Contract Manager

V 1.0.3

E-insights, LLC

October 2006

Revision History

Initial Manual	October 2005
1st Revision	October 2006
Addition of administrative interface.	

Contract Manager is a tool for managing the documents and dates around groups of contract. While it was developed for managing contract related data, it can be used to manage other kinds of data where there is a need to maintain multiple versions of documents in an un-modifiable form with flexible access control in a distributed network based environment. For example, it can also be used effectively to maintain compliance related documentation in a fashion that tracks the entry dates and identifies the persons making entries and thereafter maintains individual 'versions' in an un-modifiable form. Read only access can be granted to internal or external auditors for example to facilitate compliance testing, or to external consultants for review of proposed contracts.

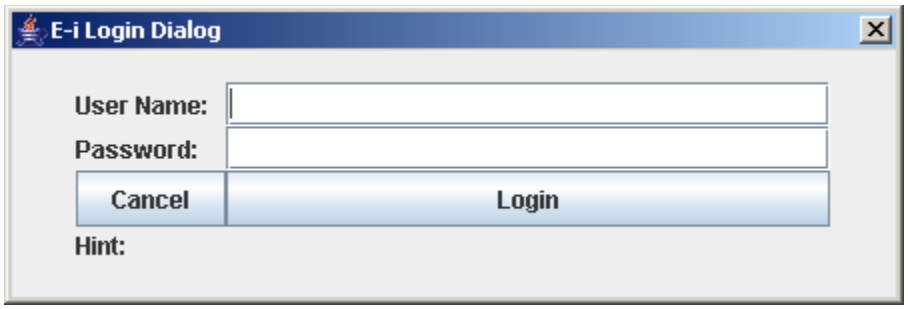
This document contains three sections, User Manual, Administration and implementation description.

User Manual

Launch & Login

Depending on how ***Contract Manager*** is launched, a separate login procedure may or may not be required. Normally when it is launched by a user logged into the E-insights web site (www.e-insights.com) by selecting the "Contract Manager" link in the navigation bar no separate login is required. However, in some cases, such as when the user is accessing the Web via a proxy server, automatic authentication may fail and a login dialog box will be presented. The credentials are the same as those used for authenticating against the E-insights web site. Likewise if **Contract Manager** is launched by a mechanism other than from the E-insights web site, authentication is required.

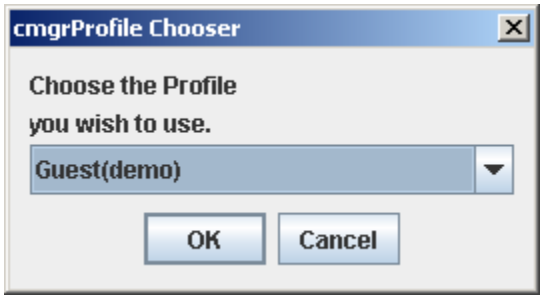
Login Dialog

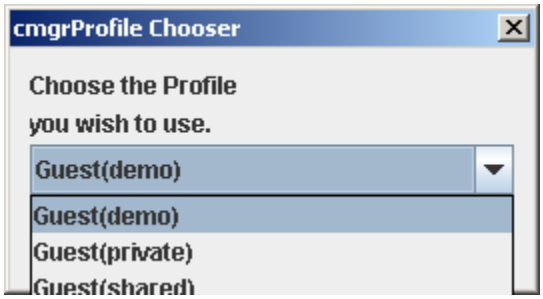


The login dialog box is shown above. Users enter their credentials and click on the "Login" button (or just hit Enter while the mouse is over the dialog box) to attempt authentication. If authentication succeeds, the process moves on to the Profile Selection stage. Otherwise, if the email entered matches that of a registered user, the Hint associated with that user is displayed on the Hint line and the user can re-enter the password. After three unsuccessful attempts the Login process terminates and ***Contract Manager*** exits. Clicking the "Cancel" button at any time cause ***Contract Manager*** to exit.

Selecting a Profile

The profile selection dialog is shown in the next two images. This allows the user to select the specific database they wish to work on in cases where the user has access to multiple databases. In cases where the user only has access to a single database then this dialog is skipped.

