Apelon

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DTS: 4.8.0 Installation Guide

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A Note Before We Begin: As of the release of DTS version 4.8.0, Apelon Customer Support will officially support installations of DTS 4.7.2 and DTS 4.8.0. If you are running an older version of DTS 4, consult the latter sections of this guide to upgrade your installation to a current version

A. Introduction

This Installation Guide provides detailed descriptions of the steps required to install the DTS 4.8.0 software and install and configure the associated JBoss, WildFly and GlassFish 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 4.8.0 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 Knowledgebase*.

The Apelon DTS Server section gives descriptions of the architecture of the DTS 4.8.0 Server and detailed instructions for downloading, installing, and configuring JBoss, WildFly and GlassFish Application Servers.

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)

- <u>CPU</u>
 - 1 or more Dual Core Minimum
 - 1 or more Quad Core Recommended
- <u>System Memory</u>
 - 8GB RAM Minimum
 - 16GB RAM Recommended (minimum if both Server and Database are on same machine and using Classification)
- Available hard drive space
 - 100GB Minimum and 150GB+ 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 10 Professional or Windows 11 Professional
 - Windows Server 2016 or Windows Server 2019
- <u>Web Browser (for DTS Browser):</u>
 - Microsoft Edge 44+
 - Firefox 81+
 - Chrome 85+

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

- **Operating Systems:**
 - Windows 10 Professional or Windows 11 Professional
 - Windows Server 2016 or Windows Server 2019
 - Redhat Enterprise Linux 6 or 7. CentOS 6 or 7
- Database Management System:
 - Oracle 12c Standard Edition 2 or Enterprise Edition (DTS 4.7 verified against 12.1.0.2, version 12.2 or later not currently supported) (NOTE: DTS 4.8.0 is the last version where Oracle will be supported)
 - MS SQL Server 2016 (Express Edition not supported. Must be hosted on a Windows Server)
 - MS SQL Server 2019 (Express Edition not supported. Must be hosted on a Windows Server)
 - MySQL Community Server 5.6 (5.6 is the only version 5 supported) (NOTE: DTS
 4.8.0 is the last version where MySQL 5.6 will be supported)
 - MySQL Community Server 8.0
- <u>Application Server:</u>
 - JBoss EAP 7.1.0 Application Server (NOTE: DTS 4.8.0 is the last version where JBoss Eap 7.1.0 will be supported)
 - JBoss EAP 7.1.0 only supported on JDK 1.8
 - JBoss EAP 7.4.0 Application Server
 - JBoss EAP 7.4.0 only supported on JDK 1.8
 - WildFly 12.0.0 Final Application Server (NOTE: DTS 4.8.0 is the last version where WildFly 12.0.0 will be supported)
 - WildFly 12.0.0 only supported on JDK 1.8
 - WildFly 23.0.2 Final Application Server
 - WildFly 23.0.2 only supported on JDK 1.8
 - o GlassFish 3.1.22 Application Server
 - GlassFish Application Server version 3.1.2.2 (Full Platform) (only this version is supported)
 - GlassFish 3.1.22 only supported on JDK 1.8
 - \circ NOTE: DTS 4.8.0 is the last version where GlassFish will be supported

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- <u>Runtime Environment:</u>
 - The DTS 4 Windows installation includes Version 1.8 of the Sun 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, WildFly, or GlassFish application servers (existing Java installations on the target machine are not affected)

B.2 Installing Apelon DTS for Windows

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

- Download the dts_64bit_4.X.X.X.exe (dts_32bit_4.X.X.X.exe for DTS 4 Editor Client installations only) installation file from the Apelon DTS download page http://www.apelondts.org. Note: The Apelon DTS Server installer includes the installation of Java JVM. Use of the 32-bit installer only supported for DTS 4 Editor Client installations.
- 2. Double click on the installation file to run the installation wizard, which guides you through the installation process.



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

6					
💮 Apelon DTS 4.8.0 Setup	_		×		
License Agreement					
Please review the license terms before installing Apelon DTS 4.8.0.			3		
Press Page Down to see the rest of the agreement.					
Apache License			^		
Version 2.0, January 2004					
http://www.apacie.org/iicenses/					
TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTR	IBUTION				
1. Definitions.					
"License" shall mean the terms and conditions for use, reproduct and distribution as defined by Sections 1 through 9 of this docum	tion, nent.				
			×		
If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install Apelon DTS 4.8.0.					
Nullsoft Install System v2.46					
< Back I	Agree	Car	ncel		

- 4. At this point the *Choose Components* window displays. As part of the installation, you are asked to select which of the Apelon DTS components you want installed. The DTS components are listed here:
 - Editor (Includes the DTS 4 Editor)
 - Server (Includes DTS Browser support)
 - Administration (Includes DTS content administration tools)
 - **Documentation** (Includes DTS API Documentation) (NOTE: The latest DTS 4 documentation can be obtained at <u>ApelonDTS.org</u>)
 - **Database** Specify the database on which you maintain your DTS Knowledgebase and the driver through which the Application Server will access the data; the appropriate DTS configuration files are updated to reflect this selection.

Apelon DTS 4.8.0 Setup Choose Components Choose which features of Apelo	on DTS 4.8.0 you want to install.	_		×)
Check the components you war install. Click Next to continue.	nt to install and uncheck the comp	onents you d	on't want	to	
Select components to install: Space required: 795.0MB	Editor Server Adminstration Documentation Database MS SQL Server MySQL	Description Position yo over a com see its des	nur mouse aponent to cription.	: D	
Nullsoft Install System v2.46 ——	< Back	Next >	Ca	ancel	_

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.

5. 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.

💮 Apelon DTS 4.8.0 Setup	- 🗆 X
Choose Install Location	
Choose the folder in which to install Apelon DTS 4.8.0.	
Setup will install Apelon DTS 4.8.0 in the following folder. To insta Browse and select another folder. Click Next to continue.	all in a different folder, click
Destination Folder C:\Program Files\Apelon DTS 4.8.0	B <u>r</u> owse
Space required: 795.0MB	
Space available: 279.7GB	
Nullsoft Install System v2.46	
< <u>B</u> ack	Next > Cancel

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

- 6. 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**.
- 7. When the *Choose Start Menu Folder* window displays, choose the default Start Menu folder in which to create the program's shortcuts.

Apelon DTS 4.8.0 Setup		_		\times
Choose Start Menu Folder Choose a Start Menu folder for the Apelon D	TS 4.8.0 shortcuts.			-
Select the Start Menu folder in which you we can also enter a name to create a new folde	ould like to create the	e program's sh	ortcuts. Y	'ou
Apelon DTS 4.8.0				
Accessibility Accessories Administrative Tools Maintenance StartUp System Tools VMware Windows PowerShell				
ulisoft Install System v2,46				
	< Back	Install	Ca	ncel

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

0	Apelon DTS 4.8.0 Setup —	\times			
Ir	nstallation Complete				
	Setup was completed successfully.	3			
	Completed				
	Output folder: C:\Program Files\Apelon DTS 4.8.0.8113\bin	^			
	Extract: drivers.xml 100%				
	Output folder: C:\Program Files\Apelon DTS 4.8.0.8113\scripts\mysql				
	Output folder: C:\Program Files\Apelon DTS 4.8.0.8113\scripts\mysql				
	Output folder: C:\Program Files\Apelon DTS 4.8.0.8113				
	Created uninstaller: C:\Program Files\Apelon DTS 4.8.0.8113\uninstall.exe				
	Create folder: C:\ProgramData\Microsoft\Windows\Start Menu\Programs\Apelon DTS				
	Output folder: C:\ProgramData\Microsoft\Windows\Start Menu\Programs\Apelon DT				
	Create shortcut: C: \ProgramData \Microsoft \Windows \Start Menu \Programs \Apelon D				
	Completed	¥			
Nul	Isoft Install System v2.46				
	< Back Next > Can	cel			

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9. Click Finish to close the installation and open the Readme document.

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

🔬 javaw.exe Proper	ties		×			
Security General	Details Compatibility	Previous Versions Digital Signature	; :S			
If this program isn't w try running the comp	orking correctly on this ver atibility troubleshooter.	sion of Windows,				
Run compatibility How do I choose co	troubleshooter	<u>/?</u>				
Compatibility mode	m in compatibility mode for	:				
Windows 8		\sim				
Settings						
8-bit (256) color						
Run in 640 x 48 Disable fullscree	80 screen resolution en optimizations					
Run this progra	m as an administrator					
Change settin	gs for all users					
	ОК	Cancel A	pply			

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

javaw.exe Properties	×				
Choose the high DPI settings for this program.					
Program DPI Use this setting to fix scaling problems for this program instead of the one in Settings <u>Open Advanced scaling settings</u>					
A program might look blurry if the DPI for your main display changes after you sign in to Windows. Windows can try to fix this scaling problem for this program by using the DPI that's set for your main display when you open this program.	¢				
Use the DPI that's set for my main display when	Use the DPI that's set for my main display when				
I signed in to Windows $$					
Learn more					
High DPI scaling override					
Override high DPI scaling behavior. Scaling performed by:					
System >					
OK Cancel					

B.3 Installing Apelon DTS for Linux

Follow this procedure to install DTS 4 on Linux. 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).

- 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 <u>http://www.apelondts.org</u>. 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
 - doc
 - javadoc
 - lib
 - scripts
 - server
- You must obtain and install Version 1.8 of the Oracle Java Development Kit (JDK) for Linux that is appropriate for the Application Server being installed as indicated in the <u>Minimum Software Requirements (Server)</u> section of this documentation. NOTE, Open JDK is not recommended.

NOTE: See section <u>Java Environment Setup for a Server</u> regarding more information on Java installation.

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

```
JAVA_HOME=/usr/java/jdk1.8.0_311
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 Database User and DTS Schema

The following database setup procedure uses **Oracle** as an example. If you are installing on **MySQL**, please refer to the **MySQL Installation Guide** at this point. You will return to this document in the <u>Populating the DTS Knowledgebase</u> section below. If installing on **MS SQL Server**, skip to section <u>Create DTS Knowledgebase Schema</u> below.

C.1.1 Oracle 12c PGA_AGGREGATE_LIMIT

Note: For Oracle 12c, the PGA AGGREGATE LIMIT needs to be set to 0.

For example, from a SQL Plus prompt, to check the current value please enter: SHOW PARAMETER PGA AGGREGATE LIMIT

If not already set to 0, set the PGA_AGGREGATE LIMIT to 0 by entering the following: ALTER SYSTEM SET PGA AGGREGATE LIMIT = 0;

C.1.2 Overview

Regardless of where the information comes from, to populate the DTS knowledgebase (either by migrating data from existing databases or performing a complete import of new subscription data) a database must first be setup. Regardless of which database engine is used (Oracle, MySQL or MSSQL Server) the setup consists of two parts: 1) establishing a database user and allocating physical disk storage space and 2) creating a DTS schema (tables, indexes, functions, stored procedures, etc.) which includes the DTS-specific database objects that are required for storing terminology content and proper API function.

C.1.3 Create Oracle Database User and Tablespace

You must define a user and create a tablespace before the DTS 4.8.0 tables can be created. If you prefer, DTS provides a utility to assist in creating an Oracle user and tablespace. Navigate to the directory where DTS 4.8.0 was installed (this directory will be referred to as *<DTS_HOME>* for the remainder of this document). In the *<DTS_HOME>* scripts/oracle directory, run the userCreate.bat (userCreate.sh on Linux) file. You are prompted for the following information; note that values from the previous user and tablespace that were created will be displayed as the default values.

🖬 C:\Windows\system32\cmd.exe	×
This utility creates a DTS Oracle user.	
Please Type the user information OR Press Enter to use the default in brackets.	
Enter DTS oracle user (dts4):	
Enter password for DTS oracle user (dts4):	
Enter tablespace name (dts4):	
Enter tablespace datafile directory (C:\app\administrator\oradata\GIGALITER):	
Enter tablespace datafile name (dts4.dbf):	
Enter datafile initial size <20000M>:	
Enter datafile autoextend size (500M):	
Enter datafile maximum size (30000M): _	

Enter DTS oracle user: Specify the name of the new Oracle user who will have the DTS schema

Enter password for DTS oracle user: Enter the password for the new Oracle user that you specified

Enter tablespace name: Enter the name of the tablespace which will hold the DTS schema for the specified Oracle user

Enter tablespace datafile directory: Specify the directory of the datafile in which the tablespace will be created

Enter tablespace datafile name: Specify the name of the datafile which the specified tablespace will use

Enter datafile initial size: Specify the size of the datafile, in bytes (use K or M to specify the size in kilobytes or megabytes, respectively)

Enter datafile autoextend size: Specify the size, in bytes, of the next increment of disk space to be allocated automatically to the datafile (use K or M to specify this size in kilobytes or megabytes, respectively)

Enter datafile maximum size: Specify the maximum disk space allowed, in bytes, for automatic extension of the datafile (use K or M to specify this size in kilobytes or megabytes, respectively). If you plan to load a large subscription namespace, such as SNOMED, you may wish to use a larger maximum datafile size such as 32GB

At this point press **Enter**. You are prompted for the **password**: Copyright (c) 1982, 2002, Oracle Corporation. All rights reserved. Enter password:

The new Oracle DTS user and tablespace are created.

C.1.4 Create DTS Knowledgebase Schema

After you create the **Oracle** tablespace or **MS SQL Server** database, you must create the DTS tables, or **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 there, copy target-connection-<database>.xml (where <database> is `oracle' for Oracle, `sql2k' for MS SQL Server, and `mysql' for MySQL) as `target-connection.xml'.
- 2. 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 an Oracle database.

```
<!-- Oracle connection. -->
<connection>
 <property name="direction" value="target"/>
<property name="type" value="oracle"/>
<property name="user" value="dts4"/>
<property name="host" value="dts4"/>
<property name="host" value="localhost"/>
<property name="databaseName" value="ORCL"/>
<property name="databasePort" value="ORCL"/>
<property name="databasePort" value="IS21"/>
<property name="jdbcDriver" value="oracle.jdbc.driver.OracleDriver"/>
<property name="url_template" value="jdbc:oracle:thin:@[HOST]:[DATABASE]"/>
<property name="blockSize" value="256"/>
</connection>
```

For the **user** and **pass** property values (highlighted) enter a valid username and password for the database user you created (when you executed **userCreate.bat** for Oracle). 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 the target-connection.xml file.

- 4. Run the file **kbcreate.bat** (*<DTS_HOME>***bin****kb****create**) (or **kbcreate.sh for Linux**) 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 \mathbf{y} , the utility drops all existing tables, then recreates them all. Type \mathbf{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 Knowledgebase* section below and then proceed to setup the Apelon DTS Server.

<u>NOTE</u>: After generation of the DTS tables you can jump to section <u>Apelon DTS Server</u> to install and setup the Apelon DTS Server using the WildFly, JBoss EAP or GlassFish application server.

D. Populating the DTS Knowledgebase

After the DTS database user and DTS 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, on <u>ApelonDTS.org</u>.

E. Apelon DTS Server

The Apelon DTS 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 Server and other application components.



DTS 4 Architecture

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

E.1 Getting Started with Apelon DTS Server

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

- Set up Java 8 JDK environment.
- Set up WildFly, JBoss EAP, or GlassFish.
- Configure WildFly, JBoss EAP, or GlassFish to run the Apelon DTS Server.

E.2 Java Environment Setup for a Server

WildFly, JBoss EAP, and GlassFish server installations require Java SE 8 JDK. We recommend using Java SE 8 JDK 8u211 or later. Must use the 64-bit version of the JDK. *NOTE1: Please do NOT use the 8u331 release of JDK because it will not work with JBoss EAP and WildFly.*

NOTE2: DTS 4.8 has been verified against the following releases: 8u311, 8u341, and 8u351. These steps are only required for server installations. The DTS 4 Editor installation includes a JRE during the installation on Windows, so if you are not setting up the server, you do not need to manually install Java on Windows.

Download the Java SE 8 JDK from the Oracle download page linked here for your convenience: <u>https://www.oracle.com/java/technologies/javase/javase8u211-later-archive-downloads.html</u>. In the example below we're using the JDK 8u351 release.

ORACLE Products Industries Re	sources Customers Partners Developers Company	Q (2) View Accounts		
Java SE Development Kit 8u351				
This software is licensed under the Oracle Technology Network L	icense Agreement for Oracle Java SE			
JDK 8u351 checksum				
Product / File Description	File Size	Download		
Linux ARM 64 RPM Package	59.32 MB	idk-8u351-linux-aarchó4.rpm		
Linux ARM 64 Compressed Archive	71.07 MB	≟ jdk-8u351-linux-aarch64.tar.gz		
Linux ARM 32 Hard Float ABI	73.78 MB	°, jdk-8u351-linux-arm32-vfp-hflt.tar		
Linux x86 RPM Package	114.52 MB	°↓ jdk-8u351-linux-i586.rpm		
Linux x86 Compressed Archive	145.58 MB	idk-8u351-linux-i586.tar.gz		
Linux x64 RPM Package	112.11 MB	idk-8u351-linux-x64.rpm		
Linux x64 Compressed Archive	142.76 MB	بُل jdk-8u351-linux-x64.tar.gz		
macOS x64 DMG Installer	203.19 MB	idk-8u351-macosx-x64.dmg		
Solaris SPARC 64-bit (SVR4 package)	134.07 MB	°↓ jdk-8u351-solaris-sparcv9.tar.Z		
Solaris SPARC 64-bit Compressed Archive	95.05 MB	idk-8u351-solaris-sparcv9.tar.gz		
Solaris x64 (SVR4 package)	134.96 MB	°↓ jdk-8u351-solaris-x64.tar.Z		
Solaris x64 Compressed Archive	92.92 MB	°↓ jdk-8u351-solaris-x64.tar.gz		
Windows x86 Installer	161.54 MB	°↓ jdk-8u351-windows-i586.exe		
Windows xó4 Installer	175.54 MB	🛃 jdk-8u351-windows-x64.exe		

Select jdk-8u351-windows-x64.exe for 64-bit Windows OS.

While installing the JDK, unselect the Source Code option as shown below.

🖟 Java SE Development Kit 8 Update 351 (64-bit) - Custo	om Setup X
Select optional features to install from the list below. You car installation by using the Add/Remove Programs utility in the C	n change your choice of features after Control Panel
	Feature Description
Development Tools	Source code for classes that comprise the public API of Java. The source code requires 27MB on your hard drive.
Install to:	
	Change
	Next > Cancel

When the installation is complete, add an environment variable named JAVA_HOME, which is directly referenced by JBoss EAP, WildFly and GlassFish startup scripts.

For Windows Server 2016, Windows Server 2019, Windows 10 Professional, or Windows 11 Professional, follow these steps:

- 1. Search for Environment Variables and choose the Edit the system environment variables in Control panel.
- 2. Click on **Environment Variables...** button.
- 3. 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 Java 8 JDK installation. An example is shown below:

DTS 4.8.0 – Installation Guide

	New System	Variable											
/ariable													
Path	Variable nam	ne:	JAVA	HOME									
гемр ГМР	Variable valu	ie:	C:\P	rogram Fil	es\Java\jd	k1.8.0_351							
	Browse Di	irectory		Brows	e File					OK	:	Canc	el
tem variables	5					New		Edit)elete			
tem variables /ariable	5	Value				New		Edit		Delete	^		
tem variables /ariable ComSpec	s	Value C:\Wind	lows\s	ystem32\0	cmd.exe	New		Edit		Delete	^		
stem variables Variable ComSpec DriverData	5	Value C:\Wind C:\Wind	lows\s	:ystem32\@ System32\	cmd.exe Drivers\Dr	New		Edit		Delete	^		
stem variables /ariable ComSpec DriverData VUMBER_OF_	s _PROCESSORS	Value C:\Wind C:\Wind 2	lows\s	system32\/ System32\/	cmd.exe Drivers\Dr	New		Edit)elete	^		
tem variables /ariable ComSpec DriverData NUMBER_OF_ DS	s PROCESSORS	Value C:\Wind C:\Wind 2 Window	lows\s lows\S vs_NT	system32\/ System32\/	cmd.exe Drivers\Dr	New		Edit		Delete	^		
atem variables Variable ComSpec DriverData NUMBER_OF_ DS Path	s PROCESSORS	Value C:\Wind C:\Wind 2 Window C:\Progr	lows\s lows\S vs_NT ram Fi	system32\d System32\l les (x86)\C	cmd.exe Drivers\Dr	New iverData	\Java\jav	Edit	Vindows	Styse	^		
stem variables Variable ComSpec DriverData NUMBER_OF_ DS Path PATHEXT	PROCESSORS	Value C:\Wind C:\Wind 2 Window C:\Progr .COM;.E	lows\s lows\S vs_NT ram Fi XE;.B4	system32\(system32\) les (x86)\C	cmd.exe Drivers\Dr Common F /BS;.VBE;.J	New iverData Files\Oracle S;JSE;.WSF;	\Java\jav .WSH;.M	Edit /apath;C:\\ ISC	Vindow:	Delete	*		

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

JAVA_HOME=/usr/java/jdk1.8.0_351	
export JAVA_HOME	

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: <u>https://developers.redhat.com/products/eap/download/</u>

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.

7.4.0

Installer	Application Platform	Release date Download (232.49 MB)
Zip File	Application Platform	Helease date

To install JBoss EAP 7.4.0 just extract the compressed archive. <u>Unzip the JBoss EAP 7.4.0</u> archive into a folder with a pathname that does NOT contain any spaces. For example, extracting to the C:\Tools folder will place the JBoss EAP 7.4.0 files in the

C:\Tools\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.

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

← → ∽ ↑ 📙 → This PC → Local Di	isk (C:) > Tools > jboss-eap	-7.4 > bin >			,
> 📙 Program Files (x86)	^ Name	^	Date modified	Туре	Size
> 📴 ProgramData	jboss-cli.sh		6/23/2021 11:26 AM	SH File	3 KB
V Tools	iboss-cli.xml		6/23/2021 11:26 AM	XML Document	3 KB
✓ jboss-eap-7.4	jboss-cli-logging.p	roperties	6/23/2021 11:26 AM	PROPERTIES File	2 KB
installation	jboss-server-migra	tion.bat	6/23/2021 11:26 AM	Windows Batch File	3 KB
well-known	jboss-server-migra	tion.sh	6/23/2021 11:26 AM	SH File	3 KB
· ····································	💿 jconsole.bat		6/23/2021 11:26 AM	Windows Batch File	3 KB
> appclient	📓 jconsole.ps1		6/23/2021 11:26 AM	Windows PowerS	2 KB
🗸 📙 bin	jconsole.sh		6/23/2021 11:26 AM	SH File	3 KB
📙 client	💿 jdr.bat		6/23/2021 11:26 AM	Windows Batch File	3 KB
init.d	🙀 jdr.ps1		6/23/2021 11:26 AM	Windows PowerS	1 KB
> docs	jdr.sh		6/23/2021 11:26 AM	SH File	3 KB
	🕌 launcher.jar		6/23/2021 11:26 AM	Executable Jar File	57 KB
migration	product.conf		6/23/2021 11:26 AM	CONF File	1 KB
> migration	💿 service.bat		6/23/2021 11:26 AM	Windows Batch File	18 KB
> modules	💿 standalone.bat		6/23/2021 11:26 AM	Windows Batch File	10 KB
> 🔄 standalone	standalone.conf		6/23/2021 11:26 AM	CONF File	3 KB
> 📙 welcome-content	standalone.conf.ba	t	6/23/2021 11:26 AM	Windows Batch File	4 KB
—	· · · ·	-			

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

nore is a sumple startup serven.
20:27:04,709 INFO [org.jboss.as.server] (Controller Boot Thread) WFLYSRV0212: Resuming server
20:27:04,709 INFO [org.jboss.as] (Controller Boot Thread) WFLYSRV0025: JBoss EAP 7.4.0.GA (WildFly Core 15.0.2.Final-redhat-00001) started in 1000
- Started 317 of 556 services (343 services are lazy, passive or on-demand)
20:27:04,709 INFO [org.jboss.as] (Controller Boot Thread) WFLYSRV0060: Http management interface listening on http://127.0.0.1:9990/management
20:27:04,709 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 JBoss EAP at the address: <u>http://localhost:8080</u>. 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.

Terminate batch job (Y/N)? y_

F.1 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 standalone.conf for Linux) 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:

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

For Linux:

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

F.2 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 click on **add-user.bat** (or **add-user.sh** for Linux). 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**".

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See the screen shot below to confirm: C\Windows\system32\cmd.exe
What type of user do you wish to add? a) Management User (mgmt-users.properties) b) Application User (application-users.properties) b) Application User (application-users.properties) c) a): a Enter the details of the new user to add. Username: apelonadmin2 Password recommendations are listed below. To modify these restrictions edit the add-user.properties configuration file. - The password should not be one of the following restricted values (root, admin, administrator) - The password should not be one of the following restricted values (root, admin, administrator) - The password should not be one of the following restricted values (root, admin, administrator) - The password should not be one of the following restricted values (root, admin, administrator) - The password should have at least 8 characters! Prevous 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)[]: Hot do user 'apelonadmin2' for ile 'C:AppServer,jboss-eap-7.1\standalone\configuration\mgmt-users.properties' Added user 'apelonadmin2' to file 'C:AppServer,jboss-eap-7.1\standalone\configuration\mgmt-groups.properties' Added user 'apelonadmin2' with groups to file 'C:AppServer,jboss-eap-7.1\standalone\configuration\mgmt-groups.prop

F.3 JBoss EAP Configuration for Apelon DTS Server

If you are currently Running DTS and are setting up JBoss EAP 7.4 to replace your existing JBoss EAP 7.1 or WildFly 12 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**, **application-users.properties**, and **mgmt.-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**.
- Copy these files, and place them (overwriting if prompted) in <JBossEAP74_HOME>\domain\configuration and <JBossEAP74_ HOME>\standalone\configuration respectively.
- 4. Start the JBoss EAP Application Server

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

F.3.1 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 click on add-user.bat (or add-user.sh for Linux). 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.properti	es)
(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:



F.3.2 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 click on add-user.bat (or add-user.sh for Linux). Follow the steps below.

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

What	type	of us	er do	you	wish	to	add?		
a)	Manage	ement	User (mgmt	usei	•s .1	propert	ies);	
b) (a):	Applic b	cation	User	Հарр	licat	;10	n-users	.prop	erties)

- 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.

F.4 Apelon DTS Server Deployment

- 2. Create a shortcut for **<JBossEAP74_HOME>\bin\standalone.bat.** Rename this to "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
```

