

PRESENTATIONS FOR THE ONLINE APCUG SPEAKERS BUREAU

Francis Chao, a member of the [Tucson Computer Society](#) in Arizona, is prepared to present any of the following programs to your computer user group. Clicking on the titles of most of these presentations will open up the presentation slides in PDF format. However, most of Francis' presentations are live demonstrations of actual software and hardware with presentation slides only used to provide introductions and explanations of the live demonstrations.

- **"ZOOM" BASICS (E)**

"Zoom" is the best online conferencing system that has ever been developed. By using virtual machines to host a real 3-computer Zoom meeting inside a Zoom meeting, we will show you the basics that you need to know:

- Zoom account options
- Problems of running Zoom without an account
- Updating Zoom if you have an account
- Three types of zoom meetings
- Two ways of getting into a Zoom meeting
- Zoom meeting details
- Using the "Participants" list in Zoom
- Text "Chat" inside Zoom
- Using Zoom to send digital photos and files to other attendees
- Zoom keyboard short-cuts
- Muting and un-muting participants

- **USING "ZOOM" TO REMOTELY TAKE CONTROL OF SOMEONE ELSE'S COMPUTER (E)**

If you have the Zoom Meetings Client app or Zoom Cloud Meetings installed on your computer or mobile phone, and someone else has the Zoom Meetings Client installed on their computer, you can use Zoom to take control of the other person's computer remotely to show them something or even to repair their computer:

- A live demonstration of using Zoom to control someone else's computer (using two virtual computers for a Zoom session that is independent from the Zoom session that is being used for this presentation).
- Preparing your free or Pro Zoom account for remote access into other's computers
- Installing Zoom Meetings Client into someone else's computer
- Any attendee of your Zoom meeting can then initiate remote control of another attendee's computer

- **USING ZOOM'S "TAKE CONTROL" OR MICROSOFT'S "REMOTE ASSISTANCE" TO HELP SOMEONE WITH THEIR "WINDOWS.." COMPUTER (E)**

You can help other folks with their computers without catching any of their diseases! This presentation will consist of live demonstrations to show you how to use your "Zoom Meetings Client" or Microsoft's "Quick Assist" or Microsoft's "Remote Assistance" to help a Windows.. computer without being physically present at their home or business. Francis will use two virtual machines with each connected to a different Internet service provider to show you how these two remote control capabilities look from the standpoint of the helper's computer AND the helped person's computer.

- A live demonstration of Zoom's **"Take Control"** feature
- A live demonstration of the bundled **"Quick Assist"** in "Windows.."
- A live demonstration of the bundled **"Remote Assistance"** in "Windows.."

- **FREE SOFTWARE FOR EDITING VIDEO RECORDINGS (E)**

We have discovered three great free software programs for editing video recordings:

- "Microsoft Clipchamp" is bundled inside "Windows 11" , available in the Microsoft Store for "Windows 10", and available as a "Progressive Web App" for macOS and Linux.
- "Kdenlive" is a "Free and Open Source" app that runs in Windows.., macOS, and ..Linux
- "Videopad" by "NCH" is free for non-commercial home use
- Basic Information for Using Video Editing Apps (that is applicable to all three of the above three video editing apps) is available at http://aztcs.apcuq.org/meeting_notes/winhardsig/videoedit/3-videoedit-basics.pdf

- **FREE SOFTWARE FOR EDITING DIGITAL PHOTOS (E)**

We have discovered four great free software apps for editing digital photos:

- Microsoft's "Photos" is bundled inside Windows 11 and Windows 10
- "Google Photo" is a free "Web app that can be accessed from an Internet-connected Web browser
- "Adobe Photoshop Express" is a free app

- "GIMP" is a full-featured Free and Open Source app

- **AN INTRODUCTION TO "UBUNTU" LINUX FOR "WINDOWS.." USERS**

If you already are familiar with the "Windows.." desktop, it is easy to learn to get around in the "Ubuntu" desktop:

- OVERALL MENU:
In Windows.., clicking on the "Start" button results in the "Start" menu.
In Ubuntu.., clicking on the "Show Apps" button results in the "Apps List"
- "DESKTOPS AND APPS IN USE" MENU:
In Windows.., clicking on the "Task View" button shows all desktops in use and all apps running inside them.
In Ubuntu.., clicking on the "Activities" button shows all desktops in use and app apps running in them
- "FILE AND FOLDERS" MENU:
In Windows.., clicking on the "File Explorer" button shows all files and folders in all of the hard drives, solid state drives, CD drives, and DVD drives of the computer.
In Ubuntu.., clicking on the "Files" button launches the "Nautilus" app that shows all files and folders in all of the hard drives, solid state drives, CD drives, and DVD drives of the computer.

- **USING "UBUNTU" LINUX TO DO REAL WORK:**

- Using the free "Libreoffice" office suite to open and edit "Microsoft Office" files:
Cost savings from having to purchase "Microsoft Office".
The downside is that there are some compatibility issues when collaborating with "Microsoft Office" users.
- Attending Zoom meetings
- Using "XSane" (free) and "VueScan" (not free) to operate scanners.
Then using the free "GIMP" software to edit and crop scanned documents
- Using the free "Efax-gtk" app and a data/fax modem to send and receive faxes:
Requires that the outgoing file to be send out be in .PDF (=Adobe Acrobat" format or PS (=Postscript) format
- Using the free "Kaffeine" app and an over-the-air TV tuner to view local television channels:
Limited support for later model "Hauppauge" over-the-air TV tuners.
- Using a copy of "Windows 10" or "Windows 11" in a virtual machine to get around compatibility problems with Linux apps and Linux driver support.

- **[SELECTING AND INSTALLING A WIRELESS Wi-Fi ADAPTER FOR YOUR LINUX COMPUTER](#)** (E)

Adding a wireless Wi-Fi adapter for your Linux computer is a bit more of a challenge compared to doing so for a Windows.. computer so here is our advice:

- Driver challenges: in-kernel versus out-of-kernel drivers
- PCi versus PCIe versus USB adapters
- Terminal commands for diagnosing Wi-Fi adapters
- Some workarounds for networking idiosyncrasies for Ubuntu and Ubuntu-based distros

- **[SCANNING PAPER DOCUMENTS AND HARD-COPY PHOTOS WITH YOUR LINUX COMPUTER](#)** (E)

You can use your Linux computer to scan paper documents and hard copy photos to reduce the amount of paper that you store at your home or business:

- Using the "SANE" Web site to determine if the free "XSane" app will work with a specific model of scanner or multi-function printer
- Installing the "XSane" app
- Purchasing and installing the not-free "VueScan" app
- Terminal commands for diagnosing your scanner
- Use the free "GIMP" program to edit the document and photo files that are created by the "XSane" or "VueScan" apps
- Use a Windows.. virtual machine inside your Linux computer if you cannot get your scanner to work with the "XSane" program or if you do not want to buy the "VueScan" apps

- **[SENDING AND RECEIVING FAXES WITH YOUR LINUX COMPUTER](#)** (E)

You can use your Linux computer to send and receive faxes to avoid the expense of purchasing a fax machine:

- To send and receive faxes without resorting to the risks of using a Web-based fax service, you have to have either an old-fashioned voice-grade telephone line or a "Voice over IP" telephone line that is capable to faxing
- Some data/fax modems that work well with Linux
- Use your Nautilus or Thunar "file management" app to see if your Linux computer has recognized your data/fax modem
- Use terminal commands to test your data/fax modem after installing it
- Install the free "efax-gtk" app.

- Using the free "efax-gtk" app to receive faxes
- Using the free "efax-ftk" app to send faxes

- **RUNNING "UBUNTU" LINUX INSIDE A VIRTUAL MACHINE INSIDE AN EXISTING "WINDOWS.." OR "macOS" COMPUTER** (E)

You can run Ubuntu Linux or another other distribution of Linux inside a virtual machine inside various configurations of "virtual machine program" and host operating systems:

- Config. Option 1: Running "Ubuntu" Linux inside the not-free "VMware Fusion" (inside "macOS")
- Config. Option 2: Running "Ubuntu" Linux inside the not-free "Oracle VM VirtualBox" (inside "macOS")
- Config. Option 3: Running "Ubuntu" Linux inside the free "VMware Workstation Player" (inside "Windows..")
- Config. Option 4: Running Ubuntu Linux inside the "Parallels Desktop" (inside "macOS")

Our four criteria for evaluating the above "virtual machine program" and host operating systems are as follows:

- Criteria 1: Can print to a USB-attached printer?
- Criteria 2: Can make a wireless Wi-Fi connection using a USB Wi-Fi adapter?
- Criteria 3: Can use "XSane" or "VueScan" apps to scan using a USB scanner?
- Criteria 4: Can send and receive faxes using the "efax-gtk" app using a USB data/fax modem?

RESULTS AND CONCLUSIONS:

- Config. Option 1 was able to meet all 4 criteria
- All of the config. options were able to meet Criteria 1
- Config. Options 2, 3, and 4 failed for Criteria 2, 3, and 4

- **USING THE FREE "GIMP" APP AND A FLATBED SCANNER TO SCAN PAPER PHOTOS AND DOCUMENTS IN A "WINDOWS.." COMPUTER** (E)

You can get rid most paper records and documents by scanning them into a set of redundant hard drives. If you have a Windows.. computer and a flatbed scanner, you can download and install the free "GIMP" app to enable this amazing "spring cleaning" of most of the paper that you are currently storing in file cabinets and file boxes.

- **USING THE FREE "XSANE" APP AND/OR THE NOT-FREE "VUESCAN" APP AND A FLATBED SCANNER TO SCAN PAPER PHOTOS AND DOCUMENTS IN A "LINUX" COMPUTER" (E)**

You can get rid most paper records and documents by scanning them into a set of redundant hard drives. If you have a Linux computer and a flatbed scanner, you can download and install the free "XSane" app and/or obtain the not-free "VueScan" app to enable this amazing "spring cleaning" of most of the paper that you are currently storing in file cabinets and file boxes.

