



The Smart Radius Solution  
For Windows NT/2000

<http://www.tccsoftware.com>

## Overview

TCCRADIUS is designed to be a fully functional RADIUS for Windows NT/2000, and is based on RFCs 2138 & 2139. Since the RFCs do not cover some features that we felt were necessary in the design of a RADIUS daemon, we have added some of our own functionality and custom attributes.

In addition to some custom attributes, TCCRADIUS is designed to provide some added emergency failsafe options. By editing a simple text file on the server, TCCRADIUS can go from Normal mode to Update mode or Accept mode without restarting.

In Accept mode, TCCRADIUS will accept every user that attempts to login provided, of course, that the NAS box is listed in the TCCRADIUS Clients file. Should there be a problem with the central RADIUS database, this allows an administrator the ability to have a functional network while the database is being repaired.

In Update mode, TCCRADIUS will accept every user that attempts to login. TCCRADIUS will also create a RADIUS profile for that user with the username and password data provided. This option is great when your user database has been lost.

In Normal mode, TCCRADIUS will simply accept every user based on his/her RADIUS profile.

## TCCRADIUS Feature Set

### Extended Database Support

TCCRADIUS supports a myriad of databases for authentication.

- TCCRADIUS custom Text Mode - each user gets his/her own authentication file.
- ODBC mode - ODBC mode can be customized to talk to any ODBC supported database including but not limited to: MySQL, MS SQL, MS Access, Paradox, Fox Pro, etc.
- NTSAM support - user passwords can be verified against the NTSAM with backup Text or ODBC databases

### Runs In A Console Window Or As An NT Service

Run as a console for quick troubleshooting, diagnosis, and a real-time view of server operation. Run as a service for Automatic Startup and background execution.

### Very Low Overhead

TCCRADIUS has very low memory and processor overhead. The executable was written entirely in C++. In Text mode, TCCRADIUS uses as little as 2 MB of system RAM. In ODBC mode, as little as 6 MB is used.

### Simple Installation And Backup

There are no DLLs or Registry entries to deal with. Simply backup your TCCRADIUS directory and your entire installation is saved!

### Local Realms Module

TCCRADIUS can be configured to accept or reject users based on their realm.

For example:

If user jblow@tccsoftware.com logs in, and taloncc.com is not listed as a valid domain, the user is rejected.

### IP Pools Module

TCCRADIUS can be configured to assign IP addresses out of a specified pool to specific user groups.

#### Customizable ODBC For Authentication And Logging

TCCRADIUS can be customized to use any data source that can speak ODBC for both Authentication and RADIUS Accounting. This means that a company's existing database can be used with little or no changes.

#### Failsafe ACCEPT And UPDATE Modes

ACCEPT mode allows all RADIUS request packets to be accepted. UPDATE mode allows all RADIUS request packets to be accepted and a user profile is created.

#### Time Interval Control

Using the custom tccradius-time-interval attributes, an administrator can limit accounts based on times of the day. This allows an ISP to offer daytime only accounts (e.g. 8:00 am to 5:00 pm) at a discounted rate in an attempt to recoup some cost on the normally underutilized daytime hours.

#### Proxy Client-Side Response

TCCRADIUS can act as the client-side of a Proxy Server. TCCRADIUS will not yet forward packets to other Radius servers, but it will reply to other Proxy servers successfully.

Note: Access providers such as Splitrock, MegaPOP, and UUNet are known to work successfully with TCCRADIUS.

#### Caller-ID Control

Using the Calling-Station-ID [31] attribute, a user account can be restricted to a particular phone number. This option is available only where Caller-ID is supported and where attribute 31 is sent along in the REQUEST packet.

#### Centralized NAS Attributes

TCCRADIUS allows you to specify NAS specific Attributes. This allows an administrator to have small and simple user profile records.

#### NT Group Authentication

Using the Group Authentication built into the NTSAM you can specify a single group of users to have access to dial into your system. Simply create a group and add which users you wish to the group!

#### NT Dial-up Restriction

When disabling an account in the NTSAM the user is also restricted from authenticating via TCCRADIUS.

#### Multiple Login Control

Globally restrict users to one connection, and/or allow certain users dual connections.

#### Both PAP & CHAP Authentication Support

Support for the Password Authentication Protocol (PAP) and Challenge-Handshake Authentication Protocol (CHAP).

#### Extensive Logging Capabilities

TCCRADIUS provides the administrator with four (4) sets of logs.

- The Authentication log provides the administrator with real-time feedback on requests, accepts, and rejects. The Auth log can be customized to display any attribute that the administrator feels is useful in connection debugging and troubleshooting.
- The standard Accounting log provides the administrator with a detailed history of every START and STOP transaction reported by the NAS units. This data can be reported via ODBC, Text, or both Text and ODBC.
- The Summary Accounting log contains only data from Accounting STOP packets, and is used primarily for usage tracking by the TCCAdmin tool. It can also be customized for other administrative tasks.
- The Administrator Log contains a real-time record of all TCCAdmin tool transactions.

# TCCRadius Documentation

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# TCCRadius 2001

## Setup Instructions

# TCCRadius Setup Instructions

## Getting Started

1. Run the TCCRadius install package. TCCRadius2001.msi
2. Gather the following information together:
  - List of NAS Server's IP Addresses and Radius Secrets
  - Radius authentication and accounting ports (usually 1645 & 1646)
  - IP Address to be used by TCCRadius server
3. Follow instructions below for getting started in Debug mode. After successful operation in Debug mode, follow the instructions for setting up as a service.

## Setting Up TCCRadius To Run In A Console Window/Debug Mode

1. Setup an icon for the TCCRadius.exe file with the following command line:
  - C:\TCCRadius\TCCRadius.exe -debug
  - (substitute C:\TCCRadius for the complete path to TCCRadius.exe)

NOTE: If you used the setup wizard this shortcut would have been created and placed on your desktop.

2. Open the config\Clients.cfg file in notepad or your favorite raw text editor. Do Not use Microsoft Word or Wordpad. Add your NAS IP Addresses and Secrets to this file like the example below:

```
192. 168. 0. 1 mysecret  
192. 168. 0. 2 mysecret2
```

3. OPTIONAL: Specify attributes for EACH NAS box. By Default, TCCRadius 2001 will use the attributes in the DEFAULT user file, in the USERS DIRECTORY. Some System Administrator want to specify attributes per NAS box and not globally.

Open the config\NAS.cfg file in notepad or your favorite raw text editor. Configure each section with default Radius attributes for each NAS. This section allows setup for default parameters for each NAS, see example below.

