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SERVICES AVAILABLE TO USERS OF THE UNT COMPUTING FACILITIES

The UNT Computing Center is located in the Information Sciences Building (ISB), Room 119. Phone Numbers:

- **Computing Center**: (817) 565-2324
- **Help Desk**: (817) 565-4050
- **Graphics Lab**: (817) 565-3479
- **ISB/O Area**: (817) 565-3890
- **BAI/O Area**: (817) 565-2350

All personnel listed below can be contacted either by calling the Computing Center or by sending them electronic mail on MUSIC/SP (ID-codes follow each name. All IDs are on BITNET node UNTMUSIC).

**BENCHMARKS** - Claudia Lynch (AS04)
**Information & ID-Codes; Disk Space Problems** - Marilyn Jett
**Statistical/Research Support** - George Morrow (AS01), Panu Sitiwong (AC09), Phanit Laosirin (AC44)
**Academic ADABAS/COM-PLETE** - Janis Burkham (AC55)
**CRSP & COMPUSTAT Problems** - Panu Sitiwong (AC09), Phanit Laosirin (AC44)
**Student Programming Problems** - CSC1 Dept., GAB Room 542A, BCIS Dept., BA Room 152
**Problems with JCL, Passwords, or Operating Systems; or Communication/Terminal Problems** - Help Desk
**Data Entry/Test Scoring & Analysis** - Betty Grise
**Administrative Applications** - Coy Hoggard
**Printout Retrieval - ISB or BAI/O Operators**

DIALING-UP UNT COMPUTERS OVER THE TELEPHONE

Phone numbers for the Local Area Network (LAN) are:
- 300/1200 BAUD: (817) 565-3300, (817) 565-3499
- 2400/9600 BAUD: (817) 565-3461
- 2400/9600 BAUD: D/FW METRO 429-6026, 429-9314

Area code 214 must dial 817 before the METRO number.

The numbers that accomodate multiple baud rates have an autobaud feature that requires you to hit the <RETURN> key repeatedly so that the receiving modem can determine the appropriate baud rate. When you have established a communications link, the # prompt will appear on your screen and you can enter one of following CALL commands to connect with the computer of your choice.

- **CALL 8040** connects with the NAS/8083 (supports line editing or PCWS).
- **CALL 3270** connects with the NAS/8083 through a 3270 protocol converter (supports full-screen editing). Operating environments available are: MUSIC/SP, VM/CMS, ADABAS/COM-PLETE, PHOENIX
- **CALL DEC** connects with the VAXcluster (VM, Sunix)
- **CALL 780** connects with the Research VAX (Unix)
- **CALL 3000** connects with the Libraries' HP-3000 (Bibliographic data base)
- **CALL 6800** connects with the NFI (Unix)

**Communications Settings**

<table>
<thead>
<tr>
<th>LAN addresses</th>
<th>Data Bits</th>
<th>Parity</th>
<th>Stop Bits</th>
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<tr>
<td>DEC, 3000</td>
<td>8</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td>8040, 3270, 780, 6800</td>
<td>7</td>
<td>E</td>
<td>1</td>
</tr>
</tbody>
</table>

HOURS FOR UNIVERSITY OF NORTH TEXAS COMPUTER ACCESS AREAS: FALL 1988*

<table>
<thead>
<tr>
<th>Location</th>
<th>Times</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computing Center RJE</td>
<td>Noon-Midnight&lt;br&gt;7 a.m.-Midnight&lt;br&gt;7 a.m., Tuesday-Midnight, Saturday (Open 24 hours/day)</td>
<td>Sunday&lt;br&gt;Monday&lt;br&gt;Tuesday-Saturday</td>
</tr>
<tr>
<td>ISB 110 Terminal Area</td>
<td>2-10 p.m.&lt;br&gt;7:30 a.m.-Midnight&lt;br&gt;7:30 a.m.-6 p.m.&lt;br&gt;9 a.m.-6 p.m.</td>
<td>Sunday&lt;br&gt;Monday-Thursday&lt;br&gt;Friday&lt;br&gt;Saturday</td>
</tr>
<tr>
<td>College of Business</td>
<td>Noon-11:45 p.m.&lt;br&gt;8:15 a.m.-11:45 p.m.&lt;br&gt;8:15 a.m.-7:45 p.m.</td>
<td>Saturday, Sunday&lt;br&gt;Monday-Thursday&lt;br&gt;Friday</td>
</tr>
<tr>
<td>GAB 550C</td>
<td>2 p.m.-Midnight&lt;br&gt;8 a.m.-Midnight&lt;br&gt;8 a.m.-5 p.m.&lt;br&gt;2 p.m.-8 p.m.</td>
<td>Sunday&lt;br&gt;Monday-Thursday&lt;br&gt;Friday&lt;br&gt;Saturday</td>
</tr>
<tr>
<td>Graphics Lab</td>
<td>Noon-10 p.m.&lt;br&gt;8 a.m.-11 p.m.&lt;br&gt;8 a.m.-6 p.m.&lt;br&gt;Noon-5 p.m.</td>
<td>Sunday&lt;br&gt;Monday-Thursday&lt;br&gt;Friday&lt;br&gt;Saturday</td>
</tr>
</tbody>
</table>

*Hours may vary. Check MUSIC/VAX News and/or posted schedules for exceptions.

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Virus Attacks ARPA Internet – UNT Uninfected

By Billy Barron, VAX System Manager (Billy@UNIVAX) and Claudia Lynch, Benchmarks Editor (AS04@UNIVM1)

A computer virus infested Unix machines on the TCP/IP Internet (ARPANET, NSFNET, MILNET, CSNET, etc) during the first week of November. Some 6000 nodes including the University of California Berkley, Lawrence Livermore, Stanford, NASA, the University of Arizona, and the University of Houston were infected. The virus worked by taking advantage of bugs in the Unix operating system. It entered computer systems through Unix mail, TELNET (remote login), FTP (file transfer), or some other network utilities. Once in a computer system, the virus found all other computer systems that the machine knew about and then attacked those systems.

