Benchmarks Online

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Feature Articles

Campus Computing News

UNT is eligible to receive $616,687 under a non-competitive grant program that includes all two- and four-year colleges and universities in the state. Click on the title above to find out how you can benefit from this program.

Free Virus Protection for Home PCs

UNT is now offering free antivirus software for all its faculty, staff, and students to use on their home computers. Read all about it!

The Force is better and stronger than ever!

The SmartForce Campus system has been updated and offers many new features and improvements. Details inside.

Remedy Enhanced: Introducing Rem-Mail

This article announces a new Remedy feature, Rem-mail and answers questions such as: What is Remedy? What does it do for the University? And, what does Remedy mean to me?

Today's Cartoon

Click on the title above for an information age laugh.

About Benchmarks *Online*

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Don't forget to check out our monthly columns. This month's topics:

- **RSS Matters** -- "Longitudinal Growth Curve Modeling with SAS Proc Mixed" A blast from the RSS past.

- **SAS Corner** -- Dr. Ho is taking a break from his column this month. Links to his previous articles are provided within.

- **The Network Connection** -- "Napster is Dead" Are you guilty of "porcelain piracy"? Answers within.

- **Link of the Month** -- "Center for Distributed Learning" - The Center offers a variety of services related to Distributed Learning. Read all about it.

- **WWW@UNT.EDU** -- "The Quest for ColdFusion: Loop-Da-Loop" Shannon Peevey continues his series with this article.

- **Short Courses** -- The Academic Computing Services (ACS) short courses are going strong this summer. Other training is also available. Check out this article for more information.

- **IRC News** -- Minutes of the Information Resources Council are printed here when they are available. The May minutes are reproduced here this month.

- **Staff Activities** -- New employees, people who are no longer employed at the Computing Center, awards and recognitions and other items of interest featured here.

Research and Statistical Support
University of North Texas

RSS Matters

By Craig Henderson, Former Employee Research and Statistical Support Services

Longitudinal Growth Curve Modeling with SAS Proc Mixed

This article is a slightly edited version of an article that appeared in the July, 1999 issue of Benchmarks Online. Dr. Herrington will have an article on this topic using S-Plus next month. His previous articles have been "Controlling the False Discovery Rate in Multiple Hypothesis Testing" in April's Benchmarks Online. The previous article in this series can be found in the December, 2001 issue of Benchmarks Online: "Dealing with Outliers in Bivariate Data: Robust Correlation" - Ed.

Multilevel Modeling

In a nutshell, multilevel modeling (also known as hierarchical linear modeling and random coefficient modeling), is a flexible data analysis technique that involves analyzing linear models (e.g., the general linear model used in conjunction with ANOVA and regression) with a hierarchically nested structure (Bryk & Raudenbush, 1992). It is actually a more restrictive form of the mixed effects general linear model. The classic example is of students, nested within classrooms, nested within schools, nested within school districts, etc. Another frequently used application is the analysis of individual growth models designed for exploring longitudinal data (on individuals) over time. Basically, multilevel modeling models expand traditional regression methods by dropping the assumption of independence of observations and allowing the researcher to estimate both fixed and random effects on more than one level of a hierarchical structure simultaneously. Relationships are no longer assumed to be fixed over contexts (e.g., schools, time) and therefore are allowed to differ. These models are more realistic than traditional regression models due to making less restrictive assumptions; however, as Kreft (1996) points out, this generality is not without its price. multilevel modeling models are not parsimonious, as more parameters are estimated, the outcomes may be more sample specific, larger data sets are needed for stable solutions, and they use more complex estimation methods than the ordinary least squares method applied in traditional linear regression.

Although multilevel models are not a panacea, finally giving researchers THE statistical technique that will generate theory for you, there are several reasons that multilevel modeling is something that researchers in the social sciences

need to know. First, there is the problem of nonindependence of observations. Basically, this problem involves a situation in which clusters of individuals in an analysis have more in common with each other than other individuals. Situations in which this would be obvious are students in the same classroom, and family members in the same family. If traditional methods are used in these cases, standard errors will be underestimated, leading to an increased probability of a Type I error. However, other problematic situations are less obvious. The intraclass correlation is a helpful diagnostic tool in determining if a multilevel modeling will be superior to a traditional method, such as regression or ANOVA. A rough rule of thumb is when the intraclass correlation is over .10, hidden clusters are present in your data, and a multilevel modeling model would be a more appropriate data analysis technique.

Second, in the absence of intraclass correlation, there is no improvement of multilevel modeling over traditional models in terms of estimating fixed effects (Kreft, 1996). However, this is not the case if the researcher is interested in estimating random effects, particularly random regression coefficients. To illustrate this point, a multilevel model involves the following equations:

$$\underline{Y}_{ij} = \underline{a}_j + \underline{b}_j X_{ij} + \underline{e}_{ij} \quad (1)$$
$$\underline{a}_j = g_{00} + g_{01} Z_j + \underline{u}_{0j} \quad (2)$$
$$\underline{b}_j = g_{10} + g_{11} Z_j + \underline{u}_{1j} \quad (3)$$

where underlining indicates a random variable, X is a single predictor, and $\underline{Y}$ is the dependent variable. Index i is used for individuals, and index j is used for contexts. The error terms $\underline{u}_{0j}$ and $\underline{u}_{1j}$ indicate that the intercept $\underline{a}_j$ and the slope $\underline{b}_j$ will vary over contexts. g_{00} indicates the grand mean, while $\underline{u}_{0j}$ measures the deviation in means across contexts from the grand mean. Likewise, g_{10} represents the grand regression slope across contexts and $\underline{u}_{1j}$ the deviation in slopes from the grand slope across contexts. The equations for $\underline{a}_j$ and $\underline{b}_j$ include a fixed component, g_{00} and g_{10}, and a random component, $\underline{u}_{0j}$ and $\underline{u}_{1j}$. $\underline{u}_{0j}$ has a variance, t_{00}, $\underline{u}_{1j}$ has a variance t_{11}, and $\underline{u}_{0j}$ and $\underline{u}_{1j}$ have a covariance, t_{01}. Z_j represents a contextual level variable (e.g., school, person in the case of repeated measurements); therefore, equation (2) demonstrates that the intercept (mean) of each context is a function of the group level variable and random fluctuation. In equation (3), the slope is a function of the same group level variable and random fluctuation. The variances of $\underline{u}_{0j}$ and $\underline{u}_{1j}$ and their covariance are parameters estimated in the model, and are found in the matrix T, which has the following structure:

$$\begin{bmatrix} \tau_{00} & \tau_{01} \\ \tau_{10} & \tau_{11} \end{bmatrix}$$

In traditional regression, a and b are treated as fixed effects, and the random fluctuations are not estimated. Why is this important? By estimating the elements in the T matrix, we can examine the unique estimates for separate contexts more efficiently than by conducting separate regression equations for each context. Furthermore, we can now examine cross level interactions. An example would be the literature on aptitude by treatment interaction literature in education. Such research operates on the theory that teacher styles differ, and that some styles are more effective for certain students than for others. Instead of asking the question, what teaching methods are most effective, the more

useful question of what teaching methods are most effective, for which students, in which contexts?

Longitudinal Growth Curve Modeling with SAS PROC MIXED

In 1992 SAS introduced the PROC MIXED routine into their statistical package. It was written by agricultural and physical scientists seeking to generalize the standard linear model to incorporate both fixed and random effects and therefore did not have the needs of social scientists in mind. However, by correctly specifying the mixed model, a researcher can fit multilevel models and individual growth curve models that have become quite popular in the social sciences (Singer, 1997). The material for this paper is provided by Singer (1997), and interested readers should study her very informative, understandable article. Using her examples, I will provide demonstrations of how to fit a longitudinal growth curve model. These examples are also provided by Bryk and Raudenbush (1992).

It would be helpful at this point to review the article I wrote on how to fit cross-sectional multilevel models with SAS PROC MIXED. In that article, I discussed how the three fundamental statements in SAS PROC MIXED syntax used to fit cross-sectional multilevel models are the CLASS statement, which identifies the categorical variable, the MODEL statement, which specifies the fixed effects, and the RANDOM statement which specifies the random effects. In this article, I will extend the use of the RANDOM statement to fit individual growth curve models. I will also discuss how growth curve models can be fit with the REPEATED statement. As with the cross-sectional multilevel model, I will begin with the example of an unconditional linear growth model.

Unconditional Linear Growth Model

In this model, we will begin with a simple two-level model. The level-1 model is a linear individual growth model, modeling the way in which each individual changes over time. The level-2 model expresses variation in the parameters from the growth model as random effects that occur between individuals (i.e., the change in individuals as a group over time); in the unconditional model, these random effects are unrelated to any person-level covariates. The equations to fit the unconditional model appear below; the level-1 (within person) parameters are indicated by p and the level-2 (between person) parameters are indicated by b:

$$Y_{ij} = p_{0j} + p_{1j}(TIME)_{ij} + r_{ij}$$
$$p_{0j} = b_{00} + u_{0j}$$
$$p_{1j} = b_{10} + u_{1j}$$

where $r_{ij} \sim N(0, s^2)$ and

$$\begin{bmatrix} u_{0j} \\ u_{1j} \end{bmatrix} \sim N \left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} \tau_{0c} & \tau_{01} \\ \tau_{1c} & \tau_{11} \end{bmatrix} \right)$$

Substituting the models into each other yields:

$$Y_{ij} = [b_{00} + b_{10}TIME_{ij}] + [u_{0j} + u_{1j}TIME_{ij} + r_{ij}]$$

This model contains two fixed effects, the intercept and the effect of TIME, and three random effects, the intercept, the slope for TIME, and the within person residual, r_{ij}. This model is a little unique in that a data set needs to be created in which each individual has a record for each time period that he/she is observed. Please see Singer (1997) for details of how to create such a data set. The syntax used to fit the unconditional linear growth curve model is presented below:

```
proc mixed noclprint covtest;
   class id;
   model y = time/solution ddfm=bw notest;
   random intercept time/subject=id type=un;
```

The CLASS statement indicates that the data represent multiple observations over time for individuals. The fixed effects are included in the MODEL statement (the intercept does not need to be written into the model statement, as SAS will include it by default), and the random effects are included in the RANDOM statement (again the intercept is included by default). The SUBJECT=ID portion of the RANDOM statement indicates that we want to allow both intercepts and slopes to vary across people. In coding the TIME variable, the intercept can be coded in such a way that it represents initial status (by coding TIME=0), average status (by centering TIME), or final status (by letting 0 represent the last wave of data, all other time points coded with negative numbers). It is usually recommended that TIME be coded in such a way that the intercept represents initial status. The SUBJECT= option indicates that the data set is composed of a set of individual subjects; the TYPE= option specifies the structure of the variance-covariance matrix for the intercepts and slopes. In our example, we are specifying an unstructured variance-covariance matrix.