- **INSTALLING AN OVER-THE-AIR TV TUNER CONNECTED TO THE KAFFEINE APP RUNNING INSIDE "MX LINUX" OR "UBUNTU" (E)**

You can use install a Hauppauge USB tuner and then connect it to the Kaffeine app running inside "Ubuntu Desktop" Linux or "MX Linux.."

- Step 1: Parts and software needed
- Step 2: Hardware installation of the Hauppauge TV tuner
- Step 3: Install the Kaffeine app
- Step 4: Install drivers for the TV tuner
- Step 5: Scan for TV channels

- **INSTALLING THE FREE "ChromeOS Flex" INTO A COMPUTER TO MAKE IT INTO A DO-IT-YOURSELF "CHROMEBOOK" (E)**

You can extend the useful life of an older Windows, Mac, or Linux computer by installing "ChromeOS Flex" into it. "ChromeOS Flex" is a non-open-source distribution of Linux that is totally free from the Google company.

- BIG STEP 100: Locate or install the Google Chrome Web browser in a Windows 10 computer
- BIG STEP 200: Install the "Chromebook Recovery Utility" extension into the Google Chrome Web browser
- BIG STEP 300: Use the "Chromebook Recovery Utility" to install the "Chromebook Flex" installation media onto a USB flash drive
- BIG STEP 400: Move the USB flash drive into the computer that you wish to install "ChromeOS Flex" into
- BIG STEP 500: Make the USB flash drive boot up the computer that you wish to install "ChromeOS Flex" into, etc.
- "ZOOM Meetings app for ChromeOS" is no longer available as of March 2023 ! "Zoom Meetings" is now offered as a "Progressive Web App" extension inside the bundled "Chrome Web Browser" inside "ChromeOS" inside all "Chromebooks".

- **"FIXED WIRELESS ACCESS" FOR LOW-COST HOME INTERNET SERVICE** (E)

"T-Mobile", "AT&T Wireless", "Verizon" and other cell phone companies are rapidly introducing low-cost "Fixed 5G Access" for homes across the U.S. This presentation will consist of a live demonstrations of a "T-Mobile Home Internet" connection and a "Verizon Home Internet" connectin

- Our speed comparison of "T-Mobile Home Internet" and "Verizon Home Internet" is available at
http://aztcs.apcug.org/meeting_notes/winhardsig/cell-phones/FWA/T-Mobile-vs-Verizon-FWA.pdf

To get a quality Internet connection from an MNO or an MVNO, you need to be located less than 3 miles from one of their cell towers. Use the two mapping sites together, as explained at

http://aztcs.apcug.org/meeting_notes/winhardsig/cell-phones/FWA/cell-towermaps.pdf

- To get a quality Internet connection from an MNO or an MVNO, you need to be located less than 3 miles from one of their cell towers. Use the two mapping sites together, as explained at
http://aztcs.apcug.org/meeting_notes/winhardsig/cell-phones/FWA/cell-towermaps.pdf
- You can spend some money and follow the instructions at the waveform.com Web site to procure and retrofit an external "donor antenna" for a "Fixed Wireless Access" gateway device to get it to work, if your current location does not have enough of a 5G cellular signal as explained at
http://aztcs.apcug.org/meeting_notes/winhardsig/cell-phones/FWA/donorantennas.pdf

- **USING "WINDOWS FAX AND SCAN" TO SEND AND RECEIVE FAXES IN WINDOWS 11, 10, 8.1, OR 7 (E)**

1-[Basic information about using a data/fax modem in a computer](https://aztcs.apcug.org/meeting_notes/winhardsig/add-ons/fax/1-WFS-basic-info.pdf)

2-[Fax modem installation](https://aztcs.apcug.org/meeting_notes/winhardsig/add-ons/fax/2-WFS-installation.pdf)

3-"Windows Fax and Scan" is bundled into all Windows 8.1 or 7 computers.

However, if you need to install in or re-install it, you can follow the instructions at

https://aztcs.apcug.org/meeting_notes/winhardsig/add-ons/fax/3-WFS-install-Win8or7.pdf

4-"Windows Fax and Scan" is not bundled into Windows 11 or 10 computers.

To get it installed, you can follow the instructions at

https://aztcs.apcug.org/meeting_notes/winhardsig/add-ons/fax/4-WFS-install-Win10or11.pdf

5-Before you can start using "Windows Fax and Scan" to send or receive faxes, you have to configure it

as described -step at

https://aztcs.apcug.org/meeting_notes/winhardsig/add-ons/fax/5-WFS-configuring-Win.pdf

6-You can use HP's free "Fax Test" service to test any fax modem, stand-alone fax machine, or online fax service

as explained at

https://aztcs.apcug.org/meeting_notes/winhardsig/add-ons/fax/6-HP-Fax-Test.pdf

7- Using "Windows Fax and Scan" to send and receive faxes

is explained at

https://aztcs.apcug.org/meeting_notes/winhardsig/add-ons/fax/7-WFS-using-in.pdf

8-After sending a fax with "Windows Fax and Scan", you can create a detailed confirmation report

as explained at

https://aztcs.apcug.org/meeting_notes/winhardsig/add-ons/fax/8-WFS-confirmation-reports.pdf

9-You can avoid paying monthly "long distance service" charges for faxing to fax machines outside of your local calling area by using a low-cost AT&T telephone calling card with your fax machine or fax modem

as explained at

https://aztcs.apcug.org/meeting_notes/winhardsig/add-ons/fax/9-calling-card-faxing.pdf

- **WAYS TO LEARN LINUX BY RUNNING LINUX INSIDE YOUR EXISTING "WINDOWS.." COMPUTER (E)**

There are five ways for you to learn to install and use Linux from inside your current Windows.. computer. This presentation is a demonstration of the four ways in order of the level of difficulty:

- Use **"Windows Subsystem for Linux"** to operate Linux from a "Windows Terminal" or "PowerShell" command line
- Use a complete copy of Linux running inside a "Virtual Machine" inside the free **"Oracle VM Virtualbox"** "virtual machine program" running inside your existing "Windows.." computer
- Use a complete copy of Linux running inside a "Virtual Machine" inside the free **VMware Workstation Player"** "virtual machine program" running inside your existing "Windows.." computer
- **Dual boot** between your existing copy of "Windows.." and Linux with both operating systems residing on your existing Solid State Drive or Hard Drive
- **Add a new Solid State Drive (SSD) or hard drive that runs Linux** to your existing "Windows.." computer

- **USING "WINDOWS SUBSYSTEM FOR LINUX" TO OPERATE LINUX FROM A "WINDOWS TERMINAL" OR "POWERSHELL" COMMAND LINE (E)**

"Windows Subsystem for Linux" ("WSL") is now sufficiently developed enough for you to use it to learn how to run Linux and Linux apps from inside your beloved Windows 10 or Windows 11 computer. This presentation will demonstrate in great detail exactly how you can use "WSL" as training wheels to take advantage of the greater security and cost savings of the Linux environment. The basic steps for installing and using "WSL" are as follows:

- BIG STEP 100: Prepare your Windows 10 or 11 computer for WSL
- BIG STEP 200: Install WSL from the Microsoft Store
- BIG STEP 300: Install Linux apps from the "WSL" command line
- BIG STEP 400: Install the XFCE "Desktop" GUI

- **CELL PHONE TETHERING (E)**

If your smart 5G-capable "Android" or "iPhone" cell phone has a "data plan" or a wireless connection to a "Wi-Fi router", it can be "tethered" to a computer, a tablet, another cell phone or to a router .

- When you do so, your smart Android or iPhone cell phone can provide Internet access to the computer, tablet, another cell phone, or to a router.
- Your 5G cell phone can be your main Internet provider for your computer or it can be set up as a redundant "hot standby" or a "cold standby" Internet provider for a computer.
- However, most cell phone services "throttle" down your upload and download speeds after you reach a certain amount of "usage" during each calendar month or billing month
- Using a cell phone as the Internet connection for a computer is much safer relative to using a public Wi-Fi hotspot

More detailed demonstrations and presentations about cell phone tethering are available:

2-Using a Wi-Fi "hotspot" emanating from an iPhone to provide an Internet connection for a "Windows.." computer is available at

https://aztcs.apcug.org/meeting_notes/winhardsig/cellphones/tethering/2-tethering-Win-iPhone-Wi-Fi.pdf

3-Using a Wi-Fi "hotspot" emanating from an Android cell phone to provide an Internet connection for a "Windows.." computer is available at

https://aztcs.apcug.org/meeting_notes/winhardsig/cellphones/tethering/3-tethering-Win-Android-cell-Wi-Fi.pdf

4-Using a USB cable so that a Android cell phone can provide an Internet connection for a "Windows.." computer is available at

https://aztcs.apcug.org/meeting_notes/winhardsig/cellphones/tethering/4-tethering-Win-Android-cell-USB.pdf

5-Using a Bluetooth connection so that an Android cell phone can provide an Internet connection for a "Windows.." computer is available at

https://aztcs.apcug.org/meeting_notes/winhardsig/cellphones/tethering/5-tethering-Win-Android-phone-Bluetooth.pdf

6-Using a "Lightning-to-USB" cable to so that an "iPhone" can provide an Internet connection for a "Windows.." computer is available at

https://aztcs.apcug.org/meeting_notes/winhardsig/cellphones/tethering/6-tethering-Win-iPhone-USB.pdf

7-Using a "Lightning-to-USB" cable to so that an "iPhone" can provide an Internet connection for a "MacOS" computer is available at

https://aztcs.apcug.org/meeting_notes/winhardsig/cellphones/tethering/7-tethering-MacOS-iPhone-USB.pdf

8-Using a USB-C wired Ethernet adapter to so that an Android cell phone can provide an Internet connection for a "Windows.." computer

is available at

https://aztcs.apcug.org/meeting_notes/winhardsig/cell-phones/tethering/8-tethering-Win-Android-cell-USB-C-Enet-adapter.pdf

- **REPLACING A SATA SSD WITH A M.2 SSD (E)**

This presentation will consist of an illustrated description of my experience with replacing a 3 1/2-inch SATA SSD in Windows 10 computers with a M.2 NVME SSDs:

- Original 3 1/2-inch SATA hard drives compared to the M.2 SSDs
- Speed advantages of M.2 SATA SSDs over M.2 NVME SSDs
- S.M.A.R.T. temperature readings can reveal problems such as speed throttling caused by overheating M.2 SSDs
- Passive heat sinks and silicon rubber pads are sometimes adequate for heat dissipation
- Fan-based active M.2 cooling devices are often required for heat dissipation of M.2 SSDs
- Most computers that we added M.2 SSDs to did not provide enough space for passive heat sinks and/or fan-based heat sinks for M.2 SSDs. We ended up using M.2 extension adapters to resolve these deficiencies.
- All of the external M.2 enclosures that we tested cause their enclosed M.2 SSDs to overheat. Because of this, we had to add passive heat sinks and/or fan-based heat sinks to external M.2 enclosures.

