Internet Services Available at HKUST

<table>
<thead>
<tr>
<th>Service</th>
<th>PC</th>
<th>Mac</th>
<th>Unix</th>
<th>VMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>telnet</td>
<td>Y</td>
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<tr>
<td>tn3270</td>
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<td>FTP</td>
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<tr>
<td>archie</td>
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<td>Y*</td>
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<tr>
<td>xarchie</td>
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<td>Y*</td>
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</tr>
<tr>
<td>USENET</td>
<td>N</td>
<td>N</td>
<td>Y*</td>
<td>N</td>
</tr>
</tbody>
</table>

Mathematical Software

- IMSL
- MATH/STAT
- Exponent GRAPHICS
- Mathematica
- Maple V
- MatLab
- MathCAD
- SAS
- S+

VAX/VMS System Reconfiguration

USTHK

USTCC1

VAX 4000
5 VUP

USTCC2

VAX 4800
24 VUP

USTCC3

VAX 4000
24 VUP

Central
Network
Server

Academic
Computing
and Software
Development

Inside:

- Internet Services Available at HKUST ..................... 3
- Access to San Diego Supercomputer Center .................. 5
- VAX/VMS System Reconfiguration ............................ 6

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6 VAX/VMS System Reconfiguration

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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 (CIC), Channel provides valuable information about CCST plans, developments and services. Topics on new trends in computing technology or other related topics of 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 all University members who are registered users of the 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.

Esther Chan, Editor of Channel
CIC ccesther@ust.hk.BITNET
Internet Services

Following the announcement of the Internet connection in the last issue of Channel, we are pleased to report that many users are already making extensive use of this facility. The importance of Internet to our University is obvious if we understand the services it makes possible to our users. The following is a short description of the major ones.

Telnet

There are many reasons a user might need to access a remote machine. A user might need to use a database at another university, he might need the power of a supercomputer to assist in his research (see “Access to San Diego Supercomputer Center” on Page 5), or might want to browse a library catalogue at another institution. This is all possible on the Internet provided the user has the proper access right to that remote machine.

Telnet allows a user to logon to computers on the Internet. It can emulate many terminal types, most often is VT100. If there is a need to access an IBM computer running the VM or MVS operating system, the user needs a special version of telnet called tn3270 which emulates an IBM full screen 3270 terminal.

FTP (File Transfer Protocol)

This is the primary method of moving files over the Internet. Authorized users may access files on any Internet machine that allows such access. There are voluminous useful electronic documents/public domain software on the network available to the public via the anonymous FTP service. A site offering the anonymous FTP service essentially lets anyone on the net to have access to a certain area of disk space in a non-threatening way. There are over 800 anonymous FTP servers that make software and documents available to people on the Internet. Access to those sites is by logging into the server with the account name “anonymous”. Generally, the user is invited to enter his/her account code as password.

Archie

Archie is a query system developed at the McGill University in Canada to track the contents of anonymous FTP sites containing over a million files stored across the Internet. There are a number of archie servers on the net. The archie servers automatically update the listing information from each anonymous FTP site about once a month. There are two main-stream archie clients, one called ‘archie’ and the other ‘archie’f (or use with X-window). The client takes a user's search pattern, query the archie database, and yield a list of systems that have the requested file(s) available for anonymous FTP.

USENET

USENET is a co-operative bulletin Board that run on a large number of machines on Internet. The transmission of USENET news is entirely co-operative. Feeds are generally provided out of good will and the desire to distribute news everywhere.

Most bulletin article carries one or more universally-recognized labels, called newsgroups. Individual site can have its own local newsgroups which are generally not available to users of other USENET sites. USENET newsgroups are organized according to their specific areas of concentration. Currently, there are over 2000 newsgroups covering topics in computing, different academic disciplines, campus administration, politics, social and cultural issues, hobbies and recreational activities, and many more. A user can post a new topic for discussion or a follow-up to a topic being discussed. The creation of new newsgroup involves a “vote” to determine popular support for (and opposition to) a proposed newsgroup.

