CEAS Web-Based Coordinated Education Activation Sytem

Installation Guide for CEAS3.0.9 (OS:Linux)

(draft 20090621)

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1. Intorduction

This document describes new installation of CEAS 3.0.9 software on a Linux system (it has confirmed on Fedora 10, CentOS 4.5[RAID] and CentOS 5.3). Following the the guide, you can install the CEAS3.0.9 as well as the softwares necessary for running the CEAS3.0.9. It takes about one hour.

1.1 List of softwares to be installed

Software	Description
CEAS 3.0.9	Source file
JDK	Java runtime environment
Tomcat	WEB server for JSP and Servlet
PostgreSQL*	Database management system(DBMS)

*MySQL is also available.

1.2 Preparation

Required hardware, software and guide:
- Linux PC for sever machine
- Windows PC for helping the installation
- CEAS 3.0.9 installation kit that can be downloaded from CEAS community page (CEAS3.0.9-yyyymmdd.zip)   an example of yyyymmdd: 20090617

Unpack the downloaded CEAS3.0.9-yyyymmdd.zip into a suitable directory and confirm that the following file system are contained:

```
CEAS3.0.9
  ┝Core1.war                              web application archieve
  ┝PropertiesEditor.jar                   configuration file editor

  ┝Windows                                CEAS for Windows
  │  ┝configure_db.bat                     DB configuration
  │  ┝configure_ceas.bat                   CEAS configuration
  │  ┝win.bat                              MySQL connection
  │  ┝software
  │  │  ┝apache-tomcat-6.0.18.exe
  │  │  ┝jdk-1_5_0_14-windows-i586-p.exe
  │  │  └mysql-essential-5.0.45-win32.msi
  │  ┝sample
  │  │  └createdb.sql                      CEASDB setup SQL
  │  └src                                 MySQL connection
  │
  └Linux                                  CEAS for Linux
     ┝software
     │  ┝apache-tomcat-6.0.18.tar.gz
     │  ┝jdk-1_5_0_14-windows-i586.bin
     │  └postgresql-8.1.10.tar.gz
     └sample
        └createdb.sql                      CEASDB setup SQL
```

Note that the softwares in the 'CEAS for Windows' are not used in this installation.

1.3 Contact

If any problems or questions during the installation, please post your message to the forum on the CEAS Community Page:
CEAS Community Page http://ceascom.iecs.kansai-u.ac.jp/

2. Setting Install Environment

The following steps (1) and (2) assume that you transfer the files from the Windows PC to the Linux PC. If the files are already unpacked on the Linux PC, copy the files indicated at the step (2) to the directory /usr/local/src, and skip the steps (1) and (2).

(1) To receive the transferred files, change the permission of the /usr/local/src directory to 777.

```
# su - root
# chmod 777 /usr/local/src/
```

(2) Transfer the following files from the Windows PC to the /usr/local/src directory of the Linux PC by using FTP or SSH.
- Three files in the software directory under Linux of CEAS3.0.9
- One file in the sample directory under Linux of CEAS3.0.9
- The Core.war file under Linux of CEAS3.0.9

(3) Create a new account 'postgres' as a super user for PostgreSQL.

```
# useradd postgres
# passwd postgres
Set the password postgres
```

(4) Set the environment variables for root in the /etc/profile by using vi editor.

```
# vi /etc/profile
```

Add the following lines at the bottom of the file.

```
PG=/usr/local/pgsql
export PATH="$PATH":$PG/bin
export PGLIB=$PG/lib
export LD_LIBRARY_PATH="$LD_LIBRARY_PATH":"$PGLIB"
export PGDATA=$PG/data
export MANPATH="$MANPATH":$PG/man
export PGDATESTYLE=iso
export JAVA_HOME=/usr/local/j2se
export TOMCAT_HOME=/usr/local/tomcat
export PATH=$PATH:$JAVA_HOME/bin
```

Let the above setting effective by the source command.

```
# source /etc/profile
```