According to press reports, a Cornell graduate student wrote the virus, which was not actually harmful to computer systems. Due to an error in logic, his program multiplied hundreds of times faster than he wanted, causing processing to slow down on the affected machines. Incredibly slow processing time on the systems that had been "hit" was what first alerted people that something was amiss. At the time of this writing, the virus program has been analyzed completely and steps have been taken to "plug" the holes in the programs that "passed" the virus along.

Although the virus was essentially harmless, it is estimated to have cost about $20 million in "man-hours" spent to clean-up the affected systems. John McAfee of the Computer Virus Association in San Francisco, California was interviewed on NBC's TODAY. He provided the "man-hours" figure stated above and further stated that if the virus had destroyed data, the damages would have run into the billions of dollars.1

The University of North Texas has two Unix machines connected to the Internet in the Computer Science Department. Action was taken by the Computer Science Department and the Computing Center to protect the machines from the virus. These actions included patching the network software, monitoring for virus symptoms, and disconnecting the machines from the network when the computer could not be monitored. Fortunately, these precautions were successful in protecting the machines.

The virus should have one beneficial effect. People will take regular backups and network security more seriously from now on. With the new focus on security, it will become nearly impossible for viruses to be written for Wide Area Networks.

---

1From a BITNET VIRUS-L discussion by Kenneth van Wyk (Lunken@LEHIIBM1)

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By Phanit Laosirirat, Academic Computing Services Consultant (AC4@UNTMUSIC)

The Compustat data tapes have been updated to include more recent data. If you are using data included in Bank Compustat, Industrial Compustat, and/or Research Compustat, you need to change your JCL in order to access the new data. This is because the tapes have been written to disk using different member names, although they are still under the same library name. The following JCL is required to access these new data (the first two lines are MUSIC/SP commands).

```plaintext
/INCLUDE OSJE
RETURN
IDSN JOB (IDSN=10,1), your name,
CLASS=APASSWORD=mypassword
EXEC SAS
COMPSAT DD DISP=SHR,
DSN=USER.AC4.COMSTAT,
UNIT=SYSDA,
VOL=SER=ACAD93
DATA INDUSTRY;
SET COMPSAT.INDUSTRY;
```
**Bank Compstat**

```
/INCLUDE 'DE OSJE
RETURN
//Dn JOB (IDn:10,1), your name,
//CLASS = A, PASSWORD = mpsw
// EXEC SAS
// COMPSTAT DD DISP=SHR,
// DSN=USER,AC44,COMPSTAT,
// UNIT=SYSDA
// VOL=SER=ACAD03
DATA BANK;
SET COMPSTAT.BANK;
```

**Research Compstat**

```
/INCLUDE 'OSJE
RETURN
//Dn JOB (IDn:10,1), your name',
//CLASS = A, PASSWORD = mpsw
// EXEC SAS
// COMPSTAT DD DISP=SHR,
// DSN=USER,AC44,COMPSTAT,
// UNIT=SYSDA
// VOL=SER=ACAD03
DATA RESEARCH;
SET COMPSTAT.RESEARCH;
```

If you have difficulty retrieving any of these data, please contact Academic Computing Services at 565-2324. 

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**Computing Center Employees Recognized for Service**

Six employees of the Computing Center were honored for their years of service to the University on November 16 at the 12th annual Service Recognition Awards Ceremony. They are:

- Richard Harris, Associate Vice President for Computing -- 25 years.
- Coy Hoggard, Manager of Administrative Information Systems -- 20 years.
- Earl Jackson, Admissions Team Leader -- 15 years.
- George Williams, General Systems Team Leader -- 25 years.
- Rachel Dowdy, Data Entry -- 10 years.
- Sue Harrison, Administrative Assistant -- 5 years.

---

**VS COBOL Installed on CMS**

By Janis Burkham, Academic Computing Services Consultant (AC55@UNTVMI)

OS/VS COBOL 2.4 has been installed under VM/CMS and provides for interactive job submission of COBOL programs. At the present time, it is available to faculty, staff, and graduate students who have CMS accounts (class instructional use of COBOL on CMS will be considered at a later date).

- To use COBOL on CMS:
  1. Logon to your CMS Userid.
  2. Enter: NTMLINK COBOL
  3. Enter: GLOBAL TXTLIB COBLIBS

Note: There are no default libraries. If you wish to use the OS/VS COBOL 2.4 Compiler and Library during every terminal session, place the NTMLINK COBOL command and the GLOBAL command in your PROFILE EXEC.

- To compile, load, and execute in the same step, enter:
  
  `RUN filename COBOL (options)`

Where `filename` is the CMS file containing the COBOL program, which must have COBOL as the filetype, and `options` are the compiler options defined in the IBM OS/VS COBOL Compiler and Library Programmer’s Guide.

- Compiling, Loading, and Executing in separate steps:
  1. To compile a program enter: `COBOL filename`
  2. To load a program enter: `LOAD filename`
  3. To execute a program enter: `START`

For serious users, the following manuals will prove to be helpful:

- IBM VS COBOL for OS/VS.
- IBM OS/VS COBOL Compiler and Library Programmer’s Guide
- IBM OS/VS COBOL Compiler and Library: General Information
- IBM OS COBOL Interactive Debug Terminal User’s Guide and Reference
- IBM VS COBOL for OS/VS Reference Summary - Format, Status Key Values, Reserved Words.
- IBM CMS User’s Guide for COBOL
- IBM Virtual Machine/370: CMS Command and Macro Reference

---

**Academic Computing Consultant Hired**

Jim Stinson has been hired to fill the part-time position in Academic Computing Services vacated by Jim Aman (we call it the "Jim" position). Jim has a B.S in Computer Science and a B.A. in Physics from Texas A&M University. He is currently working on a Master’s degree in Computer Science and plans to become an officer in the Navy Reserve in the near future. His ultimate goal is to gain employment as a software engineer, producing programs in the fields of numerical analysis, simulations of engineering processes or systems programming.

We are glad to have Jim working with us and know he will be able to provide valuable assistance to many people in his role as a consultant.

