Focusing On:

Microsoft

WINDOWS

✓ OS
✓ Applications

+ Windows NT

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Editor's Notes

Channel is a bi-monthly publication of the Centre of Computing Services and Telecommunications (CCST) of HKUST. Prepared by the Computing Information Centre of CCST and printed by ETC, Channel provides information about CCST plans, developments and services. Topics on new trends in computing technology and other related topics of general interest are also included. User contributions to Channel are welcome and should be sent to the Editor along with the author's name and department.

Channel is distributed to University members who are registered users of CCST services. Other parties who would like to have their names added to our mailing list for Channel may complete and return the form on the last page to the Computing Information Centre.

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MS-Windows 3.1 at HKUST
- A System's Perspective

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A New Operating System

Operating System (OS) is nothing but the first program that your PC runs when it gets switched on. OS does very little for you visibly, but in fact it is the foundation of the applications that you use, and it substantially affects the capabilities of those applications.

HKUST PCs used to run the MS-DOS 4.01 operating system upon which you are provided with useful tools like WordPerfect, Dbase, Lotus 1-2-3, Pathworks Mail, etc. You may have noticed 2 characteristics of MS-DOS:

- You can only run ONE application at a time;
- Basically you manipulate character based data and documents.

Our recent PC system upgrade to MS-DOS 5.0 and MS-Windows 3.1 (see System News in Channel Issue 17) has made a small step forward to give you a better MS-DOS (Version 5.0), and a big step to bring about a new OS (MS-Windows).

How is MS-Windows Better Than MS-DOS?

In the first place, you can run multiple applications simultaneously. You can have MS-Word for Windows to edit a document, MS-Excel to do a spreadsheet, VT320 to login to a Unix server and a Clock to show you time.

Then you have a completely graphical user interface. You can do things via point and click instead of commands and function keys. You can mix graphics with text.

More, different Windows applications give you consistent and almost the same common functionalities such as saving/retrieving files and printing, which means, you only need to learn once to perform a task in different applications.

MS-Windows furthermore allows large programs to process large data. In fact, you can run programs that need more memory than what you physically have in your PC.

Different MS-Windows applications can work together. You can cut and paste among them. You can make them talk to one another to solve a problem jointly via Dynamic Data Exchange (DDE). You can link data of different types together via Object Linking and Embedment (OLE).
**But There’s No Free Lunch!**

At such sophistication, MS-Windows needs a PC at least as powerful as this to work at HKUST: 368 or above + 4MB memory + mouse device.

If you do not have such a PC, you may work with your departmental computer coordinator to mail or call CCST for an estimation of upgrade possibility and costs. In most cases, upgrade is just a matter of adding memory and a mouse.

Once you start to exploit MS-Windows capabilities, you will probably want to have a 486 PC with 8MB memory and VGA.

**MS-Windows at HKUST**

CCST has put in great tuning effort to fully integrate MS-Windows into the network. Not just that we put MS-Windows and its applications on the network disk, not just that we make it able to print to the network printer, we have also made our Unix and VMS servers accessible, and electronic mail and Chinese processing work.

MS-Windows is the state-of-the-art environment for PC. It has been around for a few years through which its robustness and networking capabilities are improved to a high level. Therefore, do consider taking upgrade and training to move to MS-Windows. You will find that you can start on it quickly. Do exploit multitasking, cut and paste, and the ability to string different applications through DDE and OLE. You will discover new quality level in your works, and new possibilities for your personal or departmental computing tasks.

Technically it is impossible to subsume DOS into Windows completely, so do not expect you can run all DOS programs on Windows. Most don’ts with MS-Windows are related to pushing DOS programs under Windows too much.

**Don’ts in MS-Windows.**

- Run the UST menu system;
- Access IS systems;
- Connect/Disconnect network drives with DOS USE command (use File Manager instead);
- Expect every DOS programs, particularly games, to run.

We have installed a self-contained set of MS-Windows in your C: drive, specifically in C:\UST\W31. While this takes 8MB of your disk space, it allows you to add your own Windows stuffs. Windows can be significantly personalized in:

- Colours;
- Desktop appearance, wall paper, screen saver;
- How you arrange your favourite programs in handy Program Groups;
- What to start up automatically when you start Windows;
- Making a permanent 32-bit access swap file and using SMARTDRV to improve performance;
- Using 1024x768 pixel resolution with 256 colours;
- Adding your own devices like SoundBlaster card and video board to respectively get music and movies in.

You do not have to know Windows technically deep to do these customizations. A lot of them are just done through Window’s Control Panel program. What you should do after customization is to save a copy of the following files in C:\UST\W31:

- SYSTEM.INI
- WIN.INI
- PROGRAM.INI
- *.GRP

Window’s characteristics and personality are stored in those files. If they are screwed up, Windows will go crazy or just refuse to start up.

