

THE GURU

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Emulation

By: Nathan Truhan

By a brief description, emulation is a means of using material designed for one computer or object on another computer or object. Many of the emulators I will be talking about are run from IBM-MS DOS, but there are the same programs out there for other platforms as well. Many people know the IBM, Macintosh, Commodore Amiga, and Commodore 64 computer systems in which I will be discussing. IBM users, when you go somewhere and are only able to use a Macintosh, you run into a problem. As you may know, Macintosh can read IBM disks, but IBM, by nature, cannot read a Macintosh disk. Well, there is a program out there that can help, and it's called *Executor*. This program not only enables the IBM to read and write to the Mac disks, but it can also do many other things as well. Right now it has support for the MacOs System 6.07, but they are working on a System 7.5 now. You can run almost any program that is designed for the Macintosh Os 6.0.7 or below. This program will interpret the Operational Codes of the System 6.0.7 and you can do many things that you can do on a Macintosh with it.

Next, for you Converted Amiga Fans, there is a program called UAE (UNIX Amiga Emulator). In this

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Trumbull Computer User's Group
Since 1984
Supporting All Personal Computers

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March Meeting: For the march meeting, we will be meeting on Tuesday, March 11, between 7:00-7:15 at Cortland Banks. We are then driving to K.S.U. Trumbull Campus on Mahoning Avenue in Champion to attend the W.R.I.P.C.A. meeting. Their meeting lasts from 7:30 until 9:00 or 9:30. **There will be no meeting on Wednesday, March 19.** Hope to see you there! Next month we will resume our regular meeting on April 16.

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Newsletter

This month's Guru was produced on an IBM-comptible Pentium 133Mhz using Microsoft Publisher 95.

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Happy
St.Patty's
Day!



Emulation

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program, you provide the Amiga Kickstart, I am using v3, in one file called a ROM, and the Workbench OS on another. There are directions on how to get these with the program.

Once you provide these files and load up the program, you adjust your settings from the menu and load up the Operating System. Since you are using the actual files from the Amiga computer, the display should be very familiar, and it should run like an Amiga from there. There are a few bugs in this program that are being worked out, but I think that it might develop into a Great Amiga Emulator.

Next is the Commodore 64 emulator. There are many emulators for the C64 out there, but the best one I have found is the C64s. When you run the program, the familiar blue screen pulls up and the commands all work the same as the C64 did, even the keyboard layout is the same. It has full sound and joystick support with the registered version. The disks are a little different. It uses single file disks that C64s loads as a disk or tape (yes, tape), in which you can transfer in many different ways. They have reserved F9 & F10 for command usage, which you do not use on a C64 anyway. In these menus, you are able to change some of the system settings and insert/eject the 1541 style disks. In this latest version 2.0, only available to registered copies, almost all of the bugs are fixed and it works great 99.5% of the time. The shareware version goes up to 1.3 and it will still work great with little problem.

These are just three of the many emulators out there. If you can think about one, usually someone makes it. Some examples are game emulators (Sega Genesis, Super Nintendo, Nintendo, Gameboy, Atari, etc...) There are numerous emulators for these systems in which most are buggy, also some can be simple to run, yet others can be very complex, but once they're up, they can be well worth it.



The Death of the Internet

Popular Mechanics January 1997

The Internet is so busy that nobody bothers to go online anymore. Even users with the patience of Yogi Berra are getting frustrated by long delays.

The Internet is at a crossroads. Rather than surfing the Net, many users find themselves wading through the mud. Is this a permanent state of affairs? Or are remedies being found in "Internet time", where changes occur overnight?

Considering the demands that have been placed on the Internet-the number of users is growing at a rate of about 200%- it's remarkable that it has managed to keep up at all. In addition, the range of services that the Internet is providing was never envisioned by the people who developed what has grown into today's Net.

The Internet had its beginnings in the late 1960s as a project by the Advanced Research Projects Agency, or ARPA. The main goal of the ARPA-net was to experiment with ways to link university research centers and high-tech defense contractors together. The original ARPAnet linked four computers-at the University of California at Santa Barbara, UCLA, the University of Utah, and Stanford Research Institute. From there, the Internet grew slowly but steadily through the 1970s and 1980s.