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**Terminals Available**

The Center for Studies in Aging has 7 Televideo 910 terminals they are not using. Call Les for details: 565-2765
New Utility to Search ICPSR Data Archive on MUSIC/SP

By Panu Sittiwong, Academic Computing Consultant (AC09@UNTVM1)

As a member of the Inter-university Consortium for Political and Social Research (ICPSR), UNT has in its archives hundreds of machine readable data on various topics and disciplines. These data are available to all UNT faculty, staff and students.

To facilitate a search of this database, the Computing Center has provided a new utility called FINDICPSR. It can be executed by typing FINDICPSR at the MUSIC *GO prompt.

Database searches can be done in two ways:

- First, a search based on the ICPSR study number. If you select this method and the particular study is currently available, you will be provided with the TMS tape information which you will need to use in your DD statement in order to access the data. If the dataset is not available, it can be ordered free of charge from ICPSR.

- Second, a search based on subject or title of a study. In this method, the program searches for all the titles of the studies which contain the text that you provided. If you find a study which might be of interest, you will need to follow the search with the first method, above, to check the availability of the dataset.

If you think you want to order a dataset, contact the Computing Center at 565-2324. It normally takes from two to four weeks for the data to arrive.

BENCHMARKS FORUM is intended to serve as a vehicle for answering questions that may be of general interest to the user community. If you have a question, please send electronic mail to the BENCHMARKS editor (AS04@UNTVM1) or write it down and drop it by the Computing Center. We will try to answer it in the next issue.

Question: Sometimes when I call the dialup lines from home, the Sytek LAN displays the # prompt, but then when I type in commands, such as CALL, nothing happens. Is there anything I can do about this problem?

Answer: When this happens, try pressing the <Control><Q> keys. Often what happens is the last person on that port presses <Control><S>, which stops output from coming on the screen. If <Control><Q> does not fix the problem, you can hang up and then dial back the same dialup phone number again. Most of the time, you will get a different port since the ports are on a rotor. Also if <Control><Q> did not work, it would be helpful for you to report the problem to the Computing Center at (817) 565-2324.

Question: In Turbo Pascal 3.0 on the IBM PC, I was able to specify the compiler directive {$U+} to use <Control><C> for stopping a program in an infinite loop. Under Turbo Pascal 4.0, I can't find a way to stop a program in an infinite loop.

Answer: In Turbo Pascal 4.0, no equivalent of the {$U+} directive exists. Turbo Pascal does allow you to stop a program with <Control><C> if the program is writing to the screen. However, if your infinite loop does not have statements that write to the screen, you have to reboot your computer. Of course, when you reboot, you will lose all work done since the last time you saved. Therefore, if you are doing any programming that might end up in an infinite loop, it is a good idea to always save before executing the program.

Question: How can I get a printed list of the files in my MUSIC save library?

Answer: A two-step procedure is necessary to accomplish this:

1. First, at the *GO prompt issue the following command:

   LIB *S(filename)

   This command will generate a list of all the save library file names and save it in the file called filename.

2. Second, once this file containing the names is generated, it can be printed in the usual manner using PTPCH. For more information, contact the HELP DESK at 565-4050 (ISL 110).
What's NeXT? - The Computer Event That Has Everyone Talking

By Claudia Lynch, *Benchmarks*  
Editor (AS04@UNTVM1)

**Background**

Steven Jobs, co-founder and former chairman of Apple Computer, Inc. has made many promises, and it looks like he's going to keep most of them. When Jobs left Apple three years ago he and several colleagues founded Next Inc. and vowed to build a "scholar's workstation." The workstation was "initially conceived as a 1 Million Instructions Per Second, one Megabyte, 1 Megapixel, networked, UNIX workstation that students could buy for $3,000."¹ Along with this "dream machine" came the promise of a breakthrough in educational software development. Jobs raised investment capital from Carnegie Mellon, Stanford, and H. Ross Perot. Working closely with a higher education advisory board, it became obvious that "3-M" was really the minimum configuration. On Wednesday, October 12, in San Francisco's Symphony Hall, Jobs admitted that "... what the most aggressive researchers and educators want is a personal mainframe."² NeXT certainly seems to be a step in that direction!

**A Little Black Box**

The NeXT computer system consists of a foot-square magnesium cube containing the CPU and a laser-disk drive, a 17-inch high-resolution screen on an adjustable stand, a flat keyboard with white and green keys, and a two-button mouse. The cube is connected to the monitor by a 10-foot cable.³ Major features of the computer include:

- Two proprietary VLSI chips (Integrated Channel Processor and Optical Storage Processor) designed to provide "mainframe performance" for data transfer, allowing for multi-tasking.
- The Mach operating system, a version of UNIX developed at Carnegie Mellon University by Richard F. Rashid. It is supposed to be totally compatible with Berkeley UNIX 4.3.
- NextStep software environment, which controls how the screen looks and how the computer responds to commands. It includes Window Server, Workspace Manager, Application Kit, and Interface Builder.
- A read/write erasable optical-disk drive that uses removable 6-inch laser disks. According to Judith Axler Truner, ⁴ the folks at NeXT say the 256-megabyte storage capacity of the disk allows a student to "put his whole universe in his backpack." The disks cost $50 each and can hold the equivalent of between 300 to 400 books worth of information. It is also possible to add a 330MB or 660MB fixed-disk.
- Jacks for a microphone and a stereo-headphone. There is a built-in speaker and a 10-MIPS Motorola 56001 digital-signal-processing chip that turns sound into bits and bits into sound. The chip can also be used for FAX or a communications modem. Special software is present that makes it easy to record speech, create music, and incorporate sound into text and data files.
- Eight megabytes of RAM and the option of buying 16 megabytes.
- Three available expansion slots that can hold up to 3 more CPU boards.
- A Motorola 68030 microprocessor running at 25MZ and a Motorola 68882 floating-point processor running at 25 MZ.
- A built-in Ethernet adapter.
- A fan with a variable-speed motor that allows it to slow down automatically when it is not needed. This reduces the noise of the fan.
- An optional $2,000, 400 dot-per-inch PostScript-compatible laser printer that only works with NeXT.
- A set of reference works called the Digital Library that can be used through special searching and indexing software. Included in the library is Webster's Ninth New Co.legeate Dictionary, complete with
NeXT, A Personal Perspective

By Jon Pugh, National Magnetic Fusion Energy Computer Center, Lawrence Livermore National Laboratory (PUGH@NMFECC.ARPA)

I just got back from the NeXT introduction and thought I should report on the facts that were revealed to the world today. I must say first that while the NeXT machine is new and exciting, I don't think it is revolutionary. It is merely doing the things that people thought should be done (at least the people I talk to). It is hot. It is fast. It is easy to program.