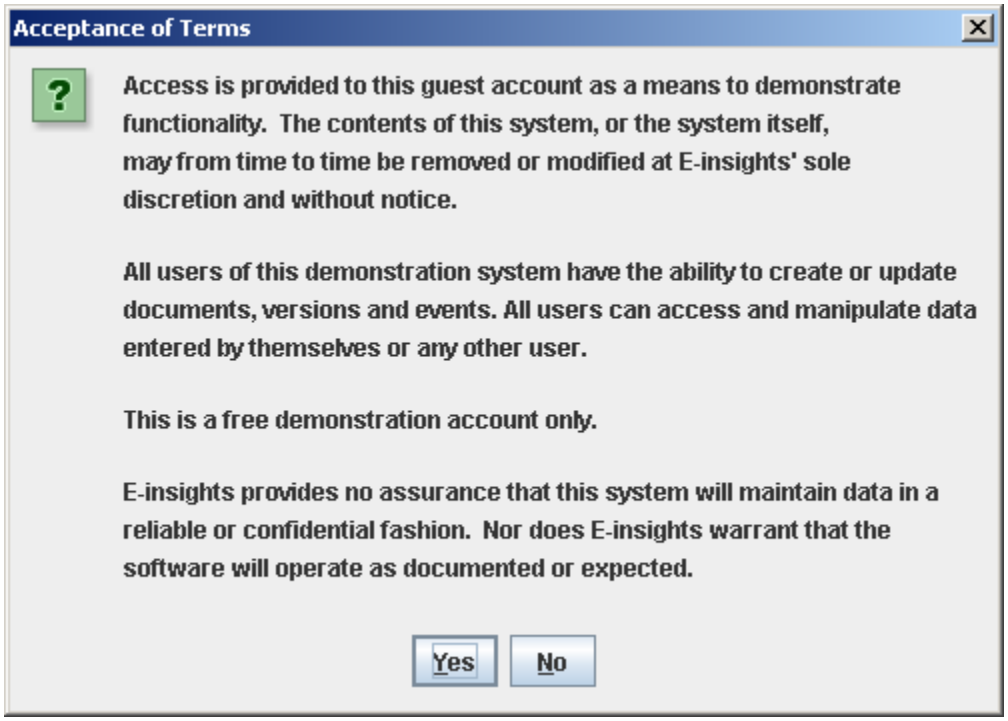




To select a specific dialog, click on the dialog list button (the solid upside down pyramid) and move the mouse until the desired profile is highlighted and click on this item. Then click on the "OK" button. Clicking the "Cancel" button will terminate ***Contract Manager***.

Terms Acceptance

Once a profile has been selected a terms acceptance dialog will be presented in cases where the database has a "terms and conditions" defined. Clicking on "No" in this dialog will result in **Contract Manager** exiting. A database may not have such a definition in which case this dialog is skipped. Such a dialog is shown below.



Contract List Screen

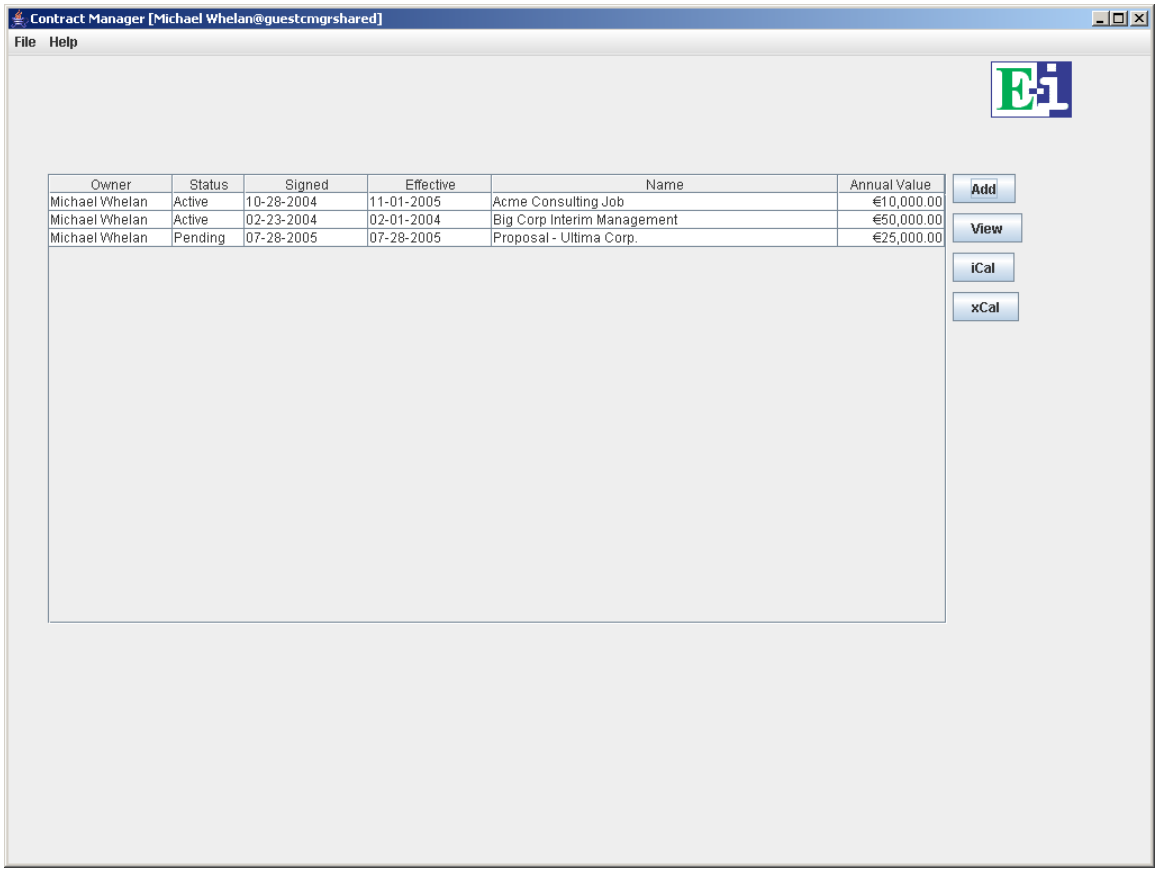
After terms have been accepted the Contract List Screen is displayed. An example of such a screen is shown below. The table in the middle lists the current contracts in the database for which the current user has privileges[1]. The buttons to the right of the table allow a new contract to be added, an existing contract to be viewed, an event calendar to be viewed or an event calendar to be exported to the local machine in ".ical" format. All buttons have "tool tips" (a brief textual description of the button's function) associated with them – moving the cursor over a button an leaving it stationary will cause the tip to be displayed at the cursor location.

To "View" a contract (or anything else for that matter) first select it by clicking on the entry in the table and then click on "View".

To exit contract Manager, click the window close icon in the top right corner (the X symbol), or by selecting the "Exit" item under the File menu. This screen can be printed by selecting the "Print" item under the File menu.

