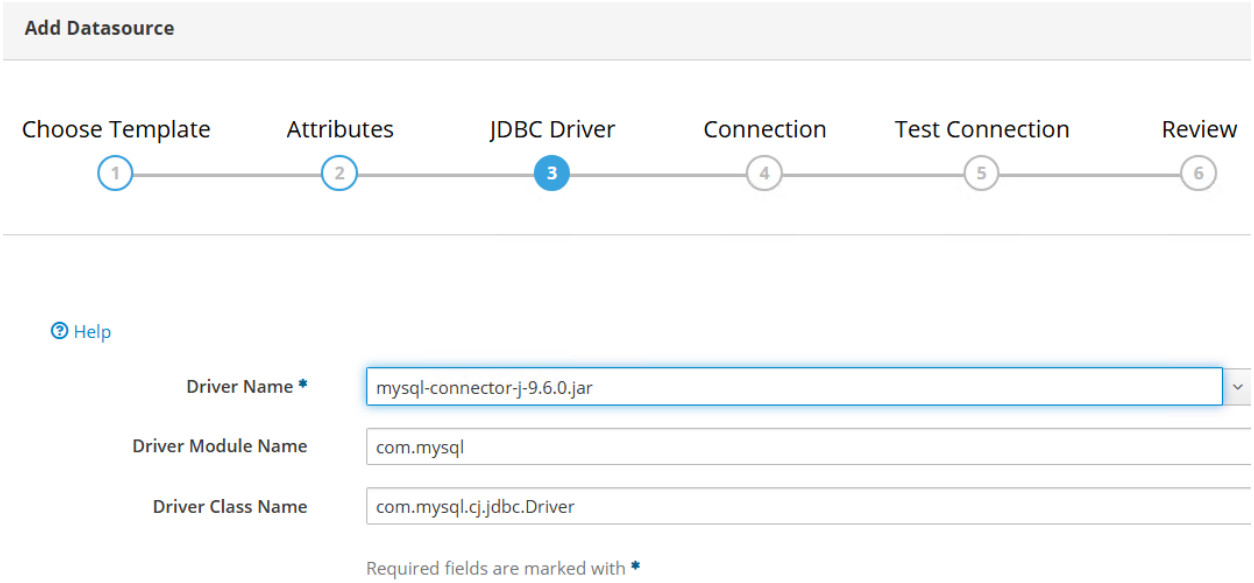


Edit the Datasource Attributes **Name** and **JNDI Name** (*Note: these values are Case-Sensitive*).
The **Name** should be: “ApelonDtsDS”
The **JNDI Name** should be: “java:jboss/datasources/ApelonDtsDS”



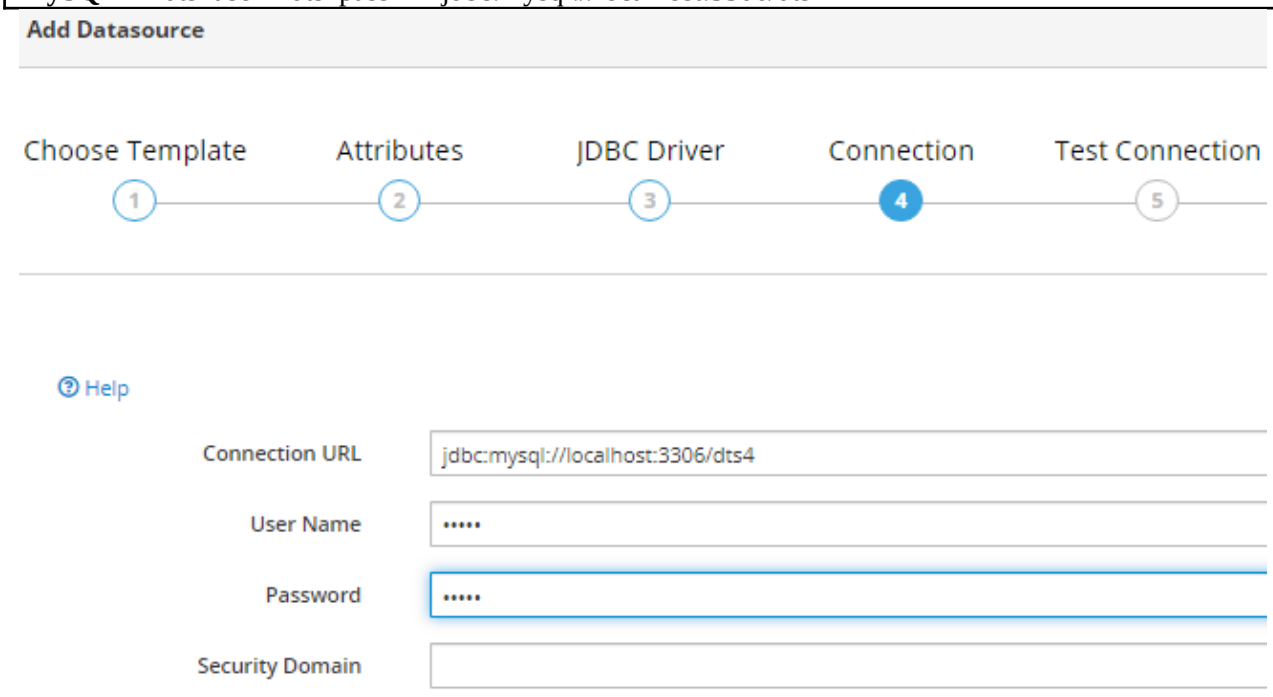
In the next window, select the database driver from the **Driver Name** dropdown. Choose the database driver you added to WildFly 26 in an earlier step and hit “Next”.

© 2026 Apelon, Inc.



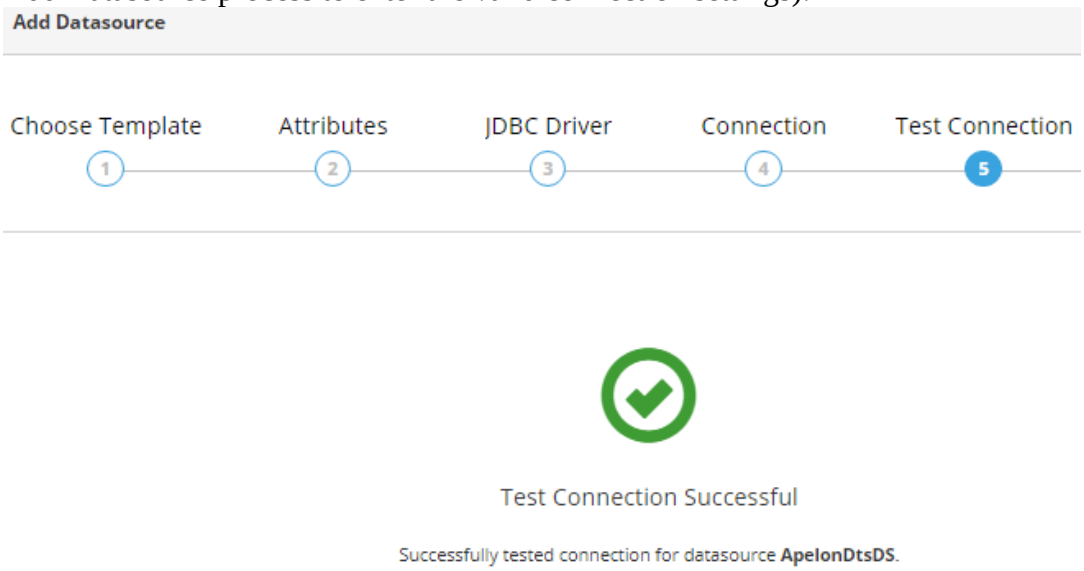
On the next window, enter the appropriate Connection URL, Username, and Password for your database environment. Examples are again presented below, but you should enter the parameters which are correct for your database (*ensure the appropriate User, Password, and database name are used if they are not the values used as an example here. Also "localhost" can be replaced with the database server IP address or server name*)

Database	User	Password	Connection URL
MS SQL Server	dts4user	dts4pass	jdbc:sqlserver://localhost:1433;trustServerCertificate=true;databasename=dts4
MySQL	dts4user	dts4pass	jdbc:mysql://localhost:3306/dts4

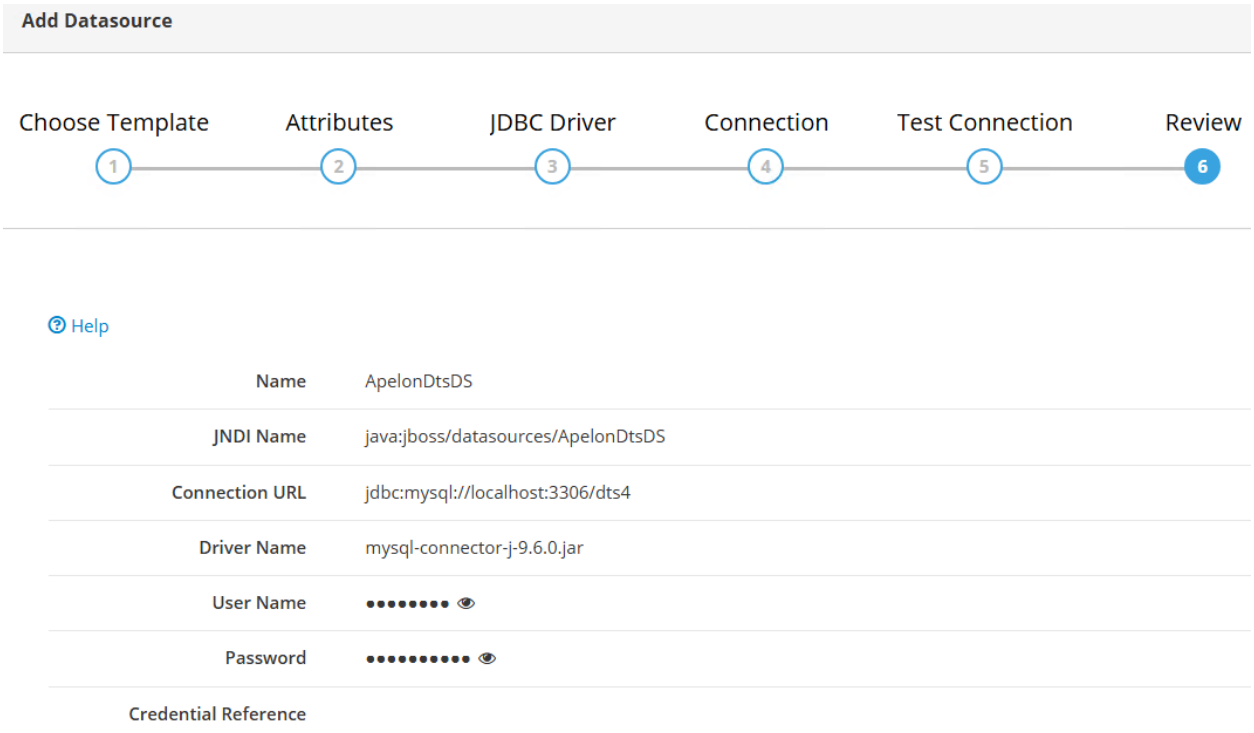


© 2026 Apelon, Inc.

The next window will provide a Test Connection option. Click on the “Test Connection” button to ensure the above entered connection settings are valid. If the connection test is successful click “Next”. If the connection test fails, click “Back” and correct the connection settings (NOTE: the connection settings may get cached by the browser so you may need to restart the Add Datasource process to enter the valid connection settings).

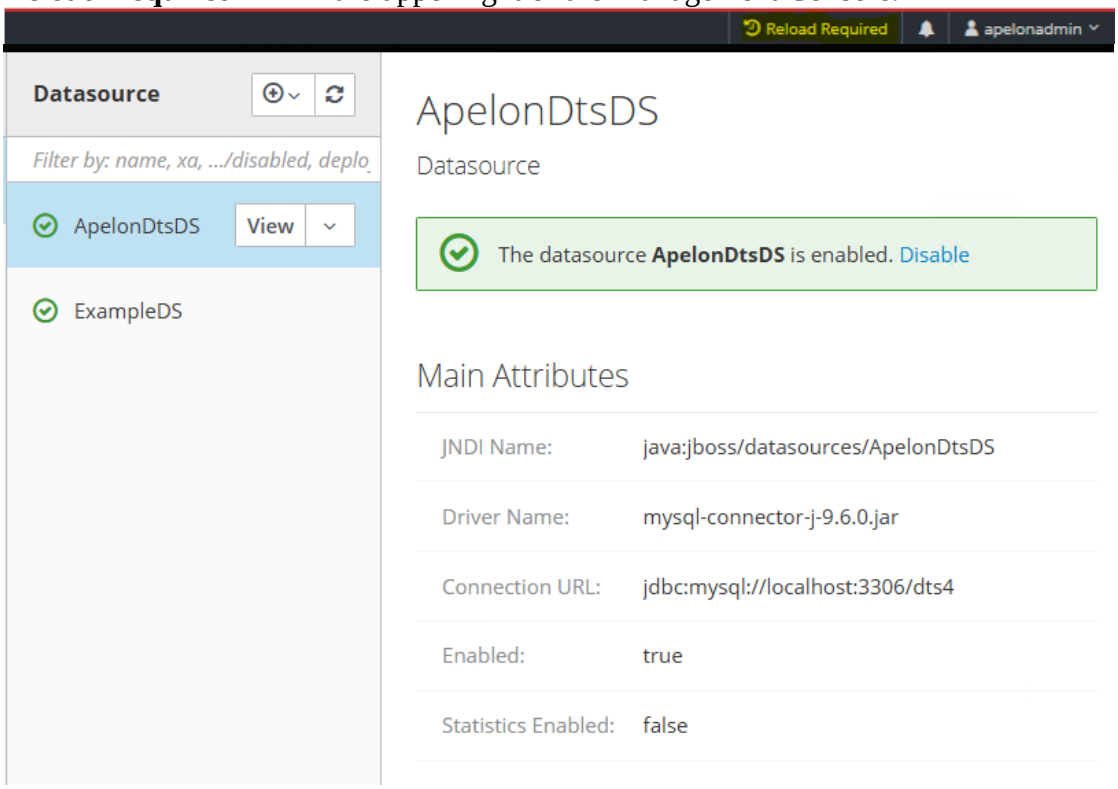


On the next window, WildFly 26 will provide you a summary of the Datasource settings. Click “Finish” to accept, or “back” to make any revisions.

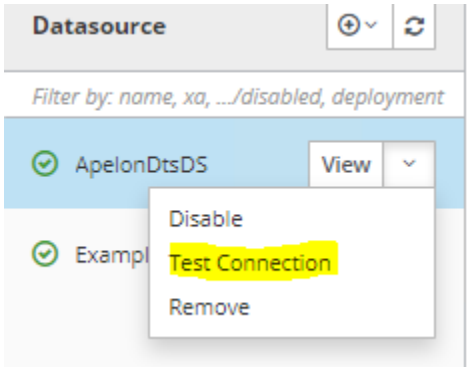


© 2026 Apelon, Inc.

After clicking “Finish” a pop-up message will be displayed indicating the server configuration changed and to reload the server. Click “Reload”. If you miss the Reload pop-up, click on the **Reload Required** link in the upper right of the Management Console.



You should receive a message that the Server was successfully loaded.
Now that the Datasource has been created, you may test the connection once again, from the dropdown next to it from the “Datasource” column.



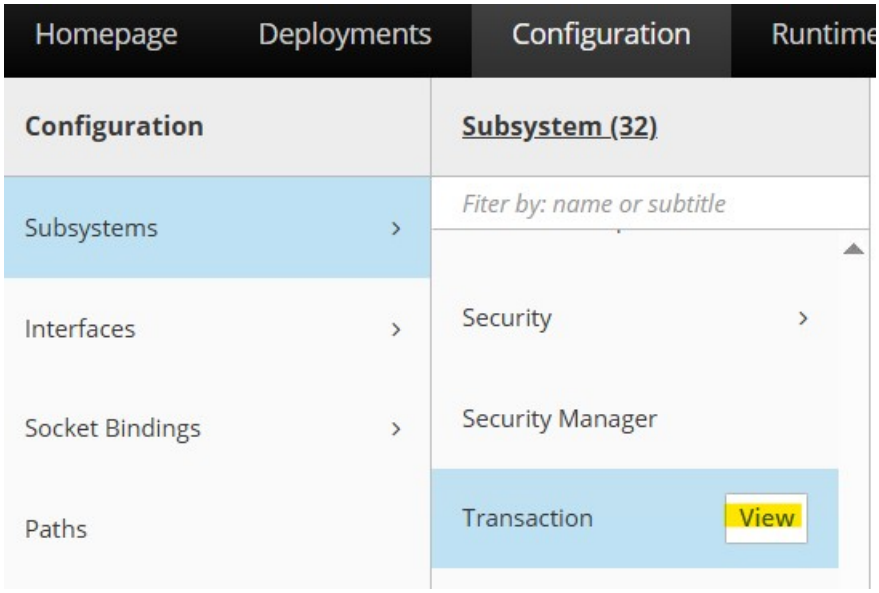
Ensure the connection test is successful before continuing.

G.5 Check WildFly Transaction Timeout Default

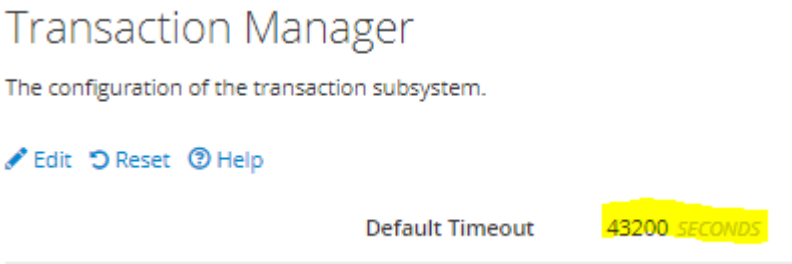
The WildFly Transaction Timeout Default is **set to 43200 seconds** to accommodate long running DTS transactions.

© 2026 Apelon, Inc.

To edit or view the WildFly 26 Transaction Timeout Default, from the “Configuration” column select “Subsystems”>”Transactions” and click “View”.



Then click “Edit” and enter the new timeout value.

