



Installation Guide for CEAS/Sakai

Version 1.0.1

(OS:Linux)

(draft 20090621)

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1. Introduction

This document explains how to install CEAS/Sakai 1.0.1 for the first time to a Linux machine. By following the steps described here you can install the software in order to run CEAS/Sakai. It will take about one hour to complete installation.

1.1 About installing CEAS/Sakai

• Overview

CEAS/Sakai is custermed based on CEAS 3.0.9[20090603] and sakai-src-2.5.4.

In addition to all the CEAS functions, you can use the following functions of Sakai Collaboration and Learning Environment, or Sakai CLE; hereafter Sakai) seamlessly from CEAS:

- Forum(sakai.forums)
- SCORM(sakai.scorm.tool)
- Wiki(sakai.rwiki)
- Resources(sakai.resources)

• Requirements

- Memory: 1.5GB (minimum)
- Disc space: 1.5GB free (minimum)
- port 8080 and 8081 can be available for installing Tomcat

• Directory structure after installation

```
/usr/local/CEAS-Sakai-Linux/  
    apache-tomcat-5.5.26    <- Tomcat for Sakai  
    apache-tomcat-6.0.18    <- Tomcat for CEAS & CAS  
    sakai-src                <- Source for Sakai  
    software                <- Installation Kit for J2SE5.0, MySQL, PostgreSQL
```

1.2 Preparation for installation

Hardware and documents required for installation

- A Linux computer as well as a Windows computer for operation check
- The following OS has been tested:

Fedora10, CentOS4.5(RAID), CentOS5.3

- CEAS/Sakai downloaded from the CEAS Community Page website (CEAS-Sakai-Linux-1.0.1-yyyyymmdd.zip) yyyyymmdd stands for Year, Month, and Date. (eg. 20090617 for 17 June 2009)
- Installation guide downloaded from the CEAS Community Page website (CEAS-Sakai_installation_guide_Linux.en.pdf)

2. Deployment of CEAS, Sakai and Tomcat and installation of JDK

2.1 Deploymet of CEAS, Sakai and Tomcat

(1) Send the file CEAS-Sakai-Linux-1.0.1-yyyyymmdd.zip into /user/local with a file transfer tool such as FTP, and unzip the file.

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```
$ su
# cd /usr/local
# unzip CEAS-Sakai-Linux-1.0.1-yyyyymmdd.zip
Now the directory /user/local/CEAS-Sakai-Linux is made.
```

2.2 Installation of JDK

Install J2SE5.0. **If you already have one, skip 2.2 and move to 2.3.**

* Notice that you need to use the J2SE 5.0 series, as the CEAS/Sakai does not work with the 1.4 or 1.6 series.

(1) Change directory to where you want JDK to be installed.

```
# cd /usr/local/
```

(2) Set the executable permissions so that the installer can do the job.

```
# chmod 777 /usr/local/CEAS-Sakai-Linux/software/jdk-1_5_0_14-linux-i586.bin
```

(3) Run the installer.

```
# /usr/local/CEAS-Sakai-Linux/software/jdk-1_5_0_14-linux-i586.bin
```

(4) Press the Space key several times when you see the [Binary Code License Agreement] message.

(5) Press [y] and [Enter] when you see the [Do you agree to the above license terms?] message.

(6) Wait some moments before the installation finishes.

(7) Create a symbolic link to jdk1.5.0_14 with the link_name j2se to help JAVA_HOME specification convenient.

```
# ln -s jdk1.5.0_14 j2se
```

2.3 Preparation for Tomcat

Add the execute authority to the Tomcat's boot script.

```
# cd /usr/local/CEAS-Sakai-Linux/apache-tomcat-5.5.26/bin
# chmod +x *.sh
# cd /usr/local/CEAS-Sakai-Linux/apache-tomcat-6.0.18/bin
# chmod +x *.sh
```

3. Installation of DBMS

3.1 Installation of MySQL

Install MySQL. **If you already have one, skip 3.1 and move to 3.2.**

Unzip the file

/usr/local/CEAS-Sakai-Linux/software/mysql-5.1.34-linux-i686-glibc23.tar.gz
file to /usr/local/mysql.

