

Macintosh: The Any OS for Schools

Apple's OS 10.4 now and 10.5 soon (August, 2006) on the newest Macs running on an Intel Core Duo processor give schools an ideal platform for students or administrators. These computers now have all the advantages of 21 years of Windows developments, 22 years of Apple's Macintosh developments, and over 30 years of Unix developments on one piece of hardware at a reasonable price point. Schools which require either or both Macintosh or Windows Operating systems for their curricular or administrative needs do not have to maintain separate labs. One piece of hardware can be booted to either Macintosh or Windows natively and without any emulation. All Macintosh OS X or Windows XP software will run on these new machines.

Besides the ability to run Windows and OS X software natively, these machines are the perfect platform to run Apple's new iLife and iWorks suites of software which provide exciting new tools for teachers and students to create Websites, documents, and multi-media creations. The built-in iSight camera and microphone gives these machines the ability to do video and audio broadcasting as well as to create movies for use in Blogs, PodCasts, and DVD based movies.

This presentation was an overview of a few of these new tools. During this presentation the following was done live:

1. Ran Windows natively.
2. Created a Website in minutes using a digital camera and pictures of the audience.
3. Uploaded the Web files to a file server on the Internet in seconds by double clicking to launch a two line Unix script.
4. Led students on a brief Internet tour using a teacher created AppleScript independently of the teacher.
5. Showed that Apple's new Pages word processor and page layout program is completely XML based and demonstrated how powerful that type of technology is by using a bluetooth scanner to scan an ISBN number from a book, pass the number to the computer via wireless bluetooth and then to use that number to look up data about the book on Amazon live on the Internet and then to pull the Title, author, and other information including a picture of the cover into the presenters personal database of his home library using Delicious Library software.

6. Took control of another Macintosh remotely in seconds using the OS X.4's built-in VNC server on the remote machine and the free Open Source Chicken of the VNC client on the controlling machine.
7. Took control of a Windows XP machine via Microsoft's Remote Desktop Connection to Windows built-in remote server software.
8. Took control of a Macintosh OS X.4 machine from a Windows XP machine running a free downloaded client.
9. Used the MacBook Pro's built-in iSight camera and microphone to Unicast video and audio live to another OS X.4 machine and to set it up live in seconds.
10. Developed a relatively complex and useful application that backs up a file or folder to a CD or DVD without writing a line of code using Apple's Automator.

All of this was done in under an hour live!

This document will describe in a little more detail *How Ray Did It™* in a way that was not possible in a one hour presentation. This document list links, bibliography, software, and methods used during the presentation.

Develop a Website live.

Building a Website is quick and easy with iWeb.™

Materials:

Kodak EasyShare CX7530 digital camera with a 1 GB SanDisk SD card (Any digital camera would have done.)



Apple MacBook Pro (Any OS X.4 Apple would have worked.)



MacBook Pro 15-inch
2.0GHz \$1999

Apple Macintosh OS X.4.6

Apple iWeb software (Part of the iLife suite)

Kingston Technology USB Media card reader connected to USB port (Reads SmartMedia, SD/miniSD, Memory Stick (Pro & Pro Duo), and CF/MicroDrive memory ("Flash") card. (Any SD to USB card reader would have worked.)



Steps:

First pictures were take of the audience and presenters with a digital camera.

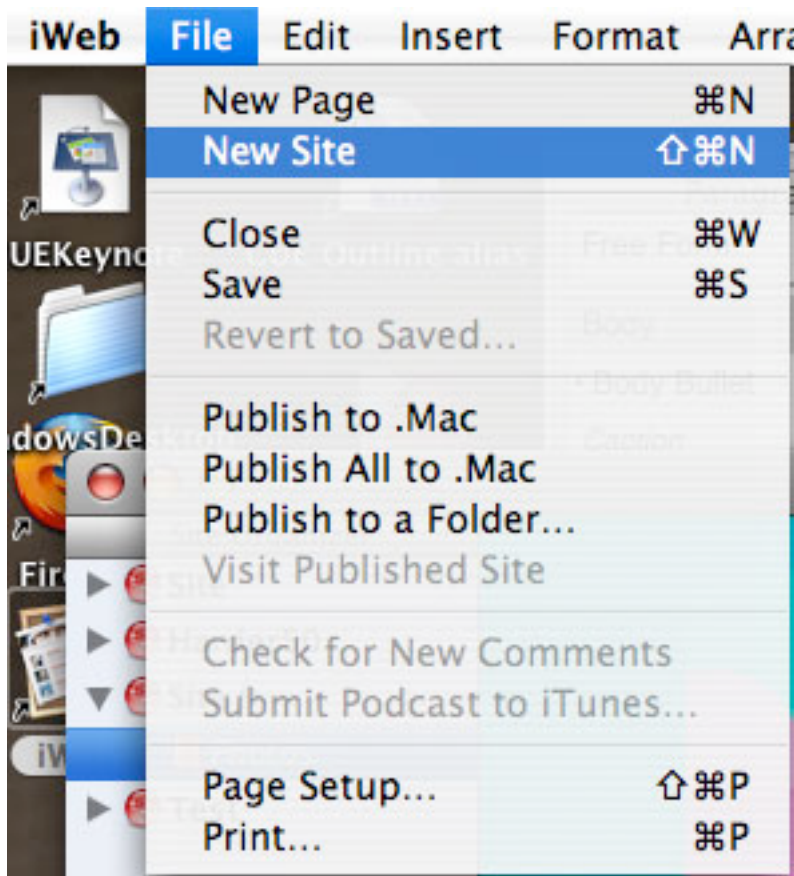


Next the pictures were moved from the camera to the computer by taking out the small SD card from the camera and inserting it into the SD card reader plugged into the MacBook Pro's USB port.

