

Bishop – High Performance Computer (FDS How-To Guide)

This document is a how-to guide for submitting Fire Dynamics Simulator (FDS) jobs on Bishop – a High Performance Computer within the Cal Poly College of Engineering. Users are responsible to adhere to the policies and etiquette specified in this document and the associated Bishop HPC website. Please read this document and the website carefully before attempting to submit a job. Questions regarding FDS job submittals can be emailed to Dr. Richard Emberley (remerle@calpoly.edu). Questions regarding FDS modeling should be directed to your course instructor or thesis advisor.

Bishop HPC website: <https://aero.calpoly.edu/technology/high-performance-computing/bishop-hpc-cluster/>


Request Account

1. Request account through the Bishop HPC website

The screenshot shows the website for the Cal Poly Aerospace Engineering department. At the top, there are navigation links for 'Current Students', 'Prospective Students', 'Parents', 'Business Community', 'Faculty & Staff', and 'Alumni'. Below this is a header with the Cal Poly logo and 'Aerospace Engineering' text. A secondary navigation bar includes 'Home', 'Give Now', 'About', 'Degree Programs', 'Faculty / Staff', 'Current Students', 'Prospective Students', 'Labs', 'Travel', and 'Technology'. The main content area is titled 'Bishop - HPC Cluster' and contains a description of the cluster. A list of links is provided, with 'Request an account' circled in red. A sidebar on the right contains a vertical list of navigation links including Home, Give Now, About, Degree Programs, Faculty / Staff, Current Students, Prospective Students, News, Alumni, Calendar, Clubs, Jobs, IAB, Contact, Labs, and Travel.

2. Enter user information in the Aerospace Technology Request Portal
 - Summary: Cal Poly FPE Graduate Student
 - Description: Conducting Fire Dynamics Simulations for FPE 596 or thesis projects.
 - Category: Bishop Account Request
 - Location: Building 192, Room 320

Aerospace Technology Request Portal

 For IT emergency support, please email Alex Ramos at aramos48@calpoly.edu. Requesting an Account for Bishop? By doing so, you agree to adhere to the HPC Policies and Etiquette.


E-mail

Summary * 0/150

Description * 0/2000

Category *

Location (Building&Room) *

 ATTACH FILE

SUBMIT

3. Wait for account request approval from Alex Ramos (aramos48@calpoly.edu)
 - Note: This may take 24-48 hours.
4. Account request approval email will have an IP Address, Username, and Password. This is specific to you and should not be shared with anyone under any circumstances.

You have requested an account to access Bishop, a HPC Cluster. If you have not already, please checkout the [Bishop HPC Cluster](#) page. Be sure to review the policies and etiquette. If you have any issues with the cluster, open a request on the [Aerospace Technology Request](#) form.

Please do not share this information with anyone.

IP Address:

Username:

Password:

Thanks,

Alex Ramos
Network Analyst
Aerospace Engineering Department
Cal Poly San Luis Obispo, CA
Office: 805-756-7162

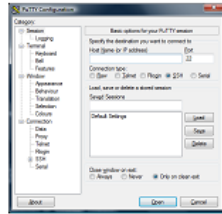
On-Campus Students and Faculty

For on-campus students and faculty connected to the Cal Poly Campus Network, use the following sections for downloading the appropriate programs to your computer. All off-campus students (and

those on-campus students connected to an off-campus network) scroll down to the off-campus access section.

Download and Install PuTTY

1. Download PuTTY at www.putty.org. Click on “here”



Download PuTTY

PuTTY is an SSH and telnet client, by a group of volunteers.

You can download PuTTY [here](#).