Target location:	bin
Target:	al\bin\standalone.bat -c standalone-apelondts.xml

- 5. Use this "Apelon DTS JBoss EAP" shortcut for running JBoss EAP configured for Apelon DTS.
- 6. For launching on Linux use the following command from terminal window:

```
<JBossEAP74_HOME>/bin/standalone.sh -c standalone-
apelondts.xml
```

F.4.1 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.4.2 Deploy Database Driver

Start JBoss EAP using the "Apelon DTS JBoss EAP" shortcut for Windows (or from terminal window for Linux) 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 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.

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

Deployments Add and manage deployments Deploy an Application Start O Deploy an application to the server. 1. Use the 'New Deployment' wizard to deploy the application 2. Enable the deployment

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".



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Navigate to the **<DTS_HOME>\lib** folder.

Select a Driver .jar file for the database as given below and click **Next**.

<u>Note:</u> For Oracle 12c see <u>Oracle 12c PGA_AGGREGATE_LIMIT</u>

Database	Driver		
Oracle 12c	ojdbc7-4.1.jar		
MS SQL	mssql-jdbc-9.4.1.jre8.jar		
Server 2016			
MS SQL	mssql-jdbc-9.4.1.jre8.jar		
Server 2019			
MySQL 8	mysql-connector-java-8.0.29.jar		
MySQL 5.6	mysql-connector-java-8.0.29.jar		
	Add Deployment		>
	Upload Deployment	Specify Names	

Upload Deployment	Specify Names	
	1	

mysql-connector-java-8.0.29.jar

Cancel < Back Next >

Ensure the **Enable** is **ON** and click "Finish".

Lipload De	nlovment	Specify Names
		2
Help		
Name *	mysql-connector-java-8.0.29.jar	
Runtime Name	mysql-connector-java-8.0.29.jar	
Enabled	ON	
	Required fields are marked with *	
		Cancel C Back
u should receive a r	nessage that the upload of the ja	Cancel Cack Fin
u should receive a n	nessage that the upload of the .ja	Cancel Cancel Back Fin ar deployment was successful.
u should receive a n	nessage that the upload of the .ja Specify Names	Cancel Cancel Back Fin ar deployment was successful. ×
Upload Deployment	nessage that the upload of the .ja Specify Names	Cancel Back Fin ar deployment was successful. ×
u should receive a m Deployment Upload Deployment	nessage that the upload of the .ja Specify Names	Cancel Cancel Back Fin ar deployment was successful.
Deployment Upload Deployment	nessage that the upload of the .ja Specify Names	Cancel Back Fin ar deployment was successful. ×
Deployment Upload Deployment	nessage that the upload of the .ja Specify Names 2 Upload successful.	Cancel Back Fin ar deployment was successful. ×
Deployment Upload Deployment	nessage that the upload of the .ja Specify Names 2 2 Upload successful 029jar has been successful View Deployment	Cancel Back Fin ar deployment was successful.
Du should receive a m Deployment Upload Deployment	nessage that the upload of the .ja Specify Names 2 2 2 2 2 2 2 2 2 2 2 2 2	Cancel Back Fin ar deployment was successful.
u should receive a m Peployment Upload Deployment	nessage that the upload of the .ji Specify Names 2 2 2 2 2 2 2 2 2 2 2 2 2	Cancel Back Fin
Upload Deployment	nessage that the upload of the .ji Specify Names 2 2 2 2 2 2 2 2 2 2 2 2 2	Cancel Back Fin

Red Hat JBoss	Enterprise Applica	ation Platform			
Homepage	Deployments	Configuration	Runtime	Patching	Access Control
<u>Deployment (1)</u>	⊕~ 2	mysql-conne	ectova-8	3.0.29.jar	
Filter by: name or d	leployment status	O The deploymen	t mysql-connect	or-java-8.0.29.jar	is enabled and active. Disable
👕 mysql-con	View ~				
		Main Attributes			
		Name:		n	nysql-connector-java-8.0.29.jar
		Runtime Name:		n	nysql-connector-java-8.0.29.jar
		Enabled, Managed, E	xploded:	~	 ✓ ×
		Status:		c	к
		Last enabled at:		8	/1/23, 9:23 PM
		Last disabled at:		n	/a

F.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 default "dts4" used as an example in this documentation*).

Database	User	Password	Connection URL
Oracle	dts4	dts4	jdbc:oracle:thin:@localhost:1521:ORCL
MS SQL	dts4	dts4	jdbc:sqlserver://localhost:1433;databasename=dts4
Server			
MySQL	dts4	dts4	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":



Configuration

Configure subsystem settings

Create a Datasource

Define a datasource to be used by deployed applications. The proper JDBC driver must be deployed and registered.

1. Select the Datasources subsystem

2. Add an XA or non-XA datasource

3. Use the 'Create Datasource' wizard to configure the datasource settings

Start 🖸

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.

Red Hat JBoss	Enterprise Applicat	ion Platform								
Homepage	Deployments	Configura	tion Runtime	Patching	Access Co	ontrol				
Configuration			Subsystem (26)			Datasources & Drivers		Datasource	⊕~ 2	Datas
Subsystems		>	Fiter by: name or subtitle	2		Datasources	>	Filter by: name, xa,/disabled, deployment	Add Datasou Add XA Datas	source
Interfaces		>	JBeret		- 1	JDBC Drivers	>	ExampleDS		use t • XA d
Socket Bindings		>	Core Management		_					datał
Paths			Datasources & Drivers		>					
System Properties			Deployment Scanners		- 1					

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

Choose one of the predefined templates to quickly add a datasource or choose "Custom" to specify your own settings. Custom H2 PostgreSQL PostgreSQL MariaDB Oracle	
Choose one of the predefined templates to quickly add a datasource or choose "Custom" to specify your own settings. Custom H2 PostgreSQL MySQL MariaBB Oracie	
 Custom H2 PostgreSQL MySQL MriaBB Oracle 	
 H2 PotgregL MySqL MriabB Oracle 	
○ PorsigeSQL @ MyQL ○ MarlaDB ○ Oracle	
MySQL MariaDB Oracle	
O MarieDB O Oracle	
O Oracle	
O Microsoft SQLServer	
O IBM DB2	
O Sybase	

Edit the Datasource Attributes **Name** and **JNDI Name**, then **Next** (*Note: these values are Case-Sensitive*).

Cancel < Back Next >

The Name should be: "ApelonDtsDS"

The JNDI Name should be: "java:jboss/datasources/ApelonDtsDS"

Add Datasource					×
Choose Template	Attribu	utes JDBC Drive	er Connection	Test Connection	Review 6
Help					
	Name *	ApelonDtsDS			
JND)I Name *	java:jboss/datasources/Ape	lonDtsDS		
		Required fields are marked v	vith *		

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".

Add Datasource				
Choose Template	Attribut	tes	JDBC Driver	Connection
Help				
Driver Nar	me*	mysql-conne	ector-java-8.0.29.jar	
Driver Module N	ame	com.mysql		
Driver Class N	ame	com.mysql.c	j.jdbc.Driver	
		Required field	ls are marked with *	

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.

Database	User	Password	Connection URL
Oracle	dts4	dts4	jdbc:oracle:thin:@localhost:1521:ORCL
MS SQL	dts4	dts4	jdbc:sqlserver://localhost:1433;databasename=dts4
Server			
MySQL	dts4	dts4	jdbc:mysql://localhost:3306/dts4

Add Datasource					
Choose Template	Attribut	tes	JDBC Driver	Connection	Test Connection
Help					
Connecti	ion URL	jdbc:mysq	l://localhost:3306/dts4		
User	r Name	•••••			
Pa	ssword				
Security E	Domain				

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 cashed by the browser so you may need to restart the Add Datasource process to enter the valid connection settings).

Choose Template	Attributes	JDBC Driver	Connection 4	Test Connection
			•	
		Test Connectio	on Successful	

Successfully tested connection for datasource ApelonDtsDS.

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.

Add Datasource					
Choose Template	Attributes	JDBC Driver	Connection	Test Connection	Review
Help Na	ame Apelo	onDtsDS			
JNDI Na	ame java:j	boss/datasources/ApelonDtsDS			
Connection	URL jdbc:	mysql://harsqadts10:3306/dts4			
Driver Na	ame mysq	ll-connector-java-8.0.29.jar			
User Na	ame ••••	•••• @			
Passw	ord ••••	••••• @			

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.

		🕲 Reload Required 🔺 👗 apelonadmin 🗸
Datasource ⊙ < ⊅ Filter by name xa _/disabled_deployment	ApelonDtsDS	5
ApelonDtsDS View	The datasource	ApelonDtsDS is enabled. Disable
⊘ ExampleDS		
	Main Attributes	
	JNDI Name:	java:jboss/datasources/ApelonDtsDS
	Driver Name:	mysql-connector-java-8.0.29.jar
	Connection URL:	jdbc:mysql://harsqadts10:3306/dts4
	Enabled:	true
	Statistics Enabled:	false

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.

Datasourc	•~	C	
Filter by: nan	ne, xa,/disable	d, deplo	yment
 Apelon(Example 	DtsDS Disable <mark>Test Connecti</mark>	View	~
	Remove		

Ensure the connection test is successful before continuing.

F.5 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".

	Home	Deployments	Configura	ation	Runtime	Access Control	
	Configura	ation		Sub	system (28)		
	Subsyste	ms	>	۹			
	Interface	5		JCA			*
	Socket Bi	inding		Dat	asources	>	
	Paths			Res	ource Adapters	>	
	System Properties		Mai	1	>		
				Tra	nsactions	View	
Then click "Edi	t" and er Trar	nter the new times action N	neout valu lanage	ue. r			
	The con	figuration of the tr	ansaction sul	bsyster	n.		
	🖋 Edit	ာ Reset 🔞 Help					
			Def	ault Ti	meout 2	43200 SECONDS	

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

F.6 Deploy Apelon DTS 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.

Red Hat JBoss Enterprise Application	Platform
Add and manage deployments	
✓ Deploy an Application Start ♥	
Deploy an application to the server.	
 Use the 'New Deployment' wizard to deploy the application Enable the deployment 	

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".

Add Deployment		
Upload Deploy	nt Specify Na	ames
	Choose a file or drag it here	

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 in reality the next open source iteration of JBoss EAP, and as such the .ear file contains "wildfly" in the name).

<u>NOTE</u>: For **Microsoft SQL Server** a 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\

Add Deployment		
Upload Deployment		Specify Names
	1	
	dtsjbosswildfly.ear	

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

Add Deployment						
Upload Deployment						
Help						
Name *	dtsjbosswildfly.ear					
Runtime Name	dtsjbosswildfly.ear					
Enabled	ON					

Required fields are marked with *

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.

IMPORTANT

In the case of upgrading an earlier DTS schema version, Do Not Restart JBoss EAP until the Deployment has completely finished and you have verified that the Database Schema is fully deployed to the correct version (See section: <u>Upgrade Apelon DTS 4.7.0 - 4.7.2 JBoss</u> <u>EAP Server & schema to DTS 4.8.0</u>). Once the correct schema version is verified, SHUT DOWN and RESTART the JBoss EAP server to ensure the changes are integrated.

F.7 Verify DTS Browser & Editor connections to JBoss EAP DTS Server

F.7.1 Verify the DTS Browser

You can access the DTS Browser from: <u>http://localhost:8080/dtsserverws</u>.

To login to the DTS Browser, you will need to enter user credentials created in the <u>JBoss</u> <u>EAP Configuration for Apelon DTS Server</u> section.

Note: If you used the example users defined in the guide, the credentials would be either **dtsadminuser/dtsadmin** or **dtsuser/dts**.

rowser	
List Concepts By: Name 🗸	Concept Term Namespace Subset
amespace: SNOMED CT 🗸	
Version: 2023.06.23AA(Jun 30, 2023 12:00:00 AM) ♥	Current V Refresh
- SNOMED CT Concept (SNOMED RT+CTV3)	
body structure (body structure)	
+ Clinical finding (finding)	Cessation of sedation (procedure)
+ DataHasValue Target	
+ > Environment or geographical location (environment / location)	ID: 241713
* > Event (event)	Code: 241/13008 Nemenanace: SNOMED CT. (Ontyles: Subscription, Read Only)
+ Observable entity (observable entity)	Status: ACTIVE
+ 🍋 <u>Organism (organism</u>)	Primitive
Pharmaceutical / biologic product (product)	History: ADDED Jan 31, 2004
+ Physical force (physical force)	
 Physical object (physical object) 	
 Procedure (procedure) 	
 Activation of implant (procedure) 	Synonym : <u>Cessation of sedation</u> (Preferred) (ADDED Jan 31, 2004)
Activity of daily living procedures and interventions (procedure)	Synonym : Cessation of sedation (procedure) (ADDED Jan 31, 2004)
+ Administrative procedure (procedure)	Synonym : End of sedative administration (ADDED Jan 31, 2004)
Anesthesia and/or sedation procedure (procedure)	

F.7.2 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 an **Instance** of '**dtsjboss**' and default **Port** number '**8080**' along with the user credentials created in the <u>JBoss EAP Configuration</u> 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".

Apelon DTSEditor 4.8	3.0-8113		\times
File Help			
😁 🖶			
G Connec	ct Parameters	×	
Host:	localhost		
Port:	8080		
Instance:	dtsjboss		
Username:	dtsadminuser		
Password:	•••••		
Use the	ese values as defaults Auto-connect on start-up		
	Connect Cancel		



F.8 Setup JBoss EAP and DTS to start as a Windows Service

To have JBoss EAP and DTS start as a service you will need to download the **''commons-daemon-1.1.0-bin-windows.zip''** file from the Apelon DTS download page –

http://www.apelondts.org.

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

- 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:\Tools\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= DTS4JBossEAP7 set DISPLAYNAME= DTS4 JBossEAP7