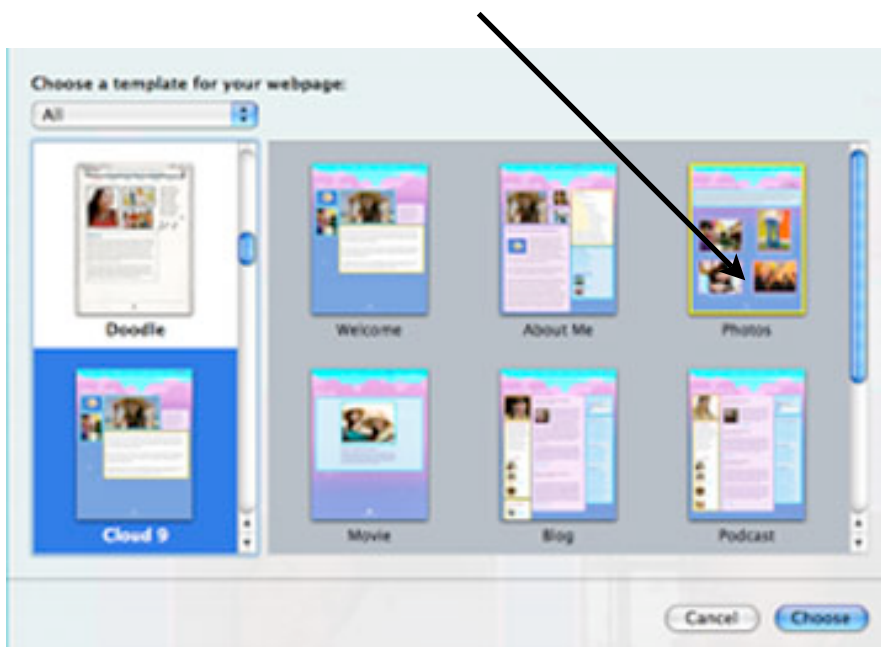


When the card mounted like a hard drive on the Mac desktop, the pictures were dragged from the SD card to a folder on the desktop.

iWeb was started and New Site was chosen from the File menu.

