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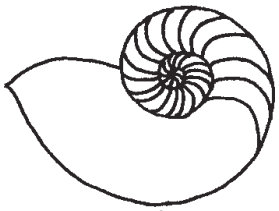

# TUUG Lines

*Technical UNIX® User Group*

Newsletter of the Technical UNIX® User Group

# U of M Network and UNIX Facilities Expanding

***By Richard Kwiatkowski***

The February meeting topic was entitled "Networking and Unix at the U of M," presented by Bill Reid, Manager of Networking, and Kathy Norman, Unix Administrator.

Bill Reid was the first to speak and discussed networking at the U of M. He mentioned that the goal of the Networking Group was to provide a LAN connection for every desk top in the University, and interconnect all of the various LANs on campus. Currently, about half of the University campus is hooked into a backbone network using approximately 5 km of cable. The remaining half of the University should be hooked into the network by the end of the summer. There are currently two main hubs on the network, one in Engineering (where the Computer Centre is), and one in Machray Hall (for the Science complex). Each building is connected by a fibre optic cable which passes through a router and connects to an Ethernet backbone withing the building.

There was some discussion on wireless network links. The U of M does not use this option because of its high cost and the fact that its four mile point-to-point range is severely reduced by obstructions such as buildings.

Bill also mentioned that the University is connected to an outside network called the Internet. This is a world-wide network of research and educational institutions, connecting over 700,000 individual computer systems, and growing by about 1000 per week.

Kathy Norman then gave a presentation on Unix at the University. Kathy mentioned that Unix is a pleasure to administer because it is a distributed system (as compared to MVS), allowing you to make changes on the fly. The other reason is that Unix is versatile, which makes it easier to respond to the needs of the users.

There are four primary servers in the Computer Centre: 1) Rigel, a Sun 4/280, is currently the main file server. 2) CCU, a 2-CPU Sun 4/670, is the login server, mail and news server, and provides various other functions. 3) Altair, a new Sun 4/670, will take over a lot of Rigel's file server functions. 4) Vega, a Sun SPARCstation with graphics and a monitor, acts as a multi-window console server, giving operators console access to the other server systems.

Rigel is the home to over 700 active Unix users. There are about six gigabytes of disk space for user files, with 5.2 currently in use. Rigel also stores /usr/local, which contains all local software packages, language compilers/interpreters, and application software.

Kathy also oversees numerous SPARC workstations, in various open areas on campus, and a few other Unix systems, such as two NeXT workstations. Some of the issues that Kathy has to address include password theft, misuse of computer resources, and administration of user IDs.

Kathy actively seeks advice and requests from her users. She also holds regular meetings to insure that the systems are meeting the needs of the people who use them.

A tour of the Computer Centre facilities followed.

## THIS MONTH'S MEETING

**Meeting Location:**
This month, the meeting is to be held at the south conference room of the CIIT Building, 435 Ellice Ave. Free parking is available in the visitor parking area, or on the street east of the building. Sign in at the security desk; the conference room is located right beside this desk. The meeting is set to start at the usual time – 7:30 PM, on March 10, 1992. A tour of the Regional NMR Facility will follow.

**Meeting Agenda:**
See last page for details.

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## PRESIDENT'S CORNER

# You Are Invited to Participate...

***By Susan Zuk, President***

Thank you to all those who have sent in their survey forms. Your replies will help us to provide the group with a program which has your interests in mind. For those of you who have not completed the survey please send it in as soon as possible.

Included with this newsletter is a sheet requesting your vote on joining the Uniforum Canada user group as well as a vote on changing the name of the user group. Please reply with your decision as soon as you can so that we may work on the decisions and reply to the group on the results in the April meeting. Again you can either mail or fax your information.

I would like to thank Kathy Norman and Bill Reid for their presentation on Networking and UNIX at the University of Manitoba. Unfortunately I was unable to attend but I heard that the session was very interesting and well received. Kathy and Bill presented a view of the computer environment at the University and then provided attendees with a tour of some of the computer facilities in the Engineering Building.