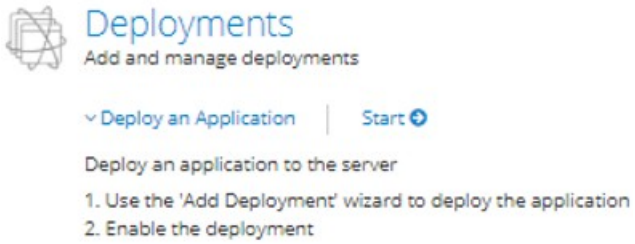


Then click “Save”. The WildFly 26 server must be restarted for the change to take effect.

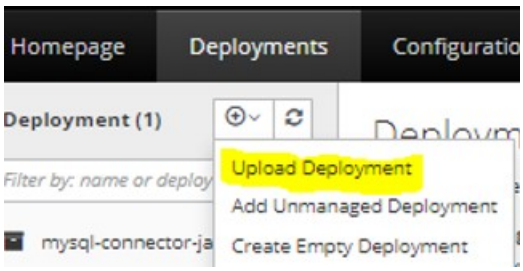
© 2026 Apelon, Inc.

G.6 Deploy Apelon DTS 4.9.0 Server

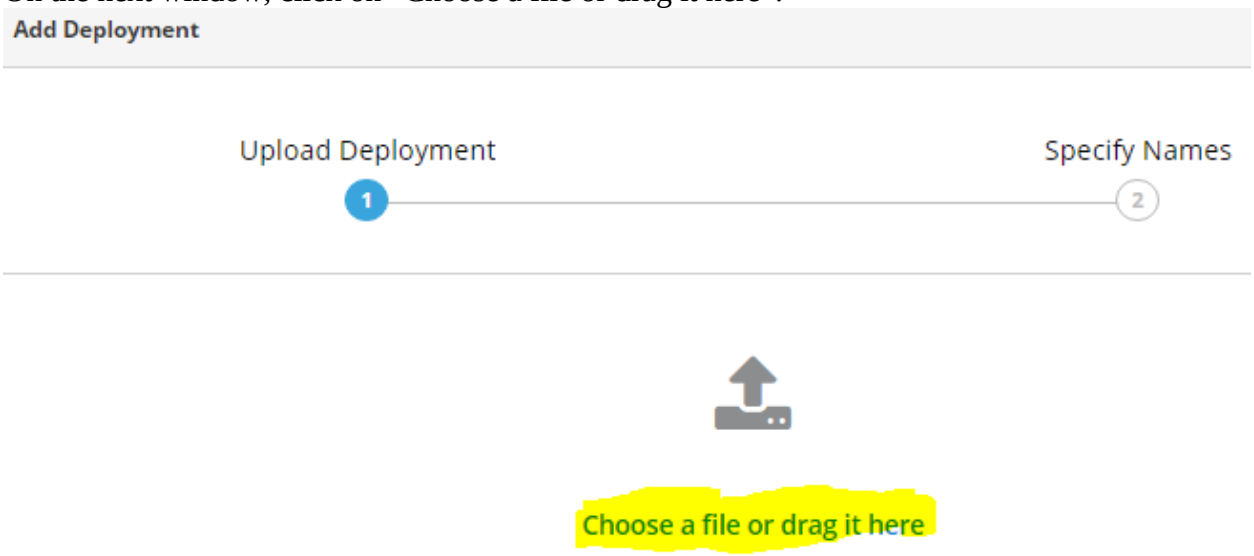
To deploy the Apelon DTS Server EAR file, click the Start arrow next to “Deploy an application” under the Deployments header from the Homepage tab.



Click the dropdown button in the upper left and choose “Upload Deployment” to begin the deployment process.



On the next window, click on “Choose a file or drag it here”.

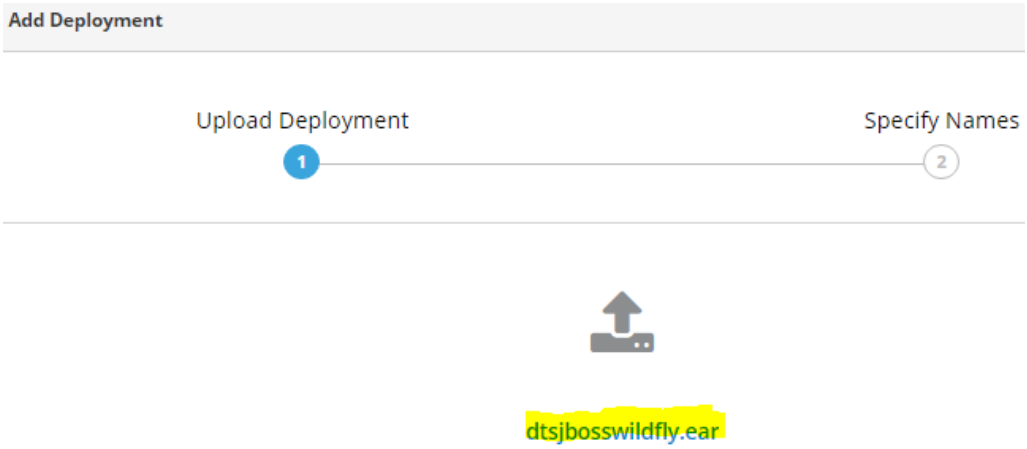


Navigate to the `<DTS_HOME>\server\wildfly\standalone\deployments` directory and select **`dtsjbosswildfly.ear`** (This is not a typo, WildFly is in reality the next iteration of JBoss, and as such the .ear file and deployed application still contain “jboss” in the name).

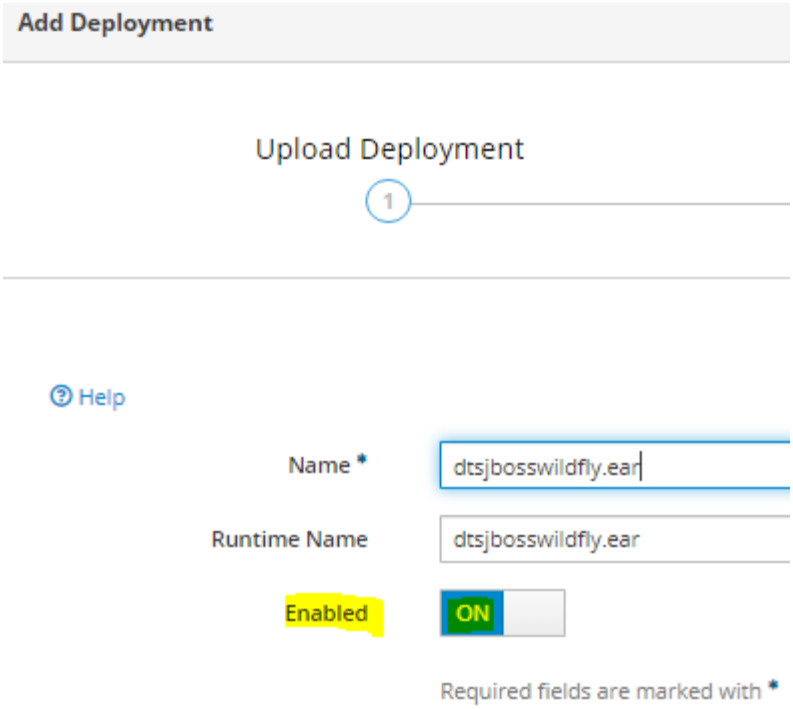
NOTE: For **Microsoft SQL Server** a `dtsjbosswildflyforsqlserver.ear` file that is specific to Microsoft SQL Server must be used.

- The SQL Server specific `”dtsjbosswildflyforsqlserver.ear”` file is in the following location:
  `<DTS_HOME>\server\wildfly\standalone\deployments\sqlserver\`

© 2026 Apelon, Inc.



In the next window ensure “Enable” is set to **ON** and then click “Finish”.



WildFly 26 will report that the deployment is in process. NOTE: you may see a message that “… management operations are running longer than expected…” but you can ignore this message.

****IMPORTANT****

In the case of upgrading an earlier DTS 4 schema version, Do Not Restart WildFly 26 until the Deployment has completely finished and you have verified that the Database Schema is fully deployed to the correct version (See section: Upgrade Apelon DTS 4.8.0 WildFly Server & schema to DTS 4.9.0). Once the correct schema version is verified, SHUT DOWN and RESTART the WildFly 26 server to ensure the changes are integrated.

© 2026 Apelon, Inc.

G.7 Verify DTS Browser & Editor connections to WildFly 26 DTS 4.9.0 Server

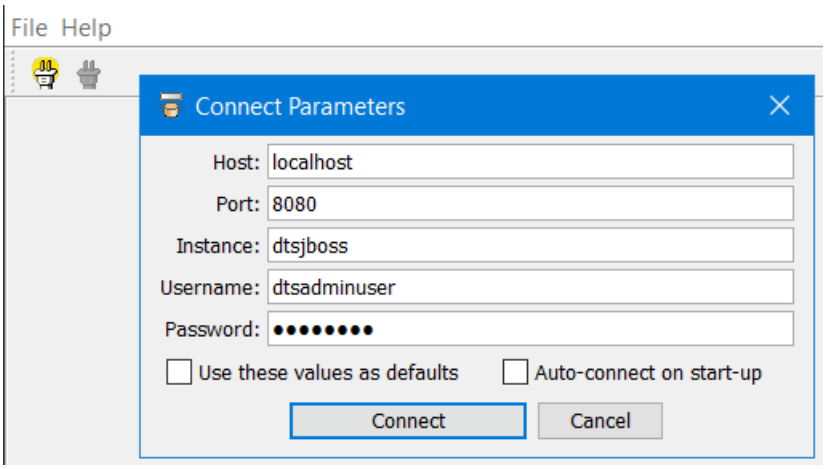
G.7.1 Verify the DTS Browser

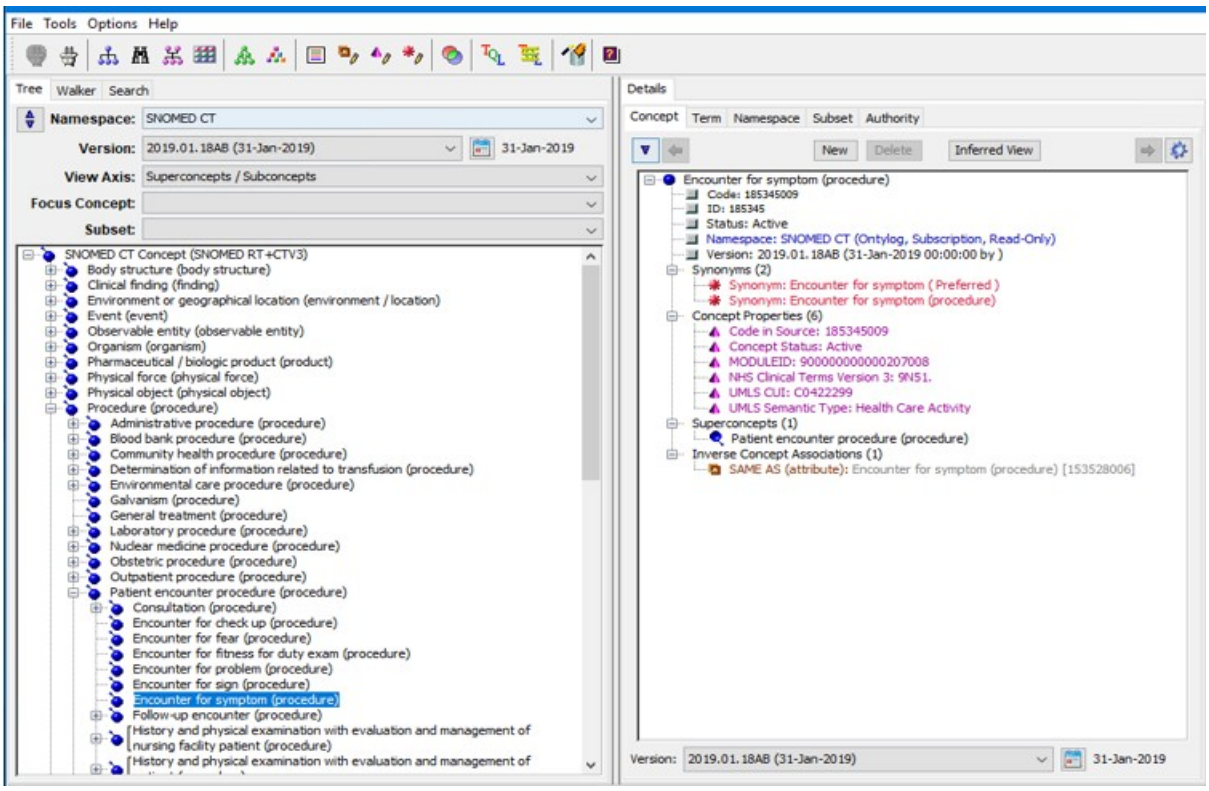
You can access the DTS Browser from:
`http://localhost:8080/dtsserverws`.
To login to the DTS Browser, you will need to enter user credentials created in the WildFly 26 Configuration for Apelon DTS 4 Server section.
Note: If you used the example users defined in the guide, the credentials would be either **dtsadminuser/dtsadmin** or **dtsuser/dts**.

G.7.2 Verify the DTS Editor connection

Run the DTS Editor shortcut (DTS Editor) provided by the DTS 4 installation.
Connect to the WildFly 26 server by using an **Instance** of '**dtsjboss**' and default **Port** number '**8080'** along with the user credentials created in the WildFly 26 Configuration for Apelon DTS 4 Server section.
Note: If you used the example users defined in this guide the credentials would be either **dtsadminuser/dtsadmin** or **dtsuser/dts**.
Click "Connect".

© 2026 Apelon, Inc.





© 2026 Apelon, Inc.

G.8 Setup WildFly 26 and DTS 4.9.0 to start as a Windows Service

Follow these steps to get your WildFly 26 server running as a windows service.

1. Copy the **`service`** directory from **`<WILDFLY26_HOME>\docs\contrib\scripts`** to **`<WILDFLY26_HOME>\bin`**

2. Edit `service.bat` file, now located in **`<WILDFLY26_HOME>\bin\service,`** and set the windows service variables.

e.g.:

```
set SHORTNAME=DTS49WildFly26
set DISPLAYNAME=DTS49_WildFly26
set DESCRIPTION=DTS 4.9 WildFly 26 Application Server
```

Note1: If present, please be sure to remove the quotations surrounding the Description value.

Note2: If the JBoss Management Port Number specified in the **standalone-apelondts.xml** provided by DTS4 is changed (i.e. from `jboss.management.http.port:9990` to `jboss.management.http.port:XXXX`), then the Controller Port Number specified in the **`services.bat`** found in the following line must be changed to match the JBoss Management Port Number:
`CONTROLLER=localhost:9990`

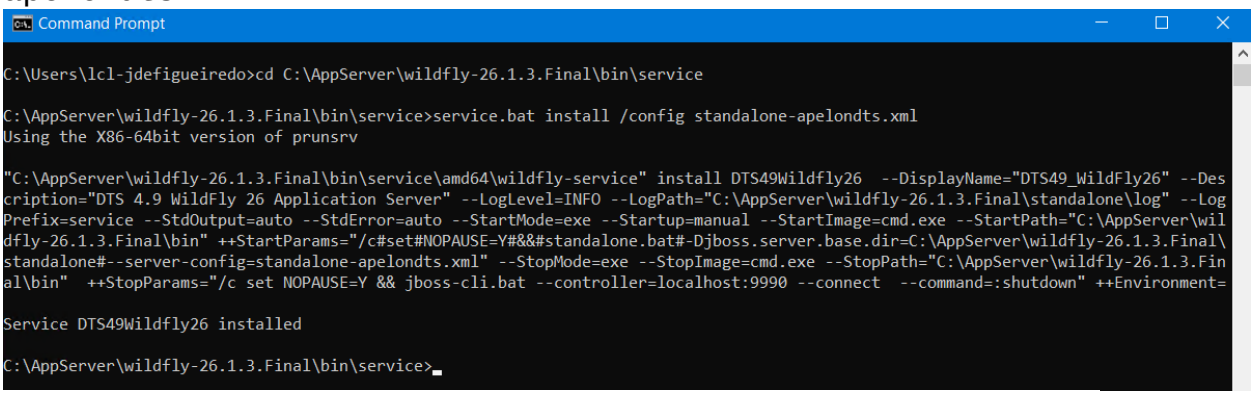
service.bat

```
114  rem defaults
115  set SHORTNAME=DTS49Wildfly26
116  rem NO quotes around the display name here !
117  set DISPLAYNAME=DTS49_WildFly26
118  rem NO quotes around the description here !
119  set DESCRIPTION=DTS 4.9 WildFly 26 Application Server
120  set CONTROLLER=localhost:9990
121  set DC_HOST=master
122  set IS_DOMAIN=false
123  set LOGLEVEL=INFO
124  set LOGPATH=
125  set PROPSPATH=
126  set ENV_VARS=
127  set JBOSSUSER=
128  set JBOSSPASS=
129  set SERVICE_USER=
130  set SERVICE_PASS=
131  set STARTUP_MODE=manual
132  set ISDEBUG=
133  set CONFIG=
134  set HOSTCONFIG=host.xml
135  set BASE=
136
```

© 2026 Apelon, Inc.

3. Open a command prompt (as administrator) and change directory to the **`<WILDFLY26_HOME>\bin\service`** directory.

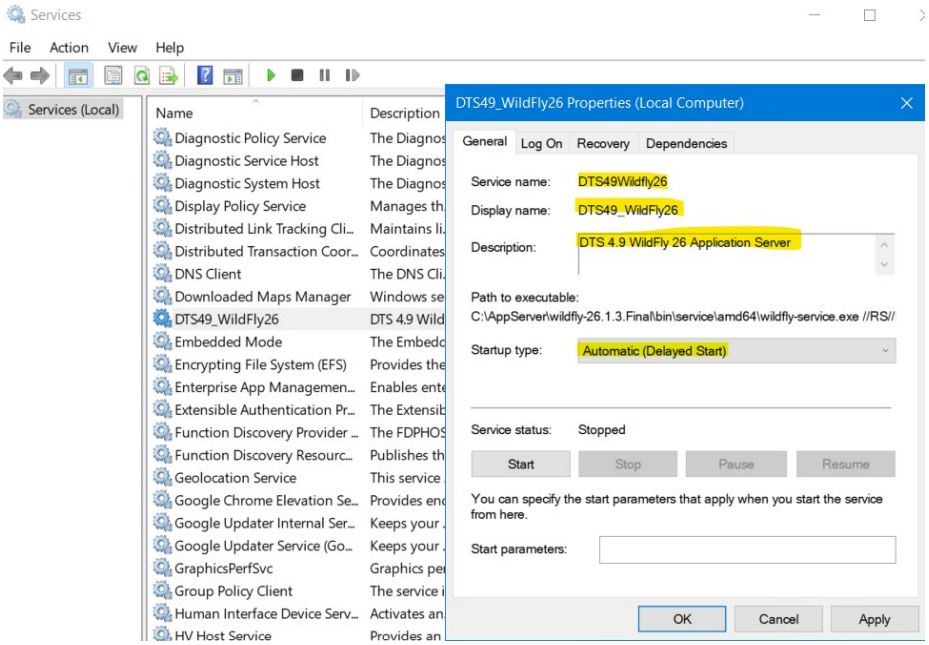
4. Issue the command: `service.bat install /config standalone-apelondts.xml`



If installed successfully, you will be able to manage your WildFly 26 server from the Windows Services console.

