PC and UNIX SAS® Reunited

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ABSTRACT

Have you ever wondered how you can use the best of PC and UNIX SAS together and make a perfect world (well, almost perfect)? SAS/CONNECT® allows you to use the Enhanced Editor and submit the code on UNIX. You can submit one DATA step or PROC at a time, view the log in the Log window as well as create data sets in the Work directory. It is a one-time setup, and you do not have to compromise the PC Enhanced Editor ever. This paper will provide you with step-by-step instructions on how you can connect and automate the PC-to-UNIX connection by using SAS. You will never have to leave the Enhanced Editor again.

REQUIREMENTS

1. PC and UNIX SAS/CONNECT® License.

2. **PuTTY** (or any other SSH client). http://www.putty.org/

3. **tcpunix.scr**: This program comes with SAS software and can be found in C:\Program Files\SAS\SAS 9.1\connect\saslink folder.

4. **connect_script.sas:** Copy the following code into SAS editor. Replace *unixservername* in the code to the name of the UNIX server and save the code as c:\connect_script.sas:

```
/*  Signon UNIX   */
%let server=localhost 4444;
options remote=server;
filename rlink ' C:\Program Files\SAS\SAS 9.1\connect\saslink\tcpunix.scr';
signon;

/*  Make UNIX work, sasuser and sashelp folders available on PC SAS    */
libname unx slibref=work    server=server;/*unix work library available on pc */
libname unu slibref=sasuser server=server;/*unix sasuser library available on pc */
libname unh slibref=sashelp server=server;/*unix sashelp library available on pc*/
```

Now we have the programs needed to set up the SAS Connect. Let's set up the Windows and UNIX to communicate with each other.

SETUP

UNIX:

Create an alias in your aliases file on UNIX. Aliases are usually found in .cshrc system file. Contact your IT department if you don't know where an alias can be created.

> *alias sp4141 '/opt/local/sas/913/utilities/bin/sastcpd -service 4141 -inheritance -shell'*
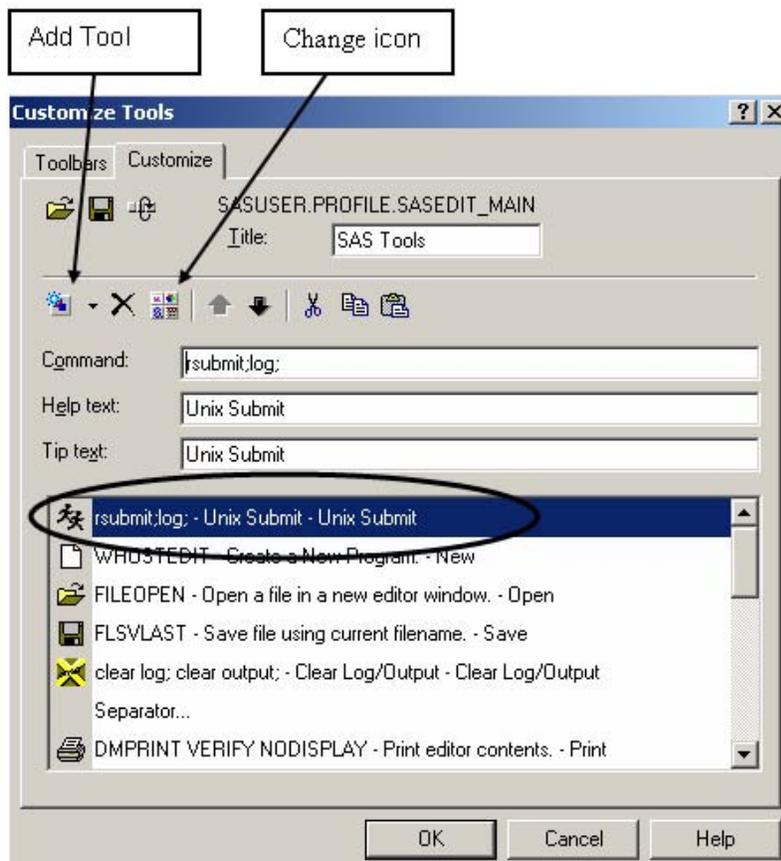
(**NOTE**: If you can't find or access alias file, you can just skip the step of creating an alias.)

Create a link to sas_en on UNIX home directory. Execute the following command on UNIX to create link:

> *ln –s /opt/local/sas/913/bin/sas_en sas*

WINDOWS:

1. **Create an icon to run the code on UNIX (just like Windows has running man)**

- Close all opened SAS systems and open a new session.

- Make sure Enhanced Editor is open and selected.

- Click on Tools Menu.

- Select Customize.

- Click on Customize tab.

- Click on Add Tool icon.

- Click on Change icon and select any icon you like (or two running man icon).

- Type rsubmit; in Command textbox. (adding log; in textbox will show log window after rsubmit)

- Type UNIX Submit in Help text and Tip text.

- Click OK.

Figure 1. Add new icon for rsubmit

After clicking OK you will see the new icon in the Enhanced editor toolbar.

