

A Study of Computer Training Environment for Decreasing Administrative Works

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Computer environment for training students should be kept regular. The administrator must continuously carry out administrative works. The works include the initial adjustment. This paper describes a way for decreasing those works. In the author's office, Tenshi College, the DHCP system and the system of network file sharing are used for that purpose. The current state of the office and the way how to decrease them are described. In conclusion, those systems can work well to decrease those administrative works.

Key words : administrative work
 computer training
 computer environment

1. Introduction

A computer environment for training students is managed by an educational institution, such as a college. There are two kinds of administrative works:

- (1) Initialization of computers
- (2) Keep them regular

When computers are introduced into the institution, they must be adjusted to a regular condition of the institution. From a point of view of computer hardware, for initial works, administrators may connect computers to hubs, format hard disk drives or put number labels on computers. It seems to be difficult to decrease such works, since there are not so many ways to do those works. When such initial works are done, it is not necessary to work so hard for keeping computer hardware regular. On the other hand, from a point of view of computer software, for initial works, administrators may adjust configurations of OS, or install some applications and device drivers. There is a chance to decrease such works.

In some cases, there are many ways for carrying out such works for software settings. Some are efficient and some are inefficient. When such initial works are done, administrators continuously work for keeping computer software regular, since it is easy to modify software configurations not only for administrators but for ordinary users. There are many cases where users modify software configurations consciously or unconsciously.

This paper describes one of ways for decreasing administrative works of computer environment for training students. Taking the computer training room, which is called 'r4302' in this paper, in Tenshi College as an instance, environments of DHCP and network

file sharing are described, since the author successfully keeps computer environment regular by using them.

2. A Present Environment.

This section describes a present environment of r4302.

2.1. Hardware

Computers in r4302 were settled in 1996 (H08). There are about sixty personal computers (PCs) in r4302. One computer is placed on a desk for a teacher and others are placed on desks for students. All of those computers have a same specification. The computer for a teacher is not special. The hardware specification of PC is shown below.

PC: NEC, PC9821 V12
CPU: Intel, Pentium 120MHz
Memory: 24Mbytes, SIMM
HDD: 850Mbytes + 500Mbytes, IDE
CD-ROM: 4x speed, IDE
NIC: 10BASE-T, PCI
Display: NEC, 15inches, CRT

All of those computers are connected to two networks. One is an ethernet network, which consists of four switching hubs. Each NIC (Network Interface Card) of a PC is connected to a port of a hub. Another is the PC-Semi network. It is made by NEC, and consists of special cables and devices. It is used for projecting a display of the teacher into displays of students.

Since the PCs have a low performance relatively to recent PCs, applications which is designed for recent PCs often do not work on the PCs. They are very old. They often go wrong. If a PC goes wrong, it is removed from a desk and the PCs are arranged again on desks so that a desk with no PC is placed to the far side.

2.2. Software

The software specification is shown below.

OS: Microsoft, Windows 95 SP1
 Applications: Microsoft, Office 97 Standard
 Microsoft, Internet Explorer 5.5 SP2
 shareware, AL-mail [ALMAIL]
 SMI soft, Perfect Key Master 1.1 [PKM]

Perfect Key Master is used for keyboard training. AL-mail is used for reading and writing E-mails. There is no anti-virus software. It must be introduced into r4302 as soon as possible.

The Service Pack Two (SP2) for Office 97 is not applied yet.

Windows, Office and Internet Explorer are installed into the local hard disk. AL-mail is installed in a hard disk of a file server computer and each PC has a link to the place where AL-mail is installed. Perfect Key Master is installed into the local hard disk, but the records of users are installed in the file server computer and each user can see the user's record from any PC through the network.

2.3. Administrative Works

This section focuses on administrative works for software.

An initial administrative work is to install OS and applications into PCs. It is needed for OS to be configured at the installation. In r4302, the TCP/IP [TCPIP] protocol is used for networking. By default of Windows 95, NetWare and NetBEUI are used. They are removed from the OS and TCP/IP protocol is installed. In order to set an IP address to the NIC, DHCP (Dynamic Host Configuration Protocol) [DHCP] is used. It is activated by default of Windows 95. For sharing files through the network, it is needed that a workgroup, or the NT domain, name is properly recorded and the Microsoft

Network Client is installed. Some short cuts to applications are placed on the 'desktop.'

The initial administrative work is finished when these configurations are finished. A state at this moment is the regular condition of software.

The administrator continuously carries out the following works to keep the condition regular.

- (1) Executing 'scandisk' and optimizing the file system
- (2) Removing unnecessary files.
- (3) Upgrading application or applying patches to them
- (4) Arrange PCs again when a PC goes wrong

PCs in r4302 often freeze by uncertain reasons. If a PC freezes, then it is rebooted by pressing a reset button. If Windows 95 is not shut down by a proper method, then the file system is broken. The scale of destruction varies, but in most cases OS can boot. Accumulation of destruction makes PCs easy to freeze.

