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## **Connectivity Coordinator**

### **Installation and Administration Guide**

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## Table of contents

<b>1</b>	<b>Introduction .....</b>	<b>1</b>
1.1	Purpose .....	1
1.2	Intended Audience .....	1
1.3	Acronyms .....	1
1.4	Overview .....	2
<b>2</b>	<b>Software Installation .....</b>	<b>3</b>
2.1	Java Development Kit (JDK) .....	3
2.2	Java Cryptography Extension (JCE) .....	3
2.3	Microsoft SQL Server .....	3
2.4	Sun GlassFish Enterprise Server (SGES) .....	4
2.5	SQL Server JDBC Driver .....	4
<b>3</b>	<b>Software Configuration .....</b>	<b>5</b>
3.1	Microsoft SQL Server .....	5
3.1.1	Create databases .....	5
3.2	Sun GlassFish Enterprise Server (SGES) .....	6
3.2.1	Create Domain .....	6
3.2.2	Install SQL Server JDBC library .....	6
3.2.3	Configure SQL Server Connection Pool and DataSource .....	6
3.2.4	Configure PKI keystore and truststore .....	8
3.2.5	Configure HTTP Listeners .....	8
3.2.6	Configure JVM Options .....	9
<b>4</b>	<b>Deploying .....</b>	<b>11</b>
4.1	Deploying the Connectivity Coordinator .....	11
<b>5</b>	<b>ELS Setup .....</b>	<b>12</b>
<b>6</b>	<b>Running the Tests .....</b>	<b>13</b>
<b>7</b>	<b>Starting and Stopping the Server .....</b>	<b>14</b>
7.1	Starting the server .....	14
7.2	Stopping the server .....	14
<b>8</b>	<b>Logging .....</b>	<b>15</b>
8.1	Viewing the server log file .....	15
8.2	Changing the server log level .....	15

# Document Information

## Change history

Version	Date	Author	Comments
1.0 draft	2009-06-30	Secure Messaging	Initial release.

# 1 Introduction

## 1.1 Purpose

The purpose of this document is to describe the installation process for the Connectivity Coordinator example implementation. The document describes how to setup the application server and get the tests running for the source distribution.

The tests show the following scenarios:

Client side to send a document	A client sends a document to an intermediary service.
Server side to receive a document	An intermediary service receives a document from a client.
Client side to retrieve documents	A client retrieves documents from an intermediary service.
Server side to retrieve documents	An intermediary service retrieves documents for a client.
Client side to send an acknowledgement	A client sends an acknowledgement to an intermediary service.
Server side to receiver an acknowledgement	An intermediary service receives an acknowledgement from a client.
Client side to retrieve acknowledgements	A client retrieves acknowledgements from an intermediary service.
Server side to retrieve acknowledgements	An intermediary service retrieves acknowledgements for a client.

## 1.2 Intended Audience

This document is intended for:

- Software Developers.

## 1.3 Acronyms

AS	Application Server
CC	Connectivity Coordinator
ELS	Endpoint Location Service
UHI	Universal Health Identifier

## 1.4 Overview

The Connectivity Coordinator has been developed in Java, using JAX-WS to implement the web service interface and JDBC to implement the database interface. The Connectivity Coordinator must be deployed to an application server for operation.

The following third party products are required to deploy the ELS server:

- JDK6
- Sun GlassFish Enterprise Server v2.1
- SQL Server 2005 (or later)

## 2 Software Installation

### 2.1 Java Development Kit (JDK)

1. Download and install JDK 6 or later.

URL: <http://java.sun.com/javase/downloads/index.jsp>

`<JDK_HOME>` will be used in this document to refer to the root directory of the JDK installation.

`<JRE_HOME>` will be used in this document to refer to `<JDK_HOME>/jre`.

2. Create a `JDK_HOME` environment variable pointing to the JDK's installation directory.
3. Create a `JAVA_HOME` environment variable set to `<JRE_HOME>`.

Please note that the JDK installs a Java Runtime Environment (JRE) in a subdirectory under the JDK. By default, it will also install another JRE in a separate directory outside the JDK (although there is an option to not install it during setup). There may also be other JREs already installed on the machine.

These instructions will use the local JRE inside the JDK directory. Be aware of which JRE is being used, because the configurations applied to one JRE installation will not be available to the others.

### 2.2 Java Cryptography Extension (JCE)

The cryptography in the JDK download is limited in strength due to the import control restrictions of some countries. The "unlimited strength" capabilities are enabled by installing certain policy files into the JRE.