IRC (Internet Relay Chat)

IRC (Internet Relay Chat) is a multi user, multi channel teleconferencing system. It allows people all over the Internet to talk to one another in real time. IRC is based on the client-server model. There are many IRC servers in the Internet. Conference attendees are referred to as clients communicating with each other via channels. You can compare conversation on a channel to a conversation among a group of people. You can see and reply everything that was said. What you type is received by everybody who's on the channel and willing to listen.
Internet Services Available at HKUST

The following table summarizes the Internet services available at HKUST now or in the near future.

<table>
<thead>
<tr>
<th>Service</th>
<th>PC</th>
<th>Mac</th>
<th>Unix</th>
<th>VMS</th>
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<td>Y</td>
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</tr>
<tr>
<td>tn3270</td>
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<td>N</td>
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</tr>
<tr>
<td>FTP</td>
<td>Y*</td>
<td>Y*</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>archie</td>
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<td>N</td>
<td>Yc</td>
<td>N</td>
</tr>
<tr>
<td>xarchie</td>
<td>N</td>
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<td>Yd</td>
<td>N</td>
</tr>
<tr>
<td>USENET</td>
<td>N</td>
<td>N</td>
<td>Ye</td>
<td>N</td>
</tr>
</tbody>
</table>

Note:

a) tn3270 terminal emulation is supported on two SUN servers, uststu and uststf.
b) Direct FTP from PC/Mac will be available in the future.
c) The archie client runs on Unix. PC/Mac users should login uststu or uststf to access the program, or telnet one of the remote archie server interactively (e.g., quiche.cs.mcgill.ca at McGill University).
d) xarchie client currently runs on SUN Unix workstation.
e) USENET service will be available soon.
f) IRC service will be available in the near future.

Support Services

Internet was made accessible to our users as soon as the connection was established. CCST is still developing the support services. Recently, the following reference documents were made available to each department:

- "Zen and the Art of the Internet" - a very well written and comprehensive beginner’s guide to the Internet.
- "Internet Resource Guide" - compiled by NSF Network Service Center. It is an index to the vast amount of resources accessible through Internet.
- An anonymous FTP servers list - it lists the popular anonymous FTP servers and the types of public domain software/electronic documents kept in them.

The documents were obtained from Internet via FTP. While informative, they do not cover the mechanics of using the various Internet services. Such information will be covered in the Internet User’s Guide being prepared by CCST. It is expected that the user guide will be available in May. Training courses will also be organized.

Be a responsible Internet user

The Internet is an international infrastructure for information and knowledge sharing. The reliable operation of the Internet and the responsible use of its resources are of common interest and concern of its users, operators, and sponsors. It is considered as unethical and unacceptable any activity which purposely:

- seeks to gain unauthorized access to the resources of Internet,
- disrupts the intended use of Internet,
- wastes resources (people, capacity, computer) through such actions,
- destroys the integrity of computer-based information, and/or
- compromises the privacy of users.
Besides, please note that the 64 KB line which connects us to the Internet is an expensive facility shared among UPGC institutions. As a responsible user, you should make proper use of this resource and avoid wastage. In particular, don’t excessively copy documents/software from FTP servers. As the documents/software would be updated from time to time, knowing where to get what and only get those when needed is far better than keep on retrieving and filing something which might be needed sometime in the future.

"Access to and use of Internet is a privilege and should be treated as such by all users of it."

__________________________

**Internet Seminar**

An Internet seminar is scheduled at the end of April. In this seminar, Mr. Edward Spodick of Library will describe how a user can access a large number of library catalogs through Internet. All users are welcome.

**Date:** April 30, 1992 (Thursday)

**Time:** 3:30 p.m. - 4:30 p.m.

**Venue:** LT-200 (200 seats)

**Topic:** Library Catalogs & Electronic Journals access through the Internet

**Speaker:** Mr. Edward Spodick
Assistant Librarian I
Library

**Abstract of the seminar:**

The resources available through the Internet are voluminous. Researchers, instructors, students, and other academics will be especially interested in the hundreds of library catalogs which can be investigated; and in the many newsletters and journals which are available in electronic format. This seminar will provide a brief introduction to these resources, and show you how to explore them from your own desktop.