2.   **Create a SAS shortcut on your desktop.**

- Right click on Desktop.

- Go to New and select shortcut.

- Click on Browse.

- Select C:\ -> Program Files -> SAS -> SAS 9.1 -> sas.exe

- Click *Next.*

- Change the Name of the shortcut to sas_connect.

- Click *Finish.*

- Go to Desktop and right click on sas_connect and select Properties.

- Click Shortcut tab and replace the Target textbox with following string:

    "C:\Program Files\SAS\SAS 9.1\sas.exe" -autoexec C:\connect_script.sas
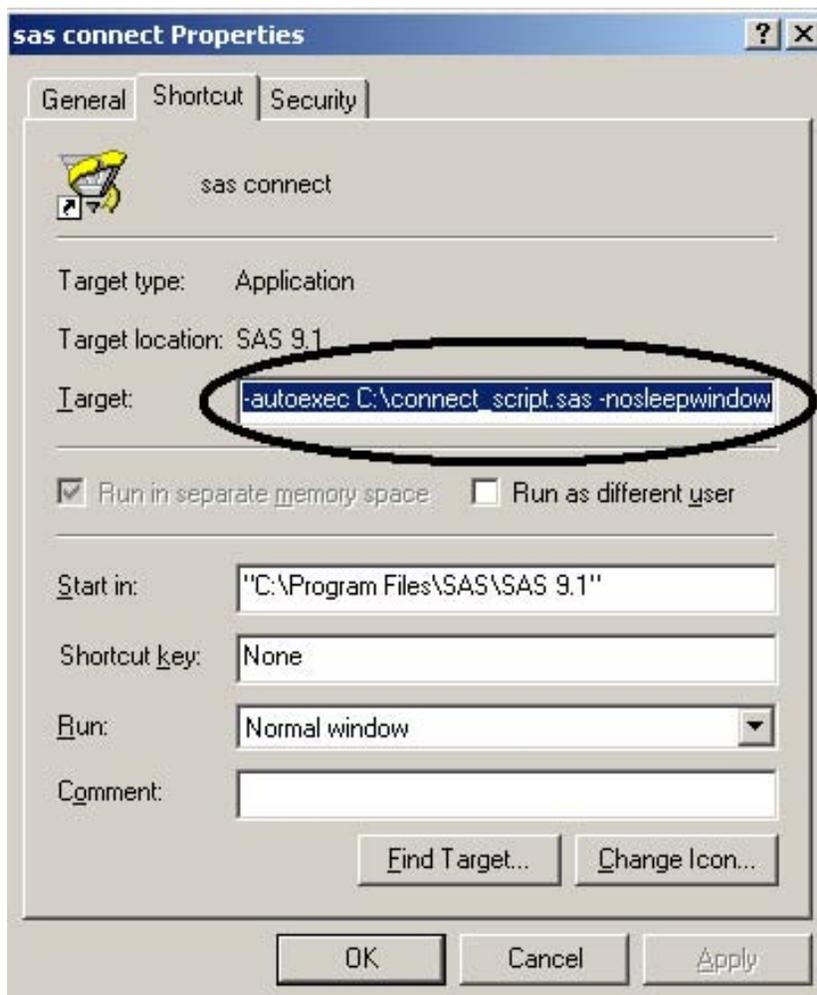
- Click OK

Figure 2. Add new SAS shortcut

PUTTY:

- Open PuTTY and go to Tunnels on the left column penal.

- Enter 4444 in the Source port and localhost:4141 in Destination. Click Add.

- Go to Sessions on the top left side of the panel.

- Enter UNIX server name in Host Name filed, and **sas01** in Saved Sessions textbox. Click on SSH radiobutton, 22 will pop in Port box.
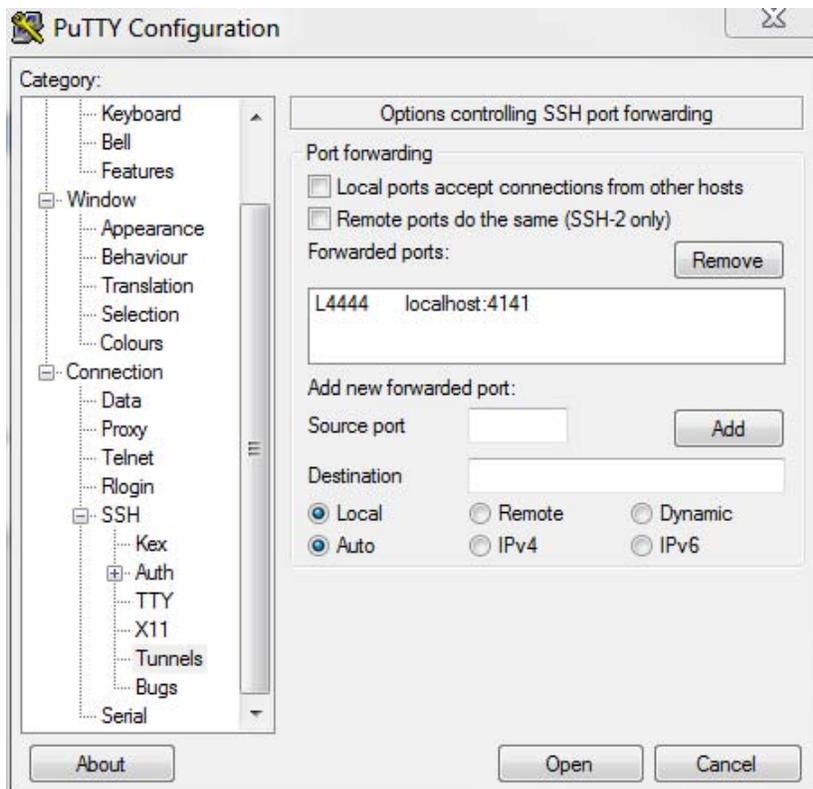
- Click Save to save settings.