(5) Postgres user's setting
1. Swicht to the postgres user, and edit the /home/postgres/.bashrc

```
# su postgres
$ vi /home/postgres/.bashrc
```

Add the following lines at the bottom of the file.

```
export JAVA_HOME=/usr/local/j2se
export TOMCAT_HOME=/usr/local/tomcat
PG=/usr/local/pgsql
export PATH="$PATH":$PG/bin
```

```
export PGLIB=$PG/lib
export LD_LIBRARY_PATH="$LD_LIBRARY_PATH":"$PGLIB"
export PGDATA=$PG/data
export MANPATH="$MANPATH":$PG/man
export PGDATESTYLE=iso
```

Let the above setting effective by the source command.

```
$ source /home/postgres/.bashrc
```

2. Edit /home/postgres/.bash_profile to set environment variable.

```
$ vi /home/postgres/.bash_profile
```

Add the following line at the bottom of the file.

```
export PATH=$PATH:$JAVA_HOME/bin
```

Let the above setting effective by the source command, and return to the root user.

```
$ source /home/postgres/.bash_profile
$ exit
```

3. Installation of JDK and Tomcat

3.1 JDK installation
(1) Move to the directory to install JDK.
```
# cd /usr/local/
```
(2) To let the installer file to be executabel, change the permission 777.
```
# chmod 777 /usr/local/src/jdk-1_5_0_14-linux-i586.bin
```
(3) start the installer.
```
# /usr/local/src/jdk-1_5_0_14-linux-i586.bin
```
(4) Hit a space bar several times when the message "Binary Code License Agreement" appeares.
(5) Hit [y] and [Enter] key when the message "Do you agree to the above license terms?" appeares.
(6) Wait for a while until the installation completes.
(7) Create a symbolic link to jdk1.5.0_14 with the link_name j2se to help JAVA_HOME specification convinent.
```
# ln -s jdk1.5.0_14 j2se
```

3.2 Tomcat installation
(1) Move to /usr/local directory, and unpack apache-tomcat-6.0.18.tar.gz into /usr/local/src.
```
# cd /usr/local/
# tar zxvf /usr/local/src/apache-tomcat-6.0.18.tar.gz
```
(2) Create a symbolic link to apache-tomcat-6.0.18 with the link_name tomcat to help TOMCAT_HOME specification convinent.
```
# ln -s apache-tomcat-6.0.18 tomcat
```
(3) Edit the /usr/local/tomcat/conf/server.xml file to make the SSL connector effective.
```
# vi /usr/local/tomcat/conf/server.xml
```
   - line 69: change the port number from 8443 to 443.
   - line 81: remove the comment tag <!—.
   - line 82: change the port number from 8443 to 443.

4

```
    - line 85: remove the comment tag -->.
    - line 88: change the port number from 8443 to 443.
```

(4) Key generation

```
# /usr/local/j2se/bin/keytool -genkey -alias tomcat -keyalg RSA
```

Enter the data as follows. You can optionally set the red portions.

```
Enter keystore password: changeit
Enter your name.
  [Unknown]: kansai-u
Department.
  [Unknown]: Information Systems Engineering Laboratory
Company/Organization or Employer.
  [Unknown]: kansai-u
City/Street.
  [Unknown]: Suita
State/Prefecture.
  [Unknown]: Osaka
Country code(two character).
  [Unknown]: JP
CN=yamada, OU=JAVA Developer, O=Sbp, L=Akasaka, ST=Tokyo, C=JP, are you OK?
  [no]: yes
Enter generated key for <tomcat>.
(If you set the key same as keystore password, input [Enter]): changeit
```

(5) Start Tomcat.

```
# /usr/local/tomcat/bin/startup.sh
```

(6) Confirm the operation of Tomcat

Access the web site at http://(the IP address of the Linux PC):8080/ from your browser on the Windows PC. If the Tomcat splash page appears, the installation has succeeded.

