OARTech Notes for June 11, 1997

Galen called meeting to order at 10:00. Everybody introduced her- or him- self. OhioLink will be moving its central site equipment from Wright State to the Ohio Supercomputer Center. The date will be August 15th through 17th. All OhioLink IP addresses will be changing and Domain Name Services will need to be re-homed. In theory, the change should be transparent to patrons.

The new vice-chair will be appointed. Think about your nominations. Motion to approve minutes was put forth and seconded. The minutes were adopted by voice vote.

Samba....

By Ransel Yoho. Samba is a server supporting the SMB used by Microsoft for file sharing. They have been using the Samba server under Linux to support Windows for Workgroups, Windows 95 and Windows NT. SMB connotes Sever Message Block. Microsoft first implemented the protocol in 1987.

- First Defined in 1987
- SMB is a client/server, request-response protocol
- Clients connect to servers via NetBIOS over TCP/IP, NetBEUI or IPX/SPX
- SMB client and server is included in W95, WFWG and NT (also DOS)

SMB falls between the Applications and the Network layers of a network protocol stack.

- Connect/disconnect to print shares
- Open/close files
- Read/write files
- Create/delete files

A number of SMB variants are available for many environments. Note that CIFS (Common Internet File System) is being developed. CIFS will be a public standard and has support from a number of vendors.

Security:

o Share level (each resource has a password coupled to the resource)
o User level (some external server provides authentication as users access resources)

Browse Lists:

o Servers broadcast shares available (may include client PCS as well)
o Broadcast scheme works under NetBEUI or IPX/SPX, but not TCP/IP due to broadcasts
  not crossing subnets
o WINS is a DNS-like service that gets around the limitations of the TCP/IP broadcast domain.

Samba, a public SMB server:

o GNU copyrighted source code
o Runs on many UNIX-like platforms: Sun, HP, Linux,...
o ftp://samba.canberra.edu.au/pub/samba
o Red Hat and Caldera Linux come pre-configured out-of-the-box

Samba Configuration

o Processes needed to support SMB:
  o Nmbd - NetBIOS/wins server
  o Smbd - samba server

o Configuration file: typically /etc/smbd.conf

Ransel demonstrated a notebook computer with Slackware Linux connected to a notebook running Windows. Here is an example smbd.conf:

```
[homes]
comment = Home Directories
browsable = no
read only = no
create mode = 0750

[printers]
....

[tmp]
comment = Temporary file space
```

```
path = /tmp
read only = no
public = yes

[web]
comment = http docs
path = /var/lib/httpd/htdocs
valid users = ransel
... user = root
... group = root
...

[global]
printing = bsd
printcap name = /etc/printcap
load printers = yes
guest account = pcguest
path = /var/spool
log file =/etc/samba/log.%m
work directory = /etc/samba/locks
share modes = yes
```

Note that Linux has NIS (formerly called yellow pages), so user information may be obtained though a convenient campus-wide NIS source. Note in the example above, that the Home Directories directive specifies that the UNIX user database is used to locate the user space. Samba has recently been enhanced for domain support, which emulates the role of an NT server.

Note turn off browse mastering on the Windows 95 clients to speed up bringing up the network neighborhood. This is configurable in the Network applet in the control panel. LM announce should be left on so that other browse masters can see your machine. Only TCP/IP is needed. In fact, the Samba server supports only TCP/IP.

Watch out for lack of security if you select resource level shares! In this case, only a password is required to access the resource. Passwords should be difficult to guess and changed frequently.

Q: How is the product supported? A: Mailing lists, commercial Linux releases, mercy of the author, the on-line documentation.

Ransel likes using Samba because he's run into a lot of problems with Netware and the Client-32. Since Microsoft is obviously going to want to

support its own networking protocol, Samba is a good choice for a non-Microsoft-branded file server. Email to ransel@kent.edu.

Survival skills in an ATM environment

Patrick Limpach from CWRU has been implementing ATM to the desktop over the approximate last 12 months. 12 months ago, CWRU was running an FDDI backbone and had severely overloaded ethernet. Management proclaimed that no more shared ethernet segments would be installed. The first phase was to choose a so-called edge switch. In CWRU's case the edge device switches between ATM and ethernet. Each device has a dedicated ethernet link from the edge device. Each switch is about the size of a Cisco 7500 (about 100 pounds and 3 feet of rack space). The switches had to be installed in about 30 buildings. At the same time, about 1000 new users had to be added to the system. The management decided to add more than 1000 ATM to desktop connections and no new ethernet. A careful rearrangement of existing equipment was able to accommodate the new ethernet users. At the same time CWRU began to implement a star topology ATM backbone with 300 megabit links for single- or multi- mode fiber with multiple redundant links. The ATM was chiefly deployed into student areas first because entering freshmen typically would be bringing in the newest equipment. About 300 ATM users were added in the last six months.