**New Services/Development**

**Access to San Diego Supercomputer Center**

City Polytechnic of Hong Kong (CPHK) has made arrangement with the San Diego Supercomputer Center for using the Center’s CRAY Y-MP8/864 supercomputer (8 processors, 2.6 Gflops, 65 GB of disk storage, 1.3 TBytes of cartridge tape storage).

The facility is accessible to all UPGC institutions. Each project approved to run on the machine will be allocated some start-up CPU time at no cost. Once a project begins using the machine for production work, the user will be charged for the CPU time used.

Interested users please contact Mr. Danny Tang (Extn. 6241) for more information.
VAX/VMS System Reconfiguration

Background

The Central Network Server for HKUST, namely USTHK, was originally a dual-host DSSI cluster. It was first installed in 1989, and was meant to provide nearly all shared-use computing services such as email, common PC applications, printing, academic computing, the administrative information system, etc.

The number of staff has been increasing rapidly since then, with only a non-proportional expansion in the capacity of the Central Network Server. Thus, an extremely great deal of effort has been put on fine-tuning its available resources in order to cope with the ever-growing demand.

Also, some roles of the Central Network Server were moved out to specialized systems during the course. For example, ADMIS, another dual-host system, arrived in late 1990 and now accommodates nearly the whole administrative information system. In mid 1991, academic computing and various software development projects were also moved out to another dual-host called USTVC. Diagram 1 below shows the said configuration.

Solution by Adopting Latest Technology

To achieve a better system performance and at the same time facilitate the easy access to email for academic users, we decided that the latest VAXcluster technology be used.

The idea is to configure a three-node DSSI cluster* as the Central Network Server using the existing systems in USTHK and USTVC. One of the nodes in the cluster would be used for academic computing such that academic users could access email and other computing resources directly from the same cluster system.

Problem

When it came to the end of last year, the system performance of the Central Network Server was finally pushed to the utmost limit, and adding a new user would simply cause a degradation of the overall system performance.

Also, as email is supported by the Central Network Server, users (mainly academics) who exploited USTVC intensively found it more convenient if both academic computing and email could be done on a single system.

Also, we decided to upgrade our VAX 4300 systems (those used in the original USTVC) to the latest VAX 4500 systems via a very attractive promotion package. According to the vendor, the upgrade would bring about a nearly three-times performance boost. Diagram 2 depicts the goal configuration:
To achieve this, a series of upgrades and re-configuration exercises was planned, and carried out on sleepless nights during the past two months. Hopefully, our effort should have brought only minimal and inevitable disruption to the users.

While the details of the re-configuration would be rather complicated to be explained here, there are a few notes worth mentioning:

1. As VAX 4500 only runs under VMS 5.5, our Central Network Server has been upgraded from VMS 5.4-2 to VMS 5.5.

2. As USTCC1, USTCC2 and USTCC3 are now in the same cluster, a single user profile would be used to access all. For example, the same password can be used to log on all three systems***, and access the same set of user files.

3. USTCC1 and USTCC2 perform the role as the Central Network Server, providing PC applications, file and print services, etc. to every department.
   - USTCC1, currently a VAX 4200, would be used mainly for administrative users, together with normal interactive VMS users for email and bulletin board services.
   - USTCC2 would serve all other staff and run most time-critical networking software.

4. Academic users requiring intensive computing power may log on USTCC3, and also perform email there.

**Future Plan**

In a simple sense, the re-configuration mentioned above is simply merging two systems into one. Apart from the increase in CPU power, the total amount of disk storage is actually reduced by 1.2 GB. This places a very significant pressure on us to allocate the available disk space.

On the other hand, the need for disk space is anticipated to grow continuously, together with the University. Therefore, we are planning to increase the storage capacity of the Central Network Server by installing a DSSI expansion box and high-capacity storage devices. Also, the expansion box can help to improve overall system reliability.

To cope with the dynamic computing demands in an advanced technology institute like HKUST, our system configuration and technology would certainly keep on evolving, and we should be very pleased to keep you posted on any update.