This month Gilbert Detillieux will be presenting a topic called "Writing Software for Portability." This is a great forum for those contemplating moving to a UNIX environment or for those who are already using UNIX. If you are interested in knowing what to watch for when creating an application for your installation and want to know how to achieve portability and openness in the process, this is the seminar for you!

Hope to see you at the meeting!

## The 1991-1992 Executive

| | | |
|---|---|---|
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## Group Information

The Technical UNIX User Group meets at 7:30 PM the second Tuesday of every month, except July and August. The newsletter is mailed to all paid up members one week prior to the meeting. Membership dues are $20 annually and are due at the October meeting. Membership dues are accepted by mail and dues for new members will be pro-rated accordingly.

# Ask Monsieur Ex

*A column in which our resident Unix expert answers questions submitted by members, or discussed at round table sessions.*

***By Gilbert Detillieux***

**Q.** What is the difference between a terminal server and a terminal multiplexer? Which would give better performance?
**A.** The first part can be answered *sans effort*. A multiplexer is simply a board that plugs into a computer, and provides connections for a number of serial ports. Normally, special driver software must be added to the system kernel, and device special files must be created, in order to be able to access these ports. A terminal server is typically a multiplexer connected to a dedicated computer with a network interface. This computer acts as a gateway for traffic between the network and the serial ports, has its own set of commands to establish a connection to a host system on the network, and in TCP/IP based networks, is likely to use the *telnet* protocol for these connections.

As for performance, that one is *très difficile*. There are a lot of issues involved, and a lot of things that can affect performance. However, for most applications, users running on terminals at speeds up to 9600 bps, connected to the same host, aren't likely to notice any difference in performance between the two approaches.

**Q.** How can users be restricted so that they can't leave their own directory structure?
**A.** There are couple of options you could try, but I suspect neither one would be *bien pratique* for what you want to accomplish. Many Unix systems have a restricted shell, that prevents users from changing directory at all, and also prevents them from changing their PATH, thus restricting them to a very limited set of commands and files. The only place I've seen this used is in setting up a restricted environment for playing games; it would be far too restrictive to allow any practical work.

Another option is to use *chroot* to set up a restricted environment for users that is more flexible than that of the restricted shell. Users are essentially presented with a subdirectory as their root directory, and they cannot access anything above this subdirectory. Setting up such an environment is a lot of work, however, since you are recreating the entire Unix file tree in miniature – you'll need to set up a **/bin** directory with the programs required, a **/etc** directory with a password and group file, and so on. Security must be kept in mind when setting all of this up, to avoid inadvertently creating a "back door" for crackers. Such an approach is used by FTP servers that allow anonymous logins, to allow access only to a limited subset of files; since such users are not running an interactive shell on the server, this is not excessively restrictive, nor is it difficult to set up.

However, for interactive users on your system, neither of these options is likely to do the job for you. You are probably better off just following good security measures to make sure no users can access files or programs they are not authorised to use. An article on security is left *à plus tard.*

**Q.** I'm new to Unix. Can you recommend any good books on Unix?
**A.** Unfortunately, M. Ex is from *la vieille école*, where Unix was learned mostly by studying source code, so there are not very many books for novices that I'd feel confident recommending. One exception is *A Practical Guide to the Unix System, Second Edition*, by Mark Sobell. For experienced programmers who are new to Unix (but not to operating system concepts), *The Unix Programming Environment*, by Brian Kernighan and Robert Pike, is still one of the definitive texts.

**Q.** I'm running a command tool window within Sun's OpenWindows environment. I log into another Unix system and try to run *vi*, and it tells me "sun-cmd: Unknown terminal type" – how do I get around this?
**A.** If you have the *esprit de hacker*, you might be brave enough to copy the *termcap* and/or *terminfo* definitions for *sun-cmd* from the Sun and install them on the other Unix system. Otherwise, you may be able to get by with the *ansi* terminal type, if that's defined. A better solution might be to just run *xterm*, rather than the command tool, on the Sun, to get full VT100 emulation, which is supported by any serious Unix system out there.