5. Search for **Services** and select the Services app. Find the **"DTS49_WildFly26"** service. Right click and select **Properties**.

6. Perform the following:
   Set the *Startup type* to **Automatic or Automatic (Delayed Start)**
   Click **Apply,** then **Start** the Service.
   Click **OK**



7. The "**DTS49_WildFly26"** service is now **Running** and set to **Automatic (Delayed Start)**.

© 2026 Apelon, Inc.

G.9 Setup WildFly 26 and DTS 4.9 to start as a Linux Service

To install the WildFly 26 DTS 4.9 server as a daemon service on Alma Linux 8/RHEL 8, you will need to copy and configure the service launching scripts that are included with WildFly 26.

Follow these Steps to configure the service.

Step 1: Create a symbolic link to your Wildfly installation directory:

```
sudo ln -s <WildFly_Home_DIR> /opt/wildfly
```

- If WildFly 26 was installed in /opt/wildfly-26.1.3.Final:

  ```
  sudo ln -s /opt/wildfly-26.1.3.Final /opt/wildfly
  ```

Step 2: Setup the System User

Ensure your user owns the new files whether you use wildfly or apelon as the system user.

- Create “wildfly” user without login shell access if one does not exist yet:

```
sudo id -u wildfly &>/dev/null || sudo useradd -r -m -d
/opt/wildfly -s /sbin/nologin wildfly

sudo chown -R wildfly:wildfly /opt/wildfly-26.1.3.Final

sudo chown -h wildfly:wildfly /opt/wildfly
```

Step 3: Install the Environment Configuration

- Copy the systemd configuration template to the native Red Hat directory and configure it:

```
sudo cp /opt/wildfly/docs/contrib/scripts/systemd/wildfly.conf
/etc/sysconfig/wildfly

sudo vi /etc/sysconfig/wildfly
```

- Update the properties inside to ensure they point strictly to your version 26 directory structure. The JBOSS_USER will be “wildfly” as in the below examples:

```
WILDFLY_CONFIG=standalone-apelondts.xml

WILDFLY_MODE=standalone

WILDFLY_BIND=0.0.0.0

WILDFLY_HOME="/opt/wildfly"

JBOSS_HOME="/opt/wildfly"

JBOSS_USER=wildfly
```

© 2026 Apelon, Inc.

Step 4: Install the Launch Script

- Move the execution manager script into place:

```
sudo cp /opt/wildfly/docs/contrib/scripts/systemd/launch.sh
/opt/wildfly/bin/

sudo chmod +x /opt/wildfly/bin/launch.sh
```

- Grant executable rights for “wildfly” user:

```
sudo chown wildfly:wildfly /opt/wildfly/bin/launch.sh
```

Step 5: Configure the Systemd Unit File

- Copy the service configuration template to your central system files:

```
sudo cp
/opt/wildfly/docs/contrib/scripts/systemd/wildfly.service
/etc/systemd/system/

sudo vi /etc/systemd/system/wildfly.service
```

- Find the EnvironmentFile variable string under the [Service] section and explicitly ensure it targets your path:

```
EnvironmentFile=/etc/sysconfig/wildfly
```

Step 6: Run and Verify the Clean Service

- Force systemd to index your clean configuration files, enable the service to persist through reboots, and start the app server:

```
sudo systemctl daemon-reload

sudo systemctl enable --now wildfly

sudo systemctl status wildfly
```

Your service status should now report active (running) without any log manager exceptions.

© 2026 Apelon, Inc.

Additional Commands

Use these commands for managing the WildFly 26 service:

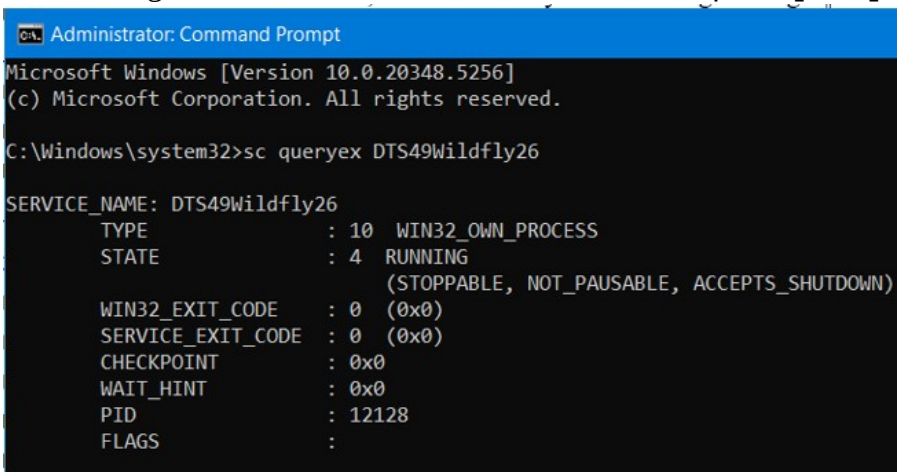
Command	Description
sudo systemctl start wildfly	Starts the WildFly service.
sudo systemctl stop wildfly	Stops the WildFly service.
sudo systemctl status wildfly	Checks the current status of the WildFly service.
sudo systemctl enable wildfly	Enables the WildFly service to start on boot.
sudo systemctl disable wildfly	Disables the WildFly service from starting on boot.

© 2026 Apelon, Inc.

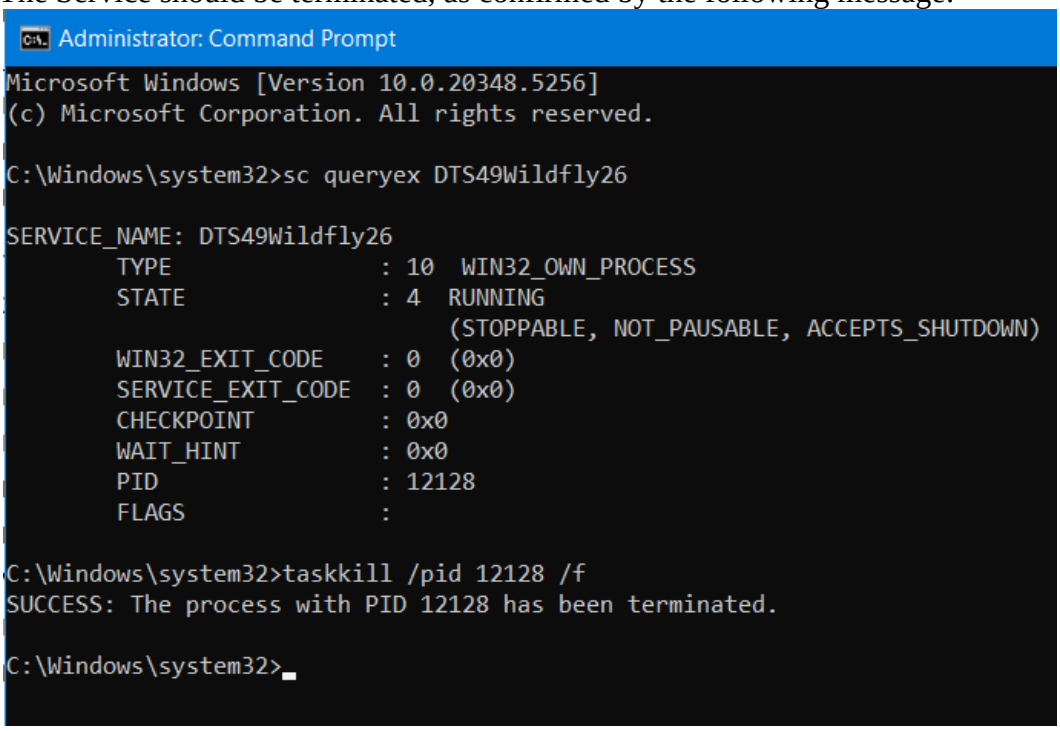
G.10 Terminating the WildFly 26 Service using taskkill

Stopping the WildFly 26 Service in the Services Window sometimes does not shut down in a timely manner, sometimes returning an error that the service is not responding. In this case, using a taskkill command to terminate the service is an effective way of circumventing this Services issue. Here are the instructions for doing so:

1. In the Services Window, right-click on the WildFly 26 Service and choose Properties.
2. In the Properties Window, identify the Service Name and copy it.
3. Open a Command Window and type the following: `sc queryex [Service Name]`
4. This should produce information about the WildFly 26 Service, including the PID.
5. Type the following in the Command Window: `taskkill /pid [PID] /f`



6. The Service should be terminated, as confirmed by the following message:



© 2026 Apelon, Inc.

G.11 Upgrade Apelon DTS 4.8.0 WildFly Server & schema to DTS 4.9.0

Perform the following steps to upgrade your Apelon DTS 4.8 WildFly Server to Apelon DTS 4.9.0 WildFly 26 Server **(Note: DTS 4.7.1 - 4.8.0 have the same schema version as DTS 4.9.0)**:

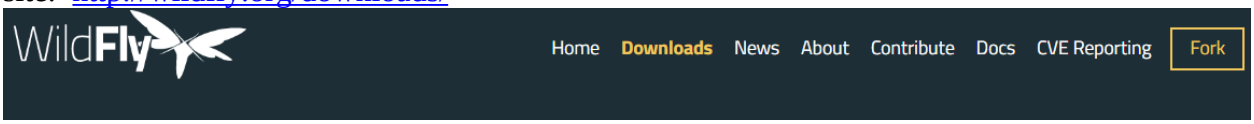
- Follow instructions in Section B for installing DTS 4.9.0 on the server to be upgraded.
- Stop the Apelon DTS WildFly service.
- Copy the WildFly configuration file from the DTS 4.9.0 home directory `<DTS_HOME>\server\wildfly\standalone\configuration\WF26` to the <WILDFLY26_HOME>**`\standalone\configuration`** folder. Replace the existing file with this new WildFly 26 configuration file.
- Restart the Apelon DTS WildFly service.
- Review the Notes below before continuing to the next steps.
- Follow steps **G.4.2**(Deploy Database Driver) through **G.7**(Verify DTS Browser & Editor connections to WildFly 26 DTS 4.9.0 Server) to finish configuring the Apelon DTS 4.9.0 WildFly 26 server.
- **NOTE1:** If upgrading from a DTS 4.7.0 schema to DTS 4.9.0, as instructed in section **G.6(**Deploy Apelon DTS 4.9.0 Server**),** when deploying the "**`dtsjbosswildfly.ear`**" **Do NOT shut down or restart the WildFly service while the schema is being upgraded**. This step could take some time, especially when upgrading DTS schemas in MySQL and SQL Server.
- **To verify the correct DTS 4.9.0 schema version, perform the following steps:**
    1. View the "server.log" file located in the <WILDFLY26_HOME>**`\standalone\log`** directory. Search the WildFly 26 "server.log" file for the statement:
        - "Schema Upgrade to 4.0.29 complete" – for SQL Server 2019 or SQL Server 2025.
        - "Schema Upgrade to 4.0.30 complete" – for MySQL 8.4.
    2. A second way to determine the schema upgrade was successful is from the DTS 4.9.0 DTS Editor.
        - Connect to the Apelon DTS WildFly 26 server.
        - Once the connection is established choose: **Help>About Apelon DTSEditor…**
        - In the help window that is launched click on the "*Details>>*" label. In the "Server Configuration:" section is displayed a "schema.version" value. The schema version should read:
            - "4.0.29" – for SQL Server 2019 or SQL Server 2025.
            - "4.0.30" – for MySQL 8.4.
- **NOTE2 - SQL Server Schema Upgrade:** If upgrading from a version older than DTS 4.4, not only may the SQL Server schema upgrade to version 4.0.29 take up to or longer than an hour, it may also require about as much available drive space for its database log file as is being used by the database prior to the schema upgrade. Consult with your SQL Server Database Administrator regarding the available drive space and the possibility of shrinking the database log after the schema is successfully upgraded to version 4.0.29.

© 2026 Apelon, Inc.

H. WildFly 23 Setup

Note: WildFly 23 requires the use of Java 8 JDK. See Java Environment Setup for DTS 4 Server and Client section above for additional details.

The WildFly 23 Application Server can be downloaded from the WildFly community download site: http://wildfly.org/downloads/

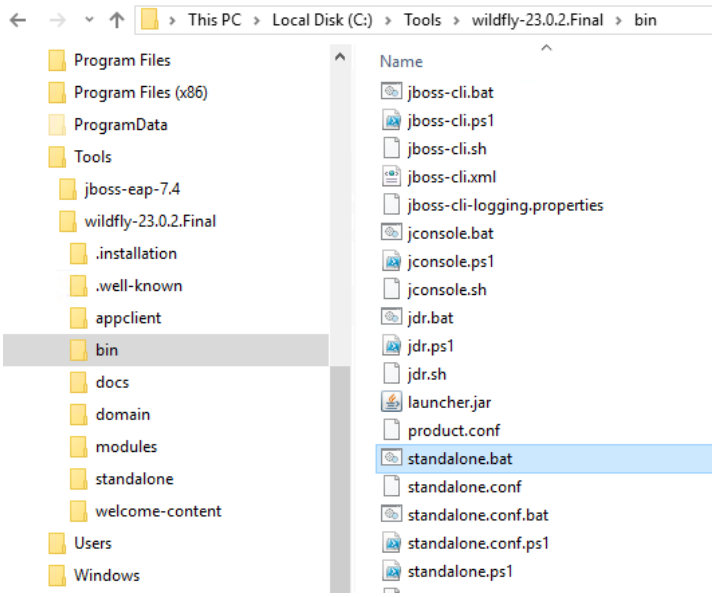


For **Windows OS**, select the **`23.0.2.Final` Apr 29, 2021 EE 8 Full & Web Distribution ZIP** file to download. For **Linux OS** use the **`23.0.2.Final Apr 29, 2021` EE 8 Full & Web Distribution TGZ** file.

WildFly 23 does not come with an installer; just extract the compressed archive. **Unzip the WildFly 23 archive into a folder with a pathname that does NOT contain any spaces.** For example, extracting to the `C:\AppServer` folder will place the WildFly 23.0.2 Final files in the `C:\AppServer\wildfly-23.0.2.Final` folder. We will identify this folder in the rest of the document as `<WILDFLY23_HOME>`. It is not necessary to create `<WILDFLY23_HOME>` as an environment variable.

To verify the WildFly 23 install, go to the `<WILDFLY23_HOME>\bin` folder and run `standalone.bat` (or `<WILDFLY23_HOME>/bin/standalone.sh` for Linux OS).

© 2026 Apelon, Inc.

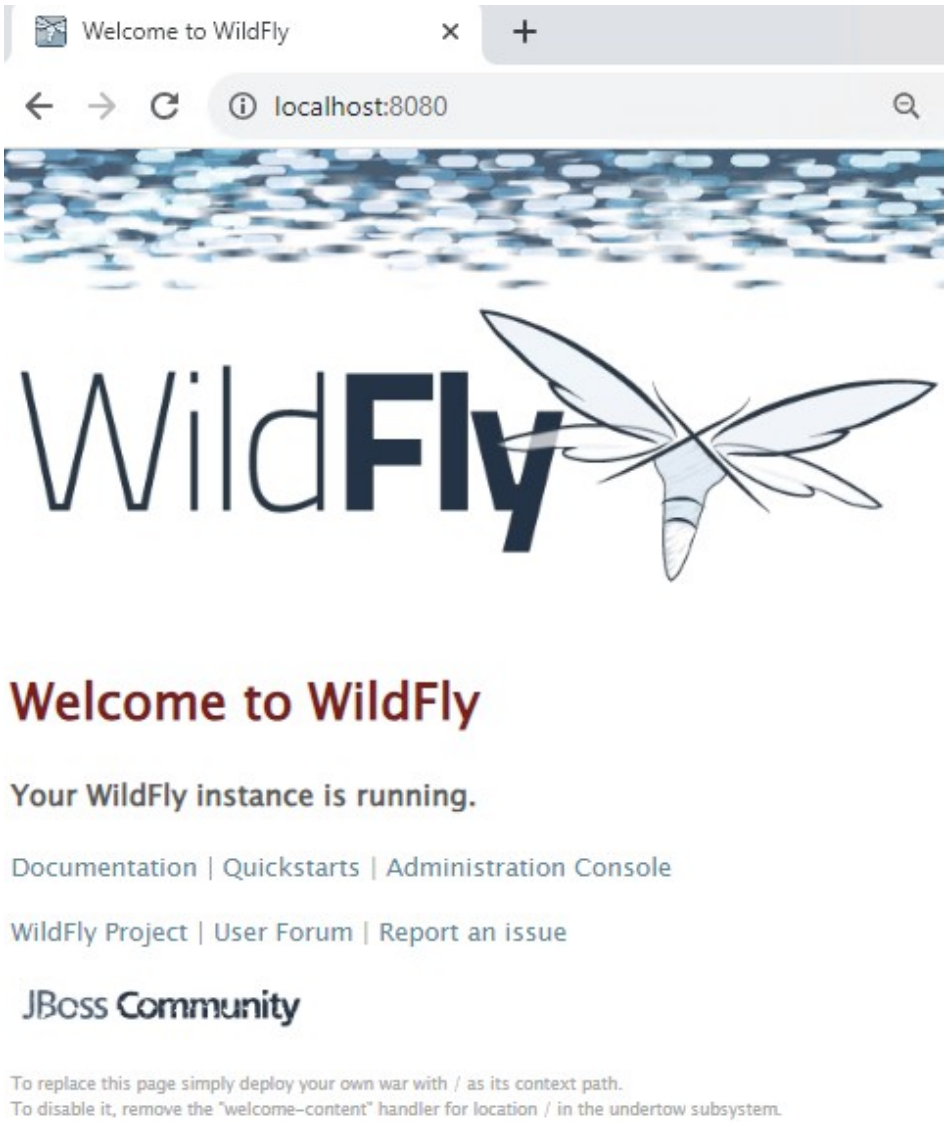


Upon successful start, the message in the last line will indicate success.
Here is a sample startup screen:

```
14:09:17,613 INFO  [org.jboss.as] (Controller Boot Thread) WFLYSRV0025: WildFly Full 23.0.2.Final (WildFly Core 15.0.1.Final) started in 9723ms
- Started 319 of 558 services (344 services are lazy, passive or on-demand)
14:09:17,628 INFO  [org.jboss.as] (Controller Boot Thread) WFLYSRV0060: Http management interface listening on http://127.0.0.1:9990/management
14:09:17,628 INFO  [org.jboss.as] (Controller Boot Thread) WFLYSRV0051: Admin console listening on http://127.0.0.1:9990
```

To verify that the server is reachable, you can point your browser to the default welcome page for WildFly at the address: http://localhost:8080 . The page should appear as below:

© 2026 Apelon, Inc.