set DESCRIPTION= DTS4 JBoss Enterprise Application Platform 7

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
```

- 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:



- 7. After the JBoss EAP service is installed, close the Command Prompt window.
- 8. Search for **Services** and select the Services app. Find the **"DTS4_JBossEAP7"** service. Right click and select **Properties**.

9,			Services	
File Action View	Help			
	à 🔒 🛛 🖬 🕨			
🔍 Services (Local)	Name	▲	Description	Status
	CTS4_JBoss	Start	DTS4 JBoss Enterprise Application Platform 7	
	DTS4_Wildl	Chara	DTS4 WildFly Application Server	
	DTS4_Wildl	Stop	DTS4 WildFly12 Application Server	
	Concepting Concepting	Pause	Provides the core file encryption technolo	
	Extensible /	Resume	The Extensible Authentication Protocol (EA	
	Function D	Restart	The FDPHOST service hosts the Function D	
	🔍 Function D	ΔII Tasks ►	. Publishes this computer and resources atta	
	🔍 Google Up		Keeps your Google software up to date. If t	
	🔍 Google Up	Refresh	Keeps your Google software up to date. If t	
	Group Poli	Properties	The service is responsible for applying setti	Runnin
	🧠 Health Key 🔍 Human Int	Help	t Provides X.509 certificate and key manage Activates and maintains the use of hot but	

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

DTS4_JBossEAP7 Properties (Local Computer)
General Log On Recovery Dependencies
Service name: DTS4JBossEAP7
Display name: DTS4_JBossEAP7
Description: DTS4 JBoss Enterprise Application Platform 7
Path to executable: C:\AppServer\jboss-eap-7.1\bin\prunsrv.exe //RS//DTS4JBossEAP7
Startup type: Automatic
Service status: Stopped
Start Stop Pause Resume
You can specify the start parameters that apply when you start the service from here.
Start parameters:
OK Cancel Apply

10. The "DTS4_JBossEAP7" service is now Running and set to Automatic.

Q		Services				
File Action View Help						
	à 🗟 🛛 🖬 🕨 🖬 🕪					
Services (Local) Name		Description	Status	Startup Type		
	DTS4_JBossEAP7	DTS4 JBoss Enterprise Application Platform 7	Running	Automatic		

F.9 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.

- 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.

- 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 /etc/init.d/jbossas
- 7. Modify the file "<JBossEAP74_HOME>/bin/standalone.conf" to specify the Java JVM to use during 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

F.10 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.

DTS4_JE	BossEAP7 Properties (Local Computer)
General Log On	Recovery Dependencies
Service name:	DTS4JBossEAP7
Display name:	DTS4_JBossEAP7
Description:	DTS4 JBoss Enterprise Application Platform 7
Path to executabl C:\AppServer\jbo	le: oss-eap-7.1\bin\prunsrv.exe //RS//DTS4JBossEAP7
Startup type:	Manual 🗸
Service status:	Running
Start	Stop Pause Resume
You can specify t from here.	he start parameters that apply when you start the service
Start parameters:	
	OK Cancel Apply

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

C41.	Administrator: Command Prompt	x
Microsoft Windows [Version (c) 2013 Microsoft Corporat	6.3.9600] ion. All rights reserved.	^
- C:∖Windows∖system32>sc quer	yex DTS4JBossEAP7	=
SERVICE_NAME: DTS4JBossEAP7 TYPE STATE WIN32_EXIT_CODE SERVICE_EXIT_CODE CHECKPOINT WAIT_HINT PID FLAGS	: 10 WIN32_OWN_PROCESS : 4 RUNNING (STOPPABLE, NOT_PAUSABLE, ACCEPTS_SHUTDOWN) : 0 (0x0) : 0 (0x0) : 0x0 : 0x0 : 0x0 : 5008 :	
C:\Windows\system32>taskkil	1 /pid 5008 /f_	

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



F.11 Upgrade Apelon DTS 4.7.0 - 4.7.2 JBoss EAP Server & schema to DTS 4.8.0

Perform the following steps to upgrade your Apelon DTS 4.7 JBoss schema to Apelon DTS 4.8.0 JBoss EAP (**Note: DTS 4.7.1 – 4.7.2 has the same schema version as DTS 4.8.0**):

- Follow instructions in <u>Section B</u> for installing DTS 4.8.0 on the server to be upgraded.
- Stop the Apelon DTS JBoss EAP service.
- Copy the JBoss EAP configuration file from the DTS 4.8.0 home directory <DTS_HOME>\server\jboss-eap\standalone\configuration to the <JBossEAP74_HOME>\standalone\configuration folder. Replace the existing file with this new JBoss EAP configuration file.
- Restart the Apelon DTS JBoss EAP service.
- Review the Notes below before continuing to the next steps.
- Follow steps F.4.2(<u>Deploy Database Driver</u>) through F.7(<u>Verify DTS Browser & Editor</u> <u>connections to JBoss EAP DTS Server</u>) to finish configuring the Apelon DTS 4.8.0 JBoss EAP server.
- <u>NOTE1:</u> If upgrading from a DTS 4.7.0 schema to DTS 4.8.0, as instructed in section **F.6**(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 4.8.0 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 Oracle 12c, SQL Server 2016, or SQL Server 2019.
- "Schema Upgrade to 4.0.30 complete" for MySQL 5.6 or MySQL 8.
- 2. A second way to determine the schema upgrade was successful is via the DTS 4.8.0 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 Oracle 12c, SQL Server 2016, or SQL Server 2019.
 - "4.0.30" for MySQL 5.6 or MySQL 8.
- <u>NOTE2 SQL Server Schema Upgrade:</u> 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.

G. JBoss EAP 7.1 Setup

Note: JBoss EAP 7.1 requires the use of Java 8 JDK. See Java Environment Setup for a Server section above for additional details.

The JBoss EAP 7.1 Application Server can be downloaded from the Red Hat Developer download site: <u>https://developers.redhat.com/products/eap/download/</u>

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 **7.1.0 December 03, 2017 Application Platform ZIP file** to download.

7.1.0

Installer	Application Platform	Release date December 03, 2017 Download (199.97 MB)
Zip File	Application Platform	Belease date December 03, 2017

To install JBoss EAP 7.1.0 just extract the compressed archive. Unzip the JBoss EAP 7.1.0 archive into a folder with a pathname that does NOT contain any spaces. For example,

extracting to the C:\Tools folder will place the JBoss EAP 7.1.0 files in the C:\Tools\jboss-eap-7.1 folder. We will identify this folder in the rest of the document as <JBossEAP_HOME>. It is not necessary to create <JBossEAP_HOME> as an environment variable.

To verify the JBoss EAP 7.1 install, go to the <JBossEAP_HOME>\bin folder and run standalone.bat (or standalone.sh for Linux).

📙 jboss-eap-7.1	^ Name	Date modified	Туре	Size
linstallation	🖄 jboss-cli.xml	11/3/2017 5:05 PM	XML File	
🍌 appclient	jboss-cli-logging.prope	rties 11/3/2017 5:05 PM	PROPERTIES File	
📙 bin	jboss-server-migration.	bat 11/3/2017 5:05 PM	Windows Batch File	
docs	jboss-server-migration.	sh 11/3/2017 5:05 PM	SH File	
📙 domain	🚳 jconsole.bat	11/3/2017 5:05 PM	Windows Batch File	
📙 migration	jconsole.ps1	11/3/2017 5:05 PM	Windows PowerS	
b modules	jconsole.sh	11/3/2017 5:05 PM	SH File	
📙 standalone	🚳 jdr.bat	11/3/2017 5:05 PM	Windows Batch File	
welcome-content	📓 jdr.ps1	11/3/2017 5:05 PM	Windows PowerS	
wildfly-10.1.0.Final	jdr.sh	11/3/2017 5:05 PM	SH File	
wildfly-12.0.0.Final	🕌 launcher.jar	11/3/2017 5:05 PM	Executable Jar File	
Java	product.conf	11/3/2017 5:05 PM	CONF File	
PerfLogs	🚳 service.bat	11/3/2017 5:05 PM	Windows Batch File	
Program Files	standalone.bat	11/3/2017 5:05 PM	Windows Batch File	

Upon successful start, the message in the last line will indicate success.

Here is a sample startup screen: C:\Windows\system32\cmd - H 🙃 🗃 Server\jboss-eap-7.1\bin\standalone.co operty to "C:\Java\CurrentJava\bin\jav alling etting otstrap Environment JBOSS_HOME: "C:\AppServer\jboss-eap-7.1" C:\Java\CurrentJava\bin\java XX:MaxMetaspaceSize=256m -Dja eStamps -XX:+UseGCLogFileRota lassUnloading'' CDetails -XX:+PrintG ss Hodules version 1.6.0 Final-redhat-1 SC version 1.2.7.SPI-redhat-1 vead 1-8) WELXSRU0049: Boss EAP 7.1.0. ment-deprecatedJ (Controller Boot Thre rface-http-interface' is deprecated n operation to learn new EAP 7.1.0.GA (WildFly Core 3.0.10.Final-Boot Thread) WFLYCTL0028: Attribute 'se precated, and may be removed in future ve is depi more abo 8)_ELYO ecation. Ty Elytron version 1.1.7.Final-redhat ool -- 20) WFLYCTL0028: Attribute 'see ice using socket-binding (m l 1-5> XNIO version 3.5.4.Final-redhat-1 wead 1-5> XNIO NIO Implementation Versi 3.5.4.Final-redhat Infinispan finispan] (ServerSe ervice Thread Pool redhat-1 t-2 starting lementations: [main] ad Pool 36> WFLYJCA0004: Deploying JDBC 1-7> WFLYEJB0482: Strict pool mdb-strict-max-pool is using a max instance size service thread 1-8> WFLYJCA0018: Started Driver service with driver-name = h^2 WFLYEJB0481: Strict pool slsb-strict-max-pool is using a max instance size of 64 (pe Naming Service Bound mail session [java:jboss/mail/Default] 5.05.Final-redhat-1 tem suspension complete E/VUV001E: Creating file handler for path 'C:v ', case-sensitive: 'true', safe-symlink-path (case-senser) fault-server. ystem sus WFLYUT00 ndler for path 'C:\AppServe safe-sumlink-naths: '[]'] ing default listening .patching] (MSC service thread 1-5) WFLYPAT0050: JBoss EAP cumulative patch ID is: base, one-off patches inclu INFO curity] (MSC servi C service thread 1-5) WFLYDM0111: Keystore C:\AppServer\j ad on first use with a self sugned certificate for host 1 service thread 1-4) WFLYDS013: Started FileSystemDeploy vtow] (MSC service thread 1-5) WFLYUT0006: Undertow HTTPS listener https listening on 127.0.0.1:8443 Nent] (MSC service thread 1-7) JBWS022052: Starting JBossWS 5.1.9.Final-redhat-1 (Apache CXF 3.1.12.re troller Boot Thread) WFLYSRU0212: Resuming se .]Doss.as] (Controller Boot Inread) WELYSKUMDDI: Http management interface listening on http://127.0.0.1:9990/management .]Doss.as] (Controller Boot Thread) WELYSKUMD51: Admin console listening on http://127.0.0.1:9990 .]Doss.as] (Controller Boot Thread) WELYSKUMD25: DBoss ENP 7.10.GA (WildFly Core 3.0.10.Final-redhat-1) started in 4079ms

To verify that the server is reachable, you can point your browser to the default welcome page for JBoss EAP at the address: <u>http://localhost:8080</u>. 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.

Terminate batch job (Y/N)? y_

G.1 Memory Configuration

The Apelon DTS Server performs better when additional memory is assigned to JBoss EAP. To increase the memory utilized, open <JBossEAP_HOME>\bin\standalone.conf.bat (or standalone.conf for Linux) 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:

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

For Linux:

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

G.2 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 **<JBossEAP_HOME>\bin** and click on **add-user.bat** (or **add-user.sh** for Linux). 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**".

See the screen shot below to confirm: C\Windows\system32\cmd.exe
What type of user do you wish to add? a) Management User (mgmt-users.properties) b) Application User (application-users.properties) b) Application User (application-users.properties) c) a): a Enter the details of the new user to add. Username: a pelonadmin2 Password recommendations are listed below. To modify these restrictions edit the add-user.properties configuration file. - The password should not be one of the following restricted values (root, admin, administrator) - The password should not be one of the following restricted values (root, admin, administrator) - The password should not be one of the following restricted values (root, admin, administrator) - The password should not be one of the following restricted values (root, admin, administrator) - The password should not be one of the following restricted values (root, admin, administrator) - The password should not be one of the following restricted values (root, admin, administrator) - The password should not be one of the following restricted values (root, admin, administrator) - The password should not at least 8 characters! Prev 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)[]: hout to add user 'apelonadmin2' for realm 'ManagementRealm' Is this correct yes/no? yes Added user 'apelonadmin2' for ile 'C:\AppServer.jboss-eap-?.l\standalone\configuration\mgmt-users.properties' Added user 'apelonadmin2' with groups to file 'C:\AppServer.jboss-eap-?.l\standalone\configuration\mgmt-groups.properties' Added user 'apelonadmin2' with groups to file 'C:\AppServer.jboss-eap-?.l\standalone\configuration\mgmt-groups.properties' Added user 'apelonadmin2' with groups to file 'C:\AppServer.jboss-eap-?.l\standalone\configuration\mgmt-groups.properties' Added user 'apelonadmin2' with groups to file 'C:\AppServer.jboss-eap-?.l\standalone

G.3 JBoss EAP Configuration for Apelon DTS Server

If you are currently Running DTS and are setting up JBoss EAP 7.1 to replace your existing JBoss 7.1.1, WildFly 10, or WildFly 12 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**, **application-users.properties**, and **mgmt.-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**.
- Copy these files, and place them (overwriting if prompted) in <JBoss EAP Home>\domain\configuration and <JBoss EAP Home>\standalone\configuration respectively.
- 4. Start the JBoss EAP Application Server

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

G.3.1 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 <JBossEAP_HOME>\bin and click on add-user.bat (or add-user.sh for Linux). 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.propertie	es)
(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:



G.3.2 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 <JBossEAP_HOME>\bin and click on add-user.bat (or add-user.sh for Linux). Follow the steps below.

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

What	t type	of us	er do	you	wish	to	add?		
a)	Manage	ement	User	(mgmt	-usei	rs.p	propert	ies)	
b>	Applia	cation	User	(app	olicat	tion	-users	.prop	erties)
(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.

G.4 Apelon DTS Server Deployment

- 8. Create a shortcut for <**JBossEAP_HOME>\bin\standalone.bat.** Rename this to "Apelon DTS JBoss EAP".



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

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

```
Target location: bin
Target: al\bin\standalone.bat -c standalone-apelondts.xml
```

- 11. Use this "Apelon DTS JBoss EAP" shortcut for running JBoss EAP configured for Apelon DTS.
- 12. For launching on Linux use the following command from terminal window:

```
<JBossEAP_HOME>/bin/standalone.sh -c standalone-
apelondts.xml
```

G.4.1 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.

G.4.2 Deploy Database Driver

Start JBoss EAP using the "Apelon DTS JBoss EAP" shortcut for Windows (or from terminal window for Linux) created in the previous step. Open a browser and go to the default JBoss EAP Management URL: http://localhost:9990/console/App.html#home



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

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

Deployments Add and manage deployments v Deploy an Application Start O Deploy an application to the server. 1. Use the 'New Deployment' wizard to deploy the application

2. Enable the deployment

Then click on the **Add** button in the upper left. In the next pop up window, ensure "Upload a new deployment" is selected, and click "Next".

RED HAT'JBOSS' ENTERPRISE APPLICATION PLATFORM							Messa
Home	Deployments	Configuration	Runtime	Access Control	Patching		
Deployme	ent	Add					
Q			eploym	ent			
		A	deployment is andard archive	anything that can be o es, or JBoss-specific de	deployed to a server, such as ployments.	WAR, EAR, and EJB J	AR applications,
	No Items	С	ommon C	Configuration Ta	asks		
		De	eploy and man	age applications and o	other Java EE resources.		
	New D	eployment				2° ×	
	Plea:	se Choose Upload a new de Use this option t Create an unma Use this option t location on the s uploaded to the from their origin unmanaged.	eployment o upload a r naged deplo o create an server's loca server's dep al location.	new artifact, such a oyment unmanaged deplo l file system. Unm oloyment reposito Exploded deploym	as a WAR or EAR archive oyment, which points to anaged deployments ar ry; they are deployed di nents are supported onl	e. e not irectly ly as	

Click the **Choose File** button and navigate to the **<DTS_HOME>**\lib folder.

New Deployment	28 X
Upload Deployment	
Please choose a file that you want to deploy.	
Choose File No file chosen	



2° ×

//,

Select a Driver .jar file for the database as given below.

New Deployment

• <u>Note:</u> For Oracle 12c see <u>Oracle 12c PGA_AGGREGATE_LIMIT</u>

Database	Driver
Oracle 12c	ojdbc7-4.1.jar
MS SQL	mssql-jdbc-9.4.1.jre8.jar
Server 2016	
MS SQL	mssql-jdbc-9.4.1.jre8.jar
Server 2019	
MySQL 8	mysql-connector-java-8.0.29.jar
MySQL 5.6	mysql-connector-java-8.0.29.jar

Verify Upload		
5		Need Help?
Name_*:	ojdbc7.jar	
Runtime Name <u>*</u> :	ojdbc7.jar	
Enable <u>*</u> :	×.	
Required fields are	marked with an asterisk (<u>*</u>).	
	Cancel « Back	Finish

Ensure the **Enable** box is checked, and click "Finish".

Verify the presence of the .jar deployment by seeing it on the list on the left of the "Deployments" page, and the confirmation message from JBoss EAP.

S JBoss	s EAP Management	× +			
$\leftarrow \rightarrow$	C 🛈 localho	st:9990/console	e/App.html#standalo 🗣 🚖 🔞 😝 🗄		
RED HAT'JBOSS' ENTERPRISE APPLICATION PLATFORM Messages: 0 & apelonadmin ~					
Home	Deployments	Configuration	n Runtime Access Control Patching		
Deploym Q Deploy ojdbc7.ja	r	Add	ojdbc7.jar Deployment is enabled Overview Last enabled at 2018-11-07 16:41:44,369 EST Managed: Yes Archive: Yes The deployment was never disabled Runtime name: ojdbc7.jar		
7.1.0.GA			▲ Tools 🛛 🎤 Settings		

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 default "dts4" used as an example in this documentation*).

User	Password	Connection URL
dts4	dts4	jdbc:oracle:thin:@localhost:1521:ORCL
dts4	dts4	jdbc:sqlserver://localhost:1433;databasename=dts4
dts4	dts4	jdbc:mysql://localhost:3306/dts4
	User dts4 dts4 dts4	UserPassworddts4dts4dts4dts4dts4dts4

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


Configuration

Configure subsystem settings

Create a Datasource Start O

Define a datasource to be used by deployed applications. The proper JDBC driver must be deployed and registered.

1. Select the Datasources subsystem

2. Add an XA or non-XA datasource

3. Use the 'Create Datasource' wizard to configure the datasource settings

Select the "Subsystems" tab. Under the "Subsystems" column, select the "Datasources" tab. The ApelonDtsDS datasource should be created as a non-cross-application datasource. Select the "Non-XA" Type, and then the blue "Add" button to proceed.

RED HAT JBOSS ENTERPR	ISE APPLICATI	ON PLATFORM			Messages: 1	apeionadmin V
Home Deployments (Configuration	Runtime Access Control	Patching			
Configuration	Subs	ystem (30)	Туре		Datasource	Add
Subsystems	, Q		Non-XA	>	ExampleDS	
Interfaces	JCA	Í	XA	>		
Socket Binding	Data	isources >				

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

Choose Datasource	
Choose Datasource	
Custom	
H2 Datasource	
PostgreSQL Datasource	
MySQL Datasource	
MariaDB Datasource	
Oracle Datasource	
Microsoft SQLServer Datasource	
IBM DB2 Datasource	
Sybase Datasource	

Edit the Datasource Attributes **Name** and **JNDI Name** (*Note: these values are Case-Sensitive*). The **Name** should be: "ApelonDtsDS"

Create Dataso	irce		2 ≯
Step 1/3: Da	itasource Attribut	es	
			Need Help?
Name:	ApelonDtsDS		
	· · · ·		
JNDI Name 🌧	java:jboss/datasources	;/ApelonDtsDS	5
Required field	s are marked with an ast	erisk (*).	
	Cancel	« Back	Next >>

The JNDI Name should be: "java:jboss/datasources/ApelonDtsDS"

In the next window, select "Detected Driver" and choose the database driver you added to JBoss EAP in the previous step, and hit "next".

Create Datasource	Z	×

Step 2/3: JDBC Driver

Select one of the installed JDBC drivers. If you do not see your driver, make sure that it is deployed as a module and properly registered.

Specify Driver	Detected Driver		
	Name		
ojdbc7.jar			
h2			
		《 1-2 of 2 》	>>
	Cancel	« Back	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.

DTS 4.8.0 – Installation Guide

Database	User	Password	Connection URL
Oracle	dts4	dts4	jdbc:oracle:thin:@localhost:1521:ORCL
MS SQL	dts4	dts4	jdbc:sqlserver://localhost:1433;databasename=dts4
Server			
MySQL	dts4	dts4	jdbc:mysql://localhost:3306/dts4
		Create Da	atasource 🖉 🖌 🗶

Step 3/3: Connection Settings

		Need Help?
Connection URL <u>*</u> :	jdbc:oracle:thin:@localhost:1521:ORCL	<i>li</i>
Username:	dts4	
Password:	••••	
Security Domain:		
Required fields are	marked with an asterisk (*).	

Cancel	« Back	Next »

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.

Create Data	source		2° ×
Test Conr	nection		
On this page	you can test the c	connection of your	datasource.
Test Conn	ection		
	Cancel	« Back	Next »

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.

Create Datasource		2	×
Summary			
Please verify your se connection by selec section and press 'T	ettings. After the datasource is created you can test the ting the datasource in the configuration or runtime est Connection'.		
Name:	ApelonDtsDS		
JNDI Name:	java:jboss/datasources/ApelonDtsDS		
Connection URL:	jdbc:oracle:thin:@localhost:1521:ORCL		
Username:	dts4		
Password:	****		
	Cancel «Back Finis	h	

After clicking "Finish" a message will be displayed indicating the server configuration changed and to reload the server. Click "Reload Server Now".

Message X X Mon Nov 05 16:44:12 GMT-500 2018 Server configuration changed The following servers need to be reloaded:

- Standalone Server

Dismiss Reload Server Now

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 in the "Configuration" tab.

Datasource	Add	
ApelonDtsDS	View -	Apelc
ExampleDS	Remove	
exampleos	Disable	
	Test Connec	tion

Ensure the connection test is successful before continuing.

G.5 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" tab select "Subsystems">"Transactions" and click "View".

	Home Deploym	ients Configura	ation Runtime	Access Control
	Configuration		Subsystem (28)	
	Subsystems	>	۹ 🗌	
	Interfaces		JCA	A
	Socket Binding		Datasources	>
	Paths		Resource Adapters	>
	System Properties		Mail	>
			Transactions	View
Then click "Edi	t" and enter the n	ew timeout valu Manager	ue.	
	Configuration for	the transaction m	anager.	
	Attributes P	rocess ID Reco	very Path	Store
	🕑 Edit			
	Default timeo	ut: 4	3200	

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

Default timeout:

G.6 Deploy Apelon DTS Server

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

Red Hat JBoss	Enterprise	Application	Platform
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Deployments Add and manage deployments



Deploy an application to the server.

- 1. Use the 'New Deployment' wizard to deploy the application
- 2. Enable the deployment

Click the blue "Add" button in the upper left to begin the deployment wizard.

RED HA	T'JBOSS' ENTERI	PRISE APPLICATIO	ON PLATFOR	RM				
Home	Deployments	Configuration	Runtime	Access Control	Patching			
Deploym	ent	Add						
Q		D	eploym	ent				
L -1	110	A d	leployment is ndard archive	anything that can be s, or JBoss-specific de	deployed to a s eployments.	server, such as WAI	R, EAR, and EJB JAR	applications,
On the	next window,	, ensure "Uplo	oad a nev	v deployment	" is selec	ted and clic	k "Next".	
Ne	ew Deployme	nt					×	^ ×
Ρ	lease Choo	se						
	Ilalaad au	a aux da a la vena a	-					
	Use this o	ption to upload	a new arti	fact, such as a \	NAR or EAF	Rarchive.		
	Create an	unmanaged de	ployment					
	Use this o server's lo deployme deployme	ption to create a cal file system. l nt repository; th nts are supporte	an unmana Unmanage ley are dep ed only as	aged deployme ed deployments ployed directly unmanaged.	nt, which p are not up from their (oints to a loca bloaded to the original locatio	ation on the e server's on. Exploded	
				Cancel		« Back	Next »	

Click on "Choose File" to navigate to the <DTS HOME>\server\jboss-

eap\standalone\deployments directory and select **dtsjbosswildfly.ear** (This is not a typo, WildFly is in reality the next open source iteration of JBoss EAP, and as such the .ear file contains "wildfly" in the name).

<u>NOTE:</u> For **Microsoft SQL Server** a 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\
```

New Deployment		2 ×
Upload Deploy	yment	deploy
Choose File	sjbosswildfly.ear	deploy.
Cancel	« Back	Next »
		1.

In the next window ensure the "Enable" check box is checked and then click "Finish".

New Deployment	2	×
----------------	---	---

Verify Upload		
	Need Help?	
Name *:	dtsjbosswildfly.ear	
Runtime Name:	dtsjbosswildfly.ear	
Enable * .:		
Required fields are	e marked with an asterisk ($\stackrel{*}{}$).	
Cance	el « Back Finish	
		,

JBoss EAP will report that the deployment is in process. ****IMPORTANT****

In the case of upgrading an earlier DTS schema version, Do Not Restart JBoss EAP until the Deployment has completely finished and you have verified that the Database Schema is fully deployed to the correct version (See section: <u>Upgrade Apelon DTS 4.7.0 - 4.7.2 JBoss</u> <u>EAP Server & schema to DTS 4.8.0</u>). Once the correct schema version is verified, SHUT DOWN and RESTART the JBoss EAP server to ensure the changes are integrated.

G.7 Verify DTS Browser & Editor connections to JBoss EAP DTS Server

G.7.1 Verify the DTS Browser

You can access the DTS Browser from: <u>http://localhost:8080/dtsserverws</u>.

To login to the DTS Browser, you will need to enter user credentials created in the <u>JBoss</u> <u>EAP Configuration for Apelon DTS Server</u> 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 JBoss EAP server by using an **Instance** of '**dtsjboss**' and default **Port** number '**8080**' along with the user credentials created in the <u>JBoss EAP Configuration</u> 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".