CCST has distributed a couple of the MS-Windows User’s Guides to the general office of each UST department (see Documentation on Page 11). The guide gives you comprehensive instructions and information. Thick though it may be, you really do not need to read anything from it before kicking off Windows.

Let us now select “Microsoft Windows” from the menu, and here we go.
"UST" MS-Windows Applications and Facilities

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HKUST Windows Environment (UST-Window)

With the recent launch of Microsoft Windows 3.1 to our PCs on the campus, CCST has brought a powerful environment that is easy to use and filled with fun to your desktop. You are now opened to a fascinating graphical Windows environment, with everything in your hand at the click of a button. Hence, it is important for all users to be aware of the facilities this environment offers, and not to lose out any of the goodies.

The applications/services in which the HKUST Windows environment offers may be subdivided into four categories. Each of these categories will now be discussed.

Figure 1 Default UST-Window Environment for Staff

Basic MS-Windows Utilities
UST-Window provides all utilities that comes with MS-Windows 3.1, under program groups MAIN, ASSESSORIES, and GAMES. The STARTUP program group is placed there for users to add applications in which they want to startup automatically at the start of Windows.
For beginners to get started with MS-Windows, just select Windows Tutorial from Help on the Menu bar. To learn on any of the utilities, just invoke the utility and select Help for descriptions. Finally, you can refer to the Microsoft Windows User's Guide for details.

**UST's Network Services**

For the convenience of our users in the Windows environment, most of the network services that existed in the DOS environment has also been incorporated into the Windows environment. This avoids the need of users to temporarily exit Windows and then re-enter Windows after using such services. These services are grouped under five program groups, namely HKUST Main Applications, Unix Server, HKUST Information Service, HKUST Windows Applic Maint, Chinese Processing.

As the name suggests, **HKUST Main Applications** is the program group that contains the main and most commonly used network services provided by CCST. It contains:

- **Electronic Mail** - That is, Pathworks Mail, identical to the version used under the DOS environment in which the users are familiar with.
- **Edit Mail Distribution List** - The same utility that is being offered in the DOS environment for editing mail distribution lists.
- **USTCC3** - VT320 terminal emulation to enable remote login to the VMS server USTCC3.
- **TELNET** - VT320 terminal emulation to provide the TELNET service.
- **Control Network Laser Printer** - This enables you to establish a connection to any networked laser printer.
- **Control Network Matrix Printer** - This enables you to establish a connection to any networked matrix printer.

In addition, Microsoft Word 2.0a and two DOS shells are placed into this program group for the convenience of the users. The difference between these two DOS shells is merely that one will display the DOS prompt inside a window so that you can work with other applications simultaneously, and the other displays the DOS environment on full screen. With the full screen DOS shell, it is very easy to forget that you are still actually inside Windows. Some users may unconsciously re-enter the menu system. Please be very cautious because our menu system has not been built to have multiple copies running concurrently. Unexpected results may arise.

The **Unix Server** program group contains facilities for remote logins to the unix servers. One will automatically connect you to the staff and postgraduate server, whilst the other will connect you to the undergraduate server. Use the one that is appropriate to you.

The **HKUST Information Service** program group provides facilities for staff to access the Electronic Notice Board and the HKUST Communications Directory. For students, only the Electronic Notice Board is provided. Although the user interface is slightly different from that of the DOS version, the same functionalities are provided.

The **HKUST Windows Applic(ation) Maint(enance)** program group will be used in the future to enable staff to individually select released network applications that they want to use. This way, the user’s desktop will not be overcrowded with applications that they do not intend to use. However, this facility is not available for the students; they will have what is given.

The Chinese Processing facility available under Windows is identical to that offered under the DOS environment, interface wise and functionality wise. However, this application must be run under full screen.

**Selected Windows Applications**

In order to provide the users with an efficient and productive Windows working environment catering for general use and academic purposes, their desktop must be adequately populated with a number of applications. Thus, CCST has selected a wide range of applications. For staff and dormitory, applications offered can be identified from Figure 1. The students environment includes also Alchemy III, AutoCAD and WIMP2001.

**User’s Self-Installed Applications**

It is inevitable that different users will have a distinct requirement on their desktop. Hence, users are allowed to freely install applications that they require onto their desktop. However, such applications will NOT be supported by CCST.

**Printing**

Under the HKUST Windows environment, once you have connected to a specific printer queue and has selected the correct printer driver for that printer, all printings from any of the Windows applications will be directed to that printer. CCST has already added printer drivers for the supported printers into your environment.
Multitasking
Multitasking enables you to simultaneously run a number of applications on the same screen. For example, I can start up MS Word in one window, whilst running MS Excel and E-mail in other windows, so that I can see and work on all three applications at the same time.