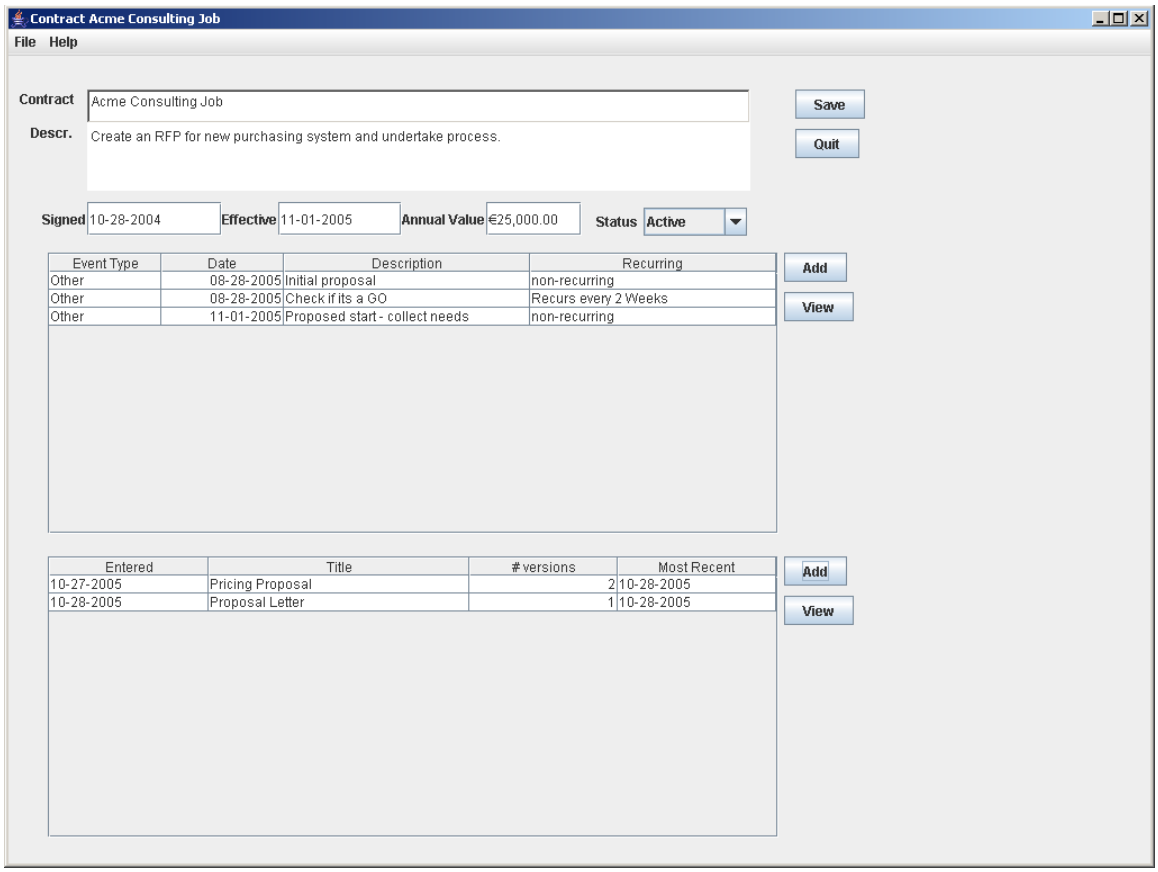
[1] These may be read only privileges.

In the case that the user's privileges for this database are read-only, the Add button will be shown in grey and will be inactive. In general, when a user's privileges do not allow a specific action the button is shown with the text in grey and the button is inactive.



Contract Screen

Upon viewing the top contract we get the screen below. The contract name and description may be altered by entering the new data and clicking the Save button. New events and documents can be added using the associated Add buttons, or existing ones may be viewed using the associated View button.



Document Dialog

Adding and viewing a document bring up the same dialog, the only difference being that the Title is blank when adding and the version table is also blank. In the case of adding a new document, Save will not proceed unless at least one version has been added (and the title field filled in).

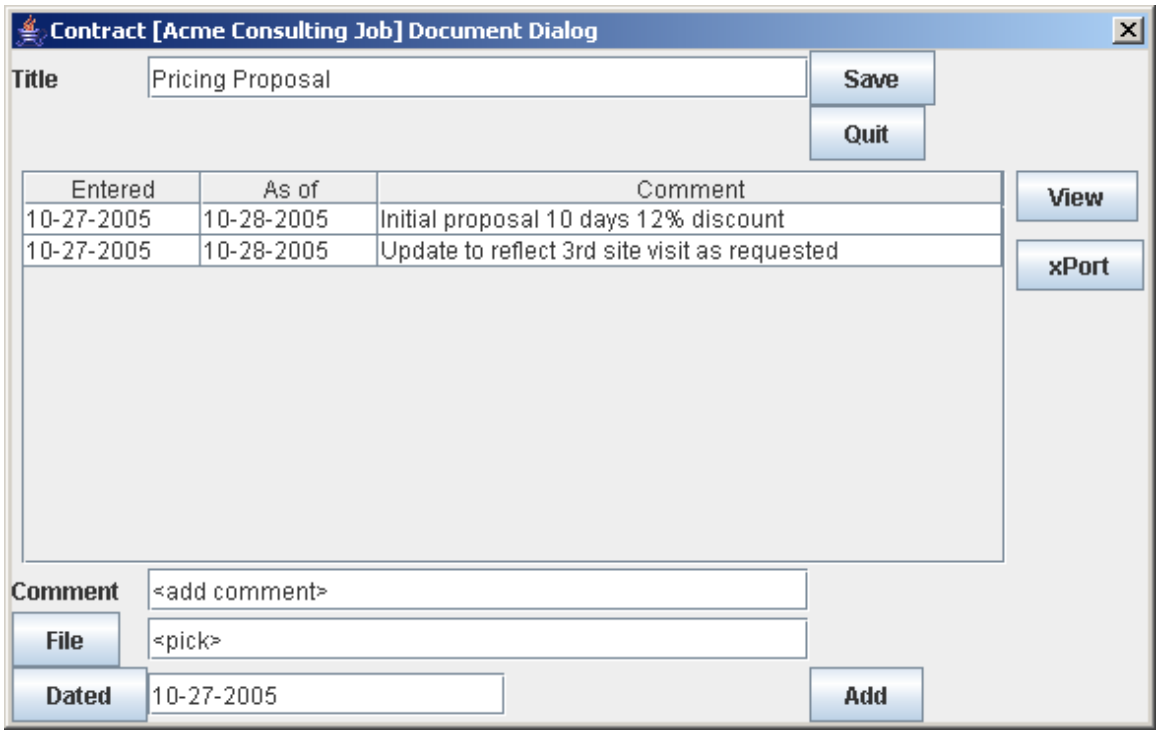
Adding versions requires a comment be added in order to provide later guidance as to how a specific version differed from others (for example "Added early termination provision"). If the user specifies no comment, the file name of the added file is used. Note however, since a single Word document might be used as a working version, this 'comment' may not be very informative. The file containing the version be selected using a java file dialog, or by directly typing in the file path. The "dated" field defaults to the current date but may be changed by the user either by typing directly in the field[2] or by using a selection dialog invoked by clicking on the Dated button. Once this has been completed, clicking on the Add button (towards the bottom right) checks the supplied information and if no errors are found adds a new version.