F Apelon DTSEditor 4.	3.0-8113	_	\times
File Help			
🐣 🖶			
😇 Conne	ct Parameters	×	
Host:	localhost		
Port:	8080		
Instance:	dtsjboss		
Username:	dtsadminuser		
Password:	•••••		
Use the	ese values as defaults 🛛 Auto-connect on start-up		
	Connect Cancel		



G.8 Setup JBoss EAP and DTS to start as a Windows Service

To have JBoss EAP and DTS start as a service you will need to download the **''commons-daemon-1.1.0-bin-windows.zip''** file from the Apelon DTS download page –

http://www.apelondts.org.

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

- 11. Unzip **commons-daemon-1.1.0-bin-windows.zip** into your **<JBossEAP_HOME>\bin** folder, where **<JBossEAP_HOME>** represents the base JBoss EAP 7.1 folder specified in the <u>JBoss EAP 7.1 Setup</u> i.e., **C:\Tools\jboss-eap-7.1** folder.
- 12. Open the **service.bat** file located in the **<JBossEAP_HOME>/bin folder**.
- 13. 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

14. Also, update the windows service variable values.

e.g.:

set SHORTNAME= DTS4JBossEAP7

set DISPLAYNAME= DTS4_JBossEAP7

set DESCRIPTION= DTS4 JBoss Enterprise Application Platform 7

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
```

- 15. Open a command prompt (as administrator) and change directory to the **<JBossEAP_HOME>\bin**\ directory
- 16. To install the JBoss Service enter and execute the following command:



- 17. After the JBoss EAP service is installed, close the Command Prompt window.
- 18. Search for **Services** and select the Services app. Find the **"DTS4_JBossEAP7"** service. Right click and select **Properties**.

9,			Services			
File Action View	Help					
🔍 Services (Local)	Name	▲	Description	Status		
	CTS4_JBoss	Start	DTS4 JBoss Enterprise Application Platform 7			
	DTS4_Wildl	Store	DTS4 WildFly Application Server			
	DTS4_Wildl	Stop	DTS4 WildFly12 Application Server			
	Concepting Encrypting	Pause	Provides the core file encryption technolo			
	🔍 Extensible /	Resume	The Extensible Authentication Protocol (EA			
	Galaction D	Restart	The FDPHOST service hosts the Function D			
	Sunction D	All Tasks 🕨	. Publishes this computer and resources atta			
	🔍 Google Up		Keeps your Google software up to date. If t			
	🔍 Google Up	Refresh	Keeps your Google software up to date. If t			
	Group Poli	Properties	The service is responsible for applying setti	Runnin		
	🧠 Health Key	Help	t Provides X.509 certificate and key manage Activates and maintains the use of hot but			

19. Perform the following:

- a. Set the *Startup type* to **Automatic or Automatic (Delayed Start)**
- b. **Start** the Service.
- c. Click Apply
- d. Click OK

DTS4_JBossEAP7 Properties (Local Computer)
General Log On Recovery Dependencies
Service name: DTS4JBossEAP7
Display name: DTS4_JBossEAP7
Description: DTS4 JBoss Enterprise Application Platform 7
Path to executable: C:\AppServer\jboss-eap-7.1\bin\prunsrv.exe //RS//DTS4JBossEAP7
Startup type: Automatic V
Service status: Stopped
Start Stop Pause Resume
You can specify the start parameters that apply when you start the service from here.
Start parameters:
OK Cancel Apply

20. The "DTS4_JBossEAP7" service is now Running and set to Automatic.

Q		Services		
File Action View	Help			
	à 🗟 🛛 🖬 🕨 🖬 🕪			
🔍 Services (Local)	Name	Description	Status	Startup Type
	DTS4_JBossEAP7	DTS4 JBoss Enterprise Application Platform 7	Running	Automatic

G.9 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.

- 10. Create a new user which will be used to launch the service. For example: => useradd -r -d /tmp/ jbossas
- 11. 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-7.1/
```

12. Optionally change the group membership of the JBoss EAP installation folder to the newly created user. For example:

=> chgrp -R jbossas /opt/jboss-eap-7.1/

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

- 13. Copy the "<JBoss EAP Installation>/bin/init.d/jboss-eap.conf" file to the folder "/etc/default". For example: => cp /opt/jboss-eap-7.1/bin/init.d/jboss-eap.conf /etc/default/
- 14. 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-7.1
# The name of the server config file to use for your Database.
JBOSS_CONFIG=standalone-apelondts.xml
```

- 15. Copy the "<JBoss EAP Installation>/bin/init.d/jboss-eap-rhel.sh" file to the folder "/etc/init.d" and rename it to "jbossas" => cp /opt/jboss-eap-7.1/bin/init.d/jboss-eap-rhel.sh /etc/init.d/jbossas
- 16. Modify the file "**JBoss EAP Installation**>/bin/standalone.conf" to specify the Java JVM to use during 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_131
```

- 17. Create the necessary links to the /etc/init.d/jbossas script so it starts and stops at the appropriate runlevels.
 - => chkconfig jbossas on
- 18. 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

G.10 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:

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

DTS4_JBossEAP7 Properties (Local Computer)
General Log On Recovery Dependencies
Service name: DTS4JBossEAP7
Display name: DTS4_JBossEAP7
Description: DTS4 JBoss Enterprise Application Platform 7 ^
Path to executable: C:\AppServer\jboss-eap-7.1\bin\prunsrv.exe //RS//DTS4JBossEAP7
Startup type: Manual 🗸
Service status: Running Start Stop Pause Resume You can specify the start parameters that apply when you start the service from here. Start parameters: Start parameters:
OK Cancel Apply

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



10. This should produce information about the JBoss EAP Service, including the PID. 11. Type the following in the Command Window: taskkill /pid [PID] /f

CA.	Administrator: Command Prompt	×
Microsoft Windows [Version (c) 2013 Microsoft Corporat	6.3.9600] ion. All rights reserved.	Â
C:\Windows\system32>sc quer	yex DTS4JBossEAP7	=
SERVICE_NAME: DTS4JBossEAP7 TYPE STATE WIN32_EXIT_CODE SERVICE_EXIT_CODE CHECKPOINT WAIT_HINT PID FLAGS	: 10 WIN32_OWN_PROCESS : 4 RUNNING (STOPPABLE, NOT_PAUSABLE, ACCEPTS_SHUTDOWN) : 0 (0x0) : 0 (0x0) : 0x0 : 0x0 : 5008 :	
C:\Windows\system32>taskkil	1 /pid 5008 /f_	

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



G.11 Upgrade Apelon DTS 4.7.0 - 4.7.2 JBoss EAP Server & schema to DTS 4.8.0

Perform the following steps to upgrade your Apelon DTS 4.7 JBoss schema to Apelon DTS 4.8.0 JBoss EAP (Note: DTS 4.7.1 – 4.7.2 has the same schema version as DTS 4.8.0):

- Follow instructions in <u>Section B</u> for installing DTS 4.8.0 on the server to be upgraded.
- Stop the Apelon DTS JBoss EAP service.
- Copy the JBoss EAP configuration file from the DTS 4.8.0 home directory <DTS_HOME>\server\jboss-eap\standalone\configuration to the <JBOSSEAP_HOME>\standalone\configuration folder. Replace the existing file with this new JBoss EAP configuration file.
- Restart the Apelon DTS JBoss EAP service.
- Review the Notes below before continuing to the next steps.
- Follow steps G.4.2(<u>Deploy Database Driver</u>) through G.7(<u>Verify DTS Browser & Editor</u> <u>connections to JBoss EAP DTS Server</u>) to finish configuring the Apelon DTS 4.8.0 JBoss EAP server.
- <u>NOTE1:</u> If upgrading from a DTS 4.7.0 schema to DTS 4.8.0, as instructed in section G.6(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 4.8.0 schema version, perform the following steps:
 - 1. View the "server.log" file located in the

<JBossEAP_HOME>\standalone\log directory. Search the JBoss EAP "server.log" file for the statement:

- "Schema Upgrade to 4.0.29 complete" for Oracle 12c, SQL Server 2016, or SQL Server 2019.
- "Schema Upgrade to 4.0.30 complete" for MySQL 5.6 or MySQL 8.
- 2. A second way to determine the schema upgrade was successful is via the DTS 4.8.0 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 Oracle 12c, SQL Server 2016, or SQL Server 2019.
 - "4.0.30" for MySQL 5.6 or MySQL 8.
- <u>NOTE2 SQL Server Schema Upgrade:</u> 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.

H. WildFly 23 Setup

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

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



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

	FINAL	Apr 29, 2021
23.0.2.Final	WildFly Preview EE 9 Distribution	LGPL <u>zip SHA-1</u> LGPL <u>tgz SHA-1</u>
	Jakarta EE Full & Web Distribution	LGPL zip SHA-1 tgz SHA-1

WildFly 23 does not come with an installer; just extract the compressed archive. <u>Unzip the</u> <u>WildFly 23 archive into a folder with a pathname that does NOT contain any spaces</u>. For example, extracting to the C:\Tools folder will place the WildFly 23.0.2 Final files in the C:\Tools\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 standalone.sh for Linux).



Upon successful start, the message in the last line will indicate success.



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



Welcome to WildFly

Your WildFly instance is running.

Documentation | Quickstarts | Administration Console

WildFly Project | User Forum | Report an issue

JBoss Community

To replace this page simply deploy your own war with / as its context path. To disable it, remove the "welcome-content" handler for location / in the undertow subsystem.

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 standalone.conf for Linux) 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:

```
rem # JVM memory allocation pool parameters - modify as
appropriate.
set "JAVA_OPTS=-Xms512M -Xmx4G -XX:MetaspaceSize=512M -
XX:MaxMetaspaceSize=4G"
```

For Linux:

```
# Specify options to pass to the Java VM.
#
if [ "x$JAVA_OPTS" = "x" ]; then
    JAVA_OPTS="-Xms512m -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). 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? _
- 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 i
WFLVDM0099: Password should have at least 8 characters!
Are you user you want to use the password entered yes/no? yes
Re-enter Password :
Mhat groups do you want this user to belong to? (Please enter a comma separated list, or leave blank
for non-1 1:
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-users
properties'
Added user 'apelonadmin2' to file 'C:\AppServer\wildfly-12.0.0.Final\standalone\configuration\mgmt-users
properties'
Added user 'apelonadmin2' with groups to file 'C:\AppServer\wildfly-12.0.0.Final\domain\configuration\mgmt-users
inproperties'
Added user 'apelonadmin2' with groups to file 'C:\AppServer\wildfly-12.0.0.Final\domain\configuration\mgmt-users
erver EdB calls.
yes/no? no
```

H.3 WildFly 23 Configuration for Apelon DTS Server

If you are currently Running DTS and are setting up WildFly23 to replace your existing WildFly 12 or JBoss EAP 7.1 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**, **application-users.properties**, and **mgmt.-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 is contained within the DTS Database, no modifications will be necessary, provided the Application Server users migrate successfully

H.3.1 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 add-user.sh for Linux). Follow the steps below.

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



- 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 server EJB calls.

See the screen shot below to confirm:

Hat type of user do you wish to add? a) Management User (mgmt-users.properties) b) Application User (application-users.properties) 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 be different from the username - The password should not be one of the following restricted values (root, admin, administrator) - The password : Password : Password : PlayMond (2: Passuond abould how of loof (2:) rassword . WFLYDM0102: Password should have at least 1 non-alphanumeric symbol. Are you sure you want to use the password entered yes/no? yes 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\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\standa rties' Added user 'dtsadmin' with groups apelondtsadmin,apelondts to file 'C:\AppServer\wildfly-12.0.0.Final\domain\configuration\application-roles.propertio s this new user going to be used for one AS process to connect to another AS process? .g. for a slave host controller connecting to the master or for a Remoting connection for server to server EJB calls. yes/no? no ress any key to continue \ldots

H.3.2 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 add-user.sh for Linux). 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. ٠
- 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?
- 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.

H.4 Apelon DTS Server Deployment

14. Create a shortcut for **<WILDFLY23_HOME>\bin\standalone.bat.** Rename this to "Apelon DTS WildFly".



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

<wildfly23< th=""><th>_HOME>\bin\</th><th>standalone</th><th>.bat -c</th><th>standalone-apelond</th><th>ts.xml</th></wildfly23<>	_HOME>\bin\	standalone	.bat -c	standalone-apelond	ts.xml

Target location:	bin
Target:	al\bin\standalone.bat -c standalone-apelondts.xml

- 17. Use this "Apelon DTS WildFly" shortcut for running WildFly configured for Apelon DTS.
- 18. For launching on Linux use the following command from terminal window:

```
<WILDFLY23_HOME>/bin/standalone.sh -c standalone-
apelondts.xml
```

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 (or from terminal window for Linux) 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 HAL Management Console 🌲 🔒 apelonadm Homepage Deployments Configuration Runtime Patching Access Control HAL Management Console Add and art Configuration Add and manage deployments Configure subsystem settings ✓ Deploy an Application Start ● VCreate a Datasource Start 🖸 Deploy an application to the server Define a datasource to be used by deployed applications. The proper JDBC driver must be deployed and registered. 1. Use the 'Add Deployment' wizard to deploy the application 2. Enable the deployment 1. Select the Datasources subsystem 2. Add a Non-XA or XA datasource 3. Use the 'Create Datasource' wizard to configure the datasource settings Access Control Runtime Monitor server status Manage user and group permissions for management operations ≺Assign User Roles Start 🧿 ✓Monitor the Server Start ♥ View runtime information such as server status, JVM status, and server log Assign roles to users or groups to determine access to system resources files. 1. Add a new user or group 1. Select the server 2. Assign one or more roles to that user or group 2. View log files or JVM usage Patching Manage WildFly Full patches ✓Apply a Patch Start ♥ Apply a WildFly Full patch to the server. 1. Download the patch file to the local machine 2. Use the 'Apply Patch' wizard to select and apply the patch

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

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

Deployments Add and manage deployments v Deploy an Application Start O Deploy an application to the server 1. Use the 'Add Deployment' wizard to deploy the application 2. Enable the deployment

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.

Homepage Deployments Configuration Deployment (0) Image: Configuration Image: Configuration Filter by: name or deployment Image: Configuration Image: Configuration Add Unmanaged Deployment Image: Configuration Image: Configuration	HAL Management Console						
Deployment (0) Image: Constraint of the second se	Homepage	Deployments	Configuration				
Filter by: name or deployment Add Unmanaged Deployment g at	Deployment (0)	⊕~ 2					
	Filter by: name or dep	loyment Add Unma	eployment anaged Deployment				

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

Add Deployment	×
Upload Deployment	Specify Names
4	
Choose a file	or drag it here.
	Cancel < Back Next >

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

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• <u>Note:</u> For Oracle 12c see <u>Oracle 12c PGA_AGGREGATE_LIMIT</u>

• 11010.	101010101120300 010001201	
Database	Driver	
Oracle 12c	ojdbc7-4.1.jar	
MS SQL	mssql-jdbc-9.4.1.jre8.jar	
Server		
2016		
MS SQL	mssql-jdbc-9.4.1.jre8.jar	
Server		
2019		-
MySQL 8	mysql-connector-java-8.0.29.jar	
MySQL 5.6	mysql-connector-java-8.0.29.jar	
	Add Deployment	×
	Upload Deployment	Specify Names
		
	-	Connector into 8.0.20 inc
	mysqi-	connector-java-6.0.29.jar

Cancel < Back Next >

Ensure the **Enable** is **ON** and click "Finish".

Upload De	ployment	Specify Names
Help		
Name *	mysql-connector-java-8.0.29.jar	
Runtime Name	mysql-connector-java-8.0.29.jar	
Enabled	ON	
	Required fields are marked with st	
		Cancel < Back
u should receive a n	nessage that the upload of the .j	Cancel Cack Fin ar deployment was successful.
u should receive a n	nessage that the upload of the .ja	Cancel Cack Fin ar deployment was successful.
u should receive a m reployment Upload Deployment	nessage that the upload of the .ja Specify Names	Cancel Cancel Back Fin ar deployment was successful.
u should receive a n reployment Upload Deployment	nessage that the upload of the .ja Specify Names	Cancel Cancel Back fin ar deployment was successful.
u should receive a n reployment Upload Deployment ①	nessage that the upload of the .ja Specify Names	Cancel Cancel Back fin ar deployment was successful.
u should receive a m Deployment Upload Deployment	nessage that the upload of the .ja Specify Names	Cancel Back Fin ar deployment was successful. ×
u should receive a n Peployment Upload Deployment	nessage that the upload of the .j	Cancel Back Fin ar deployment was successful. ×
u should receive a m Peployment Upload Deployment ①	nessage that the upload of the .j: Specify Names 2 2 Upload successful Stagar has been successfully uploaded to the content repostory. Stagar has been successfully uploaded to the content repostory.	Cancel Back in ar deployment was successful.
u should receive a n Peployment Upload Deployment ① mysql-connector-java-8.0	nessage that the upload of the .j: Specify Names 2 Upload successful N29Jar has been successfully uploaded to the content repository. View Deployment	Cancel Back In ar deployment was successful.
u should receive a m Peployment Upload Deployment (1) mysql-connector-java-8.4	nessage that the upload of the .j specify Names 2 2 Upload successful N29 Jar has been successful N29 Jar has been successful	Cancel Back Fin ar deployment was successful.
u should receive a n reployment Upload Deployment (1) mysql-connector-java-8.6	nessage that the upload of the .j specify Names 2 2 Vigar has been successful View Deployment	Cancel Back Fin ar deployment was successful.

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HAL Managem	ent Console				
Homepage	Deployments	Configuration	Runtime	Patching	Access Control
Deployment (1)	⊙ ~ <i>C</i>	mysql-conne	ctova-8	3.0.29.jar	
Filter by: name or o	View ×	The deployment	mysql-connec	tor-java-8.0.29.ja	ar is enabled and active. Disable
		Main Attributes Name: Runtime Name:			mysql-connector-java-8.0.29.jar mysql-connector-java-8.0.29.jar
		Enabled, Managed, Exp Status:	ploded:		ок
		Last enabled at:			8/2/23, 3:30 PM
		Last disabled at:			n/a

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 default "dts4" used as an example in this documentation*).

Database	User	Password	Connection URL
Oracle	dts4	dts4	jdbc:oracle:thin:@localhost:1521:ORCL
MS SQL	dts4	dts4	jdbc:sqlserver://localhost:1433;databasename=dts4
Server			
MySQL	dts4	dts4	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":



Configuration

Configure subsystem settings

Create a Datasource Start O

Define a datasource to be used by deployed applications. The proper JDBC driver must be deployed and registered.

1. Select the Datasources subsystem

2. Add an XA or non-XA datasource

3. Use the 'Create Datasource' wizard to configure the datasource settings

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.

HAL Management Console								
Homepage	Deployments	Configuration	Runtime	Patching Acces	ss Control			
Configuration		Subsystem (26)		Datasources & Drivers		Datasource	⊕~ 3	
Subsystems	>	Fiter by: name or subtitle		Datasources	>	Filter by: name, xa,/dis	Add Datasource	
		Batch	<u>^</u>		· · · ·	EvampleDS	Add XA Datasource	
Interfaces	>	JBeret		JDBC Drivers	>	Champiebs		
Socket Bindings	>	Core Management						
Paths		Datasources & Drivers	>					
		Deployment Scapport						

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

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•	Attributes	JDBC Driver	Connection	Test Connection	Review
				3	0
Choose one of the pred	efined templates to quic	ckly add a datasource or ch	oose "Custom" to specify	your own settings.	
 Custom 					
○ H2					
PostgreSQL					
MySQL					
MariaDB					
O Oracle					
Oracle Microsoft SQLServer					
Oracle Oracle Microsoft SQLServer IBM DB2					

Edit the Datasource Attributes **Name** and **JNDI Name** (*Note: these values are Case-Sensitive*). The **Name** should be: "ApelonDtsDS"

Cancel < Back Next >

tsDS"
1

Add Datasource					×
Choose Template	Attributes	JDBC Driver	Connection	Test Connection	Review
Help	Name * ApelonD	tsDS			
JNDI	Name * java:jbos	s/datasources/ApelonDtsl	Pa		

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".

Add Datasource						
Choose Template	Attribu 2	tes	JDBC Driver	Connection		
Help						
Driver Name *		mysql-connector-java-8.0.29.jar				
Driver Module Name		com.mysql				
Driver Class N	lame	com.mysql.	cj.jdbc.Driver			
		Required field	ds are marked with *			

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.

······································				
Database	User	Password	Connection URL	
Oracle	dts4	dts4	jdbc:oracle:thin:@localhost:1521:ORCL	
MS SQL	dts4	dts4	jdbc:sqlserver://localhost:1433;databasename=dts4	
Server				
MySQL	dts4	dts4	jdbc:mysql://localhost:3306/dts4	
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Add Datasource				
Choose Template	Attribute	es JDBC Drive	er Connectio	on Test Connection
Help				
Connectio	on URL	jdbc:mysql://localhost:3306	/dts4	
User	Name	•••••		
Pas	ssword	•••••		
Security D	omain			

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 cashed by the browser so you may need to restart the Add Datasource process to enter the valid connection settings).

Choose Template	Attributes	JDBC Driver	Connection	Test Connection
		0	•	
		Test Connectio	on Successful	

Successfully tested connection for datasource ApelonDtsDS.

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.

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Add Datasource						
Choose Template	Attrib	utes	JDBC Driver	Connection	Test Connection	Review
Help	Name	ApelonDts	DS			
JNDI	Name	java:jboss/	datasources/ApelonDtsDS			
Connection	n URL	jdbc:mysql	://harsqadts10:3306/dts4			
Driver M	Name	mysql-con	nector-java-8.0.29.jar			
User M	Name	•••••	۲			
Pass	word	•••••	•• @			

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.

		🕲 Reload Required 🔺 👗 apelonadmin 🗸
Datasource ⊕ ✓ 2	ApelonDtsDS	5
Filter by: name, xa,/disabled, deployment	Datasource	
ApelonDtsDS View Y	The datasource	
⊘ ExampleDS	Main Attributes	·
	JNDI Name:	java:jboss/datasources/ApelonDtsDS
	Driver Name:	mysql-connector-java-8.0.29.jar
	Connection URL:	jdbc:mysql://harsqadts10:3306/dts4
	Enabled:	true
	Statistics Enabled:	false

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.