You may start up as many applications as the amount of memory permits. But of course, with so many windows being opened at the same time, your desktop may look rather muddled. One way to keep your desktop tidy and to have the applications remain running is to 'iconize' the application. They will then sit quietly at the bottom of the screen waiting to be maximized, that is, revert to a window instead of an icon, with a double click of the mouse button.

Cut and Paste
Another handy feature of Windows worth-mentioning is the Cut and Paste command. You can use these commands to transfer text, graphics, or a combination of text and graphics between or within applications. Take an example, I can cut a paragraph from an MS Word document and paste it to another MS Word document. The very same paragraph can also be pasted onto an Excel spreadsheet.

With our existing HKUST windows environment, more can be achieved. Whilst logged in to my VMS account, I am editing a file with the EDT editor. At the same time, I am also logged in to my Unix account using the vi editor. In addition, on the desktop, I have a DOS shell opened running the DOS editor, and a window opened running MS Word. The amazing thing is that I could now transfer text between all of these text editors. Whilst I was busy cutting and pasting text across different platforms, I suddenly heard a beep. It was my Electronic mail icon sitting quietly at the bottom right corner, informing me that I had just received a new mail message.
One step further from the cut and paste function, there is the powerful feature of Object Linking and Embedding (OLE). This enables you to combine information created from different windows applications into one document. Depending on your needs, you can 'link' objects or 'embed' objects into your document. When you link an object, the object from the source document will be displayed on the destination document. When you make a change to the source document, any documents linked to this source will be automatically updated. When you embed an object, a copy of the object from the source document will be made onto your document. To make changes to this object, you simply double click on the copied object and it will automatically invoke the appropriate application for you to make modifications. Changes made on the copied object will not cause any changes to your original document.

With this limited space, I could only highlight a few of the possibilities in which some of these basic windows functions can offer you. In order to make your windows environment more effective and enjoyable to work in, you must explore and play around with the possibilities. So, why not join in with the fun now!
Now that we have Windows 3.1, it is time to look at another new computer operating system, Windows NT. As you will see, Windows NT is dynamically different from MS-Windows.

**What is Windows NT?**

Windows NT (New Technology) is Microsoft's latest attempt of a sophisticated operating system with security, robustness, extensibility, portability and performance in mind. The design team, headed by Dave Cutler, previously one of the chief designer of DEC's VMS operating system, started the design of Windows NT back in late 1988. They have built into it many features found in other operating systems like Mach, VMS and UNIX.

Although Windows NT is not yet available (as of the time of writing, Microsoft is releasing the Beta version of Windows NT), it has aroused a lot of attention and posed a threat to the UNIX community. Some UNIX vendors like SGI, NCR, DEC, Sequent have announced plans to support Windows NT as an alternative to UNIX, while others responded differently. The formation of COSE (Common Open Software Environment), including IBM, HP, SunSoft, USL, SCO and Univel, is seen by many as a direct offensive against Windows NT.

**A new Door to Windows**

The user interface to Windows NT is very similar, if not exactly the same, to Windows 3.1. The familiar ‘point and click’ techniques allows Windows user to accustom to Windows NT immediately.

Except those that need specialized hardware and/or device drivers, most existing Windows applications run unmodified on Windows NT, and the user need not learn new techniques to their applications. Based on an approach used in the 'Mach' operating system, Windows NT consists of an NT executive and protected user sub-systems. With such architecture, Windows NT is capable of supporting different user environments such as DOS, Windows 3.1, OS/2 and POSIX. NT executive provides the mechanisms for user sub-system to access files, network resources, security, etc., while different user sub-systems provides the policy and environment for the user applications to work. Applications run as separate processes and provide the system robustness absent in DOS/Windows.

Perhaps the very first difference a Windows' user would notice is the need to provide a user name and a password in order to login or gain access to the system. Login provides access control to data. Access tokens, established during login, determines what access rights the user has.

Security extends from the desktop to backend servers. Windows NT has been built with networking features inside the kernel. Networking functionalities include RPC (remote procedure call), Named Pipes, Mailslots, NetBIOS, WinSockets. NetBEUI and TCP/IP protocol come with the product by default. Other network protocols like OSI, DECnet, and IPX/SPX can be easily incorporated using the streams architecture and NDIS standard.

Another advantage of having networking architecture within the kernel is the ability to support both local and remote (network) file systems. Windows NT currently supports FAT, HPFS and NTFS as local file systems, and LAN Manager networking services (the network file and printing standard adopted in HKUST) intgrate seamlessly into Windows NT. With the concept of 'object domains' and implementations of MPR (multiple provider router) and MUP (multiple UNC provider), other file systems can be easily incorporated using the I/O and network systems within the kernel.