- **RELOCATE YOUR DOCUMENT FILES AND DIGITAL PHOTOS TO A BIGGER DRIVE IN A "WINDOWS.." COMPUTER (E)**

"Windows.." defaults to storing your document files and digital photos on your relatively small "solid state drive" which will fill up fast. The procedure for making "Windows.." store your files on a larger hard drive is easy but not intuitive.

- "Windows.." defaults to storing your digital files and photos in **"Known Folders"**
- A "Known Folder" is not a real folder since a "Known Folder" is a pointer to a real folder
- The "Known folders" are "Desktop", "Documents", "Downloads", "Music", "Pictures", and "Videos"
- Most computer users will want to re-point some of their "Known Folders" from the C: drive to a larger hard drive or a larger solid state drive (= "SSD")
- Make a new folder for the location of the "Known Folder" that you wish to relocate
- Then right-click on the specific "Known Folder" that you want to move
- Click on "Properties" in the pop-up utility menu

- Then use the "Location" tab of the "Known" folder to make the move to the new location

- **FOUR TYPES OF SOFTWARE APPS IN A WINDOWS.. COMPUTER..**

(E)

There are four types of software apps in "Windows 11" or "Windows 10" computer:

"desktop apps",

"Windows apps",

"portable apps",

and

"Progressive Web Apps".. (PWAs)

- Examples of each of the four types of apps
- Determine the type of app for any specific app in your computer
- Uninstalling the four types of apps
- Making a shortcut for a "Windows App"
- Placing a shortcut for a "Portable App" into the "Start Menu" of "Windows.."

- **INSTALLING "CAT 8" CABLING--A DO-IT-YOURSELF GUIDE (E)**

This presentation will consist of practical guide for installing "Category 8" cabling for your home or business network: ○ Why you should use "Cat 8" instead of "Cat 5", "Cat 6", or "Cat 7"

- During installation or storage, use plastic jack-to-jack connectors to protect the ends of "Cat 8" cables that are already terminated with "RJ45" plugs
- When "Cat 8" cables are in actual use, use metal jack-to-jack connectors
- Use short runs of flat "Cat 8" cables under carpets that have a lot of foot traffic
- Use "Cat 8" "RJ45" plugs and jacks that do not require crimpers ○ Migrate existing legacy "Cat 5", "Cat 6", and "Cat 7" networks by gradually replacing existing cable runs with "Cat 8" cables
- Use ink-holding 145 sized C tags to identify cable ends instead of nylon cable tie tags
- Use white HellermannTyton cable ties to avoid using cheaper generic cable ties
- Use fire stop pillows to plug up through-wall holes after installing "Cat 8" cables through them
- Use white split corrugated tubing and/or soft cable sheathing to protect exposed "Cat 8" cables

- Use state-of-the-art "Powerline Networking" links in areas where "Cat 8" cables cannot be installed

- **INSTALLING CAT 5 OR 6 OR 7 CABLING--A DO-IT-YOURSELF GUIDE (E)**

This presentation will consist of practical guide for installing "Category.. " cabling for your home or business network:

- A comparison of Cat 5, 6 and 7 cabling
- The hardware costs are miniscule compared to the labor and equipment costs of the various levels of Cat.. cabling
- Use self-taping screws instead of staples and nails to hold up cable holding devices.
- Protect any exposed Cat.. cabling with corrugated "split tube" channels, especially if you have pets that have teeth.
- Unless your local electrical code prohibits it, you can usually install Cat.. cabling through holes in walls: Use neat-looking "through wall" hardware and plug up the through-wall hardware with "fire stop" pillows
- Use long drill bits to put angled holes inside of walls but avoid drilling into existing 110 Volt, 220 Volt, and power-limited "low-voltage" cabling.
- Avoid drilling holes into carpets: the results will be a mess !
- During installation or storage, use plastic jack-to-jack "keystone" connectors to protect the ends of "Cat 8" cables that are already terminated with "RJ45" plugs
- Pass-through RJ45 plugs are much easier to install than the conventional ones
- Pass-through RJ45 crimpers can crimp both conventional RJ45 plugs and passthrough RJ45 plugs
- Do not use shielded RJ45 pass-through plugs with unshielded Cat.. cabling: Doing so will often result in intermittent RJ45 plugs--Do the wiggle test after installing any RJ45 plug !

- **USING A "WINDOWS 11 OR 10" COMPUTER, OR A "LINUX" COMPUTER TO TAKE FULL CONTROL OF AN ANDROID CELL PHONE (E)**

This presentation will consist of several live demonstrations of using a Windows 11 or 10 computer or a "Linux" computer to take full control of an Android cell phone: Using two no-cost software apps, an Android phone will show up in a Windows 11 or 10 computer or in a Linux computer as a window that looks exactly like the screen of the Android phone. From this window inside your "Windows.." computer or you can take or make cell phone calls and text messages. From this window inside your "Windows.." or Linux, you can get to use of the apps inside your Android cell phone. trtruter to take complete control of an Android cell phone

- Using the free "Phone Link" app in a Windows 10 or 11 computer to take complete control of an Android cell phone
- Using the free "scrcpy" app in a "Linux" computer to take complete control of an Android cell phone

- **DUAL BOOTING BETWEEN WINDOWS 10 or 11 AND LINUX (E)**

If you configure an existing Windows.. computer so it has both Windows.. and Linux on it, you can boot whichever of the two operating systems is best for a specific task. The net result is that, at any single point in time, you can run either Windows.. or Linux, but not both at the same time.

- If Windows 10 or 11 is not already installed, install it first using a bootable installation media CD from Microsoft's "Media Creation Tool" Web pages
- Download the installation .ISO file from the Web site of the desired Linux distribution
- Boot up your computer using the bootable live CD, bootable live DVD, or the bootable USB thumb drive that you created from the installation .ISO file of the desired Linux distribution
- At the step where the Linux installation wizard partitions shrinks down the existing Microsoft C: drive partition of your SSD or HD to create a new EXT partition(s) for the Linux operating system, determine how large of a bootable Linux EXT partition and how small of a bootable Windows NTFS partition that you wish to have
- You can use the Clonezilla bootable live CD to clone or create a back up image of a dual boot SSD or HD
- You can use "Macrium Reflect Free" in a separate Windows 10 or 11 computer to clone or create a "back up image" of a dual boot SSD or HD
- Procedure for rebooting from Windows.. into Linux..
- Procedure for rebooting from Linux into Windows..
- Use the free "GRUB Customizer" app from inside Linux to configure the GRUB bootloader that provide you the initial dual boot menu when you start up or restart the computer
- Some recoverable annoyances when sometimes occur when you use Linux to access an NTFS hard drive that "belongs" to the Windows.. operating system: Use "Error checking" in "Disk Management" in "Windows.." to fix a NTFS drive or drive partition that is "unreadable" by "File Explorer" in "Windows.." after you have used Linux to access the "NTFS drive partition

- **A DEMONSTRATION OF THE MOST POPULAR LINUX DISTRIBUTIONS (E)**

To help you pick a Linux distribution, here are short demonstrations and descriptions of the twelve most popular distributions of Linux:.

- **"MX Linux"**
- **"EndeavourOS"**
- **"Linux Mint"**
- **"Manjaro"**
- **"Pop!_OS"**
- **"Ubuntu"**
- **"Fedora"**
- **"Debian"**
- **"OpenSUSE Tumbleweed"**
- **"Garuda"**
- **"Linux Lite"**
- **"Endless OS"**

For each of these Linux distributions, we will attempt to show you the following apps:

- **"Zoom Meetings Client"**
- **"LibreOffice"**
- **"Mozilla Firefox"**
- **"Kaffeine" live over-the-air television**

- **SWITCHING FROM WINDOWS 10 OR 11 TO LINUX AND THEN BACK TO WINDOWS.., ETC (WITHOUT DUAL BOOTING) (E)**

If you configure an existing Windows.. with a second SSD that runs Linux and put in some hardware for switching between the existing "Windows.." SSD and the newlyinstalled Linux SSD, you can boot whichever of the two operating systems is best for specific task. The net result is that, at any single point in time, you can run either Windows.. or Linux.., but not both at the same time.