1. Download the JCE Unlimited Strength Jurisdiction Policy Files for the installed JDK version.

URL: <http://java.sun.com/javase/downloads/index.jsp>

2. Unpack the downloaded zip file.
3. Copy the two JAR files (*local\_policy.jar* and *US\_export\_policy.jar*) to the `<JRE_HOME>/lib/security` directory.

Overwrite the existing JAR files in the directory.

### 2.3 Microsoft SQL Server

Microsoft SQL Server is the database required for use with the reference implementation.

1. Obtain a copy of SQL Server 2005 (or later) and install it as recommended on the chosen database server (which may differ

from the development environment and/or deployment environment).

<SQL\_SERVER> will be used in this document to refer to the fully qualified host name or IP address of the server hosting the database.

## 2.4 Sun GlassFish Enterprise Server (SGES)

To install SGES:

1. Download SGES v2.1 (or later).

URL: <http://java.sun.com/javaee/downloads/index.jsp>

2. Run the downloaded file by double-clicking on it.

A wizard will step you through the installation process, such as selecting the directory to install in and the ports to use.

<AS\_HOME> will be used in this document to refer to the root directory of SGES.

3. Create an AS\_HOME environment variable set to <AS\_HOME>
4. Add AS\_HOME/bin to the PATH environment variable.
5. Read through the Quick Start Guide at:  
<AS\_HOME>/docs/QuickStart.html to learn how to start and stop the server.

## 2.5 SQL Server JDBC Driver

To use SQL Server, the JDBC driver is required:

1. Download Microsoft JDBC Driver.

URL:

<http://www.microsoft.com/downloads/details.aspx?FamilyID=99b21b65-e98f-4a61-b811-19912601fdc9&displaylang=en>

2. Accept the EULA.
3. Unzip the package to a location.

## 3 Software Configuration

### 3.1 Microsoft SQL Server

#### 3.1.1 Create databases

The databases for all the roles within the example must be created. There are three roles, GP, pathology lab and intermediary which all use the same database schema.

GP database:

1. Create a new empty database with an appropriate name for the GP. For example: CC-GP.

<SQL\_DBNAME\_GP> will be used in this document to refer to the name of the GP database.

2. Create a new database user with ownership permissions for the database. For example: cc-gp.

<SQL\_USER\_GP> and <SQL\_PASSWORD\_GP> will be used in this document to refer to the name and password of the database user.

3. Create the CC database schema in the new database by executing the SQL commands in the `sql/create-tables.sqlserver.sql` file from the distribution.
4. Set the properties in the *build.properties* file for the GP. The properties have the prefix 'gp.cc.jdbc'.

Pathology lab database:

1. Create a new empty database with an appropriate name for the pathology lab. For example: CC-PATHOLOGY\_LAB.

<SQL\_DBNAME\_PATHOLOGY\_LAB> will be used in this document to refer to the name of the pathology lab database.

2. Create a new database user with ownership permissions for the database. For example: cc-pathologylab.

<SQL\_USER\_PATHOLOGY\_LAB> and <SQL\_PASSWORD\_PATHOLOGY\_LAB> will be used in this document to refer to the name and password of the database user.

3. Create the CC database schema in the new database by executing the SQL commands in the `sql/create-tables.sqlserver.sql` file from the distribution.
4. Set the properties in the *build.properties* file for the pathology lab. The properties have the prefix 'pathology.cc.jdbc'.

Intermediary database:

1. Create a new empty database with an appropriate name for the pathology lab. For example: CC-INTERMEDIARY.

<SQL\_DBNAME\_INTERMEDIARY> will be used in this document to refer to the name of the intermediary database.

2. Create a new database user with ownership permissions for the database. For example: cc-intermediary.

<SQL\_USER\_INTERMEDIARY> and <SQL\_PASSWORD\_INTERMEDIARY> will be used in this document to refer to the name and password of the database user.

3. Create the CC database schema in the new database by executing the SQL commands in the `sql/create-tables.sqlserver.sql` file from the distribution.
4. Set the properties in the `build.properties` file for the intermediary. The properties have the prefix 'intermediary.cc.jdbc'.

## 3.2 Sun GlassFish Enterprise Server (SGES)

### 3.2.1 Create Domain

A domain is required for the intermediary role. Note that by default a domain is created when Glassfish is installed called "domain1", this can be used. The following instructions assume it isn't used.

1. Create the new domain with an appropriate name and port. For example domain-intermediary with port 5252.  

```
asadmin create-domain --adminport 5252 domain-intermediary
```

<DOMAIN\_INTERMEDIARY> will be used in this document to refer to the intermediary domain.

Refer to the Glassfish documentation for more details on creating domains.