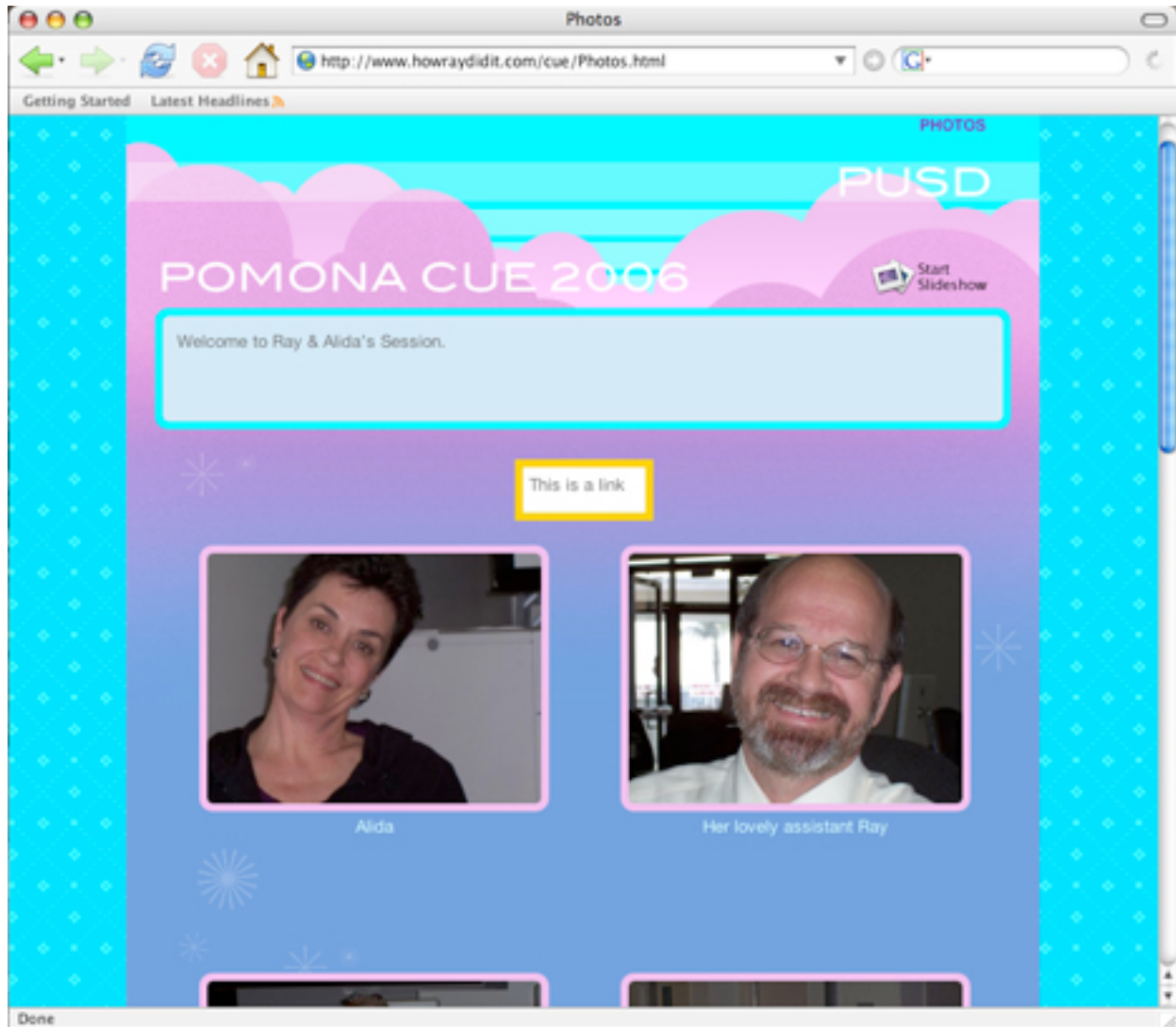


Next the Photo Page from the Cloud 9 template was chosen.



The text was changed by choosing which text in the template we wanted to replace and simply typing over it.

The pictures were dragged and dropped onto our template in the appropriate places.



The finished Website was exported to a folder on the desktop. iWeb created all of the XML code necessary for the display of the text and pictures as well as the javascript code to run a slide show of the pictures by simply double-clicking.

Since this export was of all the Websites currently being worked on in iWeb, we had to erase the ones we weren't using and move our new CUE website into a folder called wwwcue. (This could have been named anything, but this name is used in the next step of uploading our files to our Website.)

Our Website was now complete and loaded into this folder. Next we had to upload it from the folder on our MacBook Pro to our Web server on the Internet.

Upload iWeb Files to Webserver with Unix Script

Upload iWeb files to Internet based server with a one line unix bash shell script.

Materials:

Barebones Software's BBEdit (Any text editor would have done.)
<http://www.barebones.com/>

Steps:

We then double clicked a predefined two line Unix script to upload our files securely across the internet. For more information on the process click [here](#). We could have used an FTP utility application such as Transfer™ to do this. I just wanted to show off some of the built-in Unix scripting capabilities in OS X. The Unix method is simpler and more secure to use on a network.

Finally we logged onto Ray's Web server www.howraydidit.com/cue/photos.html to see our site on the Internet.

Touring the Internet Automagically with AppleScript

Using Applescript we can take kids on a tour of the Internet automatically with a teacher created lesson in AppleScript. This script will lead us on a brief tour of the Internet to see how important technologies like XML are becoming.

Materials:

Apple's Script Editor (Included free in OS X Applications:Applescript:Script Editor)

http://developer.apple.com/documentation/AppleScript/Conceptual/AppleScriptX/Concepts/work_with_as.html and <http://www.vtc.com/products/applescript.html>

Tutorial:

http://developer.apple.com/documentation/AppleScript/Conceptual/AppleScriptX/Concepts/work_with_as.html and <http://www.vtc.com/products/applescript.htm>

Script:

```
-- ShowCUE
-- Created by Raymond Harder on 5/17/06.
-- Copyright 2006 TeamHarder under the GNU general public li-
  cense. You make freely copy any and all of this code for any
  non-commercial purposes.
-- This script is designed to take CUE members
--on a tour of the modern technology world.

tell application "Finder"
  activate
  set the_text to "Hello Friends!, This is your computer. Ray
    has given me a little script to read to you and ask me
    to take you on a small tour of the Internet."
  say the_text using "Bruce"

  set the_url to "http://www.google.com"
  open location the_url

  set the_text to "I wanted to show you a few things about the
    world of computer science. I use Google to kind of pre-
    dict the future. The more hits I find for a subject, the
    more important it is at that given moment. Over time
    this allows me to see what is important in a particular
    field."
  say the_text using "Bruce"

  set the_url to
    "http://www.google.com/search?hl=en&q=Baseball&btnG=Google+Search"
  open location the_url

  delay 4

  set the_text to "As you can see, on any given day, there are
    hundreds of thousands of hits for Baseball"
  say the_text using "Bruce"
```


delay 4

set the_url to
"<http://www.google.com/search?hl=en&lr=&q=Microsoft+Office&btnG=Search>"

open location the_url

set the_text to "As would be expected, there are more hits
for Microsoft Office"
say the_text using "Bruce"

