# What's New in version 3.05   June 2013

ProAdmin version 3.05 introduces grid computing, "Deep Copy", the ability to output the interest rates used, a new ProAdmin style license, and many other features listed below.

License

♦ A new ProAdmin license type has been added. Users of a ProVal License Server may now see ProAdmin licenses listed separately. Previously, ProAdmin users were able to use ProVal's Full and Partial licenses to access ProAdmin.
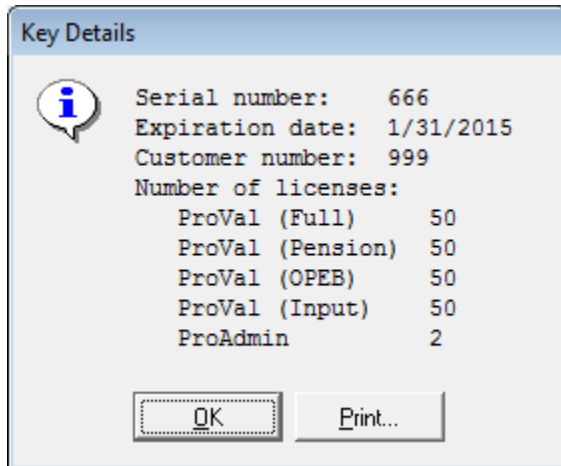

Interface

♦ The User Id for the person who set up or last modified an entry in the Estimated Benefit Calculation, Final Benefit Calculation, Dates/Age/Service, Batch Estimate library and plan repository is now saved. This is the Name set up in the ProAdmin.ini file or, if that entry is missing, the Windows login name.
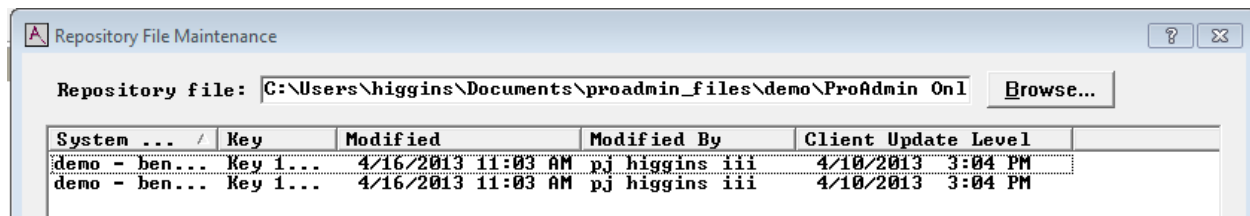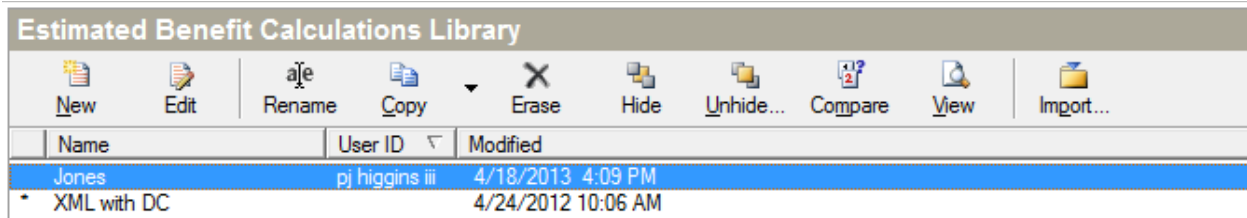
♦ In benefit definitions, benefit formula components, etc., the "Ref'd By" button can now display indirect references. For example, you can find the plan definitions where component X is used.
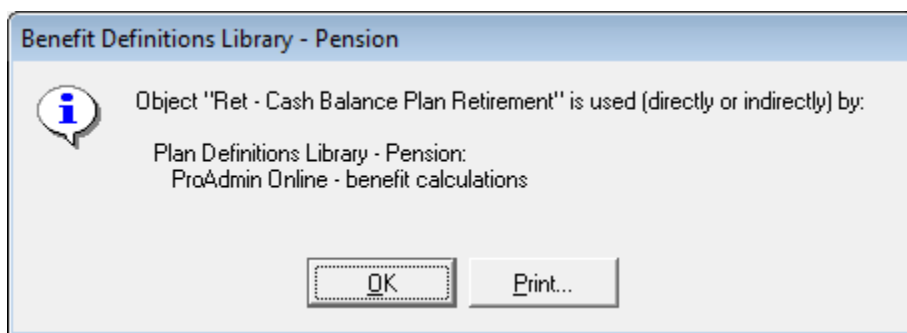
- A "Deep Copy" command creates a duplicate copy of a library entry with the option to make copies of everything the entry references. For more, see Deep Copy on page 18.

- The compare button can now apply to up to 10 objects.

- The Shortcuts Pane can now be minimized to make room for long names in the Entries Pane.
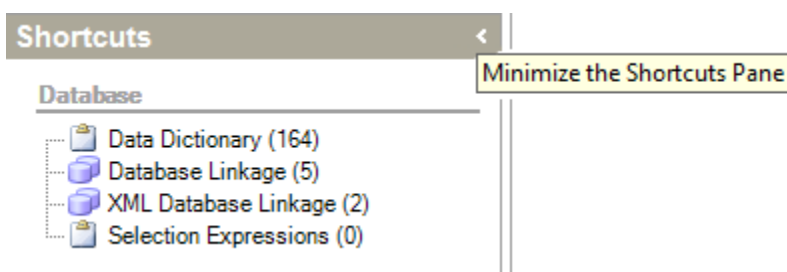
- For easier viewing, messages are now centered on the parent form, not the center of the screen.

- On dialogs with a dropdown field as the first field, the initial focus is on the OK button (or equivalent default button) to help prevent inadvertent changes that occur when bumping the mouse wheel.

- The List Objects command (under the File Menu) now parses the Last Modified column separately when the output is saved to Excel, allowing the output to be sorted.

Mortality Tables

- Improvement Scales

  o There is a new Mortality Improvement Scales library. Improvement Scales can vary by age, sex, and calendar year (if variable by calendar year, this is a so-called "2D improvement scale"). Two-dimensional scales can be input as annual reductions or cumulative factors.

  o Scales BB and BB2D are included in ProAdmin's built-in scales.

  o Mortality tables can separately specify pre- and post-commencement improvement scales and base years.

  For more, see Mortality Enhancements on page 19.

- You can now create a linked mortality table. That is, a table that combines pre- and post-commencement rates and improvement scales from different sources (and possibly applying a setback or scaling factor to the base rates) that requires no manual entry and can be reviewed with ease and confidence.

- If a mortality table or improvement scale is locked, it will be stated in the View.

Plan Definition

- A new option allows age to grow by a full month at each month end when the member was born on the last day of the month. For example, with this Plan Definition | Plan Attributes |

Miscellaneous parameters option checked, a member born on March 31st is assumed to be a full month older on April 30th.