Adding a Person-Level Covariate

Typically, in growth curve modeling, we are not only interested in change over time; we are also interested in how growth may be influenced by background covariates (e.g., IQ, family size, SES, etc.). This model adds some complexity to the unconditional growth curve model:

$$Y_{ij} = p_{0j} + p_{1j}(TIME)_{ij} + r_{ij}$$
$$p_{0j} = b_{00} + b_{01}COVAR_j + u_{0j}$$
$$p_{1j} = b_{10} + b_{11}COVAR_j + u_{1j}$$

where $r_{ij} \sim N(0, s^2)$ and

$$\begin{bmatrix} u_{0j} \\ u_{1j} \end{bmatrix} \sim N \left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} \tau_{00} & \tau_{01} \\ \tau_{10} & \tau_{11} \end{bmatrix} \right)$$

Centering is important in such a model, because as the model now stands, the interpretation of the fixed effects, b_{00} and b_{10}, are based on a scenario in which

the background covariate would be equal to 0. As this is most likely not the case, we must center the covariate at the grand mean as follows:

$Y_{ij} = p_{0j} + p_{1j}(TIME)_{ij} + r_{ij}$

$p_{0j} = b_{00} + b_{01}(COVAR\text{-}Mean(COVAR)) + u_{0j}$

$p_{1j} = b_{10} + b_{11}(COVAR\text{-}Mean(COVAR)) + u_{1j}$

where $r_{ij} \sim N(0, s^2)$ and

$$\begin{bmatrix} u_{0j} \\ u_{1j} \end{bmatrix} \sim N \left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} \tau_{0c} & \tau_{01} \\ \tau_{1c} & \tau_{11} \end{bmatrix} \right)$$

Substituting models yields:

$Y_{ij} = b_{00} + b_{10}(TIME)_{ij} + b_{01}(COVAR\text{-}Mean(COVAR))_{ij} + b_{11}(COVAR\text{-}Mean(COVAR))(TIME)_{ij} + u_{0j} + u_{1j}(TIME)_{ij} + r_{ij}$

If we let CCOVAR represent the centered covariate, we can fit this model with the following syntax:

```
proc mixed noclprint covtest;
   class id;
   model y = time ccovar time*ccovar/s ddfm=bw notest;
   random intercept time/type=un sub=id gcorr;
```

We have added two fixed effects to the MODEL statement, CCOVAR and the TIME*CCOVAR interaction. The RANDOM statement remains the same. The GCORR option will print the estimated correlation matrix among the random effects.

Exploring the Structure of the Within Person Variance-Covariance Matrix

The above syntax examples place a somewhat unrealistic assumption on the structure of the within person residuals. "Were we to fit a model in which only the intercepts vary across persons . . ., we would be assuming a compound symmetric error covariance matrix for each person" (Singer, 1997, p. 25). A compound symmetric matrix is a variance-covariance matrix in which the residual covariance for each individual is uncorrelated with that of other individuals, a rather unrealistic assumption. In addition, when we fit individual slopes, we introduce heteroscedasticity into this residual matrix. However, one of the strengths of PROC MIXED is that it allows the user to explore different structures of the error covariance matrix. "By considering alternative structures for S [the within-person error variance-covariance matrix] (that ideally derive from theory), and by comparing the goodness of fit of resulting models, the user can determine what type of structure is most appropriate for the data at hand" (Singer, 1997, p. 25). S For details on the structure of this matrix, the interested reader is referred to pages 92-102 of the book *SAS System for Mixed Models* (Littell, Milliken, Stroup, & Wolfinger, 1996). S is referred to the R matrix in SAS PROC MIXED terminology.

The structure of the R matrix is specified using a REPEATED statement. With the assumption that the R matrix is compound symmetric, the PROC MIXED syntax would be as follows:

```
proc mixed noclprint covtest noitprint;
   class id wave;
   model y = time/s notest;
   repeated wave/type=cs subject=id r;
```

In the above syntax, WAVE is included as a CLASS variable. WAVE refers to the wave of data collection (i.e., 1st collection, 2nd collection, etc.). WAVE is a series of dummy-coded variables, as opposed to TIME, which is a continuous variable. This is because the variable specified in the REPEATED statement must be categorical. With the TYPE= option, we specify the structure of the R matrix, in this example, compound symmetry. Other possible structures include UN for unstructured and AR for autoregressive. The R option above requests SAS to print out the R matrix. The idea is to try several different error structures and to compare the goodness of fit statistics for the models specifying different error structures. Please consult pp. 92-102 of the *SAS System for Mixed Models* for details.

Now, putting the information for structuring the R matrix with the model we previously tested that included a person-specific background covariate, our SAS PROC MIXED syntax becomes:

```
proc mixed noclprint covtest noitprint;
   class id wave;
   model y = time ccovar time*ccovar/s ddfm=bw notest;
   random intercept time/type=un sub=id g;
   repeated wave/type=ar(1) subject=id r;
```

The AR(1) option indicates an autoregressive structure with a lag of 1.

I hope that I have helped provide you with some information in which you can jump off into multilevel modeling. My opinion is that as structural equation modeling has increased in popularity, the same will happen with multilevel modeling. The ability to test variance components and cross-level interactions are particularly appealing features of this up and coming approach. Enjoy your researching, and good luck.

References

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Kreft, I. G. G. (1996). Are multilevel techniques necessary? An overview including simulation studies. Multilevel Models Project. http://www.ioe.ac.uk:80/multilevel/workpap.html.

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Research and Statistical Support
University of North Texas

SAS Corner

Dr. Ho is taking a break from his column this month. Below are links to articles he has written this year:

- "Create SAS Maps on the Web " in the May, 2002 issue *Benchmarks Online*.

- "Reading Web survey data" in the April, 2002 issue of *Benchmarks Online*.

- "Learn SAS....for free" in the February, 2002 issue of *Benchmarks Online*.

- "Data Capability: Data Engines" in the January, 2002 issue of *Benchmarks Online*.

Network Connection

By [Dr. Philip Baczewski](#), **Associate Director of Academic Computing**

Napster is Dead

'NAPSTER FILED FOR Chapter 11 bankruptcy on Monday, just two weeks after its major creditor, the German media group Bertelsmann, had agreed to acquire the troubled Internet music service. A Bertelsmann official, speaking on the condition of anonymity, said the Gütersloh, Germany, company is keen to acquire Napster's brand, peer-to-peer (P-to-P) technology and customer file assets, believed to be worth between $8 million and $10 million. "Despite Napster's problems, we remain convinced that peer-to-peer technology has a future in the music industry," the official said.' -- John Blau, InfoWorld, [June 3](#), 2002.

Recording Industry Association of America (RIAA) president Hilary Rosen has undoubtedly stuck another decal to the side of her gramophone. Napster, which had been limping along on fumes and monetary gusts under its wings provided by Bertelsmann, has finally gone down in flames. The RIAA's successful lawsuit was the ammunition which severely crippled Napster, but until now, it managed to continue operating -- no more. There to pick through the wreckage is Bertelsmann, better known as Bertelsmann Music Group, AKA RIAA multiple member BMG. The only thing left is the sale on the virtual courthouse steps to see who will bid for any useful items which rolled from the wreckage.

The Intellectual Property Wars

Napster's brief existence is just one skirmish in the current intellectual property wars that are raging around the Internet battlefield. To listen to the RIAA, you would never know that there are actually two sides to the historical principles of copyright law: one is the protection of intellectual property works to provide their creators with the ability to profit from those works if they wish; the other is the right of the public to fair use of copyrighted materials in order to disseminate and advance knowledge and artistic creation. Recent laws, such as the 1996 U.S. copyright legislation and the Digital Millenium Copyright Act (DMCA), have swung the pendulum greatly in favor of copyright holders and their heirs and fair use remains under attack. Those in favor of a free market of intellectual property should be chilled by Napster's demise and proposed legislation that is now moving through the U.S. Congress.

One example is the Consumer Broadband and Digital Television Promotion Act (CBDTPA), recently introduced in Congress by Senator Ernest Hollings of South Carolina (who is apparently a wholly owned subsidiary of the Disney Corporation). The CBDTPA would mandate copy-protection controls in all digital devices (see the *Wired* [article](#) on the subject for more information). This would include CD and DVD players, PCs, and potentially any programs which manipulate digital media (that would be any program, practically).

Among the findings stated in the [legislation](#) are:

> (3) Because digital content can be copied quickly, easily, and without degradation, digital program mers and content owners face an exponentially increasing piracy threat in a digital age.
> (16) Unprotected digital content on the Internet is subject to significant piracy,

through illegal file sharing, downloading, and redistribution over the Internet.
(17) Millions of Americans are currently downloading television programs, movies, and music on the Internet and by using ''file-sharing'' technology. Much of this activity is illegal, but demonstrates consumers' desire to access digital content.
(18) This piracy poses a substantial economic threat to America's content industries.

In other words, Internet user, you are guilty until proven innocent by government and industry-mandated copy protection technology. The legislation throws a bone to fair use by recognizing the right to a personal copy of transmitted media, but overall, the bill seems structured to protect "America's content industries."

Piracy?

I find it ironic that the term "piracy" is used to describe transfer of copyrighted material. To me, the term "piracy" invokes images of 17th-century seafaring outlaws who stole gold from the ships of the Spaniards who, of course, had stolen that gold from native North and South Americans. Hence the illegitimate thieves (pirates) were stealing from the legitimate thieves (Spanish explorers) who were legitimized by the Spanish government. The RIAA will tell you that they are just protecting the works of their "artists" but it seems that they are more concerned with protecting the gold gathered by their members' sale of media containing copies of those artist's works.