Futhermore, access the same site with port 443 throug https protocol, i.e., https:// (the IP address of the Linux PC):443/. If the Tomcat splash page appears again, the SSL has successfully configured.

Note: Although 'Certificate error' blocking page appears in the process when the page is loaded with SSL, it is no problem For Internet Explorer, click 'Continue to this web site (not recommended)' on the blocking page to go to the website. For Firefox, add the exception for an invalid SSL certificate. When you use the CEAS system in practice, it is recommended to acquire the certification from appropriate certificate authority.

4. CEAS3.0.9 Deployment

(1) Stop Tomcat.

```
# /usr/local/tomcat/bin/shutdown.sh
```

(2) Copy /usr/local/src/Core1.war into /usr/local/tomcat/webapps.

```
# cp /usr/local/src/Core1.war /usr/local/tomcat/webapps
```

(3) Start Tomcat.

```
# /usr/local/tomcat/bin/startup.sh
```

5. DBMS Installation

This section describes the installation of DBMS (PostgreSQL).

(1) Create an install directory, and change the ownership to postgres.

```
# mkdir /usr/local/pgsql
# chown postgres:postgres /usr/local/pgsql
```

(2) Switch to postgres user, and move to /usr/local/src directory.
    Unpack postgresql-8.1.10.tar.gz there as postgres user.
    Next, move to postgresql-8.1.10 to run configure script with the options,
    and make and make install.

```
# cd /usr/local/CEAS-Sakai-Linux/software
# tar zxvf postgresql-8.3.7.tar.gz
# cd postgresql-8.3.7
# ./configure --enable-multibyte=UNICODE --with-odbc --enable-syslog
# make
# su - postgres
$ make install
```

(3) Initialize the database server.

```
$ initdb --encoding=UNICODE --no-locale
```

Note: CEAS adopts the UTF-8 character encoding for internationalization.

(4) Start the database server.

```
$ pg_ctl -w -o "-i" start
```

(5) Return to the root user, and set the Postgres server boot automatically.
```
$ exit
# cp postgresql-8.1.10/contrib/start-scripts/linux /etc/rc.d/init.d/postgresql
# chmod a+x /etc/rc.d/init.d/postgresql
(add the postgresql service)
# chkconfig --add postgredsql
(change the startup information for postgresql on so as to the postgresql to
be started up.)
# chkconfig postgresql on
(start the postgresql service.)
# service postgresql start
```

6. Database creation for CEAS

Create a database that the CEAS uses, and register a course administrator.

(1) Set permission of the file /usr/local/src/createdb.sql executable.

```
# chmod 777 /usr/local/src/createdb.sql
```

(2) Switch to the postgres user, and move to the directory /usr/local/src/.

```
# su - postgres
$ cd /usr/local/src/
```

(3) Create a database named CEASCOREDB.

```
$ createdb CEASCOREDB
```

(4) Run the SQL file to create CEASCOREDB, to setup all tablesSome tables and
    to register the the default course administrator.

```
$ psql -d CEASCOREDB -f createdb.sql
$ exit
```

7. Editing Configuration Files

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(1) Configuration for database connection
  1. Stop Tomcat.

```
# /usr/local/tomcat/bin/shutdown.sh
```

  2. Edit the configuration file for database connection properties.

```
# vi /usr/local/tomcat/webapps/Core1/WEB-INF/dataSource.properties
```

  3. Change it as follows.

```
#PostgreSQL
driverClassName=org.postgresql.Driver
url=jdbc:postgresql://localhost:5432/CEASCOREDB
username=postgres
password=postgres
#MySQL
#driverClassName=com.mysql.jdbc.Driver
#url=jdbc:mysql://localhost:3306/ceascoredb?characterEncoding=utf8
#username=root
#password=
```

(2) Confirm/change the configuration properties file for CEAS.

```
# vi /usr/local/tomcat/webapps/Core1/WEB-INF/classes/jp/ac/ceascore/
configuration2/customConfiguration.properties      * Do not break line.
```

  No change is necessary for CEAS 3.0.9 to run, but make sure you confirm the property setting. See the CEAS configuration properties file in Appendix 1. Notice that this file is written in Unicode and will get garbled when it is opened with a text editor.

