



# Technical Need-to-know Basics

for

School Administrators

for

Technologies in Education

presented by:

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# Computers

## Options to consider:

- Warranty
- New or used/refurbished? (How much money available). What the computer is going to be used for?
- RAM (8,16,32,64,128,256, 512)Mega Bytes
- Hard Disk Capacity 10GB, 20GB, 40GB, 80GB, 100GB, 120GB
- Processor speed (500,600,800, 900)MHz, 1GHz, 1.2GHz, 1.3GHz  
(1.2,1.3, 2.4, 2.8, 3.0 GHz?)
- Branded (COMPAQ, IBM, DELL) or no-name
- Processor Type (Pentium vs Celeron)



## **Average cost of used/refurbished desktop computer**

- Pentium III of speed 500MHz and above ranges between 250,000/= to 450,000/= (SchoolNet Uganda regularly has refurbished pentium III desktop computers with the following minimum specifications: 500MHz P3 10gb HDD, 128 MB RAM, 15” Monitor, 2 USB ports, multimedia motherboard, NIC (network-ready), keyboard, mouse at 250,000/=
- Pentium IV will most of the time come in brand new computers.



## **Cost of brand new Desktop Computers as of 2<sup>nd</sup> February, 2005**

- Cyrix2000+ 40GB HDD, 128MB RAM, NIC, 15" Monitor **590,000/=**
- P3 40GB HDD, 128MB RAM, NIC, 15" Monitor **650,000/=**
- P4 2.8GHz, 40GB HDD, 128MB RAM, NIC, 15" Monitor **945,000/=**
- Celeron 2.4GHz, 40GB HDD, 128MB RAM, NIC, 15" Monitor **675,000/=**
- P4 2.26GHz, 40GB HDD, 128MB RAM, NIC, 15" Monitor **825,000/=**
- P4 3.0GHz, 40GB HDD, 128MB RAM, NIC, 15" Monitor **1,099,000/=**
- COMPAQ HP 3.0GHz, 80GB HDD, 256MB RAM, 17' Monitor, NIC  
**1,950,000/=**



## **Cost of brand new Computers as of 2<sup>nd</sup> August, 2007**

- DELL 3.2GHz, 80GB HDD, 512MB RAM, 17' TFT Monitor, NIC, CD-ROM, Floppy Drive + 1 year international warranty **1,200,000/=**
- COMPAQ/HP 3.2GHz, 80GB HDD, 512MB RAM, 17' TFT Monitor, NIC, CD-ROM, Floppy Drive + 1 year international warranty **1,200,000/=**
- A no-name computer with equivalent technical specifications will cost **600,000/=**



## Cost of brand new Laptop Computers as of 2<sup>nd</sup> August, 2007

- Toshiba 1.73GHz, 120GB HDD, 1.0GB RAM, 17' TFT Monitor, NIC, DVD writer, Floppy Drive, 2 USB, modem, wireless internet-ready, Windows Vista + 1 international year international warranty **1,600,000/=**
- DELL 1.86GHz, 120GB HDD, 1.0GB RAM, 17' TFT Monitor, NIC, COMBO (DVD-VCD-CD), Floppy Drive, 2 USB, modem, wireless internet-ready, Windows Vista + 1 international year international warranty **1,800,000/=**



# Power Supply

The power supply to all computers should be stable at all times and reliable. Never power computers directly from the mains. This mains power is unstable (keeps fluctuating) and blows up computers.



## Devices which could help to make power source stable

- UPS (Uninterruptible Power Supply) backs up your mains power to the PC to allow you save your work and systematically shut down when mains power goes off. Ordinary UPS come in brands like APC (an American brand). The minimum rating you should buy for 1 computer is 500VA and average costs is 200,000/= .
- Voltage Stabilizer removes spikes from a power supply system BUT does not provide backup power to the computer A 500VA or Watts stabilizer costs 125,000/=
- Voltage regulators are fitted on to the mains power sockets to regulate the power. They do not provide backup power to your computer.
- “Smart” UPS have built-in voltage stabilizers. They are the majority now on the market. **Blazer and Epro** are very common now on the market and are recommended “smart” UPSs. They vary between 75,000 shillings



# Printers

A printer is a computer accessory used to display on paper what the computer has processed.