♦ ProAdmin Desktop and Server now allow for commencement dates that are not the first of a month, by unchecking the new Plan Definition | Plan Attributes | Miscellaneous parameters option to "Adjust commencement dates to the beginning of the month coincident or next following."
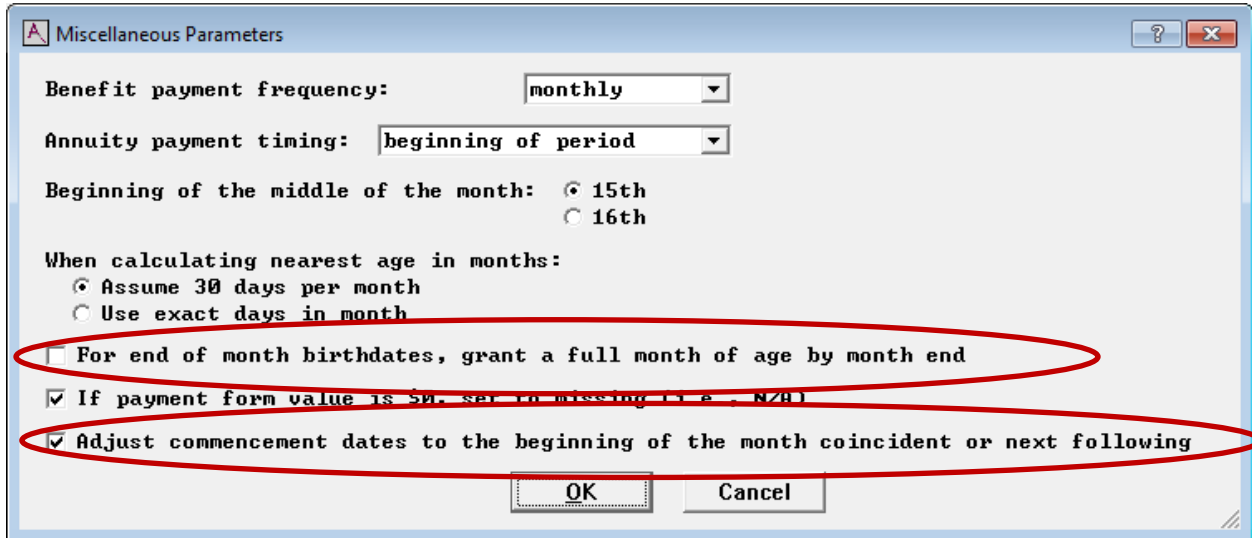
♦ The Canadian ITA Maximum Pension calculation now allows separate Service Definition Sets to be entered for early retirement reductions and benefit accruals. (See the Canadian Maximum Benefits button on the Plan Definition | Regulatory Data Canada tab.)

Interest Rate Tables

♦ Interest Rate Tables now have an option to limit historical and projected rates to a minimum of 0% during the calculations. A warning will be issued if negative interest rates are used in calculations.
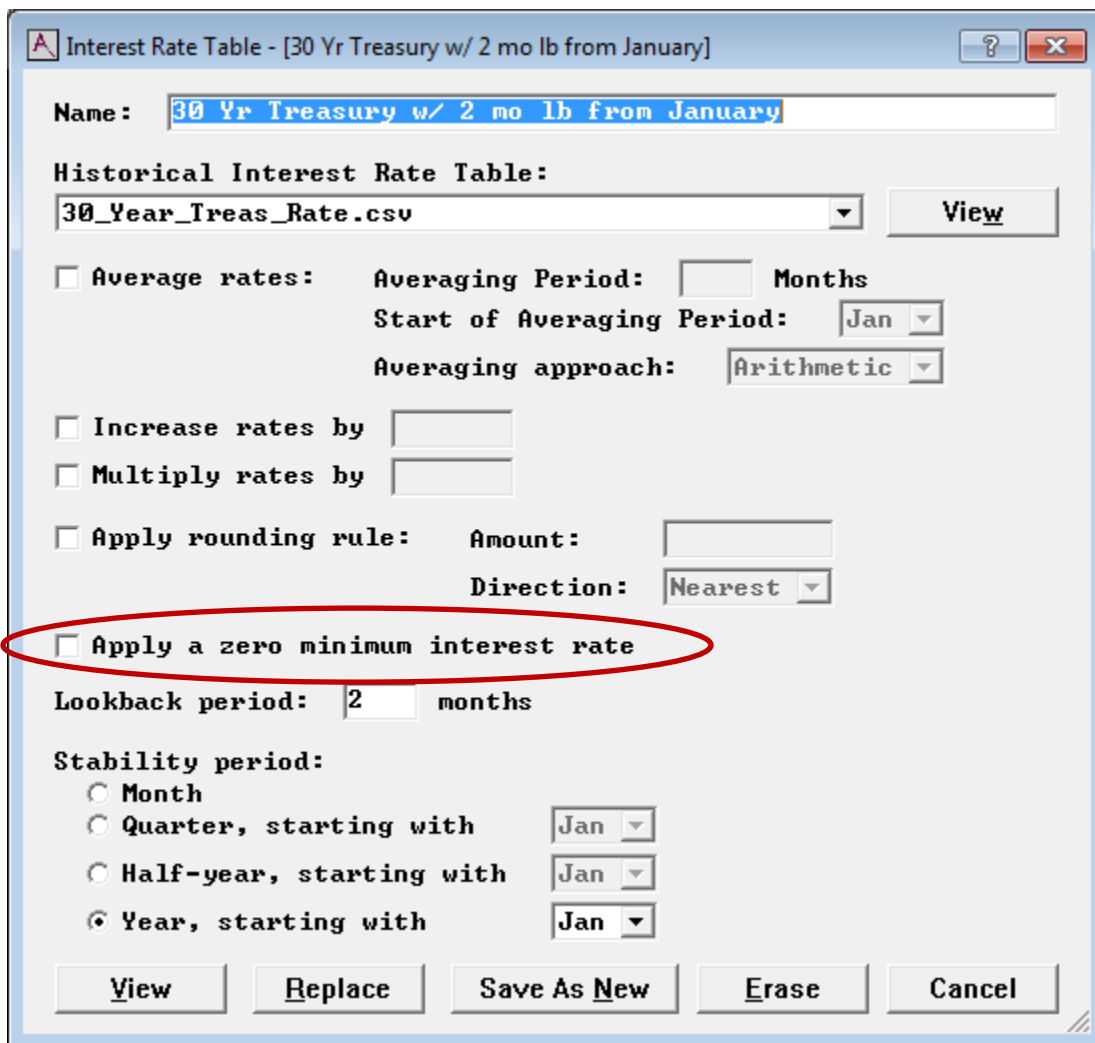
Service Definitions

♦ The #MPSUM and #MPNET operators will now work with anniversary measurement periods in Service Definition transformation expressions where the measurement period is defined as anniversary year.