- Installing an M.2 extension to move the M.2 SSD outside of a laptop
- Installing an M.2 extension to move the M.2 slot outside of a desktop computer
- Installing an M.2 to SATA data converter to get more SATA data ports for a desktop computer
- Installing a SATA data cable for use of a SATA data port outside of a desktop computer
- Installing a separate SSD for Linux for your existing Windows.. computer.
- Installing the Linux operating system using a DVD or CD OR a bootable flash drive
- Procedure for starting up the computer in Windows..
- Procedure for starting up the computer in Linux..
- Procedure for rebooting from Windows.. into Linux..
- Procedure for rebooting from Linux into Windows..
- Some recoverable annoyances when sometimes occur when you use Linux to access an NTFS hard drive that "belongs" to the Windows.. operating system: Use "Error checking" in "Disk Management" in "Windows.." to fix a NTFS drive or drive partition that is "unreadable" by "File Explorer" in "Windows.." after you have used Linux to access the "NTFS drive partition

- **POWERLINE NETWORKING (E)**

Powerline Networking is now as fast as wired Ethernet cabling if: you use the latest models of Powerline Networking adapters and if you learn little about electrical circuit breaker panels:

- Live demonstration of a real state-of-the-art Powerline Networking connection ○ Only buy the latest models of HomePlug and/or G.hn powerline adapters ○ Use

- trial-and-error or circuit breaker analysis to avoid slowdowns caused by your electrical circuit breaker panel
- Use a different powerline standard than your neighbors to avoid interference

- **INSTALLING AN OVER-THE-AIR TV TUNER CONNECTED TO THE "WINTV" APP RUNNING INSIDE "WINDOWS 11", "WINDOWS 10", OR "WINDOWS 7" (E)**

You can use install a Hauppauge USB tuner and then connect it to Hauppauge's "WinTV" app to have a fully-functional over-the-air television and program recorder inside your "Windows 11", "Windows 10" or "Windows 7" computer

- Step 1: Parts and software needed
- Step 2: Hardware installation of the Hauppauge TV tuner
- Step 3: Install the Kaffeine app
- Step 4: Install drivers for the TV tuner
- Step 5: Scan for TV channels

- **USING A SMART CELL PHONE TO ACCESS A "WINDOWS.." COMPUTER (E)**

This presentation will consist of live demonstrations to show you how to use your Android cell phone or iPhone to access your "Windows.." computer.

- Use Microsoft's "Remote Desktop Connection" app in your cell phone to take control of your "Windows.." computer if your "Windows.." computer is running
"Windows 10 Pro" or "Windows 11 Pro"
- Use the "VNC" app's free "Viewer" in your cell phone to take control of your "Windows.." computer, if your "Windows.." computer is running
"Windows 10 Home", "Windows 10 Pro", "Windows 11 Home", or
"Windows 11 Pro"

- **EXTENDING YOUR WIRED AND/OR WIRELESS LOCAL NETWORK (E)**

This presentation will consist of live demonstrations to show you how to extend the reach of your wired or wireless local network.

- Using Cat 5 or Cat 5e or Cat 6 or Cat 7 or Cat 8 cabling to make a wired extension
- Using **HomePlug AV** or **G.Hn** power line networking to utilize the existing AC power cabling in your home or business to extend your local network
- Using "**Multimedia Over Coax Alliance**" (**MoCA**) devices to extend an existing wired Ethernet network or an existing wireless Wi-Fi network
- Using Wi-Fi boosters, extenders, and mesh devices to extend a wireless Wi-Fi network
- Using multiple low-cost routers and combining them with Cat 5/5e/6/7/8 cabling and/or HomePlug and/or G.Hn power line networking
- Using multiple routers to protect your important computer assets from the security weaknesses of "Internet of Things" devices
- Using a tethered cell phone as a main or backup Internet provider
- Using a "Fixed 5G" Internet connection as a main or backup Internet provider
- For the frugal computer user, the cheapest way to extend a wired or wireless local network is usually to purchase a second router and connect it to the existing router with a power-line link or a Cat 5/6/7/8 "Ethernet" wire

- **UNDERSTANDING AND TROUBLESHOOTING Wi-Fi EXTENDERS AND Wi-Fi MESH NETWORKS(E)**

This presentation will consist of live demonstrations to show you how "Wi-Fi Extenders" and "Wi-Fi Mesh Networks" operate.

Knowledge is power: If you understand how they work, you can configure and move these devices so that they provide your home or business with faster Internet and local network speeds and better spatial coverage for both Wi-Fi and wired Ethernet access.

- Use the free versions of "Acrylic Wi-Fi" and "Netspot" to evaluate the signal levels of your Wi-Fi router(s), your Wi-Fi extenders, and your Wi-Fi mesh "nodes"
- A live demonstration of a mesh-capable Wi-Fi router and a mesh Wi-Fi "extender with "handoffs" as you move a cell phone, tablet, or laptop between the coverage areas of the two devices
- Determine the existing coverage "circles" of your existing Wi-Fi router(s), your Wi-Fi extenders, and your Wi-Fi mesh "nodes"
- Move your Wi-Fi devices to avoid overlap for their coverage "circles"
- Determine if any wireless "backhaul" connections are causing significant slowdowns in your Internet and local network speeds
- Install temporary or permanent Cat 5/6/7/8 cables or later-model powerline links to remedy any wireless "backhaul" connections are causing significant slowdowns in your Internet and local network speeds.
- Determine if additional Wi-Fi extenders and Wi-Fi mesh nodes are needed to provide coverage for existing "dead spots".
- Make use of old Wi-Fi routers or additional low-cost routers to extend your current Wi-Fi coverage instead of purchasing more expensive Wi-Fi extenders or Wi-Fi mesh units

- **INSTALLING A "Wi-Fi 6" ADAPTER OR A "Wi-Fi 6E" ADAPTER TO SPEED UP THE WIRELESS Wi-Fi CONNECTION OF YOUR COMPUTERS, YOUR TABLETS, AND YOUR CELL PHONES (E)**

You can usually speed up your Windows.. or ..Linux.. computer's wireless Wi-Fi connection by installing a USB "Wi-Fi 6" adapter or a PCIe "Wi-Fi 6E adapter as explained at

http://aztcs.apcug.org/meeting_notes/winhardsig/networks/4-USB-Wi-Fiadapters.pdf

for advice on USB "Wi-Fi 6" adapters

and

https://aztcs.apcug.org/meeting_notes/winhardsig/networks/Wi-Fi/Win11-to-WiFi6E.pdf

for advice on PCIe "Wi-Fi 6E" adapters

- **LOCAL NETWORK STRATEGIES** (E)

Judicious use of modern local networking technologies can make your home network faster, more efficient, more reliable, and less expensive.

- Two Guiding Concepts: Internet bandwidth speed and Local Network speed
- Wired networking options: Cat 5/6/7/8 cabling, AC Powerline "Homeplug AV" and "G.hn", and Multimedia Over Coax Alliance (MoCA)
- Wireless networking options
- All of the above non-cabling options are now as fast as Cat 5/6/7/8 cabling

- **USING MULTIPLE INTERNET PROVIDERS ON THE SAME COMPUTER** (E)

For any single Windows.., macOS.., or Linux.. computer, you can provide more than one broadband Internet connection. This broadband redundancy will increase the overall reliability of your Internet access, decreasing the probability of the failure of your online activities such as participation in Zoom meetings.

- Internet Providers That You Might Have Or Can Get:
 - Traditional cable modem providers
 - DSL from telephone companies
 - "Fixed Wireless Access" is a low-cost Internet option from cellular providers
- Using Up to Three Internet Connections For Your Computer
- Do Not Use Both Wired and Wireless Connections At The Same Time
 - "Speedtest" and "Speakeasy" Speed Tests Yield Synergistic Internet Speeds With Multiple Internet Providers

- **FREE ALTERNATIVES TO "MICROSOFT OFFICE"** (E)

This presentation will consist of live demonstrations of two alternative software programs that are free alternatives to the not-free "Microsoft Office" suite of not-free software programs. We will compare each of these free software programs to the latest version of "Microsoft 365" to give you an idea of whether you can stand the incompatibilities with the not-free "Microsoft Office" programs that the freebies are analogous with:

- A live demonstration of Softmaker's "**FreeOffice**" compared to "**Microsoft 365**"
- A live demonstration of The Document Foundation's "**LibreOffice**" compared to "**Microsoft 365**"

- **A DEMONSTRATION OF FASTER Wi-Fi TECHNOLOGIES** (E)

If you think that Wi-Fi is much slower than wired Ethernet connections, then you have not been keeping up with the massive improvements that have been made in the past four years. Most home and small business owners are still stuck on the super-slow 802.11N speed which is also known as Wi-Fi 4. This presentation will be a live demonstration and comparison of Wi-Fi 5, Wi-Fi 6, and Wi-Fi 6E. These relatively recent improvements in Wi-Fi technologies will improve the speed and reliability of your wireless computers, tablets, cell phones, cameras, and other wireless devices:

- A live demonstration of Gigabit Ethernet (for comparison)
- A live demonstration of legacy 802.11N (= Wi-Fi 4)
- A live demonstration of 802.11AC (= Wi-Fi 5)
- A live demonstration of 802.11AX at 5 Gigabits per second (= Wi-Fi 6)
- A live demonstration of 802.11AX at 6 Gigabits per second (= Wi-Fi 6E)
- A live demonstration of using all three Wi-Fi frequency bands (2.45 GHz, 5 GHz, and 6 GHz) simultaneously in a high-end router in order to provide better video surveillance, Wi-Fi cell phone and tablet support, and faster Internet access for your computers--all at the same time

- **"MX Linux" (E)**

"MX Linux" is a distribution of Linux that is relatively easy for users of "Windows 11" and "Windows 10" to learn:

We have a copy of "MX Linux" running inside a "virtual machine" in a real Windows.. computer.

Unlike Microsoft's "Windows 11", the "..lite" version of "MX Linux" can run in extremely low-end computer hardware.

We will demonstrate "MX Linux" running inside a "VMware" virtual machine inside a modest "Windows 10" computer. This virtual machine is running inside "VMware Workstation 16 Player" which is free for private, in-home use.

We will also demonstrate "MX Linux" running inside a "VirtualBox" virtual machine inside a modest "Windows 11" computer. This virtual machine is running inside "Oracle VM Virtual" which is also free for private, in-home use.