Ascend Sample:

```
cl i ent=192. 168. 0. 1  
user-servi ce-type=framed-user  
framed-protocol =ppp  
framed-i p-netmask=255. 255. 255. 255  
ascend-i dl e-l i mi t=1800
```

General Sample (All other NAS Units):

```
cl i ent=192. 168. 0. 2  
user-servi ce-type=framed-user  
framed-protocol =ppp  
framed-i p-netmask=255. 255. 255. 255  
framed-i p-address=255. 255. 255. 254  
i dl e-ti meout=1800
```

4. Open the config\TCCRradius.cfg file in notepad or your favorite raw text editor. Do Not use Microsoft Word or Wordpad. Configure the TCCRradius.cfg with the appropriate IP Address and Radius Auth/Acct Ports. If you do not specify an IP Address, Auth Port, or Acct Port, TCCRradius defaults to the following:

IP Address: First available IP Address bound to the NIC  
Auth Port: 1645  
Acct Port: 1646

5. Create accounts or set TCCRradius to update mode (see the Update Mode section for more information). We recommend operating in Text mode to get started and then moving to ODBC after the server has been tested and configured to work with your NAS.
6. Launch program by double clicking icon created in Step 1. Authentication packets will be logged to the screen.

## Testing TCCRradius Using RadTest.exe

1. Add the IP Address for the test workstation to the config/Clients.cfg file and assign it a common secret.

Example:

```
192.168.0.3 mywrksecret
```

Remember, you must restart TCCRradius after adding new Clients.

2. Create an account for testing. If in TEXT MODE, create a new text file in the .users directory and name it TEST. Then, enter the following information into that file. (Make certain the file has NO extension)

```
username=test  
password=testpass
```

(TCCRradius does NOT need to be restarted after adding users,  
only configuration changes.)

3. Now, start the Radtest utility with the following command: (located in the root of the TCCRradius directory)

```
Radtest test testpass
```

4. Since this is the first time RadTest has been run, it will prompt you for information. Here is a sample with our test information inserted.

```
TCCRadTest Version 2001  
Copyright 1998-2001, Talon Computer Consulting, Inc.  
http://www.tccsoftware.com - support@tccsoftware.com
```

```
RadTest.cfg file does not exist. One must be created.
```

```
What is the fqdn or IP Address of the Radius Server?  
192.168.0.254
```

```
What is port number for the Radius Daemon? (e.g. 1645)  
1645
```

```
What is the common secret?
```

mywrksecret

RadTest sending Radius Request to server 192.168.0.254 on port 1645.  
Access Accepted.

## Setting Up TCCRADIUS To Run As A Service

(Windows NT 4.0 SP3 and greater)

Once you have tested and configured TCCRADIUS to run in Debug Mode, you can now set it to run as a service. This allows the service to be booted as soon as the server comes online.

Please test TCCRADIUS in CONSOLE MODE before running as a Service. The CONSOLE MODE gives immediate feedback for assistance in troubleshooting.

1. Install TCCRADIUS into the Services Control Panel by running the following commands in the TCCRADIUS directory:

```
tccauth.exe -install  
tccacct.exe -install  
tccadm.exe -install
```

2. Open the Control Panel and double click the Services Icon. Installation as a service loads three distinct services:

```
TCCRADIUS - Performs Authentication  
TCCRADIUS Accounting - Handles Accounting  
TCCRADIUS Administration - Interfaces with the TCCAdmin tool.
```

This gives the administrator greater flexibility in controlling TCCRADIUS by allowing him to choose which services he wishes to enable or disable.

3. If you want each service to startup automatically when the server boots, don't forget to change each service's startup type to Automatic. Highlight the service name and click the Startup button. Then change the startup type from Manual to Automatic.
4. You can now start each service and use the RadTest tool to test for functionality.
5. To remove the services, stop all services and enter the following command at the console:

```
tccauth.exe -remove  
tccacct.exe -remove  
tccadm.exe -remove
```

## Setting Up TCCRADIUS For ODBC MODE

TCCRADIUS uses ADO/ODBC, the latest Microsoft technology wrapper for OLE-DB. Therefore to use TCCRADIUS, you need to have the latest Microsoft Universal Data Access Components.

The main MDAC website is at <http://www.microsoft.com/data>

Download the Microsoft Data Access Components (MDAC) (approx. 6.5 Mb)

You must have at least MDAC Version 2.1 in order to use TCCRADIUS. NOTE: This is pre-installed on Windows 2000)

## Setting Up ODBC

1. Create a System DSN that points to the database that contains the usernames, passwords, and attributes. See the included sample database for an example of what a very simple user database would look like. (The System DSN tab can be found in the Control Panel under ODBC)
2. Modify the TCCRADIUS.cfg file and put the name of the DSN that you have created. The default is DSN = TCCRADIUS.
3. Verify that the DSNUusername and DSNPassword matches the System DSN information. If you opt to not use passwords, comment out these entries with a "pound sign" (#).
4. Verify that the Database Table information in the TCCRADIUS.cfg file matches your database. Default:

```
## ODBC/SQL Information
# All fields must be in the same table
Table = UserInfo
UsernameField = Username
PasswordField = Password
AttributesField = Attributes
```

## Default Explained

Table: This is the name of the table inside the database that contains the username, password, and attributes.

Field Names: If your field names differ from the standard Username, Password, and Attributes, you can change them here.

Example:

If your database had a table called AuthInformation and had the usernames in the User field and the Passwords in the Pass field, your entry would look like this:

```
## ODBC/SQL Information
# All fields must be in the same table
Table = AuthInformation
UsernameField = User
PasswordField = Pass
AttributesField = Attributes
```

## Attributes ODBC Field

The attributes field works exactly the same as the attributes section in Text mode (see the Text Mode section), but the attributes should be semicolon delimited.

Example ODBC User:  
Username: Tom  
Password: pi zzapi e

Attributes: framed-ip-address=192.168.0.1; tccradius-time-interval=2; tccradius-start-time1=12:00; tccradius-stop-time1=20:00; tccradius-start-time2=21:00; tccradius-stop-time2=22:00

## ODBC-CONNECTION-FAILED

Receiving this error indicates a failure to load the Microsoft ADO and connect to the ODBC server specified in the DSN.

Steps to take to correct this:

1. Upgrade to the latest Microsoft Universal Data Access Components. (<http://microsoft.com/data>)
2. Verify that you have a msado15.dll on your system, typically at this location:  
c:\program files\common files\system\ado\msado15.dll
3. Verify that the System DSN you have created matches the same information specified in the TCCRADIUS.cfg file.
4. Contact [support@tccsoftware.com](mailto:support@tccsoftware.com) if all else fails.

