

How to work remotely

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April 1, 2015

Needs

- Communication (E-mail, instant messaging)
- Files (Documents, data, scripts)
- Programs
- Private services

E-mail

- Vanderbilt web mail
- Third-party clients
 - Thunderbird
 - Outlook
 - iPhone/Android*

Instant messaging

- Windows or Linux: Pidgin
- Mac: Adium

Files

- Third party services
 - Dropbox
 - Google Drive
 - iCloud
 - Vanderbilt Box
- Do-it-yourself
 - SparkleShare: <http://sparkleshare.org>
 - Samba, rsync, sshfs, etc.
 - Windows and Mac: sharing folders

HIPAA Concerns

- Most third-party services are NOT compliant*
- Vanderbilt's Box agreement includes BAA
 - Permitted:
 - Sensitive identifiable human subject research data
 - Student educational records
 - Protected health information
 - Not permitted:
 - Social security numbers
 - Student loan information
 - Payment information

Encryption

- 7-Zip
 - Works on Windows, Mac, and Linux
 - Can create encrypted zip files
- CipherShed (TrueCrypt* successor)
- GPG
- Encfs

Running Programs

- Install and run locally*
- Run remotely

Remote access

- Remote desktop session
- Secure shell (SSH)
- Requires some internet networking knowledge

Internet Protocol

- Abbreviated as “IP”
- Makes the internet possible
- Set of rules of communication between computers
- Works similarly to the US mail service

Home address



Mail example

Jay Cutler
123 Bears Lane
Chicago, IL 60290

Mail example

Jay Cutler
123 Bears Lane
Chicago, **IL 60290**

Mail example

Jay Cutler
123 Bears Lane
Chicago, IL 60290

Mail example

Jay Cutler

123 Bears Lane

Chicago, IL 60290

Mail example

Jay Cutler

123 Bears Lane

Chicago, IL 60290

IP address

- Assigned by an authority (just like your home address)
- Four numbers, 0-255, separated by dots
- Example: 123.456.789.012
- Public IP address: accessible worldwide
- Private IP address: accessible locally only

IP address example

123.456.789.012

IP address example

123.456.789.012

IP address example

123.**456**.789.012

IP address example

123.456.**789**.012

IP address example

123.456.789.**012**

Private network



Private network (cont.)

- Special reserved sets of IP addresses
 - 10.0.0.0 thru 10.255.255.255 (~17 million)
 - 172.16.0.0 thru 172.31.255.255 (~1 million)
 - 192.168.0.0 thru 192.168.255.255 (~66 thousand)
- Only accessible from the outside world through an intermediary

Finding your IP address

- Windows and Mac: view network properties
- Linux: run `ipconfig` from terminal

Using VPN

- Virtual Private Network
- Allows you “virtual” access to a private network

Vanderbilt VPN

- Windows and Mac: Junos Pulse
- Linux: do-it-yourself solutions

Remote desktop session

- Share your desktop session
- Viewable by a remote desktop client
 - Remote desktop protocol (RDP)
 - Virtual network computing (VNC)

Sharing your Windows desktop

- Built-in remote desktop server (RDP)
 - Available for Windows Professional or better
 - Enable through control panel
 - Connect using a remote desktop client
- Third-party tools (VNC)

Sharing your Mac desktop

- Enable via “Sharing” in system preferences (VNC)
- Connect from Windows and Linux via VNC client (like TightVNC)

Sharing your Linux desktop

- Enable via “Desktop Sharing” (Ubuntu VNC)
- xrdp – Remote desktop server
- Trickier to set up than Windows or Mac

Secure Shell (SSH)

- Terminal-based access
- Powerful
- Cross-platform
 - Windows: PuTTY (<http://putty.org>)
 - Installed by default for Mac and Linux

SSH “VPN”

- Mimic a VPN by hopping between computers
- Connect to a publicly accessible computer
 - Ex: `ssh data.vanderbilt.edu`
- Connect to a computer within a private network from the “jump” computer
 - Ex: `ssh 10.1.2.3`

Terminal multiplexer

- Open multiple shells through a single SSH session
- tmux and screen

SSH X Forwarding

- Works best from a Linux machine
- Run a program remotely with a local window
- Example:
 - `ssh -X 123.456.789.012`

A note about firewalls

- Firewalls can block remote connections
- Vanderbilt blocks some incoming traffic from the outside world
- Open ports:
 - 22 (SSH)
 - 80 (HTTP)
 - 443 (HTTPS)
 - 37200 thru 37255
- Closed ports: RDP, VNC