- **"WINDOWS.." OPERATING SYSTEM NUMBERING (E)**

This presentation will consist of a live demonstration of how you can determine the exact Microsoft product number of the version of Windows.. that your computer is running.

- Basic terminology of Windows.. product numbers
- Ways to determine the exact Microsoft product number

- **USING A "WINDOWS 11" OR "WINDOWS 10" COMPUTER TO TAKE FULL CONTROL OF AN ANDROID CELL PHONE** (E)

This presentation will consist of several live demonstrations of using a "Windows 10" computer to take full control of a Android cell phone:

Using two free techniques, an Android phone will show up in a "Windows 10" computer as a window that looks exactly like the screen of the Android phone.

From this window inside your "Windows 10" computer, you can take or make cell phone calls and text messages. From this window inside your "Windows 10" computer, you can get to any of the apps inside your Android cell phone. Using the mouse, keyboard, and/or track pad of your "Windows 10" computer, you can respond to text messages many times faster than you can from the screen of your Android cell phone:

- A live demonstration showing the use of the bundled "Your Phone Companion" app in "Windows 10" to take complete control of an Android cell phone that is running Microsoft's free "Your Phone Companion" app.
- A live demonstration showing the use of a free "VNC" client in a "Windows 10" computer to take complete control a an Android cell phone that is running the free "Droid VNC Server" app

- **Wi-Fi 6E** (E)

Even before the Covid pandemic, the 2.45 Gigahertz and the 5 Gigahertz radio frequency bands usually have been, and are still often, jam-packed with more users and devices that they can carry. In March 2020, the FCC opened up the 6 Gigahertz radio frequency bands for use by Wi-Fi use. This huge new set of channels will make computers, cell phones, tablets, and associated routers run faster and more reliably.

- Three Radio Frequency (RF) Bands for Wi-Fi are 2.45 GHz, 5 GHz, and 6 GHz
- Some Terminology for Wi-Fi 6E
- Technological Challenges
- Wi-Fi 6E Cell Phones
- Wi-Fi 6E Routers
- Only Easy Way to Get Wi-Fi 6E Running
- Three Ways to Get Wi-Fi 6E for a Windows computer
- Using all three Wi-Fi Radio Frequency bands at the same time to get faster and more reliable use of you broadband and "Wireless Fixed Access" Internet service.

- **USING A WEBCAM TO SPY ON SOMETHING** (E)

This presentation will consist of several live demonstrations of real and virtual Webcams with extensive how-to documentation on installing for each type of Webcam:

- Using Remote Access To View and Control Cameras Located On Other Computers On Your Local Network
 - TightVNC's free "VNC Server" and UltraVNC's "VNC Viewer"
 - Microsoft's bundled "Remote Access Protocol"
- Using a Cell Phone as a Webcam
 - for a "Windows.." computer
 - for a macOS computer
- Using Skype's Auto-Answer Capability to communicate with your dog, cat, or a small child
- Using a "Wyze Cam" to Send Video Motion Alerts, Perform Video Motion Recordings, View Video On Demand, and Do 24-hour Video Recordings
- Using "Contacam" to Send Video Motion Alerts to your Cell Phone(s) and Email Addresses

- **CLONING A SOLID STATE DRIVE FOR YOUR WINDOWS COMPUTER** (E)

Cloning

An SSD is one way to proactively back up your data files and provide for a quick repair when a bootable SSD fails in the (soon, near) future! The process of procuring a new, blank SSD and cloning it from an existing source SSD is also a great way to provide more usable storage space in your existing Windows computer.

- Free cloning apps versus non-free cloning apps
- Selecting a new SSD to purchase
- Preparing a new SSD to be a clone target
- Preparing the old existing SSD to be the clone source
- Two ways to clone SSDs
- Using the cloning app
- After cloning an SSD, do not try to boot up your Windows.. computer with both the original source SSD and the new target SSD attached at the same time
- After cloning an SSD, you can use "Disk Management" to expand C: partition of the newly-created target SSD

- **GOOGLE ACCOUNTS, GOOGLE BRAND ACCOUNTS, AND YOUTUBE CHANNELS (E)**

To make the best use of your Google Account and YouTube channels, this presentation explains their relationships:

- Two kinds of channels at YouTube
- YouTube is a wholly-owned but independently-operated subsidiary of Google
- "Personal channel" is automatically made at YouTube.com if you first log into any Google service
 - When you go to youtube.com/accounts, and you attempt to create a new channel, you create both a new Brand account at Google AND a new channel with a business or other name at YouTube
- Despite the above complexity: a Google account lets you access a Google Brand account which then lets you access a YouTube channel with a business or other name. However, you do not access them in that order.

- **MX LINUX (E)**

MX Linux has risen to the top in popularity according to Distrowatch.com: MX Linux is a mid-weight distribution (distro) that runs faster and is much easier to configure and use relative to the other popular Linux distros. ○ MX Linux is a super-configurable, fast, mid-weight Linux distribution that you can use either in a virtual machine or as the actual operating system for a PC

- A Quick Demo of MX Linux
- System Requirements for MX Linux
- Installing MX Linux
- XFCE Desktop Environment is Default for MX Linux
- Panel is Part of XFC Desktop Environment
- Thunar File Manager on the Panel
- Whisker Menu launcher on the
- Panel Apps
- LibreOffice is the default free office suite but you can install and Use FreeOffice for an easier initial learning experience

CELL PHONE BASICS (E)

Your iPhone or Android mobile phone is actually 6 separate radio transmitter-receivers in a very compact device. If you get a working understanding of the details of these 6 transmitter-receivers, you can make better use of your mobile phone and save money:

- 6 transmitter-receivers in an iPhone or Android cell phone:
 - Cellular transceiver,
 - Wi-Fi transceiver, Global navigation Satellite System (GNSS) receiver = GPS, etc.),
 - Bluetooth transceiver,
 - Near-field Communication (NFC)
 - and
 - FM radio receiver
- Not having a data plan so that Wi-Fi is the cell phone's only Internet connection
- Having a data plan but using mainly Wi-Fi for the cell phone's Internet access
- Various apps use different combinations of the 6 transmitter-receivers
- Use the "MyGPSCoordinates" and/or "GPS Status" apps to get your latitude/longitude location from the GNSS receiver
- "Cellular 911"
- 3G shutdown
- Cell phone tracking

- **CELLULAR SERVICE ANALYSIS (E)**

Knowledge is power:

By using various Websites before you buy a cell phone or a cell phone service AND by using various cell phone apps after you buy the phone or service, you can get better service at a better price:

- Use the "nPerf" Web site and the "nPerf" app to get a streetlevel map to show which cell carrier has 5G, 4G/LTE, 3G, or 2G service:
 - See
 - http://aztcs.apcug.org/meeting_notes/winhardsig/cell-phones/5Gvs4Gmaps.pdf
- Use the "Cellmapper" app to determine whether your cell phone running is 5G, 4G/LTE, 3G, or 2G:
 - See
 - http://aztcs.apcug.org/meeting_notes/winhardsig/cellphones/cellphonerunning5Gor4G.pdf
- Use the "Opensignal" app to determine the location and direction of the cell tower site that a cell phone is connected to: See http://aztcs.apcug.org/meeting_notes/winhardsig/cell-phones/Opensignal-towermap.pdf

- **5G EMERGING TECHNOLOGY IN THE UNITED STATES (E)**

Here is a quick, concise summary about 5G at the present time:

- Advantages of 5G
- 5G is actually called "5G NR" which stands for "5G New Radio"
- "5G NR" is available in two flavors: "5G Non-standalone" ("5G NSA") and "5G SA" ("5G Stand Alone")
- Use apps to determine which flavor your 5G cell phone is using
- 5G uses 3 radio frequency "clusters": Low band, Mid-band, and High band
- 5G marketing terminology is explained at:
https://aztcs.apcug.org/meeting_notes/winhardsig/cell-phones/4-5Gmarketing.pdf
- 5G "Fixed Wireless Access" will provide lower-cost broadband Internet access compared to traditional cable company modems, telephone company DSL, "Fiber to the Home", "Fiber to the Curb" and as explained at
https://aztcs.apcug.org/meeting_notes/winhardsig/cell-phones/FWA/20-5G-FWAhome.pdf
- Use the "nPerf" Web site and the "nPerf" app to get a streetlevel map to show which cell carrier has 5G, 4G/LTE, 3G, or 2G service at a specific location as explained at
http://aztcs.apcug.org/meeting_notes/winhardsig/cell-phones/5Gvs4G-maps.pdf

- **USING VIRTUAL MACHINES IN FREE VIRTUAL MACHINE PROGRAMS IN A REAL COMPUTER (E)**

If you install a free "Virtual Machine Program" into an existing Windows computer or a macOS computer or a Linux computer, you can use it to create virtual machines. These virtual machines are software entities that act like real hardware computers. You can then install any version of Windows or any distribution of Linux into a virtual machine. Using virtual machines provides you with a simulated hardware environment that isolates operating systems and software apps to prevent them from conflicting with existing hardware and/or software apps in your physical Windows computer.

- [Overview of virtual machine programs running "guest operating systems"](#)
- [Installing free "virtual machine programs"](#)
- [Virtual networks created by virtual machine programs](#)
- [Copying or moving virtual machines in VMware Workstation Player](#)
- [Copying or moving virtual machines in Oracle VM VirtualBox](#)
- [Copying or moving virtual machines in Hyper-V](#)

- **USB-C (E)**

USB-C ports started showing up in computers about 8 years ago. A "USB-C" port is an ovoid rectangle that is about one quarter the size of a USB 3 Type A port. However, it is actually a USB 2 port, a USB 3.1 port, a Thunderbolt 3 port, an HDMI port, an audio port, a Displayport port, a charging-only port or any combination of the previously-listed port types.

The exact capabilities of any specific USB-C port in any specific computer that you buy will be determined by the manufacturer of the computer.