A description of the show is in order. We lined up outside as people presented their picture ids and were cross checked on the guest list. The symphony hall in SF is a very posh place and I ended up in a balcony box right above the stage. Perfect seating. Watching the audience was a who's who of the computer biz pasttime. I saw H. Ross Perot, Hiedi Rozen, John Dvorak, The Woz, Andy Hertzfeld, Chuck Farnham, and many others. When the lights dimmed, Steve Jobs came out and began by saying, "It's been a long time." He got a standing ovation at the end.

He first went through a description of a machine's lifetime in terms of its level of innovation. Machines have a 10 year life cycle and the Apple II is a prime example of how a machine peaks innovatively about 5 years after it is introduced and then the only changes are hardware tweaks to make it perform better. The reason for the decline in innovation after 5 years is that the machine's strongest point becomes it's greatest liability. It's hardware locks it into a decline. Changing the hardware is impossible because of the base of applications that have been written for the existing hardware. Whereas, when it was new it's hardware made it the choice platform for new applications. The IBM

Footnotes
2. Ibid.
4. Ibid.
6,7. Ibid.
PC and Macintosh were also depicted on their own 10 year innovation curves. The interesting thing to note about the IBM PC and Mac curves was that they are crossing right now. The IBM PC peaked in 1986 according to Jobs, and that means that the new innovative software packages are being written for the Macintosh first. I think we would all agree that this is true. Steve is betting that the NeXT machine will be the next wave of innovation. He placed this peak in 1994, 5 years after now (well, after he starts shipping for real next year).

A tour of the hardware and a movie of the Fremont production facilities was then shown. For brevity's sake I will just outline the minimum configuration. Remember the Jobs principle, you make progress by raising the lowest common denominator. The machine has no real options, but it is expandable. A 25 MHz 68030 with a 68882 FPU and the 56001 DSP (a 10 MIPS Digital Signal Processor), all from Motorola. It comes with 8 Meg of RAM expandable to 16 Meg. That's 1 Meg SIMMs. They suspect that it should work with 4 Meg SIMMs, but they haven't been able to find any to try with. The connectors include a 2 Mac DIN8 serial ports, a DB9 printer port, a Mac pin compatible SCSI port (operating at a much higher speed), a thin cable ethernet port, and a port for hooking directly up to the DSP (just in case). They include a backplane for future expansion which is a 25 MHz Nubus wherein all the protocols are controlled by a single ROM which will be available to developers for $25. All this seems to be really incredible, but it doesn't address the single most important issue that NeXT has addressed. Memory is the bottleneck for this whole machine. All the peripheral processors cannot do squat if they are waiting for memory, so the NeXT crew looked at mainframes for the solution, and implemented 12 DMA IO channels in 2 large VLSI chips. These "mainframe in a chips" allow the NeXT machine to haul ass. They also implement a large portion of their storage controllers in these chips.

The storage itself is everything it was rumored to be. 256 Meg of read, write, erasable magneto-optical storage. That's it. It has about a 60 mSec access time, but a transfer rate of over 1 Mbit per sec. Let me tell you, the access time is not that noticeable, especially when you consider that it's all DMA access while the CPU can be doing something else (i.e. full multitasking, remember?). Their press kits included a demo disk which is supposed to cost only $50. So much for the removable disks. There is room in the machine for two onto it for ergonomic control. The whole thing is attached by a 3 meter cable to the cube. The cube is switchable to any power source. Find a cable with the right plug and it will adjust to the power supply.

The printer is a 400 dpi bit blaster. No Postscript on board since it is in the cube. It is a straight path feeder and it has a single feeder tray that can adjust to any size paper (well, smaller than 8 1/2 x 11).

The software is also impressive. They use Mach, a Berkeley 4.3 compatible Unix done better, with the NFS file system. On this they place DisplayPostscript and their own windowing system (none of the others would do enough of what they wanted). On this they placed an Application Toolkit of 20 objects and created Interface Builder, a ResEdit-like tool for adding an interface to your Application objects graphically. It very closely resembles the Smallest Browser, I am told. On top of this will sit the applications. These object oriented layers are what Jobs sold to IBM and what will be called NextStep. IBM will apparently be using it on their RISC machine and it will be application (source code) compatible with the NeXT machine.

It is all written with the GNU C compiler and Objective C 4.0. Both of these come with the machine as does Unix. Also bundled is the GDB debugger, Franz Allegro Common Lisp, Mathematica, and Sybase's SQL Server. NeXT also includes some of their software; WriteNow, Searcher, their index program, Interface Builder, and Workspace Manager, their Finder. Also included is Webster's 9th Colleague (which I would have spelled right if I'd had one) Dictionary, complete with illustrations, their Thesaurus, The Oxford Book of Quotes, and the Complete Works of William Shakespeare. Search for any word any of them. Fast tool. It also has ALL the reference manuals on line.
Serious stuff for serious tech-junkies!

Now get this, $6500 for the cube and monitor, $2000 for the printer. Then they are charging $2000 for the 330 Mb drive and $4000 for the 660 Mb drive.

That’s the university price and ONLY university people can buy them. They will be shipping 0.8 to beta sites this month, 0.9 to beta sites and aggressive users end of first quarter 89, and 1.0 to regular people end of the second quarter. When asked how people not associated with a university could get a machine, Steve replied, “Enroll.” There’s a reason to go back to school...

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**Altruistic Computing**

According to an article in the November issue of *Information Center* (Vol. IV No.11, p. 8), the Nynex Foundation recently donated $10,000 to the Society for Public access Computing (SoPAC). The money is to aid in the development of a new version of Free-Net, which is supposed to be the first community computer system in the United States to offer information services free of charge to the public.