```
# cd /usr/local
# tar zxvf CEAS-Sakai-Linux/software/mysql-5.1.34-linux-i686-glibc23.tar.gz
# mv mysql-5.1.34-linux-i686-glibc23 mysql
# groupadd mysql
# useradd -g mysql mysql
# cd mysql
# chown -R mysql .
# chgrp -R mysql .
# scripts/mysql_install_db --user=mysql
# chown -R root .
# chown -R mysql data
# ./bin/mysqld_safe --user=mysql &
```

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```
# ./bin/mysqladmin -u root password ''
* Do the installaion by following mysql/INSTALL-BINARY.
(The following is the setup for automatic MySQL boot when the OS is started.)
# cp ./support-files/mysql.server /etc/rc.d/init.d/mysql
# chmod a+x /etc/rc.d/init.d/mysql
# chkconfig --add mysql
# chkconfig mysql on
```

3.2 Installaion of PostgreSQL

Install PostgreSQL. If you already have one, skip and move to 4.

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

```
# useradd postgres
# passwd postgres
Set the password as postgres when you are asked (you will be asked twice.)
```

- (2) Make a directory for PostgreSQL.

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

- (3) Prepare installation and make install as a postgres user.

```
# cd /usr/local/src/
# 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
```

* CEAS uses UTF-8 character codes only for internationalization.

- (4) Set the environment variable at /home/postgres/.bash_profile.

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

Add the following lines to 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
```

Let the above setting effective by the source command.

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

- (5) Initialize the DB.

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

- (6) Start the PostgreSQL server.

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

- (7) Go back to the root user, and set the automatic start of the PostgreSQL server.

```
$ exit
```

(Copy the boot script)

```
# cd /usr/local/CEAS-Sakai-Linux/software
```

```
# cp postgresql-8.1.10/contrib/start-scripts/linux /etc/rc.d/init.d/postgresql
```

(Give the executable permission)

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```
# chmod a+x /etc/rc.d/init.d/postgresql
(add the postgresql service)
# chkconfig --add postgresql
(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
```

4. Making database for Sakai and CEAS

4.1 Make database for Sakai

```
# cd /usr/local/CEAS-Sakai-Linux
# /usr/local/mysql/bin/mysql -u root < sakaidbcreate.sql
```

4.2 Make database for CEAS

```
# su - postgres
$ cd /usr/local/CEAS-Sakai-Linux
$ createdb CEASCOREDB
$ psql -U postgres -d CEASCOREDB < ceasdbcreate.sql
$ exit
```

5. Editing profile files

5.1 Start-up setting

- (1) Set the environment variable for the root user
Set the environment variable for the root user at /etc/profile.

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

Add the following lines to 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 PATH=$PATH:$JAVA_HOME/bin
```

Run the source command to enable the setting after renewing the file.

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

- (2) Start up of Sakai

```
# /usr/local/CEAS-Sakai-Linux/apache-tomcat-5.5.26/bin/startup.sh
# tail -f /usr/local/CEAS-Sakai-Linux/apache-tomcat-5.5.26/logs/catalina.out
```

It takes several minutes (about 5 minutes) for Sakai to start up. Wait till you get [INFO: Server startup in] message.

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Finish the log with Ctrl+C.

(3) Shut down Tomcat for Sakai.

```
# /usr/local/CEAS-Sakai-Linux/apache-tomcat-5.5.26/bin/shutdown.sh
```

(4) Confirm/change the configuration properties file for CEAS

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.