What protocol should be used? IP over ATM, or what? The problem is that clients are running all sorts of protocols, so LAN Emulation is the only viable choice. LANE has only been ratified and standardized in the last six months. At the time, the specification only supported 255 users per ELAN with servers bridging the ELANs together. There are big problems if the ELAN crashes. The fix was to configure the network so that users can hop between ELANs.

There are cable issues. Typically in the past, there are more face plates than users. This leads to confusion if the user tries to connect to a dark plate. ATM equipment uses 1300 nm light source, which makes it more difficult to visually determine if a plate is active. There is also a problem in that the receiver PIN diode on the PC ATM card will respond to either visual or infrared, so the link light will show ON, even if the client is plugged into the wrong type of switch.

LAN Emulation: ATM differs greatly form TCP/IP in that ATM is a call-based connection oriented system with a stateful relationship between two

end-points. To be able to do TCP/IP, there must be a LAN Emulation configuration server that all clients know how to call. The server can then send the client a table of ATM addresses comprising the virtual LAN. There is also a second broadcast/unknown server which emulates UDP-like connectionless traffic.

Edge switch issues: a very important piece of the network because it is what makes it possible for a station to do anything useful on the net. Early in the implementation, there were a lot of problems with switches crashing. Their network comprises over 9000 MAC addresses. The question of whether routing should be done needed to be addressed. CWRU sees about 150 broadcast packets per second, which is a small load for ATM. Routing would reduce the number of MAC addresses in the switch, but there is the cost of trying to figure out a means of routing many different protocols. Fixing the performance of the switches was gauged to be a lot easier than to figure out how to do many different types of routing.

Client NIC boards: This was CWRU's first foray into PCI cards. They had a lot of plug n play conflicts. Name brand computers proved troublesome, but no-name computers with substandard BIOS proved even more aggravating. Normally, student assistants are used for installs, but the magnitude of the cut-over necessitated hiring temps. The change of Win-95 to the OS/r2 "Win-95B" caused trouble because not only the file system changed, but Microsoft threw away the old Hummingbird licensed protocol stack and replaced a new stack; the ATM drivers failed to work.

Due to the high cost of ATM cards and switches, they've only deployed ATM where the port density can be kept high. The current count is 600 ATM desktop users. The management ruled that no new ethernet would be purchased, so any legacy users are shared/switched 10 megabit. They have no 100 megabit.

What would you do different? Of help-desk problems, ATM accounts for a maximum of 15%. Most headaches revolved around the scale of the cut-over and the change to Win-95. Number 1, provide a lot more training to support trouble-shooting. Number-2, phase in the cut-over.

Performance issues? With ATM to desktop running LANE 1.0, the performance of sustained 125 megabits/second is possible with workstation level computers. Win-95 client performance limits have not been rigorously pursued. Patrick feels that 25 megabit ATM is a waste of money because it doesn't provide any gain over fast ethernet.

Deploy to students first: they are more flexible, they don't have any previous yardstick of experience, avoids angering faculty. The LANE server is running on the switches. Patrick tried Cabletron's fastpath switching software and had performance problems.

Note that the ATM forum has put a freeze on any standards until 3rd quarter 1997. LANE 2.0 and MPOA (multiple protocol over ATM) may be available by the end of 1997. Patrick noted that even though MPOA is allegedly available, it wasn't working well at Interop. The benefit of MPOA is that it makes cut-though switching available between ELANs to that not all packets have to be handled by the LANE servers and can be offloaded to switches. Check the web for the ATM forum. Also see the book, ATM for Dummies. CWRU tried a video CODEC from a UK company called Knet. Knet has simultaneous video in/out. Nemesis also makes a CODEC, but it is unidirectional.

Lunch break.

OPLIN

Re: the letter to Tony Yankus. The Governor has made it an issue to prevent the unfettered access to pornography et al by minors via Internet at public libraries. John is a member of the OPLIN board of trustees and the technical advisory board. John (OPLIN unplugged flip chart): OPLIN is administratively part of the state library. Their mission is to electronically tie the libraries and in turn tie the libraries to the Internet via OPLIN. They purchase databases much the way as OhioLink, and in fact is working with OhioLink. The OPLIN goal is to tie all main libraries. They are also working on tieing in the branches. The whole is attached to the state's GOSSIP network with 258+ T1 circuits.