Free-Net is currently in operation in the Ohio cities of Cleveland and Youngstown, where it is available to anyone who has a PC and a modem. The network, according to the *Information Center* article, is essentially an on-line public library. Its services include electronic mail; interactive communications with elected government officials; an "electronic schoolhouse" for students and teachers; and medical, dental, and legal information.

SoPAC incorporated as a non-profit information service in 1987. Plans are currently underway to expand the free-Net services to the northeast.

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**Micro-Tips**

This column is intended to serve as a forum for sharing useful tips on making more productive use of microcomputers. If you have a tip that you feel may be of use to campus users, submit it to the BENCHMARKS editor for possible inclusion in a future issue.

**Using XCOPY to Copy Entire Directory Structures**

If you use a version of PC or MS-DOS equal to or greater than 3.2, you can use the XCOPY command to copy entire directory structures at the same time. The reasons you would want to do this range from wanting to easily make a copy of a floppy diskette that has subdirectories on it, to duplicating an entire hard disk.

The appropriate command for copying a directory structure along with its files from one place to another is:

```
XCOPY source dest /S /E /V
```

Where:

- **source** should be a valid description of the place you want to copy from in the form d:path where d: is a valid drive name and path is a valid directory path. If, for instance, you’re copying out of the root directory of drive C, the appropriate source would be C:\not C:
- **dest** should be a valid description of the place you want to copy to in the same form as the description above for the source.

/S, /E and /V are all examples of something called command line options.

The /S option tells XCOPY to copy all the constituent subdirectories from the source to the destination. The /E option tells XCOPY to include any empty subdirectories in its copy from the source. Finally, the /V option tells XCOPY to verify the accuracy of each write to the destination.

An example would be:

```
XCOPY A:\ C:\FROM_A /S /E /V
```

For information about additional ways to use XCOPY or any other DOS commands, consult the owner’s...
Ejecting Disks from a Macintosh

Many programs that you might use on an Apple Macintosh do not provide for easy removal of disks from your computer without either leaving the program or traversing an extensive set of menus.

If you would like to eject a disk without leaving a program, simply hold the <SHIFT> and <OPTION> keys down while you press either the <1> or <2> key, depending on which drive contains the disk you want to eject. If, for instance, you want to eject a disk from your first disk drive, press <SHIFT> <1>. Similarly, if you want to eject a disk from your second disk drive, press <SHIFT> <2>.

It should be noted that this command simply ejects the disks from your computer and places them "off line". Once the disks are out of your disk drive, the disk icon on your desktop and any other icons associated with that disk will appear shaded. This means that your Macintosh still knows what is on this disk, and will ask you to insert it again if you should need to use it. If, after ejecting the disk, you know that you won't need to use it for a time, you can drag the shaded disk icon to the trashcan and "un-mount" your disk.

For further information about using micro-floppy disks with Macintosh computers, call Academic Computing Services at 565-2324, and/or browse through Apple's Technical Introduction to the Macintosh Family, and Macintosh SE (or other model) user's manual.

Sharing Files With Others On a Novell LAN

One of the attractive things about a local area network is that it allows several users to share disk files stored at a central location. This sharing, however, isn't automatic. You can set it up yourself, from your PC.

Sharing files with others could mean two things. If the file is one you would want to access primarily just to read, you might want several people to be able to read it at the same time. If you access this file both to write to it and read from it, you might want to let several people access the file, but only one at a time.

On a Novell local area network, the appropriate way to give users access to a file or group of files is to create a subdirectory that those people can access on the network drive and define rights for those individuals within that subdirectory.

Assuming that you've already created a subdirectory, you can grant rights to people using your LAN with the following command:

```
GRANT rightslist FOR path TO user_or_group_name
```

An example of this would be:

```
GRANT Read FOR f:\home\bigboss\memos

To everyone
```

In the example, you would give everyone (or rather, the formal group EVERYONE, of which all users are members) the privilege of being able to read any file that you place in the \HOME\BIGBOSS\MEMOS subdirectory on the network disk drive F:

Likewise, if you later wanted to revoke those rights from any particular users or group of users, you could use Novell's REVOKE command with similar syntax.

If you want to let several people access files in a subdirectory at one time, you could use the Novell FLAG command. The usage would be like this:

```
FLAG file_name SHAREABLE
```

For instance, if all the files in the above-mentioned memos subdirectory with a TXT extension were files that you wanted all your co-workers to be able to read, regardless of whether or not someone else was reading them also, you could make them shareable by giving the command:

```
FLAG f:\home\bigboss\memos\*.TXT SHAREABLE
```

Each of the files to which your *txt specification applied could be simultaneously read by each of users on your local area network.

If you would like more information about sharing files, LAN usage and security, or about how you could improve your computing environment with a local area network, call Office Automation or Academic Computing Services at 565-2324.

This month's Microtips have been provided by Kevin Mullet, Academic Computing Services Consultant (ACS2@UNIVAX)

Another Light Bulb Joke...

Q: How many surrealists does it take to change a light bulb?
A: Fish

From Kent Cearley, University of Colorado Management Systems (CEARLEY_K@COLORADO.BITNET)
Using FTP to Transfer Files From ARPANET to the VAXcluster

By Sean Wheeler, VAX Operator (SEAN@UNIVAX)

FTP (File Transfer Protocol) is used to access ARPA Internet hosts to transfer files between the VAXcluster and the remote host. This version of FTP is part of a complete TCP package by The Wollongong Group and provides several improvements over the previous public domain VFTP. FTP can also be used to transfer files to and from the Research Vax and the NBI.

In this article, I will illustrate the use of FTP to transfer files to the NBI here on our campus. The procedure for transferring to ARPA Internet hosts is identical.