One of the reasons that the ARPAnet was able to grow into the Internet as we know it today was its ability to interconnect networks even if they use different local protocols, such as Ethernet, Netware or AppleTalk. The common language that allowed networks to interconnect is TCP/IP, which stands for Transmission Control Protocol/ Internet Protocol.

TCP/IP owes its structure to the Internet's heritage as a Defense Department project. The protocol was devised to ensure that messages of any length could be sent from one computer to another even if parts of the network were inoperative-if the country were under nuclear attack, for example.

Although much of the Internet consists of dedicated phone lines owned by such traditional telecommunications companies such as Sprint and MCI-and most consumers connect to the Internet through traditional telephone calls-the technology that allows data to be sent from one computer to another on the Internet is far different from that used when a standard phone call is made.

The telephone network is a connection-oriented, circuit-switched network, while the Internet is a connectionless, packet-switched network. When you make a telephone call, the switches at the telephone company's central office set up what becomes a dedicated line between you and the person you call, for the duration of the call. While you're using the line, no one else can, and if there's a problem on the network, you lose your connection.

Too Many People

The Internet has seen unprecedented growth in the 1990s. New access devices that don't require a computer- such as the Philips Magnavox WebTV box or Sega's Net Link- will bring even more users on-board.

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TCP is a packet-switched networking protocol. It breaks each message into variable-length packets and inserts a header to indicate which message each packet is part of, where the message came from, and where it is going. IP is the addressing part of the protocol suite. It routes the packet from the sender to the recipient, making an effort to find the shortest route available. At the receiving side, TCP software collects the packets, extracts the data and puts them in the proper order. If some packets are missing, the senders are asked to retransmit them. This turns out to be a very efficient way to move files and messages, but it's not the best way to send such data as real-time audio and video- you can never be sure that the packets will arrive at their destination in the right order because they might travel via different paths.

Along the way, special computers called routers examine the packets and pass them from one node to another until they arrive at their destination. Another responsibility of routers is to decode domain-name addresses (such as popular.mechanics.com) to 32-bit IP addresses (198.80.88.36).

The 32-bit addressing scheme is one of the most tangible examples of how the Internet is bursting at the seams. At the current rate of growth, the Internet will run out of addresses in a little more than 10 years.

To be fair, no one could have envisioned the number of people who would be using the Internet today, or the varied uses that it would be put to. Remote access, file transfer, and E-mail were the main reasons the Internet was created. E-mail is still the No. 1 reason that people access the Internet. But the World Wide Web- which didn't exist until early this decade- is catching up fast because it gives point-and-click access to virtually all Internet resources.

When the Web was developed, it was seen as a tool for serious research and educational exchanges. Of course, it is still used for that. But who could have predicted how commercial it would become? In fact, the Internet, as originally conceived, forbade advertising. But now that the government is officially out of the Internet business- The backbone is run entirely by commercial interests- almost anything goes.

Along with its ease of use, another attribute that has contributed to the Web's popularity is its cross-platform compatibility. A correctly designed Web page can be accessed on a UNIX workstation, a Macintosh, or an IBM compatible PC with equal results.

With the Web so large, how do you get your page noticed? Some developers feel that one good way is to make it as splashy as possible. Bandwidth conversationalists would disagree- as would many users, after waiting several minutes to download a large graphic file when all they're looking for is some information. Even users with 33.6kbps modems can get frustrated in a hurry.

To make matters worse, a graphics-intensive page doesn't slow down information access just for the person downloading it. Remember that each Internet data transfer is split into TCP packets and sent down the pipe along with everyone else's. When that happened to Microsoft's FTP servers after Internet Explorer 3.0 was released: Many of those who were lucky enough just to connect to one of those servers had such long waits that they gave up.

Also, it is not just the site that you're accessing that will slow down. Any bits that are being routed to their eventual destination through the site will slow down too, as they wait to get routed to the next station on the Net.

Slow access isn't always the fault of external sites. Your Internet service provider (ISP) can have a dramatic effect on the speed of your access. Your ISP buys a dedicated line to a larger ISP, which might have yet another dedicated line to another provider, until the line eventually gets to one of the major Internet backbones operated by a company like MCI or Sprint. If any provider in the chain hasn't upgraded sufficiently, you're going to run into delays somewhere along the line- at least at peak periods when everyone else is trying to send or receive bits, too.