Now, I'll be the first to say that selling an unauthorized copy of a copyrighted work is wrong. As a composer of music I would hope that I would have the opportunity to benefit monetarily from my works if there were anyone willing to buy them. However, current industry babble on this topic includes the assertion by Jamie Kellner, chairman and CEO of Turner Broadcasting, that using PVR devices to skip commercials amounts to theft of programming. In Mr. Kellner's world, the law is "fast forward through commercials - go to jail!" Although he makes concessions for bathroom breaks, if they are not exactly 30 seconds in length, I think that he has essentially accused the majority of Americans of being porcelain pirates.

The Bottom Line?

The bottom line is the bottom line. When technology changes distribution methods, new methods are needed to assure fair profit. We've already seen this in the development of broadcast music on radio and the result was the development of licensing agreements and licensing organizations like ASCAP and BMI (who actually do provide monetary compensation directly to artists). Such licensing agreements could easily cover digital transmission and other models could be employed as well. I think that people would gladly put up with advertisements to be able to download free music as has been the model for Hotmail, Yahoo, and countless other "free" Internet services. It seems instead we are now legislating industry's right to make maximal profit from intellectual property. As a consumer, I'm about to get tired of contributing to that profit. I already pay for digital transmission of media (digital satellite) and am subjected to commercials (other than the occasional criminal bathroom break), and I am left to wonder what is fair profit and what is fair use. I'll choose no use if I don't have fair use.

Open Source Software?

Perhaps of greater concern, however, is the affect that Mr. Hollings legislation could have on the development of open source software and systems. By mandating proprietary controls within any software which manipulates digital media, the open source movement in the U.S.

could be severely crippled or even eliminated (and wouldn't Captain Bill be happy about that one?). Legislators and industry leaders need to remember one thing. No one developed the Internet. It is not a product. It is the result of a free market of information and ideas in which people were able to easily exchange software, data, and digital media. Many ideas were proposed, many systems were made available, and many programs were developed and placed in the public domain either to catch on to popular success or whither in the shadow of public neglect. The pre-commercial Internet which existed before 1995 or so was at times close to an ideal of a free market of ideas and a socially responsible community. Legislating intellectual property monopolies seems to deny that legacy. It would be a shame to waste so many people's hard work that was done in the public interest.

Link of the Month

Each month we highlight an Internet, USENET Special Interest Group (SIG), or similar mailing list(s) or Website(s).

Center for Distributed Learning*

This month's link is The Center for Distributed Learning (CDL). According to the CDL Website: http://www.unt.edu/cdl/about_cdl/ the center "was established in 1998 as a service to assist faculty with the development and delivery of distributed learning at UNT. The Center combines technology resources with expert consultation and personnel, in an effort to provide faculty with a 'one-stop' guide to technology-based courses."

The CDL Website is chock full of useful information. For example, one item currently featured on the homepage is:

> Faculty Training updated! Visit our Training and Events section to see the latest sessions available for Online Course Design, WebCT Xtreme and Videoconference training. Also, learn about the new UNTExcellence in Teaching Online Certificate!

From the Training and Events, section you can link to the "Brown Bag Seminars." According to the site, a Brown Bag "is a chance for faculty members to get together and share their experiences with distributed learning in an informal environment. Each CDL Brown Bag features one presentation by a faculty member with previous experience in distributed learning." The CDL Brown Bag meets for lunch on the first Thursday of every month at 12:00 in Chilton 245. Upcoming Presentations (Dessert provided by CDL!):

> **July 11** - Bridging the Distance (Working Remotely)

> Other future topics:

- Overcoming Online Course Obstacles
- Quizzing and Testing
- Organizing Online Communication and Feedback
- Outstanding Online Course Organization

If you are interested in **Videoconferencing**, the Videoconference Resources page will tell you all about the University of North Texas Videoconference Network (UNTVN). IT is "a two-way 'compressedvideo' network consisting of the following sites" (see tables on the page for specific location information) :

> Eight sites on the UNT Campus
> Seven sites in Dallas
> One site in Fort Worth
> One site in Frisco

These UNTVN locations have the capability to connect to over 150 sites across Texas via regional videoconference networks.

Distributed Learning Courses/Programs

You can also link to a page that lists the various programs that currently offer classes via the Web here at UNT. The statement on the Distributed learning courses page is as follows:

> We are pleased to offer a wide variety of courses and degree programs that carry the same quality, services and credit as their on-campus counterparts. Distributed learning courses provide all the benefits of regular classes with the added bonus of flexibility in scheduling and location!

---

*If you are interested in Distributed Learning, make sure and read this month's "Campus Computing News." The article talks about the availability of grant money for hiring "subject matter experts, instructional designers, curriculum development specialists, content/course conversion specialists, and programmers under this grant. Other allowed uses of the funds are for training staff and faculty on using technology in the classroom and on developing web-based curricula, distance education training, and 'enterprise integration.'"

The Quest for ColdFusion: Loop-Da-Loop

By [Shannon Eric Peevey](#), UNT Central Web Support

Hello, all! Hope that the world is treating you ok, and that this article finds you happy and full of joy :) I know that the last month has been a rare opportunity to partake of the many joys of life... Vacations, classes, and opportunities to help you all out with your ColdFusion problems.From setting up sessions, to modifying queries for a new database server, you all have been involved in many of the exciting aspects of Central Web Support, or the "edge of technology", as I like to think of it. ;) Though many of you have very specific questions about ColdFusion programming, I want to continue this month with our look at Control Structures, and in particular, <CFLOOP>s.

What are they...?

If you remember in last month's [article](#), the <CFIF> control structures allowed us to perform a test on a condition. Basically, if x where TRUE, then perform this action, "else if" x where FALSE, perform another predefined action. <CFLOOP>s are like <CFIF> statements in the fact that they allow us to define a course of action based on a set of conditions. The difference is that we are not setting up "branch", or choice, actions, but setting up recurring, or iterating actions. Therefore, while the condition is TRUE, repeat this action over and over again. This type of control structure is very nice, because it allows us to write repetitive actions in a few short lines, instead of the many lines of code it would take to perform multiple actions on a certain variable without the loop. A simple example would be a program that counts from one to ten. Check this out:

```
<!--- set the variable for our testing condition --->
<CFSET #x# =1>

<!--- open the loop and set the condition --->
<CFLOOP CONDITION="#x# LTE 10">


    <!--- this is the action that is repeated --->
    Interesting… The variable #x# keeps growing!
    It is now equal to <CFOUTPUT>#x#</CFOUTPUT>
    <CFSET #x# = #x# + 1>


<!--- let's close the loop now --->
</CFLOOP>
```

This code, when parsed by our ColdFusion server, will set a variable, "#x#", to the value of 1, enter the loop and add one to the previous value of "#x#" until "#x#" reaches the value 10, at which time the code will exit the loop and precede to the next bit of code.

Let's get a little more in depth…

Though the short explanation found in the previous paragraph adequately explains the actions to a person that is familiar with loops, perhaps a deeper explanation of each line would be more appropriate for the user that is unfamiliar with these concepts. The first line:

```
<CFSET #x# =1>
```

introduces another tag to us. The <CFSET> tag is used to set the variable value to a beginning, or default value. This actually performs a very important function. Before we can continue, we need to talk about what a variable is exactly. A variable is a "placeholder" that our programming languages use, to set aside a place in the memory of a computer. Once this placeholder has been created, we are allowed to place any value in that "place in memory". (This placeholder is really an easy mnemonic device that allows humans to think in human terms. The actual placeholder is a group of numbers that point to an address in the memory of the computer. This would be difficult for humans to program with, so programming languages now allow us to use alphanumeric names for variables, and the computer does the work of associating that name with the address in memory. Good for us!!) The placeholder holds an address in memory that contains the last value held in that address. What is this value? We have no way of knowing. Therefore, when we initialize, (meaning setting the beginning value of a variable), the variable, we are placing a known value into that "memory address". Voila! We need no longer worry about the junk values that might have used that memory address in the past. (Very important!) So, the statement:

```
<CFSET #x#=1>
```

initializes the placeholder, "#x#", to 1. Therefore, we know that the value that is associated with our variables "place in memory" is equal to 1.

What about the loop?

Now, let's look at the <CFLOOP> that we have created.

```
<CFLOOP CONDITION="#x# LTE 10">


        Your actions here

</CFLOOP>
```

The first line opens the loop, and then allows us to choose which type of loop we would like to use. (Unlike most programming languages, ColdFusion has a set of five predefined loops that we can use. These are index, conditional, list, and query loops. (That's only four, you say? There is a loop that allows us to iterate over a COM structure, but I will not actually be touching on this type of loop in these articles.) This article is dealing with the conditional <CFLOOP>.) The type of loop is identified by the attribute given to the tag. (In this case, CONDITION.) The CONDITION attribute is then given a value, which is the condition that we are testing for. In our example, we are setting the loop to true while the variable "#x#" is less than or equal to 10. Therefore, the loop will iterate 10 times. (If we increment the variable "#x#" by one each time through the loop.) We could increment the value of "#x#" by any value, and the loop will iterate the appropriate number of times.

Let's quiz you… How many iterations will take place if "#x#" is incremented by 2? Five times, right? Why not six…? If you think about it, we start with a value of 1. This meets the conditions of the loop, and executes the code found in the loop. Then 2 is added to the 1, and we have a value of 3, which also meets the condition of "#x# LTE 10". The code is executed again, and 2 is added to the current value of "#x#", which is 3, and we now have a value of 5. This meets the condition, and the code is executed again. (The third time.) 2 is added to "#x#" and we now have 7.

Condition met. Code executed, add 2 to 7 and we have 9. Condition met, (the fifth time), code executed and 2 is added to 9 to equal 11. We now check the value of "#x#" against the condition, and the value does not meet the condition, we, therefore, break from the loop and continue executing the rest of the code though out the page.