2. Click on the appropriate MSI (“Windows Installer”) file for your computer (i.e. either 32 or 64-bit)

Package files

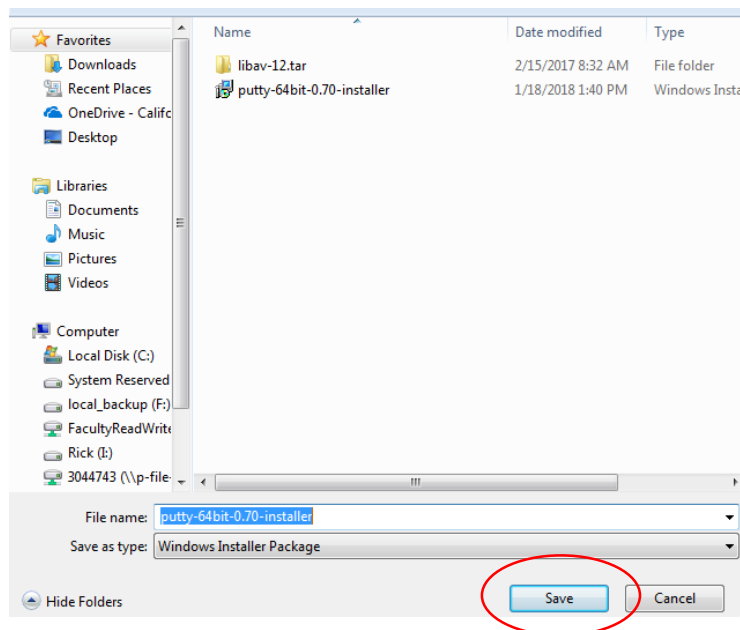
You probably want one of these. They include all the PuTTY utilities.

(Not sure whether you want the 32-bit or the 64-bit version? Read the [FAQ entry](#).)

MSI (“Windows Installer”)

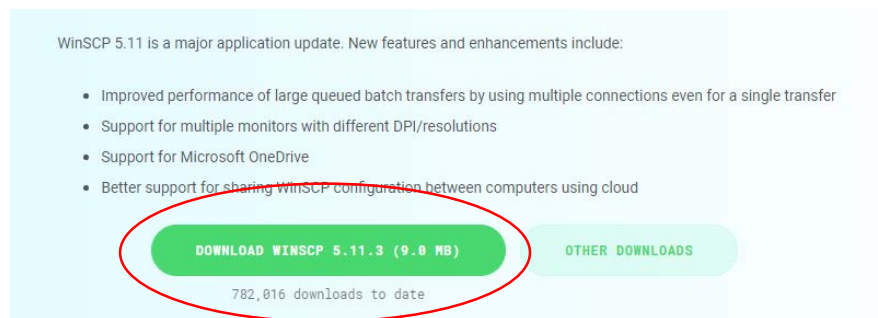
32-bit:	putty-0.70-installer.msi	(or by FTP)	(signature)
64-bit:	putty-64bit-0.70-installer.msi	(or by FTP)	(signature)

3. Save the Windows Installer Package to your computer and then run the installation.

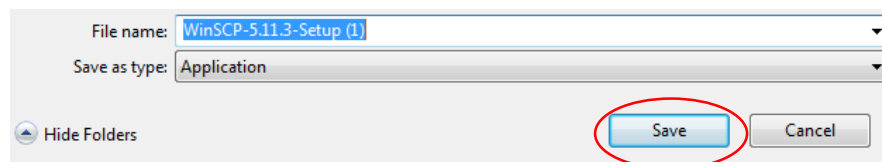


Download and Install WinSCP

1. Download WinSCP at <https://winscp.net/eng/download.php>



2. Save the WinSCP Application to your computer and then run the installation.



Download and Install Notepad++

1. Download Notepad++ from <https://notepad-plus-plus.org/download/v7.5.4.html>
 - 64-bit shown as example.

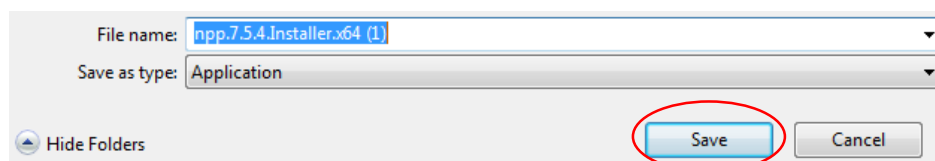
Notepad++ Installer 32-bit x86: Take this one if you have no idea which one you should take.

- **Notepad++ zip package 32-bit x86:** Don't want to use installer? Check this one (zip format).
- **Notepad++ 7z package 32-bit x86:** Don't want to use installer? 7z format.
- **Notepad++ minimalist package 32-bit x86:** No theme, no plugin, no updater, quick download and installation.
- **SHA-1/MD5 digests for binary packages:** Check it if you're paranoid.

Download 64-bit x64

Notepad++ Installer 64-bit x64: Take this one if you have no idea which one you should take.