Datasourc	•~	C	
Filter by: nan	ne, xa,/disable	d, deplo	yment
⊘ ApelonI	DtsDS Disable	View	~
⊘ Exampl	Test Connecti Remove	on	

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".

	Home	Deployments	Configura	ition	Runtime	Access Control	
	Configura	ation		Sub	system (28)		
	Subsyste	ms	>	٩			
	Interface	5		JCA			
	Socket Bi	nding		Dat	asources	>	L
	Paths			Res	ource Adapters	>	L
	System P	roperties		Mai	il	>	
				Tra	nsactions	View	
Then click "Edi	t" and en	ter the new tir	neout valu	ıe.			
	Tran	saction N	lanagei	r			
	The cont	figuration of the tra	ansaction sub	osyster	m.		
	🖋 Edit	🕽 Reset 🔞 Help					
			Def	ault Ti	imeout 4	3200 SECONDS	

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

H.6 Deploy Apelon DTS 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.

HAL	Management Console
Ę,	Deployments Add and manage deployments
	v Deploy an Application
	Deploy an application to the server
	1. Use the 'Add Deployment' wizard to deploy the application 2. Enable the deployment

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". Add Deployment

Upload Deployment	Specify Names
1	
Choose a file o	r 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

In

next iteration of JBoss, and as such the .ear file and deployed application still contain "jboss" in the name).

<u>NOTE</u>: 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\

	Add Deployn	nent			
		Upload	Deployment		Specify Names
				1	
the ne	xt windov	v ensure "Eı Add Deployr	nable" is set to ON nent	dtsjbosswildfly.ear and then click "Finish".	
			Upload Dep	loyment	
		Help			
			Name *	dtsjbosswildfly.ear	
			Runtime Name	dtsjbosswildfly.ear	
			Enabled	ON	

Required fields are marked with *

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 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 4.7.0 - 4.7.2 WildFly Server & schema to DTS 4.8.0). 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 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.

Apelon DTS Browser	A STATE OF THE STA
Browser	
List Concepts By: Name 🗸	Concept Term Namespace Subset
Namespace: SNOMED CT V	₩ Options
Version: 2023.06.23AA(Jun 30, 2023 12:00:00 AM) 🗸	Current V Refresh
- SNOMED CT Concept (SNOMED RT+CTV3)	
body structure (body structure)	
+ Clinical finding (finding)	Cessation of sedation (procedure)
DataHasValue Target	ID: 241713
Environment or geographical location (environment / location)	Code: 241713008
Observable antity (abservable antity)	Namespace: SNOMED CT (Ontylog, Subscription, Read-Only)
+ Organism (organism)	Status: ACTIVE
Pharmaceutical / biologic product (product)	Primitive
+ Physical force (physical force)	History: ADDED Jan 31, 2004
+ The State of State	✓ Synonyms (3)
Procedure (procedure)	
+ > Activation of implant (procedure)	* Synonym : Cessation of sedation (Preferred) (ADDED Jan 31, 2004)
 Activity of daily living procedures and interventions (procedure) 	Synonym : <u>Cessation of sedation (procedure</u>) (ADDED Jan 31, 2004)
+ Administrative procedure (procedure)	Synonym : End of sedative administration (ADDED Jan 31, 2004)
Anesthesia and/or sedation procedure (procedure)	

H.7.2 Verify the DTS Editor connection

Run the DTS Editor shortcut (To 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 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".

🗧 Apelon DT	SEditor 4.8	.0-8113		>
File Help				
🐣 🖶				
	Connec	t Parameters	×	
	Host:	localhost		
	Port:	8080		
	Instance:	dtsjboss		
1	Username:	dtsadminuser		
	Password:	•••••		
	Use the	se values as defaults Auto-connect on start-up		
		Connect Cancel		



H.8 Setup WildFly 23 and DTS 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=DTS48WildFly23 set DISPLAYNAME=DTS48_WildFly23 set DESCRIPTION=DTS48 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 standaloneapelondts.xml



If the command return is a success 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 **"DTS48_WildFly23"** service. Right click and select **Properties**.

🌼 Services				
File Action View	Help			
(- - - - -	à 🗟 🛛 🖬 🕨 🔲 II 🕩			
Services (Local)	Name	Descri	ption	
	DTS48_WildFly23	Р те 40	MULTER 00 A	Server
	🤹 Embedded Mode	Т	Start	enable
	🗟 Encrypting File System (EFS)	P	Stop	ion tec.
	🗟 Enterprise App Managemen	E	Pause	ז mana.
	🗟 Extensible Authentication P	Т	Resume	n Protoc
	Sunction Discovery Provide	Т	Restart	he Func
	Sunction Discovery Resourc	F		- resourc
	🧠 Geolocation Service	Т	All Tasks >	rent loc
	Google Chrome Elevation S		Refresh	
	Google Update Service (gup	ĸ		up to da
	Google Update Service (gup	ĸ	Properties	up to da
	GraphicsPerfSvc	C	Help	or servi
	Group Policy Client	T		applyin

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

DTS48_W	ildFly23 F	Properties (l	Local Computer)	×
General	Log On	Recovery	Dependencies	
Service	name:	DTS48Wile	dfly23	
Display	name:	DTS48_W	/ildFly23	
Descrip	tion:	DTS48 Wi	ildFly23 Application Server	×
Path to C:\Tool	executabl s\wildfly-2	le: 23.0.2.Final\b	oin\service\amd64\wildfly-service.exe //RS/	M
Startup	type:	Automatic	: (Delayed Start)	/
Service You can from he Start pa	status: Start n specify t re. arameters:	Stopped Stop	Pause Resume ameters that apply when you start the service	
			OK Cancel Apply	/

7. The "DTS48_WildFly23" service is now Running and set to Automatic.

Name	Description	Status	Startup Type
DTS48_WildFly23	DTS48 WildFly23 Application Server	Running	Automatic

H.9 Setup WildFly 23 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 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/wildfly.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 /opt/wildfly-23.0.2.Final/docs/contrib/scripts/init.d/wildfly-initredhat.sh /etc/init.d/wildfly
- 7. Modify the file "<WildFly23_HOME>/bin/standalone.conf" to specify the Java JVM to use during 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

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:

13. In the Services Window, right-click on the WildFly 23 Service and choose Properties.

14. In the Properties Window, identify the Service Name and copy it.

DTS48_W	ildFly23 F	Properties (L	.ocal Compute	r)		×		
General	Log On	Recovery	Dependencies					
Service	name:	DTS48Wild	ffly23					
Display	name:	DTS48_Wi	ldFly23					
Descrip	tion:	DTS48 Wil	DTS48 WildFly23 Application Server					
Path to C:\Tool	Path to executable: C:\Tools\wildfly-23.0.2.Final\bin\service\amd64\wildfly-service.exe //RS//I							
Startup	Startup type: Manual ~							
Startup type: Manual ✓ Service status: Running Start Stop Pause Resume You can specify the start parameters that apply when you start the service from here. Start parameters: Start parameters:								
						_		
			ОК	Cancel	Apply			

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

🖼 Administrator: Command Prompt	
Microsoft Windows [Version 10.0.17134.472] (c) 2018 Microsoft Corporation. All rights reserved.	
C:\WINDOWS\system32>sc queryex DTS4WildFly12	

16. This should produce information about the WildFly 23 Service, including the PID.

17. Type the following in the Command Window: taskkill /pid [PID] /f

🔤 Administrator: Command Prompt	1
Microsoft Windows [Version (c) 2018 Microsoft Corpora	10.0.17134.472] tion. All rights reserved.
C:\WINDOWS\system32>sc que	ryex DTS4WildFly12
SERVICE NAME: DTS4WildFlv1	2
ТҮРЕ	: 10 WIN32 OWN PROCESS
STATE	: 4 RUNNING
	(STOPPABLE, NOT_PAUSABLE, ACCEPTS_SHUTDOWN)
WIN32_EXIT_CODE	: 0 (0x0)
SERVICE_EXIT_CODE	: 0 (0x0)
CHECKPOINT	: 0x0
WAIT_HINT	: 0x0
PID	: 4496
FLAGS	
C:\WINDOWS\system32>taskki	ll /pid 4496 /f

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

🔤 Administrator: Command Prompt								
Microsoft Windows [Version 10.0.17134.472] (c) 2018 Microsoft Corporation. All rights reserved.								
C:\WINDOWS\system32>sc que	ryex DTS4WildFly12							
SERVICE NAME: DTS4WildFly1	2							
ТҮРЕ	: 10 WIN32_OWN_PROCESS							
STATE	: 4 RUNNING							
	(STOPPABLE, NOT_PAUSABLE, ACCEPTS_SHUTDOWN)							
WIN32_EXIT_CODE	: 0 (0x0)							
SERVICE_EXIT_CODE	: 0 (0x0)							
CHECKPOINT	: 0x0							
WAIT_HINT	: 0x0							
PID	: 4496							
FLAGS								
C:\WINDOWS\system32>taskki	C:\WINDOWS\system22>taskkill /pid 4406 /f							
SUCCESS: The process with	PID 4496 has been terminated.							
C:\WINDOWS\system32>								

H.11 Upgrade Apelon DTS 4.7.0 - 4.7.2 WildFly Server & schema to DTS 4.8.0

Perform the following steps to upgrade your Apelon DTS 4.7 WildFly schema to Apelon DTS 4.8.0 WildFly (**Note: DTS 4.7.1 and DTS 4.7.2 have the same schema version as DTS 4.8.0**):

- Follow instructions in <u>Section B</u> for installing DTS 4.8.0 on the server to be upgraded.
- Stop the Apelon DTS WildFly service.
- Copy the WildFly configuration file from the DTS 4.8.0 home directory <DTS_HOME>\server\wildfly\standalone\configuration 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(<u>Deploy Database Driver</u>) through H.7(<u>Verify DTS Browser & Editor</u> <u>connections to WildFly 23 DTS Server</u>) to finish configuring the Apelon DTS 4.8.0 WildFly server.
- <u>NOTE1</u>: If upgrading from a DTS 4.7.0 schema to DTS 4.8.0, as instructed in section H.6(<u>Deploy Apelon DTS Server</u>), 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 4.8.0 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 Oracle 12c, SQL Server 2016, or SQL Server 2019.
- "Schema Upgrade to 4.0.30 complete" for MySQL 5.6 or MySQL 8.
- 2. A second way to determine the schema upgrade was successful is from the DTS 4.8.0 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 Oracle 12c, SQL Server 2016, or SQL Server 2019.
 - "4.0.30" for MySQL 5.6 or MySQL 8.
- <u>NOTE2 SQL Server Schema Upgrade:</u> 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.

I. WildFly 12 Setup

<u>Note: WildFly 12 requires the use of Java 8 JDK. See Java Environment Setup for a Server</u> <u>section above for additional details.</u>

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



For Windows, select the 12.0.0.Final Feb 28, 2018 Java EE7 Full & Web Distribution ZIP file to download. For Linux use the 12.0.0.Final Feb 28, 2018 Java EE7 Full & Web Distribution TGZ file.

	FINAL	Feb 28	8, 2018
12.0.0.Final	Java EE7 Full & Web Distribution	LGPL	<u>zip</u> tgz

WildFly 12 does not come with an installer; just extract the compressed archive. <u>Unzip the</u> <u>WildFly archive into a folder with a pathname that does NOT contain any spaces.</u> For example, extracting to the C:\Tools folder will place the WildFly 12.0.0 Final files in the C:\Tools\wildfly-12.0.0.Final folder. We will identify this folder in the rest of the

document as <WILDFLY12_HOME>. It is not necessary to create <WILDFLY12_HOME> as an environment variable.

To verify the WildFly 12 install, go to the <WILDFLY12_HOME>\bin folder and run standalone.bat (or standalone.sh for Linux).

C:\AppServer\wildfly-12.0.0.Final\bin								
Computer ▼ Local Disk (C:) ▼ AppServer ▼ wildfly-12.0.0.Final ▼ bin ▼								
Organize 🔻 🛅 Open Print New folder							:==	
🗆 鷆 wildfly-12.0.0.Final		Name *		Date modified	Туре	Size		
		jboss-cli-logging.properties		2/28/2018 11:29 PM	PROPERTIES File	- 2	2 KB	
🛨 🛑 appolient		🚳 jconsole.bat		2/28/2018 11:29 PM	Windows Batch File	2	2 KB	
		📄 jconsole.ps1		2/28/2018 11:29 PM	PS1 File	1	ιKB	
THE MAKE		📄 jconsole.sh		2/28/2018 11:29 PM	SH File	3	3 KB	
		🚳 jdr.bat		2/28/2018 11:29 PM	Windows Batch File	2	2 KB	
🕀 🛄 docs		📄 jdr.ps1		2/28/2018 11:29 PM	PS1 File	1	I KB	
🕀 🌗 domain		📄 jdr.sh		2/28/2018 11:29 PM	SH File	2	2 KB	
🕀 鷆 modules		📓 launcher.jar		2/28/2018 11:29 PM	Executable Jar File	41	I KB	
🕀 🍌 standalone		product.conf		2/28/2018 11:29 PM	CONF File	1	ιKB	
Use welcome-content		🚳 standalone.bat		2/28/2018 11:29 PM	Windows Batch File	g	КВ	

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

DTS 4.8.0 – Installation Guide

C:N.	C:\Windows\system32\cmd.exe	
Callin Settin	g "C:\AppServer\wildf1y-12.0.0.Final\bin\standalone.conf.bat" g JAVA property to "C:\Program Files\Java\jdk1.8.0_121\bin\java"	
IBos	Poststaan Fourieroneet	
JBOS	s Hote: "C:AppServeryvildflu-12.0.0.Final"	
JAVA	: "C:\Program Files\Java\jdk1.8.0.121\bin\java"	
JAVA	_OPTS: "-Dprogram.name=standalone.bat -Xms64M -Xmx8G -XX:MetaspaceSize=512M -XX:MaxMetaspaceSize=4G -Djava.net.preferlPv4Stack=true -	Djboss.modu
les.sy	sten.pkg=org.jboss.bytenan"	
16:24: 16:24:16:24: 16:24:16:24	60.428 INFO [org.jboss.mscl(main) JBoss Modules version 1.7.0.Final 60.788 INFO [org.jboss.mscl(main) JBoss MSC version 1.3.2.Final 60.788 INFO [org.jboss.mscl(main) JBoss MSC version 2.3.1.Final 60.744 INFO [org.jboss.as] (MSC Service thread 1.2.) WELXSM00491; WildFly Full 12.0.0.Final (WildFly Core 4.0.0.Final) starting 60.744 INFO [org.jboss.as] (MSC Service thread 1.2.) WELXSM00491; WildFly Full 12.0.0.Final (WildFly Core 4.0.0.Final) starting 62.754 INFO [org.jboss.as] (MSC Service thread 1.2.) WELXSM00491; WildFly Full 12.0.0.Final (WildFly Core 4.0.0.Final) starting 62.756 INFO [org.jboss.as] (MSC Service thread 1.2.) WELXSM00491; WildFly Full 12.0.0.Final (WildFly Core 4.0.0.Final) starting 62.756 INFO [org.jboss.as] (MSC Service thread 1.2.) WELXSM00491; WildFly Full 12.0.0.Final future version for 82.756 NFO [org.wildFly.scorrige] (Service thread 1.2.) EX600091; WildFly Fultron version 1.2.2.Final 82.756 INFO [org.wildFly.scorrige] (Service Thread 1.5.) Ex600091; WildFly.Fultron version 1.2.2.Final 82.756 INFO [org.wildFly.scorrige] (Service Thread 1.5.) Ex600091; WildFly.Fultron version 1.2.2.Final 82.756 INFO [org.wildFly.scorrige] (Service Thread 1.5.) Ex600091; WildFly.Fultron version 1.2.2.Final 82.756 INFO [org.wildFly.scorrige] (Service Thread 1.5.) Ex600091; WildFly.Fultron version 1.2.2.Final 82.756 INFO [org.wildFly.scorrige] (Service Thread 1.5.) Ex600091; WildFly.Fultron version 1.2.2.Final 82.756 INFO [org.wildFly.scorrige] (Service Thread 1.5.) Ex600091; WildFly.Fultron version 1.2.2.Final 82.756 INFO [org.wildFly.scorrige] (Service Thread 1.5.) Service Thread Pool - 2.5.) VELY001075555555555555555555555555555555555	resource at ibute descr ' in the re- ee the attr
16:24: 16:24: 16:24: 16:24: 16:24: 16:24: 16:24: 16:24: 16:24: 16:24: 16:24: 16:24: 16:24: 16:24: 16:24: 16:24: 16:24: 16:24:	92,859 INPO [org.jboss.as.server] (Controller Boot Thread) WELYSRU0039: Creating http management service using socket-binding (manag 02,866 INPO [org.xnio] (MSC service thread 1-8) XNIO version 3.6.2.Final 02,816 INPO [org.xnio] (MSC service thread 1-8) XNIO NO [mplementation Version 3.6.2.Final 02,814 INPO [org.xnio.nio] (KSC service thread 1-8) XNIO NO [mplementation Version 3.6.2.Final 02,944 INPO [org.xnio.nio] (KSC service thread 1-8) XNIO NO [mplementation Version 3.6.2.Final 02,944 INPO [org.xnio.nio] (KSC service thread 1-8) XNIO NO [mplementation Version 3.6.2.Final 02,944 INPO [org.thoss.as.jaxrs] (ServerService Thread Pool — 43) VELVKS0016: RESTEasy version 3.5.8.Final 03,006 INPO [org.thoss.as.naming] (ServerService Thread Pool — 40) VELVCINPO01: Activating Subsystem [molton] (ServerService Thread Pool — 40) VELVCINPO01: Activating Subsystem [molton] (ServerService Thread Pool — 40) VELVCINPO01: Activating Subsystem [molton] (ServerService Thread Pool — 40) VELVCINPO01: Activating Subsystem [molton] (ServerService [molton] (ServerService [MICON] (ServerService [molton] (ServerServerService [molton] (ServerService [molton] (ServerService [molton] (ServerServerService [molton] (ServerService [molto	ement-http) tions is se threads with
64 ta 16:24: 16:24: 16:24: 16:24: 16:24: s org	sk threads based on your 4 available processors 03,222 INFO lorg.jboss.as.connector] (NGC service thread 1-2) WFLYJCA0009: Starting JCA Subsystem (WildFly/IronJacamar 1.4.7.Final) 03,228 INFO lorg.jboss.as.mail.extension] (NGC service thread 1-1) WFLYMAIL0001: Bound mail session [javaijboss/mail/Default] 03,288 INFO lorg.jboss.as.mail.extension] (NGC service thread 1-5) WFLYMAI0001: Starting Naning Service 03,288 INFO lorg.jboss.as.connector.subsystems.datasources] (ServerService Thread Pool — 36) WFLYJCA0004: Deploying JDBC-compliant 12.Driver.version 1.4)	driver clas
16:24: class) 16:24: lass), 16:24: -12.0 16:24: 16:24: 16:24: 16:24:	63,260 INFO logs,10655.as.connector.deployers,10007 inst service innead 1-2/ Wirdchoolo started broer service with driver-name = 63,319 INFO logs,10655.as.cbj33 (MSC service thread 1-5) WFLYEDB0481: Strict pool slb-strict-max-pool is using a max instance size 63,319 INFO logs,10655.as.cbj33 (MSC service thread 1-1) WFLYEDB0482: Strict pool mdb-strict-max-pool is using a max instance size 63,319 INFO logs.10655.as.cbj33 (MSC service thread 1-1) WFLYEDB0482: Strict pool mdb-strict-max-pool is using a max instance size 63,319 INFO logs.10163.as.cbj33 (MSC service thread 1-1) WFLYEDB0482: Strict pool mdb-strict-max-pool is using a max instance size 63,475 INFO logs.10163/J.extension.undertowl (ServerService Thread Pool 59) WFLYUT0014: Creating file handler for path 'C:\AppSer 8,5560 INFO logs.uildfly.extension.undertowl (SEC service thread 1-4) WFLYUT00125 Started server default-server. 83,528 INFO logs.uildfly.extension.undertowl (MSC service thread 1-4) WFLYUT0018: Host default-host starting 83,538 INFO logs.uildfly.extension.undertowl (MSC service thread 1-6) WFLYUT0018: Host default-host starting 83,538 INFO logs.extension.undertowl (MSC service thread 1-6) WFLYUT0018: Host default-host starting	nz of 64 (per f 16 (per c ver\wildfly s: '[]']
16:24: 16:24: 16:24: mpleDS 16:24:	03,663 INFO forg.vildfly.extension.undertow] (MSC service thread 1-1) VFLVUT0006: Undertow HTTP listener default listening on 127.0. 03,850 INFO forg.jboss.as.ejb3] (MSC service thread 1-7) WFLVEJB0493: EJB subsystem suspension complete 04,006 INFO forg.jboss.as.connector.subsystems.datasources] (MSC service thread 1-4) WFLVJCA0001: Bound data source [java:jboss/data 1 04,241 INFO forg.jboss.as.patching] (MSC service thread 1-5) WFLVPAT0050: WildFly Full cumulative patch ID is: base, one-off patches	0.1:8080 .sources/Exa include: n
one 16:24: AppSer 16:24: 16:24: 16:24: tandal 16:24: 1	04,272 INFO forg.jboss.as.server.deployment.scanner] (MSC service thread 1-6) WFLYDS0013: Started FileSystemDeploymentService for di ver.wildf1y-12.0.8.FinalYstandalone/deployments 04,444 INFO forg.vib/standalone/deployments 04,444 INFO forg.vib/standalone/deployments 04,444 INFO forg.vib/standalone/deployments 04,646 INFN forg.jboss.ws.common.imagement1/NSC service thread 1-6) WFLYDS0066: Undertow HTTPS listener https listening on 127,8.0 04,646 INFN forg.jboss.ws.common.imagement1/NSC service thread 1-70 JBN0802052: Starting JBossWS 5.2.0.Final (Apache CKF 3.2.2) 04,646 INFN forg.jboss.ws.common.imagement1/NSC service thread 1-70 JBN0802052: Starting JBossWS 5.2.0.Final (Apache CKF 3.2.2) 04,646 INFN forg.jboss.as.controller1/Controller Boot Thread/WFLYCL04449: Cannot delte file or directory C:\AppServervildf1y-12. one/configuration/standalone_xml.history.20180925-1122155204 INFVCL04449: Cannot delte file or directory C:\AppServervwildf1y-12. one/configuration/standalone_xml.history.20180925-1122155204 UFLYCL04449: Cannot delte file or directory C:\AppServervwildf1y-12. one/configuration/standalone_xml.history.20180925-1122155204 UFLYCL04449: Cannot delte file or directory C:\AppServervwildf1y-12. one/configuration/standalone_xml.history.20180925-1122155204 UFLYCL04449: Cannot delte file or directory C:\AppServervwildf1y-12. one/configuration/standalone_xml.history.20180925-112215520 04,616 WRN forg.jboss.as.controller] (Controller Boot Thread) WFLYCL04449: Cannot delte file or directory C:\AppServervwildf1y-12. one/configuration/standalone_xml.history.20180925-112215204 04,616 WRN forg.jboss.as.controller] (Controller Boot Thread) WFLYCL04449: Cannot delte file or directory C:\AppServervwildf1y-12. one/configuration/standalone_xml.history.20180925-112215204 04,616 WRN forg.jboss.as.controller] (Controller Boot Thread) WFLYCL04449: Cannot delte file or directory C:\AppServervwildf1y-12. one/configuration/standalone_xml.history.20180926-112245204 04,616 WRN forg.jboss.as.controller] (Controller Boot Thread) WF	rectory C:\ .1:8443 0.0.Final\s 0.0.Final\s 0.0.Final\s 0.0.Final\s 0.0.Final\s
16:24: 16:24: ed 292	97,51 HNO Tors., hoss.as) (Controller Boot Inread) HITSNOBES1. Hunth Console fistening on http://12/.0.0.1:9990 94,531 HNO Tors., hoss.as) (Controller Boot Thread) HITSNOBES1. Hunth Console fistening on http://12/.0.0.Final 95,51 Services (300 services are lazy, passive or on-demand)	5ms – Start

