

Proposing a Computer Network Infrastructure Model for Educational Institutes

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Abstract

Networks play a major role in the IT set up of an organization and extremely critical for the functioning of information systems. It is very important to plan a well-organized network infrastructure to utilize the available hardware as well as software resources. There is an alarming amount of legacy networking in institutions. As a result of under-resourcing, around one third of institutions still use the oldest and most basic kind of network technology that allows connections at less than a tenth of the speed possible. This article aims at proposing a Network model for the educational institutes. In this article a survey is conducted to investigate various aspects of the network infrastructure used in higher education institutes in Pimpri ,Chinchwad and

Pune area. There were various type of questions in the survey covering topics related to hardware components ,operating systems and data related to network security.

Introduction

Today's educators have a vision of where they want to take their institutions. It's a clear image of high-tech classrooms, cutting-edge labs and unprecedented access to information. The question for them is not where they want to go but how to get there, especially in light of other concerns such as administration, curriculum and budget constraints. As institutes address these challenges and overhaul their practices and teaching methods to change with the times, the right technologies, implemented correctly, will help

educators deliver the skills that students need to succeed. Right now institutes and universities throughout the world are implementing powerful network infrastructure solutions to create better learning opportunities, raise learning standards, reduce costs and improve security. Maximizing the performance of their networks, not just individual PCs, these institutions are investing in their network infrastructures from top to bottom, deploying ever-faster, higher-capacity connections for simultaneous voice, video and data.

To develop an efficient network infrastructure following factors are needed to be considered:

Plan the network's complexity to be in line with current IT trends.

[Switches and routers](#) come with hundreds of features and functions. However, engineering too many bells and whistles into the network can create support problems in the future, if the customer's IT staff does not have some basic understanding of the features and functions you implement. Recognize the business's needs without making the network overly complex.

✓ **10 Gigabit Ethernet? 100 Gigabit?**

Just because [10 Gigabit Ethernet](#) is here today and higher speeds are coming does not mean that you need those ports all over the LAN. While it is definitely practical to ensure that core switches can support these higher speeds, you may be advising the customer to waste a lot of money if you tell them that 10 Gigabit switches are needed everywhere.

✓ **Redundancy.**

Network uptime becomes more critical every year. Spend time planning a design that provides network redundancy from a physical and logical perspective.

✓ **Standards and maintenance.**

When designing a network infrastructure, [try to standardize](#) on a few different types of devices, as opposed to using a different type of switch in every wiring closet, even if all your equipments is from the same manufacturer. Standardizing on a few different types of hardware simplifies configuration and troubleshooting.

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✓ Network management tools.

While these always seem to be left off purchase orders, [network management tools](#) are invaluable in providing maximum network uptime. Software that periodically backs up all device configurations to a share on the network is simple but extremely useful.

Consultation Methodology

Questionnaires were used as way to collect information about the existing network infrastructure of the MCA institutes in PCMC and Pune area. The results of this consultation will help the

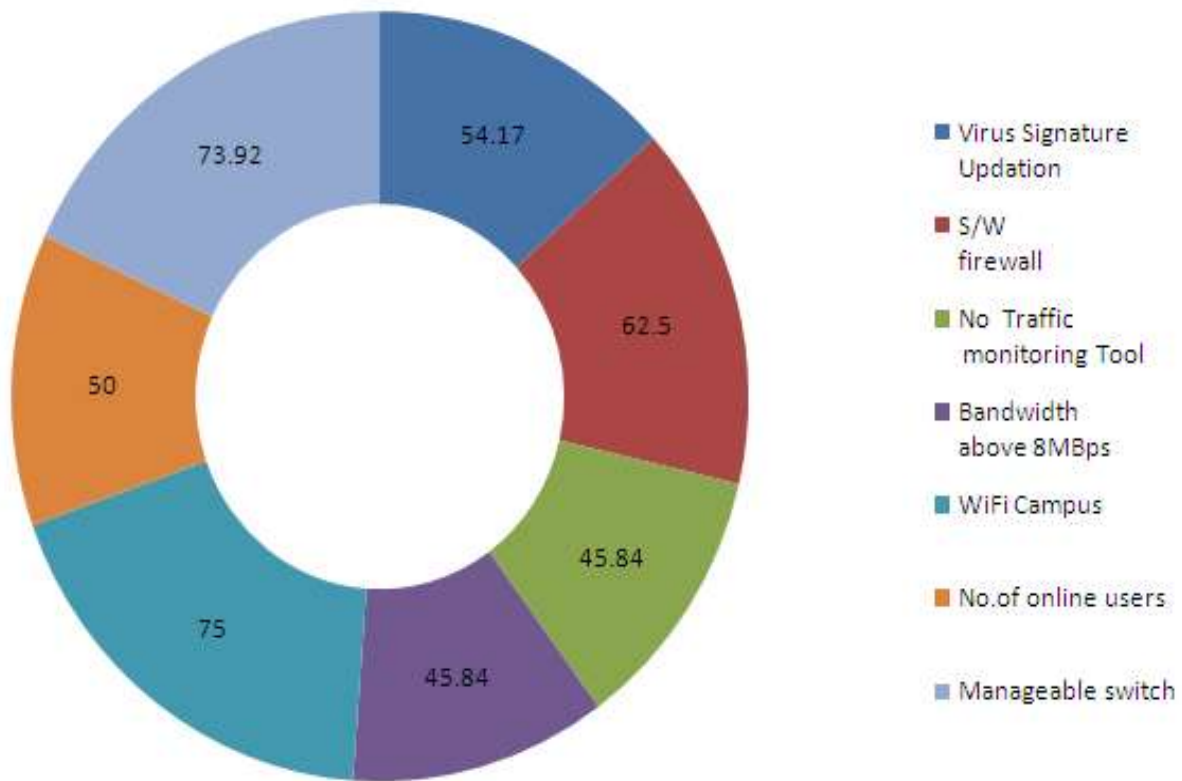
upcoming institutes to design the network infrastructure.