The first step to establishing an FTP connection is getting the right address of the machine you want to connect to. There is a list of KNOWN FTP sites in the file:

DUA1:[PUBLIC.NETWORKS.ARPA\FTP.LIST]

The local academic machines available via FTP are:

- NBLCSCLUNT.EDU (for the NBI)
- DEPT.CSCSCLUNT.EDU (for the Research Vax)
- VAXA.ACSCLUNT.EDU (for Vax A)
- VAXB.ACSCLUNT.EDU (for Vax B)

To open a connection type:

FTP NBLCSCLUNT.EDU

You will see a screen resembling the following:

```
ftp.acsclunt.edu Wollongong FTP User
Process (Version 3.2)
Connection Opened
Using 8-bit bytes.
FTP server (Version 4.112 Thu Oct 30
09:11:04 PST 1985) ready.
Name (nbi.cscl.univ.edu:sean):
```

At this point FTP is requesting the account name for log-in on the NBI, after which it will prompt you for the password, log you in and give you an asterisk (*) prompt. When connecting with a UNIX system be sure to type the username and password in all lowercase characters.

To see a list of files in your NBI account type DIR, FTP will respond with something like this:

```
<PORT command okay.
<Opening data connection for /bin/ls
(129.120.1.3,1832) (0 bytes).
<Transfer complete.
total 51
-rw---- 1 sean 285 445 Sep 8 18:25 .eirc
-rw---- 1 sean 285 175 Nov 19 1987 .login
-rw---- 1 sean 285 6 Nov 19 1987 .logout
-rw-rw---- 1 sean 285 49 Sep 7 15:55 .plan
-rw-rw---- 1 sean 285 346 Sep 22 17:37 a1.c
-rw-rw---- 1 sean 285 955 Dec 9 1987 cmake
-rw-rw---- 1 sean 285 23196 Sep 22 15:49 pl
-rw-rw---- 1 sean 285 648 Sep 22 17:39 pl.txt
-dw-rw---- 2 sean 285 512 Sep 8 00:26 stuff
-dw-rw---- 2 sean 285 512 Sep 9 15:37 apple
984 bytes in 1 seconds--782 bps
```

The LS command will also list the files but only by name not with the size, protection or other information. To change directories on the remote host use the CD command as in the following example:

```
+CD APPLE
+CD
```

The CD .. command takes you back up one directory.

At this point, let's say you want to get a file from the NBI named NEC.TXT. You would type GET NEC.TXT. You would see something like:
To see if the file got to your VAX account, you will need to do a directory on the VAXcluster. Type VMS DIR and a directory listing similar to the following will appear.

Directory $1SDUA0: [SEAN]
BENCHMARKS.DIR: 1
CDB: 1
COM: 1
DCL: 1
FTP: 1
HELP: 1
LOGS: 1
MAIL: 1
NICTXT: 1
PAS: 1
TEMP: 1
TEXT: 1
TPU: 1
Total of 13 files.

Let's say I now want to send a file from the VAX to the NBI and the file is in my TEXT directory. First I need to change to that directory and then I need to send the file. To change directories, for example:

```
*LCD [.TEXT]
Local directory changed to $1SDUA0: [SEAN: .TEXT]
```

*VMS DIR
Directory $1SDUA0: [SEAN: .TEXT]
9TH: 1
BILLCAT: 1
CATPOSTER: 1
ELEPHANT: 1
GLAB: 3
PH: 9
SCHEDULE: 1
START: 1
Total of 8 files.

To send the file:

```
*PUT PH: LIS
*PORT command okay.
Opening data connection for ph: lis (129.120.1.3, 1830) (6579 bytes).
<Transfer complete.
6579 bytes in 1 second— 6579 bps
```

Notice that you can see the new file PH: LIS on the NBI directory.

When you are through, type CLOSE The NBI will respond:

```
Goodbye.
-- Connection has Terminated --
```

Type EXIT and you are back at the VMS prompt and ready to go. Other commands of interest are:

- **BINARY** — this allows you send and receive binary files and is equivalent to VFTP's TYPE B command.
- **ASCII** — this resets the transfer mode back to ascii so that you can do directory commands.
- **TENEX** — this allows you transfer files in tenex format which is equivalent to VFTP's TYPE T command. This is usually the format to use for binary files at SIMTEL20.ARPA.
- **OPEN host name** — this allows you to establish a connect to a host if you don't specify one when you run FTP or after you have done a CLOSE command.
- **VMS command** — as you saw above this lets you do local commands on the VAX.

For more information on FTP, while on the VAX, type HELP FTP. The files in the directory DUAL: [PUBLIC:NWARKS.ARPA] also contain information. Many sites have the user ANONYMOUS set up with the password GUEST for anybody to use.

### VAX CLUSTER USAGE STATISTICS

#### September Top Ten Programs: Frequency of Runs

<table>
<thead>
<tr>
<th>Program</th>
<th>Description</th>
<th>Number of Runs</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. SET</td>
<td>VMS Utility</td>
<td>76335</td>
<td>13.9</td>
</tr>
<tr>
<td>2. LOGINOUT</td>
<td>User login</td>
<td>73106</td>
<td>13.3</td>
</tr>
<tr>
<td>3. DIRECTORY</td>
<td>VMS Utility</td>
<td>55561</td>
<td>10.1</td>
</tr>
<tr>
<td>4. DELETE</td>
<td>VMS Utility</td>
<td>50570</td>
<td>9.2</td>
</tr>
<tr>
<td>5. TYPE</td>
<td>VMS Utility</td>
<td>39010</td>
<td>7.1</td>
</tr>
<tr>
<td>6. SHOW</td>
<td>VMS Utility</td>
<td>32404</td>
<td>5.9</td>
</tr>
<tr>
<td>7. SEARCH</td>
<td>VMS Utility</td>
<td>29344</td>
<td>4.2</td>
</tr>
<tr>
<td>8. EDT</td>
<td>Editor</td>
<td>23158</td>
<td>3.9</td>
</tr>
<tr>
<td>9. NETSERVER</td>
<td>DBCast Server</td>
<td>21447</td>
<td>5.3</td>
</tr>
<tr>
<td>10. User</td>
<td>Programs</td>
<td>14293</td>
<td>2.6</td>
</tr>
</tbody>
</table>