Thunderbolt 3 devices are not always plug-and-play:

You sometimes need to open the "Thunderbolt" app in a computer and click on the problematic "Thunderbolt" device to turn it on.

If you do not know this, you might get the impression that a newly-inserted Thunderbolt 3 device is not working.

For step-by-step instructions on how to jump-start a problematic Thunderbolt 3 device, please see

http://aztcs.apcug.org/meeting_notes/winhardsig/USB3/Thunderbolt3fix.pdf

- "USB-C" to "USB A" adapters ○ "USB A" to "USB-C" adapters
- USB hubs with both USB-C and USB A downstream ports
- Using "Device Manager" and "USBTreeView" to troubleshoot problematic USB connections
- Using 2.5 Gigabit USB adapters and 5 Gigabit USB adapters to resolve problems with overheating and/or intermittent USB (1) Gigabit adapters

- **RESOLVING SOUND PROBLEMS IN "WINDOWS.." COMPUTERS** (E)

Windows 11, Windows 10, Windows 8, and Windows 7 computers have many sound-enabled devices that automatically re-configure themselves as "default" when you do not want them to do so. During this presentation, we can use "Remote Desktop" remote access into another computer to demonstrate these problems and show you how to avoid having them interfere with your use of online meeting systems such as Zoom, TeamViewer, and Skype.

- To get rid of hum in speaker and mic lines, use active USB extension cables instead of analog audio cables

- **COMPUTER SOUND EQUIPMENT (THAT I RECOMMEND)** (E)

Here are some sound products for computers that I recommend:

Bose speakers

Koss headset

Creative Sound Blaster USB sound card

HDE USB 2 Extension Cable

and

UGREEN Y Audio Splitter Cable

We recommend these products because each item has unique capabilities that distinguish them from their competitors.

- **SOUND CONFIGURATION IN A "WINDOWS.." COMPUTER THAT IS RUNNING "ZOOM"** (E)

To get your speaker and microphone audio working right in a Windows computer that is running "Zoom":

Big Step 100:

Enable/test and disable the wanted and unwanted "Playback" and "Recording" audio devices.

Big Step 200:

Start up the Zoom app and adjust the Windows "Volume Mixer" to make sure that the "Zoom Meetings" volume slider is not muted.

Big Step 300:

Start up a test meeting (with just yourself in it) and use the Zoom app's audio test feature.

- **WIPING "HARD DRIVES OF "WINDOWS.." COMPUTERS" TO PREPARE THEM FOR DONATION OR GIFTING (E)**

Most used computers are donated or sold with all sorts of recoverable data files and photo files on their old hard drives. Here is what we learned about wiping hard drives when we were asked to sanitize 10 computers for a small business.

- The free CCleaner Portable app's "wipe" does a good enough job in most cases
- The free MooO Disk Wiper app removes data from more areas
- Use them both for extra safety
- "Full Format" does the best wipe but it removes the Windows operating system which makes your computer less useful to the person or organization that you transferred your computer to
- Use the free Recuva app to see how good of a job CCleaner and MooO Disk did on cleaning the "free space" in your computer

- **USING FREE CLOUD STORAGE--AN OVERVIEW (E)**

You can use free cloud storage services to store data files and digital photos for free. The benefits of storing data files are:

- Reduce the probability of losing data files and photos due to hard drive crashes and operator error.
- Facilitates collaboration between multiple people working on the same project
- Provides you with the ability to synchronize data files and digital photo albums between multiple computers, tablets, and cell phones.

- **A COMPARISON OF "ONEDRIVE", "GOOGLE DRIVE", "BOX", "DROPBOX, AND iCloud" (E)**

This detailed comparison between the five cloud storage services provides you with objective information for selecting which ones to use:

- **USING MICROSOFT'S ONEDRIVE" CLOUD STORAGE** (E)

Microsoft's OneDrive provides you with 5 Gigabytes of free storage space. The data files and digital photos that you store on OneDrive" can be accessed from Windows, Apple MacOS, Linux, and Android computers, tablets, and cell phones but it is especially well-integrated with the Windows 10 "Start Menu" and the "File Explorer."

- **USING "GOOGLE DRIVE" CLOUD STORAGE** (E)

"Google Drive" gives you 5 Gigabytes of free storage up on Google's server farms. You can upload and download entire folders of data files or digital photos at the same time using most Web browser but uploads and downloads using Google's "Chrome" browser are especially fast, compared to uploads of folders for "OneDrive" and "Box".

- **USING "BOX" CLOUD STORAGE** (E)

"Box" gives you 5 Gigabytes storage up on their server farms. You can upload and download entire folders of data files or digital photos at the same time using most Web browser but uploads and downloads using Google's Chrome browser are especially fast, compared to uploads of folders for OneDrive and "Box". "Box has the best online viewing and editing of data files because they offer their own viewer, viewing and editing with Zoho, and viewing and editing with Google Docs.

- **USING APPLE'S "iCLOUD" CLOUD STORAGE** (E)

iCloud gives you an initial 5 Gigabytes storage up on Apple's server farms. To obtain this amount of storage, you need to first obtain an Apple ID by either filling in the form at Apple Website or by using the screens inside the iTunes program. Then you can use this Apple ID to obtain an iCloud account from inside a Mac running OS X 10.7 or higher, or from a recent model iPad", or from a recent model iPhone.

- **OVER-THE-AIR TELEVISION RECEPTION FOR FREE (E)**

You can receive digital television stations over-the-air for free. You will get less channels relative to those provided by cable television services and satellite dish services. However, the monthly cost for cable television and satellite dish service has been rising faster than the rate of inflation so this over-the-air technology can save you lots of money, if it is adequate for your needs:

- Digital television in North America uses the ATSC standard. ATSC stands for Advanced Television Systems Committee. Over-the-air ATSC television channels have been available since the first half of 2009. "
- ATSC is also known as 8VSB which stands for 8-level vestigial sideband modulation
- Steps for setting up over-the-air television reception
 - Step 1: Do an online site survey at <http://antennaweb.org>
 - Step 2: Do a pilot test of television reception at your actual physical location
 - Step 3: Procure equipment: an ATSC television or an ATSC tuner for an existing, old television set, or an ATSC-capable tuner for an existing computer.
 - Step 4: Install and configure equipment.

- **REPAIRING AND/OR RECOVERING DATA FROM INTERNAL HARD DRIVES OR SSDs** (E)

Like all hard drives, all external hard drives eventually fail. Using SATA data and power cables and/or USB hard drive adapters or enclosures, you can recover the data from or even repair the better-built models of external hard drives:

- A logical step-by-step procedure for recovering data files and photo files from a failed or failing hard drive is explained at <https://aztcs.apcuq.org/winhardsig/harddrives/recover-data/1-recover-data.pdf>
- USB adapters for connecting various types of hard drives and SSDs are described at <https://aztcs.apcuq.org/winhardsig/harddrives/2-USB-adapters-to-connect-drive.pdf>
- As an expensive last-resort, you can send failed or failing hard drives and SSDs to not-free professional cleanroom operations

- **REPAIRING AND/OR RECOVERING DATA FROM EXTERNAL HARD DRIVES OR EXTERNAL SSDs** (E)

Like all hard drives, all external hard drives eventually fail. Using SATA data and power cables and/or USB hard drive adapters or enclosures, you can recover the data from or even repair the better-built models of external hard drives:

- Connecting a 2.5-in. hard drive or a SATA SSD to a USB port
- Connecting a 3.5-in. hard drive to a USB port
- Installing an add-on fan to a 3.5-in hard drive
- Attaching a SATA internal hard drive or a SATA SSD to your computer with a SATA data cable and a SATA power cable
- Two possible hardware configurations inside an external hard drive
- When a part inside an external hard drive or an external SSD breaks, you can save money and end up with a more reliable device if you substitute quality third party parts as described at

https://aztcs.apcug.org/meeting_notes/winhardsig/harddrives/external/DY-extdrives.pdf

- **[BUILD YOUR OWN EXTERNAL HARD DRIVE ENCLOSURES](#)** (E)

The external hard drives and external hard drive enclosures that are available at retail are all designed and constructed to be cheap. None of them last very long. You can build yourself hard drive enclosures and external hard drives that are much more reliable than the ones that are available at retail. If you do so, you can usually build them at a price than is lower than the cost of buying the external hard drives and the external hard drive enclosures that are currently available at retail:

- A cheaper way to attach a SATA internal hard drive or a SATA SSD to a computer is to use a SATA data cable and a SATA power cable, instead of attaching a SATA internal hard drive or SSD to a USB port
- To build your own external hard drive enclosures or external SSD enclosures, you can use quality third-party parts as described at http://aztcs.apcug.org/meeting_notes/winhardsig/harddrives/external/Parts-forexternal.pdf

- **[STREAMING MEDIA: BASICS, MEDIA CAPTURE, AND SCREEN RECORDING](#)** (E)

The videos and audios that you view or listen to in a Web browser arrive in your computer in three ways: streaming without files, sequential file chunks, and single file downloads.