## Setting Up TCCRADIUS For NTSAM Mode

NOTE: TCCRADIUS supports the NTSAM in PAP only mode.

If you wish to use the NTSAM, your NAS must be set to send packets in PAP. Setting to CHAP, Both, or Either will result in rejection of the packets. Most NAS units send packets in CHAP first. CHAP requires that the user's password be stored on the local server in clear text. Since the NTSAM is very secure, the password cannot be decrypted to obtain a clear text password.

### NTSAM Modes

Remember, always start by testing your TCCRADIUS in Console/Text mode first to verify general operation. TCCRADIUS offers two modes of operation for interface to the NTSAM.

NTSAM - TCCRADIUS will check the Text files in the /Users directory for the user's attributes. The password will be decrypted from the NAS Request packet and compared to the NTSAM. If the user is not found, TCCRADIUS will look for a Text record and use it instead.

NTSAM\_ODBC - TCCRADIUS will check the ODBC\* database for any additional user's attributes. The password will be decrypted from the NAS Request packet and compared to the NTSAM. If the user is not found, TCCRADIUS will look for an ODBC record and use it instead.

\*See: Setting up TCCRADIUS For ODBC Mode

### Setting Up TCCRADIUS And The NTSAM

1. You must set a minimum password length in the NT Policies section. Open the User Manager and choose the Policies menu. Set the minimum password length to at least 3. If you allow blank passwords, the NTSAM will not work with TCCRADIUS.
2. Edit TCCRADIUS.cfg with a plain text editor and change the UserOption line.

Example:

```
UserOption = NTSAM  
-or-  
UserOption = NTSAM_ODBC
```

3. You must also specify an NTDomain if you are not authenticating off of the local NTSAM. Edit TCCRradius.cfg with a plain text editor and change the NTDomain line.

Example:

```
NTDomain = TALONCC
```

4. Use RadTest to test the operation of the NTSAM interface.

5. Contact support@tccsoftware.com with any questions.

Sample TCCRradius.cfg Files - Text Mode

[see Appendix](#)

Sample TCCRradius.cfg Files - ODBC Mode

[see Appendix](#)

Sample TCCRradius.cfg Files - NTSAM Mode

[see Appendix](#)

## Using UPDATE MODE (Default User Configuration)

What is the DEFAULT user file?

The DEFAULT user serves two functions. The primary function of the DEFAULT user is to allow the changing between modes. The DEFAULT user also serves as a default attributes list for each user. The administrator can opt to load default attributes in the DEFAULT user file rather than the NAS.cfg file.

Note: The order of precedence is as follows: First DEFAULT USER, then NAS.cfg, lastly specific USER Attributes. Nas.cfg overrides the DEFAULT USER, and Individual user overrides NAS.cfg.

Example DEFAULT User File - With Default Attributes

```
# TCCRradius 2001 Default File
# Copyright 1999-2001
# Talon Computer Consulting, Inc.
# http://www.tccsoftware.com
#
# This file is for Changing Radius modes
# And for Setting a Default Login Profile
# TCCRradius does not need to be restarted after changing modes
user-name=DEFAULT

# NORMAL MODE
password=normalmode

# ACCEPT MODE
```

```

# password = accept

# UPDATE MODE
# PAP Only, No CHAP (TEXT or ODBC)
# password = update

# ACCEPT ALL CLIENTS
# This Option Bypasses Client Checking
# password = acceptallclients

# Accept Mode And Skip Client Checking
# password = acceptcl

#####
# DEFAULT LOGIN PROFILE
#####

framed-protocol=ppp
service-type=framed-user
Framed-Ip-Address=255.255.255.254
framed-ip-netmask=255.255.255.255
idle-timeout=1800
#tccradius-concurrency = 1

```

## Sample TEXT MODE User File Explained

The default Radius information storage is a single text file with the user attributes listed and separated by a carriage return. Any attributes from the Dictionary.cfg file can be listed here.

If the user needs to change a password or has forgotten his/her password you can have Radius update the user's Radius record. Set the password field in the user's profile to read: password=update. The next time that the user logs in, his Radius password will be updated with the new password he used to Login.

The tccradius parameters below are custom only to TCCRADIUS. This user has a time restricted account with a static IP Address of 192.168.0.15.

```

### Sample user file - filename = 'tccradius'

Updated=04/17/1999 18:02:56
username=tccradius
password=thisisapassword
framed-ip-address=192.168.0.15
tccradius-time-interval s=2
tccradius-start-time1=12:00
tccradius-stop-time1=20:00
tccradius-start-time2=21:00
tccradius-stop-time2=22:00

### Sample Explained

```

tccradius-time-intervals

The number of time limited intervals if applicable

tccradius-start-time & tccradius-stop-time

Start and stop time intervals respectively. If a user does not login within these time frames, access will be denied.

## Sample ODBC MODE Database Record Explained

In our sample Access database, we have created a UserInfo table containing the following fields:

Username, Password, and Attributes

By using the same example in our TEXT MODE version, we can easily show you what the format of an ODBC record would look like.

```
### Sample user record 'tccraduser'  
Username: tccraduser  
Password: thisisapassword  
Attributes: framed-ip-address=192.168.0.1; tccradius-time-intervals=2;  
tccradius-start-time1=12:00; tccradius-stop-time1=20:00;  
tccradius-start-time2=21:00; tccradius-stop-time2=22:00;
```

See the TEXT MODE version for an explanation of the above record.

## Local Realms Support

TCCRADIUS can be configured to remove trailing domain names (realms), or to leave them intact. It can also approve or reject user's based on their realm identifier. If a realm is not in the list, they will be rejected by TCCRADIUS.

For example, if you would like to require users to use their complete e-mail address as their login, you could do this with the TCCRADIUS Realm support.

Authenticating by email address/realm is a great way to grow and expand your network.

Enabling Realm Support

1. Open TCCRADIUS.cfg in your favorite Text editor.
2. Change the following line: LocalRealmSupport = Yes
3. Open LocalRealms.cfg in your favorite text editor and add your domains.

tal oncc. com

Now users without those domains will be rejected.

```
joe.blow@tccsoftware.com will be allowed.  
joe.blow@tccsoftware.net will be rejected.
```

4. Decide if you want to authenticate the full email address or just by username. If you would like to truncate the '@tccsoftware.com' off of joe.blow@tccsoftware.com then add the following line:

```
TruncateRealms = Yes
```

## TCCRadius Pools Module

TCCRadius can be setup to assign IP Addresses to users based on their Group membership. Each group can have any standard number of IP Addresses assigned to it.