## **Options to consider:**

- ✓ New or used/refurbished (how much money is available?)
- ✓ What the printer is going to be used for e.g cutting stencil, printing photo/graphics
- ✓ Print quality
- ✓ Cost of cartridge replacement
- ✓ Speed (pages per minute)
- ✓ Paper tray capacity
- ✓ Memory (for queuing print jobs)
- ✓ Connection to PC (What interface?)



# Average printer costs

## **Monochrome (Black & White):**

**HP Laser Jet 1100 Printer & HP Laser Jet 1200 Printer = 650,000/=** (*production lines were discontinued*)

Printer port = Parallel

Cartridge life = 5 reams

Cost per cartridge = 140,000/=

**HP Laser Jet 1320 Printer = 600,000/=**

Printer port = Parallel

Cartridge life = 5 reams

Cost per cartridge = 150,000 / =

**HP Laser Jet 1018 = 250,000/=**

Printer port = USB

Cartridge life = 2 reams

Cost per cartridge = 70,000/=



## Monochrome (Black & White) cont'd

**Dot Matrix Printer Epson LX300 = 350,000/=**

Printer port = parallel

Ribbon life = 1 box of paper

Cost per ribbon = 15,000/=

Cost per box = 35,000/=

*Comments: capable of cutting stencil*

**Dot Matrix Printer Epson LQ2180 = 1,400,000/=**

Printer port = parallel

Ribbon life = 3 boxes of paper

Cost per ribbon = 50,000/=

Cost per box = 35,000/=

*Comments: Capable of cutting stencil*



## Color Printer:

**Deskjet HP3420** (*production line was discontinued*)

Printer port = USB

Cost per cartridge set = 60,000/= black + 70,000/= color

Cartridge life = 300 pages per set (1 ream = 500pages)

Cost per ream = 7,500/=

***Comments: Local PC should have USB port***

**Deskjet HP3830** = (*production line was discontinued*)

Printer port = USB and Parallel

Cost per cartridge set = 60,000/= black + 70,000/= color

Cartridge life = 300 pages per set (1 ream = 500pages)

Cost per ream = 7,500/=

***Comments: Better resolution than HP3420***



## Color Printer Cont'd

**Deskjet HP5550 = 300,000/=**

Printer port = USB and Parallel

Cost per cartridge set = 70,000/= black + 80,000/= color

Cartridge life = 300 pages per set (1 ream = 500pages)

Cost per ream = 7,500/=

*Comments: prints photo quality*

**Deskjet HP6122 = 500,000/=**

Printer port = USB and Parallel

Cost per cartridge set = 70,000/= black + 80,000/= color

Cartridge life = 300 pages per set (1 ream = 500pages)

Cost per ream = 7,500/=

*Comments: Automated two- sided printing capability*



## Color Printer Cont'd

**Deskjet HP3745 = 140,000/= (14ppm)**

Printer port = USB

Cost per cartridge set = 70,000/= black + 80,000/= color

Cartridge life = 300 pages per set (1 ream = 500pages)

Cost per ream = 7,500/=

**Deskjet HP5150 = 150,000/= (19ppm)**

Printer port = USB

Cost per cartridge set = 70,000/= black + 80,000/= color

Cartridge life = 300 pages per set (1 ream = 500pages)

Cost per ream = 7,500/=



## Color Printer Cont'd

- **Deskjet HP5610 = 500,000/= (21ppm) (printer + fax + photocopier)**

Printer port = USB

Cost per cartridge set = 60,000/= black + 70,000/= color

Cartridge life = 300 pages per set (1 ream = 500pages)

Cost per ream = 7,500/=

- **Deskjet HP2180 = 180,000/= (21ppm) (printer + scanner + photocopier)**

Printer port = USB

Cost per cartridge set = 60,000/= black + 70,000/= color

Cartridge life = 300 pages per set (1 ream = 500pages)

Cost per ream = 7,500/=



# Scanners

A Scanner is a computer accessory used to convert a photograph or a picture which is on paper (called hard copy) into digital form (called soft copy) which can be stored on the computer, on websites and could be attached on emails and sent to another person over the internet.