8. Operation check and setting of a sample data

8.1 Operation check for CEAS

(1) Startup the Tomcat.

```
# /usr/local/tomcat/bin/startup.sh
```

(2) Access CEAS website and login as CEAS administrator.
  Access CEAS website at
    https://(the IP address of Linux)/Core1/faces/index.jsp
  from your browser on Windows PC.
  When the CEAS login screen appears, enter ceasmgr for the ID and ceaspass for the password, and click Login.
  If you now see the Administrator's Top page, the installation of the CEAS and the creation of the database for the CEAS are completed!

  Note:
  - When not accessing via Secure Socket Layer, access CEAS at http:// (the IP address of Linux):8080/Core1/faces/index.jsp.
  -In the first time access, it takes time for the page to appear.

8.2 Setting of a sample data

8.2.1 Setting of a user sample data
  (1) Choose the Upload User List in the Package Upload menu on the left side of the Administrator TOP page.
  (2) Click the CSV file sample button on top of the Upload User List screen.
    When downloading of the sample file starts, save it in the file of your

choice, such as on the desktop. Name the file as sample_ud.csv and choose
All Files for the file type when you save it.
(3) Upload the sample_ud.csv file. Click Browse... button in the bottom of
Upload User List screen, and select the sample_ud.csv which is saved in
(2) above. Press Upload button and then Register button when the screen
has changed. The sample user data is now registered.
(4) Click Main manu on the global navigation (the black belt) on top of the
Upload User List screen, and go back to the Administrator Top page.

8.2.2 Setting of a sample course data
(1) Choose the Upload Course List in the Package Upload menu on the left side
of the Administrator TOP page.
(2) Click the CSV file sample button on top of the Upload Course List screen.
When downloading of the sample file starts, save it in the file of your
choice, such as on the desktop. Name the file as sample_cd.csv and choose
All Files for the file type when you save it.
(3) Upload the sample_cd.csv file. Click Browse... button in the bottom of
Upload Course List screen, and select the sample_cd.csv which is saved
in (2) above. Press Upload button and then Register button when the screen
has changed. The sample user data is now registered.
(4) Click Main manu on the global navigation (the black belt) on top of the
Upload Course List screen, and go back to the Administrator Top page.

8.2.3 Setting of a sample instructor's info
(1) Choose the Upload Instructor's Info in the Package Upload menu on the left
side of the Administrator TOP page.
(2) Click the CSV file sample button on top of the Upload Instructor's Info
screen. When downloading of the sample file starts, save it in the file
of your choice, such as on the desktop. Name the file as sample_ca.csv
and choose All Files for the file type when you save it.
(3) Upload the sample_ca.csv file. Click Browse... button in the bottom of
Upload Instructor's Info screen, and select the sample_ca.csv which is
saved in (2) above. Press Upload button and then Register button when the
screen has changed. The sample user data is now registered.
(4) Click Main manu on the global navigation (the black belt) on top of the
Upload Instructor's Info screen, and go back to the Administrator Top page.

8.2.4 Setting of a sample course enrollment info
(1) Choose the Upload Enrollment Info in the Package Upload menu on the left
side of the Administrator TOP page.
(2) Click the CSV file sample button on top of the Upload Enrollment Info screen.
When downloading of the sample file starts, save it in the file of your
choice, such as on the desktop. Name the file as sample_ce.csv and choose
All Files for the file type when you save it.
(3) Upload the sample_ce.csv file. Click Browse... button in the bottom of
Upload Enrollment Info screen, and select the sample_ce.csv which is saved
in (2) above. Press Upload button and then Register button when the screen
has changed. The sample user data is now registered.
(4) Click Main manu on the global navigation (the black belt) on top of the
Upload Enrollment Info screen, and go back to the Administrator Top page.