For example,

```
Group1 = 192.168.0.1,5
```

Group1 will contain 5 addresses starting with .1 and ending with .6

When all of the IPs in a group have been allocated, TCCRadius will then reject those users.

When a user logs in from the Group, TCCRadius will assign the IP and mark the IP as in use in its Pools Allocation Table (PATable) in RAM.

Enabling the Pools Module

1. Open TCCRadius.cfg in your favorite text editor.
2. Change the following line:  
    EnablePools = Yes
3. Open Pools.cfg in your favorite Text editor.
4. Define a group.  
    Group1 = 192.168.0.1,5

Save and close Pools.cfg

5. Add a user to the group.  
    Open testuser and add the following line to make him a member of Group1.  
    tccradius-group = Group1

TCCRadius will remove the IP from active use when the Accounting Stop packet for that user is retrieved.

Note: If TCCRadius is restarted, you will lose your PATable in RAM.

Keeping the Pools Current (PATable Update Option)

TCCRadius can update the PATable dynamically. Simply create a file in the TCCRadius directory called "Pools.Update.txt"

If you list every Active IP in this file, TCCRadius will clear all other IP Addresses.

Example of Pools.Update.txt

```
192.168.0.1
192.168.0.2
192.168.0.3
192.168.0.5
```

In our example group above, 192.168.0.4 and .6 would be cleared. The others would remain active.

See our Web site for a script that can convert MaxStat logs (<http://www.maxstat.com>) to TCCRadius "Pools.Update.txt" files to keep your pools updated automatically.

## ODBC Accounting Configuration

TCCRadius can be configured to log directly to any ODBC datasource. Keep in mind that this is a very CPU intensive process. If you are going to be doing large amounts of logging, plan on using a high-end database on the back end. For example: MySQL or Microsoft SQL server.

TCCRadius can also be configured to log to both ODBC and Text. In this case, ODBC is the primary logging method. This essentially means that TCCRadius will not send an acknowledgement to the NAS that an Accounting packet has been received until the packet is logged successfully to the ODBC datasource. The data will be logged to Text anyway.

An example is also provided for reference in the Appendix.

Enabling ODBC Accounting

1. Open TCCRadius.cfg in your favorite text editor.
2. Change the following line:

```
AcctLogging = ODBC
```

There are three options available in the "AcctLogging" Option

The "Text" option Logs only to log files

The "ODBC" option Logs only to the ODBC Datasource

The "Both" option Logs to both ODBC and Text

3. Next, you need to tell TCCRadius the name of the Datasource.

Also, if you have a password protected datasource, you can specify that information here as well.

```
AcctDSN = TCCRadius
AcctDSNUser = testuser
AcctDSNPass = testpass
```

If you are using a SQL server which has multiple Databases inside one large database, you can specify that database with this line:

```
AcctDSNDBase = MyAccountingDatabase
```

4. Now, TCCRradius needs to know the name of the Table in the database where the accounting information will be stored.

```
AcctODBCTable = Accounting
```

5. TCCRradius must be told which attributes to log (see the Accounting Appendix for a list)

```
AcctODBCAttributes = TS, 4, 1, 40, 8
```

Note: This sample is very simplified for explanation

This tells TCCRradius to log the TimeStamp (TS), the NAS IP Address (4), the username (1), the Acct-Status-Type [Start/Stop] (40), and the User's IP Address (8)

NOTE: The TS is a special attribute for TCCRradius which indicates to log the Time/Date.

6. Now that TCCRradius knows which Accounting data to log, we must tell it where to store each piece of data.

```
AFN-4 = NASID  
AFN-1 = Username  
AFN-8 = FramedIPAddress  
AFN-40 = AcctStatusType  
AFN-TS = TS
```

"AFN" stands for Attribute Field Name followed by the attribute number.  
The AFN Map tells TCCRradius which attribute numbers belong with each fieldnames in the database.

For example: AFN-4 = NASID

This tells TCCRradius that attribute 4 (NAS IP Address) should be logged to the Field named NASID inside the Database.

7. Start TCCRradius in Console mode for detailed SQL statements and Debug information.  
You can tell TCCRradius to show you only Accounting data by launching it with the -xacct switch like this:

```
TCCRradius -xacct
```

# Concurrency Control

## Overview:

Concurrency Control is designed to restrict users to 1 login globally or individually, and/or allowing certain groups/users dual logins.

## How it works:

Each time a user requests authentication the Concurrency Control database is checked via an accounting packet and TCCRADIUS decides to either add or reject the user. When a user logs off, they are removed from the database via the accounting packet.

## Configuration:

Sample tccradius.cfg entry:

```
ConcurrencyControl = Enable (Enable or Disable Concurrency Control)
CCDSN = CControl (Database DSN Name)
#CCDSNUser = CCUser (DSN Username)
#CCDSNPass = CCPass (DSN Password)
#CCDSNDBase = CCDBase (DSN Database)

CCTableName = UserTrack (Database Table Name)
CCUsernameField = Username (Database Username Field)
CCDateField = DateStamp (Database DateStamp Field -From Accounting Packet)
CCIPField = IPAddress (Database IPAddress Field)
CCNASIPField = NASIPAddress (Database NASIPAddress Field)
CCLoginField = Logins (Database Logins Field -Keeps track of current connections)
```

An Access database is in the CONCURRENCY directory under TCCRADIUS. You are free to use your own database if you wish, SQL is recommended. When using SQL please note CCLOGINFIELD must be an INTEGER field.

## Usage:

To restrict a particular user to 1 connection add the following attribute to their attribute field in their profile:

```
tccradius-concurrency=1
```

To restrict all users to one login add the above attribute into the DEFAULT user file (TCCRADIUS\USERS).

You can exempt certain users by allowing them to multiple connections by giving them "tccradius-concurrency=2" in their individual attribute field in their profile. =2 indicates (2) login's.

## Locked Connections:

In the event TCCRADIUS does not receive a logoff accounting packet the user will not get cleared from the database. You will have to manually open the database and remove the line for that user.

In the event your NAS unit reboots you will have to clear your database. You may simply clear all the fields and TCCRADIUS will rebuild the connections as they log in again.

# TCCRadius 2001

## Operation

## Using NORMAL MODE (Standard Operating Mode)

What is NORMAL mode?