♦ A new Service Transformation Expression topic has been added to Service Definitions that are based on elapsed time. This new feature allows you to write your own expression for service using ProAdmin's operators and operands, including the #THIS operator that references the service calculated prior to application of the expression. One application of this feature would be to modify the service calculation for members who work less than full time, as shown below.
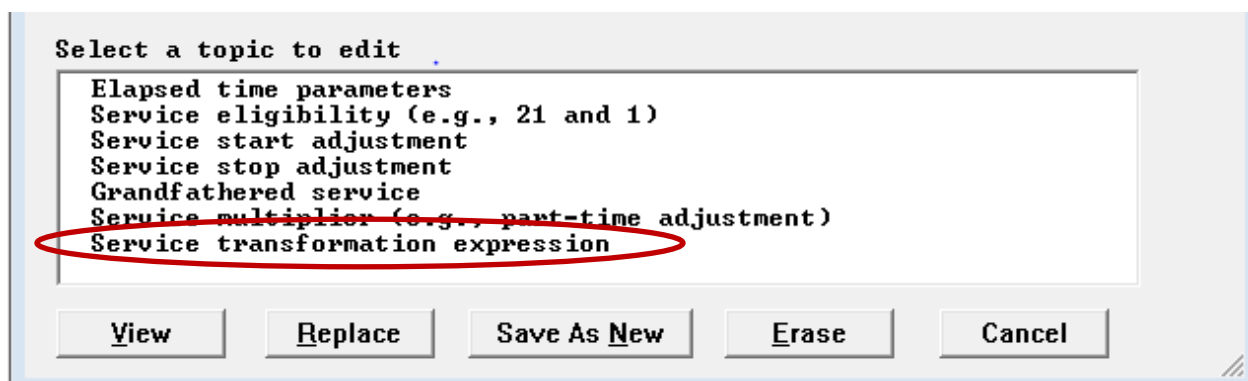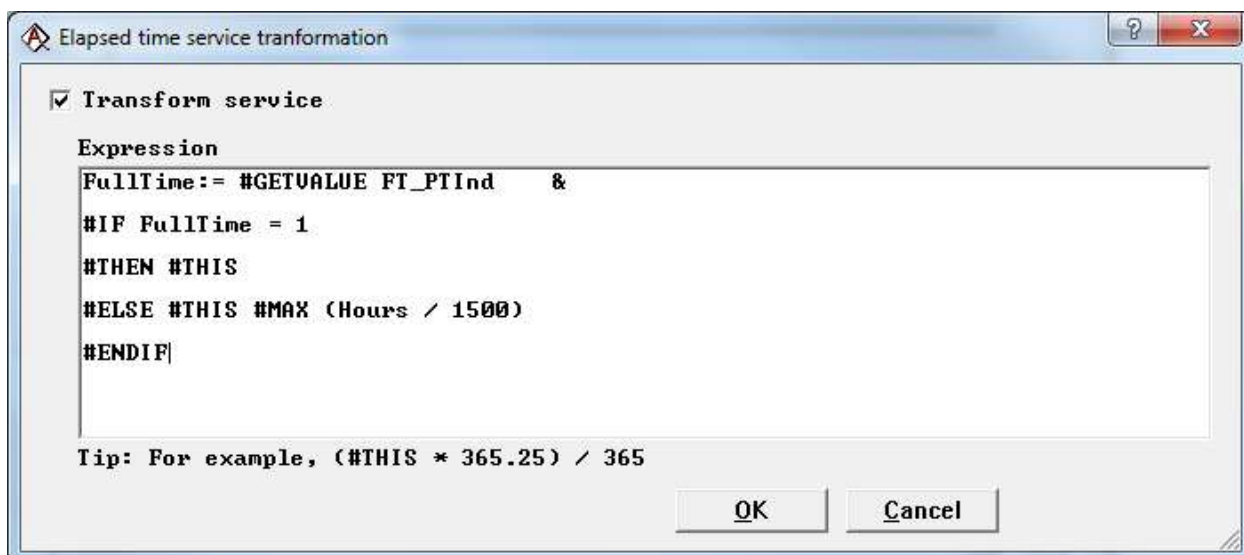
With the addition of this new feature, ProAdmin will calculate elapsed time service in the following order:

1. Calculate service from adjusted start date to adjusted stop date
2. Apply multiplier (if any)
3. Account for any prior event service
4. Apply transformation (if any)
5. Round by Measurement Period (if appropriate)
6. Add Grandfathered Service

Salary Definitions

♦ The #MPSUM and #MPNET operators will now work with anniversary measurement periods in Salary Definition transformation expressions where the measurement period is defined as anniversary year.

Benefit Formula Components

♦ Cash balance accrual definitions now have more flexibility for crediting interest to the current period accrual. The default treatment is that interest is credited only to the prior balance, including any prior period accruals (such as prior months' accruals during the plan year when interest is credited monthly). Previously there was an option to credit interest to one-half of the current period accrual. Now the option (found on the Accruals tab) has been extended to allow interest to be credited to the full current period accrual.
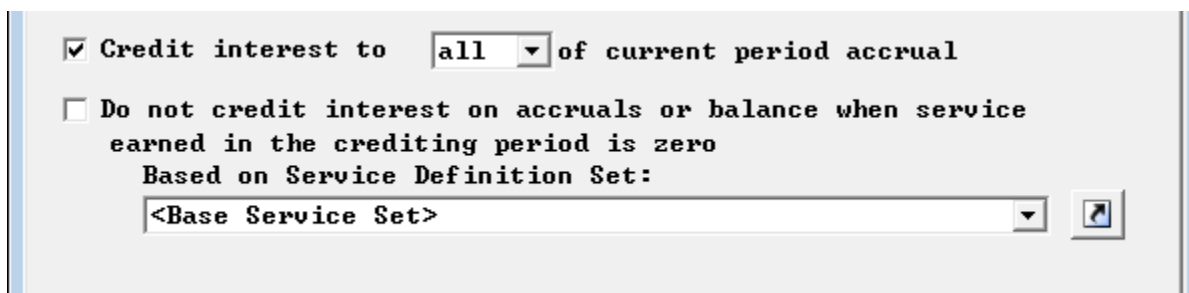
♦ Annuity Factor Benefit Formula and Accrual Basis Components can now be defined as deferred to, or temporary to, Normal Retirement Date (NRD), where NRD is defined under the Plan Definitions | Plan Attributes topic. This feature is particularly useful for determining actuarial equivalence within a formula when the normal retirement age may be fractional and/or based on service.

Payment Forms

♦ A new minimum value option has been added to lump sum payment forms. This new feature indicates that the lump sum is not payable unless it is at least the amount entered.

Projection Assumptions

♦ Interest rate projections can now reference database fields. The projection interest rate, used for Estimated Benefit Calculations for dates beyond the last known tabular rate, may now be fully specified by reference to a database field, or the last known rate can be adjusted by the value in a specified database field. The projection approach for each referenced Interest Rate Table is specified independently.

Output

♦ ProAdmin now has the ability to output all of the interest rates used in the calculation. These are available for all types of Output Definitions. For more, see Interest Rate Enhancement on page 12.

♦ A new Standard output item called User ID has been added to the XML Output Linkage and Desktop (Access) Output Definition for use with ProAdmin Desktop. This is the Name set up in the ProAdmin.ini file or, if that entry is missing, the Windows login name.

Administration Factors

♦ Year of birth mortality tables can now be used in the Administration Factors Tool. The valuation year parameter is used as the year of reference. Thus, if the valuation year is specified as 2010, an age 65 factor will be appropriate for someone born in 1945, an age 64 factor for someone born in 1946, etc.

Fulfillment Tool

♦ The Fulfillment Tool has been enhanced to work with the benefit formula component details output. In the Fulfillment Tool, when you select output from the table BFC_detail, a new dialog box displays that allows you to select the columns to include, formatting for numeric fields, and whether the output should stop at decrement or go to the last commencement date requested.