### 3.2.2 Install SQL Server JDBC library

Install the SQL Server JDBC driver required in configuring the JDBC connection pool for the domain:

1. Copy the <CC\_HOME>/lib/sqljdbc4.jar into <AS\_HOME>/domains/< DOMAIN\_INTERMEDIARY>/lib.
2. Restart the application server.

### 3.2.3 Configure SQL Server Connection Pool and DataSource

Configure a JDBC connection pool to reference the SQL Server database:

1. Start the application server if it isn't running.
2. Click on the *Resources/JDBC/Connection Pools* link in the left-hand frame.

3. Click on the *New* button in the right-hand frame.
4. Enter the following **General Settings**:

Name	Value
Name	CCConnectionPool
Resource Type	javax.sql.XADataSource
Database Vendor	Microsoft SQL Server

5. Click on the *Next* button.
6. Enter the following **General Settings**:

Name	Value
Datasource Classname	com.microsoft.sqlserver.jdbc.SQLServerXADataSource
Resource Type	javax.sql.XADataSource
Database Vendor	Microsoft SQL Server

7. Enter the following **Pool Settings**:

Name	Value
Initial and Minimum Pool Size	8
Maximum Pool Size	256 (or higher, depending on expected load)
Pool Resize Quantity	2

8. Enter the following **Connection Validation**:

Name	Value
Connection Validation	Required (tick)
Validation Method	Autocommit

9. Enter the following **Additional Properties**:

Name	Value
serverName	<SQL_SERVER>
databaseName	<SQL_DBNAME_INTERMEDIARY>
portNumber	1433 (or appropriate)
user	<SQL_USER_INTERMEDIARY >
password	<SQL_PASSWORD_INTERMEDIARY >

```
sendStringParametersAsUnicode false
```

10. Click on the *Finish/Save* button.
11. Click on the *Ping* button to confirm settings are correct.

Configure a JDBC resource to utilise the JDBC connection pool:

1. Start the application server if it isn't running.
2. Click on the *Resources/JDBC/JDBC Resources* link in the left-hand frame.
3. Click on the *New* button in the right-hand frame.
4. Create a new JDBC resource with the following attributes:

Name	Value
JNDI Name	CCDataSource
Pool Name	CCConnectionPool

5. Click on the *Finish/Save* button.
6. Restart the application server.

### 3.2.4 Configure PKI keystore and truststore

The Connectivity Coordinator uses TLS to authenticate clients. The TLS configuration requires a server certificate to be generated and added to the `<AS_HOME>/domains/<DOMAIN_INTERMEDIARY>/config/keystore.jks` file, with the corresponding CA certificates added to the `<AS_HOME>/domains/<DOMAIN_INTERMEDIARY>/config/cacerts.jks` file. It is up to the administrator of each installation to obtain a server certificate from a third-party certificate registration authority. For example, Verisign or Thawte.

In the interim while a NASH service does not exist, it is possible to use Test Medicare Australia facility certificates as organisation certificates.

To use the **Test Medicare Australia** facility certificates:

1. Add the following certificates from the distribution to the `<AS_HOME>/domains/<DOMAIN_INTERMEDIARY>/config/truststore.jks` file:
  - o `certificates/Test_Medicare_Australia_Root_CA.cer`
  - o `certificates/Test_Medicare_Australia_Organisation_CA.cer`

### 3.2.5 Configure HTTP Listeners

When a domain is created, by default two listeners are created, `http-listener-1` and `http-listener-2`. To configure the HTTPS listener for the domain:

1. Start the application server if it isn't running.
2. Log into the *Admin Console* for the application server.
3. Click on the *Configuration* link in the left-hand frame.
4. Click on the *HTTP Service* link.
5. Click on the *HTTP Listeners* link.
6. Click on *http-listener-2* link.
7. Enter the port in the *Listener Port* field. Ensures this does not conflict with the other domains listener ports.  
<DOMAIN\_PORT\_INTERMEDIARY> will be used to refer to the domain port.
8. Ensure the *Security* field is checked.

For TLS, the HTTPS listener must be adjusted as follows:

1. Select the *SSL* tab
2. Enter the following **SSL** settings:

Name	Value
Client Authentication	Enabled (for mutually-authenticated SSL)
Certificate NickName	Set as appropriate to the server certificate added to the <AS_HOME>/domains/<DOMAIN_INTERMEDIARY>/keystore.jks file.
SSL3	Enabled
SSL2	Disabled
TLS	Enabled
Ciphersuites	Select only the <b>Common Ciphersuites</b> .

