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Introduction

Background

The Cancer Central Clinical Participant Registry (C3PR) is a web-based application used for end-to-end registration of patients to clinical trials. This includes capturing the consent signed date, eligibility criteria, stratification, randomization, and screening. Clinical workflows are enabled by both subject- and study-centric views into the registration process. C3PR can be run in a standalone mode where study definitions, investigators, study personnel, and sites are entered into the system, or C3PR can be run in an integrated mode with the caBIG Clinical Trials Suite (CCTS). C3PR also enables multi-site clinical trials where registration information is entered locally at affiliate sites and the registration is completed by call-out to the coordinating site.

Throughout the development of C3PR, a number of elaborator and adopter sites are actively being engaged to help define requirements and test the application. Our primary elaborators include Duke, Wake Forest, Mayo, Westat, CALGB, CCR, and the Coalition of Cooperative Groups. Our primary adopters include Duke and Wake Forest with engagement of Georgetown and CCR.

C3PR release 1 was developed by Nortel Solutions and released in 2006. Release 2 was developed by Duke Cancer Center in collaboration with SemanticBits, LLC and was released in March, 2008. We are currently in the next phase of development with releases slated for the end of September, 2008 and March, 2009.

Scope

This installation guide outlines the supported configurations and installing, setting up and configuring the application and databases for the Cancer Central Clinical Participant Registry version 2.5 (C3PRv2.5).

This document is designed to meet the needs of administrators who will be deploying C3PR. To perform the tasks outlined in this document, you should be familiar/knowledgeable with running command-line utilities, running web applications in application containers, and configuring databases. Ideally, the person performing these functions should be someone who is an experienced system administrator.

Note: C3PRv2.5 is a component of the caBIG Clinical Trials Suite (CCTS). Installation instructions and other documentation related to CCTS can be found at https://wiki.nci.nih.gov/display/CTMS/CCTS+Installation+Guide

Note: Configuring security is not part of the installation guide. See the C3PRv2.5 administration guide for instructions on this: http://gforge.nci.nih.gov/plugins/scmcvs/cvsweb.php/c3prv2/documentation/design/c3prv2_administration_guide.doc?

C3PR Team

C3PR is a highly collaborative project made up of domain and technical experts from Duke Cancer Center, SemanticBits, Wake Forest Cancer Center, Mayo Clinic, CALGB, and Westat.

Team	Members
Duke	• Jamie Cuticchia (PI) • Bob Annechiarico (Project Director, Co-investigator) • Pankaj Agarwal (Project Manager) • Mohammad Farid (DBA) • Peter Le (IT Analyst) • Vijaya Chadaram, RN (Subject Matter Expert) • Emily Allred (Admin)
Wake Forest	• Bob Morrell (Institutional Lead, Subject Matter Expert) • Don Babcock (Technical Expert) • Lisa Dixon (Subject Matter Expert) • Claire Kimbrough (Subject Matter Expert)
CALGB	

Team	Members
SemanticBits	• Ram Chilukuri (Technical Director, Architect) • Patrick McConnell (Architect) • Kruttik Aggarwal (Lead Developer) • Ramakrishna Gundala (Developer) • Vinay Gangoli (Developer) • Himanshu Gupta (Developer) • Vinay Kumar (Business Analyst) • Shilpa Alluru (QA Tester) • David Coffey (UI Developer)
Mayo Clinic	• Sharon Elcombe (Institutional Lead, Subject Matter Expert)
Westat	• Steve Riordan (Institutional Lead, Subject Matter Expert)

	• Kimberly Johnson (Institutional Lead, Subject Matter Expert) • Amish Shah (IT Analyst)

Contact and Support

Name	Contact
End User Forum	https://cabig-kc.nci.nih.gov/CTMS/forums/viewforum.php?f=17
Technical Forum	https://cabig-kc.nci.nih.gov/CTMS/forums/viewforum.php?f=15

Related Documents

End User	Analysis	Technical	Management
C3PR Main Project Page Tool Landing Page End User Guide Training Library **Installation Guide** Configuration Guide Release Notes	Use Cases Requirements Specification Activity Diagrams BRIDG Compliance Report BAM Compliance Report COPPA Gap Analysis C3PR 2.0 Silver Compatibility Package	Architecture Guide Domain Analysis Model Implementation Model Multisite Deployment Guidelines Deployment Diagrams C3PR Multisite Deployment Pilot	Vision and Scope Project Plan Scrum Artifacts Adoption Plan Communications Plan Test Plan Test Logs Test Script Arc Requests Lessons Learned C3PR caBIG License