After you have verified the server is reachable, select the WildFly command window and then press `Ctrl+C`. You will be prompted to terminate the batch job, type **y** and hit **enter** to stop WildFly.

```
Terminate batch job (Y/N)? y
```

H.1 Memory Configuration

The Apelon DTS Server performs better when additional memory is assigned to WildFly. To increase the memory utilized, open `<WILDFLY23_HOME>\bin\standalone.conf.bat` (or `<WILDFLY23_HOME>/bin/standalone.conf` for Linux OS) and modify the JVM memory allocation pool parameters as shown below:

NOTE: *We recommend a memory limit of at least 4GB. If your DTS environment will be running Modular Classification, you will require a larger allocation to your JVM. On systems utilizing Modular Classification with 16 GB of RAM or more a setting of at least 8GB (4 GB min) is recommended.*

© 2026 Apelon, Inc.

For Windows OS:

```
rem # JVM memory allocation pool parameters - modify as
appropriate.
set "JAVA_OPTS=-Xms1G -Xmx4G -XX:MetaspaceSize=512M
-XX:MaxMetaspaceSize=4G"
```

For Linux OS:

```
# Specify options to pass to the Java VM.
#
if [ "x$JAVA_OPTS" = "x" ]; then
   JAVA_OPTS="-Xms1G -Xmx4G -XX:MetaspaceSize=512M
-XX:MaxMetaspaceSize=4G
```

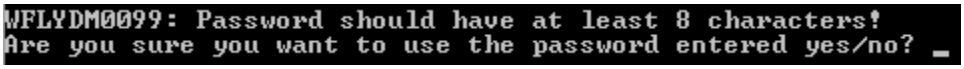
H.2 WildFly 23 Management User

You must create a WildFly Management user (e.g., **apelonadmin/apelon**) – This user administers the WildFly server. Go to **`<WILDFLY23_HOME>\bin`** and click on **`add-user.bat`** (or **`add-user.sh`** for Linux OS). Follow the steps below.

- Select Management User. **(a):** hit **enter** to accept default

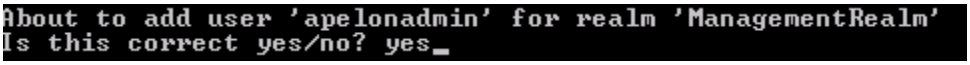
- Realm (**ManagementRealm)** will be used by default.
- Enter the desired Username. i.e., **apelonadmin**

- Enter the desired Password. The password cannot be same as the username. i.e., **apelon**
- *Note: WildFly will prompt you if your password doesn't meet the recommended criteria. You may type "**yes**" and press "**enter**" to accept the password, despite this.*



- Re-enter Password. i.e., **apelon**

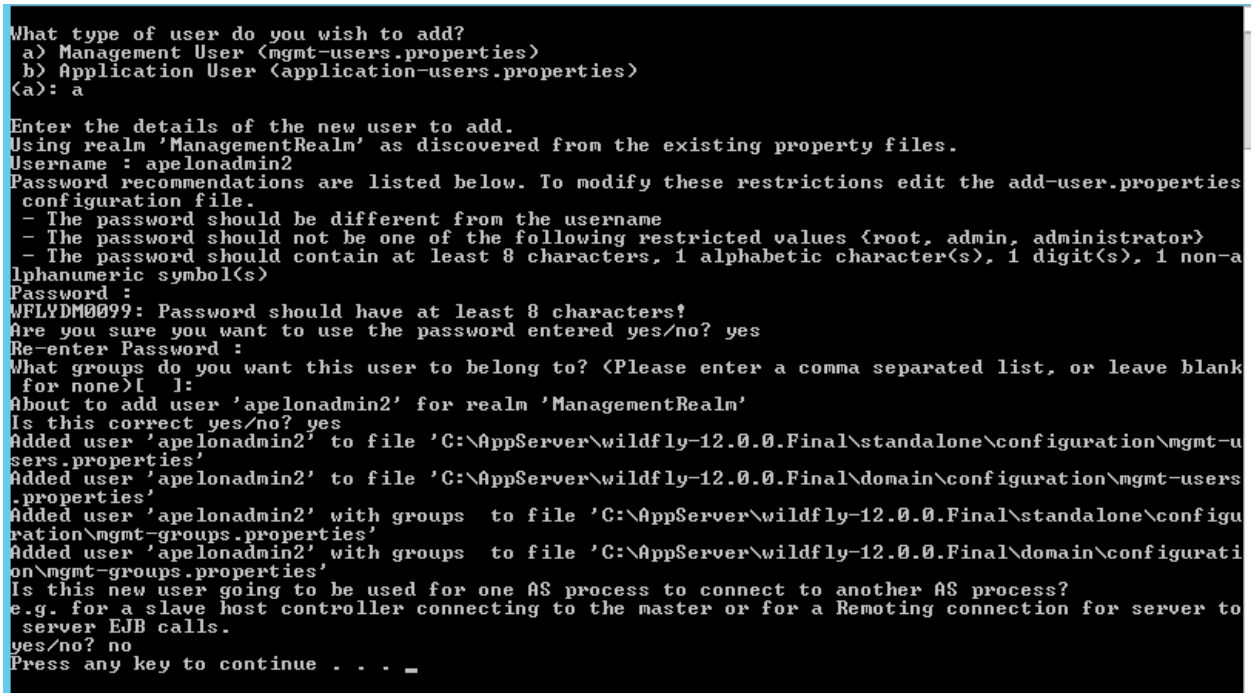
- WildFly will prompt you to add the user to any groups. For the Application Server administrator user, no groups are necessary, you may hit "**enter**" to proceed.
- Type "**yes**" to add the user and hit **enter**.



- WildFly supports an AS to AS configuration between multiple instances of the application server. When prompted if the user will be used to connect another AS process, for DTS purposes, you may type "**no**" and press "**enter**".

© 2026 Apelon, Inc.

See the screen shot below to confirm:



H.3 WildFly 23 Configuration for Apelon DTS 4 Server

H.3.1 Migrate WildFly DTS users from existing WildFly 12 server

If you are currently Running DTS and are setting up WildFly23 to replace your existing WildFly 12 environment, you can migrate your existing DTS users by performing the following steps:

1. Ensure the new WildFly23 Application Server is stopped.
2. Locate the **application-roles.properties** and **application-users.properties** files in your existing Application Server installation directory. There are 2 instances of each of these files, one in **<AppServer Home>\domain\configuration** and the other in **<AppServer Home>\standalone\configuration**.
3. Copy these files and place them (overwriting if prompted) in **<WildFly23_Home>\domain\configuration** and **<WildFly23_Home>\standalone\configuration** respectively.
4. Start the WildFly23 Application Server

Note: Since the DTS User Manager users is contained within the DTS Database, no modifications will be necessary for the DTS User Manager users, provided the Application Server users migrate successfully

© 2026 Apelon, Inc.

H.3.2 WildFly 23 DTS Admin User Configuration

WildFly Application Users must be created for every individual who will connect to *the **Apelon DTS Server via the DTS Browser or DTS Editor*** and will require access to the ***DTS Editor User Manager*** to setup ***DTS User Roles and Permissions***. These WildFly users must have the group "**apelondtsadmin**".

Go to `<WILDFLY23_HOME>\bin` and click on `add-user.bat` (or `<WILDFLY23_HOME>/bin/add-user.sh` for Linux OS). Follow the steps below.

- Select Application User. Type **b** and hit **enter**

```
What type of user do you wish to add?
 a) Management User (mgmt-users.properties)
 b) Application User (application-users.properties)
(a): b
```

- Realm (**ApplicationRealm)** is used by default.
- Enter the desired Username. e.g., **dtsadminuser**

```
Username : dtsadminuser
```

- Enter the desired Password. The password cannot be same as the username. e.g., **dtsadmin**
- *Note: WildFly will prompt you if your password doesn't meet the recommended criteria. You may type "yes" and press "enter" to accept the password, despite this.*

```
WFLYDM0099: Password should have at least 8 characters!
Are you sure you want to use the password entered yes/no? _
```

- Re-enter Password. e.g, **dtsadmin**

```
Are you sure you want to use the password entered yes/no? yes
Re-enter Password :
```

- WildFly will prompt you to add the user to any groups. For the DTS administrator user, you will need to add to the "apelondtsadmin" and optionally "apelondts" groups, separated by a comma.

```
What groups do you want this user to belong to? (Please enter a comma separated list, or leave blank
 for none)[  ]: apelondtsadmin,apelondts
```

- Type "**yes**" to add the user and hit **enter**.

```
About to add user 'dtsadminuser' for realm 'ApplicationRealm'
Is this correct yes/no? yes
```

- WildFly supports an AS to AS configuration between multiple instances of the application server. When prompted if the user will be used to connect another AS process, for DTS purposes, you may type "no" and press enter.

```
Is this new user going to be used for one AS process to connect to another AS process?
e.g. for a slave host controller connecting to the master or for a Remoting connection for server to
 server EJB calls.
yes/no? no
```

See the screen shot below to confirm:

© 2026 Apelon, Inc.

```
What type of user do you wish to add?
 a) Management User (mgmt-users.properties)
 b) Application User (application-users.properties)
(a): b

Enter the details of the new user to add.
Using realm 'ApplicationRealm' as discovered from the existing property files.
Username : dtsadmin
Password recommendations are listed below. To modify these restrictions edit the add-user.properties configuration file.
 - The password should be different from the username
 - The password should not be one of the following restricted values (root, admin, administrator)
 - The password should contain at least 8 characters, 1 alphabetic character(s), 1 digit(s), 1 non-alphanumeric symbol(s)
Password :
WFLYDM0102: Password should have at least 1 non-alphanumeric symbol.
Are you sure you want to use the password entered yes/no? yes
Re-enter Password :
What groups do you want this user to belong to? (Please enter a comma separated list, or leave blank for none)[  ]: apelondtsadmin,apelondts
About to add user 'dtsadmin' for realm 'ApplicationRealm'
Is this correct yes/no? yes
Added user 'dtsadmin' to file 'C:\AppServer\wildfly-12.0.0.Final\standalone\configuration\application-users.properties'
Added user 'dtsadmin' to file 'C:\AppServer\wildfly-12.0.0.Final\domain\configuration\application-users.properties'
Added user 'dtsadmin' with groups apelondtsadmin,apelondts to file 'C:\AppServer\wildfly-12.0.0.Final\standalone\configuration\application-roles.prope
rties'
Added user 'dtsadmin' with groups apelondtsadmin,apelondts to file 'C:\AppServer\wildfly-12.0.0.Final\domain\configuration\application-roles.propertie
s'
Is this new user going to be used for one AS process to connect to another AS process?
e.g. for a slave host controller connecting to the master or for a Remoting connection for server to server EJB calls.
yes/no? no
Press any key to continue . . .
```

H.3.3 WildFly 23 DTS User Configuration

WildFly Application Users must be created for every individual who will connect to the ***Apelon DTS Server via either the DTS Browser or DTS Editor*** and ***will not require access to the DTS Editor User Manager***. These WildFly users must have the group **"apelondts".**

Go to `<WILDFLY23_HOME>\bin` and click on `add-user.bat` (or `<WILDFLY23_HOME>/bin/add-user.sh` for Linux OS). Follow the steps below.

- Select Application User. Type **b** and hit **enter**

```
What type of user do you wish to add?
 a) Management User (mgmt-users.properties)
 b) Application User (application-users.properties)
(a): b
```

- Realm (**ApplicationRealm)** is used by default.
- Enter the desired Username. e.g, **dtsuser**

```
Username : dtsuser
```

- Enter the desired Password. The password cannot be same as the username. e.g., **dts**
- *Note: WildFly will prompt you if your password doesn't meet the recommended criteria. You may type "yes" and press "enter" to accept the password, despite this.*

```
WFLYDM0099: Password should have at least 8 characters!
Are you sure you want to use the password entered yes/no? _
```

© 2026 Apelon, Inc.

- Re-enter Password. e.g., **dts**

```
Are you sure you want to use the password entered yes/no? yes
Re-enter Password :
```

- WildFly will prompt you to add the user to any groups. For the standard DTS users, you will need to add to the “apelondts” group.

```
What groups do you want this user to belong to? (Please enter a comma separated list, or leave blank
 for none)[  ]: apelondts
```

- Type “**yes**” to add the user and hit **enter**.

```
About to add user 'dtsadminuser' for realm 'ApplicationRealm'
Is this correct yes/no? yes
```

- WildFly supports an AS to AS configuration between multiple instances of the application server. When prompted if the user will be used to connect another AS process, for DTS purposes, you may type “no” and press enter.

© 2026 Apelon, Inc.

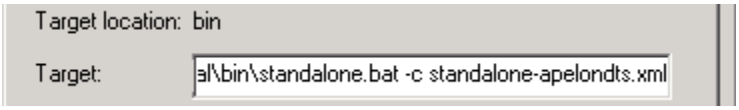
H.4 Apelon DTS 4.9.0 Server Deployment

1. Copy the **standalone-apelondts.xml** file from `<DTS_HOME>\server\wildfly\standalone\configuration\WF23` to the `<WILDFLY23_HOME>\standalone\configuration` folder.

2. Create a shortcut for **<WILDFLY23_HOME>\bin\standalone.bat.** Rename this to “Apelon DTS WildFly”.

3. Right-click on the shortcut and go to Properties. Modify target as follows:

```
<WILDFLY23_HOME>\bin\standalone.bat -c standalone-apelondts.xml
```



4. Use this “Apelon DTS WildFly” shortcut for running WildFly configured for Apelon DTS.

5. For launching on Linux OS use the following terminal command from

   `<WILDFLY23_HOME>/bin/:`

   `standalone.sh -c standalone-apelondts.xml`

© 2026 Apelon, Inc.

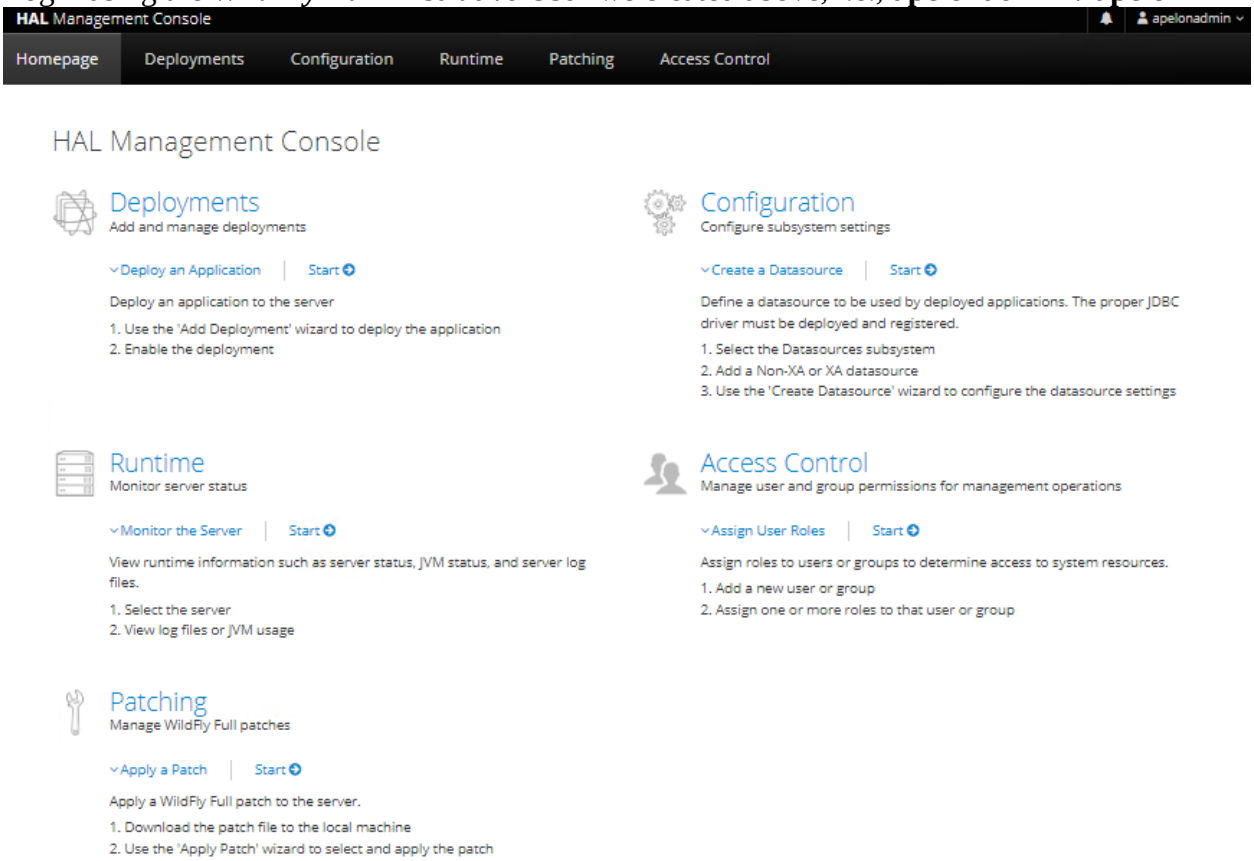
H.4.1 Data Source Configuration

Apelon DTS Server requires a data source configured with WildFly to connect to the database. The necessary steps are:

- Deploy database driver.
- Configure data source.