```
# vi /usr/local/CEAS-Sakai-Linux/apache-tomcat-6.0.18/webapps/Core1/  
WEB-INF/classes/jp/ac/ceascore/configuration2/  
customConfiguration.properties * Do not break line.
```

5.2 Modification of IP address

Substitute the IP address or the host name of the computer for localhost with a text editor such as vi.

[Files needed modification]

The files are in the /usr/local/CEAS-Sakai-Linux/directory.

```
# cd /usr/local/CEAS-Sakai-Linux  
- apache-tomcat-6.0.18¥webapps¥Core1¥WEB-INF¥applicationContext-rest.xml  
  line 23 and line 28  
- apache-tomcat-6.0.18¥webapps¥Core1¥cas-login¥login2redirect.jsp  
  lines 9 to 11  
- apache-tomcat-6.0.18¥webapps¥Core1¥cas-login¥logout.jsp  
  line 9  
- apache-tomcat-5.5.26¥sakai¥sakai.properties  
  line 82  
  Exception: At line 108, substitute 'localhost' for (127.0.0.1) as follows:  
    url@javax.sql.BaseDataSource=jdbc:mysql://localhost:3306/sakai?  
    useUnicode=true&characterEncoding=UTF-8 * Do not break line.  
- apache-tomcat-5.5.26¥webapps¥sakai-login-tool¥WEB-INF¥web.xml  
  line 52, line 56 and line 60
```

5.3 Configuration for database connection

Open the files with a text editor such as vi and change the user and password for database connection.

[Files needed modification]

The files are under the /usr/local/CEAS-Sakai-Linux/ directory.

```
# cd /usr/local/CEAS-Sakai-Linux/
```

```
• apache-tomcat-6.0.18¥webapps¥Core1¥WEB-INF¥dataSource.properties  
  lines 2 to 5 (Confirm that lines 2-5 does not begin with #.)
```

```
#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=
```

- apache-tomcat-6.0.18¥webapps¥cas¥WEB-INF¥deployerConfigContext.xml
lines 193 to 204 (Specify connection of PostgreSQL to CEASCOREDB)
(Confirm that those line are not enclosed by <!-- and -->)
- apache-tomcat-5.5.26¥sakai¥sakai.properties
line 88, line 89, and lines 105 to 110 (Confirm the following setting.)
line 88 username@javax.sql.BaseDataSource=root
line 89 password@javax.sql.BaseDataSource=
lines 105 to 110 does not begin with #.
- apache-tomcat-5.5.26¥components¥courseupdate-pack¥WEB-INF¥components.xml
lines 118 to 127 (Specify connection of PostgreSQL to CEASCOREDB)
(Confirm that those line are not enclosed by <!-- and -->)

6. Starting up and shutting down of CEAS/Sakai

6.1 Starting up of CEAS/Sakai

Start up the following two Tomcat.

```
# /usr/local/CEAS-Sakai-Linux/apache-tomcat-5.5.26/bin/startup.sh
# /usr/local/CEAS-Sakai-Linux/apache-tomcat-6.0.18/bin/startup.sh
```

6.2 Shutting down of CEAS/Sakai

Shut down the following two Tomcat.

```
# /usr/local/CEAS-Sakai-Linux/apache-tomcat-5.5.26/bin/shutdown.sh
# /usr/local/CEAS-Sakai-Linux/apache-tomcat-6.0.18/bin/shutdown.sh
```

7. Operation check and setting of a sample data

7.1 Operation check for CEAS/Sakai

(1) Start up the following two Tomcat.

```
# /usr/local/CEAS-Sakai-Linux/apache-tomcat-5.5.26/bin/startup.sh
# /usr/local/CEAS-Sakai-Linux/apache-tomcat-6.0.18/bin/startup.sh
```

(2) Access CEAS website at [http://\(the IP address of Linux PC\):8081/](http://(the IP address of Linux PC):8081/) from your browser.