Normal mode is the standard operating mode of TCCRADIUS. While in Normal mode, TCCRADIUS will authenticate off of the specified Authentication database type. With a completed and operational user database, Normal mode is the recommended mode of operation. Normal mode can also update a user's password in Text/ODBC mode when the password in the user's profile is set to:

```
password=update
```

## Using UPDATE MODE (Database Building Option)

What is UPDATE mode?

UPDATE mode gives a large amount of flexibility to the administrator when the unthinkable happens. Suppose the entire RADIUS database is lost or corrupted. TCCRADIUS can be set to LEARN the usernames and passwords of users as they log into the system dramatically decreasing downtime as the user database is rebuilt.

To enable UPDATE mode, simply modify the default user file and change the password of the default user to update.

While in UPDATE mode, TCCRADIUS will create new accounts containing only the usernames and passwords of users as they are authenticated. The only disadvantage to using this mode is that ANYONE will be able to login while in UPDATE mode.

Keep this in mind. Then, after the majority of your accounts have been created, remember to go back and filter out invalid accounts by username and change TCCRADIUS back to NORMAL mode.

TCCRADIUS is in NORMAL mode when the default file contains:

```
password=normal mode
```

### Enable UPDATE Mode

Simply modify the DEFAULT USER file in the USERS subdirectory in the TCCRADIUS directory. The file should look like:

```
username = default  
password = update
```

Now, if TCCRADIUS is running, you have just switched to UPDATE mode. There is no need to restart. Changing modes happens immediately since the default user is checked each time that a user is authenticated.

## Using ACCEPT MODE (Emergency Failsafe Option)

What is ACCEPT mode?

ACCEPT mode provides a great failsafe option for extreme emergencies or network testing. While in ACCEPT mode, TCCRADIUS will simply let all users into the system. TCCRADIUS will generate an Access-Accept packet for each user. Remember to switch back to NORMAL mode when finished.

To enable ACCEPT mode, simply modify the default user and change the password of the default user to 'accept.'

### Enable ACCEPT Mode

Simply modify the DEFAULT USER file in the USERS subdirectory in the TCCRADIUS directory. The file should look like:

```
username=default  
password=accept
```

Now, if TCCRADIUS is running, you have just switched to ACCEPT mode. There is no need to restart. Changing modes happens immediately.

## Custom TCCRADIUS Attributes

TCCRADIUS provides a handful of custom attributes to make TCCRADIUS more flexible. With TCCRADIUS, any RADIUS attribute for any NAS unit can be used as long as that Attribute is present in the Dictionary.cfg file. TCCRADIUS custom attributes do not have to be listed in the Dictionary.cfg.

### Custom Attributes

#### tccradius-active

Indicates whether an account is active or inactive.

Note: If this Attribute is not present, the account is active.

0 = User Inactive

1 = User Active

Usage:

```
tccradius-active=0
```

#### tccradius-restrict-nas

Restrict users by a particular Nas IP Address.

Usage:

```
tccradius-restrict-nas=192.168.0.1 (Restrict to one (1) NAS unit)
```

```
tccradius-restrict-nas=192.168.0.1;tccradius-restrict-nas=192.168.0.2 (Restrict to multiple NAS units)
```

#### tccradius-ntgroup

Restrict users to a particular NT Group.

Usage:

```
tccradius-ntgroup=tccsoftware
```

tccradius-time-intervals  
The number of time limited intervals if applicable

tccradius-start-time & tccradius-stop-time  
Start and stop time intervals respectively. If a user does not login within these time frames, access will be denied.

Usage:

```
tccradius-time-intervals=2  
tccradius-start-time1=12:00  
tccradius-stop-time1=20:00  
tccradius-start-time2=21:00  
tccradius-stop-time2=22:00
```

## Authentication Log Files

The TCCRADIUS Authentication Log File is the key to user and configuration troubleshooting of the TCCRADIUS Authentication Service. Each file contains Authentication decisions, information, and errors regarding the Authentication server.

The TCCRADIUS Authentication service creates a new logfile every day in the format of:

```
Auth.MM.DD.YYYY.log.  
MM = Current Month (01-12)  
DD = Current Day (01-31)  
YYYY = Four Digit Year (1999, 2000, 2001, etc.)
```

Here is an example section of an Auth Log file.

```
05/06/1999 18:13:36 -0- -0- TCCRADIUS INIT  
05/06/1999 18:14:56 208.134.145.206 20121 USER-NOT-FOUND test  
05/06/1999 18:15:56 AUTH_SHUTDOWN  
05/06/1999 18:15:56 -0- -0- TCCRADIUS INIT  
05/06/1999 18:16:04 208.134.145.206 20121 ACCESS-ACCEPT test  
05/06/1999 18:16:13 208.134.145.206 20121 UPDATEkwillis password=test
```

The layout of the file is as follows below:

Date	Time	NAS IP Address	NAS Port	TCCRADIUS Message	Username	Password & Attributes
------	------	-------------------	----------	----------------------	----------	--------------------------

### Working With The Log File

While TCCRADIUS is in Debug Mode (see Command Line Switches), all of the debug information that is written to the Auth Log is displayed on the screen.

Once TCCRADIUS is running as a service, the information is only logged to the file. Often an administrator needs easy access to this data in real time. One easy way to see this information is to use the UNIX tail command (See our FREE DOWNLOADS page for a freeware version for DOS).

By using the '-f' parameter on any file, TAIL can display new entries to the file as they are written out.

Example Command Line Usage: tail.exe -f Auth.05.24.1999.log

## Customizing The Auth Log Attributes Display

In addition to displaying the username in the Auth Log, TCCRADIUS can be configured to display any additional attributes by specifying the attribute number in the TCCRADIUS.cfg file. Simply enter the comma delimited Attribute numbers in the LogAttributes field.

For example:

```
LogAttributes = 8, 244
```

This logs Attribute 8 and 244 to the Auth Log file when they apply.

Here are their entries from the Dictionary.cfg file:

```
ATTRIBUTE Framed-IP-Address 8 integer
ATTRIBUTE Ascend-Idle-Limit 244 integer
** Static IPs and Idle Timeout value for Ascend users
```

Authentication Parameters - See APPENDIX for details

## Accounting Log Files

### Accounting Files

The TCCRADIUS Accounting Log File provides complete Radius Accounting Records. Each file contains Accounting Start And Stop Packets. One for the beginning and one for the end of each Radius server transaction.