H.4.2 Deploy Database Driver

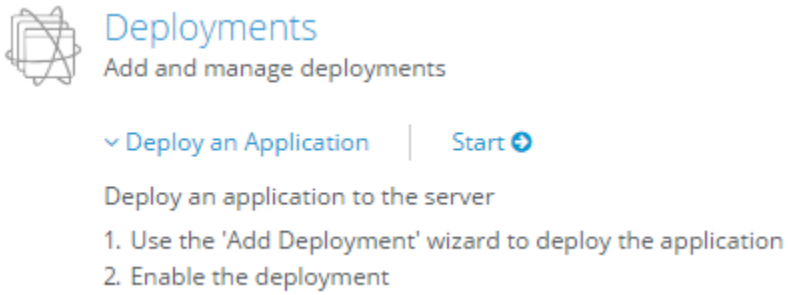
Start WildFly 23 using the "Apelon DTS WildFly" shortcut for Windows OS (or from terminal window for Linux OS) created in the previous step. Open a browser and go to the default WildFly Management URL: `http://localhost:9990/console/index.html`
Login using the ***WildFly Administrative User*** we created above, i.e., **apelonadmin / apelon**



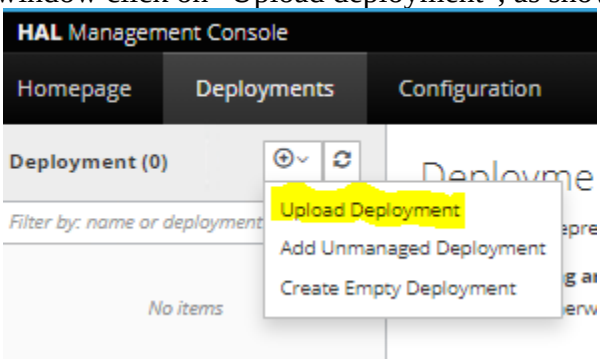
If your view does not display as shown above, refresh your browser or clear your browser cache.

© 2026 Apelon, Inc.

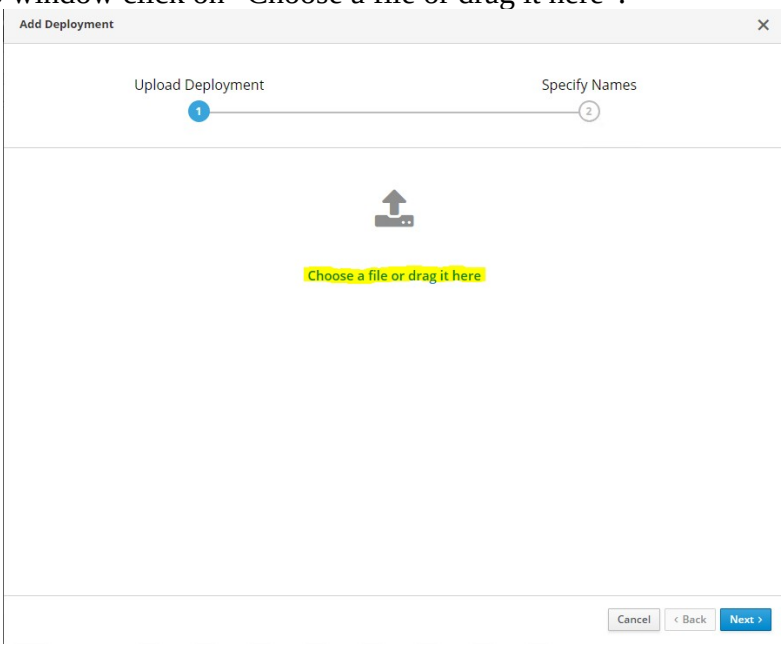
Then Under the “Deployments” header, next to “Deploy an Application” click on the Start arrow.



Then click on the dropdown button to the right of **Deployment…** in the upper left. In the pop-up window click on “Upload deployment”, as shown below.



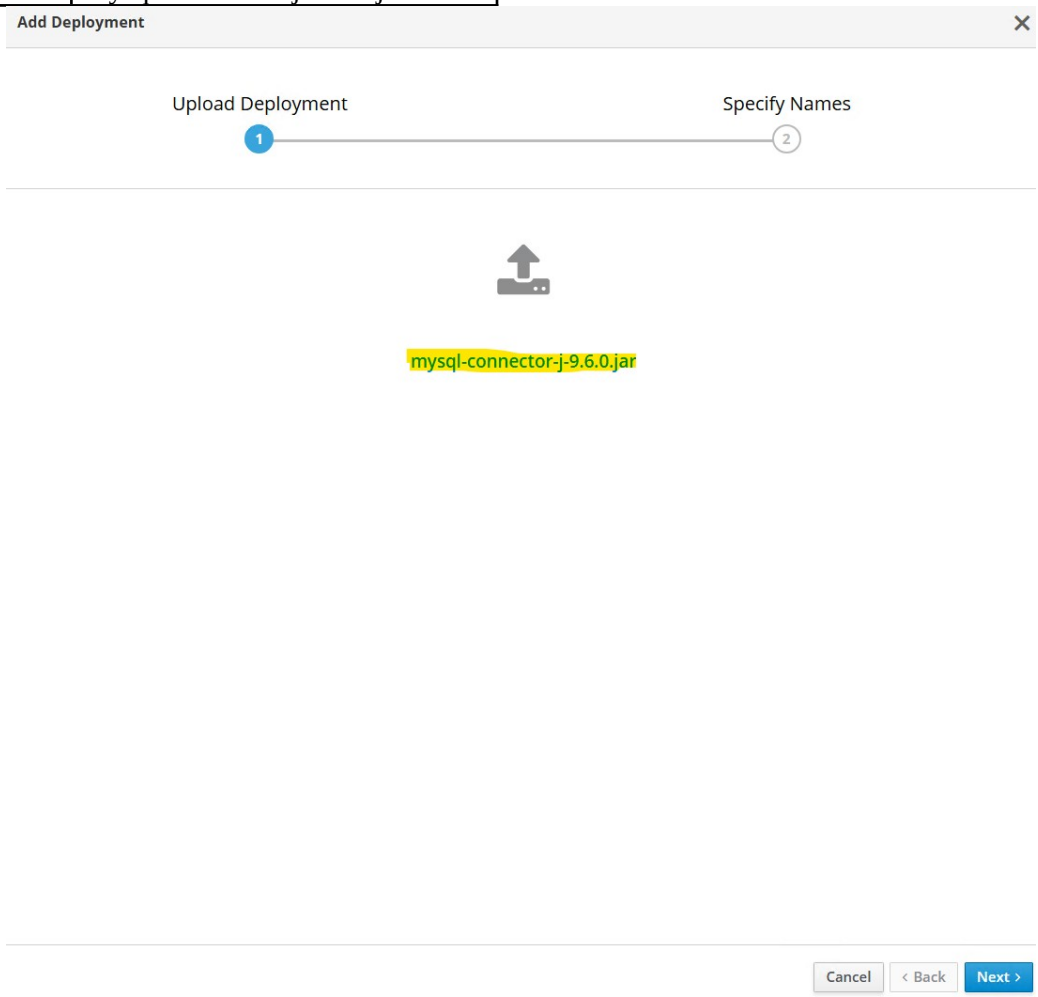
In the next pop-up window click on “Choose a file or drag it here”.



Navigate to the **<DTS_HOME>\lib** folder.
Select a Driver .jar file for the database as given below and click **Next**.

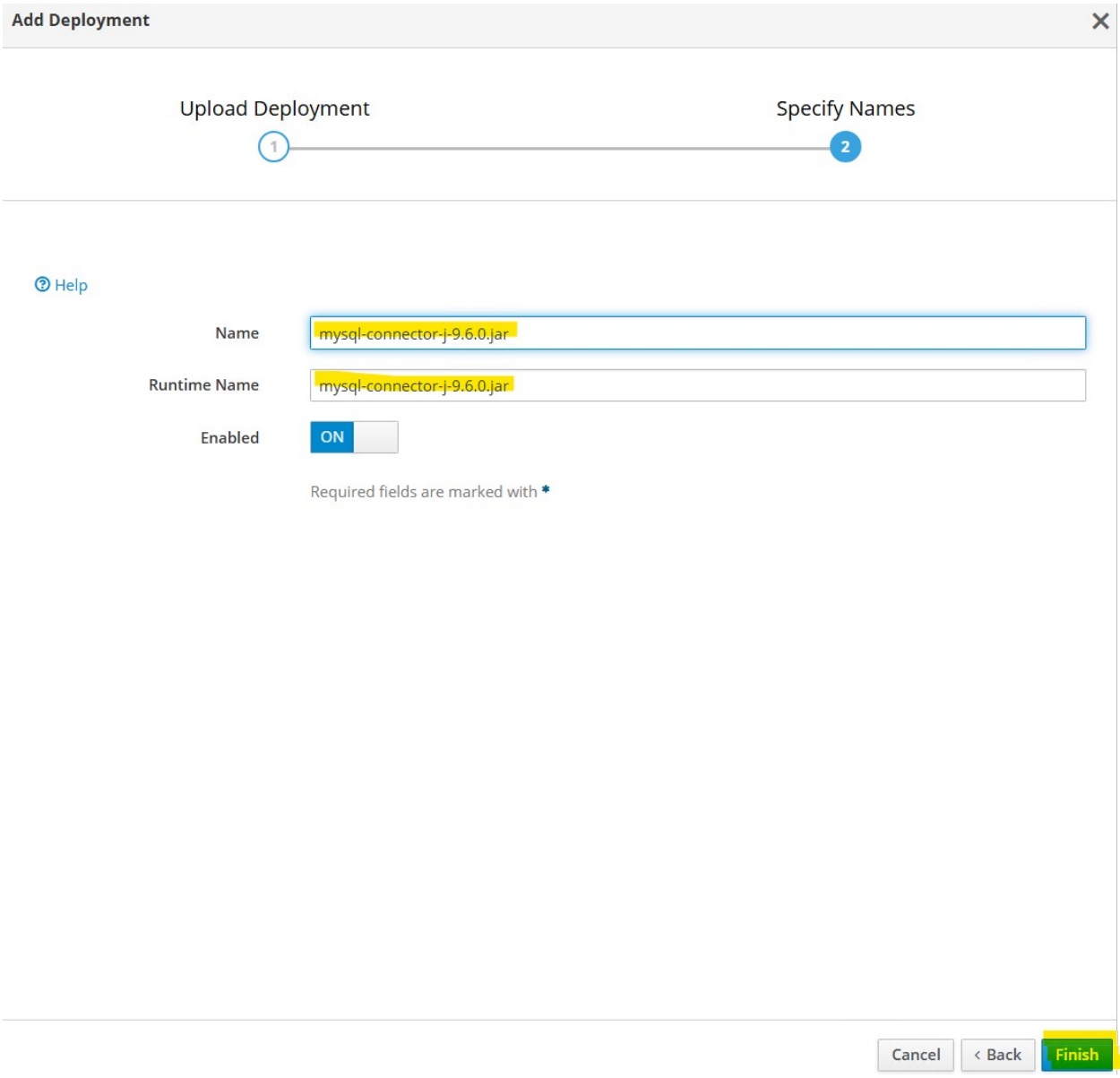
© 2026 Apelon, Inc.

Database	Driver
MS SQL Server 2019	mssql-jdbc-13.4.0.jre8.jar
MS SQL Server 2025	mssql-jdbc-13.4.0.jre8.jar
MySQL 8.4	mysql-connector-j-9.6.0.jar



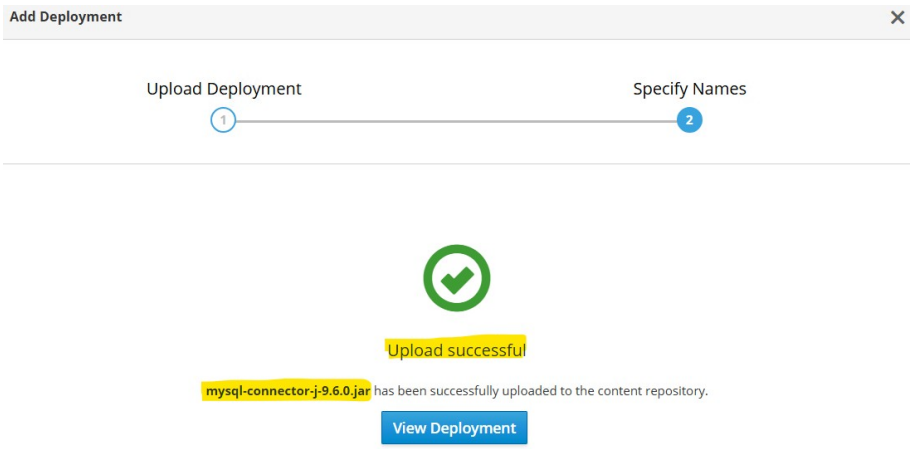
© 2026 Apelon, Inc.

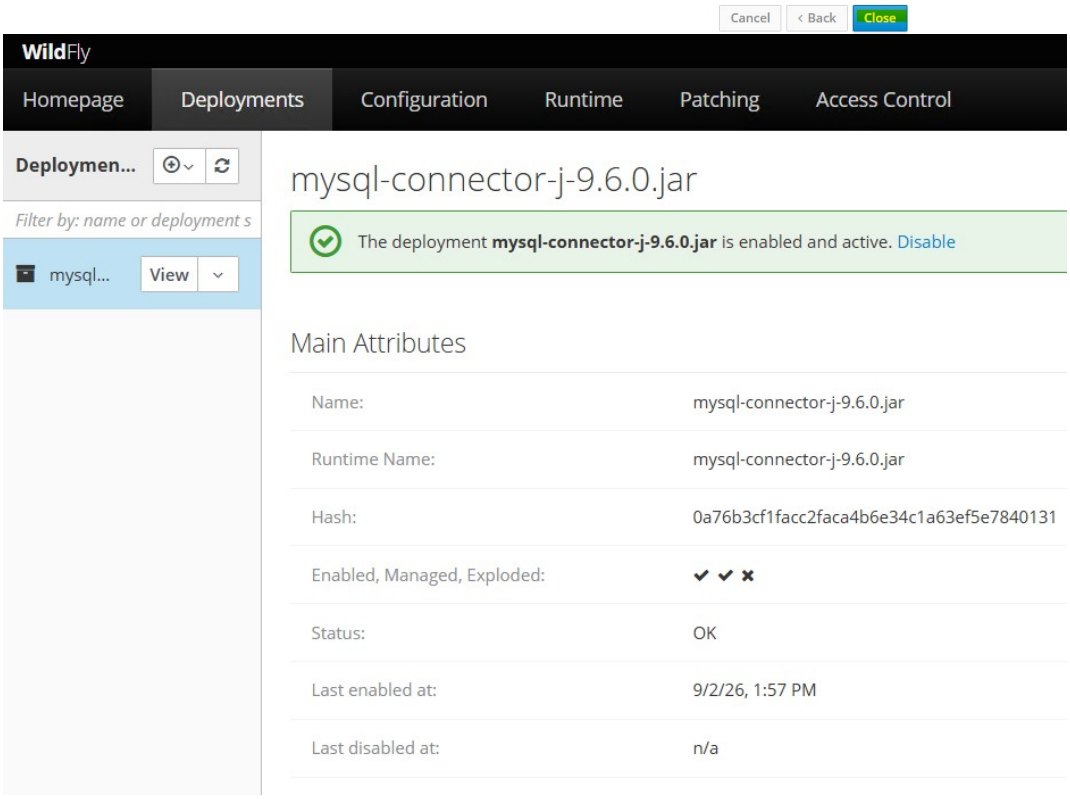
Ensure the **`Enable`** is **ON** and click “Finish”.



You should receive a message that the upload of the .jar deployment was successful.

© 2026 Apelon, Inc.





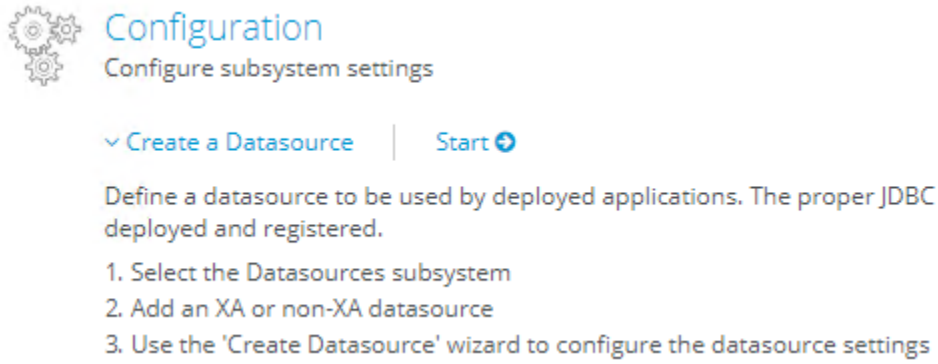
© 2026 Apelon, Inc.

H.4.3 Configure Data Source

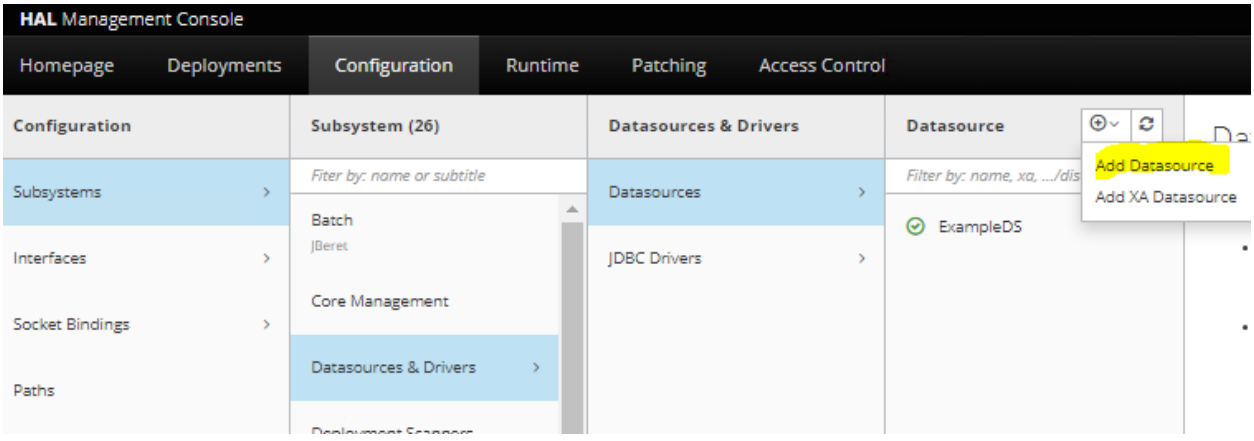
The Apelon DTS Server requires a data source named "**ApelonDtsDS**". This data source must be set up similar to the examples given below (*ensure the appropriate User, Password, and database name are used if they are not the values used as an example here. Also, "localhost" can be replaced with the database server IP address or server name*).