Now, what about this code that I have been talking about being executed in the loop… Let's look at the code found in our example:

```
<CFLOOP CONDITION="#x# LTE 10">


        <!--- this is the action that is repeated --->
        Interesting… The variable #x# keeps growing!
        It is now equal to <CFOUTPUT>#x#</CFOUTPUT>

    <CFSET #x# = #x# + 1>

</CFLOOP>
```

(I have added the open and close of the <CFLOOP> to help you visualize what is going on.) The indented code is the code that is executed every time the conditional test of the variable value returns TRUE. What is happening? First, we are printing some text to the screen. That text is:

```
Interesting… The variable #x# keeps growing!
It is now equal to <CFOUTPUT>#x#</CFOUTPUT>
```

The <CFOUTPUT> tags allow us to output the current value of "#x#" to the screen. The current value of the "#x#", on the first iteration, is 1. It is then incremented by one, and will print to the screen as:

Interesting… The variable #x# keeps growing! It is now equal to 1

Interesting… The variable #x# keeps growing! It is now equal to 2

Interesting… The variable #x# keeps growing! It is now equal to 3

Etc, etc…

Interesting… The variable #x# keeps growing! It is now equal to 10

When the number increments to 11, the condition becomes false and the loop is exited.

But, how is the variable value incremented by one? The magic to that question is found in the fourth line of indented code, "<CFSET #x# = #x# + 1>". As you can see, we see our new friend, the <CFSET> tag. What does the <CFSET> tag do again? That's right, it sets the value of our variable, or "placeholder". In this case, it is taking the current value of "#x#" and adds one to it. It then places that value in the variable "#x#" and returns to the condition statement to be tested again, repeating until the condition returns false and the loop is exited…

Here is the source code for a finished page that you can cut and paste and test on your test servers:

```
<html>
<head>
<title> This is my First ColdFusion Application that uses a loop </title>
</head>
```

```
<body>
<h1 align="center"> This Page Will Use a Loop </h1>
<h1 align="center"> to Count to 10!!! </h1>
<p
align="left">_____</p>
<!--- set the variable for our testing condition --->
<CFSET #x#=1>


        <!--- open the loop and set the condition --->
        CFLOOP CONDITION="#x# LTE 10">

        <!--- this is the action that is repeated --->
        <p> Interesting… The variable #x# keeps growing!
        It is now equal to <CFOUTPUT>#x#</CFOUTPUT></p>
        <CFSET #x# = #x# + 1>

        <!--- let's close the loop now --->
        </CFLOOP>

<p
align="left">_____</p>
<p align="left"></p>
<DIV ALIGN=CENTER>
<p align="left"></p>
<p align="left"></p>
</div>
</form>
</body>
</html>
```

or, if you would just like to see the code in action, click here.

In Conclusion...

And that's all there is to it. <CFLOOPS> are that powerful, and can save you hours of coding. They can be used to drop changing values into code, and can be used to pull values from an array, or "list" as they call them. These exciting pieces of code will have you sitting in front of your Linux workstations for hours, I know it. And, if you get some new ideas about some great ways to use them, feel free to send them to me and I will highlight a few of them in upcoming articles. Until next month, when we will explore some of the other types of loops that are available to you…

Peace!

Short Courses

By Claudia Lynch, *Benchmarks Online* Editor

The summer Short Courses are here. Please consult the Short Courses page to see the schedule. There are still classes available on SAS, SPSS, S-Plus, FrontPage 2000, Dreamweaver, and more. Please note also the other training opportunities listed below.

Customized Short Courses

Faculty members can request customized short courses from ACS, geared to their class needs. Other groups can request special courses also. Contact ACS for more information (ISB 119, 565-4068, lynch@unt.edu).

Especially for Faculty and Staff Members

In addition to the ACS Short Courses, which are available to students, faculty and staff, staff and faculty members can take courses offered through the Human Resources Department, the Center for Distributed Learning, and the UNT Libraries' Multimedia Development Lab. Additionally, the Center for Continuing Education and Conference Management has a new program for interdepartmental training in business computer literacy. These classes are offered for a fee but discounts are given to those associated with UNT, and Inter-departmental Orders are accepted.

GroupWise Training

If would like to have a Basic GroupWise seminar for your area, please contact Jason Gutierrez, Campus Wide Networks, jasong@unt.edu .

GroupWise 6 classes have already been scheduled for the fall semester. Here is the lineup:

      Sept 17-19 - Introduction to GroupWise 6
       Oct 22-24 - Basic GroupWise 6
       Nov 19-21 - Intermediate GroupWise 6

All classes are from 10 am to 11:50 am in the Eagle student Services Center (ESSC), Room 152. For signup information, go to https://home.unt.edu/hr/training/treg.htm or E-mail Bhavna Vaswani at bvaswani@unt.edu

ProDirections Instructor-led Training

UNT has formed a partnership with ProDirections to offer instructor-led computer training on Microsoft Word, Excel, PowerPoint, and Access. Classes are $99+$42 for the book. Classes in a series (3 classes in the same series) are $99 for each class and the book is free. The Excel Series includes Basic Excel, Advanced Excel-part 1, and Advanced Excel-part 2. The Access Series includes Basic Access, Intermediate Access, and Advanced Access.

Upcoming workshops:

Basic Excel
 June 26, 2002 9:00 a.m.-1:00 p.m. (lunch provided)
 July 23rd from 9 a.m.-2 p.m. (lunch provided)
 August 27th from noon-5 p.m. (lunch provided)

Advanced Excel-part 1
 June 27th from 1-5 p.m.
 July 24th from 9 a.m.-1 p.m. (lunch provided)
 August 28th from 1-5 p.m.

Advanced Excel-part 2
 June 28th from 1-5 p.m.
 July 25th from 9 a.m.-1 p.m. (lunch provided)
 August 29th from 1-5 p.m.

Basic Access
 July 9th from 1-5 p.m.
 August 13th from 9 a.m.-1 p.m. (lunch provided)

Intermediate Access
 July 10th from 1-5 p.m.
 August 14th from 9 a.m.-1 p.m. (lunch provided)

Advanced Access
 July 11th from 1-5 p.m.
 August 15th from 9 a.m.-1 p.m. (lunch provided)

Basic/Intermediate PowerPoint
 June 19, 2002 1:00-5:00 p.m.

To register, send E-mail to Bhavna Vaswani at bvaswani@unt.edu or call Human
 Resources at x4246. Payments can be made by either a check request or with a
 Purchasing Card and should go directly to ProDirections. Cancellations must be
 done 2 days prior to the workshop date to receive a refund.

For a description of each class please go to http://www.prodirections.com/ and click
 on "Corporate Workshops"

Center for Distributed Learning

The Center for Distributed Learning offers courses especially for Faculty Members.
 A list of topics and further information can be found at
 http://www.unt.edu/cdl/training_events/index.htm The center also offers a "Brown
 Bag" series which meets for lunch the first Thursday of each month at Noon in ISB
 204. The purpose of this group is to bring faculty members together to share their
 experiences with distributed learning. One demonstration will be made at each
 meeting by a faculty member with experience in distributed learning. More
 information on these activities can be found at the Center for Distributed Learning
 Website.

UNT Libraries'

The UNT Libraries' Multimedia Development Lab has also offered free training to all University of North Texas faculty and staff in the basics of FrontPage and information architecture in the past. For more information see http://www.library.unt.edu/media/services.htm#Distributed.

Technical Training

Technical Training for campus network managers is available, from time to time, through the Campus-Wide Networks division of the Computing Center. Check the CWN site to see if and when they are offering any training.

UNT Mini-Courses

These are a variety of courses offered, for a fee, to UNT faculty, staff and students as well as the general public. For additional information surf over to http://www.unt.edu/ccecm/cont_ed/Minicourse/Courses/UNT_Minicourse_Page.htm .

Alternate Forms of Training

Many of the General Access Labs around campus have tutorials installed on their computers. For example, the College of Education recently acquired some Macromedia Tutorials for Dreamweaver 4.0, Flash 5.0 and Fireworks 4.0.

The Training Web site has all sorts of information about alternate forms of training. Training tapes, Computer Based Training (CBT) and Web-based training are some of the alternatives offered. Of particular interest are courses available via SmartForce (formerly CBT Systems). See http://www.unt.edu/smartforce/ for more information.

There are also handouts for computer training on the following topics:

- GroupWise 5.2 Handout for Win95/NT
- FAQ for GroupWise 5.2
- Computers - Back to the Basics
- Introduction to Windows 95 /98/NT
- Introduction to Word 97
- Advanced Word 97 - MailMerge It Together
- Introduction to PowerPoint 97 (Creating a Slide Show)
- Introduction to Remedy (THE Call-Tracking Program)
- AND, the award winning Introduction to Excel 97

Adobe Acrobat Reader Format only for the following:

- Introduction to Microsoft Word 2000
- Introduction to Microsoft Excel 2000
- Creating a Slide Show with PowerPoint 2000
- Using Netscape Communicator & the UNT Home Page

Use the Internet to search for answers to Microsoft Office problems. See http://www.zdnet.com/zdhelp/filters/office/ December 1999's "List of the Month"

offers links to free Microsoft Word and Excel information also.

offers links to free Microsoft Word and Excel information also.

IRC News

Minutes provided by Sue Ellen Richey, Recording Secretary

IRC Regular and Ex-officio Voting Members: Judith Adkison, College of Education; Ginny Anderson, Fiscal Affairs; Donna Asher, Administrative Affairs; Craig Berry, School of Visual Arts; Cengiz Capan, College of Business, GALC; Bobby Carter, UNT Health Science Center; Christy Crutsinger, Faculty Senate; Jim Curry, Academic Administration; VACANT, Student Association; Duncan Engler, University Planning Council; Don Grose, Libraries; Jenny Jopling, Instruction Program Group; Joneel Harris, EIS Project Group; Elizabeth Hinkle-Turner, Standards and Cooperation Program Group; Abraham John, Student Affairs; Christine Mitchamore, Graduate Student Council; Ramu Muthiah, School of Community Services; Jon Nelson, College of Music; Robert Nimocks, Director, Information Technology, UNTHSC; Patrick Pluscht, Distributed Learning Team; Kathleen Swigger, College of Arts and Sciences; Philip Turner, School of Library and Information Science and University Planning Council (Chair, IRC); Virginia Wheeless, Chancellor for Planning. *IRC Ex-officio Nonvoting Members:* VACANT, Telecommunications; Charles Andrews, GALMAC; Bill Buntain, Computing Center Networking; Jim Curry, Microcomputer Maintenance Shop; Richard Harris, Computing Center and University Planning Council; Coy Hoggard, Computing Center/Administrative; VACANT, UNT Health Science Center; Maurice Leatherbury, Computing Center/Academic; Sue Ellen Richey, Computing Center (Recording Secretary).