**Remarks:**

* VUP stands for VAX Unit/s of Performance, and amounts nearly to the performance of a VAX-11/780
** This is a new cluster technology and HKUST is the first in Hong Kong to have such a configuration installed.
*** Interactive log-on to USTCC2 is currently disabled for performance reasons.
Mathematical Software

This is the first of a series of articles on academic computing. This first article summarizes what Mathematical software are available in our university. Future articles will cover other areas such as graphics and visualization, modelling and simulation, business computing, etc..

Introduction

Mathematics is no doubt the foundation of many areas of scientific and engineering researches and applications. Veteran computing users will recall, with mixed pride and pain, those early years when “computing” meant doing mathematics and “automatic programming” meant using a FORTRAN compiler. In recent years, the software industry has come to offer many more powerful tools for scientific computation - interactive investigation of mathematical phenomena and productive application of mathematics in solving different scientific and engineering problems.

In planning to support scientific computation, we have observed the following:

- Despite the widespread acceptance of the C programming language, FORTRAN continues to be one of the most widely used programming languages in scientific and engineering applications.
- There is a new class of mathematical processors which has attracted a lot of attention. These software provide sophisticated mathematical functions to support numerical, symbolic, algebraic, and graphical processing. Besides number-crunching of numerical data, these software allow exploration of symbolic relationships such as solving equations in terms of variables.
- As workstations (PC's and Unix-based workstations) become more powerful, users want more immediate feedback in the problem solving process. That feedback comes in the form of interactivity and visualization. Interactivity allows a user to try different things very quickly. Visualization gives a user immediate feedback by allowing the user to see the result.

What we have in HKUST . . .

In HKUST, the main computational platforms are high-end PC’s and Unix-based workstations. Modern mathematical processors are both CPU and graphics intensive. A powerful machine is needed to give the response time (interactivity) and high-quality graphics (visualization) demanded by today’s computational users.

The following table shows the most demanded mathematical software for teaching and research in the University.

<table>
<thead>
<tr>
<th>Software</th>
<th>Platform</th>
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<tbody>
<tr>
<td></td>
<td>PC</td>
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<tr>
<td>IMSL</td>
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<td>MATH/STAT</td>
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<td>Exponent</td>
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<tr>
<td>GRAPHICS</td>
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<tr>
<td>Mathematica</td>
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<tr>
<td>Maple V</td>
<td>✓</td>
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<tr>
<td>MatLab</td>
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<tr>
<td>MathCAD</td>
<td>✓</td>
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<tr>
<td>SAS</td>
<td>✓</td>
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<tr>
<td>S+</td>
<td>✓</td>
</tr>
</tbody>
</table>

- available
HP - available on HP platform
SUN - available on SUN platform
Mathematica, Maple, SAS, and S+ are all X-window applications and are accessible from any workstation running X.

Besides the software listed above, we are also working with the faculty on special purpose software to support simulation, Finite Element Analysis, etc.

Introduction to the software

The following is a short description of each software. Please consult CCST if you need more information about them.

IMSL (International Mathematical and Statistical Libraries)

IMSL is one of the most widely used mathematical and statistical library in scientific and engineering applications. It is a collection of about 1000 Fortran subroutines.

Another IMSL product is exponent GRAPHICS which provides powerful, versatile graphics capabilities for use with FORTRAN programs. It contains over 70 FORTRAN subroutines providing extensive plotting capabilities from automatic three-dimensional contour rendering to control of low-level graphics primitives.

Mathematica

Mathematica is a calculational tool and a programming language. It performs three basic types of computations: numerical, symbolic, and graphical. In addition to having an enormous collection of numerical functions, Mathematica provides standard symbolic operations of algebra and calculus, including integration and differentiation. The software plots functions and data in two or three dimensions. It also incorporates a powerful programming language, in which models can quickly be constructed. The software allows the creation of documents called “notebooks,” which can combine text description with “live,” interactive equations.