Figure 3. PuTTY SSH port forwarding

LOGIN

Once UNIX, Window and PuTTY are setup then we need to login to each system in chorological order. First make sure UNIX SAS is listening on the port, then logon to PuTTY using sas01 profile which will make the secure connection to SAS port on UNIX. Once PuTTy is connected to UNIX then we can connect PC SAS and UNIX using SAS shortcut (sas_connect).

UNIX:

Type the following command and hit enter twice:

> *sp4141 &*

NOTE: If you were unable to find or access the .cshrc file, you can just run the following command:

> */opt/local/sas/913/utilities/bin/sastcpd -service 4141 -inheritance –shell &*

WINDOWS:

Double-click on desktop shortcut sas_connect. You will see two DOS windows open up along with SAS system.

- First login to PuTTY using the sas01 profile. (Note: Don't close this window)

- Double-click on desktop shortcut sas_connect

- You will see a window on SAS system which will prompt you for a UserID.

    Type in your UNIX userid and click OK

    Type in your UNIX password and click OK

The following message should appear in the SAS log window: NOTE: Remote signon to SERVER complete.

Now you are ready to use the SAS connect. Write some test code:

```
data test;
x=10;
run;
```

and click on the new icon(rsubmit: two running men).

Click on Unx folder in Libraries. You will see the new dataset (test) in that folder. Unx folder is the work directory on the UNIX system. Keep the PuTTY window open while you are working on SAS system. Closing the PuTTY window will close the connection between Windows in UNIX.

LOGOUT

To logout, first disconnect the connection from Windows and then UNIX.

WINDOWS:

- Make sure you have all your datasets closed on UNIX work folder.

- Click Run menu and select *signoff* click ok.

    OR

- Type in *signoff* in the Enhanced editor's command box and hit enter.

- Close SAS system.

UNIX:

- Type following command and look for the process number:

    lsof –i tcp:4141   (for example: lsof –i tcp:4141)

- Find the PID associated with process *sastcpd* and then stop the process:

    Kill -9 process#   (for example: kill -9 1234)

PuTTY connection can be closed after logging out from PC SAS and UNIX.

CHANGE WORKING DIRECTORY ON UNIX

At times you may need to be inside a certain directory to run a certain program on the UNIX system, otherwise the program will not run. To change the directory you are in on the UNIX system, type and highlight the following, then click on new icon (rsubmit):

x cd *DirectoryPath*

x setenv PWD *DirectoryPath*

CONCLUSION

This one time setup allows user to stay on PC SAS Enhanced editor and use complete functionality of PC SAS system while submitting the code on UNIX. All logs, outputs and datasets generated by code running on UNIX can be viewed right on PC SAS.

This system was tested on Windows 2000 Professional and Sun Solaris 5.9 operating systems. Both operating systems had SAS 9.1.3. If you need to connect SAS 8.2 then change the appropriate folders paths. Replace SAS 9.1 string in folder paths with V8.

ADVANCED USER FULL AUTOMATION SETTINGS

There is also a way you can automate the login process to avoid entering username/password on PuTTY as well as on PC SAS when logging on to UNIX system.

PUTTY:

Public key authentication is an alternative to using a password. You can find more information on the internet. Once the public key is working properly then call to PuTTY can be added at the top of the connect_script.sas. We have to make sure that PuTTY is connected before PC SAS tries to connect to UNIX which can be done by sleep() function.

```
x '"C:\<path>\putty" -load sas01';
%let wt=%sysfunc(sleep(4));
```

SAS:

To avoid entering username/password on SAS system we need to make changes to tcpunix.scr file. To be safe make a copy the tcpunix.scr file. You can save the file anywhere and change to *filename rlink* path in connect_script.sas file. If you are unable to open tcpunix.scr for editing you can add .txt extension to filename and open with any text editor. But, make sure to remove the .txt extension after making the changes.

To enter username comment out the first line and add the second line as follows (replace username):

```
/* input 'Userid?'; */
type 'username';
```

To enter password comment out the first line and add the second line as follows (replace password). You can also encode the password using PROC PWENCODE and use the string instead of the real password.

```
/* input nodisplay 'Password?';  */
type 'password' ;
```

REFERENCES

PuTTY software Available at http://www.putty.org/ .

CONTACT INFORMATION

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