**Q.** How do you combine two files into one file? How do you append a file to the end of another file?
**A.** *Deux questions, une réponse*: **cat**. "**cat file1 file2 >both**" will create a file called *both* that will contain all of *file1* followed by all of *file2*. "**cat file2 >> file1**" will append to *file1* all the contents of *file2*.

**Q.** I had a hung process that "kill -9" would not fix. What else can I try?
A. *Un peu de dynamite*? Unfortunately, on many Unix systems today, we cannot count on "kill -9" to deliver the final *coup de grace*, the sure kill that it is intended to provide when all other more gentle forms of persuasion have failed. The fault usually lies in poorly written device drivers that can block in their close routine, which is called as part of the exit processing for the killed process (the only place where the signal 9 can be ignored). Sometimes, the process can be unblocked and freed from the land of the undead by fiddling with the appropriate port or peripheral device – unplugging a serial cable and reconnecting it, for instance. Often, however, the only way to fix the problem is to reboot the system.

***M. Ex**, a mysterious Frenchman who claims to be an old editor and an expert in UNIX, disappeared again before we could get a complete biography (not to mention some solid references).*
***Gilbert Detillieux** is a founding member of TUUG, and a past president, yet he was naïve enough to volunteer as newsletter editor for the year. Go figure.*

# The Internet, UUCP, Mail, News, and All That

***By Roland Schneider***

People often talk about wanting to get "Internet access." What do they mean, how do I get it, do I need it, and what is this "Internet" thing anyway? Well, simply put, the Internet is a wide area network connecting thousands of local area networks (LANs) all over the United States, Canada, and around the world.

The communications links between these LANs consist of a mixed bag of technologies, some old, some new, some fast, some not so fast, but the common thread is that every computer, X-terminal, or other device connected to the network has a unique name and address, uses the same protocols, and can be accessed transparently from anywhere else on the Internet.

### An Example

For example, let's say I'm visiting a friend at IBM in New York, and want to demonstrate a program I'm working on back at the University of Manitoba. I sit down at a computer (running UNIX, preferably, but a PC would do too) and type "telnet rum.ee.umanitoba.ca". A few seconds later I get a login prompt, and away I go. It doesn't matter to me that whenever I type a key, my computer in New York generates a packet of data which goes via the local building ethernet to the local "backbone," is routed to the Internet, to Montreal, to MBnet, to the U of M campus network, to the engineering network, and finally to the machine "rum," nor does it matter how on Earth all the equipment at each step figured out where to send the packet. All that matters to me is that my local network has been effectively extended to the world.

Of course, I can do a lot more than just log in. I can transfer files by using "`ftp`" instead of "`telnet`," and download lots of free software. I can send electronic mail, receive network news, synchronize my system's time to an atomic clock or get up-to-date weather maps. In effect, I can access any available service as if it were on my local network, assuming the remote system grants me permission. The only real limitation is that all that forwarding of packets takes time, and high-speed links cost money so the network tends to be too slow for communications-intensive interactive applications like X-windows.

So, let's all connect up to the Internet! Sure, as long as someone else pays. All that equipment isn't cheap, although it's getting cheaper, and the communications lines *really* aren't cheap, although that's improving too, and cheaper, part-time dial-up access will likely be available in the future. At the moment, though, it's still too expensive for most small companies and individuals to connect to the Internet.

### UUCP

When people talk about Internet access, what they are often really after is electronic mail and network news, which is sort of a massive bulletin board system. Both of these services are available using an older, though still widely used, communications system: UUCP.

UUCP stands for UNIX to UNIX copy. The UUCP system is a set of standard UNIX programs which can transfer files and execute commands across dial-up modem connections. UUCP used to be used to implement a continent-wide network of computers through long-distance telephone connections. This has largely been supplanted by the Internet, and UUCP is now mainly used by smaller organizations to call a system on the Internet.

