Universal Tacacs+ Accountant

Introduction

Universal Tacacs+ Accountant is an accounting utility for producing usage reports by extracting and analysing data from the Universal Tacacs+ Server log file.

Universal Tacacs+ Accountant produces detail usage reports suitable for billing and chargeback purposes.   The report lists out the login and logout times for each user, the duration of each call, the NAS lines they used and the bytes and packets they sent and received.

(Note : To gather the bytes and packets in/out information, the NAS has to be configured to use TACACS+ Accounting.)

Because of the different reporting requirements for different users, Universal Networks will release the source code (in Visual Basic 4.0 format) of Universal Tacacs+ Accountant by Email to registered users upon request.   This allows users to tailor the accounting reports to suit their own needs.

How to Use Universal Tacacs+ Accountant

To run an accounting report, simply start Universal Tacacs+ Accountant, fill in the required fields and press OK.   Universal Tacacs+ Accountant has four fields on its input form.

TACACS+ Log File Name

This is the name of the TACACS+ log file to be used as input.

Output File

This is the name of the output file which holds the usage report.   The output file can be a new file or an existing file.   If it is an existing file, its content will be overwritten by the usage report generated by Universal Tacacs+ Accountant.

Start Date / End Date

This two fields limits defines time period which Universal Tacacs+ Accountant will be used in generating usage reports.   For instance, if you want to generate usage report for a certain week, you can use the Start Date and the End Date to do so.   Start Date and End Date can accept both date and time, so you can specify an time interval down to per second precision.

The default Start Date and End Date are 01/01/1901 00:00:00 and 01/01/1999 00:00:00 respectively.   So the default is to process all the lines.

The format of date (i.e. whether to use mm-dd-yy or dd-mm-yy) used by Universal Tacacs+ Accountant follows the short date format of Windows.   The format of dates in Windows is defined in the Control Panel under the International session.

The format of time used by Universal Tacacs+ Accountant is hh:mm:ss.

Generating Usage Report

Once all the required fields are filled, you may press the OK button to start generating usage report.   A running number will be shown on the Universal Tacacs+ Accountant form showing which line it is processing.

For very large log files, Universal Tacacs+ Accountant may take a few minutes to complete.   In this case, you can minimise Universal Tacacs+ Accountant to let it process the lines in the background.

For ease of management, it is recommended that you can keep the log file small by changing the Universal Tacacs+ Server log file name periodically.   For example, you can change the log file name

weekly to produce weekly log files.   Please refer to Universal Tacacs+ Servers documentation or its on-line help for detail procedures of how to change log file name.

Interpretation of Usage Report

Universal Tacacs+ Accountant will list out the detail login and logout records for each user.   A sample output for one user is shown below.

```
User Peter
  Login  NAS Address     Line     Date      Time      Duration  BytesIn BytesOut  PaksIn PaksOut
-------------------------------------------------------------------------------------------------
  Login  208.102.145.2   Async1   1/2/96    19:05:13
  Logout 208.102.145.2   Aysnc1   1/2/96    19:10:33       320   102456    10024    4566     120

  Login  208.102.145.2   Async12  1/5/96    14:02:17
  Logout 208.102.145.2   Async12  1/5/96    15:10:17      4080  7250480   103568   81258   12450

                                            Total :    1:13:20  7352936   113592   85824   12570
```

Universal TACACS+ Accountant will automatically match logins with logouts by using the NAS Address and Line.   This allows logins and logouts to be matched correctly even if a user logged in on several lines simultaneously.

How Universal TACACS+ Accountant Handles Exception Conditions

Universal Tacacs+ Accountant will catch various exceptions, such as Communication Server Reboots and Universal Tacacs+ Server shutdown, and handled them intelligently.   The followings list some of the frequently asked questions about exceptions.