To View a version, select the version by clicking on its entry in the table and then clicking the View button. ***Contract Manager*** will use the file extension associated with the version when it was entered to determine an appropriate viewing program and then

[2] It is important to use the same date format as the default was displayed in since the date format can vary across databases and user preferences.

will launch the viewer with a temporary file containing the version. This temporary file will be automatically removed when no longer used. To export a copy of the version simply click the xPort button instead of the View button and use the File dialog to select the location to store the exported copy. Unless a new extension is explicitly supplied by the user, the file extension that was associated with the version when it was entered will automatically be appended to the file name where the copy is being stored.

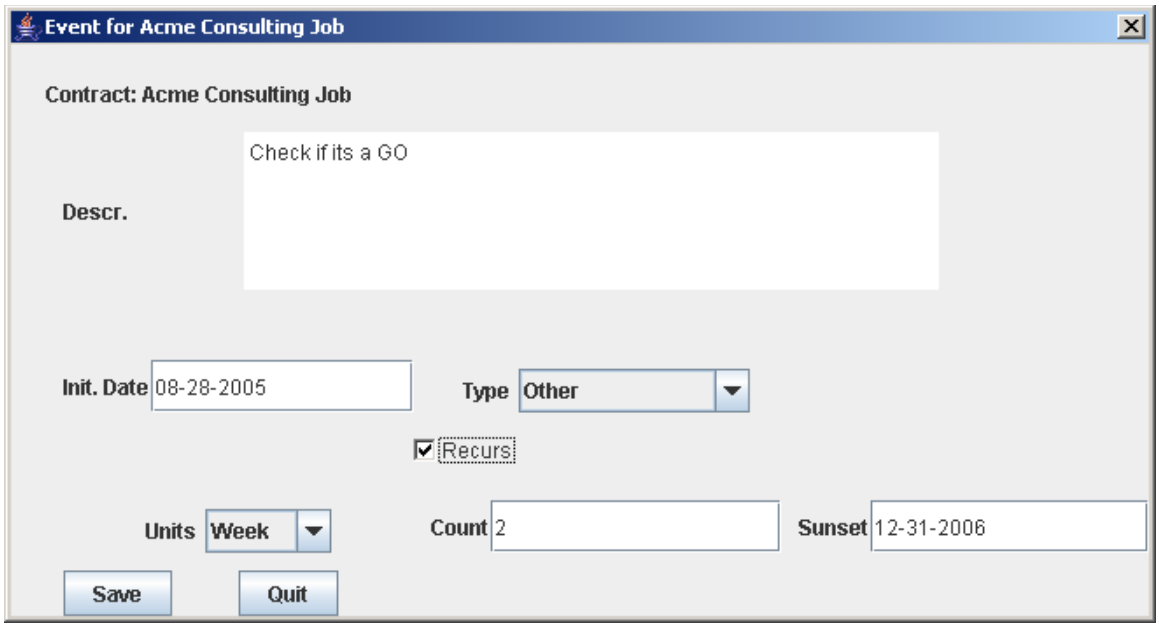
Modifications to an existing document, or the addition of a new event occur when the Save button is clicked. Clicking the Quit button instead discards any changes that might have been made.



Event Dialog

Events operate in a similar fashion to documents in that the same dialog is used for both Add and View. The initial date defaults to the current data and can be modified by the user. The recurring flag defaults to false. If the user selects the recurring check box then additional fields are shown as in the figure below. The sunset date defaults to one year from the current date and can be modified by the user. The Units and count fields control the dates upon which the event will recur. For example selecting Week for the units and a Count of 3 would cause the first recurrence to occur 3 weeks after the initial date, the next 6 weeks after etc. The sunset date is the date after which recurrences will cease.

