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a division of SAS Computing

Remote Computing

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Remote Computing

- Remote control
- File transfer (copy and sync)
- Security
- Tips
- Software list

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Concepts

- **Remote control**

  - Run programs on computer as if you are sitting at the computer; programs continue to run while disconnected

- **Server** or **Remote Computer**

  - Computer that you want to remote control or on which you want to run programs remotely

- **Client** or **Local Computer**

  - Computer from which you will perform remote control

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Remote Control
Protocols

- **Remote Desktop** (Windows)
- **SSH** (Windows, Linux)
- **VNC** (Windows, Linux)
- **Apple Remote Desktop** (Macintosh)

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Remote Control

Remote Desktop (RDP)

- ❖ Server: Window XP Pro or Vista
- ❖ Client: Windows, Linux or Macintosh
  - Software: *mstsc rdestop, tsclient*
- ✓ Encrypted
- ✓ File transfer
- ✓ Multimedia

Weaknesses

o Cumbersome file transfer
o Vulnerable to brute force attack
o Old versions vulnerable to "man in the middle"

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Remote Control

SSH (Secure SHell)

- Server: Linux or Windows
  - Server software: *OpenSSH*
- Client: Windows, Linux or Macintosh
  - Client software: *SecureCRT*, *PuTTY*
- ✓ Encrypted
- ✓ Tunnel other programs through SSH
- ✓ File transfer with SFTP

Weaknesses

- o Expert server setup
- o Command-line interface
- o Graphic interface requires X-Windows
  - Software: *Xming*

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Remote Control

VNC (Virtual Network Computing)

- ❖ Server: Linux or Windows Desktop
- ❖ Client: Windows, Linux or Macintosh
  - ▪ Software: *RealVNC*
- ✓ Shared screen among multiple users

Weaknesses

- o Lacks file transfer
- o Lacks multimedia
- o SSH tunnel required for encryption
- o Slower refresh than Remote Desktop

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Remote Control

Apple Remote Desktop

- Server: Macintosh
- Client: Macintosh

Weaknesses

o Not included automatically with Macintosh; costs extra money

o Only works with Macs

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File Transfer

Concepts

- **Transfer**

  - Copy or move files and folders between two computers

- **Sync**

  - Update files and folders on both computers so that they match and each computer has latest versions

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File Transfer

Protocols

- **Remote Desktop**
- **SFTP** and **SCP (SSH)**

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File Transfer

Remote Desktop

- ✓ Copy and Paste files between client and server

Weaknesses

- o Navigating directories is slow because whole desktop must be redrawn

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File Transfer

SFTP and SCP

- ✓ Drag and drop files between client and server
- ✓ Encrypted through SSH
- ✓ Sync files and folders
- ✓ Easy to use client software: *FileZilla*, *WinSCP, SFTPdrive*

Weaknesses

- o Expert server setup
- o Network shares accessed with UNC (\\server\share$) specification instead of drive letter

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File Transfer

Syncing Files

- *WinSCP* has a built-in sync function
  - Works through an SFTP (SSH) session

- Microsoft *SyncToy*
  - Works with Remote Desktop session
  - Works with mapped drive

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Security

Penn computers are under constant attack; hackers are scanning common ports.

- Use alternative ports for Remote Desktop and SSH.
- Use Windows XP firewall scope to allow only specific IP addresses or ranges to connect.
- Use strong passwords with a combination of symbols, numbers and letters. A very strong password has at least 14 characters.

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Security

- On public computers such as in labs, classrooms or kiosks, use the "public" switch when invoking remote desktop.

  mstsc /public

  The "public" switch tells the client software not to save any session information on the local computer.

  Tip: Create a shortcut on your flash drive that uses the public switch. Invoke remote desktop from your flash drive shortcut.

- If using a computer from IP address not specified in firewall scope, connect through SSH proxy server.

  For remote desktop, connecting through an SSH proxy will take two steps instead of one step without a proxy. The steps are:

  (2) Connect to SSH proxy server with configuration to forward ports

  (3) Connect to remote computer via localhost and port forward

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Tips

Remote Desktop

- **Drop Remote Desktop "experience" by one level.**
  {e.g. For "Broadband" use "Modem (56kbps)" }
  This setting makes refresh faster.

- **Create shortcuts for both client and server frequently accessed folders.**
  Shortcuts reduce how many times the file manager has to refresh to reach a desired folder.

- **Map drive to client folders.**
  Mapped drives provide quick access.

- **Do not edit PowerPoint presentations or other graphically intense in a remote session; copy and edit locally.**
  Graphic applications often cause remote sessions to hang.

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Tips

Remote Desktop

- **Disable clipboard extenders (programs that save multiple clips) when using remote desktop.**

  Clipboard extenders (programs that save multiple clips) often interfere with the copying and pasting between remote and local computers.

- **Run batch applications in remote sessions; these programs can continue to run after you detach. (e.g. SAS, Stata)**

  Reconnect to check the status of the program.

- **Run interactive applications in the local session.**

  Copy any needed files from the remote computer to the local computer. When finished, copy files from local computer to remote computer.

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Tips

SSH

- **Do not work with files directly when connecting from off campus** {i.e. Wide Area Network (WAN) instead of Local Area Network (LAN) }.

  Copy files between remote and local computers.

- **Synchronize folders between remote and local computers.**

  WinSCP can synchronize folders. Only need to synchronize folders on which you are currently working.

- **Use bookmarks in SSH client to access folders faster.**

  Use WinSCP bookmarks for network drives/shares. WinSCP does not recognize network drive letters; use share names. FileZilla does recognize network drive letters.

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Tips

SSH

- **Use *nohup* to run programs on Unix/Linux.**
  Check results at later time or from different location.

- **Copy results to local computer for editing and printing.**
  SecureCRT and WinSCP or FileZilla can be open at the same time.

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Software

Penn recommended:
http://www.upenn.edu/computing/product/

Remote Desktop Client: www.microsoft.com

RealVNC: http://www.realvnc.com/

Apple Remote Desktop:
http://www.apple.com/remotedesktop/

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Software

OpenSSH: http://www.openssh.com
SSH Windows: http://sshwindows.webheat.co.uk

PuTTY: http://
www.chiark.greenend.org.uk/~sgtatham/putty/
Xming: http://sourceforge.net/projects/xming

WinSCP : http://winscp.net
FileZilla : http://filezilla-project.org
SFTPdrive (commercial): http://www.sftpdrive.com

SyncToy:
http://www.microsoft.com/windowsxp/using/digitalphc

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Computing staff are available to set up secure remote protocols for you.

Please contact us:

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Questions