**Acer Benq scanner = 120,000/=**

Resolution= 600 x 1200 dpi 48bit color

**Rhombus scanner = 120,000/=**

Resolution = 600 x 1200 dpi 48bit color

**HP Scanjet 2400 = 150,000/=**

Resolution = 600 x 1200 dpi 48bit color



# Digital Cameras

A digital camera is a computer accessory used to capture pictures in digital form ready to be stored into a computer or website or to be attached on emails.

- Volcano Digital Camera with webcam = 250,000/=
- Agfa ePhoto 780C with LCD screen = 400,000/=
- Megacam Sony Digital Camera with LCD screen = 600,000/=
- Mercury Digital Camera with LCD screen = 320,000/=
- Generation Next Digital Camera = 240,000/=
- Sony Cyber slot 7.2Mega Pixel, 2.8 camera zoom, charger, USB cable, 1GB memory card = 800,000/=



# LCD Projectors

LCD Projectors are used to enlarge computer screens. They are very useful when a teacher has a computer page he/she wishes to show the whole class. They are also very useful during school meetings, parents meetings, PTAs, etc... for showing presentation slides.

- In Focus LP260 = USD2,500
- HP VPL600 LCD Projector = USD 2,500
- Sony 2200 Lumens LCD Projector = 2,100,000/=
- EPSON 1800 Lumens LCD Projector = 2,300,000/=



# CD/DVD Writers

- Internal CD Writer = 50,000/=
- Internal DVD writer = 100,000/=
- External CD Writer = 120,000/=
- External DVD writer = 170,000/=

