

**Question**: Can a Universal Machine that combines entertainment, home control/security, computing, and telephone/telecom be built to eliminate the clutter of multiple machines, and how?

**Engineering Hypothesis**: If the expansion slots and USB ports of a base computer are used and fit with third party assemblies, then computer features can be enhanced to enable Entertainment, Computing, Telephone/Telecom, and Home control/ Security to eliminate the clutter of multiple machines because a base HP computer can be used and combined with other devices to synthesize a universal device.

**Background:** A base HP Pavilion Elite HPE-180t series will be converted into a universal home machine. This base computer has the following specs.

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| **Operating System** | [Genuine Windows 7 Professional 64-bit](javascript:_tabBar.moveToTab('tab0','m_c_0','0');) | [edit](javascript:_tabBar.moveToTab('tab0','m_c_0','0');) |
| **Processor** | [Intel(R) Core(TM) i7-920 quad-core processor [3.1GHz, 1MB L2 + 8MB shared L3 cache]](javascript:_tabBar.moveToTab('tab0','m_c_1','1');) | [edit](javascript:_tabBar.moveToTab('tab0','m_c_1','1');) |
| **Memory** | [8GB DDR3-1066MHz SDRAM [4 DIMMs]](javascript:_tabBar.moveToTab('tab0','m_c_2','2');) | [edit](javascript:_tabBar.moveToTab('tab0','m_c_2','2');) |
| **Hard drive** | [2T 7200 rpm SATA 3Gb/s hard drive](javascript:_tabBar.moveToTab('tab0','m_c_3','3');) | [edit](javascript:_tabBar.moveToTab('tab0','m_c_3','3');) |
| **Graphics card** | [1GB ATI Radeon HD 4650 [DVI, HDMI, VGA]](javascript:_tabBar.moveToTab('tab0','m_c_4','4');) | [edit](javascript:_tabBar.moveToTab('tab0','m_c_4','4');) |
| **Primary optical drive** | [LightScribe 16X max. DVD+/-R/RW SuperMulti drive](javascript:_tabBar.moveToTab('tab0','m_c_5','6');) | [edit](javascript:_tabBar.moveToTab('tab0','m_c_5','6');) |
| **Networking** | Integrated 10/100/1000 (Gigabit) Ethernet, and Wireless LAN | [edit](javascript:_tabBar.moveToTab('tab0','m_c_7','8');) |
| **Front Productivity Ports** | [15-in-1 memory card reader, 1 USB, 1394, audio](javascript:_tabBar.moveToTab('tab0','m_c_8','9');) | [edit](javascript:_tabBar.moveToTab('tab0','m_c_8','9');) |
| **Sound Card** | [Integrated 7.1 channel sound with front audio ports](javascript:_tabBar.moveToTab('tab0','m_c_10','11');) | [edit](javascript:_tabBar.moveToTab('tab0','m_c_10','11');) |
| **Keyboard and Mouse** | [HP multimedia keyboard and HP optical mouse](javascript:_tabBar.moveToTab('tab0','m_c_12','13');) | [edit](javascript:_tabBar.moveToTab('tab0','m_c_12','13');) |
| **Productivity software** | [Microsoft(R) Works 9.0](javascript:_tabBar.moveToTab('tab0','m_c_14','15');) | [edit](javascript:_tabBar.moveToTab('tab0','m_c_14','15');) |
| **Security software** | [Norton Internet Security(TM) 2010 - 15 month](javascript:_tabBar.moveToTab('tab0','m_c_15','16');) |  |

It will get converted into a universal machine with, a built in DVD/ Blue Ray Writer, microphone, TV tuner, camera, high capacity RAM, home theatre speakers, home appliances/security controller, software’s like Skype for video conferencing, Webex for sharing documents. Fax software, etc. Components will be added and subtracted from the basic computer model, synthesizing a universal home machine that everyone can use comfortably. This can be done by a series of different ways.