May 7, 2002

VOTING MEMBERS PRESENT: PHILIP TURNER, Chair, LOU ANN BRADLEY (for DON GROSE), ELIZABETH HINKLE-TURNER, DUNCAN ENGLER, CRISTINE MITCHAMORE, CHRISTY CRUTSINGER, JIM CURRY, JUDITH ADKISON, ARMIN MIKLER, SEAN HIATT, RAMU MUTHIAH, WIL CLARK (for JOHN PRICE), DONNA ASHER, KENN MOFFITT, NANCY MCCRAY (for VIRGINIA WHEELESS), JENNY JOPLING, JONEEL HARRIS, ROBERT NIMOCKS, BOBBY CARTER, CENGIZ CAPAN

NON-VOTING MEMBERS PRESENT: COY HOGGARD, RICHARD HARRIS, PATRICK PLUSCHT, MAURICE LEATHERBURY, BILL BUNTAIN, SUE ELLEN RICHEY (Recording Secretary) MEMBERS ABSENT: CHARLES ANDREWS, TOM JACOB, JON NELSON, DOUG MAINS, CRAIG BERRY, ABRAHAM JOHN, GINNY ANDERSON

GUESTS: JENNIFER LAFLEUR

The minutes of the March 26, 2002 meeting were approved with one correction to the spelling of Tom Jacob's name.

IR Steering Committee

The Chair reported that the IR Steering Committee met last month but they did not consider the Security Policy at that meeting. The Web Publishing Policy has not been approved by them either, so both policies will be placed on a future meeting's agenda.

DCSMT

Maurice Leatherbury reported for the DCSMT that they have formed a Cooperation &

Coordination Committee to try and set parameters for coordinating major infrastructure changes. In addition, Internal Audit has just completed a software licensing compliance audit with favorable findings. Their only recommendation was that written materials be provided to students for training purposes on copyright compliance. These materials have been developed and were distributed to DCSMT members last Friday.

Instruction Planning Group

Jenny Jopling reported for the Instruction Planning Group that they have met electronically. The committee added a paragraph to the System Status Proposal they previously submitted to the IRC. The addition provides for notification of system outages to the Director of University Online Communications, Kenn Moffitt, so that he can post the alert on the UNT.edu Web site.

Jenny distributed copies of the revised proposal. There was some discussion about recent outages and concern that the Help Desk may not be as informed as they should be about whom to contact when informed of an outage. It was also pointed out that it is not clear who is responsible for resolving the problems that cause the outages. It was acknowledged that the Computing Center has a software called "Unicenter" which is a system monitoring software that could be used to help alert the appropriate persons in the event of any kind of outage. It was also suggested that there should be an alternative method of notification in the event that all systems are down.

Although it is not entirely acceptable, the Help Desk can be called for information in such an event. It was also suggested that UNT have an off-campus internet site where a notification could be posted. A vote was taken on the revised System Status Proposal as presented, and it was approved. The Chair then charged Maurice Leatherbury to look into an alternative method of notification, such as a bounce to an outside internet site in the event that all systems are down, as well as an alternative monitoring system.

Communications Planning Group

Lou Ann Bradley reported for the Communications Planning Group that they met to deal with the communications outage between the Library Annex and the main campus. A new laser solution is being installed until such time as fiber optic cable can be run to that building.

EIS Planning Group

Joneel Harris reported for the EIS Planning Group that the Best and Final Offers from the Software vendors had been received on Friday, May 3rd. She reported that the pricing appears to be very competitive, but she is not in a position to reveal the actual figures yet. The Best and Final Offer requests to the Service Providers went out on Monday, May 6th and are due back Monday, May 13. The goal is to try to make a recommendation to the Finance Committee of the Board of Regents as soon after that as possible. The EIS Project Group will meet this Thursday, May 9th to review the final software offers.

Research Planning Group

Armin Mikler reported for the Research Planning Group that they have met and defined a new mission for the group to take a five-year outlook toward what the Computing Center can do to help the computational scientists. At the present time, the Computing Center has

limited resources to help computational scientists get their projects on a UNIX cluster for processing. It is recommended that an additional research programmer be hired by the Computing Center for this purpose. Another issue they discussed was grid computing which is being widely utilized by universities across the U.S. It is proposed that UNT become a player in the high-end computational processing arena, and this can be done if the Computing Center can offer research equipment and technical support to this end.

Standards & Policy Planning Group

Kenn Moffitt reported for the Standards & Policy Planning Group that they met and discussed background of the Accessibility Policy. They will meet again on May 28th to go over a first draft of a revision of that policy.

Student Computing Planning Group

Elizabeth Hinkle-Turner reported for the Student Computing Planning Group that they met with RESNET representatives to gather background information, then the whole Planning Group met later to discuss an extensive list of things students need to know about computing at UNT. They discussed methods of disseminating this information to students.

Distributed Learning Team

Patrick Pluscht reported for the Distributed Learning Team that he will be bringing statistics to the Council on distributed learning enrollment since 1998. He reported that the TX DLA Conference in April was a big success, with over 500 attendees. In addition, they have a Tegrity demo scheduled on May 16 at 11:00 a.m., in ISB 201. This vendor provides a hardware solution that helps faculty convert their existing classroom teaching into something suitable for a Web-based presentation. The committee is also evaluating a software tool that allows the function of monitoring a lab over a wide-area network. Cengiz Capan commented that COBA is also evaluating a software called Virtual Classroom which provides similar functionality at a fairly low cost. Maurice Leatherbury noted that the Computing Center has also evaluated similar products, but finds that they are extremely expensive.

Lifetime E-mail Addresses

Cengiz Capan presented a Resolution from the College of Business faculty, which supports the establishment of lifetime E-mail addresses for UNT alumni. Maurice Leatherbury commented that the Computing Center has begun looking into the feasibility of this as a service to transfer E-mail to the forwarding E-mail addresses of alumni, rather than storage of E-mail.   It would then be the responsibility of the end-user to update their E-mail addresses whenever they changed.

IRC Meeting Schedule

The IRC generally meets on the third Tuesday of each month, from 2-4 p.m., in the Administration Building Board Room. From time to time there are planned exceptions to this schedule. This fiscal year, the December meeting was changed to December 11th, the April meeting was cancelled, and the May meeting to May 7th. All meetings of the IRC, its program groups, and other committees, are open to all faculty, staff, and students.

Staff Activities

Transitions

The following are new employees:

- **Debasish Mukherjee**, Programmer Analyst on EIS Project, ADM.

The following people no longer work in the Computing Center:

- **Christopher Brooks** - Computer Support Specialist on Desktop Operating Systems Team, Campus-Wide Networks, NCS.

- **Lisa Hulbert**, Programmer, UNT/HSC Fiscal Data Systems Team.

Changes

- **Rachel Johnson**, Microcomputer Consultant, Helpdesk (part-time), is now **Rachel Keith**.

Awards, Recognition, Presentations, Professional Activities

- **Dr. Elizabeth Hinkle-Turner**, Student Computing Services Manager, received an ASCAP Composers Fellowship for three piece commissions and book research. She has also been named Webmaster for the International Alliance for Women in Music, a position which brings with it a semesterly grant of $1,000 for a student employee.

  Dr. Hinkle-Turner was also interviewed for, and quoted in, an article that appeared in the June 7, 2002 issue of the *Chronicle of Higher Education*. The article is "Music's Open Secret: Confronting the line between individual attention and harassment."

Campus Computing News

By **Dr. Maurice Leatherbury**, Senior Director of Academic Computing

New Telecommunications Infrastructure Fund Grant Announced

The Telecommunications Infrastructure Fund Board recently announced a new round of grants to Texas higher education institutions, this round being dubbed "HE4" (the fourth such grant opportunity for higher education since the inception of TIF.) UNT is eligible to receive $616,687 under this non-competitive grant program that includes all two- and four-year colleges and universities in the state. Last year we received $739,004 from TIF's "HE3" grant: that money is being spent on training central Web support personnel, wireless laptops for classroom training, three additional videoconferencing rooms, online personal storage space for students' files, new WebCT servers, and some production equipment for the Center for Distributed Learning.

Use of the funds

The HE4 grants, for the first time, allow us to hire personnel in order to develop "academic programs that fully take advantage of telecommunications [that] may require high levels of interactivity, high-quality multimedia and attention to design." Specifically, we can hire subject matter experts, instructional designers, curriculum development specialists, content/course conversion specialists, and programmers under this grant. Other allowed uses of the funds are for training staff and faculty on using technology in the classroom and on developing web-based curricula, distance education training, and "enterprise integration." **We must respond to the HE4 RFP by August 2nd, the grant period starts on August 30th, and we must have all of the funds spent by August 30, 2003.**

Dr. Philip Turner has discussed the grants with the other deans and with Dr. Kesterson and one major use of the funds will probably be to fund additional course and program development for delivery using WebCT. Additional funds may also be used to pay for the large increase in our WebCT license costs next fiscal year. However, no final decisions have been made on the disposition of the funds from the grant. The grant will be discussed at the June 18th meeting of the Information Resources Council.

Free Virus Protection for Home PCs

By **Travis Brown, Campus Wide Networks Computing Team**

UNT is now offering free antivirus software for all its faculty, staff, and students to use on their home computers! Good deal? No it's Great! By installing McAfee's VirusScan Home Use Option v.6.0 on your home PC (other versions for MAC and Linux), you can have the security of knowing that you have taken the most important step to protect yourself from malicious viral attacks that plague the internet.

Features

McAfee antivirus software includes:

- **System Scan** (VShield) - scans memory to stop viruses before they can be run

- **Download and E-mail Scan** - scans files as they are downloading (Includes Microsoft Outlook Express, Eudora, AOL, Netscape and others)

- **Internet Filter** - blocks malicious Internet sites

- **Automatic Updates** - updates virus definitions automatically to help catch the latest viruses

Availability

You can download the software for free at http://cwn.unt.edu/virus/dist.html. Remember to have you EUID and password handy. The file is 23 MB in size, so it'll take a few hours to download over a modem, but it's well worth it. We may have a CD available shortly for a nominal distribution fee; keep watching UNT's virus information page (http://cwn.unt.edu/virus/) for details.