Database	User	Password	Connection URL
MS SQL Server	dts4user	dts4pass	jdbc:sqlserver://localhost:1433;trustServerCertificate=true;databasename=dts4
MySQL	dts4user	dts4pass	jdbc:mysql://localhost:3306/dts4

To create the **`ApelonDtsDS`** data source, navigate back to "Homepage" in the WildFly 23 administration console, and under the "Configuration" header, select the Start arrow next to "Create a Datasource":

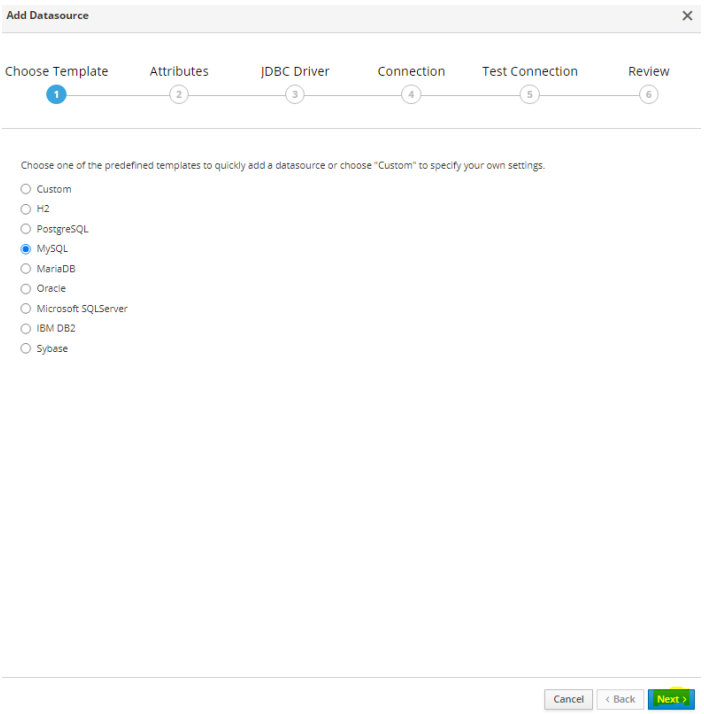


In the "Configuration" column, select the "Subsystems" tab. Under the "Subsystem" column, select the "Datasources & Drivers" tab. Under the "Datasources & Drivers" column, select the "Datasources" tab.
In the "Datasource" column click on the dropdown and choose "Add Datasource", where the ApelonDtsDS datasource will be created as a non-cross-application datasource.

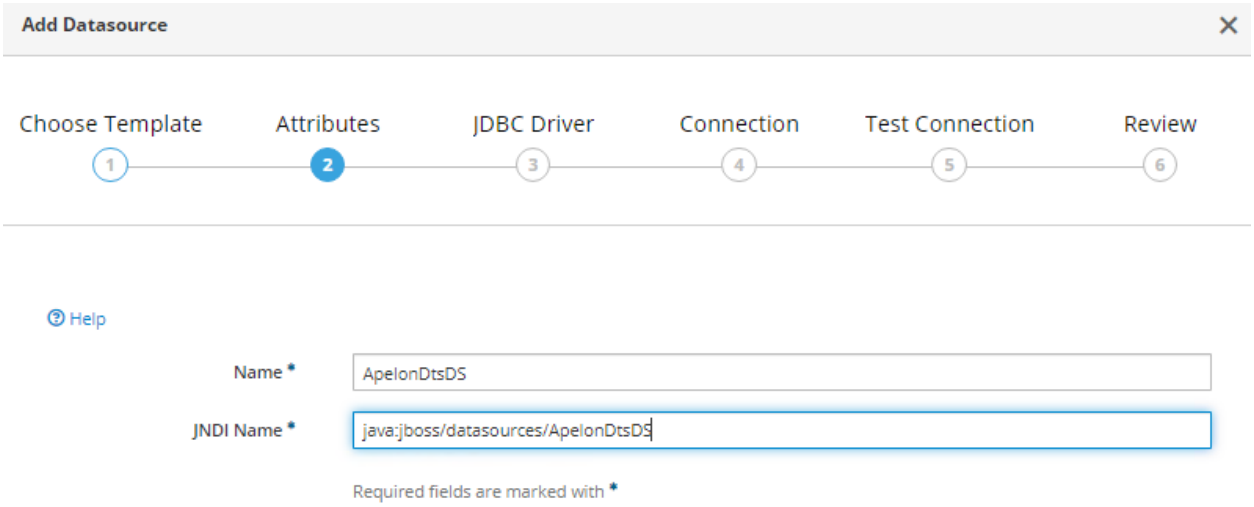


In the next popup, select the database type for your Datasource (MySQL or Microsoft SQLServer) and click **Next**.

© 2026 Apelon, Inc.

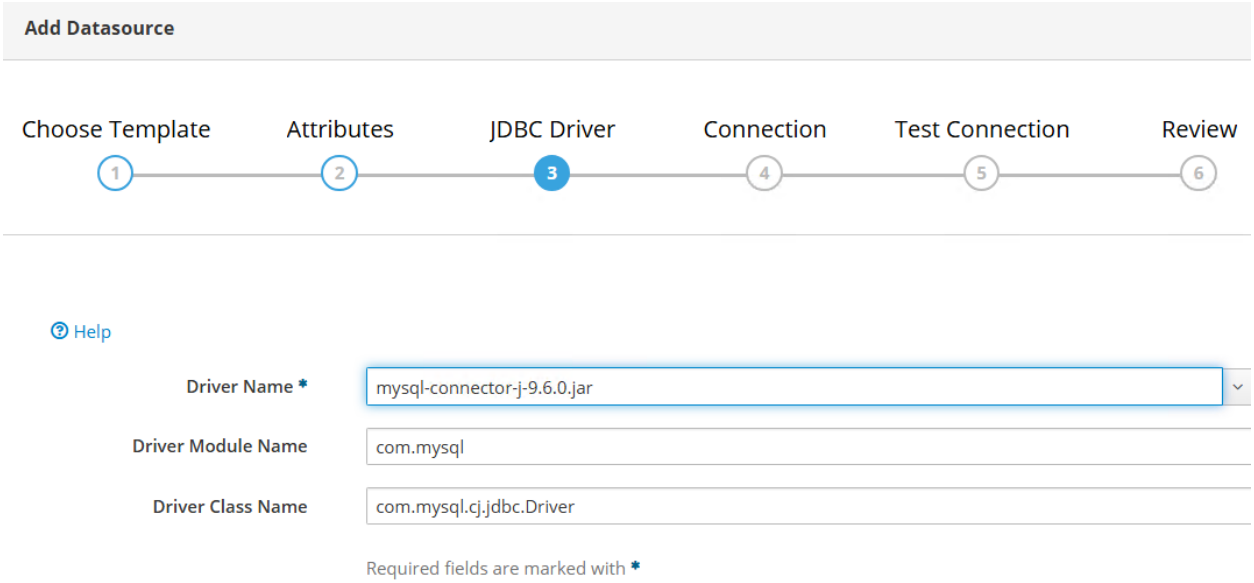


Edit the Datasource Attributes **Name** and **JNDI Name** (*Note: these values are Case-Sensitive*).
The **Name** should be: “ApelonDtsDS”
The **JNDI Name** should be: “java:jboss/datasources/ApelonDtsDS”



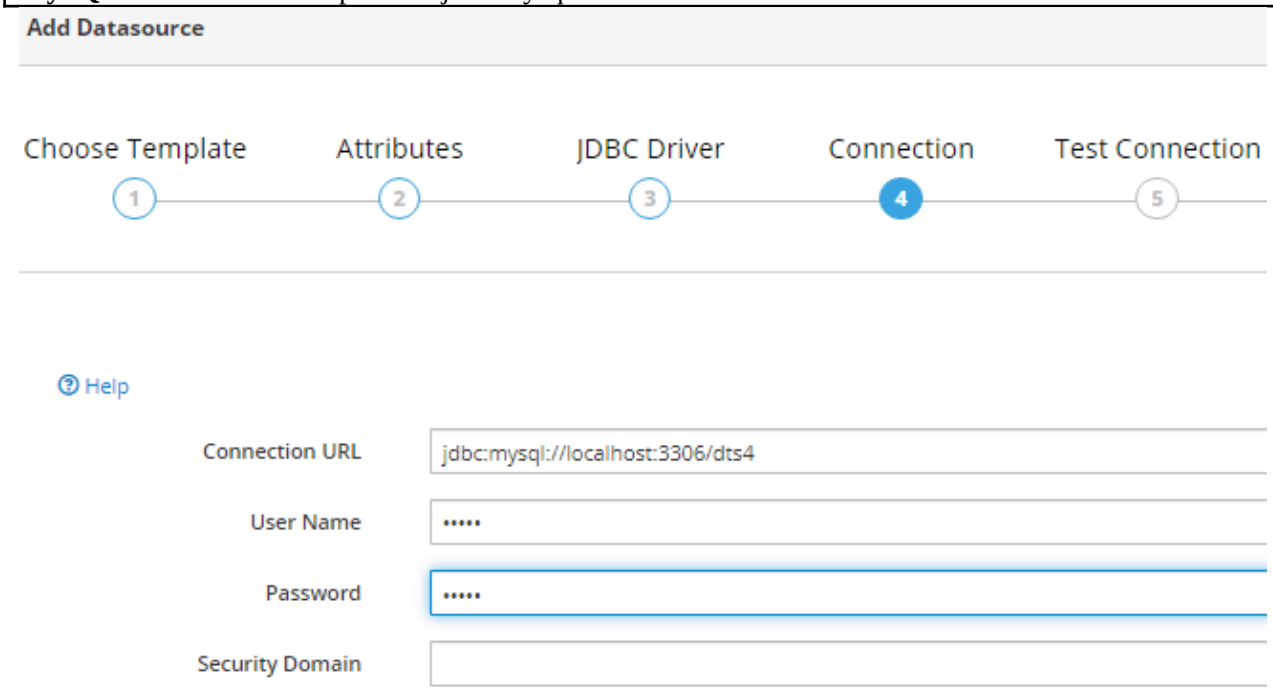
In the next window, select the database driver from the **Driver Name** dropdown. Choose the database driver you added to WildFly 23 in an earlier step and hit “Next”.

© 2026 Apelon, Inc.



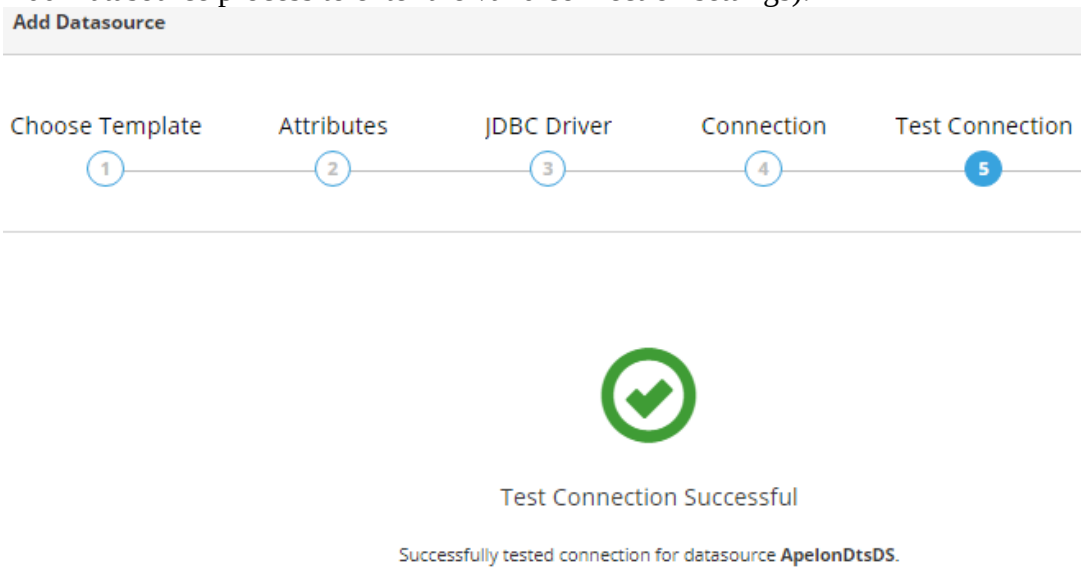
On the next window, enter the appropriate Connection URL, Username, and Password for your database environment. Examples are again presented below, but you should enter the parameters which are correct for your database (*ensure the appropriate User, Password, and database name are used if they are not the values used as an example here. Also "localhost" can be replaced with the database server IP address or server name*).

Database	User	Password	Connection URL
MS SQL Server	dts4user	dts4pass	jdbc:sqlserver://localhost:1433;trustServerCertificate=true;databasename=dts4
MySQL	dts4user	dts4pass	jdbc:mysql://localhost:3306/dts4

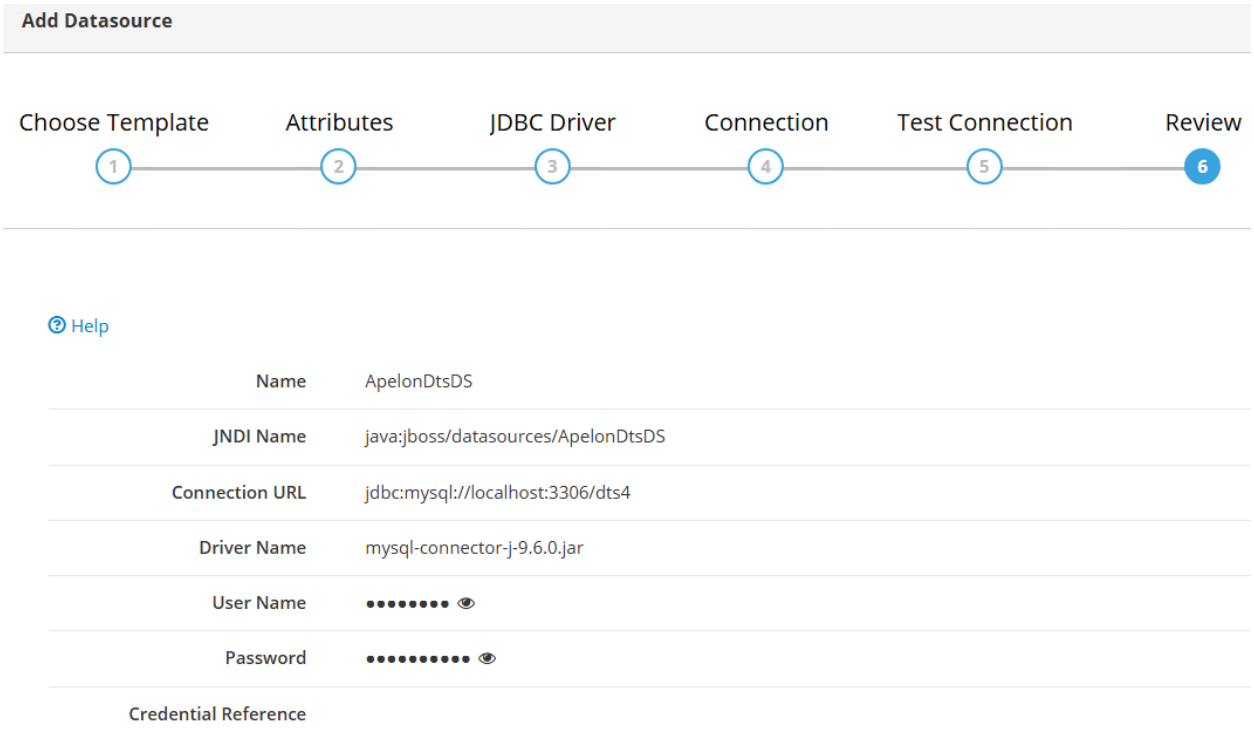


© 2026 Apelon, Inc.

The next window will provide a Test Connection option. Click on the “Test Connection” button to ensure the above entered connection settings are valid. If the connection test is successful click “Next”. If the connection test fails, click “Back” and correct the connection settings (NOTE: the connection settings may get cached by the browser so you may need to restart the Add Datasource process to enter the valid connection settings).

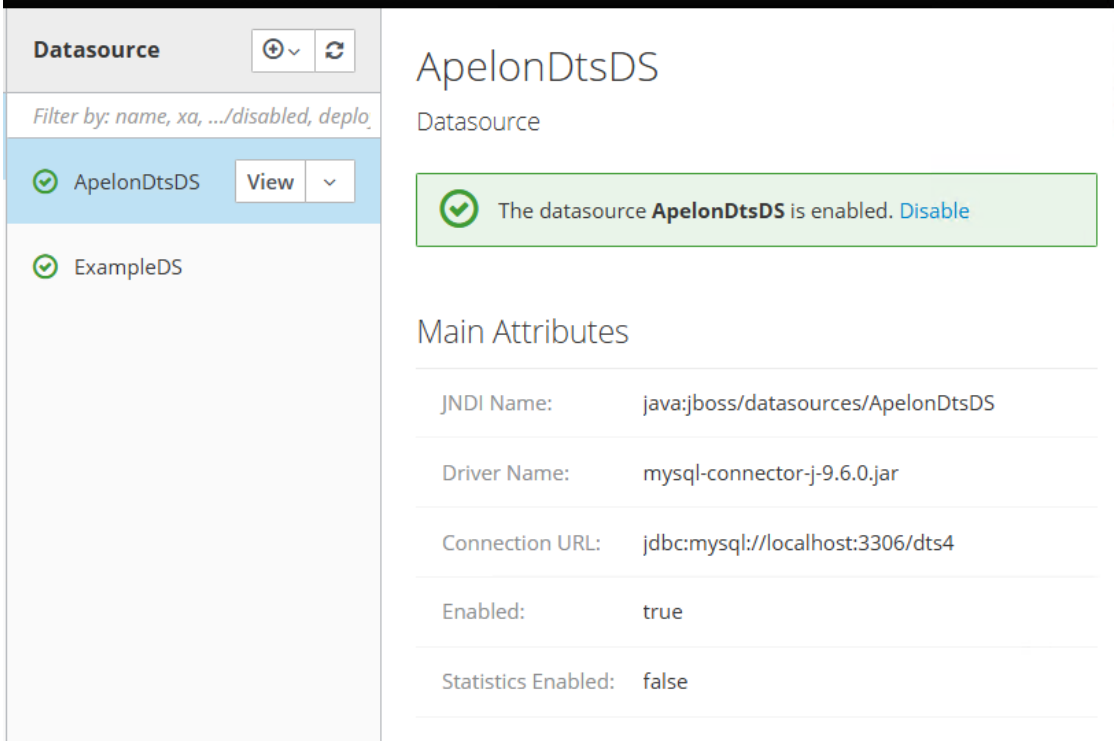


On the next window, WildFly 23 will provide you a summary of the Datasource settings. Click “Finish” to accept, or “back” to make any revisions.