8.3 Confirmation of the sample data

(1) Access at

```
     https://(the IP address of Linux)/Core1/faces/index.jsp
   from a Windows PC for the CEAS log-in screen.
(2) Enter ceasmgr for the ID and ceaspass for the password. Confirm that you
    see the Administrator's Top page.
 (3) Enter t00001 for the ID and 44444444 for the password. Confirm that you see
     the Instructor's Top page.
(4) Enter gh00001 for the ID and 11111111 for the password. Confirm that you see
    the Student's Top page.
```

Now installation of CEAS 3.0.9 is finished!

9. Miscellaneous

9.1 Character code for uploading files

Use only the UTF-8 character code for csv files for uploading lists. Note that you cannot edit or save csv files in UTF-8 with Excel or WordPad. Use a text editor which enables you to specify UTF-8 when editing. Please note that you need to save the file without BOM (Byte Order Mark).

9.2 Changing of the title and image on the log-in screen

You can change the title and image on the top of the log-in screen. For details, consult the guide 'Customising the CEAS 3 Login Page' downloaded from the Installation Guides on the CEAS Community Page.

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Appendix 1

CEAS Configuration Properties file
(customConfiguration.properties)

```
#############################################################
#####              ユーザが編集する定数                #####
#####      ※DB の設定は WEB-INF>dataSource.properties      #####
#############################################################
#CEAS index ページ アドレス
#備考：メールなどにリンクとして記載される
CUSTOM_CEASLOGINLINK=http://localhost:8080/Core1/faces/index.jsp
#SSL 利用の場合はこちら↓
#CUSTOM_CEASLOGINLINK=https://localhost/Core1/faces/index.jsp


#メールサーバホスト
#備考：メール機能を使う場合は必要
CUSTOM_SMTPHOST=localhost


#出席送信許可 IP
#備考：0 から始まる連番とすること
CUSTOM_ATTENDANCEIP0=192.168.0.*
CUSTOM_ATTENDANCEIP1=
CUSTOM_ATTENDANCEIP2=
CUSTOM_ATTENDANCEIP3=
CUSTOM_ATTENDANCEIP4=
#不正アクセス対策 1 一定時間 (分) 内に同一アカウントが一定回数以上のログインに失敗した時
#FLG1      0…無効、1…有効
#TIME1     一定時間 (分)
#COUNT1    同一アカウントのログイン失敗回数 (回)
CUSTOM_ILLEGALACCESSFLG1=0
CUSTOM_ILLEGALACCESSTIME1=10
CUSTOM_ILLEGALACCESSCOUNT1=10


#不正アクセス対策 2 一定時間 (分) 内に同一 IP アドレスから一定回数以上ログインがあった時
#FLG2      0…無効、1…有効
#TIME2     一定時間 (分)
#COUNT2    同一 IP のログイン回数 (回)
#PERIOD2   アクセスを拒否する時間 (分)
CUSTOM_ILLEGALACCESSFLG2=0
CUSTOM_ILLEGALACCESSTIME2=10
CUSTOM_ILLEGALACCESSCOUNT2=10
CUSTOM_ILLEGALACCESSPERIOD2=720


#名列番号を切り取って表示するための開始位置と終了位置
#ex.)NAMENOPREFIXSTARTNO=0,NAMENOPREFIXENDNO=13
```

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```
#    「01234567890123 シス 00-01 関大太郎」→「シス 00-01 関大太郎」と表示される
#備考：使わない場合はどちらも 0 にすること
CUSTOM_NAMENOPREFIXSTARTNO=0
CUSTOM_NAMENOPREFIXENDNO=13


####################################
##  これ以降は必要があれば変更すること  ##
####################################
#科目に設定する授業回数の最大値(回)
#備考：デフォルト値は 50
CUSTOM_MAXCLASSSESSIONCOUNT=50