With a properly administered UUCP link, you can send and receive mail much as you would if you had a real internet connection. You can even use "domain based" addresses like "rsch@ee.umanitoba.ca"* instead of the traditional UUCP "bang paths."** Network news is available too. Even ftp file transfers are possible in many cases, simply by sending mail to an automated mail server which will perform the internet ftp operation, break up the desired file into manageable pieces, encode binary information into displayable characters, and mail it to you.

### Plans

I had hoped to have a firm plan in place for providing easy access to UUCP mail and news for TUUG (MUUG? GLUUG? *UUG?) members before this newsletter deadline, but I haven't had a chance to make the necessary arrangements yet, and several possible solutions are still up in the air, as is our name. The name is relevant, since our e-mail address will have to be registered with the proper organizations, and the address will contain the name.

Our lack of e-mail is, well, embarrassing. I hope to be able to set something up soon. In the meantime, anyone who desperately wants to get a UUCP connection with access to Internet mail and network news should contact Budi Rahardjo (home phone 269-2658), who runs the Bison system. Bison only accepts UUCP system logins, not users. Anyone can get a userid on sys6626.bison.mb.ca (modem phone number 269-0084), one of the systems which Bison feeds. From there you can send e-mail to either Vic Spicer <system@sys6626.bison.mb.ca> or Budi <budi@bison.mb.ca> to arrange for a UUCP connection, if you want mail and news on your own system.

Our eventual goal is to provide free (or very nearly free) UUCP access to any *UUG member, along with easy directions, and maybe sample configurations, for *UUG members wanting to set up their UUCP link.

Watch for an article on the wonders of electronic mail and how it works in next month's newsletter.

---

* Mail to this address is really forwarded via UUCP to the machine I have here, in Selkirk.

** A "bang" is an exclamation mark, and a "bang path" is a series of machine names separated by exclamation marks, specifying the route to take to the desired recipient.

# Sun RPC Programming II

## A Tale of Two Protocols

***By Scott Balneaves***

Last time, we implemented a rather trivial program. We're going to do the exact same one this time, but in a radically different way, using different techniques. However, we're going to have to do a little theory work, first.

### UDP or No UDP, that is the question

As you have already found out, Sun RPC sends data across the network in packets. However, as an end user, there are only a few things that you can do to affect the way in which the system will actually move the data. One of the most important things is selecting the transport mechanism that the data will use to flow across the network.

The transport mechanism defines how your data will be sent across the network. The two transport mechanisms are UDP and TCP.

### UDP (User Datagram Protocol)

The UDP transport mechanism is the computer equivalent to putting a message in a bottle, and throwing it out to sea. If all the conditions are right (wind, currents, tide, etc.) your bottle will arrive safely. There is, however, no guarantee that your message will arrive in a timely fashion, or even arrive at all. UDP is referred to as an unreliable, connectionless transport mechanism. Your data is placed in a UDP packet, and shipped out onto the network. It depends on the reliability of your network hardware and software to get the message to it's destination intact, and in a timely manner. If you require some kind of method to ensure that your packets are getting through, you will have to wait for the reply to time out, and then re-send your request. This can add to your program's complexity. Another limitation of the UDP protocol is that the arguments to the RPC and the results must be smaller than the maximum UDP packet size. This is usually around 8K, but you can check your reference manuals for your implementation's size.

All this makes UDP sound like a really bad choice, doesn't it? Well, it's not, in a large amount of cases. UDP is usually much faster than the TCP transport, and if you have a fairly reliable local area network (most are) then you should be able to use UDP without any problems. If your application has the following characteristics, it may be a good candidate for the UDP protocol:

1. The procedure is indepotent. This means that the procedure can be executed more than once without causing any problems. A procedure that squares a number would be indepotent, but a procedure that creates a file or allocates core memory would be non-indepotent.
2. The size of both the arguments and return values is smaller than the UDP packet size (i.e. less than 8K)
3. The server is required to handle a lot of requests. These could order on the hundreds or (in some very extreme cases) thousands of clients. Because the UDP transport is connectionless, it does not need to keep any information about its clients, as the TCP transport does.