Virus Activity

Computer viruses are spreading faster than ever. "Iatro" (Greek for doctor) is UNT's GroupWise E-mail scanner* and stops about 3,000 infected E-mail messages each month (see http://cwn.unt.edu/virus/vstatlg.html for mind boggling details). It stopped a record number of 14,900 infected E-mail messages in May. Since new viruses appear every weak, it is *CRITICALLY IMPORTANT* that every computer is continually updated with the latest definition files. All the information you'll need and simple configuration instructions can be found at http://cwn.unt.edu/virus/.

Happy and safe computing!

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* EagleMail virus scanning is now available also. According to this article in the January 2002 issue of *Benchmarks Online*, "An attachment virus scanning

option has been added for messages that are received through the EagleMail interface. For message composition, attachments are automatically tested for viruses. If the attachment tests positive, the request to attach is refused. For messages received, there is now a link name 'Virus Scan' located next to each attachment. Click this link to determine whether the E-mail sent to you is infected. Please be aware that virus scanning is not foolproof and new undetectable viruses are created everyday, so please be cautious with all attachments."

The Force is better and stronger than ever!

By Dr. Elizabeth Hinkle-Turner, Student Computing Services Manager

Many of you have been using the SmartForce Computer Based Training offerings of Academic Computing Services for the past year. I have completed the update of the SmartForce Campus system which offers many new features and improvements. The UNT SmartForce Website has been completely updated to reflect these changes and I encourage everyone to read it thoroughly for more information.

SmartForce courses are now JAVA-BASED. That means no more downloading of their proprietary plugin! SmartForce is now recommended for the Internet Explorer 4.x, 5.x, and 6.x browser. SmartForce also works with Netscape 4.x but does not work with 6.x. SmartForce still only works reliably on Windows machines. However, we are continuing to test it on the Macintosh and Linux platforms and will let you know if and when we achieve positive results. Anyone using SmartForce should have the latest players for Realplayer, Flash, and Shockwave installed with their browser. Links to these plugins are provided on the UNT SmartForce Website.

All login information and interface information remains the same so SmartForce "veterans" should see no difference in the interface. "Newbies" to the system should read the UNT SmartForce Website thoroughly before beginning use.

More courses have been added to the server including offerings in Windows/Office XP, Linux, Oracle 9i and Solaris 8. We will also continue to expand our Linux offerings as more courses are developed. These courses were added to the server at your (the UNT community) request. :-)

New Courses

Here is a list of the NEW courses found on the SmartForce server:

- Linux: Basic System Administration I (listed under the title "Administration Tasks")
- Files in Linux (listed under the title "Managing the Filesystem")

- Introducing Oracle9i Database
- Reducing Downtime in an Oracle9i Database (listed under the title "Availability")
- Joins, Expressions and Subqueries in Oracle9i (listed under the title "Development Platform")
- The Oracle9i Database SPFILE (listed under the title "Manageability Enhancements")
- Oracle9i Database Index Usage and Monitoring (listed under the title "Scalability and Performance")
- Oracle9i Database Security (listed under the title "Security Overview")

- Solaris 8: Installation
- Solaris 8: System Operators
- Solaris 8: User Administration

- Windows XP: Fundamentals
- Windows XP: Advanced

- Common Features in Microsoft Office XP
- New and Enhanced Features for End-Users in Office XP
- New Features Review
- Office XP for the Advanced User

- Basic Features of Excel 2002 (note: "2002" and "XP" both refer to components of Office XP)
- Advanced Data Management in Excel 2002
- Advanced Data Manipulation and Analysis in Excel 2002
- Optimizing Excel 2002

- Introduction to Access 2002
- Intermediate Access 2002
- Advanced Database Design in Access 2002
- Advanced Database Features in Access 2002

- Creating Documents in Word 2002
- Working with Documents in Word 2002
- Advanced Document Features in Word 2002
- Advanced Formatting and Navigation in Word 2002
- Collaborative Features in Word 2002

- Building and Modifying Web Sites in FrontPage 2002
- Enhancing and Managing Web Sites with FrontPage 2002
- Enhancing and Publishing Web Sites in FrontPage 2002
- FrontPage 2002 Basics

- Creating Presentations using PowerPoint 2002

- Introducing Outlook 2002
- Managing Outlook 2002

CDs?

Many of you have also taken advantage of the pre-packaged CDs I have created

of these courses. The new courses will NOT be available on CD for another couple of weeks. If you have any additional questions about SmartForce training please do not hesitate to contact me at: ehinkle@unt.edu

Remedy Enhanced: Introducing Rem-Mail

By Pat Evans, Remedy Developer

Since the initial implementation of Remedy in 1998, Remedy has undergone a major system upgrade and several smaller but no less important enhancements. In the past few weeks, the latest and possibly most noticeable enhancement to the current ARS 4.5/Helpdesk 4.0 system was placed into production – that enhancement was Rem-Mail.

Remedy review

While Remedy has become an almost ubiquitous asset for many support personnel across campus, to many other people Remedy is still a mystery. Questions may arise like – What is Remedy? What does it do for the University? And, what does Remedy mean to me?

In its simplest definition, Remedy is a campus-wide trouble call tracking system for computer support problems. Its primary purpose at the University is to provide a central tracking system for every conceivable type of computer support action. Key features provided by this system are:

- Notifies groups of support staff members by various means (E-mail, pager) as soon as a new case (trouble ticket) is entered into the system and assigned to them.

- Notifies the customer via E-mail when a new trouble ticket is created, and when that ticket is placed in various states such as "Work in Progress, Pending, Resolved, and Closed."

- Enables distributed support staff to quickly escalate problems to central computing staff where appropriate, while maintaining continuous feedback to the customer.

- Provides follow-up and escalation actions for problems that are not being resolved in a timely manner.

- Empowers the customer to decide whether or not the problem was resolved, and if not, allows them to easily reopen the ticket via ARWeb or Remedy Web, which automatically notifies the support staff of that fact.

- Stores solutions to problems in a database that can be searched directly from the trouble ticket screen, and will ultimately be available to all customers as well.

- Enables customers to enter their own trouble tickets into interactive web forms that are forwarded directly to their primary computer support staff (either the distributed area or the central helpdesk).

From a customer's perspective, Remedy means a number of things. For one, it enables support staff to quickly pick your customer record and get on with recording the facts of your problem. For another, it means being told that a trouble ticket number has been created for you if the support staff couldn't resolve your problem over the phone. And finally, allows you to receive notification messages (when you have a valid E-mail address in the system) when your case has been resolved and upon resolution of your case, an opportunity to respond to a Customer Satisfaction Survey via the Web.

Okay, so what is Rem-Mail?

Rem-Mail is an E-mail Integration tool designed for use with the Remedy Action Request System. It enhances the E-mail capabilities of Remedy by allowing for "total free-form E-mail message to create or update entries within the Remedy AR System." [i] No longer are Remedy notifications to customers and individual assignees limited to a terse 255-characters; now we can have up to 32K of text and up to 5 E-mail attachments per notification/ correspondence. It is simply the best third-party solution for outbound E-mail notifications (for robustness and form) and inbound updates from practically any mail client (a feature not previously available via the ARS mail system) to existing Remedy cases.

What does Rem-Mail mean for me?

In the most general of terms, Rem-Mail makes it possible to send you comprehensive information regarding your HelpDesk or ChangeRequest ticket, and it allows you to input additional information directly into the ticket, all from the simplicity of your preferred E-mail client. Because Rem-Mail facilitates a wide range of new capabilities for Remedy, what Rem-Mail can do for you individually is broken down based on your role (Requester, Support Staff, and Manager) as defined in the Remedy Action Request System.

The Customer (Requester)?

As a Remedy customer, you have likely received E-mail notifications from arsystem@unt.edu with a subject line looking something like:

Trouble Ticket (Case) HD0000000017022 has been opened for you (Login Name "xyz0001") on the Remedy call tracking system.

This message indicates that a support staff member (or one of our problem reporting web pages on WebCT or EagleMail-mail) has created a new case for you in Remedy as a result of a telephone call, E-mail, or other customer service transaction with or for you in which a problem was reported. It is a clear indication that someone is aware of your problem, and usually provides telephone point of contact information for the group assigned to your case within the text body of the message.

But the drawback of a notification like this is its very one-way nature. You get notified by E-mail, but have to reply to Support Staff via the phone or through ARWeb (a Remedy interface via the Web). Now, using Rem-Mail, you will receive notification from remmail@unt.edu and have the ability to reply directly to a notification such as this:

Remedy HD0000000046439 for EUID/xyz0001 was created. Status: ##UPDATE##

While the message subject line still indicates by inference that a support staff member has created a new case for you in Remedy, this subject line now has the power, because of its format and content, to be read by Rem-Mail and acted upon by Remedy when properly replied back to remmail@unt.edu.

So what is the Subject line telling me?

The first part of the message, the *"Remedy HD0000000046439"* portion, tells us that a HelpDesk (hence 'HD') case numbered '46439' was created when you reported your problem to Support Staff. The second part of the message, the *"EUID/xyz0001"*, is the EUID, or Enterprise User Identification – a unique identifier that for our purposes is also your Remedy User Identification. And lastly, the Status flag word located between the ## delimiters. The standard notification flag word upon creation of a Remedy ticket has been pre-scripted for you.... *##UPDATE##*. This flag word lets you know that a ticket has been created and now you, the customer, can update your case simply by replying to this notification. (NOTE: *The information above talks about a Remedy Help Desk case, but is equally applicable to Remedy Change Requests; as identified by a preceding CHG to the change request number.*)

So how do I successfully update my Remedy case by Rem-Mail?