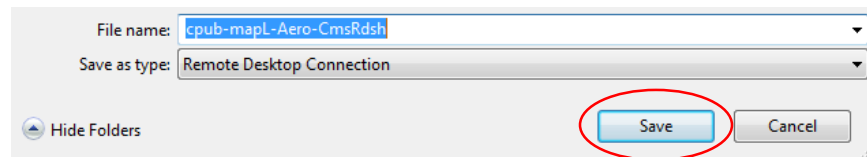
2. Save the Application Installer to your computer and then run the installation.



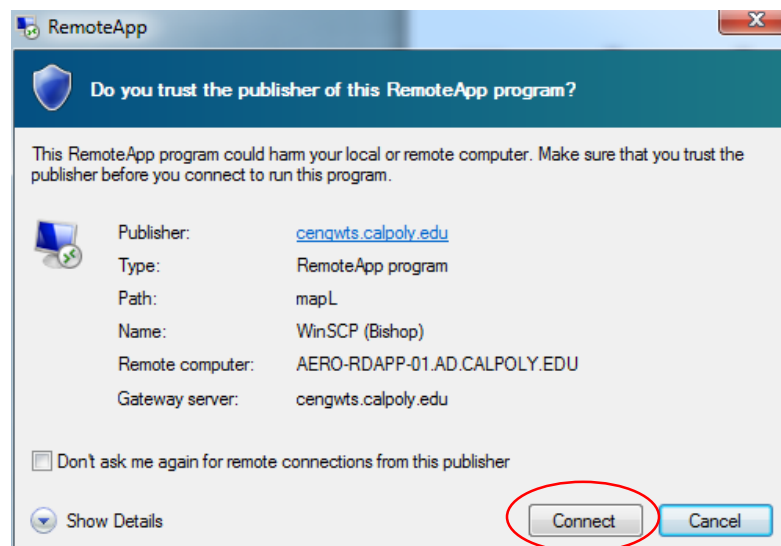
Off-Campus Students and Faculty

Off-campus students and faculty will need to connect to the Cal Poly Campus network through the following commands.

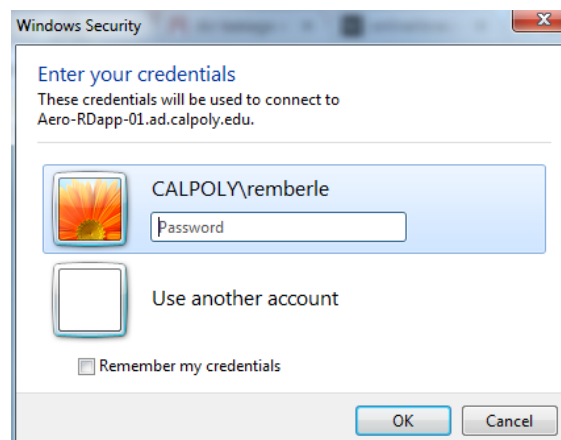
1. Log into RemoteApp Solution <https://cengwts.calpoly.edu/> and launch WinSCP.
2. Save “Remote Desktop Connection” to your computer



3. Click on downloaded file to open RemoteApp. Click “Connect”



4. Enter password. This password is your Cal Poly user name and password.



5. RemoteApp may take a few minutes to load. Accept “Yes” to any error messages or warnings.
6. WinSCP will prompt for your username and password. This is your Bishop – HPC Cluster username and password.
7. See step 4 of submitting an FDS File to the Bishop – HPC Cluster.

File Preparation for Job Submittal

Running FDS on the Bishop – HPC Cluster requires two important files: a job submission file and an FDS file. The job submission file is a file that allocates resources, loads FDS, and then runs the FDS file. The FDS input file is your desired model. See the below sections for creation of each of the files. A recommended job submission file is presented.

FDS File


Normal use of FDS will result in a text file (saved as a .fds) that is run through the command prompt feature of your computer. This text file is the appropriate file for use on the Bishop – HPC Cluster.

For those who use PyroSim, an FDS file will need to be exported in order to be used on the Bishop – HPC Cluster. See screenshot of PyroSim user manual for details on creating the .fds file.

Exporting FDS Models

PyroSim also allows you to explicitly export the current model to an FDS input file. You can manually edit the file to take advantage of advanced FDS features, or to easily transfer the input file to a different machine or special version of FDS.