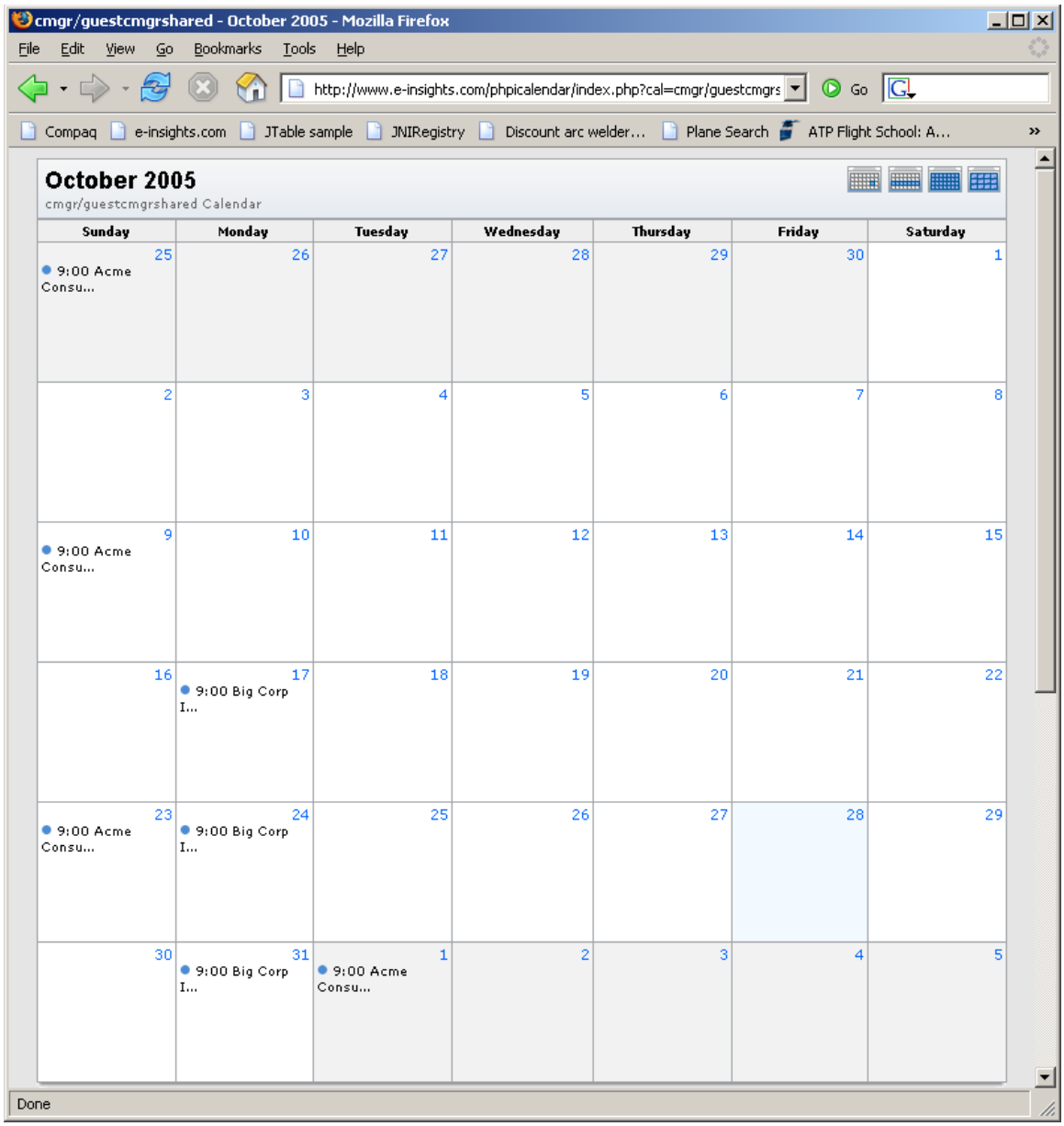
Modifications to an existing event, or the addition of a new event occur when the Save button is clicked. Clicking the Quit button instead discards any changes that might have been made.



Viewing and Exporting Event Calendars

On the Contract List screen, the iCal and xCal buttons allow the event calendar to be viewed or exported respectively. Viewing a calendar causes a .ical (Internet Calendar Format) file to be generated sent to a server running phpicalendar[3] and a browser launched to view this calendar. Each time this button is selected, the calendar is re-created so any changes made are properly updated. The figure below shows a calendar view generated in this way.

[3] See http://phpicalendar.net



The xCal button allows the .ical file to be saved to the local machine in a file. Some mail/calendar programs allow .ical files to be imported. This has not been tested so should be done with care and tested by the user on their particular system. Specifically, can the entries be easily removed after they have been imported and what happens if multiple versions of calendars from the same contract set are imported?

Limits

The database default or user's own configuration settings may impose limits on various items. These are not modifiable by the user unless the user has administration privileges.

- maxStoreSize - specified as a floating point number interpreted as the maximum size of any version being stored. If the version file being stored is a compressible

file the evaluation is made after compression has been performed. By default, ***Contract Manager*** used a value of 10 – i.e. files greater than 10MB (after compression) will not be stored. Setting a negative number as the maxStoreSize has the effect of eliminating any limit.

- maxNumberOfItems – specified as an integer. This limits the sum total of version files that can be stored in the database across all contracts. Note that since some contracts may be hidden from an individual this limit may be exceeded even when the user cannot see that number of versions. By default ***Contract Manager*** sets this to –1. Note however that in demonstration database this is typically set to some limit. Setting this to a negative number has the effect of eliminating any limit.

Administrative Interface

Preamble

Version 1.0.3 added the administrative interface. While these facilities were present in Contract Manager since its initial release, their usage required direct modification to the database tables themselves. The group administration functions attempt to maintain consistency with respect to users, groups and contracts and to ensure that contracts do not become 'inaccessible' while avoiding the need to change any data associated with the contracts themselves. The latter is a design philosophy in attempting to ensure that data related to a contract is not altered after it has been created. Consequently, some actions such as deleting a group that is the group under which a contract was created is prohibited.