You can use various software programs to save these media items for future viewing or listening

- Legal issues of media capture and screen recording
- Endless streaming media

- Single file streaming
- Streaming sequential chunks
- Media capture (at the network stack)
- Torture test for media capture software
- Screen recording
- Media capture versus screen recording

- **REPLAY CAPTURE SUITE PROGRAMS** (E)

Replay Capture Suite has 8 not-free programs that can be used for:

- media capture at the network stack
- screen recording at the Graphics Device Interface
- online music
- media file conversion
- media file splitting and editing
- media and data file encryption

- **FREE SOFTWARE FOR MEDIA CAPTURE, AND SCREEN RECORDING** (E)

We have discovered several great free software programs for doing "media capture" and "screen recording":

- "aTube Catcher" for media capture
- "Flashback Express" for screen recording
- "iSpring Free Cam" for screen recording

- **EMAIL BASICS** (E)

A typical email system consists of three servers up in the Internet cloud. Your enduser computer communicates with these three servers in order to send and receive email messages. To help you understand your options for sending and receiving email, let us tell you about how email works:

- Three Cloud-based Servers For The Typical Email Service:
 - a server for sending email,
 - a server for receiving email,
 - and
 - a Web server.
 - Access "Webmail" using a Web browser such as "Internet Explorer" ○ Access the sending and receiving servers directly using a local "Email client program" that is installed on the hard drive of your local computer
 - Advantages and disadvantages of "Webmail" compared to using an "Email client program"
 - Using both "Webmail" and an "Email client program" for maximum convenience and problem resolution
-
- **[EMAIL--ADVANCED TOPICS AND TECHNIQUES](#)** (E)

The diversity of options in email software, servers, and hardware platforms provides you with lots of ways to save money, time, and hard drive space:

 - Offline Access to Webmail
 - Three Cloud-based Servers For the Typical Email Service
 - Protocols For Sending Email
 - Protocols For Receiving Email
 - Email Client Software:
 - ["Windows apps" versus Legacy Programs](#)
 - Where Is My Email Stored?
 - Selecting An Email Service
 - [Litmus Email Analytics'](#) Email Usage Data
 - [Security Lapses of Email Providers](#)
 - Disadvantage of Email Address from Your Broadband Internet Service
 - Verizon and AT&T Are Exceptions to the Above
 - [Verizon's Acquisitions of AOL Mail and Yahoo!Mail](#)
 - Microsoft Account Creation
 - [Saving Email Locally on the Hard Drive of Your Computer](#)
 - ["Google Takeout" Website Allows You to Download All of Your Gmail Into a Single Mbox File](#)
 - Dormancy when Not Used
 - Email Away From Home

- Security Defenses for Webmail
 - Security Defenses for An Email Client Program
 - [Sending SMS Text To A Cell Phone](#)
 - [Accessing "Yahoo!Mail" from a Email Client Program Inside A "Windows.." Computer](#)
 - [Apple iCloud email in "Windows 10"](#)
-
- **[MOVING YOUR MONITOR, KEYBOARD, MOUSE, WEBCAM, HEADSET, SPEAKER, AND MICROPHONE FARTHER AWAY FROM YOUR COMPUTER](#) (E)**

Using fiber-based HDMI cables, fiber-based DisplayPort cables, and active "USB 3" extension cables, you can now place flatscreen monitors, mice, keyboards, and some USB devices up to 32 feet away from your computer. These technological advancements make it possible for you to place your computer in the next room by running cables through walls without violating electrical codes:

 - Extensions for audio cables
 - Moving your keyboard, mouse, monitor, etc. farther from your computer
 - Installing conventional HDMI cables
 - Installing passive USB 3 extension cables and powered USB 3 hubs
 - Installing active USB 3 extension cables
-
- **[REVO UNINSTALLER PORTABLE](#) (B)**

"Revo Uninstaller Portable" is a free software program that helps you clean up your hard drive and the Windows "Registry" after it runs the uninstall wizard that is part of all "desktop app" programs that run in "Windows..".

 - When you use "Programs and Features" in "Windows.." to remove a program, bad things are left behind!
 - "Revo Uninstaller Portable" cleans up the hard drive and the Windows "Registry"
 - "Revo Uninstaller Portable" Is a "portable application"
 - Programs that "Revo Uninstaller Portable" can remove: "Desktop apps" and "Windows apps"
 - Getting "Revo Uninstaller Portable"
 - Using "Revo Uninstaller Portable"

- **"WINDOWS 11" AND "WINDOWS 10" ACTIVATION (I)**

Windows 11's and Windows 10's activation process is different from any previous "Windows.." operating system product.

- There are two ways to activate "Windows 10":
"Digital License" Activation and "Product Key" Activation
- When you get a free upgrade to "Windows 10" from Windows 7, 8, or 8.1, you get a "Digital License" activation
- Both ways to activate "Windows 10" store the Uniquely Universal Identifier (UUID) of your computer's motherboard up in Microsoft's activation servers in the Internet cloud.
- The "Anniversary Update" converts a "Product Key" activation to "Digital License" activation for copies of "Windows 10" that were original activated a "Windows 10 Product Key".
- Two ways to link your "Microsoft Account" to a "Digital License" activation
- If you link your Microsoft Account to your Windows account, you get the ability to use the "Activation Troubleshooter" in "Windows 10" to activate after changing out your computer's motherboard. However, you then have to log into "Windows 10" with your "Microsoft Account". If you go back to logging into "Windows 10" with a "Local Account", you lose your ability to use the "Windows 10 Activation Troubleshooter" to change your computer's motherboard.
- If you activate "Windows 10" with a purchased "Windows 10 Product Key" and then you replace the hard drive but keep the same motherboard, you can do a "fresh install" with an Installation Media DVD or USB thumb drive. During the "fresh install" process, you can either "Skip activation" or enter in your purchased "Windows 10 Product Key". If you enter in your "Windows 10 Product Key", your "fresh install" will have a "Product Key" license. If you "Skip activation", your "fresh install" will have a "Digital License".

- **USING THE FREE "WINDOWS 11 ENTERPRISE EVALUATION" (B)**

There are two ways for you to run the free "Windows 10 Enterprise Evaluation". It is close enough to the other editions of "Windows 10.." so that you can use it to test hardware and compatibility with your existing computer(s).

- What is the "Windows 11 Enterprise Evaluation"?
- System requirements
- Ways for you to run the "Windows 10 Enterprise Evaluation":
 - Method 1: Installing it into a real, physical computer.
 - Method 2: Installing it into a virtual machine.

- **ADDING EXTERNAL PARTS TO REPAIR OR IMPROVE A COMPUTER (B)**

You can add external parts to make cost-effective temporary or permanent repairs or improvements to a computer:

- Parts of a computer fail In two ways
- Use "USBTreeView" to troubleshoot USB problems
- Disabling failed parts in a computer
- Reasons to add an external part to your computer
- Examples of external parts
- Portable and AC-Powered Monitors
- USB hubs
- External DVD/CD drives
- External hard drives and external hard drive enclosures to boot up a computer
- Gigabit Ethernet wired network adapters
- USB 3-based 802.11ac Wi-Fi wireless network adapters
- External USB mouse
- External USB keyboard
- USB sound card
- USB 3-based "DisplayLink" adapters

- **WHAT TO DO WHEN YOUR COMPUTER WILL NOT BOOT (B)**

If your computer will not boot up, here are some logical troubleshooting steps for you to follow from the simple and obvious to more complex procedures.

- Basic troubleshooting of any computer
- Change boot order during initial boot up
- Booting with a bootable DVD or CD disc, a bootable USB flash drive, or a bootable HDD
- Troubleshooting a "Windows.." desktop computer
- Troubleshooting a "Windows.." laptop computer
- Troubleshooting a "macOS" computer
- Restore a "Windows.." computer from a "system image backup"

- **SOME SIMPLE TECHNIQUES FOR MAKING A "WINDOWS.." COMPUTER EASIER TO USE (E)**

This is a hands-on demonstration of some simple tricks for making your "Windows.." computer more user friendly and efficient:

- Unhide file extensions
- Pre-pend year-month-day to file and folder names
- Circle trick for checking the aspect ratio of your monitor screen
- Copy-paste or cut-paste to the right pane of "Windows Explorer" or "File Explorer" instead of to the left pane
- Drag down or up before copy-paste or cut-paste to avoid inadvertently putting into folders
- Use a text file as an intermediate step to strip out formatting to avoid pasting formatting when copying and pasting
- Right click-rename or F2 and then copy to copy the name of a file instead of copying the file
- Use "autologon" at <https://learn.microsoft.com/en-us/sysinternals/downloads/autologon> if you want "Windows 10" or "Windows 11" to let you into your "Desktop" without demanding your Windows "Username" and password

- Use a USE Ctrl+Shift+Esc or Ctr+Alt+Delete and the "Task Manager" to avoid mousing over or clicking on hazardous URLs
- Use printable paper rulers when you need a ruler:
<https://www.inchcalculator.com/printable-ruler/>
- Ctrl + and Ctrl - to enlarge and reduce the text in most Web pages

- **POWERLINE NETWORKING** (E)
"Powerline networking" has improved greatly in speed and reliably. It is now comparable in speeds to "Gigabit Ethernet":
 - A live demonstration of a "powerline network" that connects a broadband modem/terminal/gateway, a router, and an end-user computer
 - Extending your existing network with powerline networking transceivers
 - Power networking standards: "HomePlug AV2" and "G.hn"
 - Reviews of powerline networking devices
 - Using Powerline Networking to speed up a default "mesh network" configuration
 - Setting independent groups of powerline networking transceivers

- **ANALYZING AND RESOLVING Wi-Fi PROBLEMS** (E)
To analyze and resolve Wi-Fi problems, you can install free software utility programs for your "Windows.." or "macOS" computer. These programs give you numerical and graphical information that you can use:
 - Free Wi-Fi software for your "Windows.." or "macOS" computer
 - Received Signal Strength Indication (RSSI)
 - Selecting the right Wi-Fi channel

- **RESOLVE BOTTLENECKS IN YOUR LOCAL AREA NETWORK** (E)
To get the best Internet download and upload speeds for your local network, you can use your computer to measure the actual Internet "bandwidth" at different points in

your local network. Then you can bypass or replace the troublemaking network devices. A demonstration of a real bottleneck in a typical home network:

- Big Step 100:
Measure Internet bandwidth at various locations on your home network
- Big Step 200:
Measure local network speeds at various locations on your home network

- **TESTING USB PORTS, CABLES, AND DEVICES** (E)

Using three free software programs, you can test USB ports, cables, and equipment in order to resolve problems:

- Use the free "USBTreeView" software program to check for basic functioning and stability
- Use the free "FlashBench" software program to put a "USB 2" or "USB 3" port through a series of real world tests: "Writes" and "Reads" of real files to a USB flash drive, a mechanical hard drive, or a solid state drive
- Use the free "CrystalDiskMark Portable" software program for more extensive comparison testing

- **DATA PRESERVATION ISSUES AND STRATEGIES** (B)

Hard drives and all data storage media, like every other part, of your computer have a 100 percent failure rate. That means that you have to proactively plan ahead in order to avoid the loss of data files and photo files when a hard drive or data storage media eventually fails:

- There are three surviving hard drive manufacturers: Seagate, Western Digital, and Toshiba
- Strategies for dealing with the certainty of hard drive failure:
 - Data File/Folder Backups To Internal and External Hard Drives
 - Storing Data Files and Photo Files in the Internet "Cloud" with "OneDrive", "Google Drive", "Box", etc.