Field Map Add

Word Document Label: `CBAccount`

Access Table: `BFC_detail`

Access Columns:
- ☑ Date
- ☑ BFCResult — Decimal Places: `2`
- ☑ MemberAge
- ☐ BenefitService — Decimal Places: `0`
- ☐ MemberService — Decimal Places: `0`
- ☐ TableMemberAge
- ☐ TableBeneAge
- ☑ AccrualRate — Decimal Places: `4`
- ☑ AccrualBasis — Decimal Places: `2`
- ☑ Accrual — Decimal Places: `2`
- ☐ DiscountFactor — Decimal Places: `0`
- ☑ InterestRate — Decimal Places: `4`
- ☐ AccrualInterestRate — Decimal Places: `0`
- ☐ AccrualInterest — Decimal Places: `0`
- ☑ BalanceInterest — Decimal Places: `2`
- ☐ PreProjBenefit — Decimal Places: `0`
- ☐ ProjRate — Decimal Places: `0`
- ☐ ProjFactor — Decimal Places: `0`
- ☐ PreEmpiricalBenefit — Decimal Places: `0`

VarName: `QrtlyValue`

Stop At: `Decrement Date`

[OK] [Cancel]

♦ New date formatting options have been added to the Fulfillment Tool. The new options allow you to select different parts of the date and set the format. The new options are:

- o Year(04) returns the year as a two digit number with a leading zero where appropriate
- o Year(2004) returns the year as a four digit number
- o Month(2) returns the month as a number without a leading zero
- o Month(02) returns the month as a two digit number with a leading zero where appropriate
- o Month(Feb) returns the name of the month as a three character abbreviation
- o Month(February) returns the full name of the month
- o Day(6) returns the day as a number without a leading zero
- o Day(06) returns the day as a two digit number with a leading zero where appropriate

- New numeric formatting options have been added to the Fulfillment Tool. The new options allow you to format Social Security Numbers and Social Insurance Numbers so that only the last four (4) digits are shown and to display age or service as years with integer months. The new options are:

  o XXX-XX-9999 returns the last four (4) digits of a number and XXX-XX- preceding this.

  o XXX-XXX-999 returns the last three (3) digits of a number and XXX-XXX- preceding this.

  o YYy MMm returns the integer portion of a number for the year and multiplies the decimal by 12 to return an integer for months. For example, 13.25000 would be formatted as 13y 3m.

- A new Help button on the tool bar will launch the detailed help from ProAdmin.
- If the user is in calc only mode in ProAdmin Desktop the Fulfillment Tool will limit access to Preview and Generate functionality.
- The Fulfillment Tool will now work with ACCDB files and SQL Server databases.
- The Fulfillment Tool has been enhanced to work with the interest rate output. In the Fulfillment Tool, when you select output from the table InterestRates_InUse, a dialog box displays that allows you to select the format for the date, format for the interest rate, which dates should be output (termination, commencement, or all dates), which rates should be output (first or all), and for which component these results are displayed.
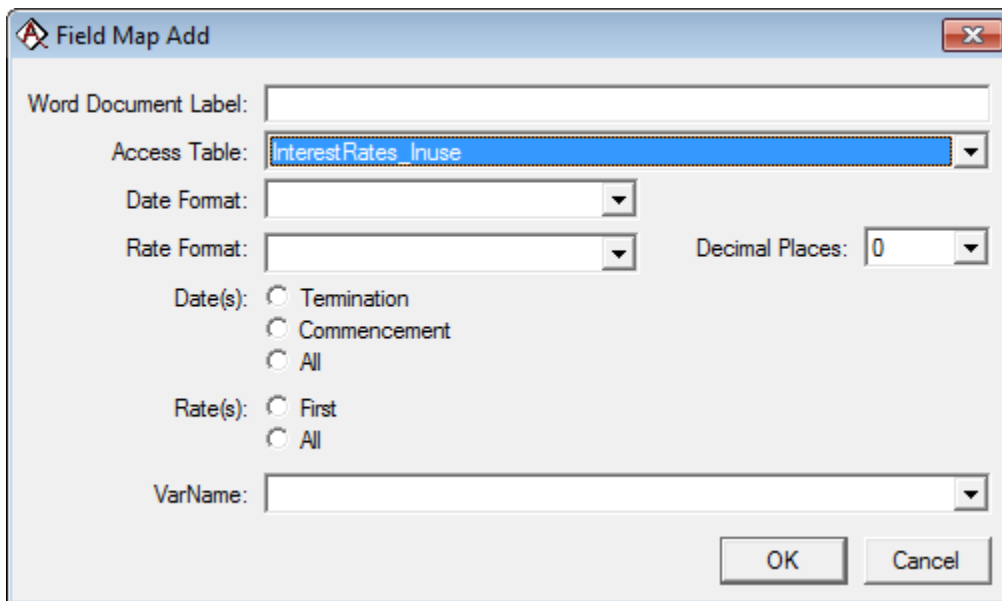
System

- Batch Calculations and the Calculation Tester now make use of multi-core processing and the Grid Platform. For more, see
- A new setting INALL has been added to the Calculator Testing script file. When this is specified ProAdmin will run all XML records within the folder specified by the preceding PI= setting.
- A new, optional, ProAdmin.ini file setting "RunWithSavedData" has been added to the [Config] section to control the behavior of the calculation Run button on the Estimated Benefit Calculation, Final Benefit Calculation, and Dates/Age/Service Calculation dialog boxes when there is saved data. If `RunWithSavedData=0` or is missing, the Run button will be set to the current default "Refresh data & run". If `RunWithSavedData=1`, the button will be set to the "Run with saved data" choice. Regardless of the setting of this new option, the other run choice can always be made by clicking on the split button arrow.

- ♦ Excel Macro-Enabled Workbooks (with .xlsm extension) can be used for importing data and saving output.

Save as type: Excel Macro-Enabled Workbook (*.xlsm)

- ♦ For new installations, the "name=" parameter in proadmin.ini is no longer set so the user who's logged into the machine (rather than the user who installed ProAdmin) will be used for things like headers and footers, reporting who's using a client, etc.

Command Reference Help

- ♦ Frequently Asked Questions and Technical Reference articles have been added with respect to editing array data, date rounding within expressions and parameterizing for PPA IRC Section 436 benefit restrictions.

Getting Started

- ♦ The manual Getting Started with ProAdmin How to Run a Calculation has been updated to reflect the new features and navigation of ProAdmin.

Changes Log

- ♦ Be sure to read the changes log (see the "Changes Log (ProAdmin).doc" file in the ProAdmin directory) about updates to certain calculations that may change results.

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Interest Rate Enhancement

ProAdmin version 3.05 adds the ability to include all of the interest rates used in a calculation to your output. This is available for all types of Output Definitions and includes rates as of the decrement date and all commencement dates.

How do I add this to my output?