This is the easy part. Simply click 'Reply' in your mail client like you would any other E-mail message and reply in the text body with the updated information you would like to convey to the Support Staff handling your case.Here is an example of how a successful reply would look using Outlook Express as a mail client:
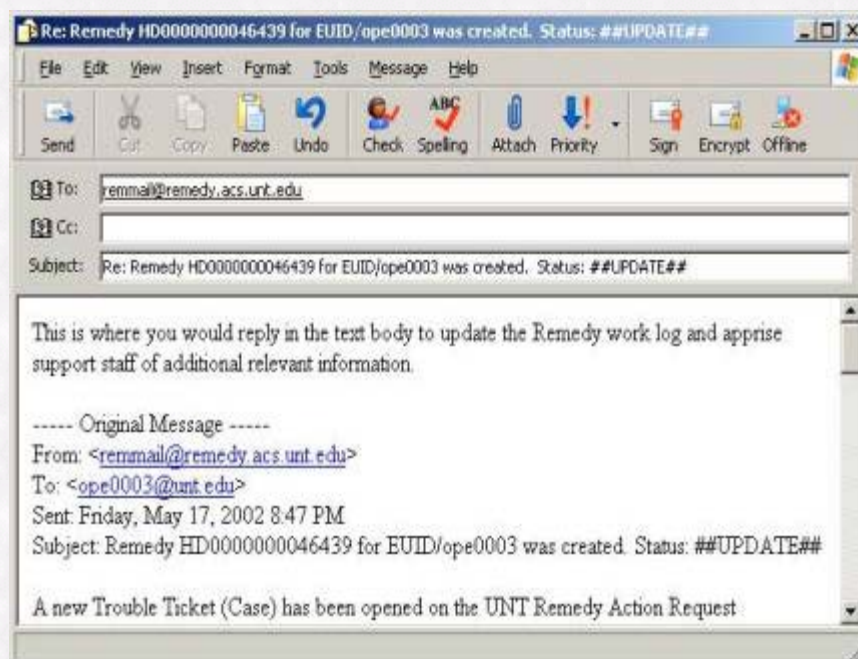
Additionally, when you are successful in updating your Remedy case, Rem-

Mail will send you a message containing a subject line like this:

You, the Requester (xyz0001) of Remedy case HD0000000046441, have successfully updated it via Rem-Mail.

This message is only a notification and cannot be replied successfully to.

What happens if I am not successful in replying to Rem-Mail or reply in error to the successful update notification message?

If you should accidentally reply to the successful update notification message or for whatever reason your reply was not successfully read by Rem-Mail, you will receive a notification from Rem-Mail telling you that your update has failed and what the likely cause for that failure was. Most common causes for failure is using an unsupported flag word (the word(s) between the ## signs) in a reply, or accidentally modifying your case number, or in the case of the success notifications, not following a reply format that Rem-Mail can understand and process.

Can I resolve my own case using Rem-Mail?

Yes, absolutely! Now you, the customer, can resolve your own case via E-mail without having to call or E-mail the assigned support staff that your problem has been resolved. Using the same E-mail notification that you received from Rem-Mail that a Remedy case had been opened for you, simply replace the word "UPDATE" with the word "RESOLVE" between the ## delimiters in the subject line. An example of this using EagleMail-mail:

I've just received a message from Rem-Mail that my case has been resolved. What do I do? What if I disagree - can I reopen the case?

If you agree that the specific problem that was reported in this case has been resolved to your satisfaction, you can do one of two things: do nothing and let the Remedy system automatically close your case or you can reply to the message and close it immediately. (NOTE: *If you close your case, but the original problem reappears, you will have to have a new case created.*)

If, however, you do not believe that your problem for this case has been resolved, you may reopen the case. To reopen the case, replace the flag word RESOLVE with the flag word REOPEN between the ## delimiters. An example is provided:
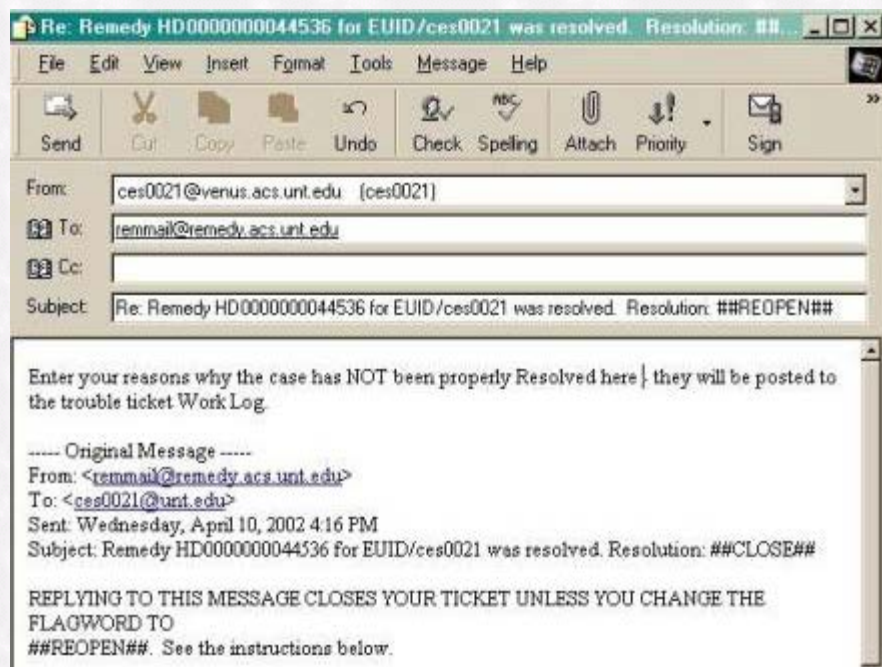
I've used Rem-Mail to reopen my case. What happens next?

Upon receiving an inbound E-mail into Rem-Mail's mailbox with the flag word of REOPEN, Rem-Mail reads the case number and Remedy takes that case number and changes the status of the case from **Resolved** to **Assigned**. The ticket is then handled as a continuation of the original problem reported.

Upon reopening your case, the originally assigned support group is notified that you have re-opened your case, and that work must resume to correct the problem that you reported. For you, the customer, the REOPEN flag word has surely got to be one of the most powerful tools you have to achieve problem resolution. No longer will you have to accept that your case is resolved when you don't believe that it is. With REOPEN, you can keep reopening your case until such time as the problem is resolved to your satisfaction; then you would agree to CLOSE the case and no further work for this ticket with this problem will occur.

(NOTE: *Please do not abuse this function. To provide the best support to you, it would not be appropriate to reopen a ticket for one reported problem, only to add a new and unrelated problem.*)

This is great! Where can I get more information about using Rem-Mail?

You can get additional information about using Rem-Mail by going to Help Desk Central at the following web-site and choosing the link for Remedy E-mail Interfaces: <http://remedy.unt.edu/HELPDESK/>

The Support Staff?

For support staff, Rem-Mail offers up a whole new and exciting way to create and manage Remedy Helpdesk cases, Change Requests, and Tasks; all from the comfort of your E-mail client. To best understand the added features to Remedy that Rem-Mail brings, let's look at the entire life-cycle of a Helpdesk case from creation to closure with an eye toward the needs of support staff working the ticket.

Creating a New Case

With Rem-Mail, you can now create a new Helpdesk case or Change Request from your mail client without ever having to open up the Remedy client. In the past, it was not uncommon for a customer to send an E-mail to a support group E-mail address requesting assistance for a problem they were experiencing. In most cases, the customers E-mail was replied to by a member of the group, but no Remedy case was created for the support provided. If the support staff did create a case from the incoming E-mail, it would require opening the Remedy client, finding the user in the People database, and then submitting the case to the appropriate support group for the customer. All in all, a more time consuming process.

Now imagine taking that same customer's E-mail and forwarding it to a Remedy mailbox that would automatically create a case and assign it to the appropriate support group for its stated problem. With Rem-Mail, this is a reality.

Processing a submitted E-mail into a Remedy request depends upon the correct format of the Subject line of the incoming E-mail message. **It also must come from an E-mail address that has been give specific rights to use this capability.** The creation of a new Help Desk Case or Change Request requires three key elements: a prefix telling Rem-Mail how to proceed with the Inbound E-mail, a pre-defined NewKeyword that Rem-Mail already understands, and the Requester's EUID (actually, their Remedy Login Name if it differs from their EUID).

Again, submitting an E-mail into a Remedy request can only come from an E-mail address that has been given specific rights to use this capability. For more detailed information about New Help Desk case or Change Request creation, please visit the following URL: http://remedy.unt.edu/helpdesk

and select the link for "Using Rem-Mail to create NEW Remedy Trouble Tickets or Change Requests" under "Remedy E-mail Interfaces."

Self-Assignment of cases

While Group Notification (notifications to each member of a support group) is not a Rem-Mail feature, group notifications have been enhanced to support Self-Assignment of cases. Leveraging the strength of the Remedy API to handle group notifications, the outbound message from Remedy has been reformatted to allow a Support Staff member or Manager to FORWARD the message to Rem-Mail, thus permitting an individual assignment and even a status change to the case.
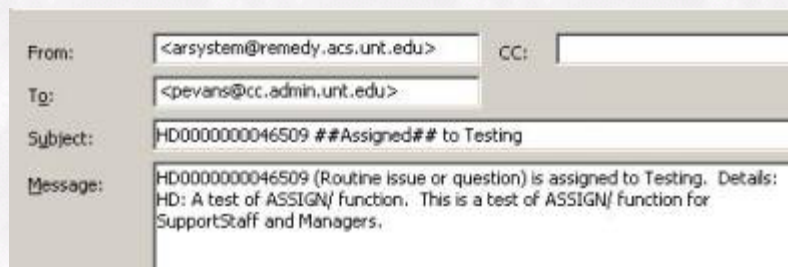
(An example of a Group Notification to a member of the Testing group)

Only designated Support Staff and Managers in the Remedy People Database have the permissions necessary to assign a ticket from E-mail, all others attempting to self-assign a ticket will result in a failure.