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| **Internal Components** |
| **Sound** |
| **Video** |
| **Home Appliance Controlling** |
| **External Accessories** |
| **Software** |

* nVIDIA Quadro FX 5800

Materials:

**Experiment:**

* Sony Blu – Ray DVD RW+- writer
* [ATI All-In-Wonder X800 XL (256MB, PCI](http://reviews.cnet.com/graphics-cards/ati-all-in-wonder/4505-8902_7-31526112.html) Card) TV Tuner Card
* Lynx Studio Technology LynxTWO-B 7.1 Sound Card
* Kingston ValueRAM memory - 16 GB ( 2 x 8 GB ) - DIMM 240-pin - DDR3
* Optional Hard Disk, and processor upgrade
* Bose Acoustimass16 speaker
* Wireless Samsung SWA-4000
* Bose Wireless interface
* Bose computer speakers
* Casio XJ-S48 XGA (1024 x 768) DLP projector
* IOGEAR - Wireless USB A/V Kit
* Smartlinc Controller
* Venstar T1800 thermostat
* M1GSYS4S INSTEON-Compatible M1 Gold System(Security System)
* SVAT Electronics CV501-16CH-006 16 Channel H.264 Network DVR System with 16 Surveillance Cameras
* [EZFlora INSTEON/X10 Sprinkler Controller](http://www.insteon.net/31270-ezrain-sprinkler-controller.html)
* INSTEON 6-Button Scene Control Keypad
* Install [PowerHome Software](http://www.insteon.net/PowerHome2-Software.html)
* [Brother MFC-9320CW Digital Color Multi-Function Center Printer](http://www.staples.com/Brother-MFC-9320CW-Digital-Color-Multi-Function-Center-Printer/product_811808)
* Belkin Bluetooth adapter
* Golan Virtual Bluetooth Keyboard
* Microsoft Bluetooth Notebook Mouse 5000
* Magic Jack Telephone transmitter
* Microsoft U9D-00001LifeCam Cinema Webcam
* Norton Internet Security, McAfee Internet Security, or Windows OneCare Internet Security
* Remote Desktop Control software
* Webex software
* e – FAX software
* Microsoft Office 2010 Professional

**Explanation of materials:**

* **Internal Components** – Internal Components such as the hard disk or GFX card are required for the machine to work properly. The GFX card needs to be changed so that one can watch entertainment with accuracy and velocity. The new RAM is needed for the same reason. The Blu – Ray writer is needed to burn DVDs’ and watch them on another machine or to record something in a DVD with capacity up to 50 gigabytes. The Blu – Ray writer can also be used to watch Blu – ray DVD’s. The TV tuner is needed to watch TV on the machine; record shows in the DVR and also to be able to get DVD’s on Demand. The sound card is updated to have better sound quality and to be able to watch entertainment with extraordinary sound quality. The Hard disk and processors can also be upgraded to have a better experience. Most of these components were just upgraded to make the machine more advanced, and to be able to have more features.
* **Video –** Videowas used to make sure the user can see what he/she is doing on the machine. Using the projector one can see what they are doing in the room with the machine, in other words it’s a big screen monitor. Using the Iogear A/V attachment it is possible to view the video in a different room so one can watch entertainment on a plasma screen in another room.
* **Sound** - Sound is required so that the user can hear what sounds the machine is transmitting. The Bose computer speakers will be in the room where the universal machine is, so the user can hear what he/she is doing in that room. The Samsung SWA – 4000 can wirelessly transmit the sound to another room in the house. Connecting this to the Bose Acoustimass16 speakers that will be in the room where the plasma screen is makes it so one’s family can hear the sound while watching entertainment. The Bose Wireless interface makes it so there are no wires running along the sides of the house to connect the rear speakers of the Bose Acustimass16 speakers.
* **The Home Appliance Controllers** - The Home appliance controllers make it so one can control their house with their computer or cell phone. The Smartlinc Controller starts the whole process up. It connects to the phone line and the internet router and spreads the internet to all the home appliance controllers. The thermostat is changed so it can work with the Smartlinc controller causing one to be able to control temperature wirelessly. The Security System is also changed so it can work in harmony with the Smartlinc controller, and so one can control their house security wirelessly. Replace the sprinkler controller for the same reason. One controls their sprinkler wirelessly with this component. Install the 6 button controller so it can wirelessly interface with the Smartlinc controller and so one can control all the lights in their house wirelessly. The SVAT Electronics CV501-16CH-006 16 Channel H.264 Network DVR System with 16 Surveillance Cameras are security cameras that can be installed in your home to get video surveillance of your home with your laptop or phone wirelessly. These are only some of the Smartlinc Home controlling appliances. There are many more such as the wireless pool controller. The Smartlinc software gets installed on to the home owner’s computer and cell phone to allow them to control the appliance wirelessly. This is the first computer software company to ever make this technology in the history of the world.
* **External Accessories**- Most of the External accessories are needed for the machine to work properly. The Virtual Golan Keyboard is needed to type something while using the machine. Same with the Microsoft Mouse except it is needed to move the cursor. The Brother Print Station is needed to wirelessly print, scan, copy, or fax documents. The Belkin Bluetooth adapter is needed to connect to Bluetooth enabled appliances such as the Golan virtual keyboard. The Magic Jack Transmitter is needed to be able to make telephone calls from the computer for no charge. A phone can be connected to the transmitter causing a regular land line phone to become a free internet phone. The Microsoft U9D-00001LifeCam Cinema Webcam is needed to make web calls so 2 or more people can be connected while seeing their faces. The webcam also has a microphone to talk to someone while online. Overall there are millions of external accessories but one should buy the ones they absolutely need.
* **Software** - Software is needed to make a computer be fit for you. There are however many software’s that are mandatory to have. A security software from brands such as Norton, Windows, or McAfee are required to keep the machine safe from predators trying to hack your computer on the web. e – FAX is required to receive a fax on the web on your e – mail account. Webex Software is required so that one can make changes to documents while another person in another location watches and makes more changes. One can have conferences, message, and even have meetings for no cost. There are many instant messaging software’s that are required such as Google messenger, Yahoo messenger, and AIM, which as the name says are just a faster version of e-mail. These software’s often have features where a webcam can be used to show the video of someone’s facial expressions on the computer screen while they talk with you. The remote desktop software will be used to be able to access your universal machines desktop from a remote computer or mobile device. Microsoft Office 2010 Professional is required to make simple documents and spreadsheets to do everyday tasks. Overall there are millions of software’s that can be installed, but one should be limited to the ones he/she will absolutely need.