Maple V

Maple V is a software package for symbolic and numeric computation, mathematical programming and visualization. It is considered as a symbolic powerhouse. The compact kernel and loadable libraries provide Maple V with remarkable speed, compactness, and flexibility. The library contains more than 2000 mathematical functions. It provides output for 2-D and 3-D graphics processing, LaTeX typesetting and Fortran compilation.

MatLab

MatLab stands for MATrix LABoratory, is an interactive numerical package whose basic data element is a matrix that does not require dimensioning. MatLab integrates numerical analysis, matrix computation, signal processing, and graphics in an easy-to-use environment, where problems and solutions are expressed just as they are written mathematically, without traditional programming.

MathCAD

MathCAD is a mathematical scratch pad. The latest PC version of it is MSWindow-based and supports the Multiple Document Interface (MDI) so that several documents can be kept open at the same time and allows easy cut and paste across documents. The software has licensed certain symbolic calculus and computer algebra features from Maple.

MathCAD’s long-standing attraction has been its scratch-pad metaphor. A scratch pad can contain live formulas, plots, and text explanations, all in a single document. However, MathCAD does not have a full-featured programming language.

SAS (Statistical Analysis System)

SAS is a modular, yet integrated software for data management and analysis. Besides its statistical supports, SAS also has modules for data management, graphics processing, and numerical computations. The following modules are available on our HP720 workstation:

- **BASE** - data management and basic analysis
- **ASSIST** - task-oriented, menu-driven interface
- **AF** - building applications and user front-ends
- **CONNECT** - distributed processing and file transfers
- **ETS** - econometric, time series, modelling
- **FSP** - interactive data entry, data edit and query
- **GRAPH** - graphics processing
- **IML** - interactive matrix programming
- **INSIGHT** - data exploration and visualization
- **OR** - operational research, decision support
- **STAT** - simple to advanced statistical analysis
S-PLUS

S-PLUS is an interactive computing environment for graphical data analysis, statistics, and computational programming, embodying both an object-oriented programming language with rich features for statistical and mathematical programming and a statistical analysis software package. The S-PLUS language supports object-oriented features like classes, inheritance and methods. It can also call routines written in C and FORTRAN.

S-PLUS has a rich and flexible environment for composing graphics for both exploratory data analysis and for final publication. It supports two dynamic graphic functions: brush and spin.

UNIX News

FrameMaker Upgrade

FrameMaker has been upgraded from Version 2.1 to Version 3.1. The followings are some of the new features:

• A Table option is added to the FrameMaker 3.1 menu-bar. Table operations such as Insert Table, Table Format, etc., are available under the Table submenu. Creation of tables no longer requires the use of tabs or anchored frames as in version 2.1.

• FrameMaker 3.1 allows a single document to keep variations of text and graphics called conditional text. It gives the capability of saving different versions of a document in a single FrameMaker document file.

• FrameMaker Postscript output now conforms with Adobe PostScript Document Structuring Conventions. This makes it possible for other applications to read FrameMaker PostScript files and rearrange the pages in any order.

VAX News

IMSL Upgrade

IMSL has been upgraded to Version 2.0 on ustec3. In this new version, the Special Functions library (SFUN/LIBRARY) is merged into the MATH/LIBRARY to form a single library. Performance enhancements for Version 2.0 have been made in several areas, most significantly in the areas of Linear Systems, Eigensystems, FFT's and Random Number Generation.

Macintosh News

Macintosh System 7.0 is Here!

“System 7” is nothing new to an Apple Macintosh fan, Apple has preached it for a few years. It is here. It comes with every new Macintosh. And now you can get support on System 7 from CCST.

Do you need System 7?

Apple says that you need it because:

1. Apple will only support System 7 in the long run.
2. There are so many goodies that you cannot miss. Things like:
   * Multi-tasking.
   * Running gigantic programs and handling gigantic data in the order of tens of megabytes.
   * Virtual memory.
* Balloon help that pops up when you point, don’t even need to click.
* Great ease in finding files.
* File sharing and exchange directly among Macintoshes without going through a file server.
* Automatic updating of composite document via subscribe & publish.
* Chaining of applications via Apple Events.