 To add the interest rate output, check the new checkbox at the bottom of the Output Definitions dialog box.
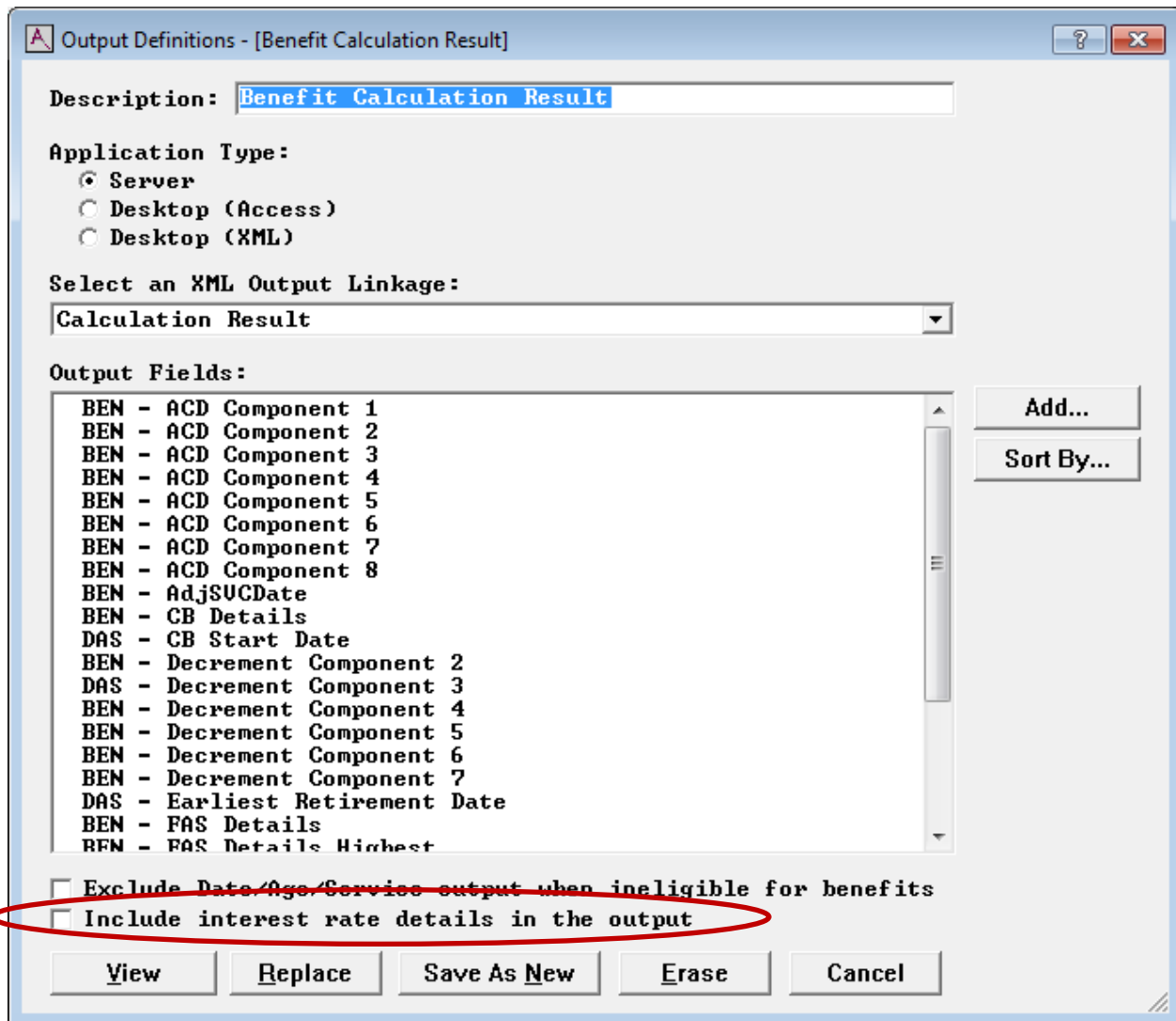
If the Output Definition is defined to "Include interest rate details in the output", information similar to the following is included in the Output Definition Results exhibit.   There is a section for each referenced Interest Rate Table identifying the table name, table type (static, spot, duration or pbgc), table code (1, 5, 6 or 2, respectively) and the table rate at each relevant date (decrement date, commencement date and any other date required for actuarial equivalence calculations). A "references table" for each Interest Rate Table then summarizes where the table was referenced for the calculation, listing the ProAdmin library name (BFCOMP, ABCOMP, ACTEQUIV, PAYFORM, PLANDEF), a type if applicable (e.g., CashBalance, LateRet, Annfactor, etc), the name of the component or library entry, and a reference type (either INTABLE if reference directly, or

ACTEQUIV if referenced indirectly through an actuarial equivalence library entry. Finally, after all referenced Interest Rate Tables have been summaries, a table of "interest rates in use" is provided which lists the actual interest rates used for all entities in the calculation that use interest rates. The displayed rates used reflect any minimums, maximums, overrides or adjustments, and also include entries for entities that reference rates that did not come from an Interest Rate Table.

```
Interest rate details


Table name:  10 year T-bill
Table type:  static
Table code:  1

    Date      Rate

 12/31/2016 0.019700
   4/1/2017 0.019700


References for "10 year T-bill":

 Library Type        Name       RefType

 BFCOMP  CashBalance CBBenQrtly INTABLE


Table name:  30 Yr Treasury w/ 2 mo lb from January
Table type:  static
Table code:  1

    Date      Rate

 12/31/2016 0.028000
   4/1/2017 0.028000


References for "30 Yr Treasury w/ 2 mo lb from January":

 Library Type      Name     RefType

 ABCOMP  IntFactor IntComp  INTABLE


Interest rates in use:

 Library Type      Name                        Date       Rate1     Rate2 Rate3 Rate4

 ABCOMP  AnnFactor int                         12/31/2016 0.076000
 ABCOMP  AnnFactor int                           4/1/2017 0.076000
 ABCOMP  AnnFactor IntComp                      12/31/2016 0.028000
 ABCOMP  AnnFactor IntComp                        4/1/2017 0.028000
 BFCOMP  AnnFactor CBConvFact                   12/31/2016 0.070000
```

Do I need to do anything for the Fulfillment Tool?

No. When you save your results to Access for use with the Fulfillment Tool, ProAdmin will create four (4) new tables: InterestRates_Header, InterestRates_Rates, InterestRates_References, and InterestRates_InUse.

InterestRates_Header lists all of the Interest Rate Table library entries that were used for the calculation. It contains the fields: library entry table name, type (static, spot, duration or pbgc), and code (1, 5, 6 or 2, respectively).

InterestRates_Rates lists the interest rate values for each referenced table as of the decrement date and each of the commencement dates of the request. It contains the fields: table name, date, and all rates and durations.

InterestRates_References lists the ProAdmin objects that used a particular interest rate table. It contains the fields: table name, component or library entry name, ProAdmin library (BFCOMP, ABCOMP, ACTEQUIV, or PAYFORM), component type (CashBalance, AnnFactor, IntFactor, LateRet; blank if not a benefit formula or accrual basis component), and reference type (e.g., a benefit formula component might reference an interest table directly (INTABLE) or through an actuarial equivalence library entry (ACTEQUIV).

InterestRates_InUse lists the actual rate used for each ProAdmin object. For example, if a cash balance component references the 30 year treasury table with a minimum of 5% and the 30 year treasury rate was 3.05%, this table will list 5%. It contains the ields: library, type, component or payment form name, date, and up to four rates.

Do I need to do anything for XML and ProAdmin Server?

Yes. You will need to add the specific tags that ProAdmin is expecting within the decrement level of your XML schema, import the schema back into an XML output linkage entry, set the check box on the Output Definition dialog box, and then add the system plan to the repository.