**Procedure:**

1. Open the computer side door revealing the interior of the CPU.
2. Remove the base graphics card located on the mother board on the square wall on the computer, by removing the two screws on either side of it and pulling it out.
3. Replace this card by the nVIDIA Quadro FX 5800, by sliding it on to the corresponding socket and reattaching the 2 screws. Install included driver. Follow the included and on – screen instructions.
4. Insert a Sony Blu – Ray DVD +- writer in the second DVD slot by pushing the drive into the secondary drive slot, and attach four 5 millimeter screws to lock it in place. Install included driver. Follow the included and on – screen instructions.
5. Attach the [ATI All-In-Wonder X800 XL (256MB, PCI](http://reviews.cnet.com/graphics-cards/ati-all-in-wonder/4505-8902_7-31526112.html) Card) TV Tuner Card on the motherboard where there is a empty PCI slot, and attach 4 five millimeter screws to lock it in place. Install included driver. Follow the included and on – screen instructions.
6. Install the Kingston Value RAM memory - 16 GB ( 2 x 8 GB ) - DIMM 240-pin - DDR3 by removing the base RAM by reviving the 2 levers on either side of each and pulling the components out. Then slide in the new RAM and push the end leavers to lock it in. Follow the included instructions.
7. Remove the base sound card, the same way the base graphics card was removed
8. Attach the Lynx Studio Technology LynxTWO-B 7.1 Sound Card the same way the graphics card was attached. Install included driver. Follow the included and on – screen instructions.
9. If wanted, hard disk and processor quality can by increased. For instructions look on the internet.
10. Close the computer side door by pushing it into the slider.
11. Take the USB attachment of the IOGEAR - Wireless USB A/V Kit and plug it into the USB port. Install included driver. Follow the included and on – screen instructions.
12. Connect the other VGA attachment of the IOGEAR- Wireless USB A/V Kit and plug it into a plasma screen TV in another room. Follow included instructions.
13. Place the IOGEAR - Wireless USB A/V Kitwireless transmitter between the 2 attachments.
14. In the living room attach the 6 Bose Acoustimass16 speaker system speakers in the 6 designated places on the wall by attaching the 4 screws that came with it on each. Place the subwoofer next to the plasma screen television. Use included instructions.
15. Connect all of the front Bose speakers with the included wires
16. Use the Bose Wireless interface to connect the subwoofer with the 2 back speakers by bringing the system close two each of the 2 speakers resulting in synchronized speakers. Use included instructions
17. Attach the wireless Samsung SWA-4000 attachment to the USB port of the computer. Install included driver. Follow the included and on – screen instructions.
18. Attach the wireless Samsung SWA-4000 attachment to the input of the Bose subwoofer. Use included instructions.
19. Install Bose computer speakers in the room where the universal machine is. Keep the subwoofer next to the machine and the 2 speakers on the left and right corners of the rear walls. Use the included instructions.
20. Connect the Casio XJ-S48 XGA (1024 x 768) DLP projector to the DVI port on your computer with a DVI-DVI cable. Mount this on the back wall in the room where the universal machine is. Install included driver. Follow the included and on – screen instructions.
21. Connect the Smartlinc Controller to the telephone line and plug the router into it, use the included instructions.
22. Install the Venstar T1800 thermostat by replacing the old thermostat by following the included instructions.
23. Install the ELK M1GSYS4S INSTEON-Compatible M1 Gold System (Security System) in the home by following the included instructions.’