Minors (as defined by the ORC) typically would not be able to go to a library and have access to pornography and "objectionable" material because libraries do not collect that material. Obviously, the appearance of the Internet has changed the equation through the ease of use in accessing URLs. Librarians have been in the business of providing access to information, rather than defining the nature ("objectionable", for instance) of that material. There are 12 persons appointed by the OPLIN board to examine the issue. The OPLIN board immediately responded to the governor and the speaker,

reminding them that this is not a new issue. For instance, the Cleveland library has had access to the internet for a number of years. Those libraries have developed acceptable use policies and have had them in place for a while. In particular, several high visibility specific incidents in Medina, etc. last fall caused an escalation of concern. OPLIN pointed out that the member libraries are autonomous units that are governed at the local level. OPLIN is a voluntary network. There are 250 public library systems in Ohio, 249 of which have joined. OPLIN has left content filtering to be dealt with legally at the local level. OPLIN has ruled that an unfiltered feed be provided to members, who will do their own filtering. There are also small libraries with one or fewer (!) FTEs of staff. Those small libraries may not have staff expertise to implement filtering and at the same time do not have staff available to provide continuous monitoring of the OPLIN terminal.

There are a number of both technological and philosophical issues surrounding filtering. A primary stumbling block is that of intent. For example, filtering, "breast," may eliminate chicken recipes or valid research related to breast cancer.

The upshot: there is no silver bullet. The current model is for a dual stream. The senate approved the current budget bill for the next biennium, thus the immediate pressure has been reduced. None the less OPLIN is looking at a solution that can be ported to the K-12 environment of Infohio and Schoolnet. Whatever solution is implemented, will have impact on a number of state institutions.

Discussion: Virginia has implemented a law that rules specifically that bars university professors from viewing objectionable material on a state-funded PC. The Stark County A-site is using a filtering package; OPLIN is looking at it. The filtering degrades network performance. The filtering misses some material that should be blocked; the filtering also blocks some material that should be allowed. Note that there are various means of implementing filtering: network firewalls or on individual PCS. Also what protocols should be filtered? What type of content should be filtered?

Is a dual-feed strategy a good idea? Adult and child terminals, for instance. What about a hardware authentication means. The ORC excludes educators, clergy and some others from prosecution when they are providing access when the material is provided in good faith. OPLIN's current preferred model is the dual stream model with the filtering criteria to be determined.

The White Paper

The White Paper is the result of a request from Osteer to Oartech to provide a set of recommendations and specifications to members who are implementing or upgrading networks.
The expected audience is the university provost level.

Introduction: no changes.

User workstations: remove vendor-specificity. Focus on performance specifications. Be more inclusive of architectures. Be more rational purchasing strategy requirements. Video resolution?

Item 7: category 5 or better?

Item 5: authentication methods?

Item 4: is SLIP worthy? is RFC-1055 still valid? Is 14.4K enough bandwidth?

Network Recommendations: need to provide adequate staffing.

Note that the White Paper is available at Ohio Northern.

Nomination for vice chairperson.

Move and second to nominate Pat Limpach for the upcoming Vice Chairperson. Pat was unanimously appointed by voice vote.

Somacs

No update.

OarNet

Kevin: Oarnet is looking for new staff. They need people to support OPLIN and some positions are available. A staff person to fill Chris Steele's old position is needed. Chris will be the primary training developer now. Internal training will be developed as will packages for Oarnet clients. Oarnet is also looking for additional space due to its expansion. The Remedy server software upgrading has progressed well with few glitches. It is

expected at some point, an end-user web interface will be available to query action items. Oarnet is looking at joining the Help Desk Institute. See the Help Desk Institute's web page. Oarnet is actively participating in the growth of Internet II and its attendant standards. Galen: should Oarnet develop a swat team to assist in networking or other projects?

Internet II

Osteer will oversee Internet II. There are still four member schools with perhaps four to six more.
Getting additional schools on board will help leverage funding from the state. Expect and annual membership fee of $25,000 with a per anum commitment of up $500,000 in equipment and related costs. Hopefully the OBR and NSF will be sensitive to the capital and operating costs, providing adequate financial support. Oarnet recognizes the usefulness of adding an additional staff advocate to help schools manage their efforts and secure funding. Oarnet is looking at partnering with other states: Michigan. Pittsburgh and western Pennsylvania, Lexington Kentucky. Overall, Oarnet has been doing well and expects continuing high level of support.

Gigapop et al

Oarnet has been able to garner an additional $2 million in money above the regular budget and all this has been placed into upgrading the capacity of the network and its equipment. Toledo has just undergone a major upgrade. Dayton just received its ATM equipment. Cincinnati and others have been installed. The final topology will be an ATM based ring around Ohio with central spokes. Much of the infrastructure is already in place. Oarnet is working on the connection at North Royalton. There is currently a lack of capacity in MCI's infrastructure. Oarnet is working with a local fiber company. Q: does Oarnet get IP addresses from Internic or MCI? A: it all comes from Internic. At current, the vBNS consists of eight switches. Cleveland is very lucky to be the location of one of the switch points. Oarnet is considering partnering with MERIT through Toledo; if so, the DS3 to Cleveland may be upgraded to OC3.

New Business

None

Adjourned at 15:06