The TCCRADIUS Accounting service creates a new logfile every month in the format of:

```
Acct.MM.YYYY.log.
MM = Current Month (01-12)
YYYY = Four Digit Year (1999, 2000, 2001, etc.)
```

These files can get very large, therefore, a new one is created every month. This also allows for the ability to compile a total usage pattern monthly for any user.

### Accounting Summary Files

Often, the Accounting Log files become too large to efficiently gather simple user statistics information. Often, Administrators simply want to know how much time a user has spent online along with how much data they have transferred.

Why sift through all of the START records and STOP records to gather that information when the STOP packet contains all of the needed information by definition?

Enter the Accounting Summary Logfile. This file is a custom Radius Attributes file that contains only the specified summary information from STOP packets. This allows for easy parsing and configuration. This file can be configured to contain as little or as much Accounting STOP information as desired.

The default parameter is as follows:

```
LogSummaryAttributes = 44, 46, 47, 48
```

This is the minimum amount of attributes required to work with the TCCAdministrator tool.

The TCCRADIUS Accounting service creates a new Accounting Summary logfile every month in the format of AcctSum.MM.YYYY.log.

MM = Current Month (01-12)  
YYYY = Four Digit Year (1999, 2000, 2001, etc.)

Accounting Summary Attributes From RFC 2139 - See APPENDIX for details

## Administrator Log Files

The TCCRADIUS Administration Log File keeps track of the transactions made by the TCCAdministrator tool.

The TCCRADIUS Administration service creates a new logfile every month in the format of Admin.MM.YYYY.log.

MM = Current Month (01-12)  
YYYY = Four Digit Year (1999, 2000, 2001, etc.)

Here is an example section of an Admin Log file.

```
[05/06/1999 21: 14: 26] TCCRADI US STOP_ADMI N
[05/06/1999 21: 14: 30] TCCRADI US START_ADMI N
[05/06/1999 21: 14: 32] 200. 200. 200. 201 Configurati on Requested
[05/06/1999 21: 14: 34] 200. 200. 200. 201 Configurati on Requested
[05/06/1999 21: 14: 34] 200. 200. 200. 201 CLI ENTS File Requested
[05/06/1999 21: 15: 01] 200. 200. 200. 201 TCCRADI US_SHUTDOWN
[05/06/1999 21: 15: 01] 200. 200. 200. 201 SHUTDOWN_ADMI N
[05/06/1999 21: 15: 01] TCCRADI US STOP_ADMI N
[05/06/1999 21: 15: 08] TCCRADI US START_ADMI N
[05/06/1999 21: 15: 19] 200. 200. 200. 201 Configurati on Requested
[05/06/1999 21: 15: 33] 200. 200. 200. 201 USER_SUMMARY Requested
[05/06/1999 21: 15: 33] 200. 200. 200. 201 SEND USER_SUMMARY: test; May; 1999
```

The layout of the file is as follows below:

Date/Time	Client IP Address	Administration Message
-----------	-------------------	------------------------

Administration Parameters - See APPENDIX for details

TCCRadius 2001

Web Administrator

# Web Administrator Tool

## Overview:

The TCC Web Admin is a web based PERL/CGI system that allows you to administer your users and tccradius config files. Add/Modify Users, change passwords, attributes, and much much more!

## Installation:

Included in some TCCRadius installs, there is a "WebAdmin" directory with the necessary files. Supplied is a readme.txt file with detailed instructions on setting up the TCC Web Admin with your IIS Web Server in either TEXT or ODBC Mode.

If you do not have a WebAdmin directory you can download the Web Administrator from <http://www.tccsoftware.com> and choose FREE DOWNLOADS from the left menu bar.

# TCCRadius 2001

## Appendix

# Accounting Summary Attributes From RFC 2139

See RFC 2139 for more detailed information

Attribute #	Name	Description
40	Acct-Status-Type	This indicates whether the packet is a START or STOP packet.
41	Acct-Delay-Time	This attribute indicates the length of time (seconds) that the NAS client has been trying to send this packet to the TCCRadius Accounting Server.
42	Acct-Input-Octets	This attribute indicates how many octets have been received from the port over the course of the session.
43	Acct-Output-Octets	This attribute indicates how many octets have been sent to the port over the course of the session.
44	Acct-Session-Id	Unique accounting ID for matching START and STOP records.
45	Acct-Authentic	Indicates how the user was Authenticated (1 = RADIUS)
46	Acct-Session-Time	Indicates total number of seconds that a user's session was in service.
47	Acct-Input-Packets	This attribute indicates how many packets have been received from the port over the course of the session.
48	Acct-Output-Packets	This attribute indicates how many packets have been sent to the port over the course of the session.
49	Acct-Terminate-Cause	Indicates how the Session was terminated. (see RFC for details)
50	Acct-Multi-Session-Id	Unique accounting ID for matching up MPP sessions.
51	Acct-Link-Count	Gives the count of links given for an MPP session at the time the accounting record is created.

## Administration Parameters Explained

START\_ADMIN

Administration Server started

STOP\_ADMIN

Administration Server Shutdown

SHUTDOWN\_ADMIN

Shutdown Initiated from Client

Configuration Requested

TCCAdmin Tool requested TCCRadius.cfg information

TCCRadius Configuration Modified

Changes made to the TCCRadius.cfg file were saved

USER\_SUMMARY Requested

Accounting Summary for a user was requested

SEND USER\_SUMMARY: username;month;year

User Summary transmitted for the username, month, and year listed

CLIENTS File Requested  
TCCAdmin Tool requested Clients.cfg information

ADD\_USER: username  
New user was added or the information for this user was updated

EDIT\_USER: username  
User information for specified user was requested and sent

REMOVE\_USER: username  
User record was deleted

AUTH\_STOP OR AUTH\_RESTART  
Authentication Daemon stop or restart was requested

ACCT\_STOP OR ACCT\_RESTART  
Accounting Daemon stop or restart was requested

BIND\_ERROR  
Unable to bind to port specified in the TCCRradius.cfg  
Example: AdminPort=7000

## Available Command Line Options

Example:

```
C:\TCCRradius>tccradius -help
```

-help, -?: Show help screen

Service Options:

-install: Install as a service on Windows NT

-remove: Removes service on Windows NT

-register: Registers TCCRradius

Format: tccradius -register XXXX-XXXXX-XXXX-XXXXX

Console Options:

-debug: Shows both Accounting and Authentication packets in the console window

-xauth: Shows only Authentication packet information in the console window

-xacct: Shows only Accounting packet information in the console window

## Authentication Parameters Explained

### ACCESS-ACCEPT

Access has been granted to this user

### AUTH\_SHUTDOWN

Authentication Server Shutdown

### BAD-CHAP-PASSWORD

Invalid Chat Packet Format

### BAD-PASSWORD

Password is incorrect

### CONCURRENCY\_CONTROL\_LOCK

Concurrency Violation. (Check Database for user)

### CONCURRENCY\_DBASE\_ERROR

Check DSN connection to database.