Q. **What will happen if some users is still logged in at the end-date ?**

For instance, you specified a start date of 01/01/96 14:00:00 and an end date of 01/01/96 18:00:00.   A user logged in at 01/01/96 17:00:00 and logged out at 01/01/96 19:00:00, so the user session run across the end-date.   How will Universal Tacacs+ Accountant handle this user ?

A. Universal Tacacs+ Accountant will consider the user to have logically logged out at the end-date, and re-login immediately after that.   So in the usage report, Universal Tacacs+ Accountant will report that the user has used 1 hour of time during the period 01/01/96 14:00:00 to 01/01/96 18:00:00, which is correct.

To distinguish a logical logout from a real logout, in the usage report, the logout record will be replaced by a reset record to represent that this is not a real logout.   This is shown below.

```
  Login  202.85.11.250    3          11/20/95     14:31:09
  Reset                               11/20/95     17:48:21
```

If you later run an accounting report for the next time period 01/01/96 18:00:00 to 01/01/96 22:00:00, the same user will be reported to have used one hour during that time period, which is correct.   The user will be considered to have logically login at 01/01/96 18:00:00.   To distinguish a logical login from a real login, the login record will be replaced by a reset record.

In summary, Universal Tacacs+ Accountant will report that the user had used 1 hour in the first time period, and 1 hour in the second time period.   In total, the user will be reported to have used 2 hours.   No time will be lost.

Q. **What will happen if the Communication Server is Reload ?**

A. In that case, there will be a Reload line in the log file.   When Universal Tacacs+ Accountant read that line, it will deduce that all users on that Communication Server must have been disconnected.   In the usage report, there will be a reset event representing a logout.   Users that are not on the reloaded communication server will not be affected.

Q. **What will happen if the Universal Tacacs+ Server has been turned off for some time, or the log file is closed down for some period ?**

A. In general, you should not turn off the Universal Tacacs+ Server if you intend to do accounting because you would then lost the loggings during the period which the Server is turned off.

If the Universal Tacacs+ Server is turned off and restarted, there will be a line server sign on message in the log file. If the log file is closed down, there will be a line saying that the log file is closed down. Universal Tacacs+ Accountant has the intelligence to understand that you have lost the loggings in between, and will try its best to interpret the remaining loggings reasonably.

When Universal Tacacs+ Accountant encountered the above exception conditions, it will, it will assume that all users would have logically logged out.

Later, when the server is restarted or the log file re-opened, there will be a server sign on message or a line saying that the log file is opened. Universal Tacacs+ Accountant will initially assume no user had logged in. However, if it later encounters a line saying a user has logged out, but cannot found a corresponding login record by matching the NAS address and the line number, Universal Tacacs+ Accountant will deduce that the user must have logged in during the period which the log file is closed. It will then assume the user is logically logged in at the server sign on time or log file re-open time.

Q. What will happen if the Universal TACACS+ Server is accidentally powered down ?

A. In that case, there will still be a server sign on message when the Universal Tacacs+ Server is restarted. Universal Tacacs+ Accountant has the intelligence to understand that the Server must had shut down, but it does not know when since there is no server closed down log message. It will then assume that the server had been logically shut down immediately before the sign on message, and will handle the case similar to a regular shutdown (see the previous question).

Q. What if I do not like the way Universal Tacacs+ Accountant handles exception, or if I do not like the Reset event to be seen by my customer ?

You can always customise the behaviour of Universal TACACS+ Accountant in any way you like by modifying the source code. Universal Networks will release source code (in Visual Basic 4.0) to any registered user by Email on request.

Q. There are some Reset entries in my accounting report. What does it mean ?

A. A reset means that Universal Tacacs+ Server has encountered a login line without a logout line, or vice versa. Normally, login and to be matched by logout in order to calculate the duration. In case Universal Tacacs+ Server cannot match login to logout or vice versa, it will replace the missing information by a Reset entry.

There are a number of reasons why this would happen. They are all described in detail in the questions and answers above.