```
ID: admin
password: admin (default)
```

7.2 Setting of a sample data

7.2.1 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.

7.2.2 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.

7.2.3 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.

7.2.4 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.

7.3 Synchronization of CEAS and Sakai

- (1) In order to move to Sakai page, click 'Sakai CLE' in the Support Tools menu which appears in the pulldown list of Instructor's Menu on the Top page leftside

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menu.

(2) Procedures on Sakai are:

From My Workspace or Administration Workspace, select Job Scheduler.

Click Job on the belt -> New Job ->

Specify:

[Job name : CEAS Sync]

[Type: CEAS DB Synchronize data for user, course, member]

Click Submit button.

Select Triger for CEAS Sync. Run Job Now -> Run Job Now (*1)

Note:

*1 The user, course, instructor and enrollment information is synchronized with Sakai. (As CEAS and Sakai use different database, you need to execute CEAS Sync in order to synchronize the databases.)

We use the CEAS password for BOTH CEAS and Sakai, since CAS authentication requires the CEAS password.

7.4 Confirmation of the sample data

(1) Access [http://\(IP address for Linux PC\):8081/](http://(IP address for Linux PC):8081/) from a Windows PC for the CEAS log-in screen.

(2) Enter admin for BOTH the ID and the password. Confirm that you now see the Administrator 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/Sakai is finished!

8. Miscellaneous

8.1 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).

8.2 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.

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
```

```
# 「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_MAXCLASSESSIONCOUNT=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

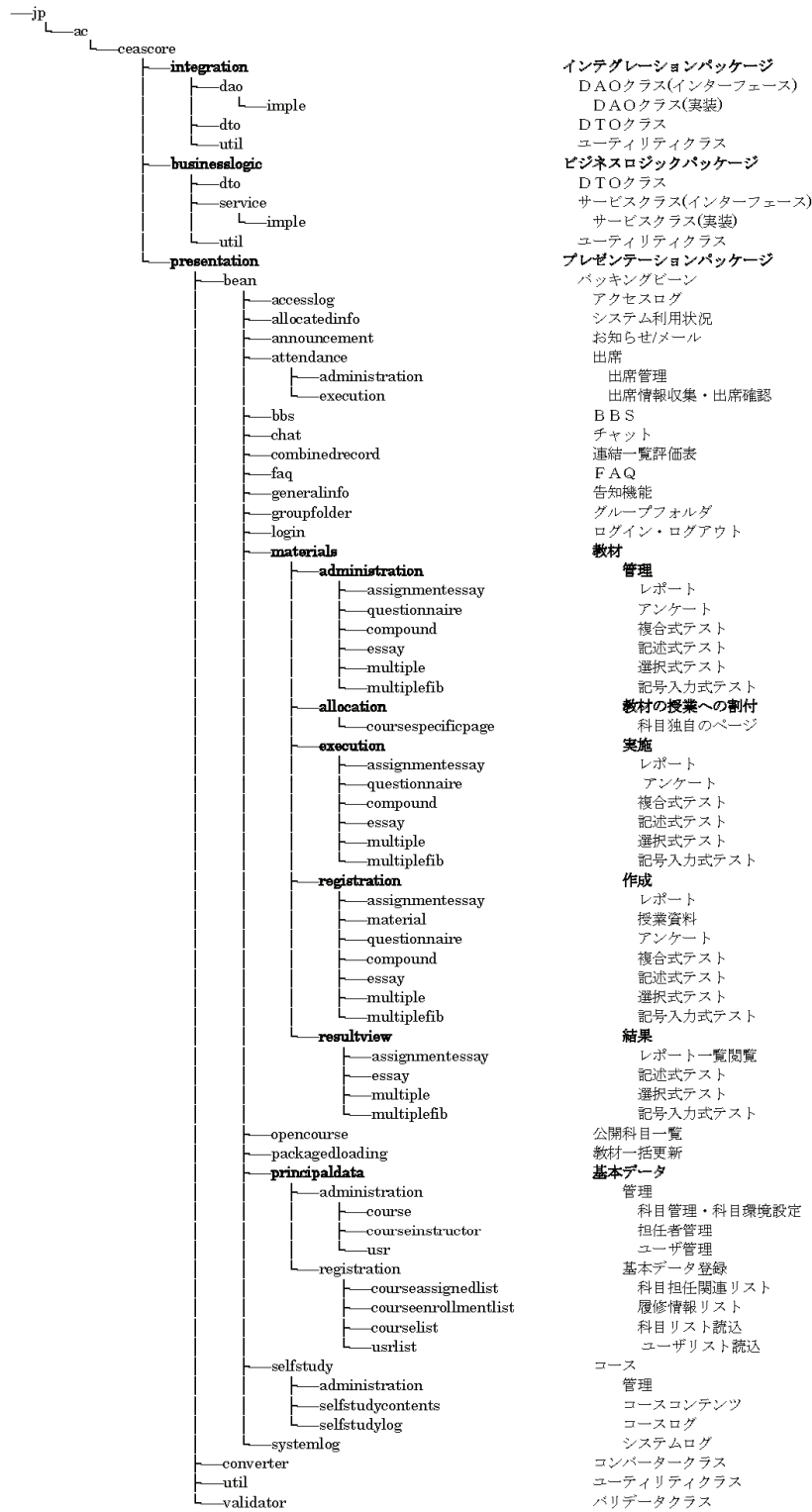