### INVALID-CLIENT

Packet received, but client is not listed in clients.cfg

### NAS\_RESTRICTION\_ENFORCED

User restricted to specific NAS by the "tccradius-restrict-nas" attribute.

### NO-PASSWORD

Password not contained in packet sent from NAS

### NO-REQUEST

Packet sent to Authentication Server was not a RADIUS Access Request packet

### NO-USERNAME

Username not contained in packet sent from NAS

### ODBC-CONNECTION-FAILED

Connection to the specified DSN could not be established for ODBC Authentication.

### REALM\_NOT\_FOUND

Specific Realm not found in localrealms.cfg

### TCCRadius INIT

Authentication Server started

### TIME-VIOLATION

User tried to login outside of time restrictions placed upon him/her by the tccradius-time-intervals attributes

### UPDATE

Invoked password update response, user file will now be updated with new users password.

### UPDATE-DBASE-ERROR

There was an error connecting to the specified database while updating the specified user's information.

#### UPDATE-ERROR

An error occurred while attempting to update the ODBC record.

#### USER-DBASE-ERROR

There was an error connecting to the specified database while retrieving specified user's information.

#### USER-INACTIVE

User account is disabled by the 'tccradius-active=0' parameter

#### USER-NOT-FOUND

User did not have a radius database entry

## Sample Config Files

### Sample Clients.cfg File

```
# Configuration Information For TCCRadius
# Copyright 1999-2001, Talon Computer Consulting, Inc.
#
# All Lines with a "#" are ignored.
#
# List Clients' IP Addresses And Shared Secret Keys Below
# IPs and Secrets must be separated by tabs or spaces
#
# Example:
# 192.168.0.1    uniquekey
# 192.168.0.23  anotherkey
# global globaluniquekey
```

### Sample Local Realms cfg File

```
# Configuration Information For TCCRadius
# Copyright 1999-2001, Talon Computer Consulting, Inc.
#
# All Lines with a "#" are ignored.
#
# This defines the local realms.
# To Enable This Module, Add
# LocalRealmSupport = Yes
# to the TCCRadius.cfg file
#
# To truncate the realm off of the username, Add
# TruncateRealm = Yes
# to the TCCRadius.cfg file
# This will cause TCCRadius to lookup user test when test@test.com
# is passed from the NAS.
#
# List local realms to be accepted below.
#
```

```
# Example of valid entries:
# tccsoftware.com
# taloncc.com
# maxstat.com
```

## Sample NAS cfg File

```
# Configuration Information For TCCRadius
# Copyright 1998-2001, Talon Computer Consulting, Inc.
#
# All Lines with a "#" are ignored.
#
# All Attributes below will be passed to the specified
# NAS IP with each user unless overridden in the user's
# profile.
#
# List Clients' Specific Attributes Below
# Examples Below. Copy and paste each as need for each NAS unit.

#You may either specify attributes in this file or by placing them in
#the DEFAULT user. (Setup by default) Remove any instances of "#" if using this file.

# BASE GENERAL CONFIG
# Works with Cisco, Lucent Portmaster, IPAD, Versanet, and more
# Idle Timeout set to 30 Mins
#client=192.168.0.1
#user-service-type=framed-user
#framed-protocol=ppp
#framed-ip-netmask=255.255.255.255
#idle-timeout=1800

# BASE Lucent/Ascend Max Config
# Idle Timeout set to 30 Mins
#client=192.168.0.1
#user-service-type=framed-user
#framed-protocol=ppp
#framed-ip-netmask=255.255.255.255
#ascend-idle-limit=1800
```

## Sample NTSam - ODBC cfg File

```
#####
## Authentication Section

# Configuration Options
# Available Options: Text, ODBC, NTSAM, NTSAM_ODBC
UserOption = NTSAM_ODBC

# User File Information For Text Mode
# Location of User Account Files
```

```

UserPath = .\users

# ODBC User File Information
# System DSN Information For ODBC

DSN = TCCRradius
DSNUser = user
DSNPass = pass
DSNDBase = TCCRradius

# ODBC/SQL Information Authentication Information
# All fields must be in the same table

Table = UserInfo
UsernameField = Username
PasswordField = Password
AttributesField = Attributes

#NTDomain = NT
#NTServerName = NT

NTGroupAuthentication = Disable
NTUserStats = No

UsernameCase = Disable
PasswordCase = Enable
UserAllUpper = Disable

#####
Sample NTSam - TEXT cfg File
#####
## Authentication Section

# Configuration Options
# Available Options: Text, ODBC, NTSAM, NTSAM_ODBC
UserOption = NTSAM

# User File Information For Text Mode
# Location of User Account Files
UserPath = .\users

# ODBC User File Information
# System DSN Information For ODBC

DSN = TCCRradius
#DSNUser = user
#DSNPass = pass
#DSNDBase = TCCRradius

# ODBC/SQL Information Authentication Information
# All fields must be in the same table

Table = UserInfo
UsernameField = Username
PasswordField = Password

```

```

AttributesField = Attributes

#NTDomain = NT
#NTServerName = NT

NTGroupAuthentication = Disable
NTUserStats = No

UsernameCase = Disable
PasswordCase = Enable
UserAllUpper = Disable

#####
Sample ODBC cfg File
#####

#####
## Authentication Section

# Configuration Options
# Available Options: Text, ODBC, NTSAM, NTSAM_ODBC
UserOption = ODBC

# User File Information For Text Mode
# Location of User Account Files
UserPath = .\users

# ODBC User File Information
# System DSN Information For ODBC

DSN = TCCRradius
#DSNUser = user
#DSNPass = pass
#DSNDBase = TCCRradius

# ODBC/SQL Information Authentication Information
# All fields must be in the same table

Table = UserInfo
UsernameField = Username
PasswordField = Password
AttributesField = Attributes

#NTDomain = NT
#NTServerName = NT

NTGroupAuthentication = Disable
NTUserStats = No

UsernameCase = Disable
PasswordCase = Enable
UserAllUpper = Disable

#####
Sample ODBC Accounting cgf File