delay 3

set the_url to
"<http://www.google.com/search?hl=en&lr=&q=PHP&btnG=Search>"

open location the_url

set the_text to "What might interest you is that the hit rate
is usuall billions when I search for P H P"
say the_text using "Bruce"

delay 5

set the_url to
"<http://www.google.com/search?hl=en&lr=&q=XML&btnG=Search>"

open location the_url

set the_text to "What is almost unbelievable is that the hit
rate is usually over 1,000,000,000 when I search for X M
L"
say the_text using "Bruce"

delay 2

set the_text to "In fact, P H P and X M L are only two of the
most influential developments in the computer world in
the last decade and will be significant for the forse-
able future -and yet, most people have never heard of
them. What happens behind the scenes in the world of
computers is much more important for developing curricu-

```
        lum and making long term decisions than the news media
        or popular knowledge and culture."
say the_text using "Bruce"
```

```
end tell
```

Steps:

This tutorial will show you how to use Apple's Script Editor to write and execute a script that will read text aloud. Open Script Editor or another Text editor and type the following

```
tell application "Finder"

    activate

    set the_text to "Hello Friends!, This is your computer. Ray
        has given me a little script to read to you."

    say the_text using "Bruce"

end tell
```

Save this text file with a name ending in .applescript. Double clicking this file should open the AppleScript editor. Clicking on the green run button to hear it read the text. (Note: Make sure your sound is on! Also, the text starting on line three ("set the_text to "Hello..." etc and ending "...to read to you.") is all on one line and only looks like two lines because of the word wrap.)

Next add in code to have our script automatically take is to the google website:

```
tell application "Finder"

    activate

    set the_text to "Hello Friends!, This is your computer. Ray
        has given me a little script to read to you."

    say the_text using "Bruce"

    set the_url to "http://www.google.com"

    open location the_url
```

```
end tell
```

Save this text file with a name ending in .applescript. Double click it or open it in AppleScript and click the green “Run” button. If you are connected to the Internet, your default browser should and take you to google.com.

Now, go back to the script above and run it and see if you can figure out the other parts of it on your own.

The “set” command creates a variable (container) called “ the_text” in the first instance of its use. It also puts the text (technically a “string”) "Hello Friends!, This is your computer. Ray has given me a little script to read to you." into the container. Then the “ say” command reads that string which is in the container.

Next the second set command does the same thing with a different container (the_url) and a different string (<http://www.google.com>). Then the “open location” command opens the URL contained in the variable (the_url). This combination of a few simple AppleScript commands can allow you to lead your students on an entirely teacher guide tour of the Internet!

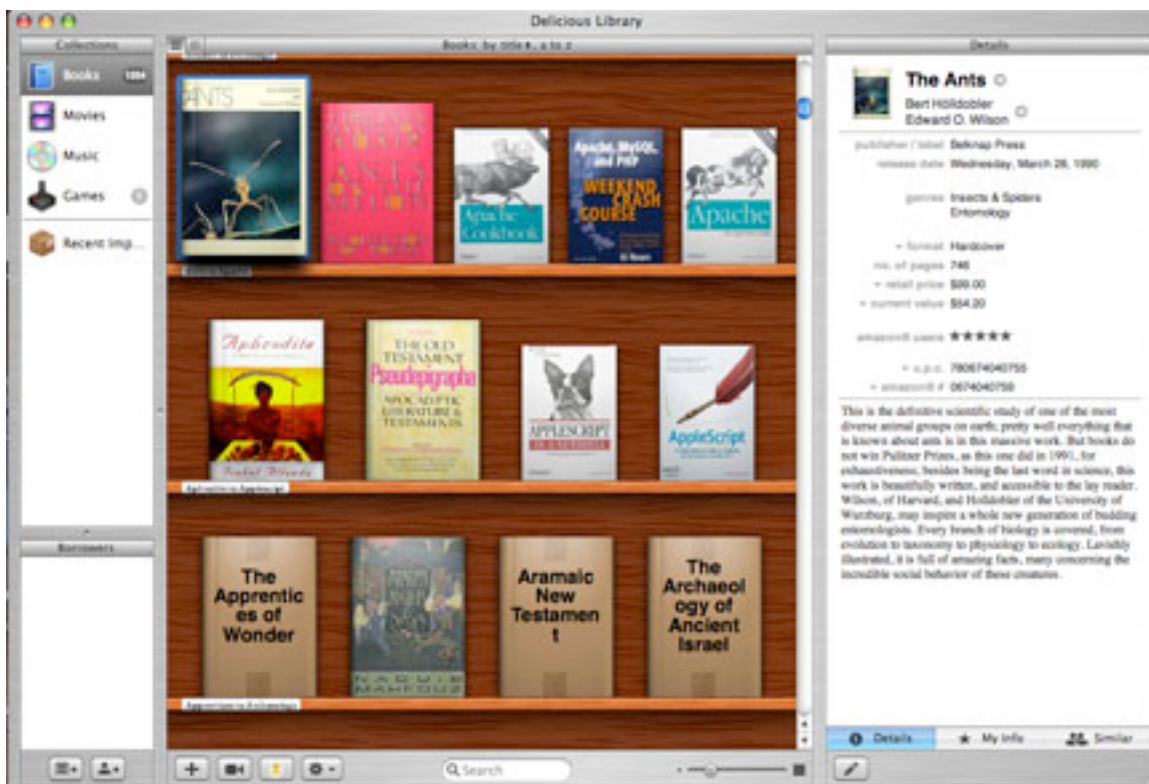
Futuristic Word Processing with Pages, XML, and Delicious Library