24. Install the SVAT Electronics CV501-16CH-006 16 Channel H.264 Network DVR System with 16 Surveillance Cameras. Install included driver. Follow the included and on – screen instructions.
25. Install the [EZFlora INSTEON/X10 Sprinkler Controller](http://www.insteon.net/31270-ezrain-sprinkler-controller.html) by following the included instructions, and then connect the sprinklers to the ports on the device.
26. Install the INSTEON 6-Button Scene Control Keypad with On/Off Switch on each light switch in the house by following the included instructions.
27. Install the included [PowerHome Software](http://www.insteon.net/PowerHome2-Software.html) on to the universal machine by following the on screen instructions.
28. Download the Powerhome Software from the internet and download it to the cell phone. Use the on – screen instructions.
29. Install the [Brother MFC-9320CW Digital Color Multi-Function Center Printer](http://www.staples.com/Brother-MFC-9320CW-Digital-Color-Multi-Function-Center-Printer/product_811808) by wirelessly connecting the printer and universal machine by following the on – screen instructions. Place the printer relatively close to the universal home machine. Install included driver. Follow the included and on – screen instructions.
30. Install the full version of Norton Internet Security, McAfee Internet Security, or Windows OneCare Internet Security by inserting the disk into the disk drive and following the on screen instructions.
31. Install a Belkin Bluetooth adapter by plugging the transmitter to a USB port, inserting the included driver to the disk drive and following the on screen instructions.
32. Install the Golan Virtual Bluetooth Keyboard and Install included driver. Follow the included and on – screen instructions.
33. Install the Microsoft Bluetooth Notebook Mouse 5000 by Installing included driver. Follow the included and on – screen instructions.
34. Install the Magic Jack transmitter and Install included driver. Follow the included and on – screen instructions.
35. Install the Microsoft U9D-00001 LifeCam Cinema Webcam. Install included driver. Follow the included and on – screen instructions.
36. Install the Remote Desktop Control software by downloading it and following the on-screen instructions.
37. Download the free e – FAX software from online, and then follow the on – screen instructions to install it.
38. Install Microsoft Office 2010 Professional by inserting the disk in the disk drive and following the on – screen instructions.
39. Install the Webex software by downloading the software and follow the on screen instructions.

**Conclusion:**

Engineering this machine using the instructions will prove that it is possible to build a universal home machine. The hypothesis, If the expansion slots and USB ports of a base computer are used and fitted with third party assemblies/ components, then the computer features can be enhanced to enable Entertainment, Computing, Telephone/ Telecom, and Home Control/security to eliminate the clutter of multiple machines because a base HP computer can be used and combined with other devices to synthesize a universal device, can be proven to be true by engineering it. In the future the experiment will be done and then redone around 500 by people of different ages of all different skill levels. The fact that the experiment was repeated continually by different people proves that everyone can use it to its full capacity safely. Everyone from a 7 year old child to a 100 year man can conformably use this machine if the proper instructions are followed. Synthesizing this machine causes the user to get the most of his/her computing time and to be able have to the ability to control their home wirelessly. No other machine like this has ever been built in the history of the world. A question, hypothesis, and procedure were made so that one could perform the experiment in the future.