### TCP (Transport Control Protocol)

The TCP transport operates like a telephone connection. The client dials the server, and a definite connection is established. Data is passed between the two, and when the connection is no longer needed, it is closed. TCP is known as a reliable, connection-oriented (connectionful??) protocol. With TCP, if the server has crashed, you will not be able to establish contact with the server, and will therefore know that something is wrong. With UDP, if you send out a request, and you time out (i.e. don't receive a reply within a set time period) you don't know whether your server has died, or is just so swamped with requests that it hasn't answered you yet. However, the TCP protocol has one disadvantage: Because it maintains a connection with the client, it uses up more streams resources that a UDP procedure would. There will be a maximum number of clients it can service, based on your machines resources.

TCP will be a good choice for you if:

1. The application must maintain a high degree of reliability.
2. The procedure is non-indepotent. If your procedure can definitely be executed only once, I'd recommend the TCP transport.
3. The size of either the arguments or the results exceed the maximum UDP packet size. (I.e. greater than 8K)

### So why do I tell you all this?

We're going to implement the exact same program as last time, but we're going to use a utility called *rpcgen* to generate some of the boring code for us. I'm not going to explain what *rpcgen* code does. I'll leave this for next time. However, I'll implement our server this time using the TCP transport protocol. Next time, I'll explain a little more what *rpcgen* can do for you, and we'll develop a somewhat more sophisticated client/server program. (I'm willing to take requests for what you want to see me do. If you'd like, you can reach me by e-mail at the university using the address sbalneav@cs.umanitoba.ca, or say Hi to me at the next meeting.)

The three files you need are:

| | |
|---|---|
| who.x | (protocol specification for rpcgen) |
| who_proc_1.c | (server code) |
| ison.c | (client code) |

Type the following to compile things:

```
rpcgen who.x
cc who_proc_1.c who_svc.c -o who_svc
cc ison.c who_clnt.c -o ison
```

You start the server by typing:

```
who_svc &
```

and query with

```
ison <machine> <user>
```

```
/*
 * who.x: remote who protocol specification.
 */
program WHO_PROG {
        version WHO_VERS {
                int WHO_PROC(string) = 1;
        } = 1;
} = 0x20000100;
```

```
/*
 * Filename: who_proc_1.c
 * Author:   Scott Balneaves, Feb 20, 1992
 */
#include <stdio.h>
#include <signal.h>
#include <string.h>
#include "who.h"

void catch_term();
#define PIPECMD        \
        "/usr/bin/who | /usr/bin/awk '{print $1}'"

int *
who_proc_1(parm)
        char **parm;
{
        static int     retval; /*NOTE STATIC DECL*/
        FILE           *pipe;
        char           buf[BUFSIZ];

        /*
         * catch sigterm so we will exit
         * gracefully, and de-register
         * ourselves from the system.
         */
        signal(SIGTERM, catch_term);

        /*
         * This is very lazy, but what the hey!
         */
        if ((pipe = popen(PIPECMD, "r"))
                              == (FILE *) NULL) {
                fprintf(stderr,
                    "Error: couldn't open pipe\n");
                exit(1);
        }

        retval = 0;

        /*
         * Find if our user is logged on.
         */
        while (fgets(buf, BUFSIZ, pipe) != NULL)
                if (!strncmp(buf, *parm,
                              strlen(*parm)))
                        retval = 1;

        pclose(pipe);

        return(&retval);       /* return results */
}
```

```
void
catch_term()
{
        fprintf(stderr, "Caught SIGTERM\n");

        /*
         * Unregister ourselves (just to be nice)
         */
        svc_unregister(WHO_PROG, WHO_VERS);
        exit(1);
}
```

```
/*
 * Filename: ison.c
 * Author:    Scott Balneaves, Feb 20, 1992
 */
#include <rpc/rpc.h>
#include <stdio.h>
#include "who.h"

int main(argc, argv)
        int argc;
        char *argv[];
{
        CLIENT  *cl;
        int     *result;

        if (argc != 3) {
                fprintf(stderr,
            "%s: useage: %s <servername> <user>\n",
                        argv[0], argv[0]);
                exit(1);
                }

        /*
         * Create client "handle" for calling
         * WHO_PROG on the server designated on
         * the command line.  We tell the RPC
         * package to use the reliable "TCP"
         * protocol when contacting the server.
         */
        cl = clnt_create(argv[1], WHO_PROG,
                                WHO_VERS, "tcp");
        if (cl == NULL) {
                /*
                 * We couldn't establish the
                 * connection with the server.
                 * Print an error message and die.
                 */
                clnt_pcreateerror(argv[1]);
                exit(1);
        }

        /*
         * Call who_proc_1 on the server machine.
         */
        result = who_proc_1(&argv[2], cl);
        if (result == NULL) {
                /*
                 * An error occurred while calling
                 * the server.
```

```
                * Print error message and die.
                */
                clnt_perror(cl, argv[1]);
                exit(1);
        }

        /*
         * RPC completed sucessfully.
         * Check our return code.
         */
        if (*result)
                printf(
                    "user %s is logged onto %s\n",
                    argv[2], argv[1]);
        else
                printf(
                  "user %s is NOT logged onto %s\n",
                    argv[2], argv[1]);

        return(0);
}
```