C3PR Software and Technology Requirements

Hardware Requirements

There are no stringent hardware requirements because C3PR is a lightweight web application not intended to have a very large code base. However, you may use the following for guidance on hardware requirements:

Processor	Pentium PIII, above 1.5 GHz
RAM	Minimum 512MB (for testing), 2 GB recommended
Operating System	Any that runs Java, recommended: Linux, Windows 2000, XP, Mac OS X 10.4.x
Hard Disk Space	Minimum 500MB free space

Software Requirements

You must download and install the required software that is not included with the C3PRv2. The software name, version, description, and URL hyperlinks (for download) are indicated in the table below:

Software	Version	Description	URL
Java Software Development Kit (SDK)	JDK 5.0 Update 11 or higher	The J2SE Software Development Kit (SDK) supports creating J2SE applications	http://java.sun.com/javase/downloads/index_jdk5.jsp
Oracle 9i/10g Database *	9i/10g only	Oracle is a commercially-available relational database management system (RDBMS) that can be used on all major operating systems	http://www.oracle.com/technology/software/products/database/orac
PostGreSQL*	8.2 only	PostgreSQL is a powerful, open source relational database system. It runs on all major operating systems	http://www.postgresql.org/ftp/source/
Globus Toolkit	4.0.3 only	Globus toolkit is an open source WSRF-compliant web services java container. Only the Java ws-core source version is needed	http://www.globus.org/toolkit/downloads/4.0.3/#wscore_bin
Tomcat Web Server*	5.0.28 or later	Open source servlet container	http://archive.apache.org/dist/tomcat/tomcat-5/v5.0.28/bin/jakarta-t
Ant**	1.6.5 or later	Ant is used for Building the C3PR application	http://archive.apache.org/dist/ant/binaries/

* Either Oracle OR PostGreSQL (not both) is required as an RDBMS for C3PR application. Note that C3PRv2 doesn't support SQL Server (which had been supported by C3PRv1)

** Included with the Graphical installer

Note - Drivers for Oracle 9i/10g and PostGreSQL are included with the C3PR. If you are using a different version of Oracle, you must obtain the appropriate drivers. JDBC drivers can be downloaded from the Sun Developer Network at http://developers.sun.com/product/jdbc/drivers/index.html, or from the individual vendors? sites (for example, the Oracle 9i driver classes12.zip can be downloaded from http://www.oracle.com/technology/software/tech/java/sqlj_jdbc/htdocs/jdbc817.html). These drivers should be placed in the {project_home}/lib directory and the {CATALINA_HOME}/common/lib directory to enable connection to the appropriate database. In addition, some manual modification of the Hibernate configuration files may be necessary. Hibernate is a set of libraries included with C3PR.

Installing C3PR

C3PRV2.5 has been tested with the operating systems and hardware specified previously in this guide. We cannot guarantee C3PRV2.5 will work if you are using variations of these operating systems and/or hardware.

C3PRV2.5 has a graphical installer to ease the installation process. The following are the steps to install C3PRV2.5 using the graphical installer.

Note: for CCTS installation, ensure all pre-requisite software has been installed in accordance with the CCTS Installation Guide. As per the CCTS Installation Guide, the following environment variables should already be established on the application server where C3PR will be installed:

* CATALINA_HOME
* ANT_HOME
* JAVA_HOME
* GLOBUS_LOCATION

Note: if the installation is being performed on a Linux server, a GUI Emulator tool must be installed to allow GUI windows to be presented for the Graphical Installer. See the CCTS Installation Guide for instructions on setting up a GUI Emulator.

Step 1

Download the latest version of the installer at:
https://cabig-kc.nci.nih.govhttps://cabig-kc.nci.nih.gov/CTMS/KC/index.php/C3PR#Installation

Note: There are two versions of the GUI installer ? Online and Offline

The Online version is very compact in size (<2MB) but requires that you be connected to the Internet during the installation. The online installer downloads required software during the install process. The online installer will also download the latest release of C3PRv2.5

The offline installer packages all the required software and is fairly large download, but can be used in situations where Internet connection is not available or is severely limited (firewall). The offline installer will have to be downloaded for each new release of C3PRv2.5

The online GUI installer is recommended.