Security Note

In order for the administrative interface to operate, it needs to have a special group ADMIN – with a group id (gid) of 0 created, and furthermore, it needs to have at least one user be a member of this group. Upon startup of version 1.0.3, if the ADMIN group does not exist, it is automatically created and the currently connecting user is added as a group member.

While convenient, this does create the possibility that an inappropriate user is made the administrator simply because they logged on using the new version first. This possibility should be avoided either by :

1. adding the group entry (0,'ADMIN') to the group table, and adding (uid,0) in the addgu table with the administrator's uid, in each Contract Manager database manually before the new version of the software is released for use, or
2. having the correct administrator connect first, possibly executing the software directly from the development environment, before the new version is made available to general users

General

The administrative interface is composed of two tabs in a tabbed user interface. When a user with Administrative Privileges[4] logs into Contract Manager, instead of a single pane displaying contract information, a tabbed user interface is displayed. This user interface has three tabs – one being the normal contract information panel, one being for the administration of users and groups, and one being for the administration of handlers[5] on Unix/Linux clients. Note that the contract display panel displays only the contracts, accounting for read only privileges, that are appropriate to the user, irrespective to their role as administrator. It is recommended that the default group membership not be set to the ADMIN group in order to avoid the need to grant membership in this group in order to view contracts since membership in this group also allows management of other users. However, no such restriction is enforced by the system.

[4]The user's default group is the ADMIN (gid=0) group, or the user has an additional group membership in the ADMIN group.

[5]The programs used to view documents of a given type which have been stored.

In addition to the tabbed interface, when a user with administrative priviliges connects, an “Admin” menu selection is also added.

The tabs and additional menu item can be seen below.

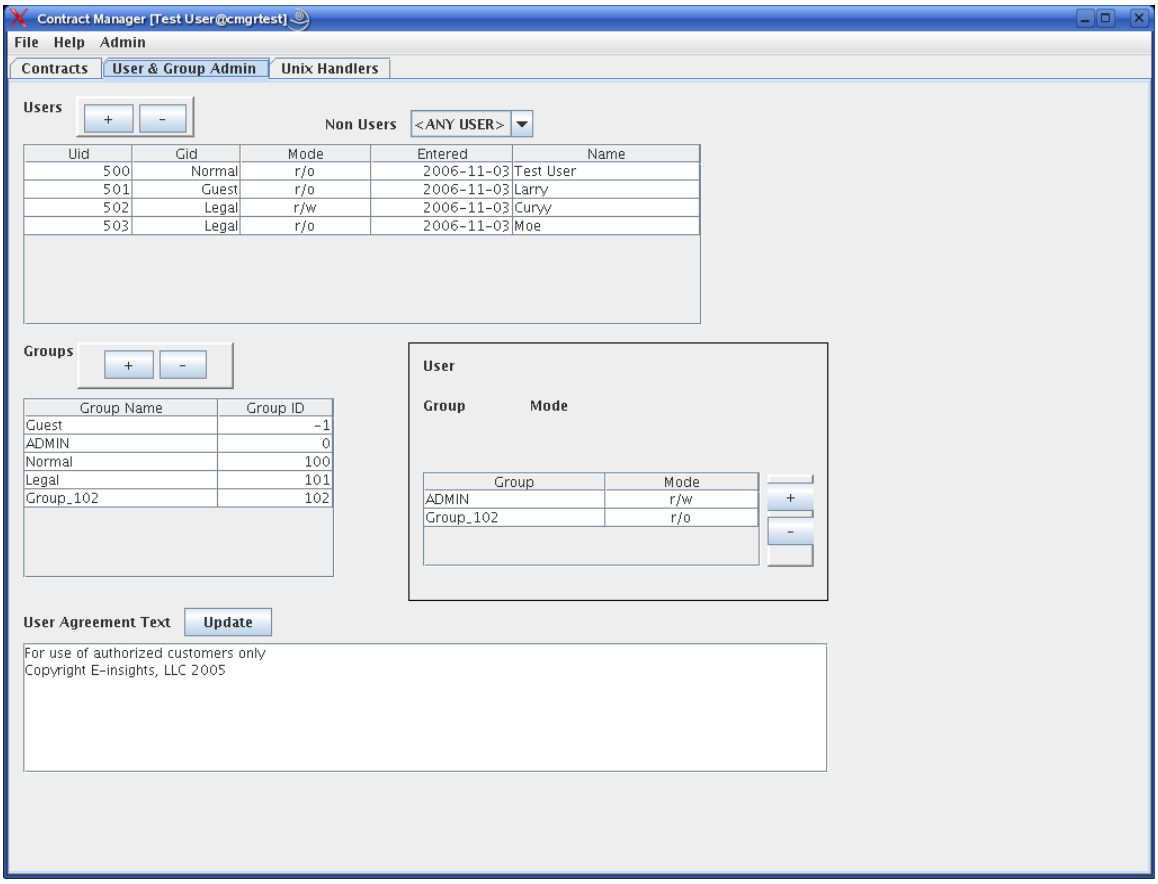
Admin Menu

The additional Menu has two choices, “Vacuum” which executes a database Vacuum/Analyze[6] cycle, and “Export” which exports the entire database into a directory viewable using a web browser. When an “Export” is performed, the entire contests of the database are exported into a directory in the user's home directory named with the database name. In this directory, a file “index.html” is created. Opening this file with a browser will then allow all the content to be examined through the browser. Note that both these functions can take a long time for a large database. Also note that exporting the database into a web viewable form removes any security protection.

User & Group Administration

Figure X.Y shows the user and group administration panel. There are three display areas; the top table is for users, the lower left is for groups and the lower right (which is only visible when a user is selected in the user table) shows the additional group membership for the selected user.