There are few errors that could have occurred in this future experiment. This is because the experiment does not include much chemistry and mainly just computer science. The main source of error will be human error. For example the exact directions might have not been followed when installing something or software might not work right because a human didn’t program correctly. There is also a chance of mechanical (machine) error, because the machine reproducing the components, and software could have had a flaw and caused disorder in a component. These are the only causes of fault in the experiment.

Finished Product

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| **Operating System** | [Genuine Windows 7 Professional 64-bit](javascript:_tabBar.moveToTab('tab0','m_c_0','0');) |
| **Processor** | [Intel(R) Core(TM) i7-920 quad-core processor [3.1GHz, 1MB L2 + 8MB shared L3 cache]](javascript:_tabBar.moveToTab('tab0','m_c_1','1');) |
| **Memory** | ValueRAM memory - 16 GB ( 2 x 8 GB ) - DIMM 240-pin - DDR3 |
| **Hard drive** | [2T 7200 rpm SATA 3Gb/s hard drive](javascript:_tabBar.moveToTab('tab0','m_c_3','3');) |
| **Graphics card** | nVIDIA Quadro FX 5800 Graphics Card |
| **Primary optical drive** | Sony Blu – Ray DVD RW+- writer |
| **Networking** | Integrated 10/100/1000 (Gigabit) Ethernet, and Wireless LAN |
| **Front Productivity Ports** | [15-in-1 memory card reader, 1 USB, 1394, audio](javascript:_tabBar.moveToTab('tab0','m_c_8','9');) |
| **Sound Card** | Lynx Studio Technology LynxTWO-B 7.1 Sound Card |
| **Keyboard and Mouse** | [Golan](javascript:_tabBar.moveToTab('tab0','m_c_12','13');) virtual Bluetooth keyboard, and Microsoft notebook Bluetooth mouse 5000 |

**TV Tuner** [ATI All-In-Wonder X800 XL (256MB, PCI](http://reviews.cnet.com/graphics-cards/ati-all-in-wonder/4505-8902_7-31526112.html) Card) TV Tuner Card

**Home Controlling apps** Insteon entire home controlling transmitters

**Printer**  Brother MFC-9320CW Digital Color Multi-Function Center with fingerprint reader

**Internet Phone**  Magic Jack phone transmitter

**Buetooth** Belkin USB Blutooth adapter

**In room sound**  Bose computer speakers

**Out of room speakers** Bose Acustimass16 speakers

**In room video** Casio XJ-S48 XGA (1024 x 768) DLP projector

**Out of room video** Panasonic 58” V10 Plasma Screen TV

**Webcam**  Microsoft U9D-00001LifeCam Cinema Webcam

**Internet Fax software**  e – FAX

**Meeting Software**  Webex, and Skype

**Instant Messaging** AIM, Google Talk, and Yahoo Messenger

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| **Productivity software** | Microsoft Office 2010 Professional |

**Software Security** Norton 2010Internet Security

**Other Software** Remote Desktop Control

* **Gaming/ High resolution Graphics** 
  + The nVIDIA Graphics Card is the most advanced graphics card in the world. This card brings gaming to the next level and has extremely mind blowing images. You can use your universal PC to game, and you don’t need a external gaming consol because the universal machine is going to be even better than the real thing.
* **Blu – Ray Writer/ Player**
  + Use the Blu – Ray writer to watch movies and burn DVD’s with data up to 50 gigabytes, which can be thousands of photos, songs, and even videos. Store your most important hard disk data in just one disk.
* **Home Theater System**
  + The 7.1 Channel sound card lets one connect seven speakers to the computer presenting the next level of home theatre, surround sound gaming and entertainment. This card has a built in component that will act as an amplifier for the Bose speakers so that one can control sound features on the universal machine without a big sound amplifier. Sound with this card and the Bose speakers is the best that it will ever get!
* **TV – Tuner/ DVR**
  + The universal machine has a dual HD TV tuner, meaning it can do 2 TV related things at the same time. It lets you watch TV, record events in a DVR, and watch DVD’s on Demand. The TV tuner has extremely saturated graphics and sound quality to make the entertainment even better. One also plug in separate components such as gaming counsels, DVD players, and even VCR’s to watch them on a plasma screen or projector.
* **All these things will make entertainment a dream of the past.**