#科目に設定するグループフォルダ数の最大値(回)
#備考：デフォルト値は 50
CUSTOM_MAXGROUPFOLDERCOUNT=50

#お知らせ等の「new」の表示期間(ミリ秒)
#ex.)3 日間＝3*24*60*60*1000=259200000(ミリ秒)
CUSTOM_NEWCHECKTIME=259200000

#レポートフィードバック使用時の最大提出可能枚数
#備考：デフォルト値は 30
CUSTOM_MAXIMUMREPORTCOUNT=30
```
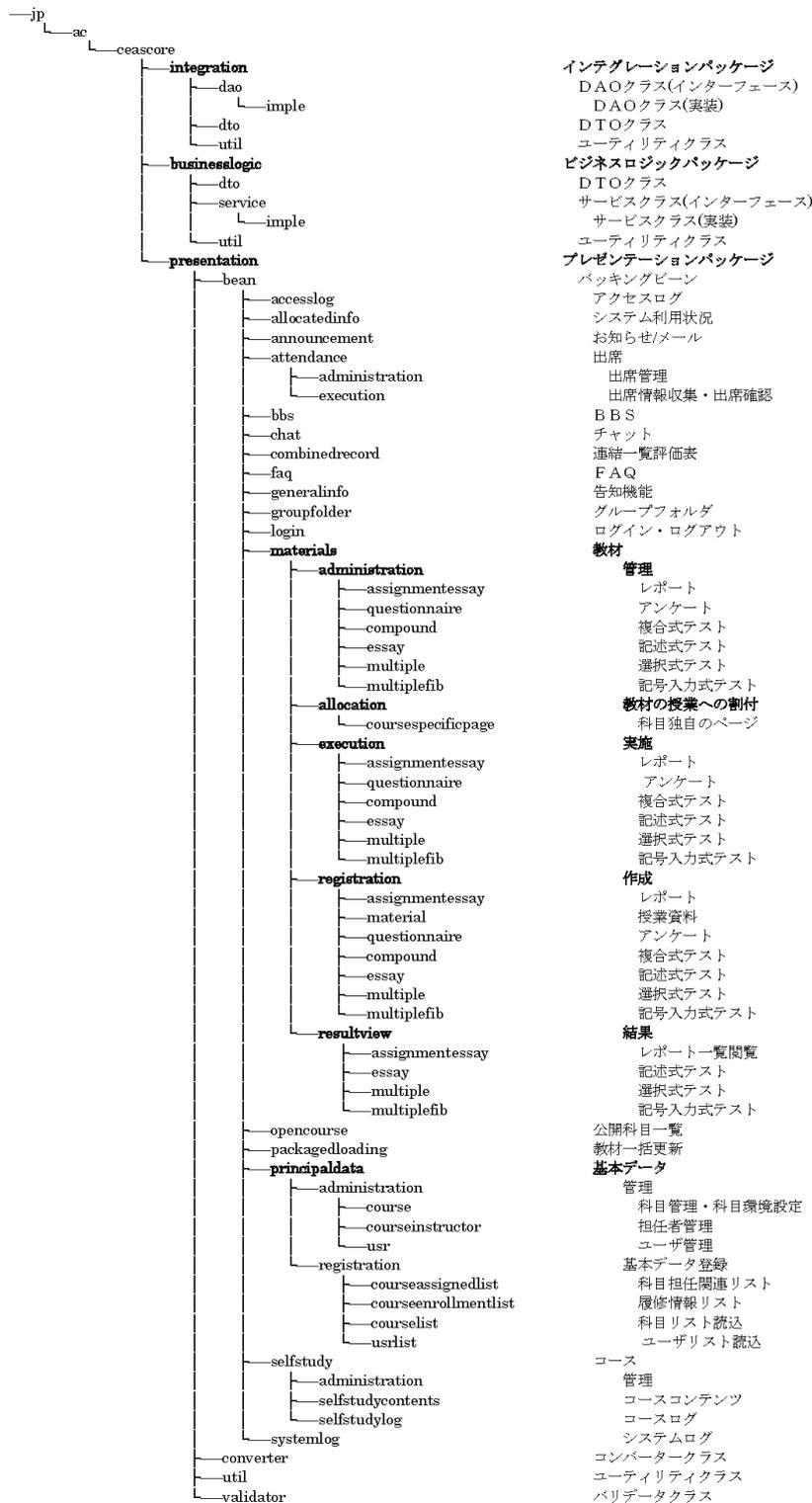
Appendix 2

CEAS Core1 Package Structure