# UniForum Canada Decision

Information is being provided to Technical UNIX User Group members to help members to decide if they feel TUUG should become affiliated with this National organization. The following is the some background on the national body. When you have finished reading please check off the appropriate box, on the extra page which was delivered with this newsletter, as to whether the group should join UniForum Canada. When completed please fax or mail this sheet back to TUUG. Please indicate if you are interested in becoming a member of this group. Thank you for you input.

### What is UniForum Canada?

UniForum Canada is a non-profit, vendor-independent trade association dedicated to the promotion of UNIX® and open systems-related products and services through the exchange of information and cooperative efforts of its individual members, corporate sponsors and affiliate groups.

UniForum Canada's central goals are:

- To encourage the co-operation and mutual assistance among users, suppliers and others of UNIX and UNIX compatible computer systems.
- To encourage the development and dissemination of and provide a forum for the exchange of techniques, applications, software, documentation, procedures and related information for UNIX and UNIX compatible computer systems.

UniForum Canada is an affiliate of **UniForum®,** the International Association of Open Systems Professionals. The international organization was formed in 1980 and was previously called /usr/group.

Uniforum Canada is affiliated with the following UNIX user's groups across Canada:

British Columbia UNIX Users' Group
Calgary UNIX Users' Group
Edmonton UNIX Users' Group
South West Ontario UNIX Users' Group
UniForum Toronto
UniForum Ottawa
UniForum Montreal
UNIX Quebec
UniForum Halifax
XUG Canada

The Board of Directors of UniForum Canada is advised by the *UniForum Canada National Council* which is made up of one representative from each Affiliate Group.

Uniforum Canada acts as a central figure in helping the affiliates to communicate and share ideas with each other as well as with the entire UniForum world. This is handled in the following ways:

- Holding director meetings at specific intervals
- Providing the affiliates with a newsletter called README which receives contributions from the Canadian groups
- Sponsoring major industry events, including tutorial series, conferences, and trade shows
- Recognizing achievements in the UNIX community by awarding selected individuals with the Canadian Open Systems Superuser Award.
- Providing on-line services through electronic mail to connect affiliates and members to a special subscription listing
- Providing a link to join the International Uniforum group with 2 types of memberships which provide various things such as discounts for publications, discounts for shows, a UNIX Product directory, monthly and bi-weekly publications
- Providing various programs which affiliates can use depending on their needs, i.e.. Corporate sponsor program, Canadian UNIX Resources Directory, Internetworking, National Newsletter, cooperative conferences and trade shows (NOTE: some of these programs are currently being created by the National Council members).

These are some of the things which the Technical UNIX User Group can use to build from as well as help to contribute to. As an active affiliate, TUUG can promote its ideas, state it opinions and let others know what Manitobans are doing in this environment.

