

Server Based Open Source Computing for Tamil Schools in Malaysia

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ABSTRACT:

In the world of rapid development of IT Technology and the dramatic increase in computing power, the nation or the society with the ability to embrace the both were able to lock into the knowledge based economy with cutting edge technology, creating a knowledge gap. In daily life-hood the knowledge gap can be seen between the urban and rural population. The urban intend to have the leading edge in both knowledge, skill and ample of opportunities in all aspect of life. However the rural somehow left behind from the main stream of development due to lack of opportunities, low purchasing power and inadequate penetration of information, which are the disadvantages to the rural students faces, to seek or leap into the wagon of development.

As for the aspect of knowledge and skill development of the Tamil school going children in Malaysia, many of the them are located in rural parts of Malaysia where quality of education are still far behind as compared to the urban students. In order to bridge the gap between the rural and urban students, information technology and the advance power of computing with open source and freeware were put together in order to deliver quality education system at an affordable cost. The server based open source computer laboratory setup were found to be very practical, useful, cheap, reliable and the most cost efficient way to enhance the IT skills and to empower the Tamil school going children with wide spectrum of knowledge.

This paper will address in detail, how the server based open source computing for Tamil schools in Malaysia were implemented and how it is turning around Tamil students to face the future with confident.

KEYWORD : Thin Client, Open source, server based computing, freeware, Tamil

1. INTRODUCTION

Computer and communications technology have transformed global educational institutions by connecting students to the vast learning resources of the world.

Most of the schools in Malaysia are well equipped with local area network (LAN) technology which integrates all the computer peripherals in the existing computer within a LAN with WAN access. The conventional computer labs equipped with stand alone CPUs and installed with licensed software are not affordable by many tamil schools in Malaysia. Tamil schools in Malaysia are not fully government aided.

Therefore the schools need a comprehensive, scalable solutions that builds on their existing investment and presents a clear path to the future. Hence the server based open source computer laboratory set-up were found to be

practical, useful, cheap, reliable and the most cost efficient way to be implemented. In fact the open source server based infrastructure designed with an emphasis on expanding accessibility to network beyond classroom or school boundaries, and on to consolidating resources on a central management server. Each students will be connected using thin client based architecture which only required to input from keyboard and mouse, with monitor for display, the processing of application is done at the server. The central server manage all the application software and educational tools and data. Thin Client technology enables wide range of educational tools to be delivered from the central server.

2. OPEN SOURCE COMPUTING

Open source computing/software describe the environment that the new copyright, licensing, domain and customer issues. The main

principles and practice of open source software development is peer production by bartering and collaboration, with the end-product (and source material) available at no cost to the public.

The following are the criteria of open source operating system and software:

- License is not restricted to any party
- License are allowed to be modified
- Modification is allowed by adding on "patch files"
- No discrimination against person or groups
- Redistribution of program can be done without the requirement for additional licenses
- License must not be specific to a product
- License must not restrict other software - it's not required for other programs to be open source

The type of open source programs:

(1) Open Office



(2) Web Browsing



Mozilla Firefox

(3) Instant Messaging



Pidgin

(4) Video Playback



VLC



(5) Video Conversion



Media Corder

(6) Video Player



Miro

(7) Graphics Editing



GIMP

(8) Email



Mozilla Thunderbird



Paint.Net

(9) Sound recording



Audacity



Inkscape

3. THIN CLIENT HARDWARE

An ideal thin client is the computer hardware without hard drive and well equipped with dedicated mini motherboard which depends on the central server for processing data and connects to the server through network to run applications, access files, print, and perform all services available in ordinary computers. Plate 1 shows an Ideal Thin Client Architecture.

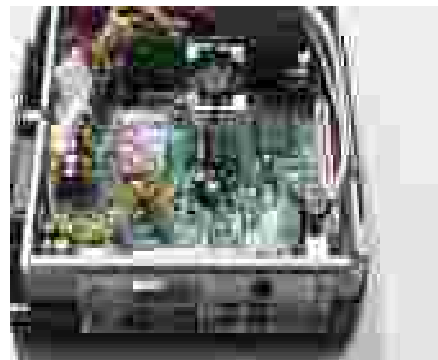


Plate 1: Ideal thin client architecture

A cost-effective similar solution is provided by using refurbished PCs. Whereby the refurbished PCs supported by open source ubuntu server platform and the PCs can be converted into powerful thin client machines with PXE

network booting mechanism from the central server. Plate 2 and 3 shows the refurbished PC and centralized raid server installed.



Plate 2: Refurbished PC



Plate 3: Centralized Raid Server

4. ADVANTAGES OF OPEN SOURCE COMPUTING SYSTEM

The thin client system in school computer labs are capable of providing affordable server-based open source computing solutions. The main advantages of using this system in schools are to increase reliability and consistency of technology. Through a password-accessible account, students, teachers, and administrators can store and can access saved documents and

personal settings. Because all files and programs are stored centrally, users can access their work from any computers on the network.

Eg. when a teacher or student “logs in”, the server provides them with their “desktop configuration”. Users can even access their “desktop” from home or other remote locations.