### 3.2.6 Configure JVM Options

The settings in the application server have to be changed to turn off the capture stack trace feature of JAX-WS. Also, additional configuration properties need to be added:

1. Start the application server if it isn't running.
2. Log into the *Admin Console* for the application server.
3. Click on the *Application Server* link in the left-hand frame.
4. Click on the *JVM Options* tab.
5. Click on the *Add JVM Option* button, and in the empty *Value* text field that appears. Repeat this step for each of these values:

To turn off the capture stack trace feature of JAX-WS:

Value
-
Dcom.sun.xml.ws.fault.SOAPFaultBuilder.disableCaptureStackTrace

```
=false
```

To configure the datasource name for the CC database:

**Value**

```
-Dcc.jdbc.datasource.name=CCDataSource
```

To configure the URL and search context of the LDAP (NASH) repository:

**Value**

```
-Dmedicare.test.ldap.search.context=c=AU
```

```
-Dmedicare.test.ldap.url=ldap://203.2.208.10:389
```

To configure ELS:

**Value**

```
-Dels.lookup.service.interface=http://ns.nehta.gov.au/  
Els/Intf/Lookup/TLS/1.0
```

```
-Dels.lookup.service.endpoint=https://<ELS_HOSTNAME>/els-  
tls/lookup
```

6. Click on the *Save* button.
7. Restart the application server.

## 4 Deploying

### 4.1 Deploying the Connectivity Coordinator

To deploy:

1. Start the application server if it isn't running.
2. Log into the *Admin Console* for the application server.
3. Click on the *Applications/Web Applications* links in the left-hand frame.
4. Click on the *Deploy* button.
5. Select the `bin/nehta-cc-0.1.ear` file from the distribution.
6. Click on the *OK* button.
7. Verify that the Sun Application Server successfully deployed the application. This can be achieved by:
  - 7.1. Checking the log file for each domain  
`<AS_HOME>/domains/<DOMAIN_INTERMEDIARY>/logs/server.log`
  - 7.2. Browsing to the web service endpoint information for each domain at the URL  
[http://localhost: <DOMAIN\\_PORT\\_INTERMEDIARY>/cdd/sop-consumer](http://localhost:<DOMAIN_PORT_INTERMEDIARY>/cdd/sop-consumer)

## 5 ELS Setup

Before the tests can be run, the ELS test data must be setup. The SQL script within the *test/testdata/elstestdata* directory contains the ELS test data. This must be run against a working ELS instance. Before the script can be run, the service endpoint addresses need to be changed to match the environment it's running within. The script currently contains the address `192.168.46.20:8383` for the service endpoints. This must be changed to match the server that hosts the intermediary service.

## 6 Running the Tests

To run the tests for the Connectivity Coordinator:

1. Run `ant unittest` from the command-line.

# 7 Starting and Stopping the Server

## 7.1 Starting the server

To start the Connectivity Coordinator:

1. Execute the following commands:

```
asadmin start-domain <DOMAIN_INTERMEDIARY>
```

Note that on Linux, if ports 80 and 443 are used by the HTTP listeners then the command must be executed by the *root* user as ports below 1024 are reserved.

To verify that the server started successfully, the following checks may be performed:

1. Read the tail of the server log file for each domain and ensure that no errors were logged during the start process.
2. Using a browser on the server, navigate to the root address of the web service endpoint  
`https://localhost:<DOMAIN_PORT_INTERMEDIARY>/cdd/sop-consumer` and verify that the web service endpoint information is retrieved:

## 7.2 Stopping the server

To stop the Connectivity Coordinator:

1. Execute the following command:

```
asadmin stop-domain <DOMAIN_INTERMEDIARY>
```

## 8 Logging

### 8.1 Viewing the server log file

The log file is located at the following location:

```
<AS_HOME>/domains/<DOMAIN_INTERMEDIARY>/logs/server.log
```

The log file is rotated by the application server according to the configured rotation policy.

The log file can be viewed by any text editor.

### 8.2 Changing the server log level

To change the logging level of the ELS Server:

1. Start the application server if it isn't running.
2. Log into the *Admin Console* for the application server.
3. Click on the *Application Server* link in the left-hand frame.
4. Click on the *Logging* tab.
5. Click on the *Log Levels* sub-tab.
6. In the **Additional Properties** panel, add a new property as follows:

Name	Value
au.gov.nehta	<LOG_LEVEL>

Where <LOG\_LEVEL> is one of the following:

- OFF
  - SEVERE
  - WARNING
  - INFO
  - CONFIG
  - FINE
  - FINER
  - FINEST
7. Click the *Save* button.

# Appendix A: References