```
─jp
   └─ac
      └─ceascore
              ├─integration                          インテグレーションパッケージ
              │   ├─dao                              ＤＡＯクラス(インターフェース)
              │   │   └─imple                        ＤＡＯクラス(実装)
              │   ├─dto                              ＤＴＯクラス
              │   └─util                             ユーティリティクラス
              ├─businesslogic                        ビジネスロジックパッケージ
              │   ├─dto                              ＤＴＯクラス
              │   ├─service                          サービスクラス(インターフェース)
              │   │   └─imple                        サービスクラス(実装)
              │   └─util                             ユーティリティクラス
              ├─presentation                         プレゼンテーションパッケージ
              │   ├─bean                             パッキングビーン
              │   │   ├─accesslog                    アクセスログ
              │   │   ├─allocatedinfo                システム利用状況
              │   │   ├─announcement                 お知らせ/メール
              │   │   ├─attendance                   出席
              │   │   │   ├─administration           出席管理
              │   │   │   └─execution                出席情報収集・出席確認
              │   │   ├─bbs                          ＢＢＳ
              │   │   ├─chat                         チャット
              │   │   ├─combinedrecord               連結一覧評価表
              │   │   ├─faq                          ＦＡＱ
              │   │   ├─generalinfo                  告知機能
              │   │   ├─groupfolder                  グループフォルダ
              │   │   ├─login                        ログイン・ログアウト
              │   │   ├─materials                    教材
              │   │   │   ├─administration           管理
              │   │   │   │   ├─assignmentessay      レポート
              │   │   │   │   ├─questionnaire        アンケート
              │   │   │   │   ├─compound             複合式テスト
              │   │   │   │   ├─essay                記述式テスト
              │   │   │   │   ├─multiple             選択式テスト
              │   │   │   │   └─multiplefib          記号入力式テスト
              │   │   │   ├─allocation               教材の授業への割付
              │   │   │   │   └─coursespecificpage   科目独自のページ
              │   │   │   ├─execution                実施
              │   │   │   │   ├─assignmentessay      レポート
              │   │   │   │   ├─questionnaire        アンケート
              │   │   │   │   ├─compound             複合式テスト
              │   │   │   │   ├─essay                記述式テスト
              │   │   │   │   ├─multiple             選択式テスト
              │   │   │   │   └─multiplefib          記号入力式テスト
              │   │   │   ├─registration             作成
              │   │   │   │   ├─assignmentessay      レポート
              │   │   │   │   ├─material             授業資料
              │   │   │   │   ├─questionnaire        アンケート
              │   │   │   │   ├─compound             複合式テスト
              │   │   │   │   ├─essay                記述式テスト
              │   │   │   │   ├─multiple             選択式テスト
              │   │   │   │   └─multiplefib          記号入力式テスト
              │   │   │   └─resultview               結果
              │   │   │       ├─assignmentessay      レポート一覧閲覧
              │   │   │       ├─essay                記述式テスト
              │   │   │       ├─multiple             選択式テスト
              │   │   │       └─multiplefib          記号入力式テスト
              │   │   ├─opencourse                   公開科目一覧
              │   │   ├─packagedloading              教材一括更新
              │   │   ├─principaldata                基本データ
              │   │   │   ├─administration           管理
              │   │   │   │   ├─course               科目管理・科目環境設定
              │   │   │   │   ├─courseinstructor     担任者管理
              │   │   │   │   └─usr                  ユーザ管理
              │   │   │   └─registration             基本データ登録