If you are support staff member or a manager in Remedy, the recommended method for self-assigning tickets is to EDIT the FLAGWORD in the Subject: line, DELETE the text after the flagword and ADD the action ASSIGN/login name one space following the flagword ## delimiters. Otherwise leave the subject line exactly as you received it, plus the "Fwd:" or "FW:" prefix appended to the Subject line by your E-mail client. Enter the text you want to add to the Work Log in the Message: body.
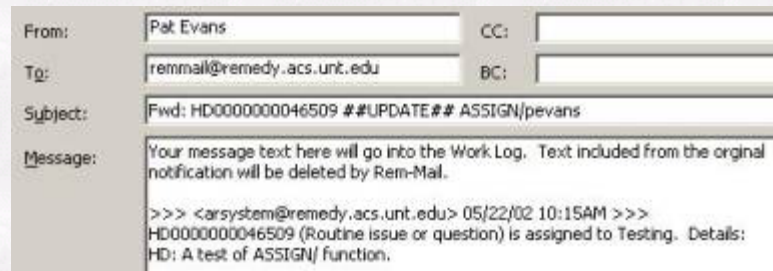
(An example of a correctly formatted self-assigned case submission)

(NOTE: Support Staff ONLY have permission to assign the ticket to themselves)

Update of assigned tickets

Once a Help Desk case or Change Request has been assigned or reassigned to an individual Support Staff (either through Rem-Mail or the Remedy client), the individual assignee will receive a notification from Rem-Mail containing pertinent information about the case. (Notification to an assignee is dependent upon the support staff having notification preference set to E-mail within Remedy.) Rem-Mail, because of its ability to handle text up to 32K in size, allows for robust notifications to include such information as Summary, Description of problem, and Status of case, Customer information and any additional Work Log entries already associated with the case. Ideally, the information in this notification would allow a Support Staff to print it, and then travel with that information to the customer's location if on-site work was required.

Much like a requester updating a case, Support Staff can also update a case with just informational updates to the Work Log, or additionally change the

status of the working case. The recommended method for updating tickets is to ONLY EDIT THE FLAGWORD in the Subject: line and leave all other elements exactly as you received them, plus the "Re:" or "RE:" prefix appended to the Subject line by your E-mail client. Enter the text you want to add to the Work Log in the Message: body.

From:	Chris Strauss	CC:	
To:	remmail@remedy.acs.unt.edu	BC:	
Subject:	Re: HD0000000042128 was reassigned to LOGIN/strauss Status: ##UPDATE##		
Message:	Text for the Work Log goes here. Text below the reply line (>>) will be discarded by Rem-Mail. >>> <remmail@remedy.acs.unt.edu> 04/03/02 04:46PM >>> Urgency: Routine issue or question Details: HD: UNT Internet Services Account		

(An example of a correctly formatted case update by a reassigned to support staff)

From:	Chris Strauss	CC:	
To:	remmail@remedy.acs.unt.edu	BC:	
Subject:	Re: HD0000000042118 is assigned to LOGIN/strauss Status: ##PENDING.information##		
Message:	Your message text here will go into the Work Log. The message text below this will not. >>> <remmail@remedy.acs.unt.edu> 04/03/02 04:06PM >>> Urgency: Routine issue or question Details: HD: A problem with PRAS Subscription		

(An example of a correctly formatted status change and update)

From:	Chris Strauss	CC:	
To:	remmail@remedy.acs.unt.edu	BC:	
Subject:	Re: HD0000000042118 is assigned to LOGIN/strauss Status: ##RESOLVE##		
Message:	Your message text here will go into the Work Log. The message text below this will not. >>> <remmail@remedy.acs.unt.edu> 04/03/02 04:06PM >>> Urgency: Routine issue or question Details: HD: A problem with PRAS Subscription		

(An example of an assignee correctly resolving a case via Rem-Mail)

Flagwords

Critical to the successful update of a Help Desk case or change request is the flagword. While the need for a valid login name and ticket number is self-evident, the flagword needs a brief explanation.

Simply put, a flagword is nothing more than the word between the ##'s in a notification. With the exception of REOPEN and CONFIRM, flagwords are the same as the choices of **Status** from the Helpdesk or Change client and are **always in UPPERCASE**.

(NOTE: *Status Pending is a unique case. Pending actually requires two parts; the Pending Status and the Pending*

*subtype. PENDING is the all-caps flagword, followed by a period (.) and the pending subtype in lower case. The pending subtype is identical to the **Pending** values from the Helpdesk or Change client.*)

Success Notifications

Success Notifications are simply indicators informing you that your submission of an update or status change update was successful and look like this:
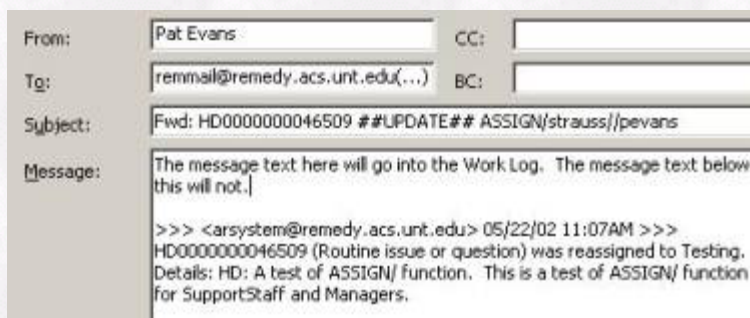
Rem-Mail update of HD0000000046797 by SECONDLEVEL, SAM SIMEON was successful.

You cannot Reply to THIS success notification and update **anything**! It is **only** an indicator that your last attempt to update the ticket succeeded. Also, as a Support Staff member, you will receive a carbon copy of the success notification received by Requesters who successfully update their ticket via Rem-Mail, whether the ticket is assigned to a group or to an individual assignee.

The Support Manager?

For the support manager, Rem-Mail expands upon the Rem-Mail feature of support staff case self-assignment. Like support staff case self-assignment, managers can assign a case via a group notification to the most qualified support staff member. Or, should one support staff member be better qualified to resolve the case over another support staff already assigned, managers can reassign the case from one to the other.
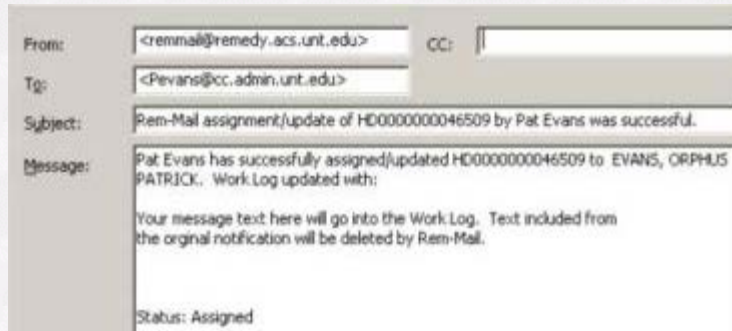
The recommended method for initially assigning/reassigning tickets is to EDIT the FLAGWORD in the Subject: line, DELETE the text after the flagword and ADD the action ASSIGN/login name//login name one space following the flagword ## delimiters. Additionally, the first login name will be of the Group member this case is being assigned to, with the second login name being that of the manager. Otherwise leave the subject line exactly as you received it, plus the "Fwd:" or "FW:" prefix appended to the Subject line by your e-mail client. Enter the text you want to add to the Work Log in the Message: body.

From:	Pat Evans	CC:	
To:	remmail@remedy.acs.unt.edu(...)	BC:	
Subject:	Fwd: HD0000000046509 ##UPDATE## ASSIGN/strauss//pevans		
Message:	The message text here will go into the Work Log. The message text below this will not.|		

>>> <arsystem@remedy.acs.unt.edu> 05/22/02 11:07AM >>>
HD0000000046509 (Routine issue or question) was reassigned to Testing.
Details: HD: A test of ASSIGN/ function. This is a test of ASSIGN/ function for SupportStaff and Managers.

(An example of a correctly formatted assignment by a manager to a support staff member)

Success Notifications for Managers

Success Notifications for managers are simply indicators informing you that your submission of an assignment/reassignment of a case was successful.

From:	<remmail@remedy.acs.unt.edu>	CC:	
To:	<Pevans@cc.admin.unt.edu>		
Subject:	Rem-Mail assignment/update of HD0000000046509 by Pat Evans was successful.
Message:	Pat Evans has successfully assigned/updated HD0000000046509 to EVANS, ORPHUS PATRICK. Work Log updated with:

Your message text here will go into the Work Log. Text included from the original notification will be deleted by Rem-Mail.

Status: Assigned

(An example of a successful assignment/reassignment notification to a Manager)

Like other success update notifications, you cannot reply to this success notification and update **anything**!It is **only** an indicator that your last attempt to assign/reassign the ticket succeeded.

What the future holds for Rem-Mail and Remedy

One of the most appealing features slated for the next Rem-Mail development cycle at UNT is the ability to push Knowledgebase information from Remedy to a customer, including file attachments (for example, an updated system file or product diagram illustration) as warranted. Where appropriate, this process could also be run in reverse, allowing a support staff or even possibly a customer to inject a file (possibly, an image file of a screen capture for example) into a trouble ticket. Another feature being considered is to develop more robust Group notifications utilizing Rem-Mail that can manage email addresses of individual group members, thus eliminating the cryptic messages currently sent out by Remedy. And at some point, using Rem-Mail as the platform to do Customer Satisfaction surveys directly, rather than having to go to a web link to complete the survey.

Still, added features aside, the Remedy/Rem-Mail Administration and Development team will continue to push for ease of use for all users; Customers, Support Staff and Managers alike.

For more information on using Rem-Mail

Please visit Help Desk Central at: http://remedy.unt.edu/helpdesk and select any of the following links for much more detailed instructions for using Rem-Mail.

Procedural Instructions for Customers (Requesters) - Rem-Mail

- Using Rem-Mail to Update Remedy Trouble Tickets or Change Requests

Procedural Instructions for Support Staff – Rem-Mail

- Using Rem-Mail to Update Remedy Trouble Tickets or Change Tickets

Using Rem-Mail to Create NEW Remedy Trouble Tickets or Change Requests
- Using Rem-Mail to Assign Existing Remedy Trouble Tickets or Change Requests

Credits

This is an original document; however some small portions of this article were previously published in *Benchmarks Online* and written by Chris Strauss, UNT Remedy Administrator. Also, thanks to Mark Warner of Ultimate Workflow Integration Partners, Inc. for all his assistance in teaching me the finer points of development with Rem-Mail and its integration with Remedy. And lastly, thanks to Sandy Burke, Computing Center HelpDesk Manager, for reminding me to keep any Remedy documentation readable.

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[i] Courtesy of Ultimate Workflow Integration Partners, Inc. (http://www.uwip.com)

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