[6]This process will reclaim storage that has been freed as a result of delete or update statements and will also re-calculate statistics that are used during query optimization.



In the usertable, a user id (uid) of -1 is used to indicate that that any user can connect to the database. This is further discussed in the main body of this manual.

To add a new user, select the user from the drop down menu, then select the group to be used as the user's default group from the group table, and then click on the Add User Button (the button with the '+' symbol above the user table) . All users are initially created with a read/write mode of “read only” by default. In order to change this (or any other) user's mode (read only, or read write), simply click in that field in the user table and select the desired value from the drop down menu. Changing the default group is accomplished in a similar fashion. Note that these changes are immediate – i.e. they are effected immediately upon selection of the drop down element – there is no secondary 'save' step.

To remove a user, select the user in the user table and then click the Remove User Button (button above the user table labeled '-'). A confirm window is used to avoid inadvertent deletions. User deletions which would result in either contacts which no remaining user could read, or the removal of the final administrator, are not accepted.

Additional Group Memberships

When a user is selected in the User Table, additional information, including all additional group membership information, concerning that user is displayed in the lower right of the

panel. Addition of an additional group membership is accomplished by first selecting the group in the group table and then clicking on the Add Additional Group membership button ('+' symbol). By default, such additional memberships are added with a read only ("r/o") mode. However, the default can be changed in the same fashion as was the case for the user table. Similarly, additional group memberships can be deleted by selecting the entry and then clicking on the remove ('-') button. Again, removals that would result in the removal of the last administrator will not be accepted.

Groups

Groups can be added with the Add Group Button ('+') and deleted with the Delete Group Button ('-'). Deletion of a group will also cause the removal of additional group memberships referencing this group. The removal of a group that is used as the default group for a user is not allowed. In this case, either remove the user(s) first, or reassign their default group. Likewise, removal of a group that has contracts associated with it is not permitted. Group names can be changed at will there are no restrictions on group names, they could even be duplicative). To change a group name, simply click on that field in the group table and type n the new name; typing a carriage return or clicking outside that entry will finalize the change. Group names have no other purpose than to display a meaningful text string rather than a number for groups. Since the group number under which contracts are entered cannot be changed, there is no provision for modifying the group number itself.

Unix/Linux Handlers

On Windows clients, the appropriate program to display a particular document is determined by querying the Registry based on the file name extension of the file as originally imported. This may not necessarily b the same program as would have been used on the computer form which the original entry was made. For example, a Microsoft Word (.doc) document stored from a PC which has Microsoft Office installed, might be viewed using Open Office on a PC without Office installed. Nevertheless, registry mappings can be relied upon to use an 'appropriate' viewing program. In the rare case where an appropriate viewer is not found in this way, the document can be exported and an appropriate viewer chosen manually.

On Unix or Linux machines, there is no Registry to rely upon. The handlers allow the specification of sufficient information to perform the same function based on the user id[7]. Note, if **Contract Manager** cannot determine a viable handler to display a particular, the file can always be exported and the user can choose the handler manually as noted above for PCs.

During the logon process, Contract Manager first loads all handler information for uid=-1 (ANYUSER). Then handler information for the uid of the user logging on is loaded, adding to or over riding the already loaded information.

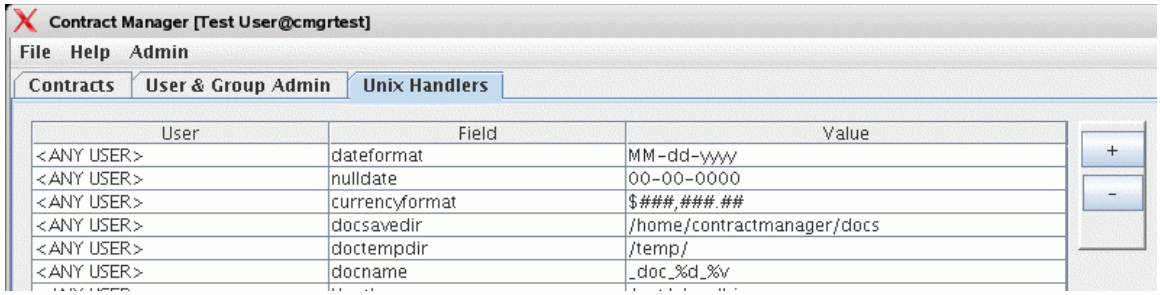
Three types of information are loaded, called Uwindowterm, Upath and Uhandler respectively.

[7]Not the machine note

Uwindowterm
This is a string that specifies how to launch a window. On Unix/Linux machines, viewers need to have the windowing system context in order to operate, and this gives it to them.

Upath
In standard Unix notation a set of directory paths separated by colons denoting the sequence of directories which should be in searched (in order) for executable programs. This avoids the need to specify all handler programs as absolute path names, and allows for some portability across Unix/Linux variants. However, handlers can be specified as absolute path names if needed.

Uhandler
A set of colon separated pairs <FileExtension:ExecutableName>. FileExtension is the standard way to denote the type of file (for example ".ppt" for a Microsoft PowerPoint Presentation). ExecutableName can either be an absolute path name (first character is / - for example "/bin/vi") or an executable name (for example "vi"). In either case additional arguments can also be specified. In the case of an absolute path, **Contract Manager** will attempt to execute the program found at the specified path. In the case of an executable name, **Contract Manager** will search the Upath directories in order attempting to find the specified executable and if found will execute the first one it finds. In both cases, the executed program is passed a temporary file with the documents contents in it for viewing. This file is deleted automatically upon termination of the executed program.



Example[8]

Assume that the current user is 99, and that the user wants to view a document that was originally stored from a location whose file extension was ".htm" .