Most users of PCs in r4302 are students. Since they are very unfamiliar to PC, there are chances to remove or create files on unsuitable places, such as the desktop. Sometimes they are conscious and sometimes they are unconscious. Since there is a small free space of hard disks, it is prohibited to create files in hard disks of PC. Files of users must be saved into floppy disks. There is no suitable place in hard disks.

Students will graduate and may use PCs of companies. Microsoft is going to produce new versions of Office and Windows. Since it is possible for students to use the new ones, the software environment for training should be as new as possible. In fact, PCs in r4302 are very old and the newest products do not work.

3. The Study

This section describes DHCP and network file sharing systems. Those are very useful for decreasing administrative works.

3.1. DHCP

PCs can get configuration information of a network by activating DHCP (Dynamic Host Configuration Protocol) [DHCP]. The information includes an IP address and a subnet mask, a DNS [BIND] server and a DNS domain name, a default gateway, and so on.

In r4302, MAC (Media Access Control) addresses [MAC] of PCs and corresponding IP addresses are statically recorded in a DHCP server. When a PC is booting, OS issue a DHCP request by broadcasting. The broadcasting includes the MAC address. A DHCP server replies to the request with network configuration information, which includes the fixed IP address. A PC is always assigned to the same IP address. If a user accesses the network in r4302, then the action is recorded in system log files. The record includes an IP address or DNS name of the address, and we can find the PC from it.

Since DHCP is activated by default of Windows 95, it is not necessary for the administrator to set TCP/IP configurations. DHCP decrease the initial administrative work.

When a PC goes wrong and PCs are arranged again, it is not necessary to assign IP addresses again to each of PCs. NICs are still assigned to fixed IP addresses. Fortunately, NICs are hard to go wrong. Thus, the administrator should not mention to TCP/IP configuration when the arrangements of PCS changes. In this point, the administrative works decrease, too.

3.2. Network File Sharing

If once Windows 95 is installed and the network configuration is completed, PCs can share files through the network. In r4302, as a file server software, SAMBA [SAMBA] (version 2.0.7) is running on Solaris 7 [SOLARIS] for x86.

The CD-ROM drive of PC is slow and PC often freezes in using its local CD-ROM drive. The reason why it freezes is unknown to the author. In r4302, if PC uses a CD-ROM drive of the file server computer, instead of the local CD-ROM drive, then the PC is hard to freeze. As an experience it is known that the speed of transferring files through the network is faster than transferring from the local CD-ROM drive. The author did not measure the difference in speed between them. It is subjective to the author.

The specification of the file server computer is shown below.

Model:	NEC, Express 5800/140
CPU:	Intel, Pentium 133MHz
Memory:	32Mbytes, SIMM
HDD:	2.0Gbytes, SCSI.
CD-ROM:	4x speed, SCSI
NIC:	10BASE-T, PCI
OS:	Sun Microsystems, Solaris 7 for x86

With network file sharing, chances of freezing and time of installation decrease. Thus, the initial administrative works decrease.

As an administrative work, icons on the desktop are kept regular. There are some short cut links to applications on the desk top. If the icon is removed or modified, then it must be recovered. In order to create a short cut link there are a few steps, and the amount of the steps is heavy for a number of PCs. For decreasing these steps, icons are saved into the file server's folder. In recovering desktop icons, administrator just

copies them from the folder to the desktop. They are copied manually not automatically. The administrative work, however, surely decreases by using the system of the network file sharing.

4. Discussions

The DHCP system decreases the administrative works of the installation of OS and those of the re-arrangement of PCs. Those works relates to (4) shown in Sec. 2.3. The network file sharing system decreases administrative works of the installation of applications and those of the maintenance of desktop icons. Those works relates to (2) and (3).

Administrative works which relate to (1) can not decrease the way described in this paper.

In fact, if we use a cloning HDD tool, such as Norton Ghost [NORTON], then administrative works become very simple. Administrator makes only one PC regular, and then clones from the PC to other PCs. Since commercial system costs, it is not used in r4302. The DHCP client is bundled to Windows 95 and the DHCP server is distributed freely by ISC [ISC]. The system of network file sharing is included in Windows 95 and the SAMBA server also distributed freely. They do not cost.

There is a free system called one-FD SAMBA [ONEFD] and it may be able to act as Norton Ghost. It is, however, not verified by the author yet. The author hopes that one-FD SAMBA system has an effect on cloning HDD.

5. Conclusion

In conclusion, the administrative works in r4302 surely decrease, but there are some other methods for this purpose. It is necessary for us to research them.

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7. References

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