**Total** 549599
### September Top Ten Programs: CPU Time Used

<table>
<thead>
<tr>
<th>Program</th>
<th>Description</th>
<th>CPU Time</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. EDT</td>
<td>Editor</td>
<td>0:20:59:40:71</td>
<td>1.7</td>
</tr>
<tr>
<td>4. MAXCLAS</td>
<td>ERDAS Utility</td>
<td>0:18:49:24:54</td>
<td>1.5</td>
</tr>
<tr>
<td>5. BACKUP</td>
<td>VMS Utility</td>
<td>0:15:12:23:10</td>
<td>1.2</td>
</tr>
<tr>
<td>6. PASCAL</td>
<td>PASCAL compiler</td>
<td>0:13:22:05:48</td>
<td>1.1</td>
</tr>
<tr>
<td>7. LOGINOUT</td>
<td>User login</td>
<td>0:10:17:41:87</td>
<td>0.8</td>
</tr>
<tr>
<td>8. BBS</td>
<td>Bulletin Board Utility</td>
<td>0:09:18:29:05</td>
<td>0.7</td>
</tr>
<tr>
<td>9. LISP</td>
<td>LISP Interpreter</td>
<td>0:07:18:34:01</td>
<td>0.6</td>
</tr>
<tr>
<td>10. DISKEEPER</td>
<td>Disk Compression Utility</td>
<td>0:06:51:45:61</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>52:18:10:02.29</strong></td>
<td></td>
</tr>
</tbody>
</table>

### COMPUTER SERVICES

Mainframe Performance Statistics

### NAS/8083 Dual Processor Performance Statistics for September

<table>
<thead>
<tr>
<th>CPU</th>
<th>SYSTEM</th>
<th>Scheduled Operating Hours</th>
<th>Planned Maintenance Hours</th>
<th>Planned Production Hours</th>
<th>Unplanned Maintenance Hours</th>
<th>Production Hours Achieved</th>
<th>Production Uptime</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACAD</td>
<td>VM/SP3</td>
<td>720</td>
<td>0.00</td>
<td>720.00</td>
<td>0.10</td>
<td>719.90</td>
<td>99.9%</td>
</tr>
<tr>
<td>ACAD</td>
<td>MUSIC/SP</td>
<td>720</td>
<td>29.58</td>
<td>690.42</td>
<td>0.65</td>
<td>689.77</td>
<td>99.9%</td>
</tr>
<tr>
<td>ACAD</td>
<td>MVS/JES2</td>
<td>720</td>
<td>0.00</td>
<td>720.00</td>
<td>0.70</td>
<td>719.30</td>
<td>99.9%</td>
</tr>
<tr>
<td>ACAD</td>
<td>COMPLETEA</td>
<td>720</td>
<td>0.00</td>
<td>720.00</td>
<td>4.53</td>
<td>715.47</td>
<td>99.4%</td>
</tr>
<tr>
<td>ADMN</td>
<td>MVS/JES2</td>
<td>720</td>
<td>2.06</td>
<td>717.94</td>
<td>3.73</td>
<td>714.21</td>
<td>99.3%</td>
</tr>
<tr>
<td>ADMN</td>
<td>COMPLETEA</td>
<td>269</td>
<td>0.00</td>
<td>269.00</td>
<td>3.71</td>
<td>265.29</td>
<td>98.6%</td>
</tr>
<tr>
<td>ADMN</td>
<td>ADABASA</td>
<td>720</td>
<td>23.54</td>
<td>696.46</td>
<td>5.15</td>
<td>691.31</td>
<td>99.3%</td>
</tr>
</tbody>
</table>
System Uptime = (Production Hours Achieved) / (Planned Production Hours)
Production Hours Achieved = (Planned Production) - (Unplanned Maintenance)
Scheduled Operating Hours = (Planned Maintenance) + (Planned Production)
MUSIC/SP Planned Maintenance Hours include 18.55 hours for system backup and 11.03 hours for VM/SP3 system backup.
ADABASA’S Planned Maintenance Hours include 21.36 hours for system backup.
The ACAD CPU achieved 100% uptime; the NAS/7360 DASD achieved 100% uptime; the NAS/7380 DASD achieved 100% uptime. The ADMN CPU achieved 99.4% uptime; the NAS/7360 DASD achieved 100% uptime; the NAS/7380 DASD achieved 100% uptime.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation. Lost productivity hours were contributed to by the key causes appearing in the table below.

<table>
<thead>
<tr>
<th>ACAD CPU:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Miscellaneous</td>
<td></td>
</tr>
<tr>
<td>1. COMPLETA system failures.</td>
<td>0.62 HOURS</td>
</tr>
<tr>
<td>2. VM/SP3 system tuning/improvements</td>
<td>0.63 HOURS</td>
</tr>
<tr>
<td>3. COMPLETA system tuning/improvements</td>
<td>1.46 HOURS</td>
</tr>
<tr>
<td>4. COMPLETA system maintenance.</td>
<td>2.65 HOURS</td>
</tr>
<tr>
<td>GRAND TOTAL FOR ACAD</td>
<td>5.36 HOURS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADMN CPU:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU, Tape, and Disk Subsystems (NAS)</td>
<td></td>
</tr>
<tr>
<td>1. Installation of additional 7380 DASD.</td>
<td>2.18 HOURS</td>
</tr>
<tr>
<td>TOTAL:</td>
<td></td>
</tr>
<tr>
<td>2.18 HOURS</td>
<td></td>
</tr>
<tr>
<td>COMTEN 3690 TCU (NCR)</td>
<td></td>
</tr>
<tr>
<td>1. Corrective maintenance.</td>
<td>3.10 HOURS</td>
</tr>
<tr>
<td>TOTAL:</td>
<td></td>
</tr>
<tr>
<td>3.10 HOURS</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
</tr>
<tr>
<td>1. COMPLETA system tuning/improvements.</td>
<td>1.06 HOURS</td>
</tr>
<tr>
<td>2. COMP &gt; ETA down to run single jobs.</td>
<td>1.83 HOURS</td>
</tr>
<tr>
<td>3. Undetermined causes for systems restarts.</td>
<td>2.05 HOURS</td>
</tr>
<tr>
<td>TOTAL:</td>
<td></td>
</tr>
<tr>
<td>4.94 HOURS</td>
<td></td>
</tr>
<tr>
<td>GRAND TOTAL FOR ADMN</td>
<td>10.22 HOURS</td>
</tr>
</tbody>
</table>

**DISK BACKUP SCHEDULES**

**OS/MVS Backup Schedule**
OS/MVS disk packs (academic and administrative) are backed up daily, Tuesday through Saturday, from 4-6:30 a.m., and Sunday from Midnight to 3 a.m. A backup of all the operating systems on the NAS CPU and their contents is done once every two weeks at some low activity period over a weekend.