Apple's new Pages word processor and page layout program combines all of the power and simplicity we have come to expect from Apple. However, under the hood lies a complete XML based page formatting system that positions Apple and Pages for some incredible future possibilities. See the power of XML combined with other modern technologies in with Delicious Monster's Delicious Library Product that uses a bluetooth barcode scanner to read the ISBN number off the back of a book, move the number to the computer wirelessly, and then use the Internet to look up the book on Amazon.com. Finally,

Materials:

Apple's Pages

Delicious Library (<http://www.delicious-monster.com/>)



BlueTooth barcode scanner (Flic® Wireless Laser Barcode Scanner)



Steps:

Apple's word processing and page layout program Pages was recommended in this context because of its internal XML file format and the futuristic power that that portends.

If we create a Pages file and save it, we can right click it and choose "Show Package Contents" to look inside the file (which is actually a folder) and we find that it contains our entire file marked up in XML format and compressed as a .gz file. This XML format will insure that our file is structured in such a way that all of our data can be moved into a database or converted to another format. It can also be searched, sorted, and organized in some exciting and powerful ways.

To see a powerful usage of these technologies we used a Flic bluetooth laser barcode scanner, Delicious Library software, and a book's ISBN bar code to show off the futuristic potential of combining XML and the Internet into a powerful system.

QuickTime Broadcasting -Quick!

Using Apple's built-in iSight Webcam and microphone it is possible to set up a video and audio broadcast live across the network to another school or office in a matter of minutes.

Materials:

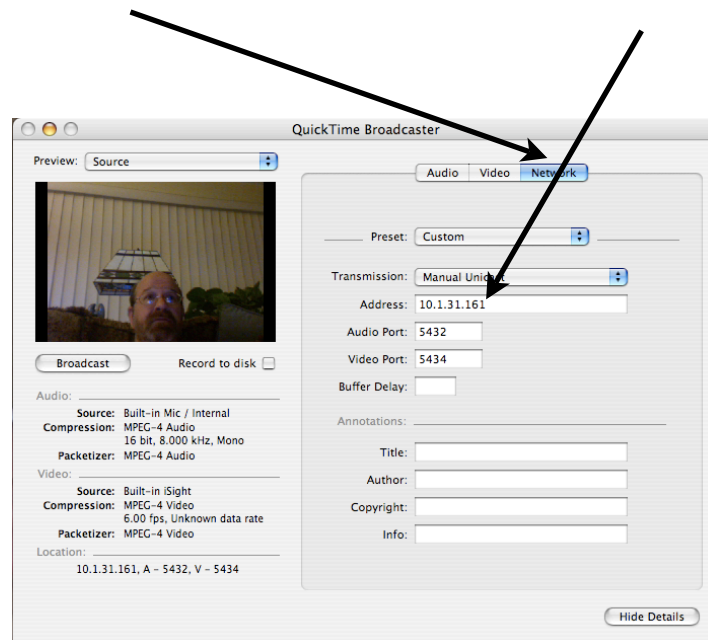
An Intel based Mac running OS X

Apple's QuickTime Broadcaster software (Included with OS X or Downloadable free from Apple)

Steps:

Open QuickTime Broadcaster

Click on the Network Tab in the upper right and type in the IP number of the *DESTINATION* machine



Set the transmission type to "Manual Unicast."

Next choose File:Export:SDP... from the file menu. Save this file on your desktop. This 4k file must be placed on the *DESTINATION* machine. Email or use Apple's built-in file sharing capabilities to moving this file to the other machine.

Click "Broadcast" on the server/broadcast machine.

Go to the other machine, double click the 4k .SDP file and you should see whatever (Or whmoever) is in range of the camera on the serving machine.

Remote Control

We used Apple's built-in VNC server to show off how OS X could take control of or be controlled by another Macintosh or Windows machine.

Materials:

A VNC Client like Chicken of the VNC
<http://sourceforge.net/projects/cotvnc/>

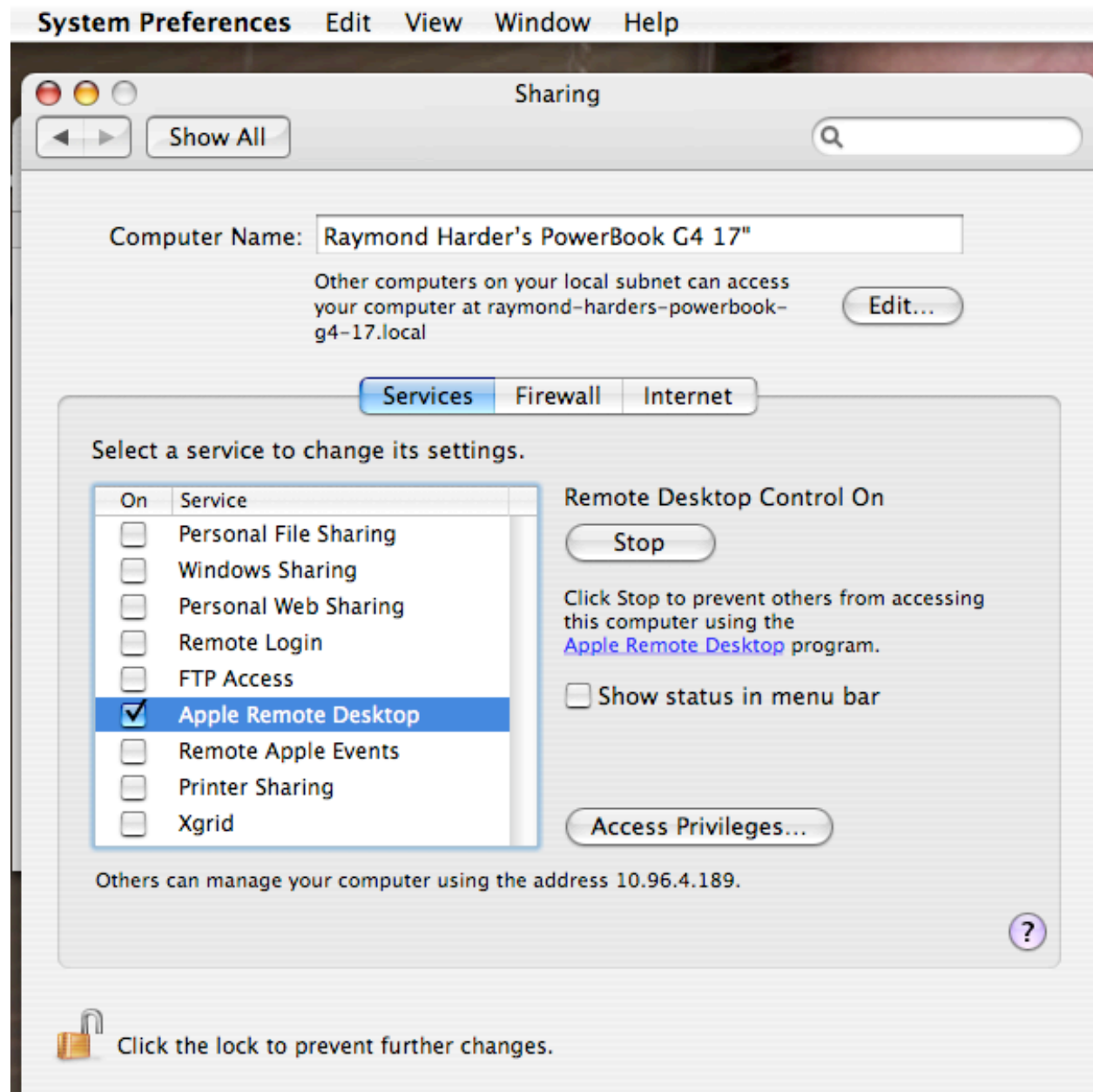
OS X

Steps:

Chose System Preferences from the Apple menu

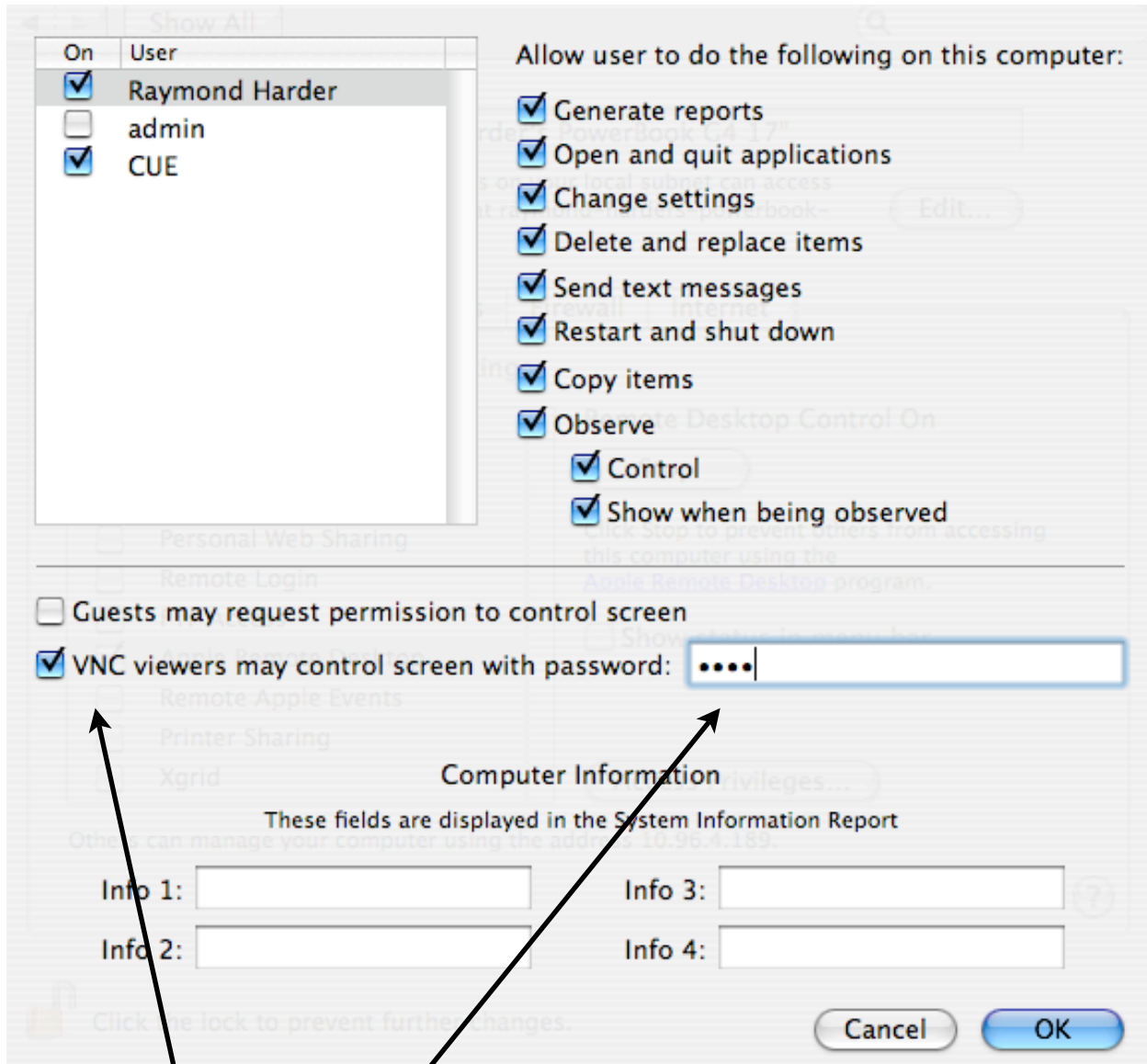
Choose the Sharing Icon.

Choose Apple Remote Desktop



Click "Start" (It will change to "Stop" when it is running.)

Click "Access Privileges..."



Check the last box that says “VNC Viewers May Control Screen With Password”

Put in a password

Click “OK”

When you get back to the screen note the last line of text which should show your IP address, E.g. “Others can manage your computer using the address 10.96.4.189.”

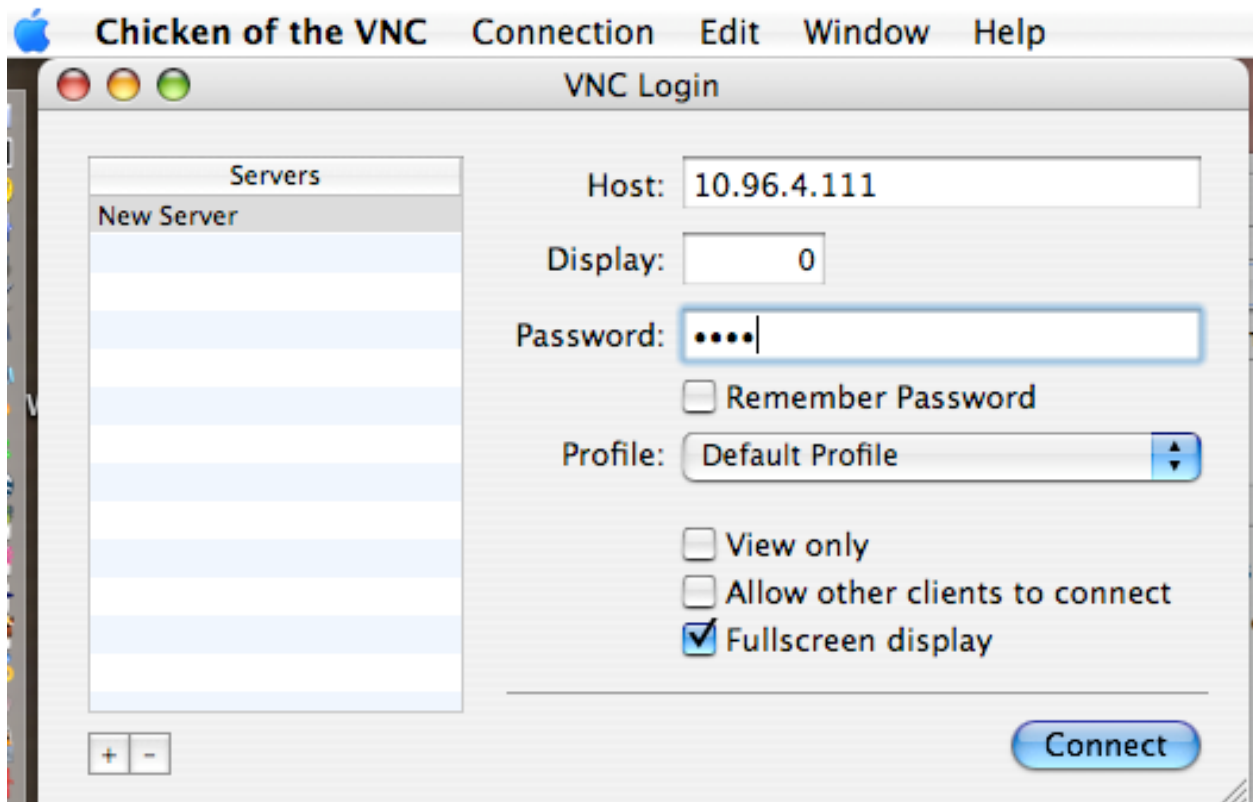
(NOTE: if you do not see this line, you probably didn't click the start button to after choosing Apple Remote Desktop.)