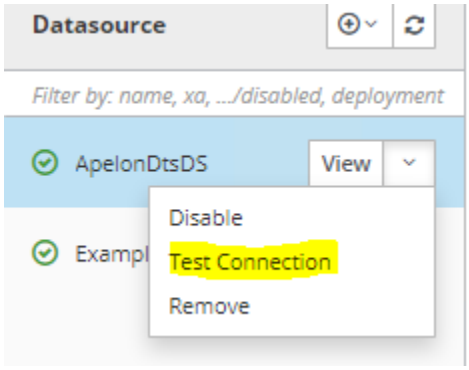


© 2026 Apelon, Inc.

After clicking “Finish” a pop-up message will be displayed indicating the server configuration changed and to reload the server. Click “Reload”. If you miss the Reload pop-up, click on the **Reload Required** link in the upper right of the Management Console.



You should receive a message that the Server was successfully loaded.
Now that the Datasource has been created, you may test the connection once again, from the dropdown next to it from the “Datasource” column.

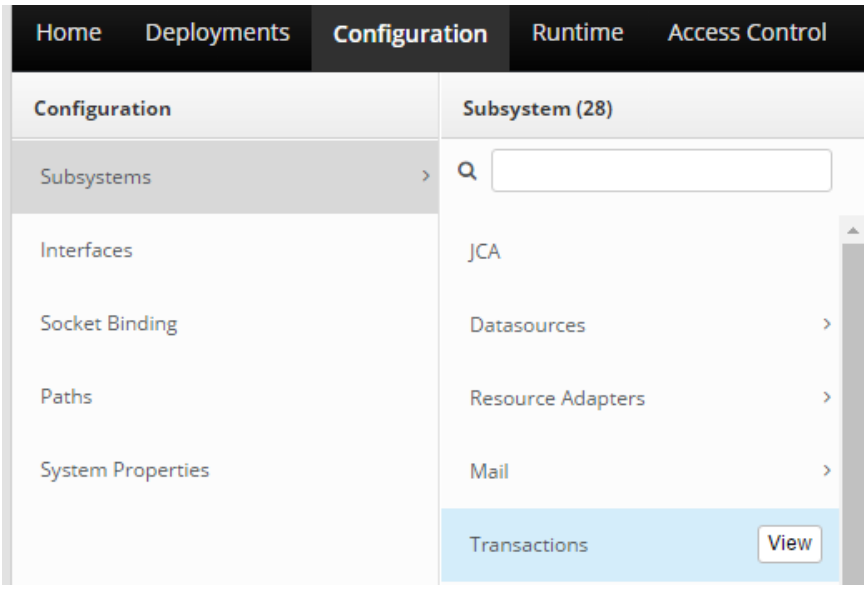


Ensure the connection test is successful before continuing.

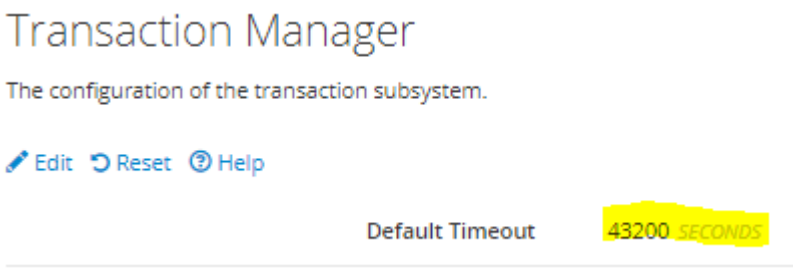
H.5 Check WildFly Transaction Timeout Default

The WildFly Transaction Timeout Default is **set to 43200 seconds** to accommodate long running DTS transactions.
To edit or view the WildFly 23 Transaction Timeout Default, from the “Configuration” column select “Subsystems”>”Transactions” and click “View”.

© 2026 Apelon, Inc.



Then click “Edit” and enter the new timeout value.

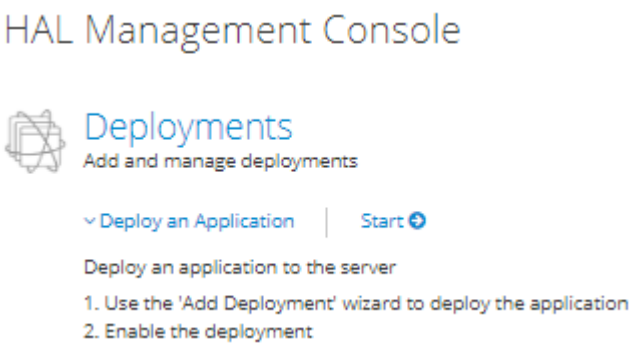


Then click “Save”. The WildFly 23 server must be restarted for the change to take effect.

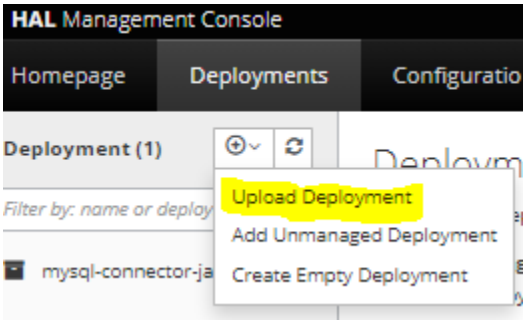
© 2026 Apelon, Inc.

H.6 Deploy Apelon DTS 4.9.0 Server

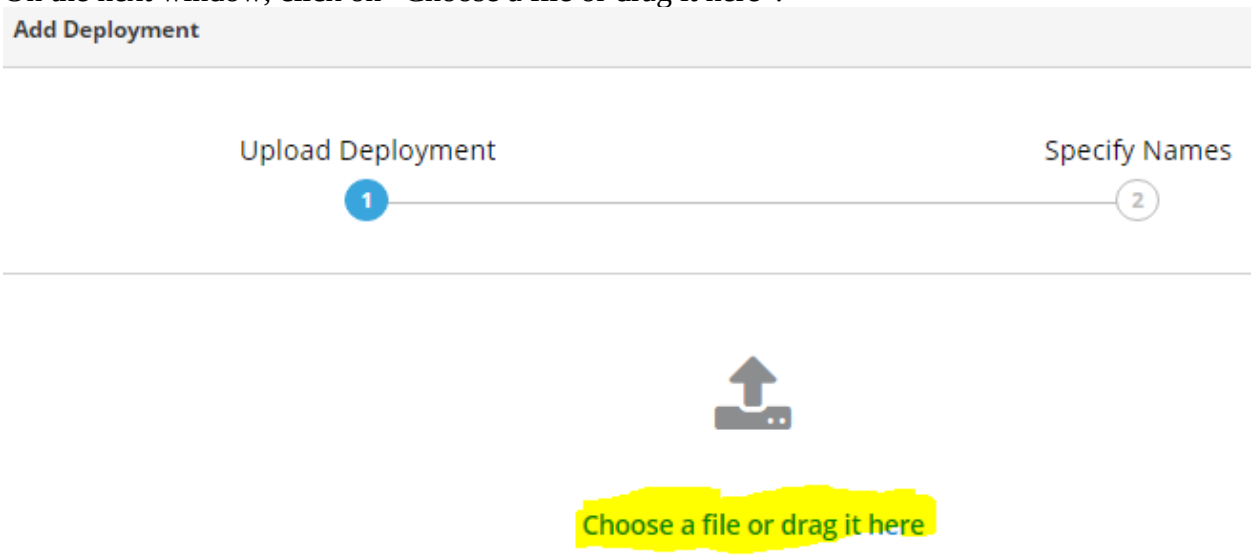
To deploy the Apelon DTS Server EAR file, click the Start arrow next to “Deploy an application” under the Deployments header from the Homepage tab.



Click the dropdown button in the upper left and choose “Upload Deployment” to begin the deployment process.



On the next window, click on “Choose a file or drag it here”.

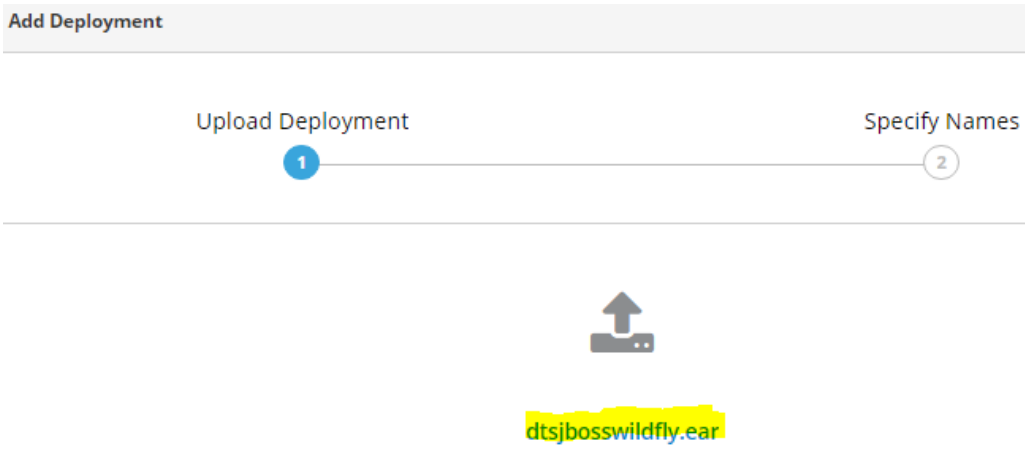


Navigate to the `<DTS_HOME>\server\wildfly\standalone\deployments` directory and select **`dtsjbosswildfly.ear`** (This is not a typo, WildFly is in reality the next iteration of JBoss, and as such the .ear file and deployed application still contain “jboss” in the name).

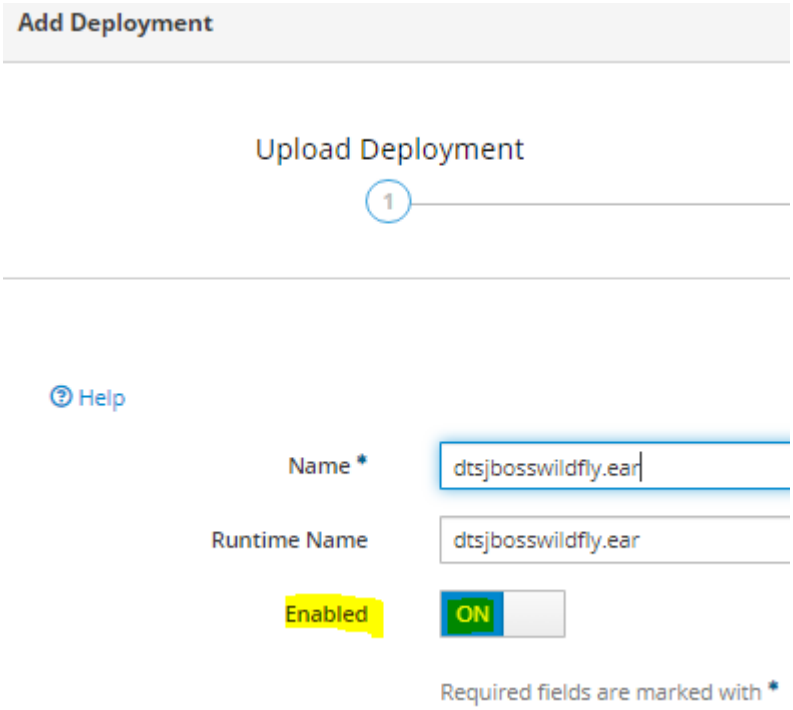
© 2026 Apelon, Inc.

NOTE: For **Microsoft SQL Server** a `dtsjbosswildflyforsqlserver.ear` file that is specific to Microsoft SQL Server must be used.

- The SQL Server specific `"dtsjbosswildflyforsqlserver.ear"` file is in the following location:
  `<DTS_HOME>\server\wildfly\standalone\deployments\sqlserver\`



In the next window ensure "Enable" is set to **ON** and then click "Finish".



WildFly 23 will report that the deployment is in process. NOTE: you may see a message that "… management operations are running longer than expected…" but you can ignore this message.
****IMPORTANT****
In the case of upgrading an earlier DTS 4 schema version, Do Not Restart WildFly 23 until the Deployment has completely finished and you have verified that the Database Schema is fully deployed to the correct version (See section:Upgrade Apelon DTS 4.8.0 WildFly

© 2026 Apelon, Inc.

Server & schema to DTS 4.9.0). Once the correct schema version is verified, SHUT DOWN and RESTART the WildFly server to ensure the changes are integrated.

H.7 Verify DTS Browser & Editor connections to WildFly 23 DTS 4.9.0 Server

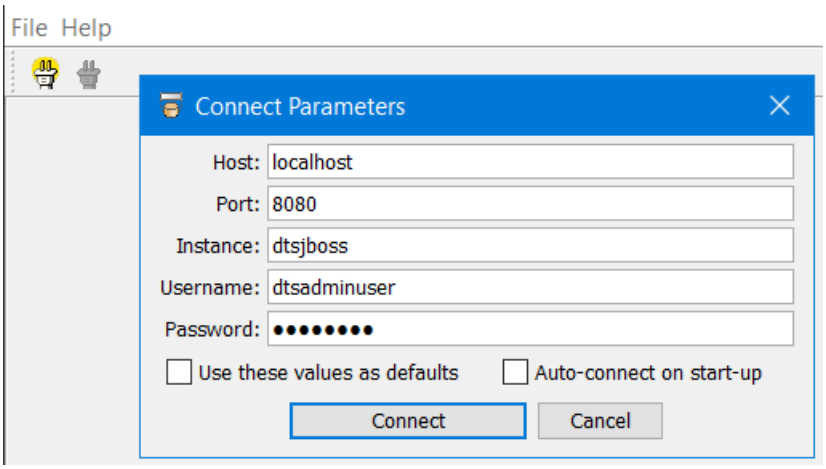
H.7.1 Verify the DTS Browser

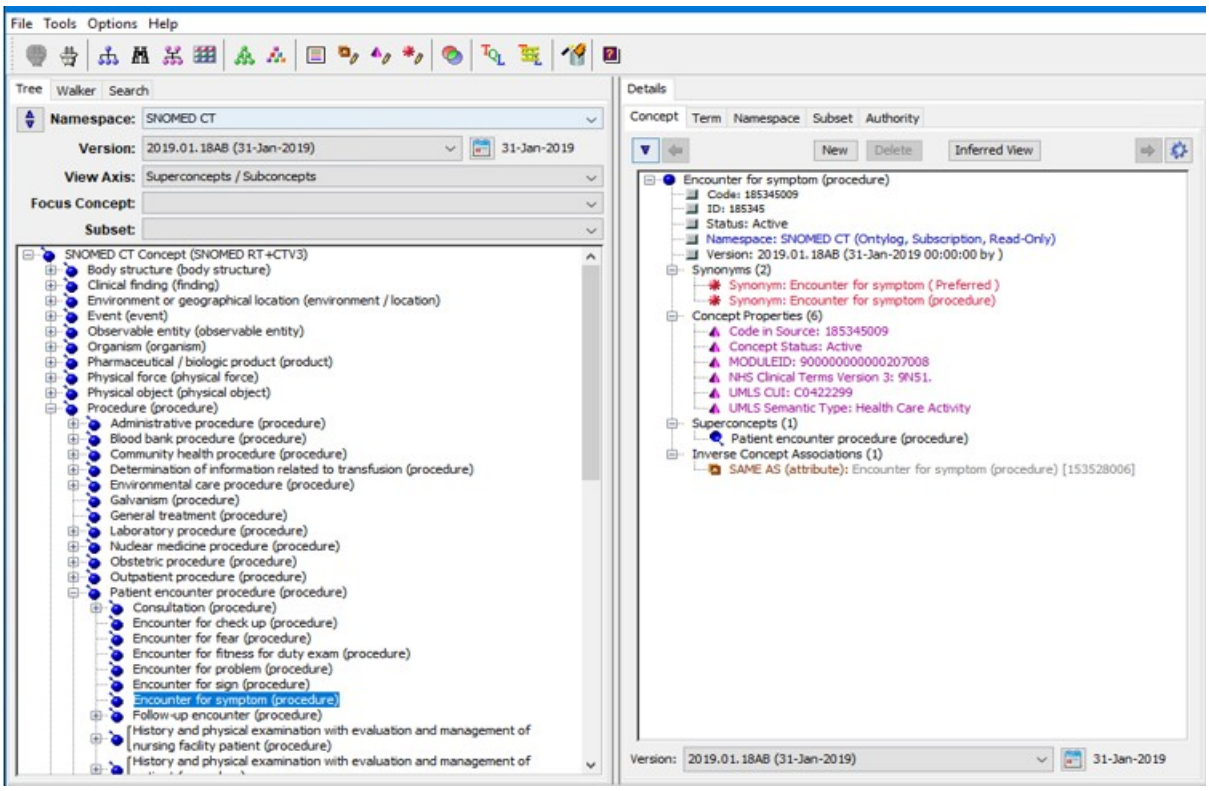
You can access the DTS Browser from:
`http://localhost:8080/dtsserverws`.
To login to the DTS Browser, you will need to enter user credentials created in the WildFly 23 Configuration for Apelon DTS Server section.
Note: If you used the example users defined in the guide, the credentials would be either **dtsadminuser/dtsadmin** or **dtsuser/dts**.

H.7.2 Verify the DTS Editor connection

Run the DTS Editor shortcut (DTS Editor) provided by the DTS 4 installation.
Connect to the WildFly 23 server by using an **Instance** of '**dtsjboss**' and default **Port** number '**8080'** along with the user credentials created in the WildFly 23 Configuration for Apelon DTS 4 Server section.
Note: If you used the example users defined in this guide the credentials would be either **dtsadminuser/dtsadmin** or **dtsuser/dts**.
Click "Connect".

