



# ImmuCast

## Installation Guide

v5.17.4



## Support Services

For general support on this product, contact your system administrator or help desk. For up-to-date documentation, visit the STC Documentation Portal at <https://documentation.stchome.com/>.

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# Introduction to ImmuCast

Immunization forecasting systems are automated software algorithms used to assess patient immunization status and recommend the dates and vaccines that should be administered next.

ImmuCast (also known as Stand-Alone Forecaster (SAF)) is based on immunization schedule guidelines recommended by the Advisory Committee on Immunization Practices (ACIP). ImmuCast evaluates a patient's existing immunization history against the guidelines and generates the next recommended immunization dates based on that status. It uses the Simple Object Access Protocol (SOAP) service, which allows an immunization registry application to obtain a patient's forecast information.

## Technical Requirements

The technical requirements for installing ImmuCast are categorized into the following areas:

- [Test Server Hardware Recommendations](#)
- [Production Server Hardware Recommendations](#)
- [Third-Party Software Requirements](#)

### Test Server Hardware Recommendations

The test server hardware recommendations are:

- Intel Xeon X3440, 2.53 GHz, 8M Cache, Turbo, HT
- 4 GB Memory, 1333 MHz
- 75 GB 15K RPM SCSI Hard Drives (running in RAID)

### Production Server Hardware Recommendations

The production server hardware recommendations are:

- Intel Xeon X3440, 2.53 GHz, 8M Cache, Turbo, HT
- 8GB Memory, 1333MHz
- 150GB 15K RPM SCSI Hard Drives (running RAID)

### Third-Party Software Requirements

The third-party software requirements are:

- Oracle Database 11g, or Oracle Database Express 11g (free)
- Java 6 JDK
- Apache Tomcat 6

Refer to the [ImmuCast Installation Instructions](#) (below) for all the necessary steps.

# ImmuCast Installation Instructions

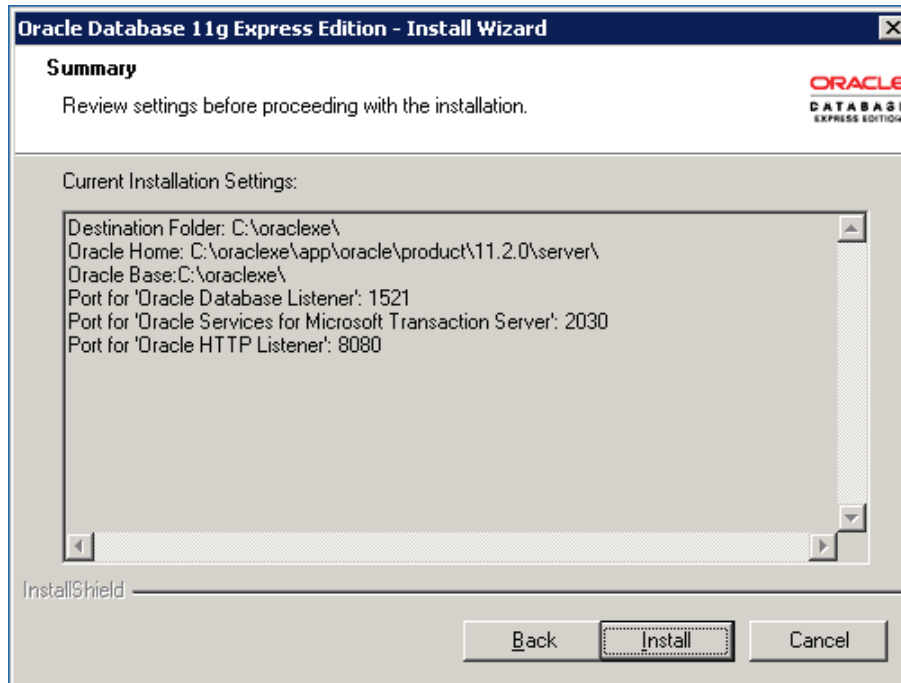
The following elements need to be installed and/or created in order to run and deploy ImmuCast:

- **Oracle** - see [Install Oracle](#)
- **Creating the database** - see [Create the Database](#)
- **Install Java** - see [Install Java](#)
- **Install Tomcat 6** - see [Install Tomcat](#)

## Install Oracle

ImmuCast can be installed to Oracle 11g or Oracle Express 11g. The Oracle product you choose depends on your state licensing. Oracle Express 11g is free to use for this type of installation. All performance testing, etc., for ImmuCast has been conducted using Oracle Express. These instructions only cover the installation of Oracle Express 11g.

1. Create an Oracle account at [www.oracle.com](http://www.oracle.com).
2. If using Oracle Express (free), download the appropriate version (the Windows version, approximately 312 MB in size).
3. Unzip the download file and run the `DISK1/setup.exe`:
  - Follow the installation wizard
  - The installer creates a schema named XE
  - The installer uses the following ports:
    - TNS: 1521
    - MTS: 2030
    - HTTP: 8080
4. There may be two error messages about a missing file named `KEY_XE.reg`. Acknowledge it and continue with the installation.
5. Disable the HTTP port by running the following at a command prompt after the installation is complete: `echo EXEC DBMS_XDB.SETHTTPPORT(0); | sqlplus / as sysdba.`



## Create the Database

1. Unzip the `saf_vX.X.X.X.zip` distribution file.
2. Edit the `SAF_DDL.sql` file located in the `db\install` subdirectory:
  - Change the path to the `SAF.DBF` file to a location you want. Example:  
`C:\oraclexe\app\oracle\oradata\XE\SAF.DBF`
  - Change the path to the `SAF_TEMP.DBF` file to a location you want.  
Example: `C:\oraclexe\app\oracle\oradata\XE\SAF_TEMP.DBF`
3. Open a Windows command prompt and change to the directory where the `SAF_DDL.sql` file is located.
4. Run the following at the command prompt: `sqlplus / as sysdba @SAF_DDL.sql.`

## Patch the Database

Edit the `forecast.bat` file located in the `db\patch` subdirectory:

- Change the Oracle SID if required for your database setup. The default of *XE* is used for Oracle Express

- Comment out any patches that have already been installed. Note that this isn't necessary, but there are harmless error messages displayed when a patch is run more than once
- Double-click the `forecast.bat` file or run it from the command prompt

## Install Java

1. Install Java 6 JDK.

**NOTE:** The installation must be the JDK (Java Development Kit), not the JRE (Java Runtime Environment).

2. Download and install the correct Java 6 JDK for your environment (currently at <http://www.oracle.com/technetwork/java/javase/downloads/index.html>).
3. After installation, create the environmental variable `JAVA_HOME` and set it to your JDK installation location.

## Install Tomcat

1. Download Tomcat 6 from the following link: <http://tomcat.apache.org/download-60.cgi>.

**NOTE:** The *32-bit/64-bit Windows Service Installer* is useful for installing Tomcat as a service on Microsoft Windows.