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

DTS 4.8.0 – Installation Guide



Note, the Welcome to WildFly page that appears incorrectly indicates WildFly 11 instead of WildFly 12. 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_

I.1 Memory Configuration

The Apelon DTS Server performs better when additional memory is assigned to WildFly. To increase the memory utilized, open <WILDFLY12_HOME>\bin\standalone.conf.bat (or standalone.conf for Linux) 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:

```
rem # JVM memory allocation pool parameters - modify as
appropriate.
set "JAVA_OPTS=-Xms512M -Xmx4G -XX:MetaspaceSize=512M -
XX:MaxMetaspaceSize=4G"
```

For Linux:

```
# Specify options to pass to the Java VM.
#
if [ "x$JAVA_OPTS" = "x" ]; then
    JAVA_OPTS="-Xms512m -Xmx4G -XX:MetaspaceSize=512M -
XX:MaxMetaspaceSize=4G
```

I.2 WildFly 12 Management User

You must create a WildFly Management user (e.g., **apelonadmin/apelon**) – This user administers the WildFly server. Go to <wildFly12_HOME>\bin and click on add-user.bat (or add-user.sh for Linux). 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 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? _____
- 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 :
WFLVDM099: Password should have at least 8 characters?
fre you sure you want to use the password entered yes/no? yes
Re-enter Password :
MAT groups do you want this user to belong to? (Please enter a comma separated list, or leave blank
for none)1 1:
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-users
properties'
Added user 'apelonadmin2' to file 'C:\AppServer\wildfly-12.0.0.Final\standalone\configuration\mgmt-users
properties'
Added user 'apelonadmin2' with groups to file 'C:\AppServer\wildfly-12.0.0.Final\standalone\configuration\mgmt-users
properties'
Added user 'apelonadmin2' with groups 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\domain\configuration\mgmt-users
properties'
Added user 'apelonadmin2' with groups to file 'C:\AppServer\wildfly-12.0.0.Final\domain\configuration
\mgmt-groups.properties'
S 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 EdB calls.
yes/no? no
```

I.3 WildFly 12 Configuration for Apelon DTS Server

If you are currently Running DTS and are setting up WildFly12 to replace your existing JBoss 7.1.1, JBossEap 7.1, or WildFly 10 environment, you can migrate your existing DTS users by performing the following steps:

- 1. Ensure the new WildFly12 Application Server is stopped.
- 2. Locate the **application-roles.properties**, **application-users.properties**, and **mgmt.-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**.
- Copy these files, and place them (overwriting if prompted) in <WildFly12 Home>\domain\configuration and <WildFly12 Home>\standalone\configuration respectively.
- 4. Start the WildFly12 Application Server

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

I.3.1 WildFly 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 <WILDFLY12_HOME>\bin and click on add-user.bat (or add-user.sh for Linux). Follow the steps below.

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



- 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 server EJB calls.

See the screen shot below to confirm:

Hat type of user do you wish to add? a) Management User (mgmt-users.properties) b) Application User (application-users.properties) 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 : Password : rassword . WFLYDM0102: Password should have at least 1 non-alphanumeric symbol. Are you sure you want to use the password entered yes/no? yes Are you sure you want to use the password entered yes/no? yes Re-enter Password : Mbat 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\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' to file 'C:\AppServer\wildfly-12.0.0.Final\domain\configuration\application-users.properties' rties' Added user 'dtsadmin' with groups apelondtsadmin,apelondts to file 'C:\AppServer\wildfly-12.0.0.Final\domain\configuration\application-roles.propertio s this new user going to be used for one AS process to connect to another AS process? .g. for a slave host controller connecting to the master or for a Remoting connection for server to server EJB calls. yes/no? no ress any key to continue \ldots

I.3.2 WildFly 12 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 <WILDFLY12 HOME>\bin and click on add-user.bat (or add-user.sh for Linux). 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. ٠
- 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?
- 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.

I.4 Apelon DTS Server Deployment

20. Create a shortcut for **<WILDFLY12_HOME>\bin\standalone.bat.** Rename this to "Apelon DTS WildFly".



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

<wildfly12< th=""><th>_HOME>\bin\</th><th>standalone.</th><th>bat -c</th><th>standalone-apelondts.xml</th><th></th></wildfly12<>	_HOME>\bin\	standalone.	bat -c	standalone-apelondts.xml	

```
    Target location: bin

    Target:

    al\bin\standalone.bat -c standalone-apelondts.xml
```

- 23. Use this "Apelon DTS WildFly" shortcut for running WildFly configured for Apelon DTS.
- 24. For launching on Linux use the following command from terminal window:

```
<WILDFLY12_HOME>/bin/standalone.sh -c standalone-
apelondts.xml
```

I.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.

I.4.2 Deploy Database Driver

Start WildFly using the "Apelon DTS WildFly" shortcut for Windows (or from terminal window for Linux) created in the previous step. Open a browser and go to the default WildFly Management URL: http://localhost:9990/console/App.html#home

dFly				Messages: 0 💧 apelonadmi
ie	Deployments Configuration Runtime Access Control Patching			
Nild	IFly			
À	Deployments Add and manage deployments		Configuration Configure subsystem settings	
	✓ Deploy an Application Start ♥		✓ Create a Datasource Start ♥	
	Deploy an application to the server. 1. Use the 'New Deployment' wizard to deploy the application 2. Enable the deployment		Define a datasource to be used by dep deployed and registered. 1. Select the Datasources subsystem 2. Add an XA or non XA datasource 3. Use the 'Create Datasource' wizard to > Create a JMS Queue Start •	loyed applications. The proper JDBC driver must be to configure the datasource settings
	Runtime Monitor server status	<u>.</u>	Access Control Manage user and group permissions for	or management operations
	Monitor the Server Start Q		~ Assign User Roles Start O	
	View runtime information such as server status, JVM status, and server log files.		Assign roles to users or groups to dete	rmine access to system resources.
	 Select the server View log files or JVM usage 		 Add a new user or group Assign one or more roles to that use 	er or group
Y	Patching Manage WildFly patches	?	Need Help?	Ger Hole
	✓ Apply a Patch Start ♥		General Resources WildFly Home	Get Help Access tutorials and guickstarts
	Apply a WildFly patch to the server.		WildFly Documentation	User Forums
	 Download the patch file to the local machine Use the 'Apply Patch' wizard to select and apply the patch 		Admin Guide Model Reference Documentation Browse Issues Latest News	IRC Developers Mailing List

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

Deployments Add and manage deployments

✓ Deploy an Application Start O

Deploy an application to the server

- 1. Use the 'Add Deployment' wizard to deploy the application
- 2. Enable the deployment

Then click on the **Add** button in the upper left. In the next pop up window, ensure "Upload a new deployment" is selected, and click "Next".

WildFly									
Home Deple	oyments	Configuration	Runtime	Access Control	Patching				
Deployment		Add							
۹ 🗌			Deploym	ient	dealers 1	and the	CAD 15"		
N	No Items		tandard archive	anytning that can be es, or JBoss-specific d	e deployed to a server, eployments.	such as WAR, I	EAR, and Eji	ы јак applicatio	ns,
			Common (Configuration 1	Fasks				
	Now	eploymont	reploy and mar	lage applications and	ouner java EE resourc	.05.	24		
	New D	epioyment					* ^		
	Image: Please of the second	se Choose Upload a new d Use this option of Create an unma Use this option of location on the s uploaded to the from their origin unmanaged.	eployment to upload a r inaged deplo to create an server's loca server's dep nal location.	new artifact, such oyment unmanaged depl l file system. Unm oloyment reposito Exploded deployr	as a WAR or EAR oyment, which po hanaged deployme ory; they are deplo ments are support	archive. iints to a ents are not oyed directly ted only as	; /		

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Click the **Choose File** button and navigate to the **<DTS_HOME>**\lib folder.





Select a Driver .jar file for the database as given below.

•	Note: For	Oracle 12c see	Oracle	12c PGA	AGGREGATE_	LIMIT

Database	Driver
Oracle	ojdbc7-
12c	4.1.jar
MS SQL	mssql-jdbc-
Server	9.4.1.jre8.jar
2016	
MS SQL	mssql-jdbc-
Server	9.4.1.jre8.jar
2019	
MySQL	mysql-
8	connector-
	java-
	8.0.29.jar
MySQL	mysql-
5.6	connector-
	java-
	8.0.29.jar

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New Deployment		2 ⁸ X
Verify Upload		N
Name_:	ojdbc7.jar	Need Help?
Runtime Name *:	ojdbc7.jar	
Enable <u>*</u> :	2	
Required fields are	marked with an asterisk (*).	
	Cancel « Back	Finish

//,

Ensure the **Enable** box is checked, and click "Finish".

Verify the presence of the .jar deployment by seeing it on the list on the left of the "Deployments" page, and the confirmation message from WildFly.

Wild Fly		
Home Deployment	s Configura	
Deployment	Add	Messages: 1
Q Deployment is enabled ojdbc7.jar		ojdbc7.jar successfully deploy Clear

I.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 default "dts4" used as an example in this documentation*)

uocument	<i>mon</i>).		
Database	User	Password	Connection URL
Oracle	dts4	dts4	jdbc:oracle:thin:@localhost:1521:ORCL
MS SQL	dts4	dts4	jdbc:sqlserver://localhost:1433;databasename=dts4
Server			
MySQL	dts4	dts4	jdbc:mysql://localhost:3306/dts4

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



Define a datasource to be used by deployed applications. The proper JDBC driver must be deployed and registered.

- 1. Select the Datasources subsystem
- 2. Add an XA or non-XA datasource
- 3. Use the 'Create Datasource' wizard to configure the datasource settings

Select the "Subsystems" tab. Under the "Subsystems" column, select the "Datasources" tab.

Home Deployments	Configuration	Runtime	Access Control	Patch	ning	
Configuration	Su	bsystem (28)		Тур	e	
Subsystems	, Q			No	n-XA	>
Interfaces	JC	Ą		Â		>
Socket Binding	Da	itasources	>			
Paths	Re	source Adapters	; >			
System Properties	M	ail	>			

The ApelonDtsDS datasource should be created as a non-cross-application datasource. Select the "Non-XA" Type, and then the blue "Add" button to proceed.

Туре	Datasource Add
Non-XA >	ExampleDS
XA	

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

Create Datasource	2 ×
Choose Datasource	
Custom	
H2 Datasource	
PostgreSQL Datasource	
MySQL Datasource	
MariaDB Datasource	
Oracle Datasource	
Microsoft SQLServer Datasource	
IBM DB2 Datasource	
Sybase Datasource	
Cancel « Back N	ext »

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"

Create Datasou	irce	2 ×
Step 1/3: Da	tasource Attributes	
	Need	i Help?
Name *:	ApelonDtsDS	
JNDI Name:	java:jboss/datasources/ApelonDtsDS	
Required fields	are marked with an asterisk (*).	ext >>
		1.

In the next window, select "Detected Driver" and choose the database driver you added to WildFly in the previous step, and hit "next".

Create Datasource

Step 2/3: JDBC Driver

Select one of the installed JDBC drivers. If you do not see your driver, make sure that it is deployed as a module and properly registered.

2 ×

Specify Driver	Detected Driver		
	Name		
ojdbc7.jar			
h2			
			> >>
	Cancel	Gack Gack	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.

Database	User	Password	Connection URL
Oracle	dts4	dts4	jdbc:oracle:thin:@localhost:1521:ORCL
MS SQL	dts4	dts4	jdbc:sqlserver://localhost:1433;databasename=dts4
Server			
MySQL	dts4	dts4	jdbc:mysql://localhost:3306/dts4

Create Datasource	2	×
Step 3/3: Conne	ction Settings	
	Need Help?	
Connection URL:	jdbc:oracle:thin:@localhost:1521:ORCL	
Username:	dts4	
Password:		
Security Domain:		
Required fields are	marked with an asterisk ($\overset{\star}{}$).	
	Cancel «Back Next»	

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.

//,

Create Datasource		2 ×
Test Connection		
On this page you can test the cor	nection of your da	atasource.
Test Connection		
Cancel	« Back	Next »

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

Create Datasource		2	×
Summary Please verify your se connection by select section and press 'T	ettings. After the datasource is created you can test the ting the datasource in the configuration or runtime est Connection'.		
Name:	ApelonDtsDS		
JNDI Name:	java:jboss/datasources/ApelonDtsDS		
Connection URL:	jdbc:oracle:thin:@localhost:1521:ORCL		
Username:	dts4		
Password:	****		
	Cancel «Back Finis	h	

After clicking "Finish" a message will be displayed indicating the server configuration changed and to reload the server. Click "Reload Server Now".

Message X X Mon Nov 05 16:44:12 GMT-500 2018 Server configuration changed The following servers need to be reloaded:

- Standalone Server

Dismiss Reload Server Now

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 in the "Configuration" tab.

Datasource	Add	
ApelonDtsDS	View -	Apelc
ExampleDS	Remove	
	Disable	
	Test Connect	ion

Ensure the connection test is successful before continuing.

Default timeout:

I.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 Transaction Timeout Default, from the "Configuration" tab select "Subsystems">"Transactions" and click "View".

	Home Dep	oloyments C o	onfigura	tion	Runtime	Access Cor	ntrol
	Configuration			Subsy	stem (28)		
	Subsystems		>	۹			
	Interfaces			JCA			^
	Socket Binding			Datas	ources		>
	Paths			Resou	irce Adapters		>
	System Propert	ies		Mail			>
				Trans	actions	V	iew
Then click "Edi	t" and enter t	he new timeo	out valu	ıe.			
	Transac	tion Mana	ager				
	Configuratio	n for the transa	ction m	anager.			
	Attributes	Process ID	Recov	very	Path	Store	
	🕑 Edit		_				

43200

Then click "Save". The WildFly server must be restarted for the change to take effect.
I.6 Deploy Apelon DTS Server

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



Click the blue "Add" button in the upper left to begin the deployment wizard.

Wild	Ξlγ							
Home	Deployments	Configuration	Runtime /	Access Control	Patching			
Deployn	nent	Add						
Q		D	eploymer	nt				
	· · ·	A o sta	deployment is any indard archives, o	ything that can be o or JBoss-specific de	leployed to a s ployments.	erver, such as WAR	, EAR, and EJB JAR	applications,
On the	e next window	, ensure "Upl	oad a new	deployment	" is selec	ted and clic	k "Next".	
1	New Deployme	nt					*	~ ×
	 Please Choo Upload a Use this o Create an Use this o server's lo deployme deployme 	ISE new deployment option to upload option to create ocal file system. ent repository; t ents are suppor	nt l a new artifa eployment an unmanage Unmanaged hey are depl ted only as u	act, such as a v ged deployme l deployments oyed directly nmanaged.	VAR or EAI nt, which p are not up from their	R archive. points to a loca ploaded to the original locatio	ation on the server's on. Exploded	
Click	on "Choose F	ile" to naviga	te to the	Cancel		K Back	Next »	
CHUK		ne to naviga						

<DTS_HOME>\server\wildfly\standalone\deployments directory and select

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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).

<u>NOTE</u>: 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\

	New Deployme	ent	2 ×	
	Upload Dep Please choose a Choose File	bloyment a file that you want to deploy. dtsjbosswildfly.ear		
	Cancel	« Back N	ext >>	
In the next window en	nsure the "Enable"	check box is checked	and then click	"Finish".
	New Deployment		2 ×	
	Verify Upload		Need Help?	
	Name:	dtsjbosswildfly.ear		
	Runtime Name:	dtsjbosswildfly.ear		
	Enable <u>*</u> :			
	Required fields are	marked with an asterisk (*).	
	Cance	(Back	Finish	
			1.	;
WildFly will report th ** IMPORTANT **	hat the deployment	t is in process.		

In the case of upgrading an earlier DTS schema version, Do Not Restart WildFly 12 until

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the Deployment has completely finished and you have verified that the Database Schema is fully deployed to the correct version (See section: <u>Upgrade Apelon DTS 4.7.0 - 4.7.2</u> <u>WildFly 12 Server & schema to DTS 4.8.0</u>). Once the correct schema version is verified, SHUT DOWN and RESTART the WildFly server to ensure the changes are integrated.

I.7 Verify DTS Browser & Editor connections to WildFly 12 DTS Server

I.7.1 Verify the DTS Browser

You can access the DTS Browser from: <u>http://localhost:8080/dtsserverws</u>. To login to the DTS Browser, you will need to enter user credentials created in the <u>WildFly 12 Configuration for Apelon DTS Server</u> section.

Note: If you used the example users defined in the guide, the credentials would be either **dtsadminuser/dtsadmin** or **dtsuser/dts**.

Apelon DTS Browser	and the second sec
rowser	
List Concepts By: Name 🗸	Concept Term Namespace Subset
amespace: SNOMED CT 🗸	✓ Options
rsion: 2023.06.23AA(Jun 30, 2023 12:00:00 AM) 💙	Current V Refresh
SNOMED CT Concept (SNOMED R1+CTV3) Body structure (body structure) Clinical finding (finding) DatablaeValue Target	Cessation of sedation (procedure)
Determine traces Determine traces Determine traces Determine traces Deservable entity (observable entity) Organism (organism) Pharmaceutical / biologic product (product) Physical force (obvisial force)	ID: 241713 Code: 241713008 Namespace: <u>SNOMED CT</u> (Ontylog, Subscription, Read-Only) Status: ACTIVE Primitive History: ADDED Jan 31, 2004
Physical object (physical object) Procedure (procedure)	
Activation of implant (procedure) Activity of daily living procedures and interventions (procedure) Administrative procedure (procedure)	Synonym : Cessation of sedation (Preferred) (ADDED Jan 31, 2004) * Synonym : Cessation of sedation (procedure) (ADDED Jan 31, 2004) * Synonym : End of sedative administration (ADDED Jan 31, 2004)

I.7.2 Verify the DTS Editor connection

Run the DTS Editor shortcut (DTS Editor) provided by the DTS 4 installation. Connect to the WildFly 12 server by using an **Instance** of '**dtsjboss**' and default **Port** number '**8080**' along with the user credentials created in the <u>WildFly 12 Configuration</u> 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".

🗧 Apelon DT	SEditor 4.8	.0-8113		>
File Help				
🐣 🖶				
	Connec	t Parameters	×	
	Host:	localhost		
	Port:	8080		
	Instance:	dtsjboss		
1	Username:	dtsadminuser		
	Password:	•••••		
	Use the	se values as defaults Auto-connect on start-up		
		Connect Cancel		



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I.8 Setup WildFly 12 and DTS to start as a Windows Service

Follow these steps to get your WildFly 12 server running as a windows service.

1. Copy the **service** directory from **<WILDFLY12_HOME>\docs\contrib\scripts** to **<WILDFLY12_HOME>\bin**

2. Edit service.bat file and set the windows service variables.

e.g.:

set SHORTNAME=DTS4WildFly12 set DISPLAYNAME=DTS4_WildFly12 set DESCRIPTION=DTS4 WildFly12 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 **WILDFLY12_HOME>\bin\service** directory.

8. Issue the command: service.bat install /config standaloneapelondts.xml



If the command return is a success you will be able to manage your WildFly 12 AS from the windows services console.

9. From the Windows Start menu choose Administrative Tools > Services and select the "DTS4_WildFly12" service. Right click and select Properties.

Q			Services
File Action View	Help	▶	
🔍 Services (Local)	Name		Description
	DTS4_WildFly1 Encrypting File Extensible Auth Function Disco Google Update Google Update Group Policy C Health Key and Human Interfa Hyper-V Data E Hyper-V Guest	Start Stop Pause Resume Restart All Tasks Refresh Properties Help	TS4 WildFly12 A rovides the core he Extensible Aut he FDPHOST sen ublishes this con eeps your Googl eeps your Googl he service is resp rovides X.509 cer ctivates and mai rovides a mecha

10. Perform the following:

Set the *Startup type* to **Automatic or Automatic (Delayed Start) Start** the Service.

Click **Apply** Click **OK**

DTS4_WildFly12 Properties (Local Computer)
General Log On Recovery Dependencies
Service name: DTS4Wildfly12
Display name: DTS4_WildFly12
Description: DTS4 WildFly12 Application Server
Path to executable: C:\AppServer\wildfly-12.0.0.Final\bin\service\amd64\wildfly-service.exe //F
Startup type: Automatic 🗸 🗸
Service status: Running Start Stop Pause Resume You can specify the start parameters that apply when you start the service from here. Start parameters:
OK Cancel Apply

11. The "DTS4_WildFly12" service is now Running and set to Automatic.

Name	Description	Status	Startup Type
🙀 DTS4_WildFly12	DTS4 WildFly12 Appli	Running	Automatic

I.9 Setup WildFly 12 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 WildFly 12.

Follow this procedure to configure the service.

- 10. Create a new user which will be used to launch the service. For example: => useradd -r -d /tmp/ jbossas
- 11. The jbossas user needs to have permission to read, write and execute to the path where WildFly 12 was installed. One option to grant this permission is to change the ownership of the WildFly 12 installation folder to the new user that was created. For example:

=> chown -R jbossas /opt/wildfly-12.0.0.Final/

12. Optionally change the group membership of the WildFly 12 installation folder to the newly created user. For example:

```
=> chgrp -R jbossas /opt/wildfly-12.0.0.Final/
```

Alternatively, add the jbossas user to a shared users group, and change the group of the WildFly 12 installation folder to this shared group.