The other advantages open source computing thin client system can be listed as below:

- **Less Administration** – Central management of users, patches, software, data, and backups.
- **Higher Security** – Elimination of viruses, Trojans or other vulnerabilities on the user desktops.
- **Hardware Independence** – Support of virtually all client devices and computer hardware and very low system requirements (Pentium 3 with 512MB RAM).
- **Easy Access** – Teacher and students can access their documents and applications from any PCs in the local area network.
- **Reduction in TCO** – Total Cost of Ownership reduction by up to 50%

Benefits for school in using open source computing thin client system:

- Lowers cost of technology over time
- Secure data and equipment
- Less downtime and greater efficiency
- Reduces administrator staffing costs
- Lessen the risk of data theft
- Disaster recovery: Data is more Secure
- Reduced time for technical Support
- Lower power consumption: save electricity
- Zero licensing management
- Minimum Maintenance
- Highly trained individuals are not required

Plate 4 and 5 shows the before and after condition of computer laboratory setup



6. CONCLUSIONS

The open source thin client computing environment implemented in Malaysia Tamil schools are an evolutionary change in teaching and learning system using ICT. The server based open source technology making it easier for students and teachers to organize and access education materials and multimedia content. At the same time the thin client network enables the schools to use this technology more effectively to monitor students real time work. With the open source applications and thin client technology it was possible to decrease the cost of installation and the cost of maintaining the computer lab. With Servers installed at each and every schools, the setting up of centralized

school management system is now possible. With the system in place, teaching and training materials can be deployed to every school at no time. This will enhance greater sharing of knowledge between schools, universities, individuals and even between countries.

Figure 1 : Shows the future of Thin Client and centralized management allowing students and schools to have full access to centralized server from anytime and anywhere.



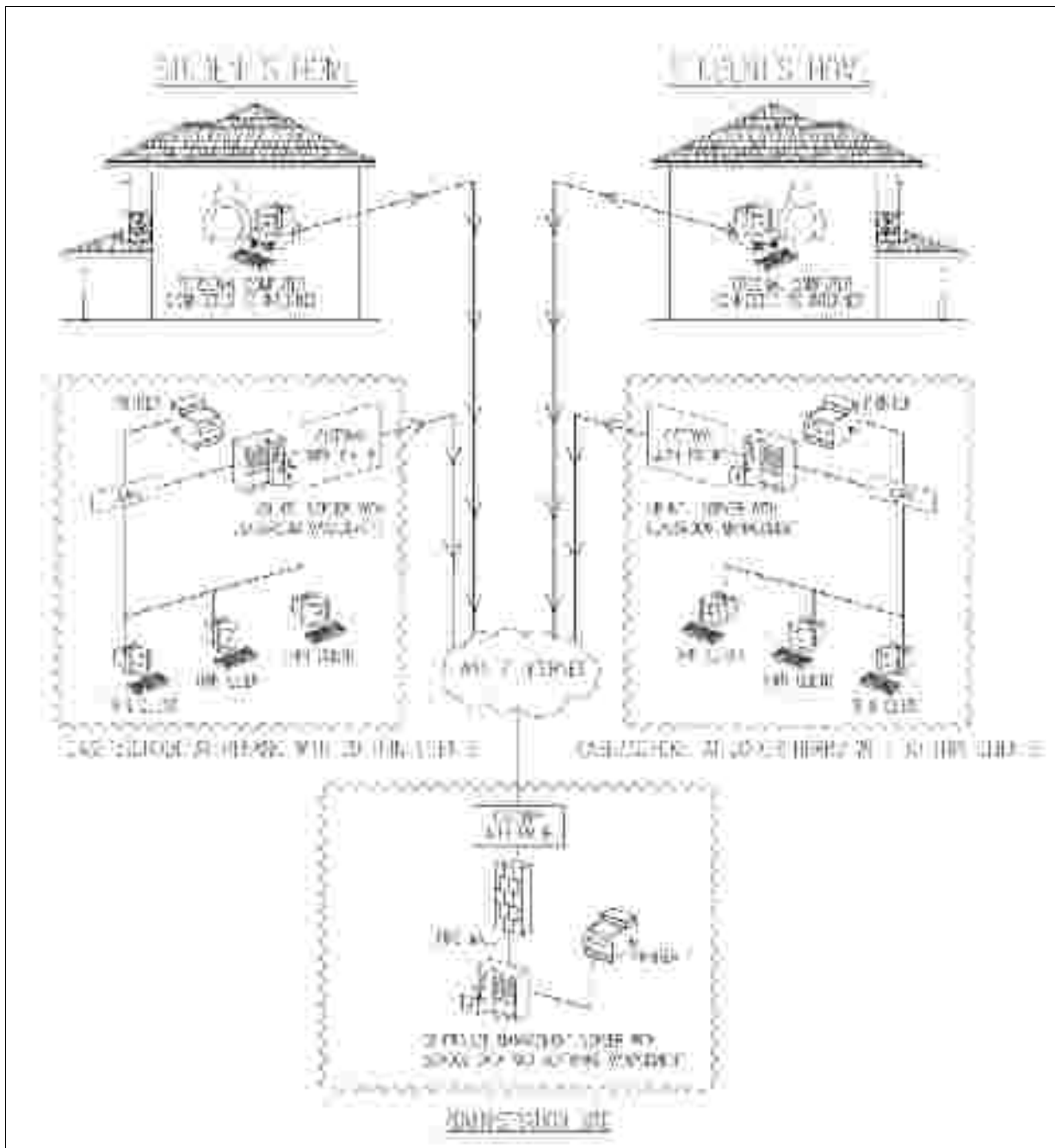


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