3. New technology, like QuickTime for real time multimedia, will be developed on top of System 7.

Our experience with it :-(

While you can boot system 7 on a 1MB Mac and Apple says that you can run system 7 with a Mac with 2MB, you really need 4MB to start with system 7 with practical usefulness. System 7 is also evolving fast, in 9 months time, it gets to system 7.0.1 and now with a “system 7 addon”.

Current Macintosh application compatibility with system 7 comes with a catch - “32 bit clean”. We found that running an existing Macintosh application in system 7, with 32 bit addressing turned on, often crashed a Macintosh. What about advanced applications on system 7? We have only MS-Excel 3.0 here. But they are coming.

Finally there is networking. File sharing in system 7 is really great. But because of different versions of LaserPrep, a system 7 Macintosh cannot print to our network printer. You need an AppleTalk connected laser printer for system 7 at the moment. Mail, access to library & servers are also not available yet.

Our network vendor - DEC - has been working closely with Apple to get the networking software upgraded to system 7. They have officially released a new version in USA. CCST is working aggressively with DEC H.K. to get that here.

What if you really need to put a hand on it?

Please call the CCST Hot-line at Extn 6200. We are more than happy to work with you to learn about the pragmatic reality of system 7 in due course.

---

Documentation

Chinese User Guides Available

CCST recently released two newly-prepared Chinese software manuals to staff members of the University. They are:

- 《倚天中文系統入門手冊》
- 《倉頡輸入法入門手冊》

Staff News

Scott Cheung, Assistant Computer Officer of the Computing Information Centre, left CCST in mid April to join the Provisional Airport Authority as End User Computing Officer. We wish him every success in his future career.

Saminda Lam, formerly Assistant Computer Officer of the Systems & Operations team, has been promoted to Computer Officer in February 1992.

QUIZ

Quiz for this issue is suspended due to limited space.

Answer to the Quiz of Last Issue

Stagger the various work areas along an invisible diagonal running through the worksheet. This ensures that adding rows or columns in one area will not affect any of the other areas.

<table>
<thead>
<tr>
<th></th>
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<th>B</th>
<th>C</th>
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CCST Contact Points

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<tr>
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<td>Problem Reporting E-mail Account</td>
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<tr>
<td>CHELP</td>
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<tr>
<td>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.</td>
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<tr>
<td>Suggestion E-mail Account</td>
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<tr>
<td>CHANNEL</td>
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<tr>
<td>For users to send in their queries, ideas, suggestions and comments concerning services we provide. A</td>
<td></td>
<td></td>
</tr>
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Centre of Computing Services and Telecommunications . . . .

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Ext.</th>
<th>Phone</th>
<th>E-mail</th>
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<tr>
<td>Director</td>
<td>Dr. Wm. Max Ivey</td>
<td>6182</td>
<td>ccmax</td>
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<tr>
<td>Assoc. Director &amp; Mgr. Systems &amp; Operations</td>
<td>Mr. Lawrence Law</td>
<td>6201</td>
<td>cclaw</td>
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<td>Mgr. Information Systems</td>
<td>Mr. William Tung</td>
<td>6221</td>
<td>ccbtung</td>
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<tr>
<td>Mgr. CIC</td>
<td>Mr. Danny Tang</td>
<td>6241</td>
<td>ccdanny</td>
<td></td>
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<tr>
<td>Mgr. Systems Engineering</td>
<td>Mr. Michael Tang</td>
<td>6261</td>
<td>ccwtang</td>
<td></td>
</tr>
<tr>
<td>Editor of Channel</td>
<td>Miss Esther Chan</td>
<td>6242</td>
<td>ccesther</td>
<td></td>
</tr>
</tbody>
</table>

FAX 358 0967
Dialup 358 2440
Computer Operation 6220
SE workshop 6280

The telephone extensions are (852) 358-xxxx.
The BITNET addresses are E-mail address@usthk.BITNET

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
- Address change (write new address below)
- Remove my name from the mailing list

Name: ____________________________
Organization: _____________________
Address: __________________________

The telephone extensions are (852) 358-xxxx.
The BITNET addresses are E-mail address@usthk.BITNET

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