```
13. Copy the "<WildFly 12 Installation>/docs/contrib/scripts/init.d/wildfly.conf"
file to the folder "/etc/default" and rename it to just "wildfly". For example:
    => cp /opt/wildfly-
    12.0.0.Final/docs/contrib/scripts/init.d/wildfly.conf
    /etc/default/wildfly
```

14. 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-12.0.0.Final
# The name of the server config file to use for your Database.
JBOSS_CONFIG=standalone-apelondts.xml
```

- 15. Copy the "<WildFly 12 Installation>/docs/contrib/scripts/init.d/wildfly-initredhat.sh" file to the folder "/etc/init.d" and rename it to "wildfly" => cp /opt/wildfly-12.0.0.Final/docs/contrib/scripts/init.d/wildfly-initredhat.sh /etc/init.d/wildfly
- 16. Modify the file "**WildFly 12 Installation**>/bin/standalone.conf" to specify the Java JVM to use during 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_131
```

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

=> chkconfig wildfly on

18. 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

I.10 Terminating the WildFly 12 Service using taskkill

Stopping the WildFly 12 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:

19. In the Services Window, right-click on the WildFly 12 Service and choose Properties.

20. In the Properties Window, identify the Service Name and copy it.

DTS4_Wil	dFly12 Pi	roperties (L	ocal Computer)	×					
General	Log On	Recovery	Dependencies						
Service	name:	DTS4Wild	Fly12						
Display	name:	DTS4_Wile	dFly12						
Descrip	tion:	DTS4 Wild	dFly12 Application Server	~					
Path to C:\Tool	Path to executable: C:\Tools\wildfly-12.0.0.Final\bin\service\amd64\wildfly-service.exe //RS//I								
Startup	type:	ype: Manual ~							
Service S You car from he Start pa	status: itart n specify t re. arameters:	Stopped Stop he start para	Pause Resume ameters that apply when you start the service	-					
			OK Cancel Appl	y					

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

🔤 Administrator: Command Prompt	
Microsoft Windows [Version 10.0.17134.472] (c) 2018 Microsoft Corporation. All rights reserved.	
C:\WINDOWS\system32>sc queryex DTS4WildFly12	

22. This should produce information about the WildFly 12 Service, including the PID.

23. Type the following in the Command Window: taskkill /pid [PID] /f

💽 Admi	nistrator: Command Prompt			
Microso (c) 201	ft Windows [Version 8 Microsoft Corporat	10 tio).0.17134.472] on. All rights reserved.	
C:\WIND	OWS\system32>sc quer	۰ye	ex DTS4WildFly12	
SERVICE	NAME: DTS4WildFly12	2		
	ТҮРЕ		10 WIN32_OWN_PROCESS	
	STATE		4 RUNNING	
			(STOPPABLE, NOT_PAUSABLE, ACCEPTS_SHUTDOWN)	
	WIN32_EXIT_CODE		0 (0x0)	
	SERVICE_EXIT_CODE		0 (0x0)	
	CHECKPOINT		0x0	
	WAIT_HINT		0x0	
	PID		4496	
	FLAGS			
C:\WIND	OWS∖system32≻taskki]	11	/pid 4496 /f	

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

Administrator: Command Prompt	
Microsoft Windows [Version (c) 2018 Microsoft Corporat	10.0.17134.472] tion. All rights reserved.
C:\WINDOWS\system32>sc quer	yex DTS4WildFly12
SERVICE NAME: DTS4WildFly12	2
ТҮРЕ	: 10 WIN32 OWN PROCESS
STATE	: 4 RUNNING
	(STOPPABLE, NOT_PAUSABLE, ACCEPTS_SHUTDOWN)
WIN32_EXIT_CODE	: 0 (0x0)
SERVICE_EXIT_CODE	: 0 (0x0)
CHECKPOINT	: 0x0
WAIT HINT	: 0x0
PID	: 4496
FLAGS	
C:\WINDOWS\system32>taskki]	ll /pid 4496 /f
SUCCESS: The process with P	PID 4496 has been terminated.
C:\WINDOWS\system32>	

I.11 Upgrade Apelon DTS 4.7.0 - 4.7.2 WildFly 12 Server & schema to DTS 4.8.0

Perform the following steps to upgrade your Apelon DTS 4.7 WildFly 12 schema to Apelon DTS 4.8.0 WildFly 12 (**Note: DTS 4.7.1 and DTS 4.7.2 have the same schema version as DTS 4.8.0**):

- Follow instructions in <u>Section B</u> for installing DTS 4.8.0 on the server to be upgraded.
- Stop the Apelon DTS WildFly 12 service.
- Copy the WildFly 12 configuration file from the DTS 4.8.0 home directory <DTS_HOME>\server\wildfly\standalone\configuration to the <WILDFLY12_HOME>\standalone\configuration folder. Replace the existing file with this new WildFly 12 configuration file.
- Restart the Apelon DTS WildFly 12 service.
- Review the Notes below before continuing to the next steps.
- Follow steps I.4.2(<u>Deploy Database Driver</u>) through I.7(<u>Verify DTS Browser & Editor</u> <u>connections to WildFly 12 DTS Server</u>) to finish configuring the Apelon DTS 4.8.0 WildFly 12 server.
- <u>NOTE1:</u> If upgrading from a DTS 4.7.0 schema to DTS 4.8.0, as instructed in section I.6(Deploy Apelon DTS Server), when deploying the "dtsjbosswildfly.ear" Do NOT shut down or restart the WildFly 12 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 4.8.0 schema version, perform the following steps:

1. View the "server.log" file located in the

- <WILDFLY12_HOME>\standalone\log directory. Search the
 WildFly 12 "server.log" file for the statement:
 - "Schema Upgrade to 4.0.29 complete" for Oracle 12c, SQL Server 2016, or SQL Server 2019.
 - "Schema Upgrade to 4.0.30 complete" for MySQL 5.6 or MySQL 8.
- 2. A second way to determine the schema upgrade was successful is from the DTS 4.8.0 DTS Editor.
 - Connect to the Apelon DTS WildFly 12 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 Oracle 12c, SQL Server 2016, or SQL Server 2019.
 - o "4.0.30" for MySQL 5.6 or MySQL 8.
- **NOTE2 SOL 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

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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.

J. GlassFish 3 Setup

Note: GlassFish 3.1.2.2 12 requires the use of Java 8 JDK. See Java Environment Setup for a <u>Server section above for additional details.</u>

J.1 Install GlassFish

The DTS Server can be installed on the 3.1.2.2 series of the GlassFish Full Platform server. The GlassFish 3.1.2.2 installation package can be obtained from the GlassFish download site: https://javaee.github.io/glassfish/download



Note – the 5.0 and 4.0 GlassFish series are not supported.

Choose to download the "**glassfish-3.1.2.2.zip**" file which can be used for both Windows and Linux installations. You can follow this direct link to the "**glassfish-3.1.2.2.zip**" file: <u>https://download.oracle.com/glassfish/3.1.2.2/release/index.html</u>

←	\rightarrow	С		(j)	https://download.oracle.com/gl	lassfish/3.1.2.2/release/index
---	---------------	---	--	-----	--------------------------------	--------------------------------

Name	Last modified	Size
Parent Directory		-
🧾 <u>javaeeбu4-ri-3.1.2.2-web-aix.zip</u>	Aug 9 2012	49M
<u> ■ javaee6u4-ri-3.1.2.2-aix.zip</u>	Aug 9 2012	86M
javaee6u4-ri-3.1.2.2-web.zip	Aug 6 2012	39M
<u>javaee6u4-ri-3.1.2.2.zip</u>	Aug 6 2012	76M
glassfish-ose-3.1.2.2-docs-pdf.zip	Jul 21 2012	19M
glassfish-lbconfigurator-3.1.2.2.zip	Jul 19 2012	58M
<u>metro-2.2.0.1.zip</u>	Jul 15 2012	47M
glassfish-3.1.2.2.zip	Jul 15 2012	84M
glassfish-3.1.2.2-windows.exe	Jul 15 2012	55M
glassfish-3.1.2.2-windows-ml.exe	Jul 15 2012	64M
glassfish-3.1.2.2-web.zip	Jul 15 2012	46M
📾 olassfish-3-1-2-web-windows exe	Int 15 2012	33M

Just extract the compressed archive. <u>Unzip the "glassfish-3.1.2.2.zip" into a folder with a</u> <u>pathname that does NOT contain any spaces</u>. For example, extracting to the C:\Tools folder will place the GlassFish 3.1.2.2 files in the C:\Tools\glassfish3 folder. We will identify this folder in the rest of the document as <GlassFish_HOME>.

NOTE: Using **Java 8** you will need to make the following additional edits: Modify the **osgi.properties** file located in **...\glassfish3\glassfish\config** Add the following line at the end:

jre-1.8=\${jre-1.7}
Save and close this file.

Launch GlassFish by running this command in a console window: glassfish3\bin\asadmin start-domain Open <u>http://localhost:4848</u> to validate that it is started.

J.2 Install Database Driver

Copy the correct database driver for your installation into the folder <**GlassFish_HOME**>\glassfish3\glassfish\domains\domain1\lib\ext from the **<DTS HOME**>\lib folder.

The driver you need is dependent on the database software that you are using.

- Oracle 12c
 - o ojdbc7-4.1.jar
- Microsoft SQL Server 2016:
 - o mssql-jdbc-9.4.1.jre8.jar
- Microsoft SQL Server 2019:

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- o mssql-jdbc-9.4.1.jre8.jar
- MySQL 8
 - o mysql-connector-java-8.0.29.jar
- MySQL 5.6
 - o mysql-connector-java-5.1.24.jar (<u>NOTE:</u> located in <DTS_HOME>\server\GlassFish\lib\ext)

Restart the GlassFish Server so that the new libraries are available.

glassfish3\bin\asadmin stop-domain glassfish3\bin\asadmin start-domain

J.3 JVM Memory Configuration

In the administrative application available at <u>http://localhost:4848</u> browse to the **Configurations** > **server-config** > **JVM Settings** section.

Make the following changes in the **JVM Options** tab:

- Change MaxPermSize option to 384m (-XXMaxPermSize=384m).
- Change Max heap to 4096m (–Xmx4096m). (see notes below regarding recommended JVM memory allocations.)
- In order for GlassFish to operate in 64 bit mode and utilize a memory limit higher than 2048m, you must also add a new JVM Option of '-D64'.
- Click Save.

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.

Tree C	JVM	Options				
🔻 🔛 Resources	Manage	• JVM options for the server. Values containing one or more spaces must be enclosed in double quotes (" <i>value string</i> ").				
✓ □ JDBC ► □ JDBC Resources	BC Resources					
 	Optic	ons (29) Add JVM Option Delete				
TimerPool		Value				
► 🔒 Connectors		-Djava.awt.headless=true				
Resource Adapter Configs		-Xmx3096m				
F 🛃 JMS Resources		-Djava.security.policy=\$(com.sun.aas.instanceRoot)/config/server.policy				
- JavaMail Sessions		-Dfelix.fileinstall.disableConfigSave=false				
► SINDI		-Dosgi.shell.telnet.maxconn=1				
Configurations		-XX:NewRatio=2				
- Deraut-coning		-Dfelix.fileinstall.poll=5000				
VM Settings		Djava.endorsed.dirs=\$(com.sun.aas.installRoot)/modules/endorsed\$(path.separator)\$(com.sun.aas.installRoot)/lib/endorsed				
- The Logger Settings		-Dosgi.shell.telnet.port=6666				
- 📇 Web Container		$- D com. sun. enterprise. config. config_environment_factory_class=com. sun. enterprise. config. server beans. Apps erver ConfigEnvironment_factory_class=com. sun. enterprise. config. server beans. Apps erver ConfigEnvironment_factory_class=com. sun. enterprise. config. server beans. Apps erver ConfigEnvironment_factory_class=com. server beans_factory_class=com. server_factory_class=com. server beans_factory_class=com. server$				
- 🗃 EJB Container		Djava.ext.dirs=\${com.sun.aas.javaRoot}/lib/ext\${path.separator}\${com.sun.aas.javaRoot}/jre/lib/ext\${path.separator}\${com.sur				
🕨 对 Java Message Service		-XX:PermSize=64m				
Security		-Dgosh.args=nointeractive				
Transaction Service		-Djavax.management.builder.initial=com.sun.enterprise.v3.admin.AppServerMBeanServerBuilder				
► 🧙 HTTP Service		-Dcom. sun.enterprise.security.httpsOutboundKeyAlias=s1as				
► 👰 Virtual Servers		-XX:MaxPermSize=384m				
🕨 🧙 Network Config		-XX:+UnlockDiagnosticVMOntions				
Thread Pools		-Dfelix fileinstall hundles startTransient=true				
RB 🔋 🖉						
📕 🔚 Admin Service 🚽						

J.4 Oracle 12c JVM Hibernate Dialect

If using **Oracle 12c** as the database connection then add the following hibernate dialect parameter to the GlassFish JVM Options.

In the administrative application browse to the **Configurations** > **server-config** > **JVM Settings** section.

Add and Save the following hibernate dialect parameter in the **JVM Options** tab:

-Dhibernate.dialect=org.hibernate.dialect.Oracle10gDialect

Tree <	_					
	General	Path Settings	JVM Options	Profiler		
Common lasks	D/04 0-4					
– 📀 Domain		lions				
– 📄 server (Admin Server)	Manage JVM	options for the serve	r. Values containin	g one or more spac		
- 😤 Clusters	Configuration Name: server-config					
– 🗐 Standalone Instances	3 3					
🕨 🖳 Nodes	Ontions (3)	1)				
Applications		Add JVM Option	Delete			
– 🛟 Lifecycle Modules						
– 🛃 Monitoring Data	Value					
🔻 🎦 Resources	U -Xmx309	96m				
▶ 📄 JDBC	Djava.a	wt.headless=true				
🕨 👸 Connectors	Djava.s	ecurity.policy=\${con	n.sun.aas.instance	Root}/config/server.		
– 👸 Resource Adapter Configs	Dosgi.s	shell.telnet.maxconn	=1			
🕨 🧊 JMS Resources	Dfelix.fi	ileinstall.disableConf	igSave=false			
– 🖂 JavaMail Sessions	Dfelix.fi	ileinstall.poll=5000				
🕨 🛄 JNDI	-XX:New	/Ratio=2				
🔻 📑 Configurations	Diava.e	ndorsed.dirs=\${com	.sun.aas.installRo	ot}/modules/endors		
► 📑 default-config	-Dosai s	shell teinet port=6666	3	,		
▼ 📑 server-config	-Dcom	sun enternrise config	- config environmer	nt factory class=cr		
– 👲 J∨M Settings	-Diava e	vt dire=©com eun a	as javaDootVlib/ev	t§(nath canarator)\$		
- 🖟 Logger Settings			as.javar.ootpiib/ex	τψ(path.separator)ψ		
– 🔠 Web Container	-xx:Perr	nSize=64m				
– 🔠 EJB Container	U -Dgosh.	args=nointeractive				
🕨 🚅 Java Message Service	Dhiberr	nate.dialect=org.hibe	rnate.dialect.Oracl	e10gDialect		
🕨 🔒 Security	Djavax.	management.builder	r.initial=com.sun.e	nterprise.v3.admin./		

• <u>Note:</u> For Oracle 12c see <u>Oracle 12c PGA_AGGREGATE_LIMIT</u>

J.5 Configure Database Connection Pool

The next step is to configure the database connection by creating a JDBC Connection Pool. Navigate to **Resources > JDBC > JDBC Connection Pools**

Home About							Help
User: admin Domain: domain1 Serve	er: localhost						
GlassFish [™] Server Open Sou	rce Edition						
8							
Tree <		4	i - B I-				
💷 Common Tasks	To store, organize	nect e, and	ION POOIS retrieve data, most applica augh the JDBC ADL Befor	tion	s use relational databases. Java EE applicat	ions a	ccess
Domain server (Admin Server)		es tilli	agn the 3000 AFT. Delot	e an	application can access a database, it must	yerat	connection.
- Clusters	Pools (2)						
E Standalone Instances	EV E New		elete	_	1		
Applications	Pool Name	t.	Resource Type	14	Classname	tų.	Description
Applications Applications	DerbyPool		javax.sql.DataSource		org.apache.derby.jdbc.ClientDataSource		
- Monitoring Data	LTimerPool		javax.sql.XADataSource		org.apache.derby.jdbc.EmbeddedXADataS	ource	
► DBC Resources							
JDBC Connection Pools							
 DerbγPool							
► 🔒 Connectors							
– 🔒 Resource Adapter Configs							
🕨 🚅 JMS Resources							
– 🖂 JavaMail Sessions							
► 🚔 JNDI							
🔻 📑 Configurations							
🕨 📑 default-config							
server-config							
localhost:4848/common/index.jsf#							

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Click the **New** button, and create a new Pool named "**ApelonDTSPool**" with a Resource Type of **javax.sql.DataSource.** Next choose the **Database Driver Vendor.**

Home About		Help
User: admin Domain: domain1 Serve	er: localhost	
GlassFish [™] Server Open Sou	rce Edition	
€		
Tree <		tion Bool (Chan 4 of 2)
Common Tasks	New JDBC Connec	Ction Pool (Step 1 of 2)
Domain	Identify the general settings to	r the connection pool. * Indicates required field
- Server (Admin Server)	General Settings	
- Re Clusters		
– 🗐 Standalone Instances	Pool Name: *	ApelonDTSPool
▶ 🖪 Nodes	Resource Type:	javax.sql.DataSource
- Applications		Must be specified if the datasource class implements more than 1 of the interface.
- 🛟 Lifecycle Modules	Database Driver Vendor:	MicrosoftSqlServer
- 🛃 Monitoring Data		
🔻 🍟 Resources		Select or enter a database driver vendor
	Introspect:	🗹 Enabled
► DBC Resources		If enabled, data source or driver implementation class names will enable introspection
JDBC Connection Pools DerbuBack		introspection.
Connectors		
Resource Adapter Configs		
▶ 📑 JMS Resources		
JavaMail Sessions		
🕨 💼 JNDI		
🔻 📑 Configurations		
► 📑 default-config		
► 📑 server-config		
📔 🗆 🎯 Update Tool		

Click **Next**, and then specify the SQL connection information. This will vary depending on the database you are using.

- Microsoft SQL Server:
 - Datasource Classname: com.microsoft.sqlserver.jdbc.
 SQLServerConnectionPoolDataSource
 - Additional Properties
 - portNumber: 1433
 - databaseName: dts4
 - user: dts4
 - password: dts4
 - serverName: localhost
- Oracle 12c:
 - o Datasource Classname: oracle.jdbc.pool.OracleDataSource
 - Additional Properties
 - url:jdbc:oracle:thin:@[Host]:[Port]:[Database]
 - e.g. url: jdbc:oracle:thin:@localhost:1521:orcl
 - user: dts4

- password: dts4
- for MySQL 5.6:
 - Datasource Classname:
 - com.mysql.jdbc.jdbc2.optional.MysqlDataSource
 - Additional Properties
 - user: dts4
 - password: dts4
 - **URL:** jdbc:mysql://[Host]:[Port]/[Database]
 - e.g. URL: jdbc:mysql://localhost:3306/dts4
- for MySQL 8:
 - o Datasource Classname: com.mysql.cj.jdbc.MysqlDataSource
 - Additional Properties
 - user: dts4
 - password: dts4
 - UseSSL: false
 - **URL:** jdbc:mysql://[Host]:[Port]/[Database]
 - e.g. URL: jdbc:mysql://localhost:3306/dts4

Note: There is a bug in the GlassFish 'Introspect' feature for the MySQL driver – it creates the URL property with the name of 'Url' which is incorrect, and will not work. Ensure that your URL parameter name is 'URL' (all uppercase). If a 'Url' property is present it MUST BE DELETED otherwise the existence of this property will cause connection to the DTS 4 Browser to fail.

When the configuration is complete, select the newly created **ApelonDTSPool**, and click the **Ping** button to verify the connection.

DTS 4.8.0 – Installation Guide

Home About User: admin Domain: domain1 Serv	er: localhost	Help	
GlassFish [™] Server Open Sou	rce Edition		
ø			
	1		•
💷 Common Tasks	General Advanced	Additional Properties	Ē
- 🚱 Domain	Ping Succeed	ded	
– 📄 server (Admin Server)			
Clusters	Edit JDBC Conne	ction Pool Save Cancel	
Standalone Instances	Modify an existing JDBC con	nnection pool. A JDBC connection pool is a group of reusable connections for a particular database.	
Nodes Applications	Load Defaults Flush F	Ping	
- Applications		* Indicates required field	
- Monitoring Data	General Settings		
▼ ≧ Resources	Pool Name:	ApelonDTSPool	
🔻 📄 JDBC	Resource Type:	iavax.sol.DataSource	
IDBC Resources		Must be specified if the datasource class implements more than 1 of the interface.	
▼ ☐ JDBC Connection Pools	Datasource Classname:	com.microsoft.sglserver.idbc.SQLServerConnectionPoolDataS	
- ApelonDTSPool		Vendor-specific classname that implements the DataSource and/or XADataSource APIs	
DerbyPool	Driver Classname:		
		Vendor-specific classname that implements the java.sql.Driver interface.	_
- B Resource Adapter Configs	Ping:	🗖 Enabled	
► ➡ JMS Resources		When enabled, the pool is pinged during creation or reconfiguration to identify and warn of any erroneous values for its attributes	
JavaMail Sessions	Description:		
🕨 👝 JNDI			
🔻 📑 Configurations	Pool Settings		
default-config	Initial and Minimum Pou	ool Size: a	
► ■ server-config		Minimum and initial number of connections maintained in the pool	
– 💕 Update Tool	Maximum Pool Size:	32 Connections	-
	•		Ć

J.6 Configure a JDBC Resource

Navigate to **Resources > JDBC > JDBCResources** and click the **New** button as shown below.

Home About						Help
User: admin Domain: domain1 Serv	er: localhost					
GlassFish [™] Server Open Sou	irce Edition					
۶						
Tree <						
🔲 Common Tasks	JDBC Resources provide appl	cations with a means to con	nect to a datab	ase.		
- 🎯 Domain						
Server (Admin Server)	Resources (2)					
- Standalone Instances	😂 🗄 New Delete	Enable Disable				
► R Nodes	JNDI Name	🔩 Enabled	tų.	Connection Pool	±.	Description
Applications	Jdbc/TimerPool	✓		TimerPool		
- 🖧 Lifecycle Modules	D jdbc/default	✓		DerbyPool		
- Monitoring Data						
🔻 🍟 Resources						
🔻 📄 JDBC						
JDBC Resources						
IDBC Connection Pools						
🕨 👸 Connectors						
– 🔒 Resource Adapter Configs						
🕨 🚅 JMS Resources						
JavaMail Sessions						
► 🛄 JNDI						
Configurations						
erault-config						
Server-config						

Create a new JDBC Resource named "datasources/ApelonDtsDS" as shown in the next screen. Connect it to the ApelonDTSPool in the Pool Name dropdown. Click OK.

This datasource is referenced by the dtsserverejb persistence.xml file which is embedded in the DTS application.



J.7 GlassFish User Configuration for DTS Server

The first step for configuration of DTS Server users is to navigate to **Configurations > server-config > Security > Realms > file**

On the Edit Realms page, click the Manage Users button.



To create a new user, click the **New** button.

<	File Lleere	
Ionitoring Data		
esources	wanage user accounts for the curre	entiy selected security realm.
onfigurations		
) default-config	Configuration Name: server-co	nfig
] server-config		
🥧 JVM Settings	Realm Name: file	
👼 Logger Settings		
🗃 Web Container	File Users (N)	
🗃 EJB Container	New Delete	
对 Java Message Service		Correct List
🔒 Security		Group List:
🖣 📄 Realms	No items found.	
🗕 🔒 admin-realm		
- 🔒 certificate		

J.7.1 GlassFish DTS Admin User Configuration

This is a *DTS admin user* example. You must grant a user with the *apelondtsadmin* role for every KB admin user/modeler that will connect to the Apelon DTS Server via either the DTS Browser or DTS Editor and *requires* the authority to access the *DTS Editor User Manager* to manage *DTS User Roles and Permissions* in the DTS Server. The user should also be granted the role **apelondts**.

Create a new user and make the user a member of the Group List "*apelondtsadmin:apelondts*", as shown below.

New File Realm Us	er OK Cancel
Create new user accounts for	the currently selected security realm.
	" Indicates required field
Configuration Name: serv	rer-config
Realm Name:	île
User ID: *	dtsadminuser
	Name can be up to 255 characters, must contain only alphanumeric, underscore, dash, or dot characters
Group List:	apelondtsadmin:apelondts
	Separate multiple groups with colon
New Password:	
Confirm New Password:	

Click **OK** to complete the user creation.

J.7.2 GlassFish DTS User Configuration

This is a general *DTS user* example. You must create a user with the *apelondts* role for every general DTS user/modeler who will connect to the Apelon DTS Server via either the DTS Browser or DTS Editor and *does not require* the authority to access the *DTS Editor User Manager*.

Create a new user, and make the user a member of the Group List "*apelondts*", as shown below.

New File Realm User

OK Cancel

Create new user accounts for the currently selected security realm.

* Indicates required field

Configuration	Name:	server-config
---------------	-------	---------------

Realm Name:	file					
User ID: *	dtsuser					
	Name can be up to 255 characters, must contain only alphanumeric, underscore, dash, or dot characters					
Group List:	apelondts					
	Separate multiple groups with colon					
New Password:						
Confirm New Password:						

J.7.3 GlassFish DTS User List

By navigating to **Configurations > server-config > Security > Realms > file** and clicking the **Manage Users** button on the **Edit Realm** page, you will see the user/group list.

F	File Users		
M	Manage user accounts for the currently selected security realm.		
	Configuration Name: server-config		
	Realm Name: file		
Ei	la lleare (2)		
Ne	w Delete		
	User ID	Group List:	
	dteadminuear	apelondtsadmin	
	utsaummuser	apelondts	
	dtsuser	apelondts	

J.7.4 Securing the GlassFish Adminstration GUI

By default, the GlassFish Administration tool does not require a user name or password if you are connecting from the system where it is installed. To set a password, browse to **Configurations > server-config > Security > Realms > admin-realm** and click the **Manage Users** button.

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Click on the user admin, set a password for the user, and click Save. The GlassFish administration GUI will now require these credentials.

J.8 Install the DTS Application

Navigate to the **Applications** node, and click the **Deploy** button. Select the dtsgf.ear file from the <DTS_HOME>\server\GlassFish\standalone\deployments\ folder. **NOTE:** For **SQL Server** a dtsgf.ear file that is specific to SQL Server must be used.

• For a DTS 4 Windows install the SQL Server specific dtsgf.ear file is in the following location:

<DTS_HOME>\server\GlassFish\standalone\deployments\sqlserver\

← → C 🗋 localhost:4848/common/index.jsf	◎ ☆ =
Home About User: admin Domain: domain1 Server: localhost GlassFish [™] Server Open Source Edition	Help
8	
Tree Common Tasks Deploy App Specify the location	ications or Modules OK Cancel of the application or module to deploy. An application can be in a packaged file or specified as a directory.
Oomain Server (Admin Server) Location: Clusters Standalone Instances	* Indicates required field Packaged File to Be Uploaded to the Server Choose File dtsgf.ear
Rodes Applications Lifecycle Modules	Local Packaged File or Directory That Is Accessible from GlassFish Server Browse Files Browse Folders Browse Folders
■ Monitoring Data ■ Persources ■ ■ JDBC	prise Application 💌
▶ A Connectors Application Nation	me: * dtsgf
Configurations Status: default-config	Enabled Allows users to access the application.
▶ ■ Server-config Java Web Star	Enabled Specifies whether Java Web Start access is permitted for an application client module. Ps: Precompiles JSP pages during deployment.

The default values for all of the fields should be acceptable. Click **OK**. Wait for application deployment to finish.

NOTE: If performing a schema upgrade, Do NOT shut down or restart the GlassFish service while the schema is being upgraded (for more information see section: <u>Upgrade</u> <u>Apelon DTS 4.7.0 - 4.7.2 GlassFish Server & schema to DTS 4.8.0</u>). SHUT DOWN and RESTART the GlassFish service to ensure the changes are integrated.

J.9 Verify the DTS Application

Navigate to <u>http://localhost:8080/dtsserverws</u> to validate that the DTS Browser launches.

owser		Contraction of the second					
List Conce	epts By: Name 🗸	▲ Cor	ncept	Term	Namespace	Subset	
mespace:	SNOMED CT V		Option	8			
rsion:	2023.06.23AA(Jun 30, 2023 12:00:00 AM) 💙		Current	~	Defrach		
2 4 + 1 6 4 + 2 6 4 + 2 6 4 + 1 6 +	Clinical finding (finding) DataHasValue Target Environment or geographical location (environment / location) Event (event) Diservable entity (observable entity) Organism (organism) Pharmaceutical / biologic product (product)	III C M S F F	Cessa ID: Code: Namespa Status: Primitive History:	2: 2: ce: <u>S</u> A	41713 41713008 NOMED CT. (C CTIVE DDED Jan 31, 3	on (prod	cedure) scription, Read-Only)
+ 0 E	Physical force (physical force) Physical object (physical object)		⊌ Syn	onym	ıs (3)		
	<u> rocedure (procedure)</u> <u> Activity of daily living procedure)</u> <u> Activity of daily living procedures and interventions (procedure)</u> <u> Administrative procedure (procedure)</u>		* Syr * Syr * Syr	ionyn ionyn	n : <u>Cessation o</u> n : <u>Cessation o</u> n : <u>End of seda</u>	f sedation () f sedation (p tive adminis	Preferred) (ADDED Jan 31, 2004) rocedure) (ADDED Jan 31, 2004) tration (ADDED Jan 31, 2004)

When connecting the DTS Editor to the GlassFish server – use an **Instance** of '**dtsgf**' and **Port** number **3700** along with the appropriate credentials created in the above <u>GlassFish User</u> <u>Configuration for DTS Server</u> section.

Note: If you used the example users defined in this guide the credentials would be either **dtsadminuser/dtsadmin** or **dtsuser/dts**.

Apelon DISEdito	or 4.8.0-8113 - Default I	DTS Layout —	
File Tools Options	Help		
🐣 🖶 🖧	1 X 12 A A	x ■ 9 4 */ ● 吨 吨 11 ■	
Tree Walker Seard	h	Details	
Namespace:		Concept Term Namespace Subset Author	rity
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View Axis:	Superconcepts / Subcon	ncepts ~	
Focus Concept:		✓	
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	Connect Host: Port: Instance: Username: Password: Use the	ct Parameters localhost 3700 dtsgf dtsadminuser itese values as defaults Auto-connect on start-up Connect Cancel	01-Aug-2023

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Troubleshooting DTS Editor Connectivity Issues

There is a known issue when GlassFish is installed on a Linux server where the DTS Editor client may hang during the connection process to the server.

Note – this bug only impacts GlassFish installations on Linux. Windows installations are not affected.

This occurs because the GlassFish server is not identifying the correct IP address of the server where it is installed and sends the wrong address to the client during the connection sequence.

To test to see if your Linux GlassFish installation is likely to be impacted by this bug, run the following command:

[root@server]# resolveip `hostname` IP address of server is 127.0.0.1 [root@server]#

Ideally, this command will return the external IP address of your server. If it does not (instead returning a local address such as 127.0.0.1) you will need to change the network configuration on the server.

One way to do this is to place the external IP address into your /etc/hosts file.

If your /etc/hosts file looks like this:

127.0.0.1 localhost localhost.localdomain localhost4 localhost4.localdomain4 server

Replace the 127.0.0.1 address at the beginning of the line with the external IP address of the system:

192.168.0.72 localhost localhost.localdomain localhost4 localhost4.localdomain4 server

The hostname command should now return the external IP address of the server:

[root@server]# resolveip `hostname` IP address of server is 192.168.0.72 [root@server]#

The DTS Editor client will now connect to the server properly.

J.10 GlassFish DTS Client Timeouts

When the DTS Editor connects to a GlassFish DTS server, there is limit of 2 hours on any single long-running operation. Normally, this limit is long enough – but depending on the hardware and number of terminologies installed – users may find the need to lengthen this value. Long running operations such as classification have the highest likelihood of reaching the default timeout value.

The timeout value is specified in milliseconds – the default value is 7200000. This is the equivalent of 2 hours: 2 hours * 60 minutes * 60 seconds * 1000 milliseconds = 7200000

This value is entered in the startup script for the DTS Editor.

J.10.1 Increasing the timeout value on Windows Edit the following 2 files which are part of the DTS Editor installation:

<DTS_HOME>\bin\ajwc.bat <DTS_HOME>\bin\ajc.bat

Calculate the new timeout value as shown above, and then edit the following lines with the new value:

rem GlassFish Client Timeout (in milliseconds) - 2 hours by default set CLIENT_TIMEOUT=com.sun.corba.ee.transport.ORBWaitForResponseTimeout=7200000

J.10.2 Increasing the timeout value on Linux

Edit the following file which is part of the DTS Editor installation:

*<DTS_HOME>/*bin/shell_functions

Calculate the new timeout value as shown above, and then edit the following lines with the new value:

#GlassFish Client Timeout (in milliseconds) - 2 hours by default CLIENT_TIMEOUT=com.sun.corba.ee.transport.ORBWaitForResponseTimeout=7200000

J.11 Setup GlassFish and DTS to start as a Windows Service

To install GlassFish DTS as a service on windows, you can use the service creation tools that are included with GlassFish. Follow the steps below to create a service launching script.

- Open the file <GlassFish_HOME>\glassfish3\glassfish\config\asenv.bat in a text file editor.
- 2. Add an appropriate "AS_JAVA" variable to the end of the file so that GlassFish starts with the correct Java JVM. For example:

```
REM The location of the Java 1.8 installation on this system
SET AS_JAVA=C:\Program Files\Java\jdk1.8.0_351
```

- 3. In a command console window, navigate to the folder that contains your glassfish installation.
- 4. Execute the command:

```
=> glassfish3\bin\asadmin create-service
```

```
C:\glassfish-3.1.2.2>glassfish3\bin\asadmin create-service

The Windows Service was created successfully. It is ready to be started. Here are t

he details:

ID of the service: domain1

Display Name of the service:domain1 GlassFish Server

Server Directory: C:\glassfish-3.1.2.2\glassfish3\glassfish\domains\domain1

Configuration file for Windows Services Wrapper: C:\glassfish-3.1.2.2\glassfish3\glass

sfish\domains\domain1\bin\domain1Service.xml

The service can be controlled using the Windows Services Manager or you can use the

Windows Services Wrapper instead:

Start Command: C:\glassfish-3.1.2.2\glassfish3\glassfish\domains\domain1\bin\domain1

Service.exe start

Stop Command: C:\glassfish-3.1.2.2\glassfish3\glassfish\domains\domain1\bin\domain1

Service.exe restart

Uninstall Command: C:\glassfish-3.1.2.2\glassfish3\glassfish\domains\domain1\bin\domain1

Install Command: C:\glassfish-3.1.2.2\glassfish3\glassfish\domains\domain1\bin\domain1

Service.exe install

Install Command: C:\glassfish-3.1.2.2\glassfish3\glassfish\domains\domain1\bin\domain1

Service.exe install

Status Command: C:\glassfish-3.1.2.2\glassfish3\glassfish\domains\domain1\bin\domain1

Service.exe status

You can also verify that the service is installed (or not) with sc query state= all

windows.service.uninstall.good=Found the Windows Service and successfully uninstalled

d it.

For your convenience this message has also been saved to this file: C:\glassfish-3.1.2.2\glassfish-3.1.2.2

C:\glassfish-3.1.2.2.>
```

5. Open the Windows Service tool – from the Start Menu Administrative Tools > Services Locate the service "domain1 GlassFish Server"

🖏 Services						_0_	×
File Action View	Help						
	à 📑 📘 🖬 🕨 🔲 II ID						
Services (Local)	🔅 Services (Local)	,					
	domain1 GlassFish Server	Name 🔺	Description	Status	Startup Type	Log On As	
		Certificate Propagation	Propagates certific		Manual	Local System	_
	Start the service	CNG Key Isolation	The CNG key isolati		Manual	Local System	
		🔅 COM+ Event System	Supports System E	Started	Automatic	Local Service	
	Description:	COM + System Application	Manages the config		Manual	Local System	
	GlassFish Server	🔍 Computer Browser	Maintains an updat		Disabled	Local System	
		🔍 Cryptographic Services	Provides four mana	Started	Automatic	Network S	
		🔍 DCOM Server Process Launcher	Provides launch fun	Started	Automatic	Local System	-
		🔍 Desktop Window Manager Session Ma	Provides Desktop	Started	Automatic	Local System	
		🔍 DHCP Client	Registers and upda	Started	Automatic	Local Service	
		🔍 Diagnostic Policy Service	The Diagnostic Polic	Started	Automatic	Local Service	
		🔍 Diagnostic Service Host	The Diagnostic Ser		Manual	Local Service	
		🔍 Diagnostic System Host	The Diagnostic Syst	Started	Manual	Local System	
		🌼 Distributed Link Tracking Client	Maintains links bet	Started	Automatic	Local System	
		🔍 Distributed Transaction Coordinator	Coordinates transa	Started	Automatic (Delayed	Network S	
		🔍 DNS Client	The DNS Client ser	Started	Automatic	Network S	
		🔍 domain 1 GlassFish Server	GlassFish Server		Automatic	Local System	
		🔍 Extensible Authentication Protocol	The Extensible Aut		Manual	Local System	
		Function Discovery Provider Host	Host process for Fu		Manual	Local Service	
		Supervision Resource Publication	Publishes this comp		Manual	Local Service	
		🔍 Group Policy Client	The service is resp	Started	Automatic	Local System	
		G Health Key and Certificate Management	Provides X.509 cert		Manual	Local System	
		🥋 Human Interface Device Access	Enables generic inp		Manual	Local System	
		🔍 IKE and AuthIP IPsec Keying Modules	The IKEEXT service	Started	Automatic	Local System	
		🥋 Interactive Services Detection	Enables user notific		Manual	Local System	•
	Extended Standard						

6. Right click on the service and click on the properties option. Verify that the service is set to start automatically. The service can be manually started or stopped from this dialog.

domain1 GlassFish	Server Properties (Local Computer)	×		
General Log On	Recovery Dependencies	_		
Service name:	domain1			
Display name:	domain1 GlassFish Server			
Description:	GlassFish Server			
Path to executabl C:\glassfish3\glas	e: sfish\domains\domain1\bin\domain1Service.exe			
Startup type:	Automatic			
Help me configure service startup options.				
Service status:	Stopped			
Start	Stop Pause Resume			
You can specify the from here.	he start parameters that apply when you start the service			
Start parameters:				
	OK Cancel Apply			

- By default, the log file for the server console will be written to
 <GlassFish_HOME>glassfish3\glassfish\domain1\logs\server.log
- 8. For advanced service configuration options, run the command => glassfish3\bin\asadmin create-service --help or view the official documentation.

J.12 Setup GlassFish and DTS to start as a Linux Service

To install GlassFish DTS as a daemon service on Linux, you can use the service creation tools that are included with GlassFish. Follow the steps below to create a service launching script.

- Open the file <GlassFish_HOME>/glassfish3/glassfish/config/asenv.conf in a text file editor.
- 2. Add an appropriate "AS_JAVA" variable to the end of the file so that GlassFish starts with the correct Java JVM. For example:

```
#The location of the Java 1.8 installation on this
system
AS_JAVA=/opt/java/jdk1.8.0_351
```

- 3. Navigate to the folder that contains your glassfish installation.
- 4. Execute the command:

```
=> glassfish3/bin/asadmin create-service
```



5. The server is now configured to automatically start and stop with the system. To manually start the server, execute: => /etc/init.d/GlassFish_domain1 start

To manually stop the server, execute:

=> /etc/init.d/GlassFish domain1 stop

- 6. By default, the log file for the server console will be written to **glassfish3/glassfish/domains/domain1/logs/server.log**
- For advanced service configuration options, run the command
 => glassfish3/bin/asadmin create-service --help
 or view the official documentation.
J.13 Upgrade Apelon DTS 4.7.0 - 4.7.2 GlassFish Server & schema to DTS 4.8.0

Perform the following steps to upgrade your Apelon DTS 4.7 GlassFish server and schema to Apelon DTS 4.8.0 GlassFish (**Note: DTS 4.7.1 and DTS 4.7.2 have the same schema version as DTS 4.8.0**):

- Follow instructions in <u>Section B</u> for installing DTS 4.8.0 on the server to be upgraded.
- Ensure you are using the most up-to-date database driver for GlassFish. Refer to <u>step H.2</u> for instructions on installing the correct database driver for your GlassFish installation.
- Ensure your Apelon DTS GlassFish service is started.
- Start you GlassFish administrative application available at <u>http://localhost:4848</u> and navigate to the **Applications** node.
- Check the "dtsgf" Application and click on the **Undeploy** button.

Home About						
User: admin Domain: domain1 Server: localhost						
GlassFish [™] Server Open Source Edition						
Ø						
Common Tasks	Applications					
- 🚱 Domain	Ap	Applications can be enterprise or web applications, or various kinds of modules. Restart an application or module by clicking on the reload link, this action will apply only to the				
server (Admin Server)	tar	targets that the application or module is enabled on.				
Clusters	De	Deployed Applications (1)				
Standalone Instances	BC B Deploy Undeploy Enable Disable Filter:					
▶ 🛐 Nodes		Name	Enabled	Engines	Action	
 Applications 		dtsof	V	ear eib webservices web	L Redenloy I Reload	
atsgf		utogi		cur, cju, neuscriticu, neu	Treading Treaded	
I ifecvcle Modules	1					

- When the dtsgf.ear undeployment is finished, shutdown the GlassFish service.
- Navigate to your GlassFish applications folder located in
 <GlassFish_HOME>\glassfish3\glassfish\domains\domain1\applica tions. Ensure the dtsgf folder has been removed. Delete the dtsgf folder if it wasn't removed during the Application undeployment.
- Restart your GlassFish service.
- Review the Notes below before continuing to the next steps.
- Start you GlassFish administrative application available at http://localhost:4848 and navigate to the **Applications** node. Follow steps **H.8**(Install the DTS Application) through **H.9**(Verify the DTS Application) to finish configuring the Apelon DTS 4.8.0 GlassFish server.
- **<u>NOTE1</u>**: Step **H.8**(<u>Install the DTS Application</u>), will upgrade the DTS 4.7.0 schema to DTS 4.8.0 schema when the DTS 4.8.0 "dtsgf.ear" is fully deployed. **Do NOT shut down or restart the GlassFish 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 4.8.0 schema version, perform the following steps:
 - 1. View the "server.log" file located in the
 - <GlassFish_HOME>\glassfish3\glassfish\domain\doma in1\logs directory. Search the GlassFish "server.log" file for the statement:
 - "Schema Upgrade to 4.0.29 complete" for Oracle 12c, SQL Server 2016, or SQL Server 2019.

- "Schema Upgrade to 4.0.30 complete" for MySQL 5.6 or MySQL 8.
- 2. A second way to determine the schema upgrade was successful is from the DTS 4.8.0 DTS Editor.
 - Connect to the upgraded Apelon DTS GlassFish 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 Oracle 12c, SQL Server 2016, or SQL Server 2019.
 - "4.0.30" for MySQL 5.6 or MySQL 8.
- NOTE2 DTS 4.5.1 GlassFish Reasoners: You must remove any previously existing DTS 4.5.1 Reasoners used for Classification. Search the entire GlassFish installation directory for an existing **Reasoners** folder. Delete the entire folder and its contents.
- <u>NOTE3 SQL Server Schema Upgrade:</u> When 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 you 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.