Questionnaire Response

In total 24 responses are received. The questioner is divided into three categories viz. most important ,important and least important. Out of 24 responses ,13 responses are received for most important questions,8 responses for important questions and 4 responses for least important questions.

Data Analysis

	Virus Signature Updation (%)	S/W firewall (%)	No Traffic monitoring Tool (%)	Bandwidth above 8MBps (%)	WiFi Campus (%)	No.of online users (%)	Manageable switch (%)
Percentage	54.17	62.5	45.84	45.84	75	50	73.92

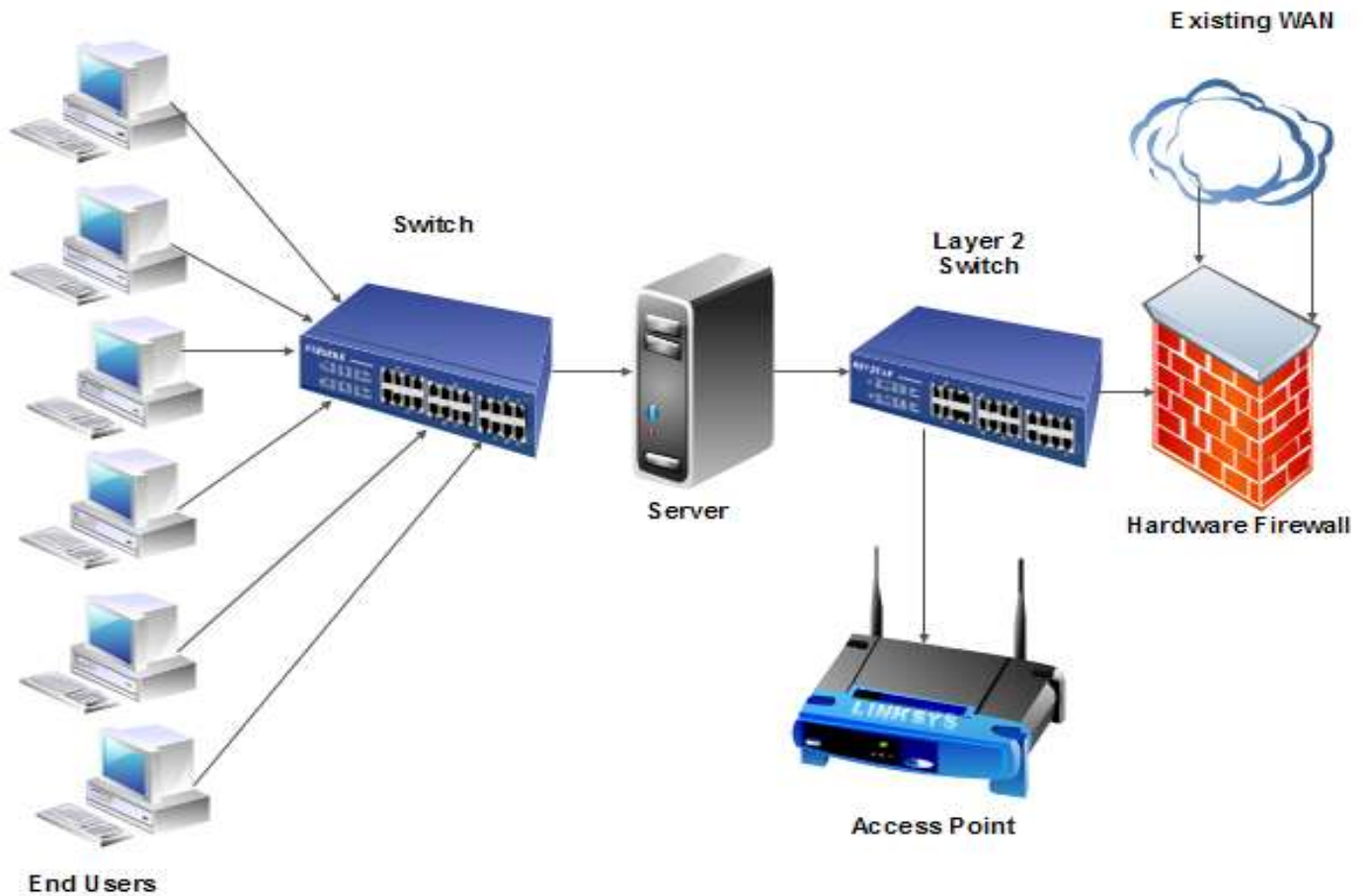


Conclusion

As per the data analysis done on the basis of the questioners collected from various MCA institutes situated in PCMC and Pune area 62.5% institutes are making use of software firewall and 75% institutes have wifi campus. 50% institutes are having more than 200 online users. 74% institutes are using manageable switch.

On the basis of above analysis the network model compatible to the institutes is as follows:

PROPOSED NETWORK MODEL



Limitations

The proposed model mainly focuses on wired network infrastructure and the related parameters. In future the model can be enhanced to accommodate all the required parameters for a wireless network infrastructure.

References

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