              │   │   │       ├─courseassignedlist   科目担任関連リスト
              │   │   │       ├─courseenrollmentlist 履修情報リスト
              │   │   │       ├─courselist           科目リスト読込
              │   │   │       └─usrlist              ユーザリスト読込
              │   │   ├─selfstudy                    コース
              │   │   │   ├─administration           管理
              │   │   │   ├─selfstudycontents        コースコンテンツ
              │   │   │   └─selfstudylog             コースログ
              │   │   └─systemlog                    システムログ
              │   ├─converter                        コンバータークラス
              │   ├─util                             ユーティリティクラス
              │   └─validator                        バリデータクラス
```

Appendix 3

CEAS Basic Data Format

				User List	
No.	item	required	No. of charactors	Content	Note
1	ID code	required	2	fixed as "ud"	
2	status flag	required	1	1: register 2: update 3: logical delete 4: physical delete 6: update roll number order only	6 (update roll number order only) is not currently available on CEAS: You need a separate batch program.
3	user's account	required	<64	one-byte Roman alphabets and numbers only	
4	password	required	<128	one-byte Roman alphabets and numbers only	
5	student roll number	required	<128	for sorting the student list	
6	name (in kanji)	required	<64	use no more than 32 two-byte characters	
7	name (in kana)		<64	use no more than 32 two-byte characters	
8	administrator authority	required	1	1: administrator 2: instructor 3: student	
9	sex		1	1: male 2: female	0: unknown, optional field
10	date of birth		8	in yyyymmdd	
11	email address		<256		
12	code moved		1	4: temporaliry withdrawn 5: withdrawn 6: expelled 7: moved out 8: graduated	
13	date moved		8	in yyyymmdd	
14	validation date		8	in yyyymmdd	Notice that it does not automatically update the data on this day.

				Course List	
No.	item	required	No. of charactors	Content	Note
1	ID code	required	2	fixed as "cd"	
2	status flag	required	1	1: register 2: update 3: logical delete 4: physical delete	
3	course code	required	<128	one-byte Roman alphabets and numbers only	
4	course title	required	<64	use no more than 32 two-byte characters	
5	AY	required	4	in yyyy	
6	semester	required	1	0: unspecified 1: spring term 2: summer term 3: fall term 4: winter term 5: first semester 6: second semester 7: intensive course 8: full-year course 9: others	

7	department		<64	use no more than 32 two-byte characters	
8	instructor's name		<128		
9	day of the week		1	1: Monday 2: Tuesday 3: Wednesday 4: Thrusday 5: Friday 6: Saturday 7: Sunday 0: unspecified	
10	period		1	1: 1st period 2: 2nd period 3: 3rd period 4: 4th period 5: 5th period 6: 6th period 7: 7th period 8: 8th period 0: unspecified	
11	validation date		8	in yyyymmdd	

Instructor Info List

No.	item	required	No. of charactors	Content	Note
1	ID code	required	2	fixed as "ca"	
2	status flag	required	1	1: register 3: logical delete 4: physical delete	
3	user's account	required	<64	one-byte Roman alphabets and numbers only	
4	course code	required	<128	one-byte Roman alphabets and numbers only	
5	AY	required	4	in yyyy	
6	semester	required	1	0: unspecified 1: spring term 2: summer term 3: fall term 4: winter term 5: first semester 6: second semester 7: intensive course 8: full-year course 9: others	
7	validation date		8	in yyyymmdd	

Enrollment Info List

No.	item	required	No. of charactors	Content	Note
1	ID code	required	2	fixed as "ce"	
2	status flag	required	1	1: register 3: logical delete 4: physical delete	
3	user's account	required	<64	one-byte Roman alphabets and numbers only	
4	course code	required	<128	one-byte Roman alphabets and numbers only	
5	AY	required	4	in yyyy	
6	semester	required	1	0: unspecified 1: spring term 2: summer term 3: fall term 4: winter term 5: first semester 6: second semester 7: intensive course 8: full-year course 9: others	
7	validation date		8	in yyyymmdd	