To export an FDS file:

1. On the **File** menu, click **Export**, then click **FDS File...** or click the **Export** button  on the main toolbar.
2. Enter the file name and click **Save**.

The file exported by PyroSim will be compatible with version 6 of FDS.

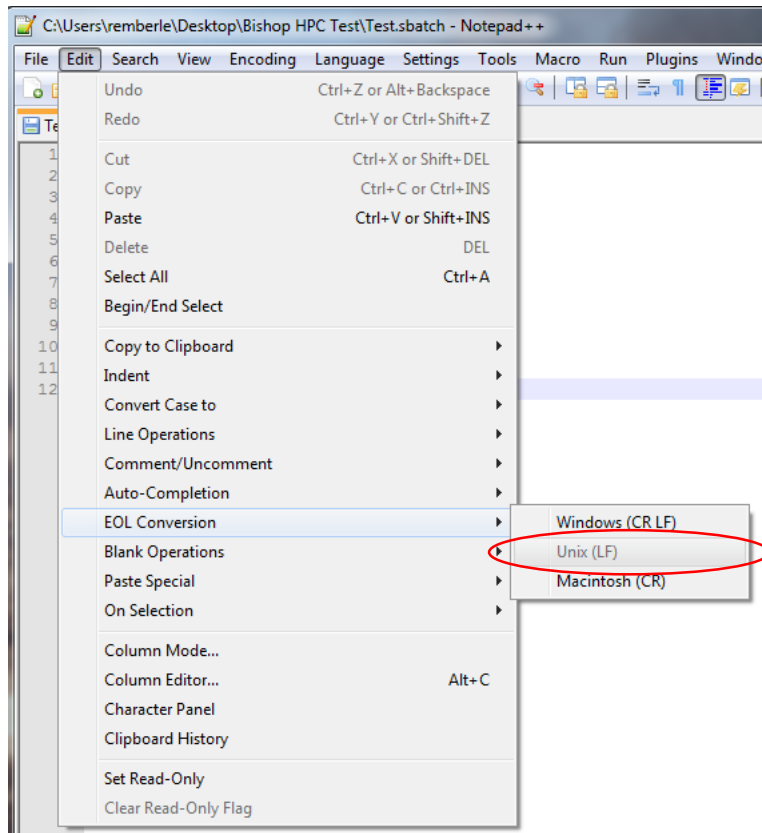
Once the .fds file has been created, note the location of the file for future use.

Users are recommended to test the FDS model on their local computer to ensure geometry, grid size, devices, slice files, etc. are in their desired places and are functioning correctly before submitting to the Bishop – HPC Cluster

Job File

The job file is used to tell the Bishop – HPC Cluster to open FDS and run the FDS input file. Careful creation of this file is important. Please follow the instruction closely.

1. Open Notepad++ on your computer
2. Select Edit>EOL Conversion>Unix (LF)
 - The Bishop – HPC Cluster requires the text file to be in Unix (LF) format. Normal Windows passed text file editors such as Notepad or WordPad do not save the file in the correct format.



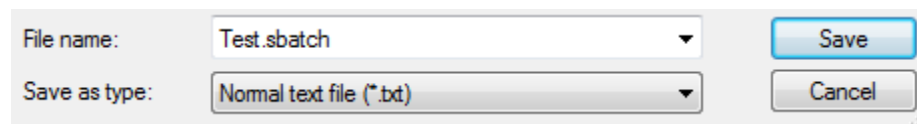
3. Once the Unix (LF) selected, the job file can be typed. The image below provides the sample job file that needs to be created. Where “test” has been placed, an appropriate name can be used for your job.

Underscores (“_”) should be used in the output, error, and fds file names to eliminate space errors

```
Test.sbatch x
1  #!/bin/bash
2  #SBATCH --job-name=test
3  #SBATCH --output=test_simple.out
4  #SBATCH --error=test_simple.err
5  #SBATCH --time=00:100:00
6  #SBATCH --nodes=1
7  #SBATCH --ntasks=1
8
9  # Load Module
10 module load FDS-SMV
11
12 fds Test.fds
```

Note that the time is Hours:Minutes:Seconds. This is the computation time limit (i.e. the model will stop after 100 minutes). Please increase the allotted computation time within reason.