```

```

#####
## ODBC Accounting Setup Information

## Can be Text, ODBC, or Both
AcctLogging = ODBC
AcctODBCTable = Accounting
AcctDSN = ACCT
AcctDSNUser = testuser
AcctDSNPass = testpass

## Attributes to Log and Field Names
## 1 = Username
## 4 = NAS IP Address
## 5 = NAS Port Number
## 8 = Framed IP Address (User)
## 31 = Calling-Station-ID
## 40 = Acct-Status-Type (START,STOP)
## 41 = Acct-Delay-Time
## 42 = Acct-Input-Octets
## 43 = Acct-Output-Octets
## 44 = Acct-Session-ID
## 45 = Acct-Authentic
## 46 = Acct-Session-Time
## 47 = Acct-Input-Packets
## 48 = Acct-Output-Packets
## 49 = Acct-Terminate-Cause
## 50 = Acct-Multi-Session-ID
## 51 = Acct-Link-Count
## TS = TimeStamp (Date/Time)

AcctODBCAttributes = TS,4,5,1,8,44,46,47,48,40,41,42,43,45,49,50,51,31

AFN-4 = NASIPAddress
AFN-5 = NASPortNumber
AFN-1 = Username
AFN-8 = FramedIPAddress
AFN-31 = CallingStationID
AFN-40 = AcctStatusType
AFN-41 = AcctDelayTime
AFN-42 = AcctInputOctets
AFN-43 = AcctOutputOctets
AFN-44 = AcctSessionID
AFN-45 = AcctAuthentic
AFN-46 = AcctSessionTime
AFN-47 = AcctInputPackets
AFN-48 = AcctOutputPackets
AFN-49 = AcctTerminateCause
AFN-50 = AcctMultiSessionId
AFN-51 = AcctLinkCount
AFN-TS = MyTime

#####

```

Sample TEXT cfg File

```
#####  
## Authentication Section  
  
# Configuration Options  
# Available Options: Text, ODBC, NTSAM, NTSAM_ODBC  
UserOption = Text  
  
# User File Information For Text Mode  
# Location of User Account Files  
UserPath = .\users  
  
# ODBC User File Information  
# System DSN Information For ODBC  
  
DSN = TCCRradius  
#DSNUser = user  
#DSNPass = pass  
#DSNDBase = TCCRradius  
  
# ODBC/SQL Information Authentication Information  
# All fields must be in the same table  
  
Table = UserInfo  
UsernameField = Username  
PasswordField = Password  
AttributesField = Attributes  
  
#NTDomain = NT  
#NTServerName = NT  
  
NTGroupAuthentication = Disable  
NTUserStats = No  
  
UsernameCase = Disable  
PasswordCase = Enable  
UserAllUpper = Disable  
  
#####
```

# Advanced Features

## ODBC Trimming:

This feature trims padded password fields. In some database you specify the length of the password field, ie.30, but if the user's password is only 5 characters long, there will be 25 spaces at the end. Fox Pro users especially should turn this feature on.

```
EXCERPT FROM TCCRADIUS.CFG
ODBC_TRIMMING= Disable
```

To toggle the default, simply replace the word `Disable` with `Enable`

## Case Sensitivity:

You can toggle case sensitivity on Username's, Passwords, and All CAPS.

```
EXCERPT FROM TCCRADIUS.CFG
UsernameCase = Disable
PasswordCase = Enable
UserAllUpper = Disable
```

To toggle the settings, replace the word `Disable` with `Enable` or vice versa.

## Logging Options:

The below logging options can come in very handy during troubleshooting.

```
EXCERPT FROM TCCRADIUS.CFG
```

```
AuthLogging = Enable (Logs Authentication requests and errors)
AuthDebug = Disable (Logs detailed Authentication messages ie. Packet Structure)
AcctDebug = Disable (Extensive Accounting Logs. Grows VERY quickly)
LogFilePath = .log (Tells TCCRADIUS where to place the log files)
LogExtension = .log (Tells TCCRADIUS what extension to place on the log files)
UsernameOption = Enable (Sends the username back to the NAS unit during authentication)
```

# TCCRadius Support

## Resources

TCCRadius Online Documentation at: <http://www.tccsoftware.com/support.asp>

Latest Microsoft Data Components (ADO) at: <http://www.microsoft.com/data/>

## Pre-Sales Support

Pre-Sales Support for TCCRadius is free. Feel free to contact us with any questions about the capabilities of any of our products.

## TCCRadius Support Options

TCCRadius is supported through e-mail, voice, and this section of the web site:

<http://www.tccsoftware.com/support.asp>

\*\*Be sure to check our Knowledge Base articles. There is a database full of Q's & A's with ranges from basic to advanced articles.

TCCRadius includes FREE LIFETIME E-mail support.

Voice support is available from 9:00 am to 6:00 pm. Don't hesitate to contact us, our experienced technicians are here to help you.

See the Online Ordering section of our web site at <http://www.tccsoftware.com> for more information on special support options. Please feel free to contact us at [support@tccsoftware.com](mailto:support@tccsoftware.com) with any questions.

## Beta Program

The TCCRadius beta program is open to any TCCRadius customer. Visit the support section of <http://www.tccsoftware.com> for information on how you can subscribe to our BETA program.

Our BETA members are given access to the latest developmental versions of our software. We ask that you please NOT run BETA software in a production environment. We cannot guarantee the stability of BETA software.

## FREE DOWNLOADS

This section is dedicated to tools designed to enhance using TCCRadius. Some tools are custom written by us, other tools are submitted by customers using TCCRadius. Most of the tools in this section are FREE. New tools will be posted on our web site at:

<http://www.tccsoftware.com>

Feel free to send us any of your scripts or tools used in your deployment of TCCRadius. Send tools to [support@tccsoftware.com](mailto:support@tccsoftware.com) with a little description of what the tool does. Please send examples of using the tool if you have one.

## HOW TO CONTACT US

### SUPPORT DEPARTMENT

The Support Department can answer installation, setup and pre-sales technical questions about your software.

E-mail support is available with responses often available even after hours at:

[support@tccsoftware.com](mailto:support@tccsoftware.com)

Voice support is available from 9:00 AM to 6:00 PM, CST US, weekdays. If you reach our office after hours, or are routed to our voice mail, please leave a message. We will return your call as rapidly as possible.

903-534-9911

### SALES DEPARTMENT

The Sales Department can handle product orders, billing questions, licensing issues and non-technical questions.

877-629-7828 (toll-free in U.S.)

You may also reach the Sales Department via E-mail at:

[sales@tccsoftware.com](mailto:sales@tccsoftware.com)

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