#お知らせ等の「new」の表示期間(ミリ秒)
#ex.) 3日間=3*24*60*60*1000=259200000(ミリ秒)
CUSTOM_NEWCHECKTIME=259200000

#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

(created: 8/21/2006, updated 6/21/2009)

CEAS Core1 Package Structure



- インテグレーションパッケージ**
- DAOクラス(インターフェース)
- DAOクラス(実装)
- DTOクラス
- ユーティリティクラス
- ビジネスロジックパッケージ**
- DTOクラス
- サービスクラス(インターフェース)
- サービスクラス(実装)
- ユーティリティクラス
- プレゼンテーションパッケージ**
- バックギンビーン
- アクセスログ
- システム利用状況
- お知らせ/メール
- 出席
- 出席管理
- 出席情報収集・出席確認
- BBS**
- チャット
- 連結一覧評価表
- FAQ**
- 告知機能
- グループフォルダ
- ログイン・ログアウト
- 教材**
- 管理**
- レポート
- アンケート
- 複合式テスト
- 記述式テスト
- 選択式テスト
- 記号入力式テスト
- 教材の授業への割付**
- 科目独自のページ
- 実施**
- レポート
- アンケート
- 複合式テスト
- 記述式テスト
- 選択式テスト
- 記号入力式テスト
- 作成**
- レポート
- 授業資料
- アンケート
- 複合式テスト
- 記述式テスト
- 選択式テスト
- 記号入力式テスト
- 結果**
- レポート一覧閲覧
- 記述式テスト
- 選択式テスト
- 記号入力式テスト
- 公開科目一覧
- 教材一括更新
- 基本データ**
- 管理**
- 科目管理・科目環境設定
- 担任者管理
- ユーザ管理
- 基本データ登録
- 科目担任関連リスト
- 履修情報リスト
- 科目リスト読込
- ユーザリスト読込
- コース**
- 管理**
- コースコンテンツ
- コースログ
- システムログ
- コンバータークラス
- ユーティリティクラス
- バリデータークラス

Appendix 3

CEAS Basic Data Format

User List					
No.	item	required	No. of characters	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 yyyyymmdd	
11	email address		<256		
12	code moved		1	4: temporarily withdrawn 5: withdrawn 6: expelled 7: moved out 8: graduated	
13	date moved		8	in yyyyymmdd	
14	validation date		8	in yyyyymmdd	Notice that it does not automatically update the data on this day.
Course List					
No.	item	required	No. of characters	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: Thursday 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 yyyyymmdd	

Instructor Info List

No.	item	required	No. of characters	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 yyyyymmdd	

Enrollment Info List

No.	item	required	No. of characters	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 yyyyymmdd	