4. The file must be saved as a “.sbatch” file. This can be done by typing “.sbatch” after the file name.

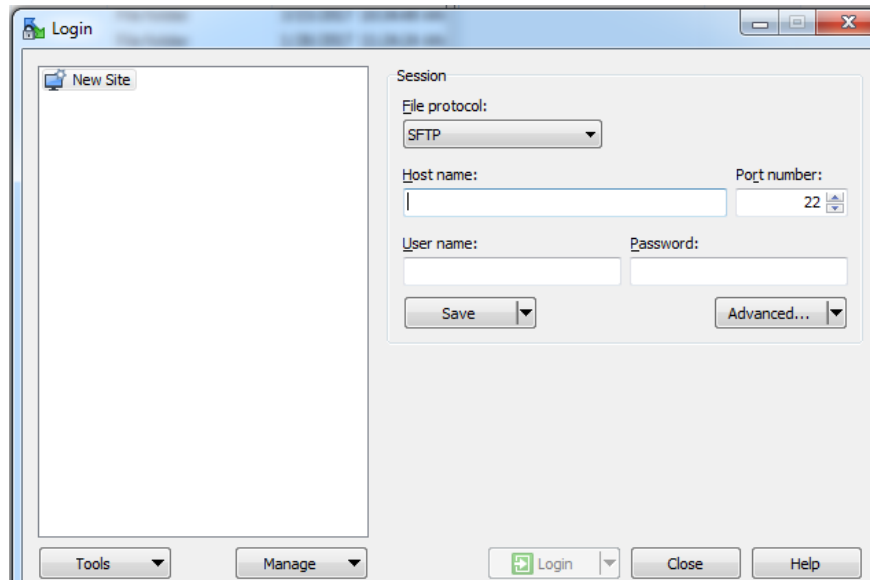


Once you have save the job file and the FDS input file, you have both files necessary for submission to the Bishop – HPC Cluster.

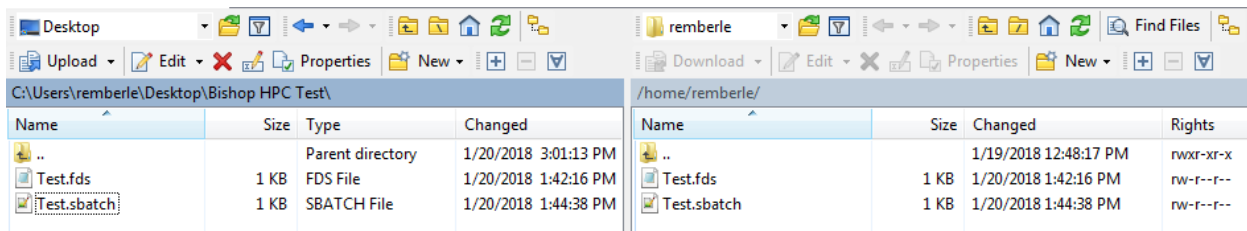
Submitting an FDS File to Bishop – HPC Cluster

Off-campus students and faculty should see section “Off-campus Students and Faculty” for accessing the Bishop – HPC Cluster. Ignore steps 1-3. Steps 4 and on apply.

1. Open WinSCP on your computer.
2. Enter the host name (IP Address), username and password given to you in the request access approval email.

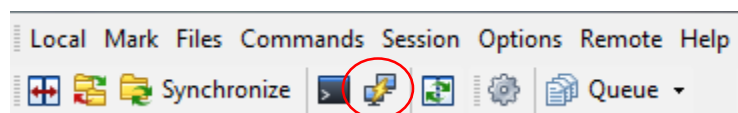


3. Click Login and then Continue past the Authentication Banner
4. Two sides of the WinSCP display are shown. The left side is your local computer and the right side is your folder in the Bishop – HPC Cluster.
5. Add the FDS file and the job file to your folder in the Bishop – HPC Cluster by navigating to the files on the left side of the screen and the dragging them to the right side.



Files cannot be stored on the Bishop – HPC Cluster that are not being actively used for computation running. After you have run a model, transfer the files from the Bishop – HPC Cluster to your local computer. You can then post-process and analyze your models from there.