© 2026 Apelon, Inc.





© 2026 Apelon, Inc.

H.8 Setup WildFly 23 and DTS 4.9.0 to start as a Windows Service

Follow these steps to get your WildFly 23 server running as a windows service.

1. Copy the **service** directory from **<WILDFLY23_HOME>\docs\contrib\scripts** to **<WILDFLY23_HOME>\bin**

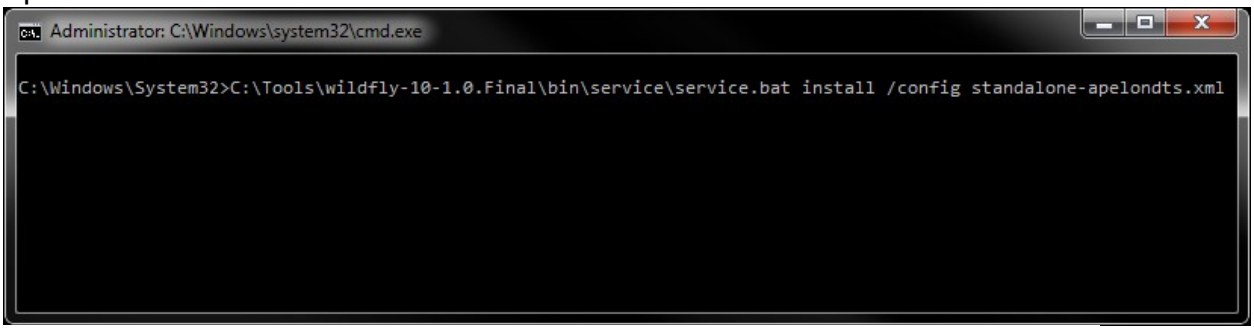
2. Edit service.bat file and set the windows service variables.
e.g.:
set SHORTNAME=DTS49WildFly23
set DISPLAYNAME=DTS49_WildFly23
set DESCRIPTION=DTS49 WildFly23 Application Server

Note1: If present, please be sure to remove the quotations surrounding the Description value.

Note2: If the JBoss Management Port Number specified in the **standalone-apelondts.xml** provided by DTS4 is changed (i.e. from `jboss.management.http.port:9990` to `jboss.management.http.port:XXXX`), then the Controller Port Number specified in the **services.bat** found in the following line must be changed to match the JBoss Management Port Number:
`CONTROLLER=localhost:9990`

3. Open a command prompt (as administrator) and change directory to the **<WILDFLY23_HOME>\bin\service** directory.

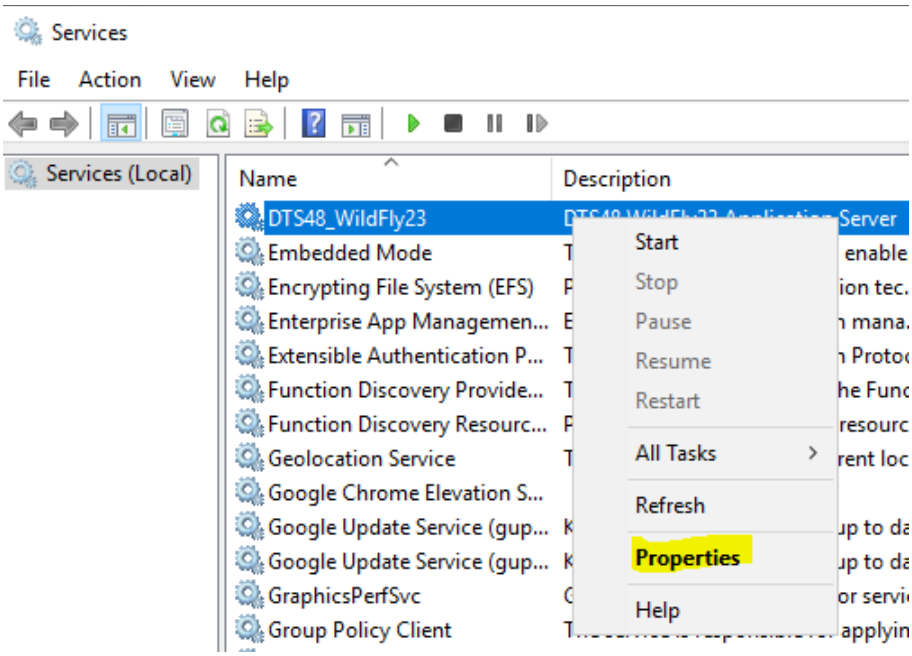
4. Issue the command: `service.bat install /config standalone-apelondts.xml`



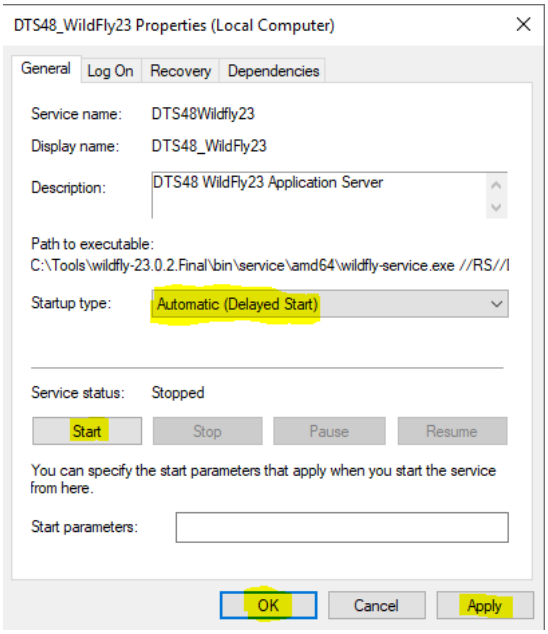
If installed successfully, you will be able to manage your WildFly 23 server from the Windows Services console.

5. Search for **Services** and select the Services app. Find the **"DTS49_WildFly23"** service. Right click and select **Properties**.

© 2026 Apelon, Inc.



6. Perform the following:
   Set the *Startup type* to **Automatic or Automatic (Delayed Start)**
   Click **Apply,** then **Start** the Service.
   Click **OK**



7. The "**DTS49_WildFly23"** service is now **Running** and set to **Automatic (Delayed Start)**.

© 2026 Apelon, Inc.

H.9 Setup WildFly 23 and DTS 4.9 to start as a Linux Service

To install DTS as a daemon service on Linux, you will need to copy and configure the service launching scripts that are included with WildFly 23.

Follow this procedure to configure the service.

1. Create a new user which will be used to launch the service. For example:
   ```
   => useradd -r -d /tmp/ jbossas
   ```

2. The `jbossas` user needs to have permission to read, write and execute to the path where WildFly 23 was installed. One option to grant this permission is to change the ownership of the WildFly 23 installation folder to the new user that was created. For example:
   ```
   => chown -R jbossas /opt/wildfly-23.0.2.Final/
   ```

3. Optionally change the group membership of the WildFly 23 installation folder to the newly created user. For example:
   ```
   => chgrp -R jbossas /opt/wildfly-23.0.2.Final/
   ```

   Alternatively, add the jbossas user to a shared users group, and change the group of the WildFly 23 installation folder to this shared group.

4. Copy the "**<WildFly23_HOME>/docs/contrib/scripts/init.d/wildfly.conf**" file to the folder "**/etc/default**" and rename it to just "**wildfly**". For example:
   ```
   => cp
   /opt/wildfly-23.0.2.Final/docs/contrib/scripts/init.d/wil
   dfly.conf /etc/default/wildfly
   ```

5. Add or update the following lines in the newly created "**/etc/default/wildfly**" file, customizing as necessary for your installation.

```
# The username that should own the process
JBOSS_USER=jbossas

## The amount of time to wait for startup
STARTUP_WAIT=90

# The installation path of JBoss
JBOSS_HOME=/opt/wildfly-23.0.2.Final

# The name of the server config file to use for your Database.
JBOSS_CONFIG=standalone-apelondts.xml
```

6. Copy the "**<WildFly23_HOME>/docs/contrib/scripts/init.d/wildfly-init-redhat.sh**" file to the folder "**/etc/init.d**" and rename it to "**wildfly**"
   ```
   => cp
   ```

© 2026 Apelon, Inc.

```
/opt/wildfly-23.0.2.Final/docs/contrib/scripts/init.d/wil
dfly-init-redhat.sh /etc/init.d/wildfly
```

7. Modify the file "**<WildFly23_HOME>/bin/standalone.conf**" to specify the Java JVM to use when the service starts. Add a `JAVA_HOME` parameter to your file, customizing as necessary for your installation. Note – this parameter may already exist in the file – if it does – you can either modify the existing one, or comment it out. For example:

```
# Specify the location of the Java home directory.
#If set then $JAVA will be defined to $JAVA_HOME/bin/java, else
#$JAVA will be "java".
#
#JAVA_HOME="/opt/java/jdk"
JAVA_HOME=/opt/java/jdk1.8.0_351
```

8. Create the necessary links to the **/etc/init.d/wildfly** script so it starts and stops at the appropriate runlevels.

```
=> chkconfig wildfly on
```

9. The server is now configured to automatically start and stop with the system. To manually start the server, execute:

```
=> /etc/init.d/wildfly start
```

To manually stop the server, execute:

```
=> /etc/init.d/wildfly stop
```

To check the status of the server, execute:

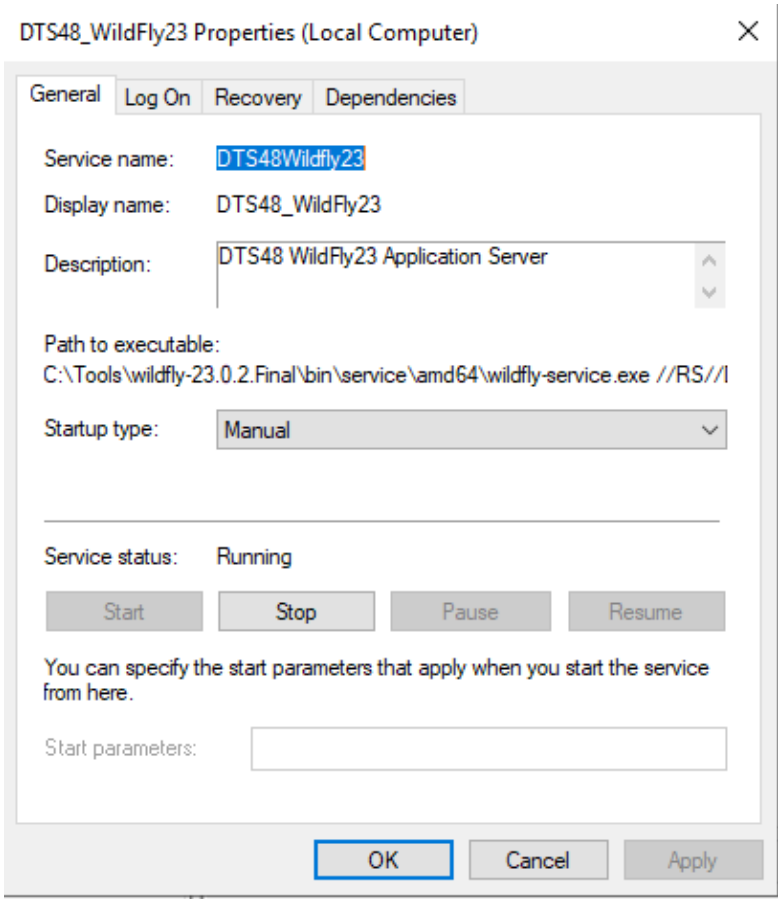
```
=> /etc/init.d/wildfly status
```

© 2026 Apelon, Inc.

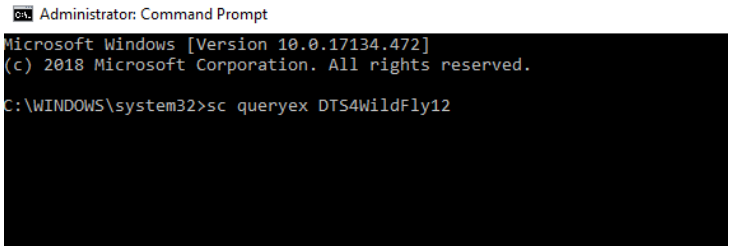
H.10 Terminating the WildFly 23 Service using taskkill

Stopping the WildFly 23 Service in the Services Window sometimes does not shut down in a timely manner, sometimes returning an error that the service is not responding. In this case, using a taskkill command to terminate the service is an effective way of circumventing this Services issue. Here are the instructions for doing so:

1. In the Services Window, right-click on the WildFly 23 Service and choose Properties.
2. In the Properties Window, identify the Service Name and copy it.

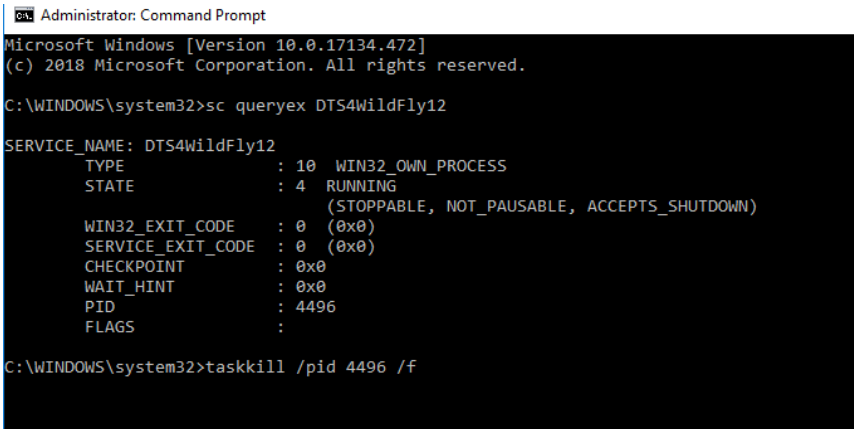


3. Open a Command Window and type the following: `sc queryex [Service Name]`

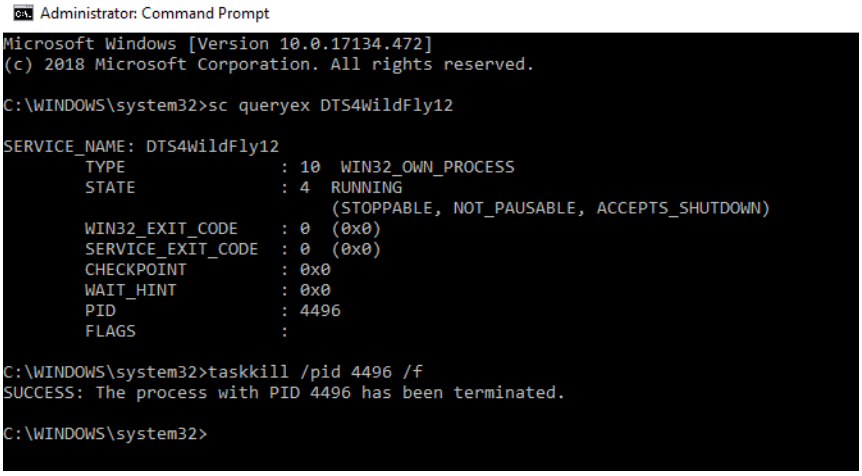


4. This should produce information about the WildFly 23 Service, including the PID.
5. Type the following in the Command Window: `taskkill /pid [PID] /f`

© 2026 Apelon, Inc.



6. The Service should be terminated, as confirmed by the following message:



© 2026 Apelon, Inc.

H.11 Upgrade Apelon DTS 4.8.0 WildFly Server & schema to DTS 4.9.0

Perform the following steps to upgrade your Apelon DTS 4.8 WildFly schema to Apelon DTS 4.9.0 WildFly 23 Server **(Note: DTS 4.7.1 - 4.8.0 have the same schema version as DTS 4.9.0)**:

- Follow instructions in Section B for installing DTS 4.9.0 on the server to be upgraded.
- Stop the Apelon DTS WildFly service.
- Copy the WildFly configuration file from the DTS 4.9.0 home directory <DTS_HOME>\server\wildfly\standalone\configuration\WF23 to the <WILDFLY23_HOME>**\standalone\configuration** folder. Replace the existing file with this new WildFly configuration file.
- Restart the Apelon DTS WildFly service.
- Review the Notes below before continuing to the next steps.
- Follow steps **H.4.2 (Deploy Database Driver**) through **H.7 (Verify DTS Browser & Editor connections to WildFly 23 DTS 4.9.0 Server**) to finish configuring the Apelon DTS 4.9.0 WildFly server.
- **NOTE1:** If upgrading from a DTS 4.7.0 schema to DTS 4.9.0, as instructed in section **H.6(**Deploy Apelon DTS 4.9.0 Server**),** when deploying the "**dtsjbosswildfly.ear**" **Do NOT shut down or restart the WildFly service while the schema is being upgraded**. This step could take some time, especially when upgrading DTS schemas in MySQL and SQL Server.
- **To verify the correct DTS 4.9.0 schema version, perform the following steps:**
    1. View the "server.log" file located in the <WILDFLY23_HOME>**\standalone\log** directory. Search the WildFly 23 "server.log" file for the statement:
        - "Schema Upgrade to 4.0.29 complete" – for SQL Server 2019 or SQL Server 2025.
        - "Schema Upgrade to 4.0.30 complete" – for MySQL 8.4.
    2. A second way to determine the schema upgrade was successful is from the DTS 4.9.0 DTS Editor.
        - Connect to the Apelon DTS WildFly 23 server.
        - Once the connection is established choose: **Help>About Apelon DTSEditor…**
        - In the help window that is launched click on the "*Details>>*" label. In the "Server Configuration:" section is displayed a "schema.version" value. The schema version should read:
            - "4.0.29" – for SQL Server 2019 or SQL Server 2025.
            - "4.0.30" – for MySQL 8.4.

NOTE2 - SQL Server Schema Upgrade: If upgrading from a version older than DTS 4.4, not only may the SQL Server schema upgrade to version 4.0.29 take up to or longer than an hour, it may also require about as much available drive space for its database log file as is being used by the database prior to the schema upgrade. Consult with your SQL Server Database Administrator regarding the available drive space and the possibility of shrinking the database log after the schema is successfully upgraded to version 4.0.29.

© 2026 Apelon, Inc.