Just as amounts of commercial traffic has taxed the Internet, so have some of the new bandwidth-intensive technologies that have come into common use. Want to make a phone line call? Do it on the Internet. Want to conduct a video conference? The Internet again. Want to control an avatar and roam about virtual worlds interacting with others? Where else but on the Internet?

What's happening on the Internet is exemplified by what has happened on some corporate networks where users have installed the PointCast Channel Viewer to gain access to the PointCast Network, a news service that delivers customizable reports over the Internet, with regular updates 24 hours a day. Although the PointCast view isn't particularly bandwidth-intensive itself, it is able to bring a network to a crawl if too many people install the software.

Demand for such applications as PointCast is being fueled by inexpensive rates for unlimited Net access. Users have no incentive to reduce their bandwidth.

Consumer demand will only increase as cheaper access terminals hit the market. With the WebTV box, you don't need a computer- just a television. Even video-game players can get in on the action with devices that convert their video-game consoles into Internet-access devices.

With so many potential bottlenecks, you'll want to do everything you can to get the best performance. If you're

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currently using a 14.4kbps modem, you'll find that upgrading to a 28.8- or 33.6kbps modem will make your wait for downloads seem significantly shorter- as long as your ISP supports the faster access. A new modem technology, x2, developed by U.S. Robotics, increases the top speed of a standard modem to 56kbps- in one direction (downloading) only. It takes advantage of service providers who have their data servers connected to the digital telephone network. Leading ISP's, including America Online, Prodigy, CompuServe and Netcom, are supporting the technology, which is due to hit the market in early 1997.

An ISDN phone line- if you can get one- can speed up your access to 64- or 128kbps. That's up to four times the speed of a 28.8 modem- but it often seems faster because the all-digital nature of ISDN ensures that you'll always connect at the rated speed. Your modem won't fall back to a lower speed because of noise on the analog phone lines.

The disadvantage of ISDN is that it is still not available everywhere, and in many places it is outrageously overpriced- sometimes so high that even businesses can't justify the expense. Many ISP's don't support ISDN connections, and it is still possible that ISDN just won't ever catch on in a big way thanks to even faster technologies on the horizon.

Cable modems are vying to become the de facto high-speed access device for homeowners and business alike. With potential speeds as fast as 40Mbps- more than 1000 times that of today's fastest analog modems- it's easy to see why cable companies see Internet access as a potentially huge moneymaker for them.

Unfortunately, cable modems still have a number of obstacles to overcome before you'll be able to call up your local cable company and order up an ultrafast connection. First, cable-modem manufacturers have yet to agree on any standards for the devices. That keeps prices high for both consumers and the cable companies who are building their infrastructure.

Another reason that cable modems offer only a partial solution is that cable plants were never built for 2-way communication- they were built to deliver programming from the head end to subscribers, not to accept incoming data from individuals. Without a 2-way cable network, a standard analog modem must be used as a back channel. Although your cable-modem connection might be capable of blazing fast speeds, you might have to share that bandwidth with up to 2000 other users on your cable-television feeder line. If everybody else is trying to download large files or conduct videoconferences, you will have little bandwidth left over for yourself to use.

The phone companies aren't placing all their bets on ISDN- especially with the growing threat of competition from cable companies. That is where Asymmetric Digital Subscriber Line (ADSL) technology comes in.

ADSL can conceivably pass data at a rate of up to 9Mbps, and can do it over normal telephone lines depending on a large variety of factors, including the length of your local telephone loop.

Unfortunately, when these high-speed technologies become widely available at the consumer level, the bandwidth crunch will just get worse unless the Internet's underlying infrastructure is improved. Any improvements, however, won't come for free- service on providers who are operating on razor-thin margins have little incentive to upgrade, especially because the performance they can offer is still limited by the other hosts that they're connected to. One technology that could potentially have a dramatic impact, however, is known as Asynchronous Transfer Mode (ATM) switching.

ATM addresses the cause of the biggest backups on the Internet, the routers that direct e-mail messages, Web pages and files on their way from source to destination, one hop and one packet at a time. By contrast, ATM takes a connection-oriented approach. A message can speed through an ATM switch faster because, in effect, the entire transmission has been preaddressed with its own route.