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* **Home Control/Security**
  + Control security devices/appliances such as the sprinkler, lights, A/C temperature, and security cameras with your universal machine. Even sync your cell phone to the universal machine and control these things remotely with your cell phone.
* **External Accessories**
  + Keyboard
    - The keyboard is a virtual one that shines on to the table allowing for a keyboard that acts as you press the table because of infrared technology. This results in a clutter free work area.
  + Mouse
    - The Bluetooth mouse is very small yet a very precise interface allowing it to catch the smallest movements made.
  + Bluetooth
    - The Bluetooth adapter allows for Bluetooth enabled things to interface with the universal machine.
* **Print Station**
  + Print, Scan, Copy and Fax at high quality with the Brother Multi Function Center laser printer.

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* **Sharing Documents**
  + Have meetings and conferences, talk, and share and make changes to documents with another person across the globe with Webex. Also listen to Voice Mails sent directly to your e – mail.
* **Free Internet Talking**
  + Talk till your heart gives up for free with the Magic Jack Internet Phone and also watch each other on video at the same time with the webcam. Finally listen to voice mails remotely using email. Even connect a land line phone to the transmitter and talk for free on the phone wirelessly.
* **Webcam**
  + An included webcam allows you to see someone’s facial expressions thousands of miles away. The microphone on the webcam allows you to talk with the person as if you’re right next to him/her. With the combination you can’t tell if the person is right next to you or not!
* **Instant Message** 
  + Exchange Instant messages using the webcam and softwares such as Google talk, Yahoo messenger, AIM, Skype, and Webex.

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* **Antivirus** 
  + With the Norton Security software, you’ll always know that you are safe from malware, virus, spam and spyware.
* **Remote Desktop** 
  + If you ever need anything from your universal PC and you’re not in town, The Remote desktop control software lets you access all your documents, and software from a remote pc or smart phone.
* **Word Processing**
  + Microsoft Office 2010 allows anyone to make and share documents, spreadsheets and more. The software has many features that make it very different from the rest. This software has a use in everyone’s life everyday and is very simple to use. Something that one can do with this software is making graphs and charts.

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* Project your computer output in the universal PC’s room on a screen up to 120”!
* Listen to what you’re doing in the room of the universal PC at amazing sound quality.
* Watch entertainment on plasma screen TV with your family in another room with the entertainment streaming from the universal PC.
* One can hear entertainment on their Bose Acoustimass16 speakers with the family in another room.
* Combining these 2 things lets one watch and hear entertainment like Blu – Ray movies on their plasma screen with their family in different room than the PC. You don’t need a DVD Player and Home Theater System crowding your TV space.

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* State of the Art high-tech features.
* With a price tag of $7000, it’s a very high-quality product at an incredibly low price.
* Since the universal machine is almost a server, it has plenty of open slots on its mother board to attach more components such as more HDD, RAM or a 1394 card. This is what makes this PC universal and what makes it stand out from the rest.
* This machine will be tested hundreds of times insuring that everyone can use it. Anyone from a 7 year old kid to a 100 year old man can perform tasks with haste.

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* **Processor**
  + The universal machine has a high tech processor. With four cores, one can run 4 very high graphic, and memory consuming applications at the same time at blazing high speeds.
* **Hard Disk**
  + With a hard disk space of 2 Terabytes (2000 gigabytes), one can store his/her entire movie/song/video/photo/office/personal data library in one hard disk with space to spare.
* **Operating System**
  + The universal machine has Windows 7 Professional, the newest Microsoft operating system. This is the easiest operating system to use and has blazing speeds.
* **RAM**
  + With 16 gigabytes of RAM memory this machine can run all the applications at high speeds. The start – up and shut down of the machine are both very rapid and with this memory, one can have hundreds of apps open at the same time.