Data sharing across networks should not be bound by local languages and dialects. Multi-lingual support is another important feature of Windows NT. Windows NT is one of the first operating systems that has built-in Unicode support. Unicode is a code set that supports practically all languages in the computer commerce today. (Code sets like traditional Chinese, simplified Chinese, Korean, Japanese, etc. are all uniquely defined in Unicode). As a consequence, Windows NT no longer needs to carry different operating system extensions in order to cater for different languages.

Windows NT runs on different hardware platforms. A 'Hardware Abstraction Layer' insulates the operating system from the details of different hardware platforms. The beta-test
version of Windows NT has been running on Intel 386/486, MIPS R4000, DEC Alpha and on Symmetric Multiprocessor Architecture. The range of hardware supported reinstates the portability and extensibility of the operating system. In order to take advantage of different platform capabilities, recompilation is needed, and source code compatibility is almost guaranteed to provide the scalability.

**Will the Users Need It?**

Windows NT does present rich functionality and features to programmers and designers, which will in turn benefit end users when the base of native NT applications (Win32) further builds up.

Because of the portability and scalability of Windows NT, hardware vendors will be unleashed from the burden of ‘reinventing’ operating system details like SMP, threads, etc., but focused on adding value in their hardware designs. Software suppliers will also enjoy better source and binary compatibility. These ultimately benefit the users with better products and services, a picture that may not be found even in the open but fragmented UNIX environments.

With the huge number of possibilities in Windows NT, it is no doubt a powerful OS. However, the software does, at this moment, have a comparatively large requirement for hardware resources for an ordinary user. It is estimated that the first release needs at least 8 MB of memory and a 386 processor.

Given that technology is improving in the fast lane, such requirements may not be a hill too hard to climb. And in this respect, only time can tell.
New Services/Development

HKUST Electronic Noticeboard

On May 1, we rolled out the MS-Windows version of HKUST Electronic Noticeboard. To use this program, your PC must be running under the MS-Windows 3.1 environment. The program item is HKUST Electronic Noticeboard inside the HKUST Information Services group on your Windows desktop. To start up the program, double click the item. Online Help is available.

HKUST ComDir

Since April 7, both the MS-Windows and Macintosh versions of the HKUST Communications Directory are available for the use of HKUST staff computer users.

The Directory contains information about all HKUST staff including the title, full name, department code, e-mail account code, phone extension, and office location. CCST is dedicated to maintain the information as up-to-date as possible. In view of the move to Phase II of various departments, the Directory should provide a handy way to locate an office or a staff member.

To use the MS-Windows version of the program, your PC must be running under the MS-Windows 3.1 environment. The program itself is the icon, HKUST Online Communications Directory, inside the HKUST Information Services group. To start up the program, double click the icon with the mouse button. Online Help is available.

System

USTHK: FDDI VMScluster

USTCC1/2/3 systems were migrated to an FDDI-based VMScluster consisting of 3 new VAX 4000 Model 90 systems on April 11. User account directories were also redistributed to newly installed user disks.

Centre News

MATLAB & Its Applications

Organized by the Centre, the Department of Electrical & Electronic Engineering and the Department of Mathematics, the MATLAB and Its Applications workshop on scientific computation was held on May 5.

Centre Visit

Thirty members from the Hong Kong Computer Society visited the Centre on May 5. The Society was introduced to the university computing environment in detail.

Documentation

Microsoft Word User's Guide (D-WINU00-0) was released and distributed to all staff users, one each user, in early May. At the same time, MS-Windows 3.1, MS-Word on Windows 2.0 and MS-Excel on Windows 4.0 documentation sets from suppliers were given away to all departments for reference.

User Training

The Centre launched a number of MS-Windows training sessions for UST general users in May. The course recorded an attendance of over 150 users.
CCST Contact Points

User Consultation Coordinator -
Mr. Tony Chan - 6243 cctony

Telephone Services Coordinator -
Ms. Christine Cheng - 6190 cccheng

Training Courses Registration -
Ms. Anna Mak - 6189 ccanna

Requests for Computing Resources -
(Admin & Business)
Mr. William Tung - 6221 cctung
(Others)
Mr. Danny Tang - 6241 ccdanny

Problem Reporting E-mail Account -
CCHelp -
For users to send in their problems and difficulties via e-mail. A consultant will respond to messages sent to this account as soon as possible.

Suggestion E-mail Account -
CHANNEL -
For users to send in their queries, ideas, suggestions and comments concerning services we provide. A consultant will respond to messages sent to this account as soon as possible.

Channel Mailing List

A mailing list is maintained for the distribution of Channel. To be placed on the mailing list*, fill out this form completely and mail to the Computing Information Centre, CCST, Hong Kong University of Science and Technology, Clear Water Bay Road, Hong Kong. Please print clearly.

☐ Add my address to the mailing list
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Name: ____________________________
Organization: __________________
Address: _______________________
_________________________________

*Registered users of the CCST services are placed automatically on the mailing list.