- Imaging of Hard Drives with bundled Microsoft software
- Image backups of Hard Drives with third party software such as "Macrium Reflect Free", "Clonezilla", or "Acronis True Image"
- Data Recovery Software such as "Recuva"
- "Fix when broke" using a cleanroom services such as "DriveSavers" or "OnTrack"

- **"macOS" COMPUTERS AND HOW THEY DIFFER FROM "WINDOWS.." COMPUTERS (B)**

Let's look at the pricing and models AND the user interface of Apple's "macOS" computers and compare them to "Windows.." computers:

- Four Models of Macs
 - "Mac Mini" is a small-form-factor computer
 - "iMac" is an "All in One" device
 - "MacBooks" are laptops
 - "Mac Pro" is a small tower
- Pricing of Macs
- User Interface of Macs
 - "Menu Bar" is always visible on the top of the screen
 - "Dock" is similar to the "Task Buttons" in the center of the Windows.. "Taskbar".
 - "Finder" icon in the "Dock" is similar to "Windows Explorer" in "Windows.."
 - Keyboard differences
- Running "Windows.." Inside Macs
 - Method 1: Running "Windows.." inside a virtual machine running in "Parallels Desktop", "VMware Fusion", or "Oracle VM VirtualBox".
 - Method 2: Running "Windows.." inside a "Boot Camp" partition

- **MAKING "WINDOWS.." EASIER TO USE BY SHOWING FILE EXTENSIONS AND BY PROVIDING LOGICAL NAMES FOR FILES AND FOLDERS (B)**

All versions of "Windows.." from "Windows 95" to "Windows 8.1" suffer from various problems that Microsoft has inadvertently designed into them. Here are some tips and tricks for making "Windows.." easier to use including turning on the display of file extensions, and providing logical names for files and folders:

- Problems caused by the default of "Hide file extensions of known file types"
- Turning off "Hide file extensions of known file types"

- File and folder naming with year-month-day prepended
 - Naming of the files that you send to other "Windows.." computer users
-
- **EXTEND THE USEFULNESS OF YOUR "WINDOWS..", "macOS", OR LINUX COMPUTER WITH PERIPHERAL AND VIRTUAL ADD-ONS (E)**

You can use peripheral and/or virtual add-ons to enhance the usefulness and security of your computer:

 - With the addition of real hardware peripherals such as fax modems, TV tuners, and Webcams, your computer can perform the same functions as real fax machines, TV sets, and video surveillance systems.
 - You can use free software to create virtualized computer hardware to massively expand the variety of operating systems and software applications that you can operate.
 - By combining virtualized computer hardware and real hardware peripherals, you can obtain synergistic benefits such as super secure Web access.
-
- **TELEVISION INSIDE YOUR COMPUTER (E)**

You can create a working virtual television set inside your computer by installing a television tuner and running television viewing software such as "Windows Media Center", "WinTV", or "Kaffeine":

 - [TV Inside Your "Windows.." or "macOS" Computer](#)
 - [TV Inside Your "Ubuntu" Linux Computer](#)
 - [TV Inside Your "MX Linux" Computer](#)
-
- **MAKING THE FREE "LIBREOFFICE" PROGRAM DEFAULT TO THE .DOCX, .XLSX, AND .PPTX FILE FORMATS OF "MICROSOFT OFFICE.." (B)**

The free "LibreOffice" suite of software programs is a great alternative to not-free "Microsoft Office..". However, you should set the various programs inside

"LibreOffice" to default to the most common file formats of .DOCX, .XLSX, and .PPTX in order to have maximum compatibility. Let us show you the steps for making "LibreOffice Writer", "LibreOffice Calc", and "LibreOffice Impress" get along with "Microsoft Word", "Microsoft Excel", and "PowerPoint".

- **[TROUBLESHOOTING PRINTER PROBLEMS IN A "WINDOWS.." COMPUTER](#)**

(B)

We will show you how to use various screens in the Windows "Control Panel" and the "Services Console" to troubleshoot and resolve problems in the "print spooler", the "print processor", and the "port monitor" to resolve problems that are more complex than the usually-misleading fixes that are suggested by the "Troubleshoot" wizards that "Windows.." provides for your various printers.

- **[TROUBLESHOOTING PRINTER PROBLEMS IN A "MacOS" COMPUTER](#)** (B)

We will show you how to use various screens in the "System Preferences" window and the "Terminal" app to troubleshoot and resolve problems.

- **[MAINTAINING AND REPAIRING HARD DRIVES FOR WINDOWS COMPUTERS](#)**

(E)

When confronted with hard drive problems, you should perform low-risk, less invasive procedures first, followed by increasingly aggressive, higher-risk procedures. As you perform these increasingly invasive procedures, you will either repair the hard drive and return it to service or you will decide that it is beyond economical repair:

- [Always Click on "Cancel" when an "Initialize Disk" box pops up\(unless you have just attached an unformatted hard drive or USB flash drive device to your computer\)](#)
- [Maintenance and Repair Strategy](#)
- ["Error-checking" in "Windows.." to Resolve Bad Clusters](#)
- ["Soft Repairs" with Utilities in Linux](#)
- [Data Recovery with Utilities in Linux](#)
- [Radical "Surgery" to Extend the Life of Failed Hard Drives:](#)

If you are unable to recover the data files from a failed hard drive and it's platters are still spinning, you can usually use "Disk Management" in "Windows" to create partitions to "block out" the bad sections of the hard drive, in order to extend the useful life of the hard drive.

- **USING VIRTUALIZATION OF HARDWARE TO SAVE MONEY, TIME, AND SPACE** (E)

You can save money, space, and time by using the virtual software "devices" to simulate all or part of real, physical equipment:

- "Windows Fax" or "FaxTalk FaxCenter Pro" instead of a real fax machine
- Use a USB TV tuner and "WinTV" instead of a real television set
- Software-based "virtual machines" and "virtual hard drives" instead of real computer hardware and real hard drives.
- Virtual networks and virtual network devices instead of real network devices

- **CHOOSING A VIRTUAL MACHINE PROGRAM FOR YOUR "WINDOWS.." COMPUTER** (B)

There are three free virtual machine programs that you can run inside your "Windows.." computer: "VMware Workstation Player", "Oracle VM VirtualBox", and "Hyper-V". Each of these programs let you create and clone "virtual machines" which are complete software-based computers. Since they are all free, you can run all of them in your "Windows" computer. The compelling reasons for picking one of the virtual machine programs are presented to you to help you pick the best one for your needs.

(The presentation slides for all of our presentations on virtual machines are located at

http://aztcs.apcug.org/meeting_notes/winhardsig/virtualmachines/virtualmachines-concise.pdf and

http://aztcs.apcug.org/meeting_notes/winhardsig/virtualmachines/comparison-vm-programs.pdf and

http://aztcs.apcug.org/meeting_notes/winhardsig/virtualmachines/virtualmachines

[-longterm.pdf](#) and

http://aztcs.apcug.org/meeting_notes/winhardsig/win8/win8-Hyper-V.pdf

- **BENEFITS OF USING VIRTUAL MACHINES** (E)

Let us show you how virtual machines can save you time, money, and space. You can use “virtual machines” to perform activities that you would otherwise have to do with real computers. When you use virtual machines in free “virtual machine programs”, it is like getting a pile of computers to use for free with all of them residing inside your existing physical “host” computer. When you run virtual machine programs, you can use fewer real computers because you can create “virtual machines” instead of keeping old computers around or buying additional new computers.

- **FREE ONLINE COMPUTER TRAINING** (E)

Your computer and its Internet connection can provide you with hundreds of hours of free training that you can access in the comfort of your home. The Tucson Computer Society has a collection of categorized hyperlinked shortcuts to Web sites that have free computer training. These shortcuts include free training from the Web sites of Adobe and Microsoft. You also can get free and non-free training from the Web sites of training organizations such as Lynda.com, Hewlett Packard, SeniorNet, Oasis, and various public libraries.

- **[SPEEDING UP "WINDOWS 11" OR "WINDOWS 10"](#)** (I)

We have prepared extensive step-by-step instructions for you to use to speed up your "Windows 11" or "Windows 10" computer(s). We will use an actual "Windows 11" virtual machine to show you how to use the "System" applet in the control panel to perform various speedup tweaks including "supersizing" the virtual memory "swap file". Then we will show you how to run "services.msc" in "Microsoft Management Console" to turn off and disable unneeded services, which will speed up your "Windows 11" or "Windows 10" computer.

SHARING FILES AND PRINTERS BETWEEN "WINDOWS 11", "WINDOWS 10", "WINDOWS 8.1", "WINDOWS 7", AND "WINDOWS XP" COMPUTERS (E)

When you need to share files and/or printers between "Windows 11" computers, "Windows 10" computers, and computers running earlier versions of "Windows..", you have to use traditional file/printer sharing. You might also have to use IP addresses to "kick start" the sharing process. Using virtual machines running "Windows 10", "Windows 8.1", "Windows 7" "Windows Vista", and "Windows XP", we will show you how file and printer sharing can be done between disparate versions of "Windows..".

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