While ATM is optimized for carrying such multimedia traffic as real-time audio and video, traditional routers are faster and more efficient at getting e-mail and files through the Net. Presumably, finding the right mix of routers and ATM switches could ease delays substantially.

One conundrum is that adding bandwidth to the network is only a temporary solution. Just as new lanes on highways attract more cars, faster Internet connections draw more users- and things slow down even worse than before.

One proposed remedy for the Internet is to create a sort of toll road on the Information Superhighway- to have users who want to make sure that their important messages get through pay an extra charge. Right now, the Internet is democratic to a fault. The junk e-mail message from a spammer gets the same treatment as an e-mail from the president. However, with RSVP, the reservation protocol, some messages can get priority service.

Currently under development is IPv6, or IP version 6. The new version changes how packets are identified, and includes bits to indicate priority.

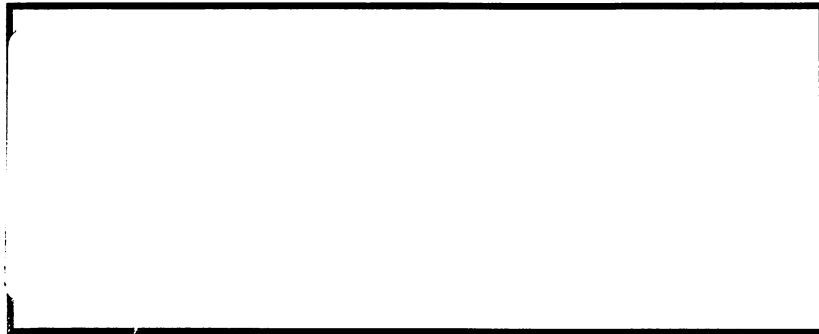
Just as many municipalities have switched to carpool lanes to boost transportation capacities, Internet developers are looking for ways to boost the efficiency and, thus, the capacity of Internet links.

IP multicasting is one technique that promises to conserve bandwidth by sending a single data stream to multiple users, rather than establishing separate point-to-point data stream for each of the users.

Although the Internet's growing pains are obvious, and the solutions aren't all easy to implement, the Internet is on its way to becoming as important as the telephone network- too important to be allowed to become a victim of its own success.



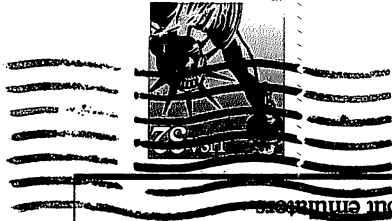
Meeting Notice: Third Wednesday of each month (except for July and August) at 7:00 PM. Our next meeting will be held on Tuesday, March 11, 1997 at the Cortland Banks, Warren branch on Elm Road, North of McDonald's and across from Sims Buick.



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How long will the Internet last? Also, learn more about emulators

In This Issue...

Upcoming Events!

**March 16 and 22,
10am-3pm:**
*Peter Trapp Computer
Show-* Tadmor Shrine
Temple, 3000 Krebs
Dr., Akron, Ohio

March 11, 7pm-9pm:
TRUMCUG meeting-
Cortland Banks, War-
ren...then traveling to
Kent State, Trumbull

March 23, 10am-3pm:
*Peter Trapp Computer
Show-* Cuyahoga
County Fairgrounds
164 Eastland Rd.,
Berea, Ohio

TRUMCUG NOTICES

Library Update!

If you have **any** programs (regardless of computer type!) for sale, trade, etc..., please contact Kristina at arx@grapevinenet.com and bring the software to the next meeting along with a brief description of it. It will be kept in the TRUMCUG Library, and a later publication of the directory will be in circulation.

Thanx! :-)

Attention All Members!

In order to better serve all members and affiliates of TRUMCUG, it becomes necessary to keep a running detailed directory of all current members and alumni. Contact Chris Shonk, President, for submission forms.

TRUMCUG Publicity

Enclosed in this mailing (page5) is a poster describing the club. It is asked that each member display this poster where all can see. We're hoping that this publicity will draw attention to the club, and hopefully, new members, too.

WRITERS NEEDED!

Have any good ideas you think could would help inform our readers? Become a writer for The Guru! No experience needed.