Uwindowterm	ANYUSER	/opt/kde3/bin/konsole -e
Upath	ANYUSER	/bin:/usr/bin
Uhandler	ANYUSER	.htm:Mozilla -c
Uhandler	USER99	.htm:FireFox

[8]Note that the entries in this table are dependent on the version of Unix/Linux a user uses. The items above are from a Suse installation.

Based on the file extension ".htm", the Uhandler "FireFox" would be used (note – as part of the log on process, the handlers associated with ANYUSER would have been loaded first and then those for USER99, effectively allowing entries to be over ridden for USER99 or added. Consequently, Contract Manager would search (in order) the "/bin" and "/usr/bin" directories for the executable "FireFox". If it is found, then it executes a Uwindowterm with the arguments necessary to start FireFox to view a temporarily saved version of the file.

Keep in mind that entries associated with ANYUSER will apply to each and every user, unless specifically overridden for that user. Handler information is only read during the database connection process. Therefore, it will be necessary for a user to logoff and log on again to see changes in handler data.

Add ('+') and delete (-) entries similarly to groups and users. The user field can be selected by clicking and choosing from the drop down menu, while the name field (Uhandler, etc.) and value fields can be altered by selecting the field and typing in the appropriate value in the same fashion as used in modifying a group name.

Implementation Description
This is preliminary

Contract Manager manages a set of contracts in a single database. Contract ownership and user group mechanisms can be used to control access (including read-only access) on a contract by contract basis.

In the description below, items that are italicized are items that are created by the system while underlined items are entered by the user. Items that are normal text are logical entities where a suffix of "*" indicates zero or more instances of while a suffix of "?" indicates one or zero instances of.

Contract
A contract consists of name, description, signed date, effective date, *entered date*, *user id*, *group id*, annual value, status, a set of events and a set of documents.

Event
An event is a representation of a single date or recurring date sequence that is of significance to a contract. Single events occur once on the specified date. Recurring events occur on an initial date and then upon subsequent dates based on an integer multiple of time units (days, months, quarters or years).

- Termination
- Annual COLA (Cost of Living) Adjustment recurring yearly on the anniversary of the initial date until the contract termination date.

Document
A document is comprised of a title , entered date and last modified date and a non-empty set of versions.

Version
A version consists of a comment, an asof date, an *entered date*, a *last modified* date and a document file and the original file name. The system also maintains a version number for each version.

Document Files
Contract Manager is completely agnostic with respect to types. Document files can contain anything. When document files are loaded into versions they are compressed and stored in the database along with the original filename used to access the file. When a document is viewed, the file extension is used to try and find an appropriate program to 'view' the file with. On a Windows computer, the Registry is queried to find an appropriate viewer. On a Unix computer, a set of default configurations search for normal viewers for a large collection of file types. User specific configuration entries can

be used to add additional handlers. For example – an 'mpeg' file will likely launce a video display program such as Real Player or Windows Media Player, depending on what is installed on the specific computer. Since the local computer is used to determine an appropriate viewer, there is no guarantee that a viewer will exist, or that it will be the same viewer that will be used on other computers.

Dates

signed date – the date upon which a contract or agreement was signed– is entered when the contract is entered into the system and can be updated by the contract owner.

effective date – the effective date of a contract or agreement – is entered when the contract is entered into the system and can be updated by the contract owner.

sunset date – Specified for a recurring event and is the date beyond which no further occurrence of that event will occur.

entered date – The date a contract, or document version is entered into the system. This date is set automatically can cannot be modified.

asof date – Describes the date a specific document version was 'current' – is entered when the contract is entered into the system and can be updated by the contract owner.

last modified date – Describes the date the item was entered, or the last date the item was modified (e.g. the description on a contract changed).

Rights

Contract Manager databases are implemented in Postgres and as such can be protected by using the Postgres's configuration control mechanisms.

Within the ***Contract Manager*** application, contracts are associated with the user id and group id of the user who created the contract.

Users & Groups

Each user upon logging into ***Contract Manager*** for a specific database, is associated with a user id and group id and a flag specifying whether this is a read-only user. User and group ids are positive integers. This user and group id are associated with every contract created by this user in this database. Read-only users may view contracts to which their group privileges gives them access but may not create new items or modify existing ones.

In addition to their default group, a user may also have privileges associated with other groups. Such additional privileges have a read-only flag.

A user can view contracts that

Were created by the same group as the user's default group, or

Were created by a group for which the user has a group membership.

A user is blocked from adding elements to an existing contract if the user's read-only flag is set to true, or if the user is using an additional group membership in order to view the contract and the associated read-only flag is set to true.

In both the user table and the additional group membership tables, an entry of -1 has special. The signon[9] process proceeds in three stages signon, additional group association and user specific configuration.

If there is a usertable entry for the id
    use the associated groupid and read-only flag

else if there is a usertable entry with -1 as the user id
    use the associated read-only flag
    if the associated groupid is >= 0 set this as the effective group id
    otherwise use the user id as the group id
else – signon fails

If the signon process succeeds, the additional user table is scanned for entries with a matching id and then for entries with a userid of -1 and these entries (group id and read-only flag) are added to the user's record.

At this stage, the configuration table is examined for configuration parameters associated with the user id.

[9] Authentication is not handled directly by Contract manager – validating a name and password and determining the unique id assigned to that user are handled by E-insights' Registration system.

Contract Structure

A contracts consists of:

{
name
description
signed date
effective date
annual value
status
entered date
ownerid
event*
{
description
initial date
type
recurrence?
{
units
count
sunset date
}
}
document*
{
name
description
version*
{
title
document file
entered date
version number
}

}