Close all System Preference windows.

Download or copy Chicken of the VNC (Any true OS X or Windows VNC client will do) to another machine.

Launch Chicken of the VNC on the remote machine.

Choose "New connection..." and point CVNC back to the machine you where you turned on Apple Remote Desktop by putting the IP address you noted earlier into the "Host" box. (The screen shot below shows 10.96.4.411, this should be replaced by the actual IP of the Host you are trying to connect to. (10.96.4.189 in our example above).



Type in the password and hit return. If the two machines are on the same network (Not necessarily at the same site) you should see the remote machine in a window on the VNC client.

You should now be able to operate the remote machine from you desk --even if it is across town at another school! (As long as it is on the same network.)

NOTE: This probably won't work from home to work and back because of firewalls and differing networks. This is very useful for helping someone over the phone. You can actually see and control the machine they are trying to tell you about!

Like VNC, Microsoft's Remote Desktop Connection (Freely downloadable for OS X from the Microsoft website) can also be used on a Macintosh to Control a Windows XP machine remotely . Simply turn on remote access on the Windows machine and configure RDC on the Mac.

Automated Programming

Apple's Automator has brought programming to a new level of ease. Using this exciting new tool we will build a program which automatically backs up the folder of our choice to a CD. Automator has taken a task that would have taken days with a traditional programming language like C++, Pascal, or even BASIC; and reduced it to minutes.

Materials:

Apple's Automator (Free with OS X)

OS X

Steps:

Open Automator. A new Untitled project opens. Automator works by choosing actions from the center column and dragging them to the right hand column and configuring them as we desire.

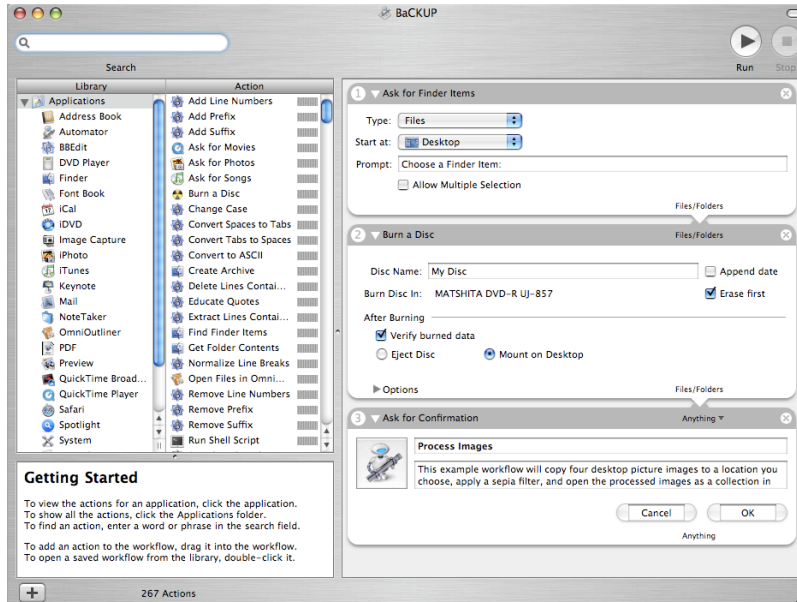
First, choose "Finder" in the left hand column to see all the Finder related actions.

Next, scroll the second ("Action") column until you see the "Ask for Finder Items" Action. Drag this Action to the rightmost window. Change the "Type" pull down to "Files and Folders." Type whatever prompt you want to appear in the dialog box

Click on the System Library in the left hand column. Now, drag the "Burn a Disc" Action to the rightmost column below the "Ask for Finder Items" Action already there. Name the Disc in the appropriate box.

Click on the Application folder in the Library column. Scroll the Actions column until you see the "Ask for Confirmation" Action. Drag this Action below the other two in the right hand window.

Your final Automation should like:



Choose "Save As..." from the File menu. Change the File Format to "Application." Click "Save."

Double click the resulting file to launch your new application. Choose a folder you want to back up. (Note it must have contents totaling less than 700 mb or 4.7 gb --the free space on the CD or DVD you are using for backup.)

Insert a Blank CD or DVD onto which to backup your data.

Check your CD or DVD to make sure, but your data should all be backup by your very own program!