Example download for a Linux system:

```
%> cd $HOME
%> mkdir C3PRv2.5
%> cd C3PRv2.5
%> wget http://gforge.nci.nih.gov/frs/download.php/3096/c3prv2.5-installer-of
```

Step 2

OPTIONAL. If a previous version of C3PR was installed, delete your existing c3prv25 web application. This will usually mean deleting $CATALINA_HOME/webapps/c3prv2.5 directory

Step 3

Download the Globus (version and download URL provided in Table 2) and Unzip the downloaded archive into a local folder (henceforth referred to as <globus_root_folder>.

Step 4

```
Note for CCTS installation: this step is handled once before any installations
```

Verify that the following environment variables are set:

- JAVA_HOME (pointing to the root directory of the Java installation)
- GLOBUS_LOCATION (pointing to <globus_root_folder>)

Also, ensure that your PATH statement includes the locations of the Java binaries. Optionally, set CATALINA_HOME if you wish to use an existing tomcat installation. Otherwise, the installer will install one for you.

To set environment variables in Windows:

1. Right-click My Computer > Properties (from the shortcut menu) > Advanced tab.
2. Click the Environment_Variables button.
3. In the New System Variable dialog box, add the Variable and Variable Value.

Examples:

- Variable = JAVA_HOME
- Value = C:\j2sdk1.5.0_11
- Variable=GLOBUS_LOCATION;

- Value=C:\ws-core-4.0.3;

To do this in Unix/Mac:

```
$ export JAVA_HOME=/usr/java..1.5
$ export GLOBUS_LOCATION=/usr/local/ws-core-4.0.3
$ export CATALINA_HOME =/usr/apache-tomcat-5.0.28
```

Step 5

Launch the C3PR installer by running the following command (applies to any OS):

```
java ?jar c3prv2.5-installer-1.0.jar
```

This will launch the graphical installation wizard.

```
Note: Do not launch the jar using Java Jar Launcher tool (double clicking
on the file). This does not use the environment variables you set in Step 4
```

Step 6

Follow the installation wizard to configure and install C3PR. Most screens during the installation process are self explanatory.

Step 7

Welcome to the C3PRV2.5 Installer Program

On the welcome page, Click Next

Step 8

License Agreement

You can either accept or reject the license. The license needs to be accepted to proceed with installation, if the license is rejected the installation will be aborted. Click Next to continue.

Step 9

Installation directory

You can let the installer select the installation directory(C:\Program Files\c3prv2.5) or can select a different directory of your choice using the ?Select Folder?.This is where the application will be installed. Click Next to continue and it will confirm for the creation of the selected directory click yes to accept.

Step 10

Install Tomcat

You can let the installer deploy and configure tomcat or choose an existing installation of tomcat on your system. If you choose to use an existing tomcat, see Tomcat SSL How To web page for information on configuring the tomcat server for the HTTPS protocol (C3PRV2.5 uses SSL to secure client server interaction). Click Next to continue.

Step 11

Select Directory to install Tomcat

You can let the installer select the directory(C C:\Program Files\c3prv2.5\apache-tomcat-5.5.23) or can select a different directory of your choice using the ?Select Folder?.This is where the Tomcat will be installed. Click Next to continue and it will confirm for the creation of the selected directory click yes to accept.

Step 12

Components to Install

Choose the components that you want to install and click Next

Step 13

Configure Tomcat

If you chose ?Choose Existing? in the Install Tomcat Section follow the instructions to configure the Tomcat..

```
Note: Ignore these instructions if you are using the installer to
install a new tomcat.
```

Step 14

Select Log File name

You can let the installer deploy and configure tomcat

Step 15

Configure CSM

Select to configure CSM and click Next.

Step 16

Select to Enable/Disable Authorization

Select to enable or disable Authorization and click Next

Step 17

Select Database

Select the Database you want to use and click Next

Step 18

Database Properties Specify the Database URL ,Username and Password

```
Note: An empty database must already exist.
```

Step 19

C3PRV2.5 Installation Process

Click Install to start the installation process. This will initiate the installation and display the installation's status.