The new schema fragment follows below. Please note: this schema fragment assumes that your schema is using xs: as the schema namespace prefix (e.g., <xs:schema …). If your schema uses a different namespace prefix (e.g., <xsd:schema …) then you'll have to change the prefix in this fragment before you can use it (e.g., replace xs: with xsd:).:

```xml
<xs:element name="ProAdminInt" minOccurs="0">
    <xs:complexType>
        <xs:sequence>
            <xs:element name="Table" maxOccurs="unbounded">
                <xs:complexType>
                    <xs:sequence>
                        <xs:element name="TableName" type="xs:string"/>
                        <!-- ProAdmin table name -->
                        <xs:element name="Type" type="xs:string"/>
                        <xs:element name="Code" type="xs:decimal"/>
                        <!-- (1=static, 2=pbgc, 5=spot, 6=duration) -->
                        <xs:element name="Details" maxOccurs="unbounded">
                            <xs:complexType>
                                <xs:sequence>
                                    <xs:element name="Date" type="xs:date"/>
                                    <xs:element name="Rate" type="xs:decimal" minOccurs="0"/>
                                    <xs:element name="Dur" type="xs:decimal" minOccurs="0"/>
                                </xs:sequence>
                            </xs:complexType>
                        </xs:element>
                        <xs:element name="Ref" maxOccurs="unbounded">
                            <xs:complexType>
                                <xs:sequence>
                                    <xs:element name="Name" type="xs:string"/>
                                    <!-- Name of entity which reference this table -->
                                    <xs:element name="Library" type="xs:string"/>
                                    <!-- ABCOMP, ACTEQUIV,BFCOMP,PAYFORM, PLANDEF -->
                                    <xs:element name="Type" type="xs:string" minOccurs="0"/>
                                    <!-- AnnFactor, BasisOnly, CareerAverage, CashBalance, FAS, IntFactor, LateRet, LSQ -->
                                    <xs:element name="RefType" type="xs:string"/>
                                    <!-- Reference type: INTABLE, ACTEQUIV -->
                                </xs:sequence>
                            </xs:complexType>
                        </xs:element>
                    </xs:sequence>
                </xs:complexType>
            </xs:element>
```

```xml
<xs:element name="RatesUsedBy" minOccurs="0" maxOccurs="unbounded">
    <xs:complexType>
        <xs:sequence>
            <xs:element name="Name" type="xs:string"/>
            <xs:element name="Library" type="xs:string"/>
            <xs:element name="Type" type="xs:string" minOccurs="0"/>
            <xs:element name="Details" maxOccurs="unbounded">
                <xs:complexType>
                    <xs:sequence>
                        <xs:element name="Date" type="xs:date"/>
                        <xs:element name="Rate1" type="xs:decimal"/>
                        <xs:element name="Rate2" type="xs:decimal" minOccurs="0"/>
                        <xs:element name="Rate3" type="xs:decimal" minOccurs="0"/>
                        <xs:element name="Rate4" type="xs:decimal" minOccurs="0"/>
                    </xs:sequence>
                </xs:complexType>
            </xs:element>
        </xs:sequence>
    </xs:complexType>
</xs:element>
```

The Table node contains all of the library entries from the Interest Rate Tables that were used for the calculation. It contains the elements: Name, Type (static, spot, etc.) and Code.

The Details node contains the interest rate values for the table as of decrement and commencement date for the request. It contains the elements: Date (decrement or commencement), Rates and Dur (durations). This is the rate based on the Interest Rate table parameters set in ProAdmin, which may or may not be the rate reflected in a specific calculation depending on minimums, maximums, etc.

The Ref node contains the ProAdmin objects that used a particular interest rate table. It contains the elements: Name, Library (BFCOMP, ABCOMP, ACTEQUIV, etc.), Type (CashBalance, AnnFactor, etc.), and RefType.

The RatesUsedBy node contains the actual rate used for each ProAdmin object. For example, if a cash balance component references the 30 year treasury table with a minimum of 5% and the 30 year treasury rate was 3.05% it will list 5%. It contains the elements: Name ,Library, Type, Details contains Date, (decrement or commencement), Rate1, Rate2, Rate3, and Rate4.

Multi-Core and Grid Computing

ProAdmin version 3.05 includes a major performance enhancement. Batch Calculations and the Calculation Tester now run much faster on multi-core computers by simultaneously running calculations on up to four local processors. In prior versions, ProAdmin would only use a single processor regardless of the number of processors available.

How much faster will my calculations be?

Longer runs will show the most improvement. Runs which currently take a short amount of time, such as less than two minutes, may not see any improvement (or be slightly slower).

For these longer runs, the number of processors (P) is the primary factor that affects performance. You can estimate how much faster by using the equation $1 / (0.05 + 0.95 / P)$. For example, a long run will be about 1.9x faster on a computer with 2 processors and about 3.5x faster with 4 processors. Note that if the processors are using Hyper-Threading (see discussion below), the number P should be decreased by dividing by 1.9.

What do I need to do to take advantage of multi-core computing?

ProAdmin will automatically distribute the request on up to four local processors. The first thing you will notice is additional performance information on progress dialogs.
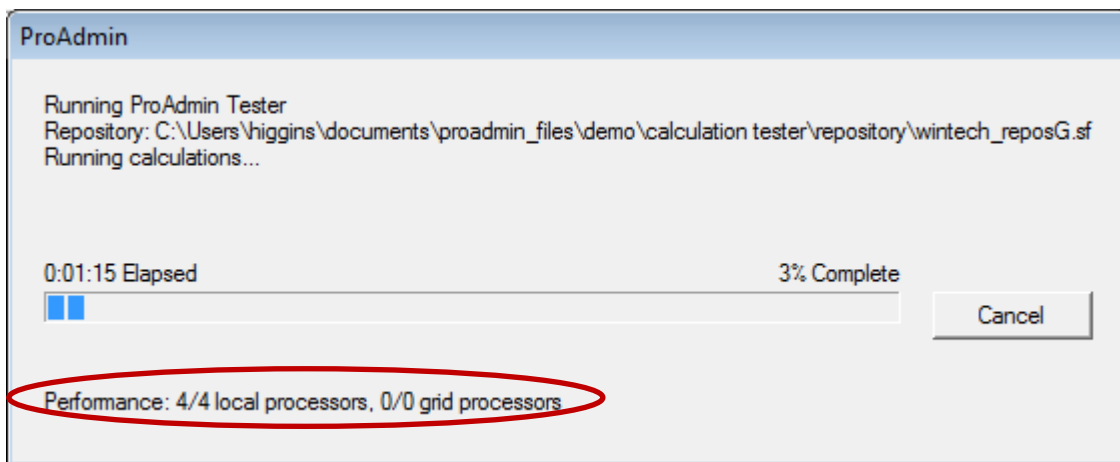
How do I determine how many processors my computer has?

An easy way to determine the number of processors on your computer is to view the Task Manager. There are at least two ways to view the Task Manager: either press Ctrl-Alt-Delete and select Start Task Manager, or right click on the taskbar (runs across the bottom of your window) and select Start Task Manager. Once the Task Manager is started, select the Performance tab. You should see a window similar to below. The number of processors equals the number of mini-graphs under CPU Usage History. In the case below, there are 8 processors on the computer.
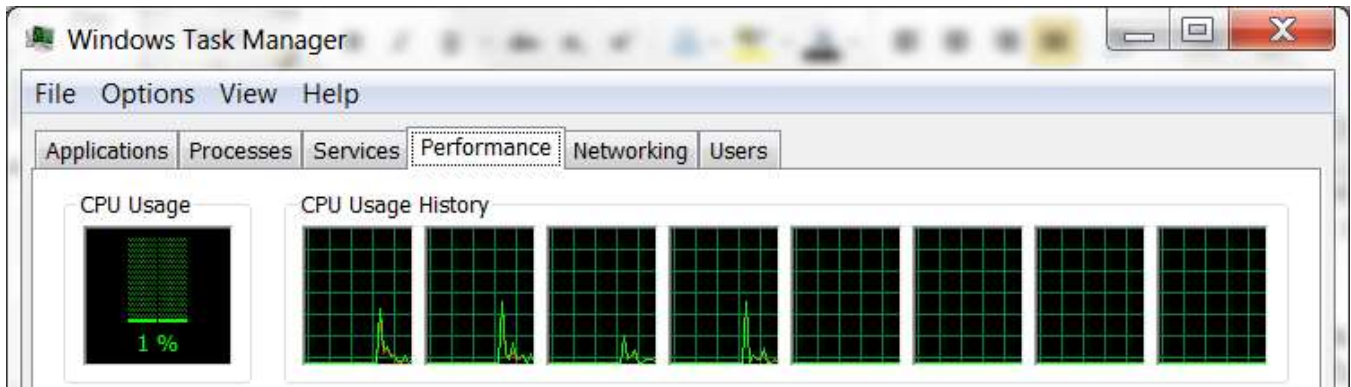
Hyper-Threading

An interesting and recent development with processors is a feature known as Hyper-Threading. Intel® Hyper-Threading Technology is a hardware feature supported in many Intel® architecture-based server and client platforms that enables one processor to run two software threads simultaneously. Basically, if the computer has installed Intel Hyper-Threading hardware, it will report to Windows twice the number of actual processors.