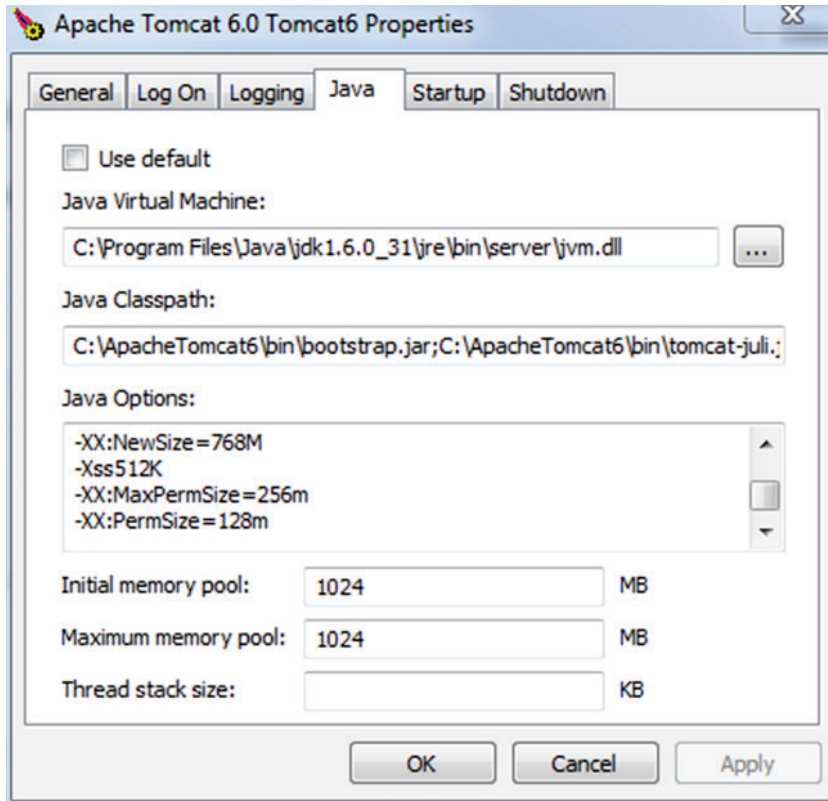
2. Follow the Tomcat installation instructions for the version you have downloaded (unzip, and/or run the installer as appropriate).
3. Once Tomcat is installed as a service, the following settings (shown in the illustration below) are recommended:

- Set the `jvm.dll` to the one supplied with the JDK
- Append the following to the Java options:

```
XX:NewSize=768M
Xss512K
XX:MaxPermSize=256m
XX:PermSize=128m
```

- Set Initial Memory Pool to 1024
- Set Maximum Memory Pool to 1024





4. In order to open the Apache Tomcat Properties screen, open the Program Menu and select **Tomcat > Configure Tomcat**.
5. Create the datasource in the Tomcat `context.xml` file.
6. Edit the `context.xml` file from `[tomcat installation]\conf` directory:

```
<Context>
  <WatchedResource>WEB-INF/web.xml</WatchedResource>
  <Resource name="jdbc/com/stc/forecaster" auth="Container"
type="javax.sql.DataSource" driverClassName="oracle.jdbc.OracleDriver"
url="jdbc:oracle:thin:@localhost:1521:xe" username="SAFUSER" password="SAF"
maxActive="100" maxIdle="10" maxWait="-1"/>
</Context>
```

7. Add a `<Resource ...>` block similar to the following:

```
<Resource name="jdbc/com/stc/forecaster" auth="Container"
type="javax.sql.DataSource" driverClassName="oracle.jdbc.OracleDriver"
url="jdbc:oracle:thin:@localhost:1521:xe" username="SAFUSER" password="SAF"
maxActive="100" maxIdle="10" maxWait="-1"/>
```

8. Change the URL to match the address and TNS port (default: 1521) of the server that the Oracle database is running on.
9. Add the Oracle driver file (`ojdbc-10.2.0.1.0.jar`) to `[tomcat installation]\lib`.

# Deploy ImmuCast

1. Copy the `forecaster-web.war` file to the `<Tomcat Directory>\webapps` directory.
2. Restart Tomcat.
3. Edit the `spring-ws-servlet.xml` file located in the `<Tomcat Directory>\webapps\forecaster\WEB-INF` directory.
4. Set the number of threads to the number of processor cores available on your server:

```
<bean id="forecastingEndpoint"  
class="com.stchome.saf.ws.endpoint.ForecasterServiceEndpoint"  
scope="prototype">  
  <constructor-arg value="4" /> <!-- Thread count -->  
</bean>
```

5. Restart Tomcat.
6. Verify the application is deployed correctly by navigating to the online application:  
`http://[Yourserver]/forecaster/`.