After navigating through the GUI screens, the install process will run through to completion. C3PRv2.5 install is complete.

Running C3PR

If you selected to install a new tomcat then set your CATALINA_HOME environment variable .

Open command prompt, change directory to <CATALINA_HOME>\bin

Run the following command to start tomcat server:

```
startup.bat (windows)
startup.sh (unix)
```

After your web application server has completely finished starting, open the browser with the following URL: http://localhost:9080/c3pr

C3PR Login page should be displayed with successful installation.To login use the default Username:c3pr_admin and Password:c3pr_admin

```
Note: The installer?s version of tomcat runs on port 9080. Your existing
tomcat might be on a different URL/Port.  Replace localhost:port with the
correct hostname/port assignment.  The port assignment will be the Tomcat
container that has been configured for the application server.
Example:
  http://cbvapp-q1009.nci.nih.gov:8080/c3pr
  To login, use the default userid: cctsdemo1@nci.nih.gov
  Password: cctsdemo1
```

Configuring C3PR

See the C3PR Administration Guide for configuring C3PR:

```
Note: for CCTS installation, you will have to configure WebSSO integration.
See the administration guide for more details.
```

Troubleshooting

Problem: My installation failed with the message ?class sun.tools.javac.Main not on the classpath. Perhaps JAVA_HOME does not point to the JDK. Its currently set to c:/Program Files/Java/jre_1.5.0_11?

Solution: This can happen when installing in the Microsoft Windows Operating system. First, try running the installer from the command prompt (as described in step5).

If the above solution does not work then copy the tools.jar file from $JAVA_HOME/lib/ to c:/Program Files/Java/jre_1.5.0_11/lib/ext directory. If the $JAVA_HOME/jre/lib/ext does not exist then go ahead and create it. Re-run the installer after doing this.

```
Note: c:/Program Files/Java/jre_1.5.0_11 can be different on your system
```

Problem: My installation failed at the final step with the message ?edu.northwestern.bioinformatics.bering.Migration??

Solution: This means the database create/update scripts did not work. Please check the database URL you entered in the installer. Also, make sure that an empty database is available to the installer. The installer can created the tables etc. but not create a database.

Problem: My installation failed at the final step with the message: ?FATAL ERROR: c3pr_dev datbase does no exist?

Solution: This implies that you do not have an empty database created as instructed in Step 8 of the Graphical Installer chapter.

Appendix A. Glossary

Term	Definition
AJAX	Asynchronous JavaScript and XML
API	Application Programming Interface
BC	Binding Component
caArray	cancer Array Informatics
caBIG	cancer Biomedical Informatics Grid
caBIO	cancer Biomedical Infrastructure Objects
caCORE	cancer Common Ontologic Representation Environment
caDSR	cancer Data Standards Repository
C3PR	Cancer Translational Research Informatics Platform
CDE	Common Data Element
CSM	Common Security Module
CSV	Comma Delimited
DAO	Data Access Objects
DCQL	Distributed Common Query Language
DWR	Direct Web Remoting
EA	Enterprise Architect
ESB	Enterprise Service Bus
EVS	Enterprise Vocabulary Services
GAARDS	Grid authentication and authorization with Reliably Distributed Services
GUI	Graphical User Interface
HASTE	High-level Automated System Test Environment
HTTP	Hypertext Transfer Protocol
IdP	Identity Provider
JAAS	Java Authentication and Authorization Service

JAR	Java Archive
Javadoc	Tool for generating API documentation in HTML format
JDBC	Java Database Connectivity
JMS	Java Message Service
JSP	JavaServer Pages
JUnit	A simple framework to write repeatable tests
metadata	Definitional data that provides information about documentation or other data
NCI	National Cancer Institute
NCICB	National Cancer Institute Center for Bioinformatics
NMR	Normalized Message Router
ORM	Object Relational Mapping
RDBMS	Relational Database Management System
SDK	Software Development Kit
SE	Service Engine
Semantic connector	A development kit to link model elements to NCICB EVS concepts
SQL	Structured Query Language
UML	Unified Modeling Language
WSRF	Web service resource framework