In the case of the computer above, Windows believes there are eight processors but in reality there are four with Hyper-Threading.

The relevance of Hyper-Threading to ProAdmin's new multi-core enhancement is for estimating performance improvements. Two Hyper-Threaded processors have a throughput of about 1.05 processors (not 2). Hence, when estimating the speed up using the equation above, the number of processors P should be decreased by dividing by 1.9 (1.9 = 2 / 1.05).

Grid Platform

WinTech's Grid Platform allows ProAdmin users to distribute Calculation Tester and Batch Calculation Requests across a network of computers to achieve faster processing times.

The Grid is created by connecting ProAdmin to one or more Grid Agents, using a common network folder. ProAdmin ships executable packets to the common folder, where a listening Agent fetches the packets, executes that small portion of the run, and ships results back to the shared folder. ProAdmin then fetches all results for a particular run and aggregates them.

Grid Agents are designed to utilize 100% of the machine's CPU. They should be installed on computers dedicated to running ProAdmin or ProVal jobs. They should not be installed on individual workstations since there won't be free CPU cycles to run other applications.

What's included with a Grid Platform license?
Unlimited Grid Agent machines.
Unlimited processors on local and Grid Agent machines.

How do I get it?
Contact WinTech Sales.

Deep Copy

When revising a Plan Definition (e.g., for a plan change), it is often desirable to leave the old Plan Definition intact. This facilitates comparisons (old plan vs. new plan). However, the task can quickly become tedious since you must create a set of duplicate Benefit Formula Components, Benefit Definitions with updated Benefit Formulas, and Plan Definition referencing the new Benefit Definitions. One way to avoid much of the tedium is to make a copy of the Client, make the changes, and then import them back into your original client. Now, Deep Copy lets you do this completely within the original Client.
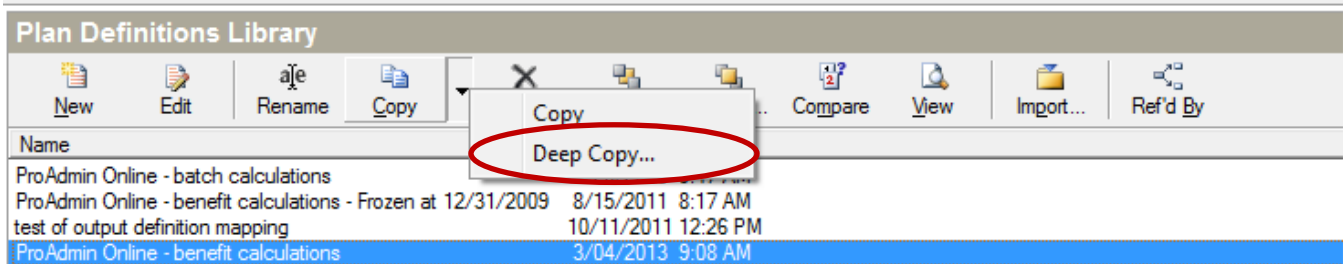
Deep Copy lets you make a copy of an object (e.g., Plan Definition) and selected objects it references (e.g., Benefit Formula Components), automatically updating references to refer to the new copies. You can even provide Target Names for the new objects instead of using ProAdmin's default "#2" suffix.
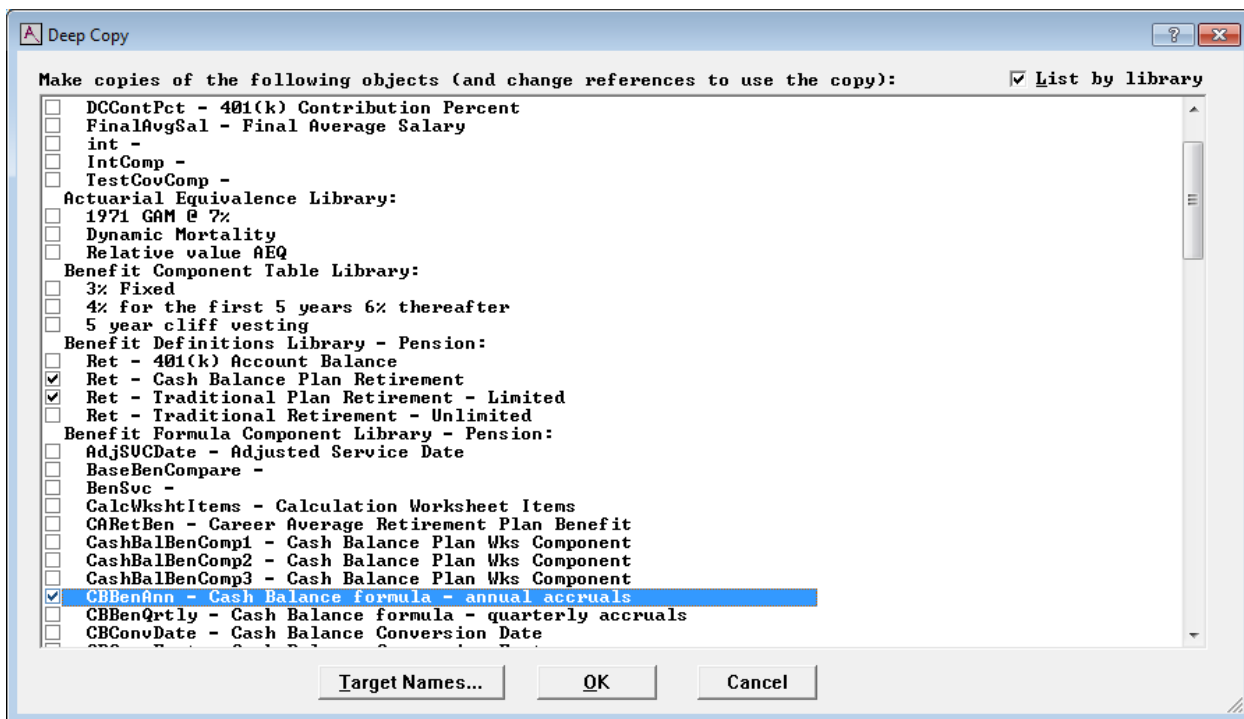
The easiest way to use Deep Copy is probably to select the lowest level objects that you want to revise (e.g., Benefit Formula Components) and let ProAdmin check and uncheck related objects to keep your selections logically consistent. For example, checking the "CBBenAnn" component above causes the Benefit Definitions "Ret – Cash Balance Plan Retirement" and "Ret – Tradtional Plan Retirement – Limited " to be checked, as well as all of the components (Service Definitions, Salary Defintions, etc…) that it uses.

Deep Copy is available in all ProAdmin libraries that refer to other libraries, not just Plan Definitions. Thus, you can make a Deep Copy of any high level object such as a Benefit Definition or System Plan.

Mortality Enhancements

ProAdmin 3.05 contains dramatic enhancements to the Mortality Rates Library, including the ability to create a "linked" table that draws its base rates from another table or tables, with multiplicative or age setback adjustments; a new library devoted to mortality improvement scales; the ability to apply different improvement scales pre- and post-commencement, optionally with different base years applied; and the use of so-called "two-dimensional" mortality improvement scales, in which the rate of mortality improvement (or decline) depends not only on the age corresponding to the relevant mortality rate, but also on the years over which the improvement occurs.