If you would like more information or have questions please call Susan Zuk at 788-7312 or come to the next meeting to be held on March 10th. Please provide us with your decision no later than March 20th.

# Technical Unix User Group Membership List

***By Gilles Detillieux***

Once again, due to popular demand, we present you with our up-to-date membership list. We are including on this list only those members who gave us permission, on their membership application form, to release this information to other members.

This information is released for personal use only by our members. Please do not abuse it. It is not to be used for commercial or advertising purposes, nor for soliciting business.

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## THE FORTUNE FILE

# A Joke from the Net...

***Submitted by Sunil Rottoo***

It appears that after his death, Albert Einstein found himself working as the door-keeper at the Pearly Gates. One slow day, he found that he had time to chat with the new entrants. To the first one he asked, "What's your IQ?" The new arrival replied, "190." They discussed Einstein's theory of relativity for hours. When the second new arrival came, Einstein once again inquired as to the newcomer's IQ. The answer this time came "120." To which Einstein replied, "Tell me, how did the Cubs do this year?" And they proceeded to talk for half an hour or so. To the final arrival, Einstein once again posed the question, "What's your IQ?" Upon receiving the answer "70," Einstein smiled and asked, "Got a minute to tell me about VMS 4.0?"

# TUUG Meeting Minutes

***Tuesday, February 11, 1992, 7:30 PM***
***Senate Chambers***
***245 Engineering Bldg.***
***University of Manitoba***
***Ft. Garry Campus***

**Chair:** Gilbert Detillieux
**Attendance:** 30

**Business Meeting:**

1) Membership report
   - TUUG currently has 61 members

2) Newsletter
   - Deadline for March newsletter is Feb 21

3) Treasurer
   - absent

4) Meeting coordinator's report (by K. Norman)
   - Eric Carsted is in Florida
   - March meeting: Writing software for portability – Gilbert Detillieux
   - April meeting: Amdahl's UTS system
   - May meeting: TBA
   - June BBQ: will be hosted by Roland Schneider

5) Old business – Symposium windup report
   - gifts were presented to Al Hykaway and Susan Zuk in recognition of their work on the symposium.

6) Old business – Survey
   - members are asked to please fill in the survey forms included in the last newsletter and hand them in to Gilles Detillieux, FAX them, or mail them.

7) New business – Name change
   - members are asked to read the article about changing the TUUG name in preparation for a vote at the next meeting.
   - it was pointed out the it is not necessary to have "UniForum" in the new name since UniForum does not require this of affiliates.
   - a name search has to be done on the new name.

8) New business – UniForum
   - there will be vote on whether or not to join UniForum
   - benefits include access to UniForum speaker list and contactwith other UniForum affiliates.

**Presented topic:**
Networking and UNIX at the U of M. (See cover story.)

# Agenda

***for***
***Tuesday, March 10, 1992, 7:30pm***
***CIIT Building Conference Room***
***435 Ellice Ave.***

1. Round Table 7:30

2. Business Meeting 8:00
   a) President's Report
   b) Membership Secretary's Report
   c) Newsletter Editor's Report
   d) Treasurer's Report
   e) Meeting Coordinator's Report
   f) New Business

3. Break 8:20

5. Presented Topic 8:30
   Writing Software for Portability
   *One of the big benefits of Unix is its portability. However, that portability isn't automatically gained by programs written for Unix – it must be carefully designed in. Gilbert Detillieux will discuss various techniques that can be used to facilitate portability.*

6. Adjourn 9:30

**Note**: Please try to arrive at the meeting between 7:15 and 7:30 pm. Thank You.

## Next Month

**Meeting:**
Our April meeting is scheduled for Tuesday, April 14, at 7:30 PM. The presented topic is about UTS, and is presented by Amdahl. The meeting will start off with our usual round table and business meeting. Location is the senate chambers at the U of M Engineering Building.

**Newsletter:**
We will likely continue with our Q&A column, and RPC Programming by Scott Balneaves, next month. I would like to see something for next month's "Industry" and "Technology" headings, or any other topics that would be of interest to members. Any other aspiring writers out there?