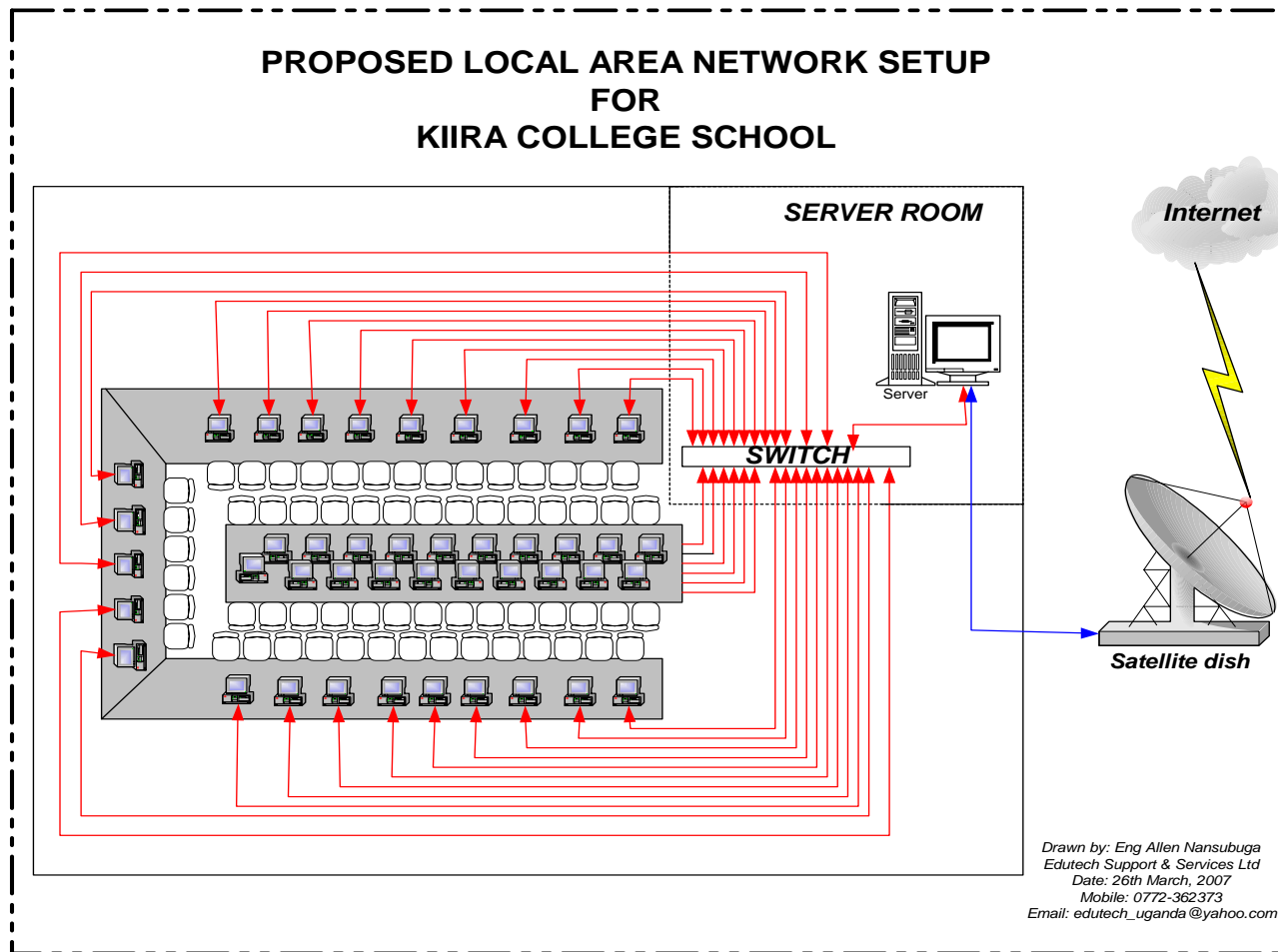


# Photocopiers

- CANON 1R 2060 Photocopier printing 22 pages per minute costs 2,850,000/=
- CANON IR 1018 Photocopier printing 16 pages per minute costs 1,900,000/=



# How should a school computer lab be setup?





## **Why a Network?**

To share and maximize available resources like content on a single PC or CD-ROM, printers, disk drives, a single connectivity line (dial-up) or wireless link or a VSAT link through a server.

## **What is required for Networking?**

### **Materials:**

1. Network Interface Cards (15,000/= ) But these days they are available in all computers even refurbished ones.
2. Networking switch (75,000/= , 150,000/=, 250,000 for 8, 16 and 24 ports respectively)
3. RJ-45 Connectors (500/= each)
4. RJ-45 Sockets (optional)
5. CAT5(e) Cable (150,000/= to 300,000/= for 300m role)
6. Cable trunkings 8,000/= each
7. Cable ties (20,000 a packet)
8. Wood screws + sockets (3,000/= per packet each)



## What is required ...Cont'd

### Tools:

1. RG-45 Cable stripper and crimper (75,000/= to 100,000/=)
2. Various screw drivers
3. Electric drill and various drill bits (You may borrow/hire)
4. Mallet hammer
5. RJ-45 cable tester



# Servicing and Maintenance of computers and accessories

- **Why service?** To prevent against the most common causes of system crashes, slow performance, and damaged data.

## How often?

- **Weekly:** Check your file system for errors, defragment your hard disk, update your VirusScan DAT files.
- **Monthly:** Check for physical defects on your hard disks when checking for file system errors; Check for Windows updates using Internet Explorer 5.5 Install all critical updates; Check that you have at least 20% of each hard disk available as free disk space; Upgrade Virus Scan if you are not already upgrading it weekly.
- **Termly:** Blowing dust out of the inside, re-installing software applications, re-configuring the LAN setup, updating anti-virus software to protect computer against viruses, hardware checks, putting new tags on the workstations (optional), documentation (service report).



## **Budgeting for replacements and service & maintenance**

- For replacements, budget for installation of replacements. A school can budget for hired skilled labor or for equipping interested teachers and students with the necessary skills. The later option is what we recommend.
- Labour ranges between 10,000/= to 50,000/= per computer (depending on bidding processes and contractor if you are to hire skilled labor)