**MUSIC/SP Backup Hours**
A message will be sent to all users signed on to MUSIC/SP approximately 10 minutes before backups are begun. It will be in the form **MUSIC SHUT DOWN AT xxxx AM SCHEDULED BACKUP**. To find out the backup hours while signed on to MUSIC/SP, enter HELP HOURS.

The following backup schedule is currently in effect:
- Tuesday 3 a.m. (for about 3 hours)
- Weekly backup
- Wednesday 3 a.m. (for about 2 hours)
- Daily backup
- Thursday-Monday 4 a.m. (for about 1 hour)
- Daily backup

**PHOENIX Backup Hours**
PHOENIX is backed up weekly on Sunday night. The backup begins at midnight and lasts for approximately 30 minutes.

**VAX Backup Schedule**
Incremental backups of the VAXcluster are performed Monday through Thursday at 6 p.m. Users do not have to log-off, but any files that are open at the time of the backup will NOT be backed up.

Full backups of both systems are done every Friday beginning at 8 a.m. These generally will take all day to complete. Again, users do not have to log-off, but any files that are open will not be backed up.

A "Stand Alone" backup of the system disk is done once a month. This procedure makes a copy of the system disk that can be used to restore its contents if the disk is completely destroyed. The system will be shut-down for this. Watch the system log-on message for specific times and dates.

**NOTE:** Requests for restoration of files should be made via Mail to the username OPERATOR. Your file can only be restored if it existed before the last backup was done.
### Academic (NAS) Program Hit Parade

#### September Top Ten Programs: Frequency Of Runs

<table>
<thead>
<tr>
<th>Program</th>
<th>Description</th>
<th>Number of Runs</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. IEWL</td>
<td>Linkage Editor</td>
<td>5425</td>
<td>14.3</td>
</tr>
<tr>
<td>2. PTPCH</td>
<td>Dataset Lister</td>
<td>5345</td>
<td>14.1</td>
</tr>
<tr>
<td>3. PGM = *.DD</td>
<td>Compiled Program</td>
<td>5340</td>
<td>14.1</td>
</tr>
<tr>
<td>4. IKFCBLO0</td>
<td>VS COBOL Compiler</td>
<td>4013</td>
<td>10.6</td>
</tr>
<tr>
<td>5. SASLPA</td>
<td>SAS</td>
<td>3526</td>
<td>9.3</td>
</tr>
<tr>
<td>6. IEBGENER</td>
<td>IBM Utility</td>
<td>2446</td>
<td>6.4</td>
</tr>
<tr>
<td>7. IKJEFT01</td>
<td>Password Change</td>
<td>2153</td>
<td>5.7</td>
</tr>
<tr>
<td>8. SCRIPT</td>
<td>Waterloo/SCRIPT</td>
<td>1658</td>
<td>4.4</td>
</tr>
<tr>
<td>9. SPSSX</td>
<td>SPSS(^A)</td>
<td>1617</td>
<td>4.3</td>
</tr>
<tr>
<td>10. IEV90</td>
<td>Assembler H</td>
<td>1306</td>
<td>3.4</td>
</tr>
</tbody>
</table>

#### September Top Ten Programs: CPU Seconds Used

<table>
<thead>
<tr>
<th>Program</th>
<th>Description</th>
<th>CPU Seconds</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. SASLPA</td>
<td>SAS</td>
<td>59699</td>
<td>46.3</td>
</tr>
<tr>
<td>2. PGM = *.DD</td>
<td>Compiled Program</td>
<td>16761</td>
<td>13.0</td>
</tr>
<tr>
<td>3. COMPLETX</td>
<td>Academic COM-PLETE</td>
<td>11017</td>
<td>8.5</td>
</tr>
<tr>
<td>4. SPSSX</td>
<td>SPSSX</td>
<td>7951</td>
<td>6.2</td>
</tr>
<tr>
<td>5. FATS</td>
<td>Tape Verification</td>
<td>4887</td>
<td>3.8</td>
</tr>
<tr>
<td>6. IKFCBLO0</td>
<td>VS COBOL Compiler</td>
<td>4085</td>
<td>3.2</td>
</tr>
<tr>
<td>7. PTPCH</td>
<td>Dataset Lister</td>
<td>4055</td>
<td>3.1</td>
</tr>
<tr>
<td>8. MAIN</td>
<td>FORTRAN Programs</td>
<td>3545</td>
<td>2.7</td>
</tr>
<tr>
<td>9. SCRIPT</td>
<td>Waterloo/SCRIPT</td>
<td>3539</td>
<td>2.7</td>
</tr>
<tr>
<td>10. ISTINM01</td>
<td>VTAM Utility</td>
<td>2143</td>
<td>1.7</td>
</tr>
</tbody>
</table>

The programs listed in this section were used the most frequently on the NAS CPU during the month of September, 1988.

**Please Note** that ACAD is the official designation of the part of the NAS/8083 CPU that is dedicated to faculty and student use. The portion of the computer reserved for University administrative purposes is termed ADMN."
Get a Subscription to BENCHMARKS

Benchmarks is a vital link between the UNT Computing Center and the users of our facilities. It is important for all users of the computing facilities to maintain a file of these newsletters because they contain materials which will periodically update existing documents as well as information and suggestions on uses of OS/MVS, MUSIC/SP, the VAXcluster, Microcomputers, and other resources available to UNT students and faculty. To facilitate the dispersal of Benchmarks, *** FREE *** subscriptions are available. To receive yours, send the following information to us either by snail mail (the post office or campus mail) or electronically, to the UserID AS04 on MUSIC, VMS, or CMS.

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Mailing Address:_____________________________________

_____________________________________

_____________________________________

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University of North Texas Computing Center

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