6. Open PuTTY using the icon circled below



7. Enter password

- Note: you will not see letters or asterisk put in place of letter when typing password. Green box will not move. Ensure careful password typing.

```
Using username "rememberle".
Please be aware. Failure to login 5 times in a 10 minute window will ban your session for 1 hour.
rememberle@          password: █
```

8. Successful password input will open Bishop Cluster

```
Welcome to the Bishop Cluster!
Please be sure to review Policies and Etiquette.

Shortcut Commands:          SLURM Shortcuts:
View Policies:      policy   Schedule Job:        sbatch script.bash
View Queues:        queues   View Queued Jobs:   squeue
View Welcome:       welcome  View Job Info:      sacct
Linux Commands:     commands  Cancel a Job:       scancel jobid
Support Help:       support   More SLURM help:    shelp

Home Drive:
Used      Avail
OMB 107375MB

[rememberle@Head ~]$ █
```

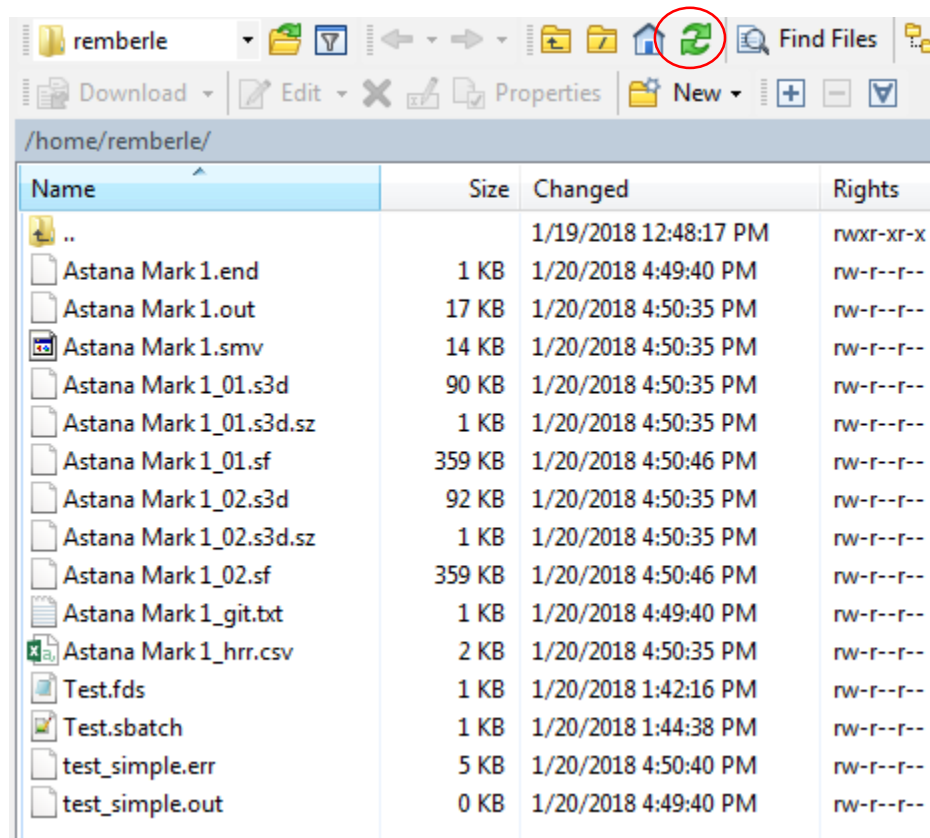
Bishop Cluster runs off SLURM commands. Familiarize yourself with the commands in order to cancel, pauses and perform other job controlling commands

<https://aero.calpoly.edu/technology/high-performance-computing/bishop-hpc-cluster/how-to/use-slurm/>

9. Enter the command `sbatch filename.sbatch` into the command line where “filename” is the name of your job file.

```
[rememberle@Head ~]$ sbatch Test.sbatch
```

10. If the job has been entered correctly, you will be given a batch job number
11. Use the SLURM commands, such as “`squeue`” to check the status of your job and the run time.
12. In WinSCP, click the refresh button above the Bishop – HPC Cluster (right side) in order to see the files generate by your FDS model.



To view Smokeview or other output files, copy them to your local computer and run them
Copy all files from your Bishop – HPC Cluster to your local computer and then delete the files from your Bishop – HPC Cluster folder

13. When your FDS model has finished running and your files have been transferred and deleted from the Bishop – HPC Cluster, close your session by closing PuTTY and WinSCP. Off-campus students should closer internet page accessing the RemoteApp Solution.