## Internet Connectivity

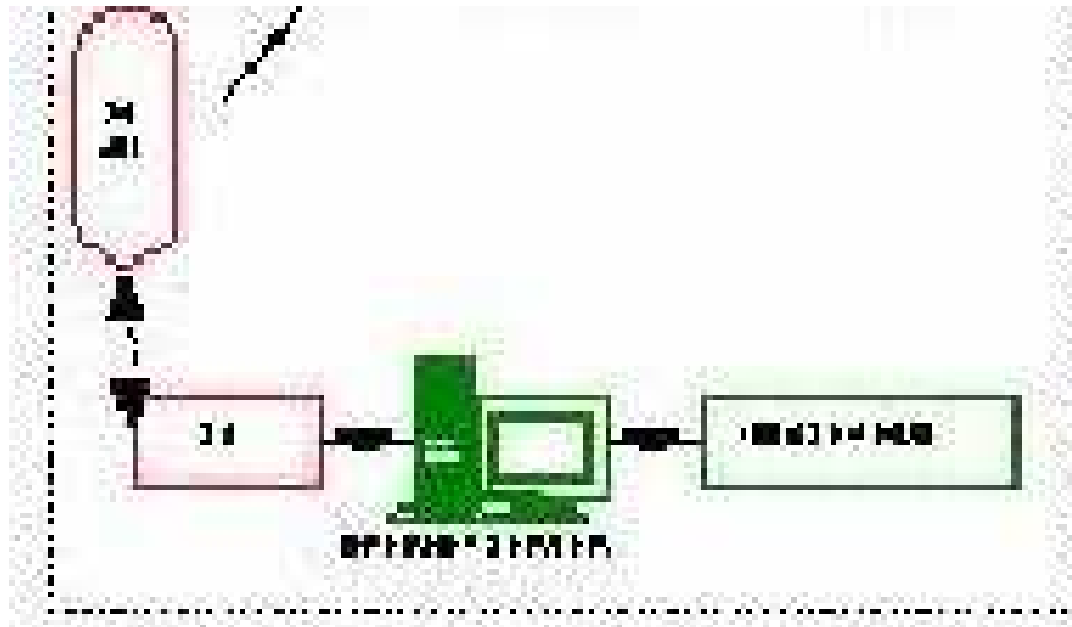
There are 3 types of internet connectivity you could opt for depending on the needs and affordability at hand.

- Dial-up vial fixed wireless phones from UTL and MTN are available avegarely at 300,000/= for equipment + installation and 100,000/= for monthly access.
- Wireless antenna and radio(modem) connection for those within line-of-site with communication towers in towns. One2Net merged with SPACENET and BUSHNET and they are working with UCC to establish internet points of presence in all townships around the country. Their offer is USD850 for the wireless antenna and radio and USD175 per month for 8 - 10PCs. The following towns so far have been covered:





# Wireless Internet connectivity





1. Arua --	Arua Town
2. Gulu ---	Gulu Town
3. Lira --	Lira Town
4. Soroti -----	Soroti Town
5. Kumi ---	Kumi Town
6. Malaba -	Malaba Town
7. Tororo ----	Tororo Town
8. Mbale ----	Mbale Town
9. Kamuli -----	Kamuli Town
10. Iganga --	Iganga Town
11. Jinja --	Jinja Town
12. Masindi -	Masindi Town
13. Hoima ---	Hoima Town
14. Mubende --	Mubende Town
15. Lugazi -----	Lugazi Town
16. Mukono -----	Mukono Town
17. Kayunga ----	Kayunga Town
18. Fort Portal ---	Fort Portal Town
19. Kabale -----	Kabale Town
20. Mbarara -----	Mbarara Town
21. Masaka -----	Masaka Town
22. Bulago Island -	The island
23. Entebbe -----	Entebbe Town
24. Busia ---	Busia Town
25. Pallisa ----	Pallisa Town



## VSAT Internet connectivity

- This is by far the most reliable type of connectivity because it is independent of terrain and existing terrestrial links (cables, exchanges, switches, etc) by telecommunications service providers
- In Uganda today there are 2 known VSAT service providers i.e AFSAT Communications Uganda Ltd and Uganda Telecom. Their type of service differs and so does the price as follows:
  - UTL gave SNU an educational special rate of USD3,000 for equipment installed and USD171 for monthly connection for 10-15 computers on a network.
  - AFSAT's offer is USD1,700 for equipment installed, USD250 for annual maintenance and license, USD 250 for monthly connection for about 6 computers on the network and USD350 for monthly for a connection of 10 computers



## **Need more information?**

Please contact SNU Technical coordinator. We'll be happy to help you establish a functional Educational technology platform at your school.

Mobile: 0772-362373 OR 0782-212373

Thanks for your attention!