Linked Tables

When creating a new mortality table, a new option exists to link the base rates and draw them from another table (or distinct tables pre- and post-commencement).

Upon entering the parameters, specify the other table or tables from which base rates should be drawn, as well as multiplicative or setback adjustments. In the case below, a linked table will be generated which uses no pre-commencement mortality, but post-commencement mortality drawn from 90% of the male rates in the 1983 Group Annuity Mortality table, setback 6 years for females.


Upon clicking OK, the base rates will populate based on the specified source table or tables and will no longer be manually editable. This allows for dramatically easier review and checking whenever

mortality tables are based on modifications to existing standard tables. Note that if the source table(s) are non-protected (i.e. can be modified), then modifications to the source table(s) will automatically modify this dependent table and, if appropriate, erase any dependent valuation/core projection results.

Improvement Scales Library

Previously in ProAdmin, any mortality improvement scales used for a mortality table would be included within the mortality table itself, whether a standard scale or a user-defined custom scale.
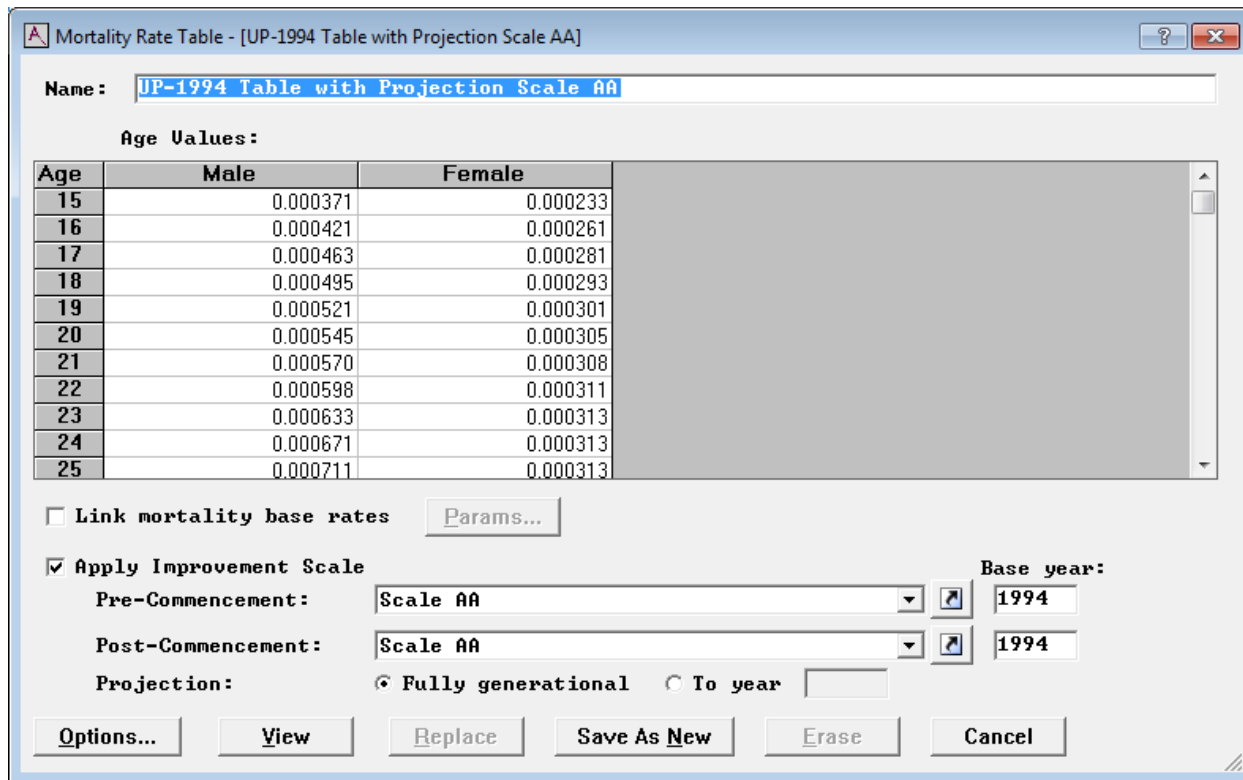
Now, ProAdmin contains a fully independent Mortality Improvement Scales Library, where scales are separately stored and can be viewed or imported/exported independently of the mortality tables in which they are used:

Shortcuts

Database
- Data Dictionary (164)
- Database Linkage (5)
- XML Database Linkage (2)
- Selection Expressions (0)

Benefit Calculations
- Eligibility Definitions (15)
- Service Definition Sets (17)
- Salary Definition Sets (5)
- Plan Definitions (4)
    - Benefit Definitions (11)
    - Benefit Formula Components (59)
    - Benefit Component Tables (5)
    - Accrual Basis Components (7)
    - Custom Operators (13)
    - Payment Forms (24)
    - Errors / Warnings (7)
    - Message Definitions (9)
- Census Specifications (4)
    - Errors / Warnings (7)
    - Message Definitions (9)
- Output Definitions (8)
    - XML Output Linkage (1)
- Final Benefit Calculations (1)
- Projection Assumptions (1)
- Estimated Benefit Calculations (10)

Reference Tables
- Mortality Rates (22)
- Mortality Improvement Scales (5)
- Interest Rate Tables (6)
- Actuarial Equivalence (4)
- Conversion Tables (9)
- Custom Regulatory Tables (1)

Mortality Improvement Scales Library

New | Edit | Rename | Copy ▾ | Erase | Hide | Unhide...

Name	Modified
Scale AA	1/01/2000 4:00 AM
Scale BB	9/14/2012 5:02 PM
Scale BB2D (RPEC Q&A A3)	9/14/2012 5:02 PM
Scale D	1/01/1971 4:00 AM
Scale H	1/01/1983 4:00 AM

Two-dimensional Mortality Improvement

Background

In September 2012, the SOA Retirement Plans Experience Committee (RPEC) released the *Mortality Improvement Scale BB Report*, as well as supporting Q&A based on the previously released Exposure Draft. Available on the Society of Actuaries [website](), the report contains, among other items, a discussion of Scale AA, which was released over a decade ago and does not appear to be tracking well with recent mortality improvement experience, and its eventual successor.

As part of their analysis, RPEC referenced recent work by the Continuous Mortality Investigation (CMI) group of the Institute and Faculty of Actuaries in the U.K., modeling mortality improvement as a two-dimensional array that varies by both age and calendar year. In modeling the divergence between recent experience and the mortality improvement implied by Scale AA, RPEC also released the interim Scale BB without a calendar year dimension, for use with existing valuation systems, as a precursor to the official replacement for Scale AA, expected in late 2013 or early 2014. However, they noted that the official replacement would almost certainly include a dimension related to the calendar year of mortality improvement.

In *Questions and Answers Regarding Mortality Improvement Scale BB*, RPEC published the two-dimensional rates underlying the development of interim Scale BB.

Implementation

In addition to Scale BB (shown above), ProAdmin 3.05 now also includes its two-dimensional source (dubbed "BB2D"), as well as full functionality for custom two-dimensional mortality improvement scales. When working within this library, clicking on Options allows the user to define a mortality scale to be of either the Attained Age type or the Age by Year of Improvement type.

Furthermore, when applying two-dimensional scales, ProAdmin supports the use of either annual reductions, as published by RPEC, or cumulative multiplicative factors, as preferred in the U.K. by the Institute and Faculty of Actuaries. For more information, see the articles in ProAdmin Help for Mortality Improvement Scales in the Command Reference and Mortality Improvement (Generational Mortality) in the Technical Reference.